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# The Regional Greenhouse Gas Initiative: CO<sub>2</sub> Cap and Trade in New Hampshire

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# The Regional Greenhouse Gas Initiative

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## CO<sub>2</sub> Cap and Trade in New Hampshire



**Andrew J. Edwards**

**August 26, 2009**

**Professor Kent J. Rissmiller**

### **INTERACTIVE QUALIFYING PROJECT REPORT**

*Submitted to the faculty of Worcester Polytechnic Institute  
in partial fulfillment of the Degree of Bachelor of Science*

*In cooperation with the Science, Technology & Energy Committee  
of the New Hampshire House of Representatives*

## **Abstract**

Our greatest challenge in confronting climate change will be the transition away from fossil fuel combustion as our primary source of electricity. The market-based policy of cap and trade is a preferable solution to this problem that forces electric generators to compete for the right to emit CO<sub>2</sub> while minimizing damage to the economy. This policy is studied from the perspective of a state legislator deciding whether to adopt it, and evaluated in the context of a proposed federal policy.

## **Acknowledgements**

This project would not have been completed without the persistent support and guidance of Professor Kent Rissmiller. I could not have hoped to find an advisor more enthusiasm, expertise, and fluency in the subject matter. He turned my legislative experience into an academic success and for that he is owed a great deal of thanks.

This project also would not have been conceived without the dedication of my colleagues who worked tirelessly on HB 1434. I would like to specifically thank Representative Naida Kaen, my former chair on the Science, Technology & Energy committee, and Representative Tom Fargo, my former seatmate. In the course of this project, I learned a great deal from both of them about what it means to be a public servant.

## Executive Summary

Anthropogenic climate change will alter the course of human development in the next few decades. Preventing climate change requires that we undergo a cultural and technological revolution, and that continued prosperity be no longer dependent on fossil fuel combustion. The market-based approach of cap and trade promises concrete emissions reductions at the lowest cost possible, using economic incentives to change both consumer and producer behavior. With the Regional Greenhouse Gas Initiative, New Hampshire is using this policy to target the greatest source of CO<sub>2</sub> emissions: the electric industry.

### Background

New Hampshire's electric industry is dominated by Public Service of New Hampshire, which serves 70% of all utility customers. Deregulation of the industry in the 1990's forced regulated utilities to divest of generation facilities and instead purchase electricity from merchant generators on the regional market. PSNH was excluded from this and still generates about half of the electricity it supplies — 85% of which comes from coal. The deregulated market provided new natural gas facilities to supply future electric demand, which is growing almost twice as fast as the state's population. Though natural gas generates 2–3 times less CO<sub>2</sub>, state customers will remain dependent on coal as long as it produces the cheapest electricity.

New Hampshire led government efforts to reduce CO<sub>2</sub> emissions by adopting one of the most comprehensive clean power strategies in the nation. It formulated an agreement with neighboring states in 2001 to increase efficiency in electric consumption, decrease CO<sub>2</sub>-dependence in electric production, and create a regional emissions trading program. It enacted the first mandatory CO<sub>2</sub> cap in the U.S. in 2002, forcing PSNH to reduce its emissions to 1990 levels by 2006. New Hampshire has since created widely-successful energy efficiency programs for utility customers, and a requirement for utilities to get an increasing share of their electricity from renewable generation.

Cap and trade is the logical next step for reducing power plant emissions in the long-term. Environmentalists prefer it to a carbon tax because it sets a binding emissions cap over the entire industry. Politicians prefer it to a carbon tax because it uses tradable CO<sub>2</sub> permits to establish a price for emissions rather than having the government set one directly. It is also more politically viable because it regulates electricity producers, but not consumers. The policy achieved an efficient reduction of SO<sub>2</sub> and NO<sub>x</sub> emissions during the 1990's, and government regulators believe it will have similar success with CO<sub>2</sub>.

### Methods

The project was conducted primarily in the role of participant-observer, followed by more traditional methods of research and analysis. It took on an added dimension of civic responsibility through actual participation in legislating the proposed cap and trade program. It also substituted policy recommendation with policymaking, which could have sacrificed academic objectivity for political efficacy. The legislative role was maximized for data collection to negate such an effect. This first-hand experience then supplemented secondary research methods of literature review and modeling for the purpose of interpreting and evaluating the legislative result.

## Results

The Regional Greenhouse Gas Initiative became the first CO<sub>2</sub> cap and trade system in the U.S. It began as a 2003 agreement between governors from the states of CT, DE, MA, MD, ME, NH, NJ, NY, RI and VT. It then took on the form of a Staff Working Group consisting of government regulators and experts who worked for two years to collect data, analyze state policies, and develop a model cap and trade policy. That policy framework was then formalized by the governors in a 2005 Memorandum of Understanding and a 2006 Model Rule. This gave New Hampshire until 2009 to implement a cap and trade program that does the following:

- Cap electric industry emissions at 8.6 million tons per year
- Reduce cap by 10% from 2015 to 2018
- Mandate cap compliance from fossil fuel plants 25 MW and above
- Issue tradable emission allowances for every ton of CO<sub>2</sub> under the cap
- Auction at least 25% of emissions allowances
- Grant bonus allowances for early reductions made from 2006 to 2008
- Accept CO<sub>2</sub> offsets in lieu of allowances for up to 3.3% of compliance
- Expand the use of offsets under Price Trigger Events

The House Science, Technology & Energy committee drafted HB 1434 in 2008 with the intent of enacting the prescribed program. It gathered overwhelming public support for the legislation in an initial hearing lasting two full days. It solicited advice from government regulators, climate scientists, economists, environmental activists and businesses in legislative deliberation. It increased the legislation's technical and political effectiveness through a two-week amending process. The committee made the legislation a custom fit for New Hampshire, deciding the following details of the program left unspecified in the multistate agreement:

- Regional auction to distribute allowances
- 100% of allowance revenue used for consumer energy efficiency programs
- Consumer rebate for allowance costs exceeding a certain price threshold
- 12 million bonus allowances to PSNH for converting a 150 MW oil-fired unit to biomass

The cap and trade program prevailed in the state legislature with supermajority support and was enacted in June 2008. It received a positive recommendation from the Science, Technology & Energy committee in a 12-2 vote. It passed the House of Representatives in a bipartisan vote of 214-107. It withstood challenges from industry lobbyists in the Senate Energy & Environment and Finance committees, with only minor changes to the price thresholds. It passed the Senate in a bipartisan vote of 16-8 and was promptly signed by the Governor in a highly-publicized ceremony.

The policymaking process succeeded due to strong direction from the executive branch. It originated in the Governor's office, which had cultivated a supportive policy environment over the course of a decade. It was appropriately overseen by regulatory officials who were centrally involved in planning the Regional Greenhouse Gas Initiative. These officials asserted a significant degree of influence in the legislative process to preserve the core of the program while helping it overcome political obstacles. The process guaranteed a definite policy result by minimizing opportunities for disagreement or error.

Cap and trade affects a new energy-emissions dynamic in the state. It effectively freezes fossil fuel generation at current levels, forcing future growth in electric production to come from renewable energy. It creates a new long-term cost equation for power producers by turning CO<sub>2</sub> emissions into a scarce commodity that must now factor into financial planning. It also starts to bend the electric demand curve by realizing economies of scale for existing energy efficiency programs. These consumer-based programs supplement the cost of cap and trade to producers, allowing them greater flexibility in reducing emissions.

New Hampshire's adoption of cap and trade also paves the way for a much-needed federal program. It builds momentum behind U.S. support for an international cap and trade agreement that has been 12 years in the making. It also builds confidence and support in an electric industry that is adverse to change due to its concern for long-term stability and economic certainty. It presents a successful model for cap and trade that would function more effectively at the national level. Congress is considering such a move under H.R. 2454, which would absorb the regional cap and trade system and implement a comprehensive strategy for reducing greenhouse gas emissions similar to New Hampshire's.

## **Conclusion**

There is broad consensus over the reality of climate change — what we need now is action. Cap and trade is a timely approach to reducing greenhouse gas emissions that is popular and easy to implement, making it a comfortable transition for the public. The complicated problem of stopping global warming in the face of rising electric consumption might seem to demand an unprecedented level of government intervention. By acting quickly to adopt cap and trade we can achieve a more efficient environmental outcome through the power of the market, generating a technological revolution and continued prosperity for generations to come.

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# 1 Introduction

From December of 2007 to November of 2008, I had the pleasure of serving the city of Nashua as a state representative in the New Hampshire legislature. During that time I worked on issues that were of personal importance to me, such as genocide and criminal justice, and issues that were of concern to my constituents and the state as a whole, such as civil rights and education. These were issues I sought active involvement in, either by submitting legislation or speaking about them publicly. However, the most important work I did as a legislator was to help decide the fate of a bill that had come before my committee. I consider myself privileged to have been involved at all with this legislation because it did not just affect me, my family, or my constituents, but people everywhere on Earth.

Global warming is the single greatest threat to civilization that we currently face, or ever have faced, and House Bill 1434 was New Hampshire's attempt to stop it. Though anthropogenic climate change is a relatively new problem, it promises to forever alter the course of human development in the course of a few decades. Acknowledging the truth that greenhouse gas emissions are bringing about this change is not enough. The consequences of ignoring it could be virtually unlimited, and would force us to adapt under the harshest of conditions. To avert climate change is to respond to an invisible problem — carbon dioxide emissions — requiring sacrifices which we cannot immediately justify. It will be a test of human nature, but something we are completely capable of accomplishing.

Our society has achieved a rapid pace of development with fossil fuel combustion at the center. Judging by the growth in other technologies in just the past 100 years, our continued use of fossil fuels is not necessary but simply convenient. It is inevitable that we outgrow this source of energy, for other reasons besides climate change, and we already have new alternatives to choose from. The hardest part of switching away from a carbon-based economy is transforming the electric generation sector, which has been the most resistant to change over the years. Neither the government nor the market alone can accomplish this result at the speed or cost that we need, but working together, they can efficiently create a new energy economy and ensure continued prosperity.

Cap and trade has emerged as the favored mechanism of weaning us off cheap fossil fuel-generated electricity. It works to reduce carbon dioxide emissions to slow the rate of global

warming while also creating a market incentive for power generators to transition towards cleaner methods of producing electricity. As a market-based policy, cap and trade is more acceptable to the public than direct government regulation. This kind of program requires more work on the part of the government to implement and oversee, but it also allows the government to guarantee an absolute reduction in CO<sub>2</sub> emissions at the lowest cost possible. Most importantly, cap and trade is not foreign to power generators and has demonstrated success with previous applications in the electric industry.

While New Hampshire implements cap and trade with neighboring states in the Northeast, the country as a whole decides how it will address climate change. The evolution of the policy contained in HB 1434 must be looked at in this broader context, as it provides a model that the federal government might choose to adopt. Creating program this complex is no small feat politically, and in the current economic climate the public needs added assurance that it will not suffer further as a result of it. If and when federal cap and trade becomes a reality it will supersede the state's program, but that should not be seen to minimize this initial effort. Instead, the current direction of federal policy can be traced back to our experience, so this story of cap and trade in New Hampshire can give us a sense of how it will fare at the national level.

## **2 Background**

In recent years the American public has come to recognize the reality of global warming – an effect of human development that threatens to drastically alter life on this planet. The central role of carbon dioxide in both the acceleration of this phenomenon and our energy production presents a complex problem that public policy must address. New Hampshire has assumed the lead in moving to reduce CO<sub>2</sub> emissions at a time when the federal government was unable to provide policy direction. The larger trend towards cap and trade programs as a way to reduce emissions without inhibiting economic growth led the state to consider being one of the first to institute such a program in the United States.

### **2.1 NH Electric Power Industry**

Generation of electricity accounts for a major share of CO<sub>2</sub> released into the atmosphere which has made the electric sector a prime target for emission reductions. Power plants are the largest stationary sources of CO<sub>2</sub> emissions and are heavily reliant on fossil fuels, coal in particular. At the same time electric utilities provide a basic service that society has grown increasingly dependent upon. As a result the industry is allowed to be more vertically integrated than most and subject to a greater degree of government regulation. While it is possible to institute emissions controls more directly in such an environment the economic impact is equally direct, making it a politically sensitive issue.

#### **2.1.1 Electric Demand**

New Hampshire is the fastest growing state in New England and had an estimated population of over 1.3 million in 2006 (United States Census Bureau, 2007). Residential electric consumption grew more than twice as fast as the population did between 1995 and 2006 (United States Energy Information Administration [EIA], 2007). Consumption increased the greatest in the commercial sector while it decreased in the industrial sector due to the decline of manufacturing in the state. The resulting share of electric consumption by sector was roughly 40% residential, 40% commercial, and 20% industrial, consistent with the overall breakdown in New England. During this period electric rates increased by an average of 1.6% each year. Although the price of electricity was highest for residential customers the greatest increase in

electric rates during this period was seen by commercial and industrial (C&I) customers. Table 2-1 summarizes the overall increases in state population, consumption and rates during this eleven-year period:

**Table 2-1: Change in Population, Electric Consumption, Electric Rates from 1995 to 2006**

	<b>1995</b>	<b>2006</b>	<b>Percentage Change</b>
<b>Population</b>	1,157,561	1,35,828	13.6
<b>Electric Demand (megawatthours)</b>	9,007,000	11,094,000	23.1
<b>Electric Rate (cents/kWh)</b>	11.72	13.84	18.0

**Source: ISO New England Inc. [ISO-NE], 2007**

New Hampshire has seen the highest growth in electric demand of all the states in New England. Annual electric demand grew by 2% between 1995 and 2006 and was projected to continue growing at 1.6% each year between 2007 and 2016. Peak demand in the summer grew twice as fast during this period and reached an all-time high in August 2006. It was projected to continue growing at 2.3% each year between 2007 and 2016. The ratio of annual hourly demand to peak hourly demand has steadily declined in NH and the region and is projected to continue falling due to increasing summer temperatures and use of air conditioning.

An increase in peak demand will require the installation of additional generating capacity in the region even if average demand remains relatively stable. The Northeast Power Coordinating Council, responsible for ensuring the reliability of the regional electric grid, sets an Installed Capacity Requirement (ICR) in excess of projected peak demand. There is currently 33,199 MW of installed capacity in the region which is enough to meet the projected peak demand of 27,885 MW for 2008 (ISO-NE, 2007). In order to meet the ICR based on the 2016 projection there would need to be 3,550 MW of additional capacity installed.

### **2.1.2 Electric Generation**

There are four electric utilities distributing power in separate service territories of the state. They are subject to regulation by the NH Public Utilities Commission (PUC). The PUC approves rate schedules and rates of return for the companies based on their costs and revenues from providing service. The largest utility is Public Service Company of New Hampshire (PSNH) which serves 70% of the state. Unitil and the NH Electric Cooperative each serve 12% and Granite State Energy (owned by National Grid) serves 6%.

The electric industry underwent restructuring between 1996 and 2003 after the NH legislature decided to separate electric transmission and distribution from electric generation contemporaneously with other states in the region. The intent was to create a competitive market for electric generation while continuing to regulate power delivery. The state made an exception to this policy by allowing Public Service Company of New Hampshire (PSNH) to retain some of its own generation assets to meet customer demand. The majority of electric demand in the state is supplied by merchant generators in NH and in the region. This electricity is purchased on the regional market administered by ISO New England (ISO-NE).

Installed generating capacity in NH is more than enough to meet the electric demand of NH customers so the state is a net exporter of electricity. In 2006 a total of 22 million MWh of electricity was produced which is twice the amount the state consumed that year. Approximately 4.5 million of this was generated by PSNH and sold directly back to customers. The remaining 17.5 million was generated mostly by merchant plants and sold on the regional market. The Seabrook Station nuclear facility generated 9.4 million of this and rest was generated mostly by Granite Ridge, Newington Energy, and TransCanada (EIA, 2007).

A substantial portion of electric generation in NH comes from fossil fuels. The three predominant fuels used are coal, oil, and natural gas. As an abundant resource in the United States coal has historically been the predominant fuel source in electric generation. Through 2006 the use of coal in NH has increased slightly while the use of oil has decreased. In that year the cost of generating electricity from coal was \$2.56 per million Btu while the cost of using oil was more than three times that (EIA, 2007; see Appendix A). While the increasing price of oil has caused a similar volatility in natural gas prices, this has not led to a significant decline in usage of natural gas in the state. Natural gas-fired generation was introduced primarily to meet growing peak demand in 2001 and 2002, prior to the spike in fuel prices, and secondarily because natural gas produces lower emissions than coal and oil (United States Environmental Protection Agency [EPA], 1997). Table 2 lists the five major coal, oil, and natural gas plants in the state by ownership, fuel type and capacity rating:

**Table 2-2: Major Fossil Fuel-Fired Generation in New Hampshire**

<b>Plant</b>	<b>Owner</b>	<b>Fuel</b>	<b>Capacity (megawatts)</b>
Merrimack Station	PSNH	Coal	434
Schiller Station	PSNH	Coal	119
Newington Station	PSNH	Oil	406
Granite Ridge	Granite Ridge Energy LLC	Natural Gas	720
Newington Power Facility	Newington Energy LLC	Natural Gas	525

**Source: New Hampshire Department of Environmental Services [DES], 2001b**

Coal helps PSNH provide regular service to electric customers at low cost but is also the most carbon-intensive fuel source in the state. In 2006 about 85% of PSNH’s self-supplied electricity was generated by the two coal plants and it is estimated that they produced more than half of all sector-wide emissions in that year. Meanwhile the two natural gas plants generated 50% more electricity than the coal plants did and it is estimated that they produced one third of all sector-wide emissions. Granite Ridge and Newington Energy sell their electricity on the regional market mostly during times of peak demand. While the electricity from these gas turbine units is more expensive due to higher fuel costs their fast start-up time provides reliability to the system during demand spikes.

The electric sector is now the largest source of emissions in NH. Electric generators emitted 7.7 million tons of CO<sub>2</sub> in 2005 which is 36% of emissions statewide (EPA 2007). This contrasts with the Industrial and Transportation sectors in the state, which have reduced emissions in recent years. Figure 1 compares the emissions data by sector from 1995, 2000, and 2005:

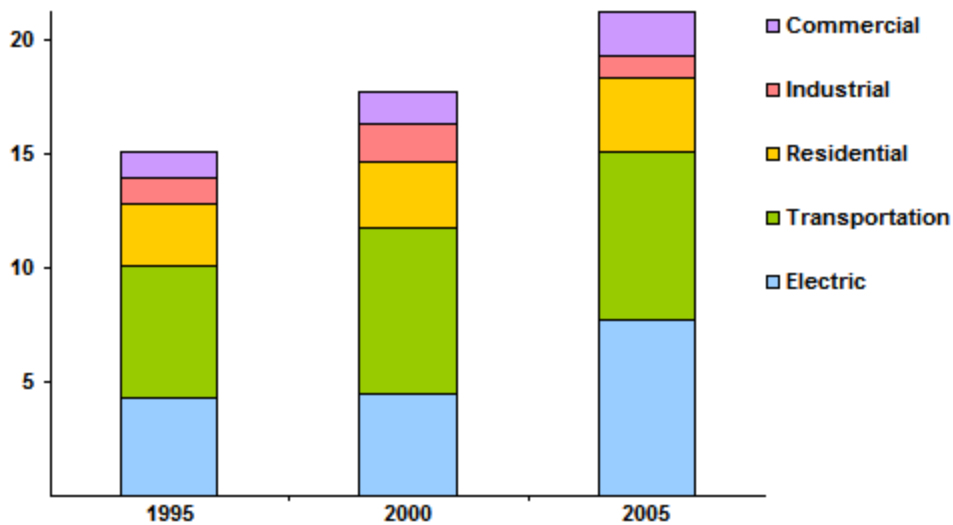


Figure 2-1: Emissions from Fossil Fuel Combustion in New Hampshire (million tons CO<sub>2</sub>)

## 2.2 State Policy Environment

The state government has set public policy in the direction of reducing greenhouse gas emissions (GHG). In advance of a planned move to regulate CO<sub>2</sub> emissions NH has enacted programs to track emissions, reduce electric demand, and stimulate alternative energy production. Consistent political leadership has been responsible for much of the progress in the past decade and now with a recent increase in public interest it is anticipated that the policy will be implemented in full.

### 2.2.1 Reducing Greenhouse Gas Emissions

In July 1999 the state created a voluntary NH Greenhouse Gas Registry which led to the creation of similar programs in other states and discussions about creating such a program regionally between states. The intent of the registry was to allow companies to inventory their CO<sub>2</sub> emissions and register early emission reductions to establish a baseline for any future federal GHG reduction program to come at the federal level. The idea came after observing in the Federal Acid Rain Program (SO<sub>2</sub>) how some companies that had not controlled their pollution prior to the start of the program began with an advantage over companies that had made early reductions (DES, 1998). The creation of the registry also coincided with discussions about interstate GHG trading agreements.



Following the successful implementation of the SO<sub>2</sub> program and a regional NO<sub>x</sub> trading program, Governor Jeanne Shaheen directed the New Hampshire Department of Environmental Services (DES) to develop a strategy for further reducing air pollutants. The department then released the NH Clean Power Strategy (CPS) in January 2001, which issued reduction targets in excess of federal and regional SO<sub>2</sub> and NO<sub>x</sub> requirements, as well a new goal of reducing mercury and CO<sub>2</sub> emissions (DES, 2001). Although Massachusetts and Connecticut had already made similar plans the CPS became the most comprehensive environmental policy in the country at the time. The strategy called for a cap on CO<sub>2</sub> emissions at 7% below 1990 levels, which would be reached through an allowance trading system. The NHCPS applied only to electric generation facilities of at least 25 MW, and specifically targeted the three fossil fuel-fired plants owned by PSNH. It exempted the two large natural gas facilities which were not yet online, stating that they would already be subject to more stringent environmental regulations than the grandfathered PSNH plants, also adding natural gas is “inherently a much cleaner fuel.” In the NHCPS it is evident that DES made two presumptions in favoring natural gas which were not borne out: 1) PSNH would comply with restructuring by selling its coal and oil-fired plants to private investors, and 2) the new, cleaner natural gas facilities would then cut out much of this coal and oil-based generation in a deregulated market. HB 284 was concurrently introduced in the 2001 session to implement the NHCPS but was retained in committee for further study.

In August of that year the Conference of New England Governors and Eastern Canadian Premiers (NEG/ECP) set forth an aggressive approach to GHG reductions with its Climate Change Action Plan (CCAP). The plan proposed that the states and provinces agree to coordinate their policies regionally in order to meet GHG emissions reduction goals. The regional goals are listed below:

**Short-term Goal:** Reduce regional GHG emissions to 1990 emissions by 2010.

**Mid-term Goal:** Reduce regional GHG emissions by at least 10% below 1990 emissions by 2020, and establish an iterative five-year process, commencing in 2005, to adjust the goals if necessary and set future emissions reduction goals.

**Long-term Goal:** Reduce regional GHG emissions sufficiently to eliminate any dangerous threat to the climate; current science suggests this will require reductions of 75–85% below current levels (NEG/ECP, 2001).

More importantly the plan established nine Action Items for the participants to work on in order to meet these goals. Action Items 5, 6, and 9 set individual goals that paralleled those in the NHCPS. Item 5 called for a 20% reduction by 2025 in the level of CO<sub>2</sub> emitted per MWh generated. Item 6 called for a 20% increase by 2025 in the amount of electricity saved through conservation programs. Item 9 called for the creation of regional emissions banking and trading standards so as to build experience in the region with trading mechanisms and to encourage early reductions. Recommendations for creating such a system were to be presented to the states at the NEG/ECP conference following the plan's adoption.

It was around this time that the DES commissioner of twelve years, Robert Varney, left the department after being picked by President Bush to head the EPA's Northeast region. A few months later a follow-up report was released by DES listing recommendations for meeting the new NEG/ECP goals (DES, 2001a). While renewing calls for the legislature to implement the NHCPS in the upcoming 2002 session, the DES report did not contain any significant policy developments and was largely perfunctory.

It is assumed that during this time DES was more concerned with securing the passage of retained HB 284. Officials from DES, PUC, and the Governor's office, along with legislators and representatives of the environmental community, were in negotiations with PSNH over the contents of the bill and successfully reached an agreement on November 2, 2001 (DES, 2001c). The agreed upon amendments were made to the bill in committee and it was then passed on the House floor in the beginning of the 2002 legislative session. HB 284 was passed by the Senate later that spring and signed into law by Gov. Shaheen on May 9, 2002, upon which it became known as the Clean Power Act.

The program created by the Clean Power Act (CPA) contained all the main components described by the NHCPS, with only one substantial change. DES was still responsible for implementing the integrated multi-pollutant strategy, which included administering the emissions allowances to be banked, traded, or used for annual compliance. The CO<sub>2</sub> emissions cap was not as aggressive as what DES had wanted. Its proposal was to use 5,425,866 tons, PSNH's emissions from 1990, as a baseline and beginning in 2006 to enforce a cap 7% below that, which would be 5,046,055 tons. The CPA cap instead begins at 1990 levels in 2006, with a future cap for 2010 and beyond to be decided by the legislature no later than 2005 (State of New Hampshire

Revised Statutes Annotated [NH RSA]. 125-O:3, 2002). DES put a positive spin on this by pointing out that the CPA cap would bring the state in line with reduction goals from the NEG/ECP CCAP.

As a result of the agreement with PSNH, there were additional provisions included in the CPA. A new section was created for an Energy Efficiency, Renewable Energy, and Conservation and Load Management Incentive (NH RSA 125-O:5, 2002). It provided that conservation and load management programs would be promoted as part of the strategy, and that PSNH could use funds normally designated for electric customers leftover from the System Benefits Charge (discussed in the next section) on internal energy efficiency projects.<sup>1</sup> The most important provision in this section grants PSNH extra emissions allowances equivalent to the cost of any voluntary investments it makes in energy efficiency, conservation and load management, or renewable energy projects. Depending on market prices, this created the potential for PSNH to accumulate more emissions allowances than it could use. These “bonus” allowances would essentially finance projects that reduce emissions for PSNH, assuming that in the future they could be sold on emissions trading markets or even offset the purchase of new allowances through a cap and trade program.

## **2.2.2 Reducing Energy Usage and Reliance on Fossil Fuels**

In the past decade, the state also created new programs to reduce the demand for fossil fuel-fired electric generation as it developed a comprehensive approach to reducing CO<sub>2</sub> emissions. Consumer-based energy-efficiency programs have seen major success. The state joined a regional effort to increase the use of alternative energy by electric utilities. There are also new incentives to increase renewable generation by electric customers.

The PUC oversees the CORE Energy Efficiency Programs which were created in 2002. There are eight individual programs available to residential customers and commercial and industrial (C&I) customers, operated by the electric utilities and funded through the Systems Benefits Charge (SBC) assessed on monthly electric bills. The ENERGY STAR® Homes Program provides incentives for customers and builders to construct or renovate homes with

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<sup>1</sup> Prior to the agreement PSNH had been pursuing additional SBC funds through a filing at the PUC. For more, see Public Utilities Commission, *Docket No. DE 01-169* (September 20, 2001)

20% more efficiency than building energy codes.<sup>2</sup> Rebate programs for ENERGY STAR® appliances and lighting purchased are also available to residential customers. The Home Energy Solutions Program subsidizes part of the cost of insulation, weatherization and other energy efficiency upgrades up to \$4,000 for existing homes and the Low Income Home Energy Assistance Program (LIHEAP) subsidizes the entire cost of these upgrades to needier customers through a combination of state and federal funding. C&I customers larger than 100 kW are eligible for rebates through the New Equipment and Construction Program and the Large C&I Retrofit Program, and smaller customers are eligible for a 50% rebate on lighting, heating, and refrigeration upgrades through the Small Business Energy Solution Program. Greater energy savings have been realized through C&I programs overall, however the ENERGY STAR® Lighting program has also provided a comparable benefit per dollars spent. In the first five years the CORE programs have served over 275,000 customers in the state and will result in a lifetime savings of 4.3 billion kWh or \$608 million (New Hampshire Public Utilities Commission [PUC], 2007).

The state legislature recently passed two pieces of legislation encouraging the increased use of small-scale renewable generation to offset the electric load for utilities. HB 447 was enacted in 2007, doubling the limit on net-metering – renewable energy generated by customers and sold back into the electric grid – to 1% of statewide load. The bill also increased the limit on applicable generation from 25 kW to 100 kW. HB 1628, enacted in 2008, provides residents with up to \$6,000 in rebates for the installation of distributed solar and wind energy systems through a Renewable Energy Generation Incentive Program. The money for this program comes from the state’s new Renewable Portfolio Standard (RPS) and is distributed on a first-come, first-served basis.

The RPS was created in 2007 with the passage of HB 873. It established basic levels for different classes of renewable energy which must be reflected in each electric utility’s portfolio. It was designed with the goal of achieving 25% renewable energy in the state by 2025, following a commitment signed by Gov. Lynch in 2006. Renewable Energy Credits (RECs) are issued to utilities for the purchase of blocks of electricity from renewable sources and must be used to meet the standard each year, otherwise that utility must make Alternative Compliance Payments (ACP) to the state. The program functions similar to Cap and Trade as the standard increases

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<sup>2</sup> The current standard is the 2006 International Energy Conservation Code.

incrementally over time and the RECs can be traded between utilities and with other states in the region that have implemented an RPS.

## **2.3 Cap and Trade**

The government now faces the challenge of addressing the greenhouse gas problem directly. In deciding the most effective way to achieve CO<sub>2</sub> emissions reductions, it is important to consider the economics of carbon pollution. Would it be better to regulate emissions by imposing a tax on them, or would a market-based mechanism work better? There is already a precedent of cap and trade achieving these kinds of reductions using the power of the market. If the state is to implement a cap and trade policy it is important to look how it has functioned in the past and what can be expected from it under similar and dissimilar conditions.

### **2.3.1 Policy Options**

Consensus has formed around the idea that CO<sub>2</sub> emissions must be reduced through an incentives-based policy instead of placing strict controls on them through government regulation. An incentive requires that there be an observable cost for emitting CO<sub>2</sub> into the atmosphere. Thus, there are two basic variables that will determine how it functions and how it will be implemented.

A carbon tax would make cost an independent variable. Emissions continue to vary based on a host of factors but ultimately reduce over time given the economic pressure. The government can adjust the tax to balance the immediate needs of the economy with the goal of slowing climate change. This also provides economic certainty, encouraging many of the capital-intensive projects needed to reduce emissions. The revenue generated from such a tax can be used to either directly fund reduction programs or offset the related costs to consumers. Implementing this policy requires assessing the consumption of fossil fuels, similar to the way gasoline is taxed.

Cap and trade does the reverse, making total emissions the independent variable. This is done by quantizing CO<sub>2</sub> emissions, creating a tradable allowance that can be bought and sold within an absolute cap. The market for emissions allowances then provides much of the economic pressure to encourage reductions. While this involves more economic uncertainty, it makes it advantageous for emitters to make reductions faster than other competitors in the

market. Allowing emission allowances to be banked and traded makes them a financial instrument likely to appreciate as they become scarcer. This occurs as the government lowers the cap to meet its emissions reduction goal over time. An initial auction of allowances allows the government to fund programs to encourage reductions or provide a rebate for consumers to lessen the economic impact. Implementation of this policy requires a regulatory body to monitor CO<sub>2</sub> emissions and administer allowances.

The carbon tax has been widely favored by economists, liberal and conservative alike (Wall Street Journal, 2007).<sup>3</sup> A number of studies done through public and private institutions have determined that the carbon tax is the most economically efficient method of reducing emissions. They all cite clear market signals due to its simple and direct nature as reasons for this (Green, Hayward & Hassett, 2007; Metcalf, 2007; Shapiro, 2007). Some of this support for the carbon tax comes in response to perceived weaknesses with cap and trade in Europe, particularly the lack of an auction and opportunities to game the system. For similar reasons, many have described the weakness of a tax policy as its novelty and political inexpedience.

The public debate over the issue has ruled in favor of cap and trade over a carbon tax, although they are not exclusive. Popular perception has largely been shaped by the inherent political branding of the two policies. The general antipathy toward new taxes and apathy about market-based solutions plays a role in this. Conservative support for the carbon tax confuses the issue further. Progressive environmental organizations and politicians have therefore stuck to cap and trade as the policy with a successful chance of passage. A cap and trade program does not preclude a carbon tax from also being used in the future and for the interim can imitate some of the effects of a tax.

Certain controls can be designed into a cap and trade systems to protect against volatility and provide greater economic certainty (United States Congressional Budget Office, 2008). Placing upper and lower limits on allowance prices reduces hazardous costs to consumers while maintaining an active market. Allowing alternative methods of compliance eases concerns of a price emergency. Though the cap itself can also be periodically adjusted to reflect these kinds of concerns, time is still one variable that does not easily translate to this policy. It is in fact because of this that cap and trade is – and has been – seen to guarantee absolute results.

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<sup>3</sup> Prominent supporters range across the spectrum, with such notables as Paul Volcker, Alan Greenspan, Robert Reich, Lawrence Summers, Joseph Stiglitz, Edwards Snyder, Herman Daley, Jeffrey Sachs, and Gregory Mankiw.

### **2.3.2 Case Study of NO<sub>x</sub> Budget Program**

It is instructive to explore an existing implementation of the cap and trade model in the United States. The Ozone Transport Commission (OTC) was the first multistate effort to develop a cap and trade system for controlling air pollutants. The OTC NO<sub>x</sub> Budget Program (NBP) achieved NO<sub>x</sub> emissions reductions through regional cooperation, while important decisions for its implementation were left to individual states. There are certain technological, economic, and political conditions and variables which might explain the successful design and execution of the NBP. Understanding the successes of this policy and policymaking process is essential because, as was seen in the case of the NBP, a regional cap and trade program will have necessary implications for future, expanded policy.

The NBP resulted from the 1990 amendments to the Clean Air Act, limiting the emission of air pollutants which contribute to acid rain. In addition to a federally administered SO<sub>2</sub> permitting program, the legislation also established the Ozone Transport Commission (OTC) for the purpose of reducing NO<sub>x</sub> emissions (Clean Air Act Amendments of 1990). The commission brought together representatives from nine northeastern and mid-Atlantic states – Connecticut, Delaware, Massachusetts, Maryland, New Hampshire, New Jersey, New York, Pennsylvania, and Rhode Island – and the District of Columbia. NH joined the other states in signing a Memorandum of Understanding in 1994, seeking to design a cap and trade system. A model rule for such a system, developed by the OTC with technical assistance from the EPA, was finalized in 1996. The NBP went into effect in 1999 upon implementation of the model rule by the states. The regional cap lasted through 2002 and was set at 219,000 tons of NO<sub>x</sub> annually. NH agreed to a statewide cap of 14,589 tons (DES, 2003).

The program applied to sources in the electric utility industry of 15 MW or greater and comparably sized industrial sources. The states decided individually how to allocate allowances among affected sources in their state. The EPA enforced compliance and oversaw most of the accounting for the program, including tracking of allowances. The program included allowance banking but also featured a “flow control” mechanism, causing unused allowances to depreciate in successive years. There was no revenue associated with the program as it did not provide for an allowance auction. The market for allowances was active despite this and bolstered reductions, yielding 25% in just the first year the program was operational (Farrell, 2000).

Overall the NBP reduced NO<sub>x</sub> emissions by 60% below 1990 levels. The related cost increase for wholesale electricity prices was less than half a percent, having a negligible impact on growth. This did not result in an increased demand for imported electricity from outside the OTC region (referred to as “leakage”), despite the prevalence of restructuring in electric generation. Instead generation in the region continued to grow during this period, with the ratio of emissions to power generated decreasing significantly. This demonstrates cap and trade’s capability to achieve emissions reductions without impeding development (Auslisi, Pershing, Farrell & VanDeveer, 2005).

It is important to note that the issue of controlling NO<sub>x</sub> emissions is significantly different from CO<sub>2</sub> in two ways. Increased concentration of nitric acid in the atmosphere, contributing to acid rain, is a relatively localized problem compared to global warming. Acid rain also poses an immediate danger to public health, unlike the gradual effects of climate change, and makes a compelling case for regulatory prerogative. Despite these differences, a useful analogy can still be made. “Upwind” industrial centers in the Mid-West and Ohio River Valley were responsible for most of the acid rain that occurred “downwind” in the Northeastern states. Because the effects of NO<sub>x</sub> emissions were removed from the source, similar obstacles to regulation that existed then have been seen recently with respect to CO<sub>2</sub> emissions. The real success of the NBP was not just in producing emissions reductions between 1999 and 2002, but also in convincing a large swath of the country west of the OTC region to control NO<sub>x</sub> emissions after that (Auslisi et al., 2005).

The particular success this cap and trade program depended on broad participation and agreement to an effective regulating scheme. Though the OTC tested a fairly unorthodox model for environmental policymaking, the policy output of this multilateral process was similar to that of other cap and trade programs. With a few exceptions, engagement in the stakeholder process and the competitive nature of the program itself provided the impetus needed for affected sources in the participating states to assent to the new regulations (McLean, 2005). This came with the realization that companies would benefit more if their competitors were held to the same standard. Viewed in the proper context then, this inclusive mechanism was needed to solve the real problem: getting “upwind” polluters outside the OTC region to agree to NO<sub>x</sub> emission controls.



This was accomplished when the regional NBP developed into federal cap and trade system administered by the EPA. The NO<sub>x</sub> State Implementation Plan (SIP) Call began in 2003 by assimilating the successful NBP and came to include 22 states by 2007. This renewed the emissions cap and extended it westward to states that contributed significantly to NO<sub>x</sub> levels in downwind states. It also included rules to allow for the conversion of banked NBP allowances during the first two years of the new trading program. As of 2006 the EPA claimed emissions reductions of 60% below 2000 levels in states governed by the NO<sub>x</sub> SIP Call (Napolitano, Stevens, Schreifels & Culligan, 2007).

The example that the NBP set as a successful implementation of the cap and trade model was critical for achieving that broader participation. Its performance over the four years it was in operation had a substantial influence on confidence in the NO<sub>x</sub> SIP Call, leaving the OTC states in a strong position as this later program commenced. Valuable lessons can be drawn from this experience about how to achieve a functioning trading market and, more importantly, substantial reductions in power plant emissions. Looking to the future of CO<sub>2</sub> cap and trade, it is especially important to consider how the economic efficiency realized in the NBP was dependent on the availability of control technologies.

Front-end retrofits allowed power generators to make early reductions in the 1990's at relatively low cost. While NO<sub>x</sub> is a byproduct of fossil fuel combustion, it can be minimized by lowering the combustion temperature and improving thermal efficiency. Two-stage combustion using overfire air allows for NO<sub>x</sub> reductions between 50-70% in boilers and furnaces. Low-NO<sub>x</sub> burner technologies also exist for cyclone turbines. The FLOX combustion process achieves reductions by lowering peak flame temperature. Water injection systems for cyclone boilers lower the peak combustion temperature, reduce heat loss to the combustion chamber, and improve compression by increasing the fuel-to-air ratio. Therefore, these solutions had the added benefit of increasing efficiency, making them even more cost effective (IEA Clean Coal Centre, 2008).

When the NBP took effect in 1998, these cheaper methods of reducing emissions had largely been exhausted. Selective catalytic reduction (SCR) and "scrubber" technologies could reduce NO<sub>x</sub> emissions further yet by 75-90% but required a huge investment. The emissions cap, in combination with a more limited set of control options available, made these back-end solutions even costlier. This led most utilities to avoid such capital costs during the first year of

the program by instead making operational changes, such as load shifting and importing power from outside the OTC region. When affected sources could not do this or did not have enough time to make the capital investment necessary for control technology this created an unexpected demand for allowances before the program even began (Huetteman, 2002).

A volatile market reflected the perceived shortage in supply of allowances at first. Allowance prices in late 1998, and even into 1999 after the NBP took effect, actually traded at above the average cost of control. Many expected that the price of allowances would be influenced by fuel costs, which are also volatile, but the well-established costs of emission control technology would lend them stability (Colburn, 1996). Economists have attributed the early difficulties to market uncertainty. Pointing to the lack of a mechanism for price discovery prior to the NBP, many have suggested holding early auctions or granting early reduction allowances as a way to avoid this in the future (Auslisi et al., 2005).

The initial spike subsided as the market began to adapt and become more active. Allowance prices settled to around \$1000 per ton of NO<sub>x</sub> by the end of 1999 after having been above \$5000 at the beginning of the year. New Hampshire played prominently in reducing allowance demand with its introduction of early reduction allowances in April and the timely installation of control technology on many of its plants. Companies began to respond to the economic incentives associated with reducing emissions as allowance trading increased and the market matured. Despite early misgivings and anxiety, the government's unwavering support for the market system enabled it to operate efficiently and reduce NO<sub>x</sub> emissions without any form of price trigger or safety valve.

Certainty is hugely important for electric utilities, and the government's ability to provide it ultimately decides the performance of a cap and trade system. The NBP was able to ensure a certain environmental outcome; the same would have been unlikely if it had included a price control mechanism (Pizer, 1999). The use of allowance banking combined with a flow control mechanism maintained the environmental benefits of the program while actually increasing long-term economic certainty for the regulated sources. In the late stages of the program, price volatility was once again tied to uncertainty – that surrounding the anticipated federal program (Huetteman, 2002).

Recognizing the immutable nature of the electric power industry is critical in developing a strategy for emissions reductions. Power generators stress the fact that their foremost concern

is producing enough electricity to satisfy demand, usually based on long term contracts, and guaranteeing reliability to the electric grid. While it is not their expressed interest to pollute as much as possible, there exists a tremendous institutional hurdle in regulating emission sources on the scale needed to slow the effects of climate change. The OTC states appear to have understood this because the NBP budget was in excess of actual emissions by 10% over the life of the program (EPA, 2003). Although it could have been more effective with a tighter cap, proving that cap and trade works and securing cooperation from the industry was more important in the long term.

### **2.3.3 Lessons for CO<sub>2</sub> Cap and Trade**

The environmental threats posed by CO<sub>2</sub> and NO<sub>x</sub> pollution are best defined in terms of time and space. Acid rain materializes faster and is localized in comparison to global warming. The usefulness of the NBP as functional model then is clearly limited but a comparison can still be made taking these differences into account. Stopping climate change will also be as much a political feat as a technological one. Not only must the government create a functioning program but it must secure public confidence in it as well, the NBP being a case in point.

Both emissions are tied to fossil fuel-fired electric generation – primarily coal – but their chemical roles in it create some major differences in how they can be controlled. NO<sub>x</sub> is formed as a byproduct of combustion under certain conditions but is not directly linked to power output. Its formation can be reduced to a limited extent by changing certain variables and methods of the combustion process, with front-end control technologies such as those previously discussed. The formation of CO<sub>2</sub> is a necessary byproduct of hydrocarbon combustion and is directly related to power output. This also makes it easier to monitor CO<sub>2</sub> emissions because they can be inferred by amount of fuel consumed rather than measured directly as NO<sub>x</sub> emissions are.

Effective reductions in CO<sub>2</sub> emissions will require switching away from fossil fuels and replacing fossil fuel-fired generation units entirely. For this reason, the timeline for reducing CO<sub>2</sub> emissions is currently measured in decades while the necessary reduction in NO<sub>x</sub> emissions was accomplished in a matter of years. There is a possibility that back-end retrofitting for CO<sub>2</sub> emissions will become a viable option in the future. However, it is unlikely that such technology will reach the same level of availability or affordability of NO<sub>x</sub> scrubbers and SCR, which are already considered expensive. Still, carbon sequestration could end up being relatively cheaper

than building a new plant altogether, so its demonstrated success would certainly be a game-changer.

Emissions reductions will be capital intensive for CO<sub>2</sub> as they were for NO<sub>x</sub>, and the economic factors in making those decisions will similarly depend on how cap and trade influences market conditions. Though the two programs target the same sector, the effects will be felt differently in the case of CO<sub>2</sub> and will be much more dependent on the economy as a whole. The consequences of stopping global warming or allowing it to continue will be extensive either way. The primary benefits will be felt in the long term, while the cost of making reductions will be felt immediately. This was not the case with NO<sub>x</sub> because acid rain posed tangible environmental costs in the present, so the benefits of controlling emissions were easily quantifiable.

There will be secondary benefits from CO<sub>2</sub> cap and trade that can increase the efficiency of the CO<sub>2</sub> cap and trade program. The NBP did not impact electric rates in a significant way and relied entirely on pressure between producers. Investments in control technology not only gave electric utilities an advantage over their competitors within the program, but had the added benefit of improving plant efficiency. CO<sub>2</sub> cap and trade can also incentivize gains in efficiency, but they will most likely go to consumers. Electric demand will be a critical component of this system, shifting in response to higher electric rates and putting additional pressure on producers of electricity. Fundamental changes in energy consumption and electric generation did not occur in NO<sub>x</sub> cap and trade, whereas with CO<sub>2</sub> they play a central role in reducing emissions.

With this huge potential for economic change, a CO<sub>2</sub> cap and trade program must contain safeguards against price spikes. While allowance prices were volatile during the early and late stages of the NBP, decisions over compliance options were also being made in a shorter timeframe. Affected sources will need more price stability to plan the major investments needed to control CO<sub>2</sub> emissions. Price discovery is an important way to avoid the initial volatility that was seen in the NBP and could best be accomplished through an auction. This would also provide a revenue stream to increase the secondary benefits of the program, creating positive feedback loops not present in the NBP. Price controls might also be appropriate in this case as well. While they can dilute the effectiveness of cap and trade, volatility poses a greater threat to the success of the program.

Apart from the technical aspects of the program itself, the policy environment surrounding it may give us more useful information about how CO<sub>2</sub> cap and trade will fare. The political history of the NBP provides a model that is reproducible and entirely applicable to CO<sub>2</sub> cap and trade. State officials and regulators have followed such blueprint in creating a new regional cap and trade program and have seen similar success in terms of stakeholder participation. As it was with the NBP, the real intention of a regional cap and trade program is not just to demonstrate the effectiveness of the model but to position these early states with an eye toward future federal policy. The agreements and concessions required to secure broad support for these regional programs were based on this expectation. In the case of the NBP, these state agreements were honored when the program was rolled into the NO<sub>x</sub> SIP Call. There is no way to know if this will hold true for CO<sub>2</sub> cap and trade. With the ability of Congress to preempt state action to reduce CO<sub>2</sub> emissions, the regional program could tentatively be reduced to a public relations effort aimed at influencing this debate.

Though it is likely that a federal cap will undermine or do away with an existing regional program, states will continue to lead the way in defining environmental policy as a whole. The cap and trade program, as only one component of an effort to stop global warming, will have a direct effect on the allocation of resources and the size of the political battle that surrounds it is best waged on the national or international level. Innovative public programs will be required to support this policy and apportion the benefits from it efficiently. New Hampshire has been exemplary thus far in creating a consistent policy direction that helped shape national policy. The state needs to reinforce the cap and trade program and take aggressive action beyond it in order to continue making this case as the rest of America looks on.

### **3 Methodology**

The proposed cap and trade program was studied in an unorthodox approach, as both a legislator and a student. Research was conducted primarily through my role as a policymaker and the close interaction this gave me with other parties surrounding this issue. That legislative perspective supplements my perspective as a student using traditional methods of research and analysis.

The project began with my participation in the deliberations on HB 1434 in my capacity as a New Hampshire state representative. I sat on the policy committee responsible for doing the largest share of the work on the bill as it made its way through the legislature. The qualitative and quantitative information that I accumulated through this experience served the dual purpose of informing my political actions as an elected official and forming a basis for my research during this project.

#### **3.1 Qualitative Research Methods**

The qualitative data collection in this phase of the project consisted of observations made through field research. My research was conducted using a form of *participant observation*. Common to the study of social sciences, participant observation is summarized below:

The method of data collection most closely associated with field research is participant observation, the process through which the investigator attempts to obtain membership in or a close attachment to the group he or she wishes to study. The researcher can assume either a complete participant role or a participant-as-observer role. Complete participants conceal their identities and do not make their research objectives known, whereas participants-as-observers make their presence known to the group being studied (Frankfort-Nachmias & Nachmias, 1996, p. 281).

There are many subjective observations to be made in a legislative setting. In most instances, my investigative interests for the project overlapped with my legislative prerogatives. There were some observations, which I normally would not record in the course of my legislative work, that were still in keeping with my goals as an elected official and actually aided me in achieving them. None of these observations required me to step into an exclusively participant-as-observer role, and in almost all instances I chose to stay a complete observer.

There are some methodological and ethical caveats on being a participant observer, particularly in the complete participant role (Frankfort-Nachmias & Nachmias, 1996, p. 284; Babbie, 1989, p. 264). A phenomenon can occur, known as the Hawthorne effect, whereby the outcome of the process being observed is influenced, directly or indirectly, by the presence of the researcher. There is also the risk of “going native,” or assimilating to the point where the objectivity of one’s research is in question. And lastly, there is a moral question about hiding one’s identity as a researcher.

In its dual nature, as previously described, this project is presumed to be unique. While the explicit focus of my research is on a specific policy proposal, research was implied in my overall experience as a college student serving in the state legislature. I began my term in public office a year prior to the commencement of this project with the intent of serving the public good while furthering my education. I requested placement on the STE committee with the sole interest of conducting research on a topic such as this one. In that way, it resembles the act of an observer assuming the role of a participant and is truly academic in nature.

The process of developing a relationship with the community and persons under observation, I believe, leaves me subject to some level of scrutiny. The exercise of my own political authority is an obvious way in which the process might have been altered by my presence as a researcher, although my own decisions are included among the topics covered in this project. However, the goals of choosing the best policy and promoting the interests of NH’s citizens are not at odds with one another, so my participation in voting could be considered an added benefit to the project.

The only concern should be the question of my objectivity; the project depends on my having already “gone native.” In my qualitative research, there was no fine line between subjective observations and personal opinion and the resulting notes and data were not absolute in this regard. The important step was in screening out information that was not objective and then in using sound methods of analytic induction.

Although the environment I studied was by its very nature morally ambiguous, there were few ethical considerations associated with my method of research. A primary concern for the public interest did not in any way inhibit me from taking on a complete observer role. I faced only one personal ethical decision over whether or not to alert my colleagues about my research objectives. I decided to assume a participant-as-observer role among my fellow committee

members, due to the relationships of trust I had built with them over time. Particularly esteemed was the subcommittee chair for having been my seatmate and confidant from the time we were elected as freshmen and the committee vice-chair for having carpooled with me occasionally.

My role as a genuine participant in this process was arguably the defining feature of my project. Mine was the best position from which to document the nuances and subtleties of the legislative process. My familiarity and unrestricted access to the actors surrounding this policy provided me with an enriched perspective from which to evaluate it.

### **3.2 Quantitative Research Methods**

The quantitative data collected during this phase of the project was another major asset. I worked with HB 1434 up close in STE and took away a full portfolio containing all of the written material that was used by the legislature to evaluate it. I used also my power as a representative to call upon additional resources from public and private entities, giving me potentially unlimited access to material data without having to search for it myself.

I was provided with current scientific and policy reports pertaining to the problem and its proposed solution. All the relevant background information was supplied by government officials and lobbyists for the interest groups, explaining their relationships to the problem and their positions on the proposed solution. In addition to the hard copies given to me directly, I was given access to the entire legislative file on HB 1434, consisting of all the evidence and transcripts recorded by the committee clerk and staff. Lobbyists also assisted by supplying information that filled gaps in my record and by providing additional context to the public discussions. The legislative budget, drafting, and research offices were also available to answer legal and financial questions with respect to state government.

What resulted was a comprehensive collection of documents resembling what an outside researcher might have accumulated with much effort. This information constitutes the basis on which I evaluated HB 1434 in my role as a policymaker. It also guided and supplemented further research in the project.



### 3.3 Legislative Process

The qualitative and quantitative research methods were used in a structured approach based around the legislative process. Each interaction in my role as policymaker required different levels of communication and decorum, and therefore provided varying opportunities for collecting quantitative and qualitative data. Explicating this research environment was first necessary to explain what the competing interests were, where the areas of conflict were and how they were resolved, and how HB 1434 reached its final form. Figure 1 outlines the legislative process:

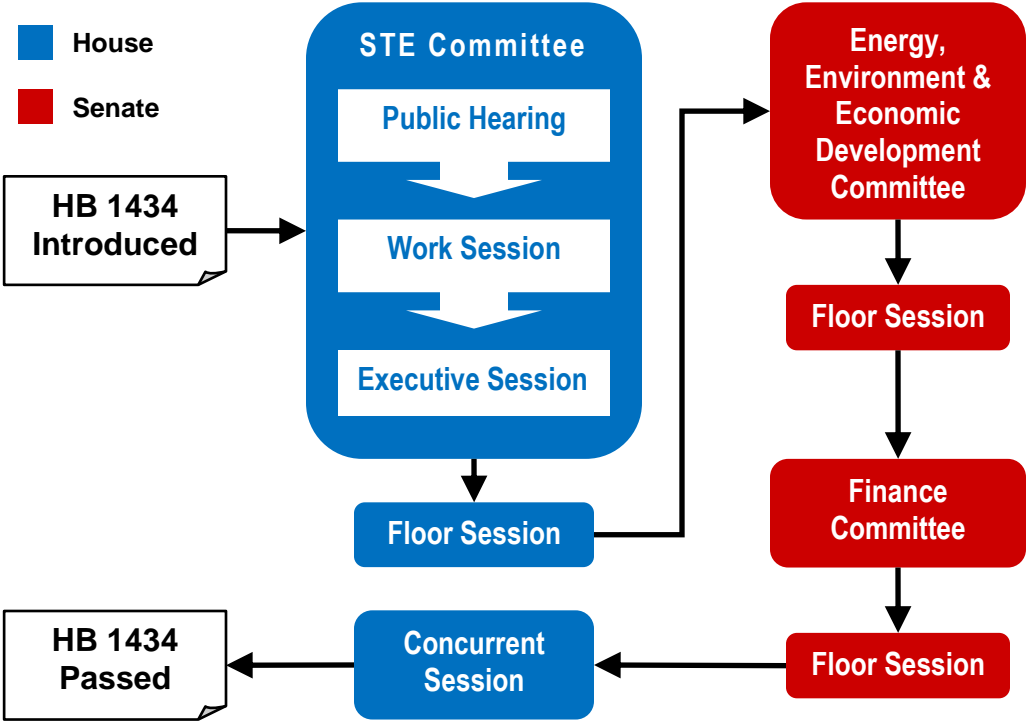


Figure 3-1: Legislative Flowchart

There were legislative briefings prior to the hearings which were publicly noticed but intended for the benefit of legislators. These were full of useful historical and background information and devoted a generous block of time for questions to be answered. The question and answer period was an opportunity to preview the inclinations and concerns of fellow committee members and interest groups, providing social and political context for the formal legislative process that followed.

The committee meetings were the most formal stage of the process. The public hearing especially has become almost a formality in terms of importance. Written testimony submitted during the hearing contributed somewhat to my quantitative research with most of it being repetitive. Subcommittee hearings or work sessions are the venue where powerful interest groups clashed. This point in the process was more useful for collecting qualitative data. Formal parliamentary rules still apply in these meetings, creating an environment where tensions are high and yet subtle actions and behavior are more easily noticed. Attention to whispers, looks, body language, seating arrangement, and people entering and exiting the committee room is important for understanding what is actually happening in the negotiation process.

The most decisive vote on the bill was taken during general floor sessions of the House and Senate. There were no significant policy modifications made to the bill on the House floor. Floor amendments are much more common in the Senate so this point was the last chance for special interests have their demands met. Partisanship arose during the politically-charged floor debate and the ensuing level of support the bill received was indicative of how the public and the media perceive the issue. After the policy committees' recommendations were acted on by the entire bodies, the respective House and Senate leaders decided whether to refer the bill to a second committee for further deliberation.

Private discussions were an important tool for both quantitative and qualitative research. Much of the process took place outside of the committee room behind closed-door or hallway conversations. Lobbyists or other actors involved in the process reveal more about their positions in this setting, either through direct advocacy or by asking leading questions. Such discussions between legislators were more informal and also produced information that had not been stated publicly. These happened frequently in the House chamber and antechambers, both restricted to legislators. My assigned seat next to a fellow committee member was understandably another major asset in this method of research.

Written correspondence was the least effective tool for research. Constituents and interest groups sent us an overwhelming amount of post and e-mail building up to the critical votes that were taken on HB 1434. Most were simple declarations of support or opposition but there were rare instances where these sources contributed new information. They were useful for documenting the stated interests of certain groups "on paper," which were modified during the process and at times contradicted their true interests.

## **4 House Bill 1434**

House Bill 1434, an act relative to the regional greenhouse gas initiative and authorizing a cap-and-trade program for controlling carbon dioxide emissions, was considered by the New Hampshire General Court during the 2008 legislative session. The bill's prime sponsor was Representative Naida Kaen, the chair of STE. It was cosponsored by the vice-chair, a third member of the committee, and five senators including the Senate President, Sylvia Larsen, and the chair of Energy, Environment & Economic Development, Martha Fuller-Clark. This powerful lineup shows how greatly anticipated the bill was. HB 1434 resulted from over four years of pre-legislative planning, a process referred to as RGGI.

### **4.1 Regional Greenhouse Gas Initiative**

The Regional Greenhouse Gas Initiative (RGGI) is an effort by ten Northeast and Mid-Atlantic States to develop and implement a regional CO<sub>2</sub> cap and trade system. The participating states are Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, and Vermont, and observers to the process are the District of Columbia, Pennsylvania, New Brunswick, Ontario, Quebec, and the Eastern Canadian Provinces.

RGGI was created in response to the 2001 NEG/ECP Climate Change Action Plan and Climate Plans in each of the individual states calling for GHG emissions reductions in the electric utility sector. The effort began informally in April 2003 at the invitation of NY Gov. George Pataki. The responding states began discussion of a cap and trade program in August of that year through the formation of the RGGI Staff Working Group, made up of governors' staff and state regulatory officials. The group drafted a two-year action plan setting an overall goal and action items to be carried out by different task subgroups.<sup>4</sup>

A timeline divided the planning process into learning and development phases. The learning phase was used to collect background information on the states' GHG reduction policies and legal mechanisms that they would use to implement a new one. The development phase contained the work of the task subgroups as well as a stakeholder process. NH was assigned to work on the Data Gathering & Technical Analysis and Model Rule Development subgroups, in addition to planning the stakeholder process. The stakeholder process allowed interested parties

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<sup>4</sup> The RGGI Staff Working Group Action Plan can be viewed at <http://www.rggi.org/docs/actionplanfinal.pdf>

in the private sector to follow the development of the program and submit input for its design as well as comments on the outputs of the Staff Working Group. Among the stakeholders were major organizations from the electric utility and manufacturing industries and environmental community.

The development phase concluded with a formal agreement by the states, in the 2005 Memorandum of Understanding (MOU), to participate a regional cap and trade system. The MOU called for the creation of RGGI, Inc., a non-profit organization to oversee the regional program and provide support functions to the states. Commissioners from the NH DES and PUC both sit on the Board of Directors of RGGI, Inc. The MOU was followed in early 2006 with the creation of the Model Rule which served as a framework for the RGGI program. The MOU and Model Rule established the basic components of the regional system but also left considerable flexibility for state implementation. The major components of RGGI are summarized in Table 1:

**Table 4-1: Major Components of RGGI:**

<b><u>Component</u></b>	<b><u>Model Rule/MOU</u></b>	<b><u>State Authority</u></b>
Applicability	Generation of 25 MW and over Exemption for biomass facilities	Define “sustainable” biomass fuel sources
Cap	Compliance over three-year period Stabilizes current emission levels during first two compliance periods Decreases by 2.5% each year thereafter – achieves a 10% reduction by 2018	None
Budget Allowances	NH: 8.6 million allowances/yr Region: 188 million allowances/yr Unlimited banking	None
Auction	25% auction for consumer benefit	Allocate 75% of allowances Auction design
Bonus Allowances	Converted from Early Reduction Allowances Early Reduction period from 2006 to 2008	Limits on use Conversion factor
Offset Allowances	Limited to 3.3% of total emissions Limited to US projects: Afforestation End-use Efficiency	None

	Landfill Methane capture Livestock Methane reduction Sulfur Hexafluoride reduction	
Price Triggers <sup>5</sup>	Allowance price of \$7: Offset limit increases to 5%  Allowance price of \$10: Compliance extends to 4 years Offset limit increases to 10% International offsets accepted	None
Voluntary Retirement	Allocated Allowances retired for renewable energy purchases  Ineligible towards RPS and vice-versa	RPS participation

Source: RGGI Inc., 2007

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<sup>5</sup> Based on a twelve-month rolling average

## **4.2 Presentation on HB 1434**

HB 1434 was introduced and referred to STE on January 2, 2008. The bill was presented to the committee for the first time the following morning, at a general information session in Representative's Hall conducted by the DES. We also received material from an earlier DES briefing from September 24, 2007, detailing the final contents of the RGGI MOU and Model Rule.

We were informed that the bill would delegate most of the regulatory authority to the department, which had been responsible for the comparable Federal Acid Rain Program before. This would mean that most of the decisions would be made through administrative rulemaking rather than in statute. We also found out that the bill would have most of the budget allowances sold, and that the auction revenues would go towards energy efficiency.

An economist then presented a report on auction design done by the University of Virginia (Holt, Shobe, Burtraw, Palmer & Goeree, 2007). He identified competition, fairness and resistance to collusion as the most important goals and recommended a uniform price, sealed-bid auction done regionally instead of state-by-state (Shobe, 2008). He also defused concerns that speculation and hoarding might compromise the effectiveness of the program. I spoke to the economist during lunch and he explained for me the superiority of a carbon tax over cap and trade in terms of price signals and efficiency. He implied that cap and trade was the more politically expedient of the two policies.

A question and answer session followed, where we learned from the Public Utilities Commissioner that the MOU had anticipated a federal cap and trade program in the future, and that the regional would transition over in that case. Representative John Thomas stood out as a skeptic of the trading program, worrying that an outsider such as George Soros might try to game the system by buying up allowances so that they couldn't be used. We also witnessed the first exchange in what would clearly become a heated dispute on the subject of Bonus Allowances. PSNH claimed that it was entitled to 32 million, earned through the Clean Power Act, while the DES said it was 4 only million.

### **4.3 Public Hearing**

The public hearing on HB 1434 was likely the largest of any in the 2008 session. The hearing was scheduled for two consecutive Thursdays, January 10<sup>th</sup> and 17<sup>th</sup>, and was held in Representative's Hall instead of the regular committee room. Over a hundred people attended and the majority chose to submit written testimony instead of signing up to speak. The speakers represented a good cross-section of the parties surrounding the legislation, and all but a few voiced strong support for it. Although much of the testimony was repetitive and easy to anticipate there was enough useful information in the oral remarks to fill ten pages worth of notes. While many public hearings serve as no more than a tradition of the democratic process, attendance at this particular one was important for all the committee members and interested parties who wanted to be involved in the discussion.

The first speakers were elected officials, generally placed in order of importance and relation to the bill. The prime sponsor came up first and quickly yielded the floor to the Governor. Governor Lynch rarely attends legislative hearings so this attracted media attention. He stated that there is a need for national action and changes in our energy policy to address global warming but that we cannot wait for this to happen and must instead take the first step ourselves. He also stated that New Hampshire will be affected by RGGI regardless of whether or not we participate and that we should choose to accept the benefits that it will offer the state in the area of energy efficiency. The vice-chair of STE testified after this, speaking of the complementary relationship that this program would have with the RPS, which also operates in a regional market. A staffer then testified on behalf of the House Majority Leader, suggesting that this program would have both environmental and economic benefits to the state if we participate. DES began to speak next, but their testimony was interrupted midway to accommodate the schedules of several elected officials. Senator Larsen impressed upon us that this was the most important initiative that the legislature would vote on this session. Senator Fuller-Clark then characterized the program as "forward-looking" and pointed out that under it the state would retain the right to decide how allowances are used. The last elected official to speak was Executive Councilor Raymond Burton, a Republican, who testified in favor. It became apparent by this point that success for the bill was seen as crucial albeit politically advantageous, and worth expending political capital if required.

DES provided the most in-depth and knowledgeable testimony and was the first to entertain questions at the hearing. Commissioner Tom Burack submitted four pages of written testimony and opted not to take up any time speaking, yielding the floor to Director Bob Scott for a PowerPoint presentation (Burack & Scott, 2008). Mr. Scott started off by drawing a connection between global warming and New Hampshire's recent severe weather and flood emergencies. He then gave future changes predicted for NH's climate if warming trends are not reversed. He stated that the winter season would be cut in half, the sea level would rise upwards of three feet, we would experience sixty days of 90°+ and between four and twenty-eight days of 100°+ temperatures each year, the state would see a 0.5 – 1% decline in GSP due to extreme weather events and would see a 5-20% decrease in consumption annually, and that the insurance markets are already reacting in advance of these changes. Much of this was an implicit reference to NH's economic prosperity, which depends heavily on tourism during ski season. He concluded these warnings by making an example of the UK, where CO<sub>2</sub> emissions were reduced by 14% from 1990 to 1999 and saw increases of 15% in growth and 5% in jobs during the same period.

Mr. Scott's testimony then transitioned over to what effect RGGI would have for NH. Providing context first, he informed us that the multi-state region covered by RGGI represents the seventh highest emitting country in the world, larger than Australia, France or Italy. He told us that energy prices in that regional market, from which we purchase 50% of our electricity, will be affected by the program no matter what. He said the only way to mitigate those costs will be to participate, allowing us to benefit from the sale of allowances and have influence on the program itself.

Mr. Scott suggested that using the revenue from allowances on energy efficiency would be most beneficial to the state. He informed us that NH's peak demand during the summer has risen to 28,000 MW and that it is growing at twice the rate of average load. He said that reducing demand by 5% during peak usage would save the state \$580 million each year. This could be aided by the creation of a fuel-neutral fund, along with the improving technologies and varying opportunities, resulting in energy efficiency improvements that help us avoid the construction of more generating capacity.

Mr. Scott finished making his case in favor of the program by pointing to outside sources. He pointed to the analysts at ISO-NE, the quasigovernmental organization that operates the



regional energy market, who say that RGGI will work due to transparent prices, open access, and regional transmission planning within the system. He highlighted the positive results of a UNH economic impact study, which said that the benefits to household utility bills would be seen as early as 2012. He left us with the prospects that the program could bring in the area of research and development, citing Powerspan (CO<sub>2</sub> capture) and GT Solar (photovoltaic technology) as examples of innovation and leadership in NH.

At this point, after yielding to the Senators and Councilor, Mr. Scott went into a technical overview of the program. Most of what was said in this part was previously covered in the briefing. He did draw attention to areas of the bill which would require decisions by the legislature, particularly conversion of CPA allowances, auction of allowances, and usage of auction revenue. The bill as introduced would leave the bonus allowance issue for DES to resolve, auction all of the remaining allowances, and have the PUC administer an Energy Efficiency fund to use the revenues for improvements both in and outside of the utility sector with 5% designated for LIHEAP. The bill would also keep 1% of allowances set aside for voluntary retirement through REC purchases.

Questions at the conclusion of his testimony focused generally on the energy efficiency programs. Representative Andersen rhetorically asked how it was fair for only 5% of the revenues to be devoted to low-income assistance. Representative Thomas was once again skeptical, implying that there were constitutional issues with targeting revenues to other sectors while consumers were being hit on their electric bills, and also wondering why a multi-state organization like RGGI should get to decide what qualifies as an offset. Both of his concerns were addressed by Mr. Scott.

The next speaker was Public Utilities Commissioner Cliff Below, who had been the agency head leading NH's contingent to RGGI. The only thing he had to add to DES' testimony was on the nature of the RGGI discussions, which he said had involved a lot of collaboration between DES, PUC, and the Consumer Advocate with outside agencies.

The Director of the Office of Energy and Planning, Amy Ignatius, reminded us that this legislation is another piece in the Governor's 25 x '25 renewable energy commitment and strongly urged that it be passed this year and not delayed through a study committee.

The Consumer Advocate, Meredith Hatfield, expressed support for the aims of the program and NH's participation in it as being in the interest of residential ratepayers. She

expressed two main concerns regarding the design of the program in NH. The first was how the revenues are used, recommending that 100% go towards coordinated, multi-fuel energy efficiency programs, including those to benefit low-income customers. The second was the initial cost impact on ratepayers, recommending that mechanisms be included in the overall program and auction that will provide price protection to consumers. She suggested the specific approach of setting a maximum price for allowances. Representative Thomas reiterated his concerns about the cost to ratepayers but was skeptical about Ms. Hatfield's recommendations for how to address this.

Ross Gittell, from UNH's Whittemore School of Business and Economics, delivered to us an independent assessment on RGGI, with the help of his understudy, Matt Magnuson. Their oral remarks were accompanied by a PowerPoint presentation summarizing the methodology and findings of their economic analysis and a FAQ prepared with the help of DES (Gittell & Magnuson, 2008; DES, 2008). Their methodology used a review of existing REMI analysis and documentation, current information on the NH economy and electricity market, consumption and price forecasts from ISO-NE, and input from stakeholders (Petraglia & Lynch, 2004). Using previous studies they determined that NH should participate in RGGI regardless of allowance pricing. Their ratepayer impact study found that a residential customer with a \$90/month electric bill would see a negative impact of \$0.96/month initially but a positive impact of \$1.46 over the long term and businesses investing in energy efficiency would see even greater savings. Their economy-wide impact study found that using auction revenues for corporate tax relief would provide the greatest boost in GSP with moderate job growth, and investing it in 100% energy efficiency would increase the GSP only half as much but result in greater job growth. Other important points were brought up in their presentation were that 100% energy efficiency is the only scenario that benefits all ratepayers, that going with corporate tax relief would have the highest cost to ratepayers, and that PSNH customers will be affected differently by RGGI in that they will see higher costs than if we do participate than if we do not. The committee found this information to be sufficient and did not ask any questions.

The testimony for rest of the hearing was not pre-planned and speakers were called according to their position on the sign-in sheet. The first was Brett Lamb, Planning Director for the City of Keene. He told us that cities have a lot at stake in the cap and trade program, as many have implemented or are in the process of implementing climate action plans. He elaborated on

Keene's Climate Action Plan established in 2004, and included an inventory which found that buildings and transportation were each responsible for 30% of emissions. The plan set a reduction target of pre-1995 emissions levels, with a 10% residential goal and a 20% municipal goal. He described how the city was reducing emissions by using LED bulbs, instituting an "anti-idling" campaign and a biodiesel program for vehicles, installing geothermal heating and methane-to-energy recovery units, and creating renewable energy tax credits. We were also presented with a summary report of Keene's Climate Adaptation Action Plan (City of Keene, 2004).<sup>6</sup>

A policy analyst from Northeast Energy Efficiency Partnerships, Natalie Levitt, advocated directing revenue into existing energy efficiency programs and to avoid creating new programs that duplicate or compete with existing ones. She also submitted a report on the potential for energy efficiency in New England (Northeast Energy Efficiency Partnerships Inc., 2005).

A concerned citizen from Fremont, Neil Rowland, questioned the underlying basis for the program. He challenged the assumption that anthropogenic climate change is scientifically accepted, and accused Al Gore of propagating theory of global warming to amass personal wealth. In regards to the bill, he spoke of a conversation he had with Commissioner Below in which he learned that NH is actually net exporter of electricity despite purchasing half of what it consumes from the regional market. He urged against participating in regional programs such as RGGI, citing the Northeast Blackout of 2003 as a reason why interdependence is bad for reliability. A few committee members did not show restraint in assailing Mr. Rowland during his questioning. Representative Garrity was able to break the tension with some light-hearted humor. While it was apparent that Mr. Rowland's did not represent the mainstream of political views, other committee members felt that he had the right to be heard without being mocked.

The town planner from the town of Epping, Clay Mitchell, insisted that municipalities were uniquely qualified to benefit from and implement the cap and trade program. It was quickly understood that he was referring to the energy efficiency component as he went on to describe energy assistance and efficiency programs in his own town. He hoped that we could

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<sup>6</sup> Keene was the first of five U.S. cities to participate in the Climate Resilient Communities pilot program run by the International Council of Local Environmental Initiatives.

use the revenues to jumpstart a “new alignment,” which he described as a transition towards more efficiency that would reduce the need for general assistance.

The first speaker from an environmental interest group was Doug Bogen, representing Clean Water Action. He supplied a general history of environmental actions taken by the state, wanting to provide context to RGGI. He pointed out that our previous commitments had set a 10% reduction goal by 2010, not 2018 as contained in HB 1434. He urged us to act timely in passing the bill, saying that we cannot weaken it any further because many compromises and concessions have already been made.

The first person to testify on behalf of a business interest was Jeff Rose, Director of Government Relations for BAE Systems. I learned from his written testimony that BAE’s Electronics and Integrated Solutions plant in Nashua employs 4,700 people, is the largest manufacturer in the state, and that 35% of its expenses are related to its energy costs. He told us that BAE had some objections with the bill, while appreciating its goal of addressing global warming. He said they are concerned because energy costs are at record highs and he recommended that the program revenues be returned to industry. Representative Kaelin wanted to know if BAE participates in any of the energy efficiency programs funded by the System Benefits Charge. Mr. Rose responded that they do but that he did not know to what extent.

The second business interest to testify was Nancy Hirshberg, Vice President of Natural Resources for Stonyfield Farm. She expressed strong support for RGGI and recommended two areas to focus on. The first was the impact and the second was competitiveness. She said that the environmental impact on businesses would be worse than the short-term cost of cap and trade. She also told us that Stonyfield spends \$2 million/year on energy and has saved \$1.7 million since 1995 due to efficiency measures.

The next speaker was Erika Staaf of Environment NH, but she immediately yielded to Will Abbott, Vice President of Policy and Land Management at the Society for the Protection of NH Forests. He informed us that his 10,000 member organization was working in cooperation with Environment NH and the conservation community in supporting HB 1434. He insisted that using open markets as would be done in RGGI is the best way to get the desired results. He also expressed optimism that it would encourage other conservation measures, suggesting that timberland owners could receive credit for carbon storage in trees.

A lobbyist delivered testimony authored by Jim Roche, President of the NH Business and Industry Association (BIA), which had not yet taken an official position on HB 1434. He began by lauding the goal of addressing climate change but told us that he would mainly be discussing their concerns with the legislation. He listed concerns regarding the open auction that were similar to what Representative Thomas had spoke of previously. The next concern took the form of a set of questions asking whether or not certain events might occur, should a generator use up all of its allowances before the end of a compliance period. The BIA also felt that there should be constitutional protections on how and where program revenues could be used, similar to those governing the Highway Trust Fund. Their final point suggested that we consider potential negatives impacts that the state could encounter if a national cap and trade program is instituted. There were no questions at the end of this testimony, out of fairness to the lobbyist and the author of the testimony who was not present.

STE does not normally consider religious interests but the HB 1434 hearing was so large that we were not surprised when Jane Dougherty from the Episcopal Diocese of New Hampshire testified. A member of the Faith-Environment Network, she told us she was speaking on behalf of congregations and normal voters who support the legislation. She informed us that the National Council of Churches has supported cap and trade since before the UN IPCC's studies began. She said that we needed to fulfill our moral obligation and start now because we "only have a few years," according to the IPCC.

We then heard from Jim Grady, President of LighTec which is the state's largest provider of high efficiency lighting systems and ENERGY STAR® products. He gave testimony that revenues should be directed away from renewables and towards existing energy efficiency methods that have proven success and cost much less.

Susan Arnold of the Appalachian Mountain Club came next but decided to yield the floor to Jim O'Brien of Granite State Conservation Voters. He described how the environmental community was approaching HB 1434 in a united front and intended to be active in committee discussions. Their coalition consisted of the Appalachian Mountain Club, Audubon Society, Clean Water Action, Environmental Defense Fund, Environment NH, Society for Protection of NH Forests, Granite State Conservation Voters, Nature Conservancy, and NH Rivers Council, with the Conservation Law Foundation (CLF) and Union of Concerned Scientists (UCS) heading up their advocacy team.

Bruce Berke came next, representing Ski NH. He told us that the state's ski areas all are in support of the bill because they are more affected by climate change than any other industry. He also informed us that most ski areas are currently taking advantage of SBC-funded programs due to the energy-intensive process of snowmaking. Representative Garrity asked how business had been that winter so far and upon learning that it was going better than average joked that it disproves climate change.

Erika Staaf from Environment NH came back up again to give her testimony, which responded to many criticisms or concerns that had been brought up by previous testimony. The first point she made was this program will be important for setting the stage for a national cap and trade program. Her second was that the benefits of the program could extend beyond the 10% emissions reductions by helping the state transition into a "clean energy economy," but only if a 100% auction policy is adopted as soon as CPA expires. Her last point was that there should not be any price caps on allowances because they would be pointless in a market-based system, saying that if there was a compelling case for a cap it would have been mentioned in the model rule.

Susan Arnold of the Appalachian Mountain Club also returned to reclaim her time and briefly told us about current studies that were being done in high altitude ecosystems where the distinctive impacts of climate change were seen. She urged us to move forward with the bill as introduced, without price caps.

The opposition to price caps was repeated by Jim Ruben from UCS. He ended the public hearing with the controversial statement that PSNH should be given 4 million bonus allowances from CPA.

Noticeably absent from those who spoke at the public hearing were the electric utilities themselves. PSNH had lobbyists present throughout the process but no testimony was submitted for the record, either oral or written. National Grid did submit extensive written remarks in support of the program along with recommendations to make the cap tighter, auction 100% of the allowances, and devote 100% of the revenue to energy efficiency.

## **4.4 Work Sessions**

Formal deliberation on HB 1434 resumed three weeks after the public hearing on Thursday, February 7<sup>th</sup>. Representative Kaen appointed Representative Tom Fargo, a junior member of the committee, as chair of the subcommittee. This effectively left Rep. Fargo in charge of STE during the work sessions because the subcommittee, unlike most others, included every member of the STE. The work sessions were scheduled in a way to allow STE to take care of many smaller bills first before devoting its full attention to the cap and trade bill. This also allowed more time for constituents to lobby members of the committee and for interest groups to determine their strategies. The discussions that then occurred in these sessions, which were held over the course of two weeks, addressed all the points of conflict which would ultimately decide the fate of HB 1434.

The actors significantly involved in the subcommittee discussions were DES, PUC, PSNH, BIA, and UCS/CLF. DES continued in its support role to the committee, authoring a draft amendment containing language that would address the main points of contention. The DES draft also reorganized the structure of HB 1434 as written by OLS to give it functionality more in line with RGGI. The other groups did not submit draft amendments, choosing instead to provide draft language to sympathetic members of STE. Based on debate that the subcommittee had with the interested parties and among its members, a proposed amendment was agreed upon which closely resembled the DES draft.

The work sessions began with consideration of three specific aspects of the bill. Rep. Fargo enumerated these topics of discussion on a flipchart which was then used to record the main arguments pertaining to each. These topics covered some portions of the bill which were not truly debatable because they were previously decided on in the MOU. Others were not controversial and resulted in immediate decisions. The most difficult decisions did not lend themselves much to these specific topics and succeeded the structured discussions in the form of a new dialogue which consumed most of our time in the work sessions.

### **4.4.1 Auction**

There was not much debate over the design of the auction. Rep. Fargo presented the question of whether we should use a state auction or participate in the regional auction, then listing the arguments in favor of each. A regional auction would be less volatile, easier to

administer, and thus less costly to the state. A state-run auction could begin earlier and have a greater impact on the state, both positive and negative. This, in addition to the UVA study recommendations and the lack of debate on the topic, made for an easy decision in favor of the regional auction and it was so voted.

The next decision was over how the allowances would be allocated. This decision took into account two interrelated concerns. The first was the impact the system would have on electricity prices for ratepayers. The second was the systems effectiveness at reducing carbon emissions.

We knew that at least 25% of the allowances had to be auctioned for consumer benefit or a strategic energy purpose, according to the RGGI agreement. Rep. Fargo listed different activities which could fulfill those purposes. We could use the revenue to promote energy efficiency, mitigate ratepayer impacts, promote renewable technologies, or stimulate investment in abatement. Most members of the subcommittee liked best the idea of giving this money back directly to electric customers.

After providing that context, Rep. Fargo then shifted the discussion slightly by telling us that NY, MA, VT, RI, CT and ME had all chosen to auction 100% of their allowances, to be used for energy efficiency. He presented the argument, affirmed by the Gittell study, that under such a scenario the state would see the greatest benefit as it would both lower prices for consumers and meet the overall reduction goals more quickly. The subcommittee was in general agreement that creating this dynamic between emission reductions and electricity prices was the best policy for NH, and leaned towards the 100% auction.

#### **4.4.2 Metrics**

The subcommittee was in agreement over how to use the auction revenue and now needed to decide who would administer the funds and more importantly how to measure their progress. Rep. Fargo asked us to view the program through a business perspective, focusing on “metrics” as a way to ensure its effectiveness.

Members of the subcommittee suggested different results-based methods. We could look at the amount of money available for the SBC, expected to be about \$20 million for 2008. We could look at RPS revenue, projected to be between \$8-9 million. Someone also suggested using a CO<sub>2</sub>/kWh conversion.



We looked to the DES draft, which contained new reporting requirements for the DES and PUC. It proposed that they would issue an annual report to the legislature emphasizing the prices and availability of allowances and the trends in electric rates in the state. It suggested reporting on the number of allowances sold and unsold, who was buying them, how much they sold for in the auction and secondary markets, how each state was spending auction revenues, emissions from each affected source and the emissions reductions associated with the spending of auction revenue.

The draft also proposed the creation of a greenhouse gas emissions reduction fund administered by the PUC, and advisory board to issue recommendations for fund usage by reviewing energy efficiency and demand-side management programs in the state. The fund would give money to programs which provide electric cost savings, reduce electric demand, or reduce emissions from fuels used to provide electricity, heating, and cooling in the state. The legislature would also receive an annual PUC report justifying how the money was spent.

The subcommittee approved the provisions for reporting by DES and PUC and creation of the emissions reduction fund. Rep. Andersen informed us that the proposed advisory board would have overlapping functions with what was proposed in his bill. HB 1561, which would have created an Energy Conservation and Efficiency Board, was much more comprehensive in terms of coordinating energy efficiency initiatives in the state, and Rep. Andersen proposed that we use its language in place of the advisory board provision. Most of the subcommittee members expressed gratitude at this towards Rep. Andersen, who had built a reputation as a strong advocate for energy efficiency and conservation. Rep. Thomas then raised concerns about having identical language in two separate bills, insisting that we could not keep both. This was followed by a long debate over legal ramifications which was settled by Joel Anderson, our committee researcher, who explained how statutory precedence works.

#### **4.4.3 Volatility**

The next topic of discussion concerned how to limit risks to consumers. Rep. Fargo first reminded us of price protections already built into the program, reviewing the trigger event provision that allows expanded use of offsets. We then discussed the need for additional price controls.

The DES draft had set a price “threshold” for allowances, at which point auction revenues would be rebated back to ratepayers. The proposed threshold was \$12/ton for 2009 to 2010, \$13/ton for the next two years, \$14 for the following two years, and finally \$15, at which point it would be pegged to the Consumer Price Index. The environmental lobby reiterated their opposition to price controls, saying that this would defeat the point of auctioning allowances and weaken the cap and trade program. The opponents of this provision were easily overpowered as the BIA and the Consumer Advocate both argued in favor of it. Members of the subcommittee were generally more concerned with the short-term economic impact of the program in its beginning stages, but were still mindful of the long-term economic functionality it needed to have in order to be effective. We decided on a compromise by agreeing to include the proposed threshold prices but to sunset them after 2015.

#### **4.4.4 Early Reduction Allowances**

It was evident from previous statements that there was a looming conflict over the conversion of CPA allowances. While it was known that PSNH would be granted allowances in return for their early emission reductions, the specific amount appeared to be open to interpretation. The situation was complicated even further by the fact that PSNH was the only company in the region eligible for such allowances.

The subject was broached during the work session by Donna Gamache of PSNH, joined by the company’s corporate lawyer. She issued a new claim of 41 million early reduction allowances, up from 32 million a month before. She argued that ratepayers would need the benefit of these allowances due to rising energy prices with the added cost of cap and trade. The attorney informed the committee that PSNH might sue the state if its expectations were not met. He told us that PSNH took a risk by spending \$75 million dollars on the conversion of the Schiller unit, and as a regulated utility, was only able to do so because of the assurances it had been given by the state. He explained how the company felt it deserved just compensation for agreeing to make early reductions in the CPA, being the first in the nation to comply with a mandatory cap.

Bob Scott and Joanne Morin of the Air Resources Division then argued the position of DES. Their allowance calculation of 4 million had stayed the same since it was initially

calculated a year earlier.<sup>7</sup> They also directed our attention to new language in the draft amendment which would give DES the final say over the conversion and also establish a flow control mechanism to prevent the converted allowances from being used all at once. The flow rate it proposed was 2.5 million allowances in 2009 and 2010 and 1.5 million in each year thereafter. They argued that the total number of allowances given to PSNH was not as important as how much of an advantage the company would gain from their use in the beginning of the program.

Jim Rubens of UCS and Melissa Hoffer of CLF argued on behalf of the environmental coalition, which was supportive of the DES position. They first provided us with the relevant language in the CPA (emphasis added):

For expenditures made by PSNH independent of SBC funds for energy efficiency, new renewable energy projects, or conservation and load management, the department shall provide emissions allowances to PSNH equivalent to the amount of such allowances **that could have been purchased at market prices** by the same dollar amount as the expenditure made (NH RSA 125-O:5, 2002).

Noting the statute's use of the past tense, they argued that the DES was correct in using the European Union Emission Trading Scheme (EU ETS) as a baseline because they were the only ones trading CO<sub>2</sub> allowances at the time.<sup>8</sup> They showed us how PSNH was instead using the Chicago Climate Exchange (CCX) as a baseline.<sup>9</sup> They noted the discrepancy between allowances in the EU ETS and the voluntary reduction credits which traded on the CCX. They said that even with flow control, PSNH would still have enough allowances to last them over 25 years if their demands were met. They predicted that PSNH's claim to these allowances would complicate the creation of a national cap and trade system as well.

Ms. Hoffer then proposed a solution to the subcommittee. Rather than leave the decision up to DES, leaving the dispute open to litigation from PSNH, the conversion price could be set in statute, allowing us to find a reasonable middle ground or simply use the DES determination.

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<sup>7</sup> PSNH was sent a preliminary determination by Director Scott in a letter dated April 16, 2007. For the final determination, see [http://des.nh.gov/organization/divisions/air/tsb/tps/aetp/documents/response\\_to\\_psnh\\_co2.pdf](http://des.nh.gov/organization/divisions/air/tsb/tps/aetp/documents/response_to_psnh_co2.pdf)

<sup>8</sup> The EUA average price for 2004-2006 was 15.33€/tonne. EU ETS market data is available at <http://new.evomarkets.com>

<sup>9</sup> The CFI price has historically remained at \$3.95/ton. CCX market data is available at <http://www.chicagoclimatex.com>

They warned that if we did not do this, a resulting lawsuit might delay the implementation of RGGI for years. We then asked DES for their opinion but they declined, saying that it was a policy decision for us to make.

By the end of the last work session, on Tuesday, February 19<sup>th</sup>, the subcommittee had sided with the environmental community. The members were locked in debate over whether to let DES and PSNH resolve the issue or to put the DES amount into statute using language proposed by Rep. Borden. Rep. Fargo and Rep. Chase became agitated when members of the subcommittee appeared to be leaning towards the Borden amendment. Most of the committee was not sure how they would vote until Rep. Kaen entered the room towards the end of the debate and simply stated her support of the Borden amendment. This took Rep. Fargo by surprise; after the subcommittee voted in favor of the Borden amendment he concluded the work session with a look of disbelief.

#### **4.5 *Executive Session***

The final action on HB 1434 by STE was taken on Thursday, February 21<sup>st</sup>. This resulted in the most substantial changes that would be made to the bill throughout the entire legislative process. The committee amendment that was passed contained all the recommendations agreed upon by the subcommittee with the exception of the decision made two days beforehand.

The clerk of the committee, Rep. Chase, chaired the executive session because the chair and vice-chair had both recused themselves as sponsors of the bill. He began by yielding to Rep. Kaen who once again took the committee by surprise with her remarks. She apologized, saying that she'd had a change of heart with her support of the Borden amendment. She offered a metaphor, that "Reggie" was trapped down inside of a mine shaft and that we were trying to rescue it. She thought she could hear the way out and mistakenly led us down the wrong tunnel which turned out to be too narrow a pass for Reggie to fit through. But now she assured us that she knew the only way to save Reggie was to return down the path which we all knew Reggie could fit through. The metaphor implied that we should support a substitute amendment she had drafted the day before, in-lieu of the Borden amendment.

The committee was unsure what to make of this but decided it would be a good idea to consider the substitute amendment. Rep. Kaen explained that this would leave DES to make the decision on early reduction allowances, but would sunset PSNH's collection of bonus allowances

after the second compliance period ends in 2014. The committee then came to the conclusion that in practice much of this would not matter if a federal cap and trade program was instituted. She then proposed that we should adjust the flow control to allow the usage of 2.5 million early reduction allowances during each year of the first compliance period, and then 1.5 million during the second. With the sunset in place this would theoretically limit PSNH to a total of 12 million allowances – considered to be a more than fair compromise between 4 and 41 million. The committee ended up agreeing to this, seeing it as the most fair and practical solution.

I discovered afterwards from Rep. Fargo that in between the work and executive sessions he had talked with Rep. Kaen about what had happened. He learned that she was worried about “giving away the farm” to PSNH and, like many members of the committee, was inclined to defer to the environmental interest groups. He talked her into offering the substitute amendment for the reasons aforementioned, also reminding her that the Gittell study had predicted PSNH would see more negative costs associated with the program than its peers.

The final vote in favor of the bill as amended was 12 to 2. Rep. Garrity joined Rep. Thomas in the minority, saying that he thought RGGI was unnecessary in NH and that we were just creating another fund for the state government to raid.

#### **4.6 House Session**

HB 1434 came up for a vote on the House floor on Wednesday, March 19<sup>th</sup>. The floor debate was fairly insignificant. The committee amendment was passed on a voice vote without any discussion. Rep. Thomas then gave a short speech in opposition and entertained questions from more representatives who were concerned about the economic impact that it could have on ratepayers. Rep. Garrity also spoke against the bill but did not take questions. Rep. Kaen then went up to the well only to answer questions, telling the body that instead of giving a speech she would refer us to the House Calendar where the committee’s reasoning for and against were summarized well by Reps. Fargo and Thomas, respectively. The majority report that was printed in the calendar is reproduced below (State of New Hampshire, 2008):

This bill would formally enter New Hampshire in the Regional Greenhouse Gas Initiative (RGGI) following a 10-state memorandum of understanding (MOU) to cap large fossil-fueled power-generator carbon emissions at 2003 levels between 2009 and 2014, and to decrease CO<sub>2</sub> emissions by 10 % by 2019. The MOU, signed in December 2005 by the Governors of the ten

RGGI states, allocates to NH approximately 8.6 million out of a total of 188 million carbon emission allowances annually, giving NH a 4% stake in this regional program. A 2007 UNH study concludes that since NH participates in a regional power distribution system, NH ratepayers will pay for other states' participation even if New Hampshire chooses not to join. The UNH study further concludes that joining RGGI is in the best long-term economic interest of NH. The committee worked very hard to maximize the benefit to the citizens and businesses of NH, and to minimize the impacts to the ratepayers, while staying within the constraints of the MOU. HB 1434 will create a dedicated Greenhouse Gas Emissions Reduction Fund by selling, through a regional auction, NH's carbon emissions allowances. Proceeds from that auction will be directed primarily to consumer-level energy efficiency investments that will accomplish two main goals: 1) to reduce energy demand, thereby reducing overall carbon emissions through conservation; and 2) to invest locally in energy efficiency business development. HB 1434 recognizes past and on-going investments by PSNH to reduce carbon emissions as required by NH's Clean Power Act of 2002. HB 1434 includes several safeguards to protect NH's electricity consumers: 1) the Governor and Executive Council can suspend requirements of RGGI during an "emergency supply crisis"; 2) the NHDES is empowered to reserve 1% of the allowances to relieve suppliers during periods of high demand; 3) generators can opt to purchase qualified carbon offsets; 4) should the auction price exceed a safety threshold, fund proceeds above that threshold will be rebated to the ratepayers; and 5) HB 1434 includes provisions for routine reporting back to the General Court regarding program performance and any potential need for changes in NH's RGGI program.

The minority report that was printed in the calendar is reproduced below (State of New Hampshire, 2008):

The minority of the committee feels that the societal and environmental goals of RGGI are laudable (attempting a regional cap and reduction of carbon dioxide). But we disagree with the approach for the following reasons: 1) It saddles the electric ratepayer with short term rate increases; 2) It is unfair to electric ratepayers, because they will be subsidizing energy efficiency projects for non-electric users; 3) It creates a new "greenhouse gas emissions reduction fund". This new fund could potentially hold between \$16 million to over \$100 million in its coffers. Although the funds are intended to be used for energy efficiency investments, there is no guarantee that a future legislature or governor will not raid that fund to balance budgets; in that case, our citizens will have borne the financial burden of the program without state department of

environmental services (DES) and public utilities commission (PUC) away from their primary New Hampshire mission to serve a multi-state, non-elected bureaucracy. 6) RGGI only addresses one sector of the carbon-producing economy (fossil-fuel based electric generating plants), but does not address the carbon dioxide from the transportation sector, residential heating sector or industrial sector. We feel this creates an unfair disadvantage to NH electric ratepayers (our neighbors and constituents). 7) New Hampshire's slowing economy cannot afford to be further hampered by increases in the costs of producing goods and services caused by government-imposed mandates like RGGI. Timing is not right for New Hampshire to join RGGI, and RGGI will not fix what ails Mother Earth.

Rep. Kaen then requested a roll call vote, sufficiently seconded by a roughly a dozen legislators, and the question was called. HB 1434 was then passed as amended with a vote of 214 in favor and 107 opposed.

#### **4.7 Senate**

The bill was introduced in the Senate on March 27<sup>th</sup>, where it was first sent to the Energy, Environment and Economic Development Committee (EE&ED). The bill was then sent to floor where it was referred to the Finance Committee before coming back to the floor. The differences between the House and the Senate were settled without a committee of conference and the bill subsequently went to the Governor's desk where it was signed into law.

The Senators were not interested in making major changes and respected the work that STE had done to deal with the particulars of the bill. Their only concern was the price for electric customers. At the public hearing, the BIA and many of the larger business interests testified strongly in favor of lowering the price threshold. This was then discussed in a meeting between the chair of EE&ED, Sen. Martha Fuller-Clark, Reps. Kaen and Fargo, Bob Scott, Mike Fitzgerald and Joanne Morin from DES, and Commissioners Below and Getz from PUC. The two commissioners estimated that the SBC could handle up to \$60 million in spending a year, which could be attained with a rebate set as low as \$6. Sen. Fuller-Clark then proposed an amendment which reset the threshold to \$6 starting in 2009, increasing by \$3 every two years thereafter before being phased out in 2016. It also increased the revenue dedicated to low-income assistance from 5% to 10%. The committee adopted her amendment with a 4-1 vote and it was then passed on the floor 16-8 before being sent to Finance.

The chair of Finance, Sen. Lou D'Allesandro, did not see a good reason for HB 1434 to be sent to his committee. He supported the bill already from what he knew of it, assuming that the price controls were right. Upon hearing the bill in Finance he encountered more pressure from the BIA and ended up supporting their efforts to lower the price cap even further. The majority of the Finance Committee did not support this and they instead adopted an amendment that slightly changed the price threshold by increasing it from \$6 in 2009 to \$8 in 2010.

Sen. D'Allesandro opposed his committee's amendment on the Senate floor. Eight others joined him but the amendment passed with fifteen voting in favor. Three successive floor amendments were then introduced and defeated. The first amendment proposed a threshold of \$2 pegged to the CPI. The second, from Sen. D'Allesandro, proposed a threshold of \$4 increasing by \$1 each year after. The third was a non-germane amendment to the RPS statute. The Senate then voted to pass the bill as amended by the Finance committee with a vote of 16-8, including the entire Democratic caucus and two Republicans.

#### **4.8 Passage**

The final step for the bill was to reconcile the changes made in the Senate. After discussing the new \$6 threshold with DES and PUC, Reps. Kaen and Fargo decided that they were happy with the finished product and a committee of conference would be unnecessary. Rep. Kaen then made a motion to concur with HB 1434 as amended by the Senate during the May 21<sup>st</sup> House session. The motion passed without debate and the bill was officially enrolled by the legislature.

Gov. Lynch then signed HB 1434 into law on June 11, 2008. The governor's public statement proclaimed urgency in addressing global warming and assured that the law would not hurt the state economically.<sup>10</sup> The actual signing was followed by a well-attended signing ceremony in the executive chamber on June 16<sup>th</sup>. Rep. Fargo remarked that the representatives of PSNH appeared wistful during the celebration. One of them explained to him that the company was unsure about whether or not to be happy with how the bill turned out. From the conversation Rep. Fargo gathered that PSNH had not fully absorbed what the program would mean for its future, even less so the eventuality of federal cap and trade.

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<sup>10</sup> The Governor's entire press release is available at <http://www.nh.gov/governor/news/2008/061108.html>



## **5 Analysis**

### **5.1 Politics of HB 1434**

The result of the legislative process was a bill that had been carefully deliberated and reshaped to better reflect the needs of New Hampshire. That the policy was introduced and successfully enacted by the state legislature was important for the political success of the program. Such a far-reaching policy decision would not have carried the same authority or public support had it instead been handed down through the executive branch. Along with increasing the impact of the policy, this also made the policymaking process more accountable to the public and allowed a wider array of interests to weigh in. Given that most of the essential provisions of the program were prescribed by the RGGI agreements, the legislature was able to devote more of its attention to the political balancing act surrounding HB 1434 in order to accomplish most important step – successfully passing it.

The most important thing to remember when viewing this result is that the legislative process is a means that justifies an end. In order to understand who won and who lost in this battle, we need to identify what motivated the changes that were made to the legislation as it gradually came to resemble what was passed into law. The first-person perspective of a legislator had limitations in this regard, despite its fundamental importance to this research. It is unbecoming of a legislator to ascribe motives or question the intent of another. Though based on observations taken at face value, the record of my experience with HB 1434, taken together with successive versions of the bill as it was amended, provides the information required to account for what resulted.

With the exception of technical changes imposed by the Office of Legislative Services, the modification of HB 1434 represented political compromises, major and minor, that helped it towards receiving a supermajority of votes in both chambers of the legislature. One of these decisions in particular was essential to bridging a momentary impasse, while others were more forward-looking, but all of them conferred gains and losses to one group over another and necessitated a reallocation of power. While the legislature was the final arbiter of these decisions, the guiding hand of the DES is unmistakable in each of them. It follows then that the bill's fate can best be described in that context.

As HB 1434 came directly out of RGGI, and the NEG/ECP by extension, the motivating force behind passing it was the executive branch. After signing the MOU, Governor Lynch was compelled to start a cap and trade program in NH by the end of 2008, and every decision regarding HB 1434 ultimately rested on this expectation. The governor's interest in passing HB 1434 – intact – was transmitted through Democratic leadership in the House and Senate, which also had a partisan agenda listing greenhouse gas reduction as a top priority. But one thing the governor and his executive department heads had which the legislature did not, was a prospective seat at the table for the development of a federal program. It makes sense then that the bill was shepherded through by DES, whose career government employees were positioned on the frontier of the most important piece of environmental policy in history.

This orientation towards the regional and national spheres shaped every major decision made by STE, whether or not the committee members shared it. The issue of allowance allocation was presented to the committee as a question of whether to participate in a regional auction or hold a state one. In reality they could have chosen “neither” and provided for allowance distribution through some other mechanism or simply granted them to affected sources at no cost, as had been done in the EU ETS. Interestingly, DES also included a provision for direct sale of allowances, alongside one for auctioning them, in the draft amendment they submitted to the committee. When the question arose over what point there would be to selling allowances directly in addition to auctioning them, DES responded that there was none. There was no consideration of direct sale before or after that, demonstrating the amount of control the department had over the discussion.

The option to participate in a regional auction was similarly presented as the obvious one. The only thing committee members needed to hear was that other states were planning to participate in it, and their minds were made up. The same held true in deciding how to use the auction revenues. The 100% energy efficiency scenario was promoted not only by DES but also quite convincingly by the state-commissioned UNH Impact Study, which presented recommendations that were NH-specific. The results of that study would have proven true in any state, but it was clear that this choice needed to be impressed upon the legislature in the event that it showed an independent streak. The fact that most of the members of the committee initially opposed this option again speaks to the important role of DES.

Though there is room for debate over the nature of the department's involvement, it is clear that this was one portion of the bill that it felt strongly about. Not only was it a politically dynamic area for the committee, but it was also the crucial point upon which some votes were cast. The unambiguous direction that DES provided helped to build consensus early on around these issues and secure bipartisan support for the bill. It happens that the main grievance of those who were steadfastly opposed to HB 1434 was not its acceptance of climate science, but that they saw it as ceding state authority to an outside body. This had the effect of separating out the ideological opponents of RGGI, leaving those who might not have agreed with its intent to weigh the secondary benefits it could still bring to the state in the way of energy efficiency. DES foresaw most of the problems that arose over these components of the legislation and did not leave anything up to chance, given their interest in upholding the standard that other states had set.

The one debate in which DES did not have any apparent interest, yet still played a role in preempting difficulty, was over price controls. The department included in its draft amendment the provision creating price thresholds accompanied by a consumer rebate. The department had understandably been in agreement with the environmental community on much of the substance of the program, and generally did not opine on economic matters. With the business lobby and the Office of the Consumer Advocate both in favor of price controls, however, this was destined to become a sticking point for HB 1434, with potential to threaten its passage. While the House was somewhat less concerned with blunting the economic impact of cap and trade, it was viewed as a necessary safeguard against political backlash in Senate and became their only real point of difference with the House. Arguably, the legislation was not significantly weakened by adding price controls. The final threshold price was arrived at based on realistic expectations of the state's capacity to provide energy efficiency benefits to consumers in the first year of the program. The department originally set a threshold price that was double the optimal amount, knowing full well that the Senate would likely change it.

Whereas the DES tried to remain above the fray during much of the deliberations, it was dragged into the dispute with PSNH in full view of the public. This damaged its role as facilitator to the committee, but by that time most of the intended changes to the bill had already been finalized. In this case the department claimed that they could not have undue influence on the committee's decision. If the legislature chose to delegate the responsibility for allowance

conversion to DES this could have put them in a precarious legal situation. STE struggled to interpret the CPA in the absence of firm direction from the department, but ultimately it rendered the matter ineffectual using the flow control mechanism.

Though this dispute was resolved in the committee room, by no means did it develop there. During the stakeholder process, CPA allowance calculation was clearly identified as a major obstacle that would have to be overcome. Carefully worded letters were exchanged between PSNH and the department during that period, staking out their respective positions before the legislation was even drafted. DES was either unwilling or unable to negotiate with PSNH in that environment. Understanding the legal ambiguity of the situation, the department deferred this decision for the legislature to rule on. DES was able to reach its primary goal in this instance not in spite of the RGGI process but because of it.

Thus, the most important lesson that can be learned from the story of HB 1434 is not one of DES's skill at playing the legislative game. The multistate policymaking process did all the heavy lifting necessary to creating the first binding cap and trade program in the United States. The expertise required to get this large, complicated piece of policy through the legislature was not to be found among these volunteer legislators with limited resources. The states instead assembled their most qualified technocrats to develop RGGI into a viable policy prescription. Their job also was to mete out solutions to wherever problems arose, extending beyond the pre-legislative planning stages and into the political process. In that, their central involvement in the program from the outset made them authoritative.

Regardless of what one thinks of the Department's involvement, the bill should be judged by its outcome and not how it was created. There has been substantial criticism of the power of technocratic elites to direct public policy but, as they apply to RGGI, such arguments merit a more in-depth discussion (Brint, 1990). The professional power exercised by DES and others was legitimized by the legislature, which, if anything, would seem to suggest its own inadequacy. The lack of resources and professional expertise in the New Hampshire General Court is an entirely separate issue and one which had a negligible impact in this case. That the program was enacted should be seen as validation of the process that formed it; the bill was made to satisfy the public interest without straying from its purpose.

## **5.2 Economics of HB 1434**

RGGI is evaluated in its current state, in the absence of any other GHG reduction policies, as to how it would be expected to perform over the period from 2009-2018.

To determine impact of the program we have to look at the economic forces at work in the energy market and how it will influence them. The primary benefit of this program is an absolute reduction in CO<sub>2</sub> emissions from electric generation in NH. The secondary benefits of the program in the way of energy efficiency create a positive feedback loop that increases its overall effectiveness. Both components will be necessary in transforming the energy market to one that is less dependent on fossil fuels.

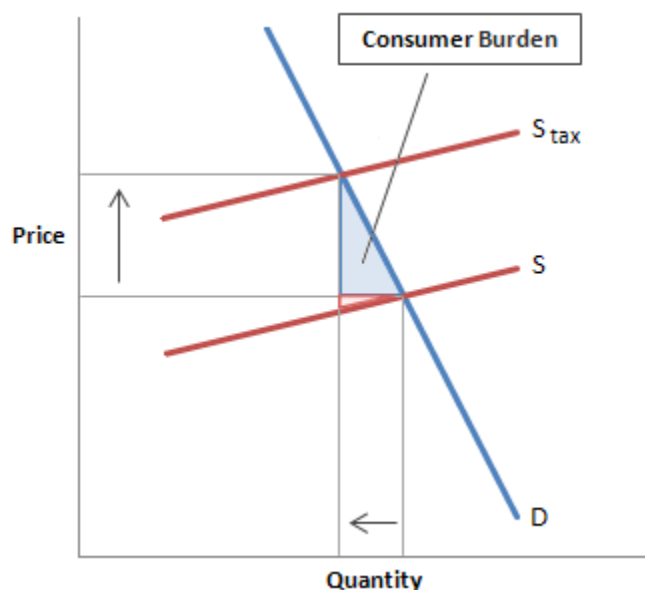
The RGGI program reduces GHG emissions using the market-based, cap and trade mechanism. It accomplishes this by mandating the desired environmental outcome and creating a market to allocate resources efficiently in meeting that mandate. Cap and trade does not posit an increase in the price of electricity the way a direct tax would, but creates market conditions that practically ensure it. The price of electricity responds to changes in electric demand and supply that develop as a result of the cap. The market for allowances also responds to these changes, creating new competition within the generation market that did not exist previously.

The important part of this program is the cap, which guarantees a set environmental outcome. It creates a separation between the negative externality involved in the production of electricity from the amount consumed. This change is critical for preventing climate change in the long term while maintaining a healthy economy in the short term, often seen as competing interests. The cap essentially freezes generation from fossil fuels where it is now; future growth in installed capacity must come from renewable energy. As the then cap tightens, coal-fired generation will likely be the first to go. Generation from natural gas and renewables will become more favorable as a result but the cap by itself does not make a large-scale shift to alternative energy economically feasible.

The trade component of the program turns CO<sub>2</sub> emissions into a commodity, made scarce by the cap. An allowance only gives a generator the right to emit 1,000 tons of CO<sub>2</sub> and in theory has no monetary value in and of itself. The auction and trading system then establishes a price for allowances relative to the demand for emissions among generators. While purchasing allowances does not pose a significant cost at the outset, their appreciation over time makes them an asset to generators if they are not expended. As financial instruments, these allowances give

generators more flexibility in the timing of investments to reduce their reliance on fossil fuels. This is particularly important for PSNH, which is one of the most carbon-intensive generators in the region, and explains why they fought as hard as they did to receive bonus allowances. Though the flow control limits their ability to expend them in the near term, PSNH's bank of allowances gives them a competitive advantage in the long term.

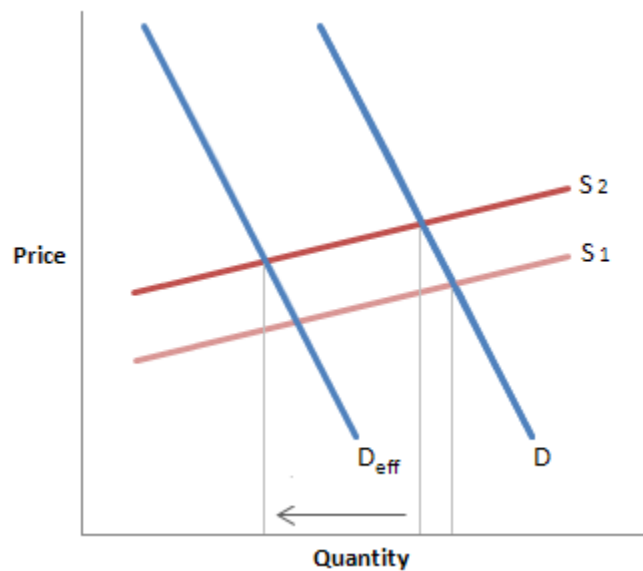
Allowance expenditures will not lead to a dramatic rise in electricity prices nor will they affect the amount of electricity demanded. It can be assumed the additional cost of cap and trade will act similar to a carbon tax, causing a slight reduction in electric consumption. Figure 5-1 describes the effect of an externality tax on the retail electric market:



**Figure 5-1: Supply and Demand of Electricity with an Externality Tax**

Demand for electricity is relatively inelastic compared to supply in the short term. This stems from the fact that electric utilities are a regulated monopoly and provide a basic public service that consumers are largely dependent on. The result is that consumers will bear the burden of the cost associated with emissions control almost entirely. However, the projected price increases under RGGI will only amount to pennies on the dollar and will likely go unnoticed by retail customers. Any change in consumption resulting from this will be negligible and will not contribute significantly to reduced emissions. While the program is not likely to change consumer behavior using price signals, it will affect consumption in another way.

The program converts the cost of allowances into a secondary benefit to consumers, which will also cause a shift in electric demand. Rather than rebating the proceeds from auctioned allowances directly to customers, this money will be reinvested in the CORE Energy Efficiency programs. Based on the historical performance of the programs it is estimated that they will save one kilowatt-hour for ever \$0.33 spent. At that rate — double the price of 1 kWh of electricity — the CORE programs can yield one dollar of electricity savings for every two dollars of cap and trade revenues. As a function of program revenues, energy savings will keep pace with price increases that result from cap and trade, effectively cutting the retail cost of cap and trade in half. Figure 5-2 compares the demand shift from energy efficiency to the change in demand that results from cap and trade alone:



**Figure 5-2: Demand Shift from Energy Efficiency**

Based on projections, the program will slow the annual growth in electric demand by about 25% initially and by 50% in 2018. This comes close to reaching the 10% maximum increase in energy efficiency that the PUC commissioners say can be realized through the CORE programs in the next ten years. Though it could increase if energy efficiency measures become cheaper due to increased investment and advances in technology, the extent of these reductions relative to overall electric demand will be small. Demand reduction will blunt the consumer impact of cap and trade to allow for continued economic growth, and will supplement the impact generators an extra year of flexibility in timing emissions reductions.

To reach compliance with cap and trade New Hampshire must turn to renewable generation in meeting future demand. Cap and trade is designed to reduce CO<sub>2</sub> emissions primarily by forcing a technological change in electric generation. While it is true that New Hampshire's reliance on renewable generation will have to increase it is unclear whether the cap will force fossil-fuel fired generation out of the market. As stated, the deciding factor in the switch from coal to cleaner energy is the price of allowances. If the cap had been set too low the allowance market would be short, causing allowance prices to trade exorbitantly high and denying the industry the flexibility it needs to function efficiently. In worrying that such an outcome would consign the program to failure, the states instead set the RGGI cap too high. NH's gap between actual emissions and those allocated under the cap is 10% according to the EPA, but other organizations say it could be as high as 17% regionwide (Environment Northeast, 2009). Such a discrepancy means that a 10% reduction in the cap does not necessitate a 10% reduction in emissions.

Overallocation has not prevented the RGGI market from functioning, but it does dilute the value of allowances. Judging by auction results RGGI has seen success in its first year, and independent monitors are generally satisfied with activity on the secondary market. No allowances put up for auction went unsold, so there is a sufficient demand for allowances. The secondary market has seen regular trade volumes around 1 million a day and decreased volatility as the market matures (Potomac Economics, 2009). The clearing price at the first auction in September 2008 was \$3.07, rising to \$3.38 in December and \$3.51 in March 2009 before settling back down to \$3.23 in June.<sup>11</sup> The price of RGGI futures finally settled back down to around \$3.00 and did not trade significantly higher than the auction price for much of the year.<sup>12</sup> This is a bit higher than the expected price of \$2.00 which was used to model the impact of RGGI but well below the threshold price of \$6.00 a ton.

If allowance prices remain as they are now, the program encourages marginal emissions reductions but will not be putting coal generators out of business anytime soon. The PSNH plants emit roughly 1 ton of CO<sub>2</sub> for every MWh produced, so the current cost of the program to them is \$3.00/MWh. Factoring that into a plant cost of \$40 per MWh, this is less than a 10% increase in production costs for only a third of their total generation (United States Department of Energy,

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<sup>11</sup> For updated auction results, see <http://www.rggi.org/co2-auctions/results>

<sup>12</sup> For the current price of RGGI futures, see [http://www.ccfef.com/mktdata\\_ccfe/futuresSummary.jsf?symbol=rggi](http://www.ccfef.com/mktdata_ccfe/futuresSummary.jsf?symbol=rggi)



2007). This will have an impact on their generation choices, and together with changes in fuel prices will cause them to use their own coal plants less and purchase more electricity from hydroelectric and biomass plants on the market. However, it will be difficult to shut down the coal plants entirely because PSNH has a public interest in operating them not present with other generators.

Having a deregulated energy market is important for cap and trade to function properly. NH ratepayers receive an additional benefit from PSNH owning its own generation but it comes at an environmental cost that it cannot afford in the long run. This exception is the result of an unresolved political issue that New Hampshire will eventually have to confront if a more stringent emissions reduction policy is adopted. The movement of capital towards alternative energy can be directed most efficiently by the market and the risk associated with such long-term investment should be borne by the private sector. The vast majority of New Hampshire served by PSNH is currently insulated from such changes by the large reserve of bonus allowance that the utility has, but this advantage will almost certainly not hold under a federal cap and trade program.

### **5.3 *National Policy Environment***

Despite its limited ability to stop climate change, RGGI has a greater impact on the country as a whole as it prepares to regulate CO<sub>2</sub> emissions. Seeing itself as the vanguard of environmental policy in America, NH's legislature was rallied by the historic nature of its work and valued a strong consensus over a strong cap and trade program. This might make HB 1434 seem like more of a symbolic victory, but getting the electric industry to agree to regulation on CO<sub>2</sub> emissions presents an enormous challenge in stopping climate change. Cap and trade enacted on the national level will have major implications for the regional program. Whether or not this will be an improvement depends on the extent to which the federal government can build on the political success of RGGI.

### 5.3.1 National Cap and Trade

The idea of national cap and trade is nothing new to the United States, but only recently has it become a political reality. When the question was raised in 1997, over participation in international cap and trade under the Kyoto Protocol, the prevailing view was that it would result in serious harm to the American economy (EIA, 1998). Opposition to Kyoto was so unanimous that President Clinton decided not to submit articles of the treaty to the Senate for ratification. Without legislative approval, the United States' signature of Kyoto was effectively meaningless. The decision to formally join Kyoto was then left up to the Bush administration, which chose to run out the clock until the 2005 deadline for ratification had passed.

The rest of the world looks for the United States to take a step forward in order to negotiate a replacement for Kyoto in 2010. The fear of economic damage resulting from an emissions cap is tied to past opposition from developing nations such as India and China. Preventing climate change will not be possible without the participation of these countries, and the United States does not want to move early to reduce emissions if it is not going to have a serious impact. While the perception is that these countries, not the United States, are standing in the way of a broad international agreement, the reality is their citizens are much more supportive of one than we are. According to a 2009 poll of public opinion across 19 countries comprising 60% of the world's population, Americans placed the lowest priority on their government addressing climate change (World Public Opinion, 2009). Thus, the difficulty of enacting a national policy is at the heart of the United States' reluctance to commit to emissions reductions on the international stage. Getting separate nations to agree all at once to reduce emissions may prove to be easier than actually reaching agreement within the United States beforehand.

Taking decisive action to reduce CO<sub>2</sub> emissions requires building a national consensus between geographically disparate regions of the United States. The "upwind" opponents of NO<sub>x</sub> cap and trade in the 1990's have reemerged, albeit under a new name. Fittingly referred to as "coal states," they make up America's agricultural and manufacturing base and, as a result, have the most carbon-intensive electric generation. The RGGI states, by contrast, are among the least coal-dependent, accounting for less than 4% of total coal-fired generation in the United States despite representing over 16% of its total population (EIA, 2008). Including the three large Pacific states planning a regional cap and trade system similar to RGGI, the average reliance on

coal in the remaining 37 states is 10 times higher per-capita. Such a discrepancy poses a political obstacle to national cap and trade that was not present with RGGI.

The task of enacting nation-wide cap and trade program is complicated also by the difference between state and federal government. As was the case in NH, executive branches had a dominant role in seeing RGGI through to the end and in some states they created the program without any legislative involvement. The political and geographic unity of the states empowered technocratic elites, many of whom had already developed relationships working together on energy and environmental issues. The central involvement of government regulators also encouraged greater cooperation from the electric industry. A similar policy environment — one which allows cap and trade to be a relatively painless endeavor — does not exist at the federal level.

The global implications of climate change demand action from the United States and the President is ultimately responsible for ensuring it. The relevant federal agencies have a wealth of expertise with regulating power plant emissions, though it was not used effectively under the Bush administration, which opposed emissions controls. Under President Obama, who strongly favors cap and trade, the EPA and the DOE are now in alignment behind the policy. The president is also using his Economic Recovery Advisory Board to mobilize businesses in support of cap and trade (Doerr, 2009). But while the executive has unparalleled power in setting this new policy direction, his ability to follow through on it is checked by congressional prerogative.

The economic implications of cap and trade demand that it have political efficacy that only Congress can provide. The advice of government experts remains indispensable in the overall design of a program, but the biggest decisions concern its details, over which legislators will negotiate intensely on behalf of their constituents. The opportunities for compromise in Congress are unlike anything cap and trade saw at the state level. A strong, carefully-crafted piece of legislation can make it through the House of Representatives relatively unscathed due to effective party leadership. But cap and trade faces an enormous institutional hurdle in the Senate, where coal state senators could potentially stop the entire process in its tracks. Though portions of the policy may be sacrificed to make it through, cap and trade enacted at the federal level will undoubtedly have a greater impact than RGGI.

### 5.3.2 American Clean Energy and Security Act

On June 26, 2009, the U.S. House of Representatives voted 219-212 to pass H.R. 2454, the Waxman-Markey American Clean Energy and Security Act. At over 1,400 pages long, the bill promises an explosion of federal programs to combat climate change, making it the most comprehensive piece of legislation in history but a politically unwieldy one the same time. The central component of the bill is national cap and trade, for which it has drawn fire from the fossil fuel industry and Republicans, who have given it the misnomer of “cap and tax.” As a complement to cap and trade, the bill also contains initiatives resembling everything advocated for in New Hampshire’s Clean Power Strategy back in 2001, and then some. This speaks to the fact that this bill is essentially trying to make up for lost time; this area of policy has seen no progress on the federal level in almost a decade.<sup>13</sup>

With respect to the electric industry, H.R. 2454 creates incentives beyond cap and trade to accelerate emissions reductions. It provides for research and investment in transmission planning, net metering, smart grid, carbon capture and sequestration, nuclear and other advanced technologies. It also creates new building, lighting and appliance, industrial, residential, and low income community energy efficiency programs. But if there is one secondary program in the bill that is indispensable, it is the federal Renewable Electricity Standard. This replaces the patchwork of state renewable standards, creating a blanket policy for electric utilities across the nation that will guide the switch to renewable sources of electric generation. A strong federal incentive structure such as this, coupled with public funding for research in clean energy, will make possible the transformation in the electric generation market needed to comply with emissions controls.

The cap and trade program proposed in Waxman-Markey will replace RGGI with a more aggressive emissions target of 83% of 2005 levels in 2020, down to 17% by 2050. It also builds on the quarterly auction design of RGGI, setting a reserve price of \$10 in the first year that increases by 5% each year thereafter. The program includes affected sources under RGGI while expanding to cover smaller industrial emitters over time. The allowance conversion from regional to federal is based on the average auction price from the year that allowance originated. This gives RGGI generators at least a 3-to-1 advantage, assuming federal auctions produce allowance prices over \$10, and the recent drop in RGGI allowance prices suggests they seek to

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<sup>13</sup> The read the full text of H.R. 2454, see <http://thomas.loc.gov/>

press this advantage further. The RGGI states themselves welcome the stronger federal program, and expect that it will carry over funding for state energy efficiency programs (Bowles, 2009).

RGGI states will inevitably have to make concessions to coal states if Waxman-Markey is to become law. They can expect the conversion of RGGI allowances to be one such bargaining point. RGGI allowance-holders already took a hit in the compromise that got the bill through the House. In it, the majority of new allowances are no longer auctioned as planned, but initially given to generators for free as a consumer benefit. While this prevents it from having a large economic impact initially, the program in H.R. 2454 is still an improvement over RGGI because it takes an economy-wide approach to increasing efficiency and promoting clean energy. However, in order for it to be effective in reaching the underlying goal of halting climate change, Congress must learn from our experience with RGGI and set the emissions cap carefully. The Northeast states began cap and trade in the absence of leadership from Washington but now look to the federal government to pick up where they left off.

## 6 Conclusion

It first needs to be said that in the two years that I spent working with RGGI — participating in its creation and later observing as it took on a life of its own — what surprised me most was the unquestioned dedication of our executive department employees to an issue that is so politically challenging. With another two years of study, I still would not know enough about this integral sector of our economy, and how to go about changing it. Also remarkable was that despite a proximity to political and corporate interests that would leave most people cynical, these officials pressed ahead in serving a public interest not nearly as salient. In fact, the most frustrating thing about working with this issue is how difficult it is to grasp not only the solutions, but the problem itself and what it really means for our future. When overwhelmed by the enormity of an issue like this, politicians become susceptible to uncertainty and doubt. It was the confidence exuded by New Hampshire's career civil servants, who saw RGGI through from start to finish, that prevented this from ever occurring.

The decisions I had to make during our consideration of RGGI were all made with confidence. The immediate question for some concerned the underlying premise of reducing greenhouse gas emissions, but for me the reality of global warming was a foregone conclusion and I only benefited from learning more of the climate science surrounding it. With that out of the way, two major questions remained. First I had to decide whether or not the proposed policy was the right one to achieve the desired outcome. My own ideas about this going into the process were therein challenged, but my basic answer to this question did not change — it only became more nuanced. I also had to decide if this particular piece of legislation maximized the effectiveness of the chosen policy while shielding the citizens of New Hampshire from unintended consequences.

Based on the political circumstances and the timeliness of addressing climate change, I decided that cap and trade was the correct policy for New Hampshire in 2008. With a primary goal of reducing CO<sub>2</sub> emissions, no policy provided more certainty over emission levels than this one. In an environment where the public supported government action against global warming but had no conception of what it would cost, this policy used the power of markets to determine a price for CO<sub>2</sub> emissions. The implementation of this policy demanded more responsibility from the electric industry through a highly regulated system but required little involvement, if any, from the public. At the same time, it made sure to balance the cost of emissions reductions

between producers and consumers by making positive use of the revenues through energy efficiency measures. Lastly, the trade component of the policy provided greater flexibility to power producers by creating a long-term financial instrument that would help them in planning investments in cleaner technology.

Knowing that primary goal of reducing emissions would be secured in passing the cap and trade, I made my decisions on all secondary matters pertaining to the bill so as to ensure public confidence in it. There was a certain amount of pride associated with creating a historic piece of environmental legislation, and I was among those who hoped New Hampshire's would be a shining example to others. However, when put into proper historical context, our responsibility was not to ensure we had the best cap and trade program but to ensure it would not be the last. On the less controversial matters of participating in the regional auction and instituting price controls, I was in agreement with the majority in my committee that these were beneficial to the state's citizens. In the argument over conversion of CPA allowances, I initially believed that a large share of bonus allowances would tilt the equation too far in PSNH's favor. But when a compromise arose, promising to preserve the program's effectiveness, I saw it necessary to protect the interests of PSNH and the vast majority of ratepayers it serves. In deciding these issues, I was confident that we had made HB 1434 appropriately sensitive to the economic needs of New Hampshire.

Passing cap and trade in New Hampshire did not solve the climate crisis, but it was a necessary step in what must be a continued evolution of public policy. Whether this method will be the most effective way of reducing emissions remains to be seen, but whatever becomes of it, we must remember that RGGI was our earliest attempt at addressing this problem. While the initial results suggest that the program has had a weak effect, new data suggests that emissions are set to grow significantly in 2010 after having been abnormally low in 2009 due to the recession (EIA, 2009). It would seem then that the Northeast states were prescient in setting a cap that was not too tight, lest it go down in history as having prevented economic recovery. That judgment reflects the five-year consensus-building process responsible for making RGGI a resounding political success. The prospect of national cap and trade could make this seem like merely an exercise in confidence-building, but there is no doubt that 2008 was the year when we began moving in the right direction, from which there will be no turning back.

## Appendix A NH Electric Power Industry

### Energy Information Administration Data

Electric Power Net Generation (megawatthours) by Primary Energy Source and Industry Sector, 1990, 1995, 2001, and 2006:

Energy Source	1990	1995	2001	2006
<b>New Hampshire</b>				
Electric Utilities.....	10,810,155	13,936,033	13,095,085	4,574,520
Coal.....	2,959,203	3,367,488	3,706,399	3,885,433
Petroleum.....	2,293,037	1,003,899	428,990	230,474
Natural Gas.....	-	201,304	42,143	61,054
Independent Power Producers and Combined Heat and Power.....	1,595,041	1,498,346	1,979,539	17,489,175
Petroleum.....	53,456	60,857	52,687	207,076
Natural Gas.....	-	-	76,383	5,947,173
Nuclear.....	-	-	-	9,397,856
Hydroelectric.....	403,863	385,924	765,769	1,186,679
<b>Total Electric Industry.....</b>	<b>12,405,196</b>	<b>15,434,379</b>	<b>15,074,624</b>	<b>22,063,695</b>

Source: EIA, 2007

Electric Power Delivered Fuel Prices and Quality for Coal, Petroleum, and Natural Gas, 1990, 1995, 2001, and 2006:

Fuel, Quality	1990	1995	2001	2006
<b>New Hampshire</b>				
Coal (cents per million Btu)	178	159	167	256
Average heat value (Btu per pound)	13,303	13,111	13,050	13,196
Average sulfur Content (percent)	1.81	1.38	1.34	1.29
Petroleum (cents per million Btu)	227	233	337	782
Average heat value (Btu per gallon)	154,329	154,402	151,190	155,071
Average sulfur Content (percent)	1.86	1.51	0.81	1.01
Natural Gas (cents per million Btu)	-	183	239	W
Average heat value (Btu per cubic foot)	-	1,018	1,010	1,043

Source: EIA, 2007



**Electric Power Industry Emissions Estimates, 1990, 1995, 2001, and 2006 (thousand tons):**

Emission Type	1990	1995	2001	2006
<b>New Hampshire</b>				
<b>Sulfur Dioxide .....</b>				
Coal.....	37	33	40	35
Petroleum.....	23	8	5	2
Natural Gas.....	-	*	-	*
Other.....	*	*	1	*
Total.....	60	41	46	37
<b>Carbon Dioxide .....</b>				
Coal.....	2,816	3,260	3,690	4,121
Petroleum.....	2,115	1,009	503	433
Natural Gas.....	-	121	195	2,398
Other Renewables.....	102	101	108	112
Total.....	5,032	4,492	4,496	7,065

Source: EIA, 2007

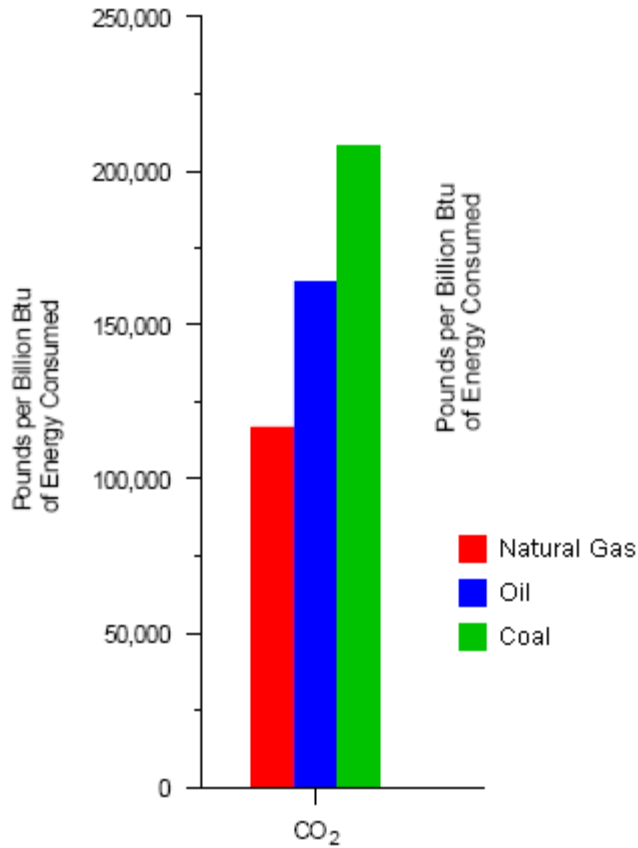
**Retail Sales and Average Retail Prices by Sector, 1990, 1995, 2001 and 2006:**

Sector	1990	1995	2001	2006	Percentage Share	
					1990	2006
<b>New Hampshire</b>						
<b>Retail Sales (thousand megawatthours) .....</b>						
Residential.....	3,444	3,364	3,789	4,401	38.4	39.7
Commercial.....	2,010	3,226	3,911	4,563	22.4	41.1
Industrial.....	3,418	2,286	2,483	2,131	38.1	19.2
Other.....	107	131	133	NA	1.2	NA
All Sectors.....	8,980	9,007	10,316	11,094	100.0	100.0
<b>Average Retail Prices (cents/KWh) .....</b>						
Residential.....	10.34	13.50	12.49	14.68	NA	NA
Commercial.....	9.50	11.38	10.53	14.07	NA	NA
Industrial.....	7.47	9.56	9.11	11.62	NA	NA
Other.....	12.74	12.32	13.28	NA	NA	NA
All Sectors.....	9.09	11.72	10.95	13.84	NA	NA

Source: EIA, 2007

## U.S. Environmental Protection Agency Data

CO<sub>2</sub> Emissions Factor by Fuel Type:



Source: EPA, 1997

CO<sub>2</sub> Emissions (million metric tons) from Fossil Fuel Combustion in New Hampshire:

State	Sector	1990	1995	2000	2001	2002	2003	2004	2005
New Hampshire		14.68	15.08	17.74	16.79	17.52	20.55	21.83	21.21
	Commercial	1.32	1.15	1.44	1.31	1.31	1.52	1.81	1.93
	Industrial	0.83	1.09	1.64	1.24	1.13	1.07	1.14	0.98
	Residential	2.47	2.76	2.93	2.86	2.68	3.24	3.40	3.17
	Transportation	5.21	5.76	7.24	7.25	8.10	7.54	7.77	7.43
	Electric Power	4.85	4.32	4.49	4.14	4.30	7.17	7.71	7.70

Source: EPA, 2007

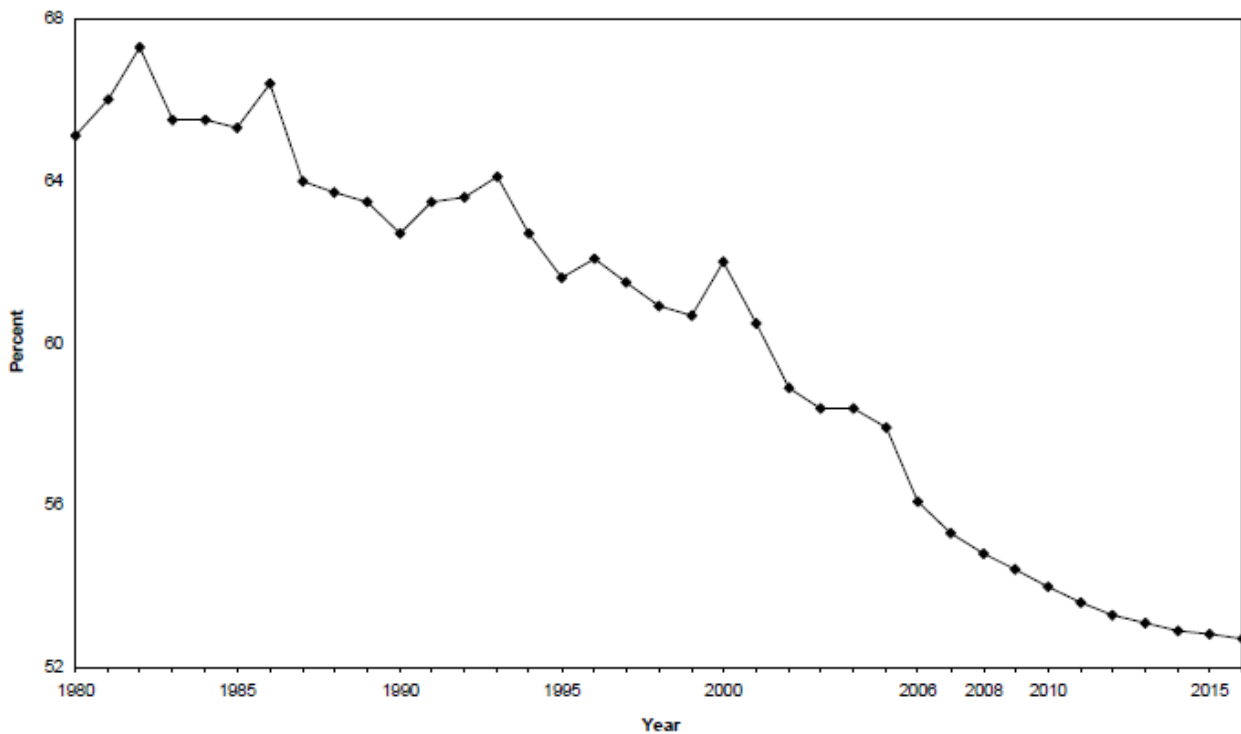
## ISO-New England Data

Summary of Annual and Peak Use of Electric Energy for New England and the States:

State	Net Energy for Load (1,000 MWh)			Summer Peak Loads (MW)				
	2007	2016	CAGR	50/50		90/10		CAGR
				2007	2016	2007	2016	
New England	132,615	147,190	1.2	27,360	31,885	29,160	34,170	1.7
Connecticut	33,930	38,060	1.3	7,320	8,475	7,810	9,080	1.6
Maine	11,820	13,390	1.4	2,035	2,400	2,130	2,530	1.8
Massachusetts	60,155	65,670	1.0	12,625	14,595	13,430	15,605	1.6
New Hampshire	11,985	13,775	1.6	2,445	3,000	2,665	3,300	2.3
Rhode Island	8,465	9,270	1.0	1,880	2,185	2,005	2,345	1.7
Vermont	6,355	7,020	1.1	1,070	1,230	1,130	1,310	1.6

Source: ISO-NE, 2007

New England Annual Load Factor (i.e., the ratio of average hourly demand to hourly peak demand) (ISO-NE, 2007):



Source: ISO-NE, 2007

## NH Public Utilities Commission Data

### Budget, Participation, and Lifetime kWh Savings Goals for 2008 New Hampshire CORE Energy Efficiency Programs:

	National Grid		NHEC		PSNH		UNITIL		TOTALS	
<b>PROGRAMS</b>										
<b>Energy Star Homes</b>										
Number of Homes / Lifetime kWh Savings	89	290,757	29	187,159	365	1,314,857	71	893,342	554	2,686,115
B/C Ratio / Planned Budget	1.47	\$263,337	1.54	\$114,847	1.53	\$858,826	1.10	\$221,500		\$1,458,510
<b>Home Energy Solutions</b>										
Number of Units / Lifetime kWh Savings	87	1,324,409	81	1,775,005	1,278	24,055,277	82	1,174,862	1,528	28,329,553
B/C Ratio / Planned Budget	1.86	\$43,290	1.46	\$119,755	1.10	\$1,627,249	0.50	\$166,500		\$1,956,794
<b>Energy Star Appliances</b>										
Number of Rebates / Lifetime kWh Savings	710	1,468,274	961	1,506,044	10,586	12,003,536	1,083	1,689,301	13,340	16,667,155
B/C Ratio / Planned Budget	1.41	\$61,770	1.11	\$87,811	1.30	\$632,819	1.10	\$109,503		\$891,903
<b>Home Energy Assistance (see Note 1)</b>										
Number of Units / Lifetime kWh Savings	48	1,213,394	75	1,215,014	684	12,316,986	76	10,440,401	883	25,185,795
B/C Ratio / Planned Budget	1.60	\$173,675	1.35	\$148,421	1.09	\$1,655,953	1.00	\$296,296		\$2,274,345
<b>Energy Star Lighting</b>										
Number of Rebates / Lifetime kWh Savings	8,920	3,289,707	14,094	4,083,602	242,772	72,965,127	54,939	14,308,748	320,725	94,647,184
B/C Ratio / Planned Budget	3.29	\$49,702	2.73	\$90,503	3.50	\$1,039,631	3.60	\$174,071		\$1,353,907
<b>C&amp;I New Equipment &amp; Construction (see note 2)</b>										
Number of Participants / Lifetime kWh Savings	34	23,049,600	16	7,936,054	140	72,926,467	6	4,891,687	196	108,803,808
B/C Ratio / Planned Budget	3.51	\$409,073	2.73	\$134,679	2.10	\$2,077,399	3.10	\$150,000		\$2,771,151
<b>Large C&amp;I Retrofit (see note 2)</b>										
Number of Participants / Lifetime kWh Savings	23	17,929,408	13	11,111,906	144	167,755,620	15	15,915,355	195	212,712,289
B/C Ratio / Planned Budget	1.97	\$347,897	2.39	\$132,328	2.54	\$2,448,364	2.00	\$306,171		\$3,234,760
<b>Small Business Energy Solutions</b>										
Number of Participants / Lifetime kWh Savings	72	9,606,055	20	2,544,318	460	82,147,746	60	11,597,792	612	105,895,911
B/C Ratio / Planned Budget	2.14	\$425,376	1.36	\$94,747	1.43	\$2,374,171	2.10	\$300,000		\$3,194,294
<b>Educational Programs (see Note 3)</b>										
B/C Ratio / Planned Budget		\$8,608		\$43,263		\$127,720		\$15,000		\$185,983
<b>Company Specific Programs</b>										
Number of Participants / Lifetime kWh Savings			12	4,273,326	37	42,658,783				46,932,109
B/C Ratio / Planned Budget		\$0	1.47	\$222,451		\$865,760		\$81,050		\$1,169,261
<b>Smart Start Program</b>										
Number of Participants / Planned Budget		\$0		\$20,510		\$50,000		\$0		\$70,510
<b>Utility Incentive</b>										
B/C Ratio / Planned Budget		<u>\$141,930</u>		<u>\$96,745</u>		<u>\$1,100,631</u>		<u>\$145,607</u>		<u>\$1,484,913</u>
<b>TOTAL PLANNED BUDGET</b>		<b>\$1,916,050</b>		<b>\$1,306,060</b>		<b>\$14,858,523</b>		<b>\$1,965,698</b>		<b>\$20,046,331</b>

Source: PUC, 2007

## Appendix B Analysis

### *RGGI Model Inputs*

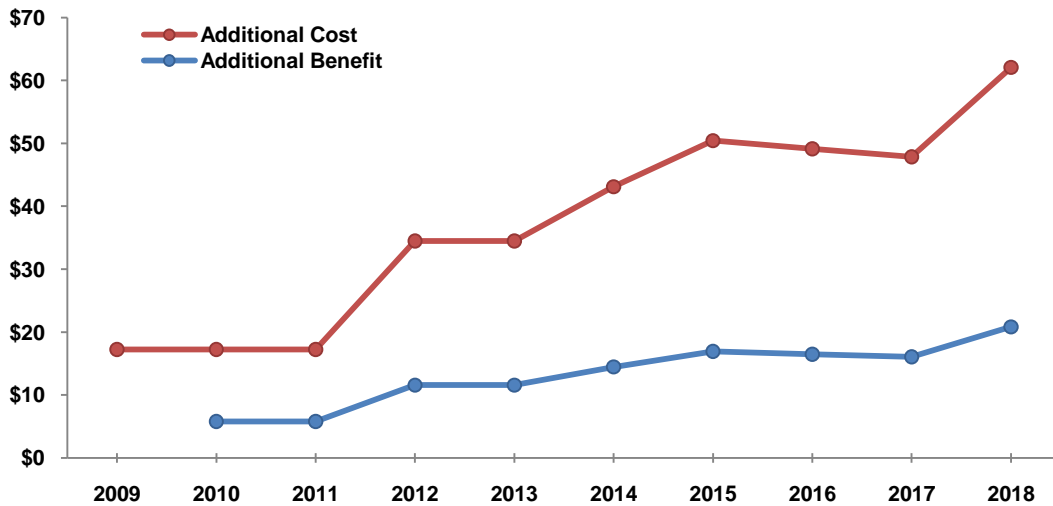
**Model Assumptions:**

Year	Electric Demand (kilowatt-hours)	Electric Price (per kilowatt-hour)	CO <sub>2</sub> Emissions (tons)	CO <sub>2</sub> Price (per ton)
2009	12,265,000,000	\$0.154	8,620,460	\$2.00
2010	12,430,000,000	\$0.155	8,620,460	\$2.00
2011	12,660,000,000	\$0.155	8,620,460	\$2.00
2012	12,890,000,000	\$0.155	8,620,460	\$4.00
2013	13,115,000,000	\$0.155	8,620,460	\$4.00
2014	13,330,000,000	\$0.155	8,620,460	\$5.00
2015	13,550,000,000	\$0.155	8,404,948	\$6.00
2016	13,775,000,000	\$0.155	8,189,436	\$6.00
2017	14,004,000,000	\$0.155	7,973,924	\$6.00
2018	14,236,000,000	\$0.155	7,758,412	\$8.00

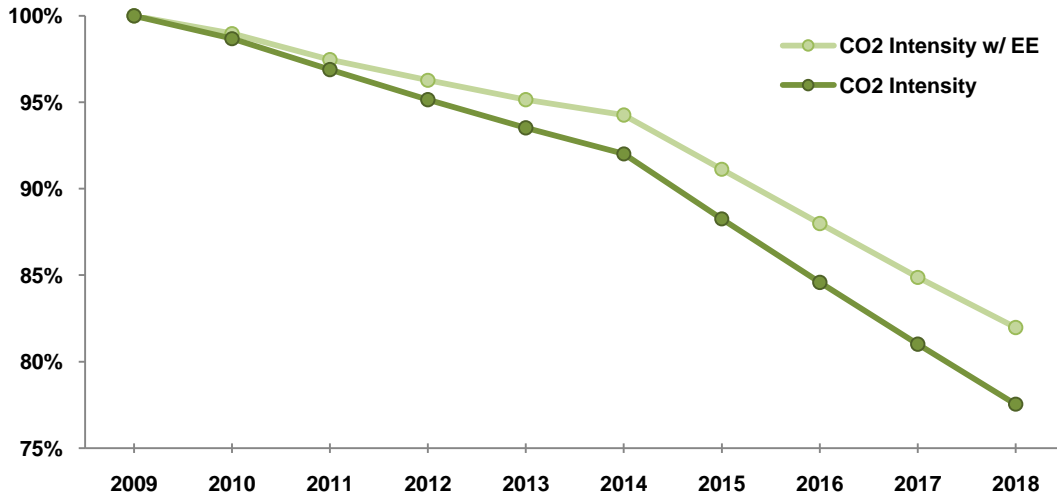
Source: Gittell & Magnusson, 2008a

### *RGGI Model Outputs*

**Projected Annual Program Cost and Benefit to Consumers (millions):**

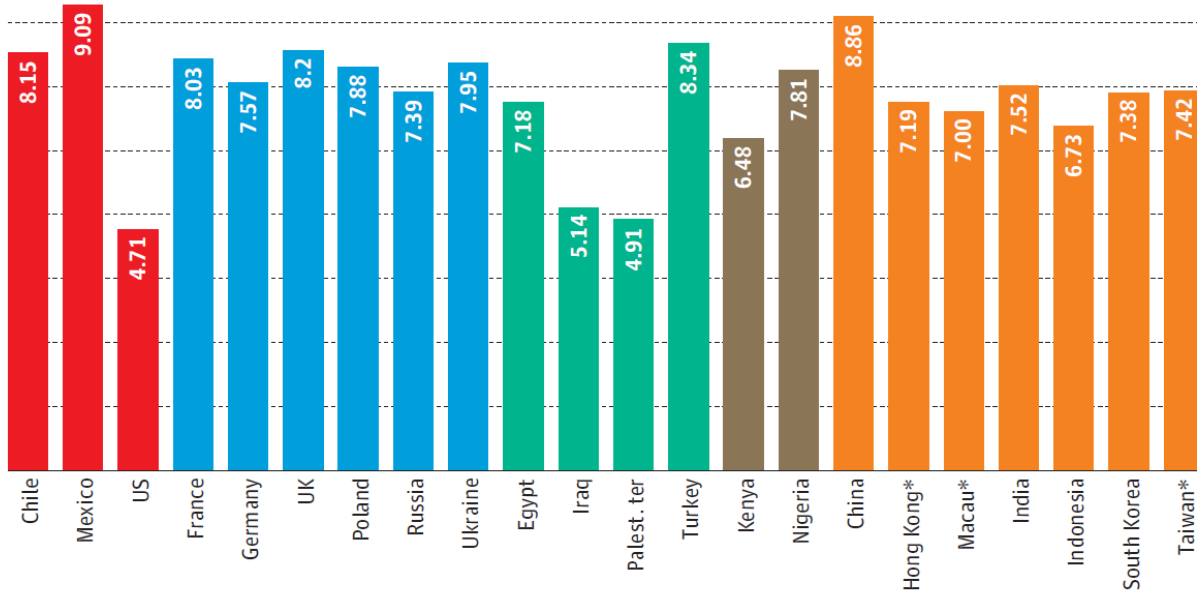


**Forced Reduction in Carbon Intensity of Generators from Emissions Cap and Projected Demand Increases:**



**National Policy Environment**

**Climate Change as a Public Priority (10 being the highest):**



Source: World Public Opinion, 2009

## Appendix D Legislation

### *NH General Court*

Final version of House Bill 1434 (State of New Hampshire 2008):

STATE OF NEW HAMPSHIRE

*In the Year of Our Lord Two Thousand Eight*

AN ACT relative to the regional greenhouse gas initiative and authorizing a cap-and-trade program for controlling carbon dioxide emissions.

*Be it Enacted by the Senate and House of Representatives in General Court convened:*

182:1 Findings.

I. New Hampshire signed a Memorandum of Understanding (MOU) with 9 other states wherein each state agreed to propose legislation or seek regulatory approval to implement an electric power sector cap and trade program on CO<sub>2</sub> emissions, known as the regional greenhouse gas initiative (RGGI). The MOU outlines the primary elements of RGGI including:

- (a) Establishing a total CO<sub>2</sub> emissions allowance cap for the region as well as individual state allowance budgets;
- (b) Setting aside a minimum of 25 percent of the state's allowances for consumer benefit and other strategic energy purposes;
- (c) The limited use of documented CO<sub>2</sub> emission reductions outside the electric power sector to help with compliance and the expanded use of such reductions when certain price thresholds for allowances are exceeded; and
- (d) Cooperation with other states in implementing the RGGI program.

II. RGGI is a modest first step in addressing greenhouse gas emissions consistent with the direction of the New England Governors/Eastern Canadian Premiers goals and provides leadership in promoting a federal or international plan. If a comparable federal CO<sub>2</sub> cap and trade program becomes law, the general court should consider the need to continue participation in RGGI in accordance with the provisions of the RGGI MOU.

III. According to a recent economic study by the University of New Hampshire, implementation of the regional greenhouse gas initiative is in the best economic interests of New Hampshire and investment in energy efficiency and conservation will help to reduce energy costs for New Hampshire citizens.

IV. For these reasons, the general court supports the implementation of RGGI to achieve CO<sub>2</sub> emissions reductions through an electric power sector cap and trade program that encourages energy conservation and efficiency.

182:2 New Subdivision; Regional Greenhouse Gas Initiative. Amend RSA 125-O by inserting after section 18 the following new subdivision:

### Regional Greenhouse Gas Initiative

125-O:19 Statement of Purpose and Findings. The general court finds that global climate change is a significant environmental problem which could already be contributing to changes in New Hampshire average temperatures, frequency of extreme storm events, number of days with snow cover, timing of spring river flows, and date of spring blooms. Recent studies and scientific evidence indicate that global climate change is caused by a buildup of natural and manmade greenhouse gases in the atmosphere. Carbon dioxide (CO<sub>2</sub>) is a significant greenhouse gas that contributes to global climate change. Therefore, the purpose of this subdivision is to reduce greenhouse gas emissions resulting from energy use in New Hampshire.

125-O:20 Definitions. In this subdivision:

I. "Affected CO<sub>2</sub> source" means any source with one or more fossil fuel-fired electricity generating units having a nameplate rated capacity equal to or greater than 25 megawatts.

II. "Budget allowances" means those RGGI allowances comprising the state annual budget for CO<sub>2</sub> emissions specified in RSA 125-O:21, II.

III. "Commission" means the public utilities commission.

IV. "Compliance period" means a 3 calendar year time period, unless extended one calendar year by a stage-2 trigger event. The first compliance period is from January 1, 2009 to December 31, 2011, unless a stage-2 trigger event extends the first compliance period to December 31, 2012. Each subsequent sequential 3 calendar year period is a separate compliance period subject to a one-year extension if a stage-2 trigger event occurs during the compliance period. The compliance period shall never be longer than 4 calendar years.

V. "Consumer price index" or "CPI" means the United States Department of Labor, Bureau of Labor Statistics unadjusted consumer price index for all urban consumers for the United States. city average, for all items on the latest reference base, or if such index is no longer published, such other index as the department determines is appropriate. The CPI for any calendar year is the 12-month average of the CPI published by the United States Department of Labor, as of the close of the 12-month period ending on August 31 of each calendar year.

VI. "Department" means the department of environmental services.

VII. "Early reduction allowances" means allowances provided to affected CO<sub>2</sub> sources for eligible projects undertaken which have the effect of reducing emissions at the affected CO<sub>2</sub> source by an absolute reduction of emissions during calendar years 2006, 2007, and 2008, from a baseline approved by the department, through emission rate improvements or permanently reducing utilization of one or more units at a source.

VIII. "International trading programs" means international programs approved by the department such as the European Emission Trading Scheme (ETS) and offset credits established under the Clean Development Mechanism (CDM) to be used to obtain equivalent RGGI offset allowances pursuant to RSA 125-O:22, II(b).



IX. "Market settling period" means the first 14 months of any compliance period.

X. "Offset allowances" means allowances issued to projects determined to be eligible by the department undertaken outside of the electric power sector to reduce CO<sub>2</sub> or CO<sub>2</sub> equivalent emissions.

XI. "PSNH" means Public Service Company of New Hampshire or any successor to the company's public utility franchise.

XII. "Regional greenhouse gas initiative" or "RGGI" or "RGGI program" means the program to implement the memorandum of understanding (MOU) between signatory states, dated December 20, 2005, as amended on August 8, 2006 and April 20, 2007, and the corresponding model rule to establish a regional CO<sub>2</sub> emissions budget and allowance trading program for emissions from fossil fuel-fired electricity generating units.

XIII. "Regional organization" means a non-profit organization formed by the signatory states to RGGI to provide technical and administrative assistance for such things as: emissions and allowance tracking, offsets development and implementation, allowance market monitoring, and data collection. The organization shall have no regulatory or enforcement authority.

XIV. "Retire" means submitting a RGGI allowance to the department for compliance or other purpose or retaining a RGGI allowance by the department such that the allowance may never be sold or otherwise used again.

XV. "RGGI allowance" means a limited authorization to emit one ton of CO<sub>2</sub> issued by the department or other RGGI signatory state in accordance with this subdivision or the RGGI program and shall include budget allowances, offset allowances, and early reduction allowances.

XVI. "Stage-one trigger event" means a 12-month rolling average CO<sub>2</sub> allowance price that is equal to or greater than \$7 in 2005 dollars, such figure adjusted annually on January 1 of each calendar year according to the consumer price index, but only when such a rolling average price occurs in any 12-month period beginning after the end of the market settling period.

XVII. "Stage-2 trigger event" means a 12-month rolling average CO<sub>2</sub> allowance price that is equal or greater than \$10 in 2005 dollars, such figure adjusted annually on January 1 of each calendar year according to the consumer price index plus 2 percentage points, but only when such a rolling average price occurs in any 12-month period beginning after the end of the market settling period.

#### 125-O:21 Carbon Dioxide Emissions Budget Trading Program.

I. The department shall establish and enforce a CO<sub>2</sub> emissions budget trading program consistent with this subdivision that shall be in substantial accordance with the RGGI program.

II. The program shall include a statewide annual budget allowance of 8,620,460 tons during the years 2009 through 2014. Beginning January 1, 2015 and ending December 31, 2018, the budget shall decline by 215,512 tons per year, resulting in a 10 percent total reduction from the initial budget, after which it shall remain unchanged until further legislative action.

III. The department shall make available for sale at one or more auctions all of the budget allowances for a given year, except for those granted or reserved under RSA 125-O:22, VI, 125-O:24, and 125-O:25. The department may also make available for sale at one or more auctions a portion of

future year budget allowances. Such auctions may be conducted in coordination with other states. Revenues from the sale of allowances shall be deposited in the greenhouse gas emissions reduction fund established under RSA 125-O:23.

IV. The department shall grant to affected CO<sub>2</sub> sources early reduction allowances, at no cost, for projects eligible to receive such allowances.

V. The department shall grant offset allowances to owners of eligible offset projects located in New Hampshire.

VI. The department and the commission shall report on an annual basis to the air pollution advisory committee under RSA 125-J:11 and the legislative oversight committee on electric utility restructuring under RSA 374-F:5, on the status of the implementation of RGGI in New Hampshire, with emphasis on the prices and availability of RGGI allowances to affected CO<sub>2</sub> sources and the trends in electric rates for New Hampshire businesses and ratepayers. The report shall include but not be limited to:

- (a) The number of allowances sold in the RGGI program and the type of entities purchasing allowances;
- (b) The number of unsold allowances in the RGGI program;
- (c) The available price data of allowances from the regional auction and secondary markets;
- (d) Market monitoring reports;
- (e) The CO<sub>2</sub> emissions by affected source, state, and RGGI region;
- (f) The spending of revenues from auction allowances by each RGGI state; and
- (g) The allocation and spending of the greenhouse gas emissions reduction fund, including associated energy savings and emissions reductions.
- (h) The status of any proposed or adopted federal CO<sub>2</sub> cap and trade program, the impact on New Hampshire's RGGI program, and recommendations for any proposed legislation necessary to accommodate the federal program.

VII. The department may establish and enforce the CO<sub>2</sub> emissions budget trading program in cooperation and coordination with other states or countries that are participating in regional, national or international CO<sub>2</sub> emissions trading programs with the same or similar purpose including:

- (a) Entering into any agreement or arrangement with the representatives of other states, including the formation of a for-profit or non-profit corporation, any form of association or any other form of organization, in this or another state; and
- (b) Participating in any such corporation, association, or organization, and in any activity in furtherance of the purposes of this subdivision, in any capacity including, but not limited to, as directors or officers.

VIII. Any actions taken under this subdivision by the department or the commission shall not constitute a waiver of sovereign immunity and shall not be deemed consent to suit outside of New Hampshire.

125-O:22 Compliance; Permit Required.

I. Each affected CO<sub>2</sub> source shall obtain and retire a quantity of RGGI allowances equivalent to its CO<sub>2</sub> emissions from fossil-fuel fired generation for each compliance period.

II. An affected CO<sub>2</sub> source may use offset allowances for up to 3.3 percent of its compliance obligation, except that in a given compliance period:

(a) If a stage-one trigger event occurs, an affected CO<sub>2</sub> source may use offset allowances for up to 5 percent of its compliance obligation; and

(b) If a stage-2 trigger event occurs, the compliance period shall be extended to 4 years and an affected CO<sub>2</sub> source may use offset allowances for up to 10 percent of its compliance obligation, including offset allowances or credits permanently retired from eligible international trading programs, as approved by the department.

III. Purchasers or acquirers of RGGI allowances may retain unused RGGI allowances without limit. Affected CO<sub>2</sub> sources may use retained RGGI allowances in future compliance periods.

IV. No person shall operate an affected CO<sub>2</sub> source without a temporary or operating permit issued by the department in accordance with this chapter and RSA 125-C. An affected CO<sub>2</sub> source that is in operation upon the effective date of this subdivision, shall submit a complete application for a permit modification to the department no later than January 1, 2009. Applications for permits shall be upon such forms, and shall include such information as the commissioner requires under rules adopted pursuant to RSA 541-A. The commissioner shall act upon a permit application within a reasonable period of time.

V. In addition to the provisions set forth in RSA 125-O:7, an affected CO<sub>2</sub> source that fails to obtain and retire sufficient RGGI allowances during a compliance period, in accordance with RSA 125-O:22, I, shall obtain and surrender 3 RGGI budget or early reduction allowances in the next compliance period for each RGGI allowance that the affected CO<sub>2</sub> source was short in obtaining compliance.

VI. Budget allowances shall be provided to affected CO<sub>2</sub> sources as needed and upon request for CO<sub>2</sub> emissions in periods of operation during which an Operating Procedure 4 capacity deficiency alert is in force as established by the ISO New England Inc. The department shall reserve from auction for such emergency conditions a quantity of allowances equal to one percent of the annual budget allowances which shall be the maximum made available in a given year under this paragraph. The department shall directly sell these allowances to the affected CO<sub>2</sub> sources at the last regional auction clearing price. Those allowances reserved but not sold in a given year as provided in this paragraph shall be auctioned the following calendar year.

VII. Upon recommendation of the commission, the governor with consent of the executive council may declare an emergency supply crisis, and the governor and council may allow affected CO<sub>2</sub> sources to forgo strict compliance with paragraph I for a given compliance period and be given reprieve from any associated penalties, provided that those affected CO<sub>2</sub> sources obtain and retire an additional number of allowances during the next compliance period equivalent to any shortfall in allowances that may have occurred for the compliance period during which the declared emergency was made.

VIII. A distribution company may recover the actual, prudent and reasonable costs of investments in carbon emissions reduction or capture technologies through its default service charge pursuant to RSA 369-B:3, IV(b)(1)(A), provided that the commission first determines that the investment is in the public interest.

125-O:23 Greenhouse Gas Emissions Reduction Fund.

I. There is hereby established a greenhouse gas emissions reduction fund. This nonlapsing, special fund shall be continually appropriated to the commission to be expended in accordance with this section. The state treasurer shall invest the moneys deposited therein, as provided by law. Income received on investments made by the state treasurer shall also be credited to the fund. All programs supported by these funds shall be subject to audit by the commission as deemed necessary. A portion of the fund moneys shall be used to pay for commission and department costs to administer this subdivision, including contributions for the state's share of the costs of the RGGI regional organization. Any new employee positions to be paid for using fund moneys shall be approved by the fiscal committee of the general court pursuant to RSA 124:15. The commission shall transfer from the fund to the department such costs as may be budgeted and expended, or otherwise approved by the fiscal committee and the governor and council, for the department's cost of administering this subdivision.

II. Fund moneys shall be used to support energy efficiency, conservation, and demand response programs to reduce greenhouse gas emissions generated within the state, which may include programs proposed and administered by private entities, as well as by the department, the commission, and other state and local governmental agencies. Such programs may include, but not be limited to, improving the electrical and thermal energy efficiency of New Hampshire's residential housing and commercial building stock via weatherization, energy auditing, energy efficiency related work force training and development, revolving loan funds for efficiency related investment, related industrial process and control systems, integration of passive solar heating and ventilation systems, and efforts to increase adherence to energy related building and electrical codes. These funds shall not be transferred or used for any other purpose.

III. At least 10 percent of the moneys shall be used to assist low-income residential customers, as defined by the commission and in a manner compatible with other low-income programs administered by the commission, to reduce total energy use including heating fuels and to foster the development and retrofitting of highly efficient and affordable housing.

IV. Notwithstanding paragraphs I, II, and III, all amounts in excess of the threshold prices listed below for any allowance sale made prior to January 1, 2016 that are deposited in the fund shall be rebated to all electric ratepayers in the state on a per-kilowatt-hour basis, in a timely manner, to be determined by the commission. For the following years listed, the threshold price shall be:

(a) 2009, \$6/ton.

(b) 2010, \$8/ton.

(c) 2011 and 2012, \$9/ton.

(d) 2013 and 2014, \$12/ton.

(e) 2015, \$15/ton.

(f) After 2015, no threshold price.

V. In the event that the commission finds that a significant amount of unencumbered dollars have accumulated in the greenhouse gas emissions reduction fund, and are not needed for program purposes, the commission shall refund such unencumbered dollars to ratepayers in a timely manner.

VI. All penalties collected pursuant to this subdivision shall be deposited in the greenhouse gas emissions reduction fund.

VII. In selecting programs to be funded under this section the commission shall consider, at a minimum, the extent to which the proposed program can be expected to:

(a) Reduce greenhouse gas emissions from all fuels used to provide electricity, heating, and cooling in New Hampshire;

(b) Be cost-effective;

(c) Reduce New Hampshire's peak electric load;

(d) Promote market transformation, innovative technology and economic development, and energy cost savings; and

(e) Otherwise be consistent with the public interest and the purposes of this subdivision.

125-O:24 Conversion of Allowances.

I. PSNH shall receive credit for allowances received prior to the inception of the RGGI program in the manner described in this section.

II. PSNH shall submit all necessary documentation to the department by January 30, 2009 relative to compliance with RSA 125-O:3, III(d).

III. PSNH shall submit all necessary documentation to the department within 90 days of the effective date of this paragraph relative to RSA 125-O:5, III.

IV. As soon as practicable after the start of the program, the department shall determine the number of allowances previously allocated to PSNH under RSA 125-O:3, II or awarded to PSNH under RSA 125-O:5, III, that remain in PSNH's account of CO<sub>2</sub> allowances held by the department as banked allowances, after the company has completed compliance with the emissions cap of RSA 125-O:3, III(d) for the 2007 and 2008 calendar years.

V. At the distribution rate specified in paragraph VI, the department shall grant to PSNH budget allowances, at no cost, equivalent to the total of the banked allowances pursuant to paragraph IV minus the early reduction allowances granted to PSNH under RSA 125-O:21, IV. PSNH shall be obligated to apply for early reduction allowances for any eligible projects it has undertaken.

VI. The department shall grant budget allowances pursuant to this section as expeditiously as possible, but in no event shall the amount of budget allowances granted pursuant to this section total more than 2.5 million allowances per year in years 2009, 2010, and 2011, and 1.5 million allowances in each year thereafter. For each budget allowance granted, one banked allowance shall be retired.

VII. In the event the state no longer participates in the RGGI program due to legislative action or the RGGI program becomes invalid or unenforceable as determined by the department and certified to the secretary of state, the department shall cease granting budget allowances pursuant to paragraphs V and VI. Notwithstanding the other provisions of this section, PSNH shall have no right or claim to receive any additional budget allowances under this section beyond those already granted to it up to that point in time when participation in the program has ceased or the program has become invalid or unenforceable. If this point in time occurs part way through a year, the number of budget allowances given to PSNH for that year shall be pro-rated based on the distribution rate in effect for that year, provided the total amount of allowances calculated pursuant to paragraph IV has not already been granted to PSNH.

VIII. The department shall not grant budget allowances after December 31, 2014 pursuant to this section without legislative authorization to continue the granting of allowances. Notwithstanding the other provisions of this section, PSNH shall have no right or claim to receive any additional budget allowances under this section beyond those already granted by December 31, 2014, should the legislature not authorize continuation of the allowance granting.

IX. No remaining banked allowances held by the department originating from the calculation performed under paragraph IV, shall be used for RGGI compliance purposes after the department ceases to grant budget allowances in accordance with paragraph VII or VIII. These remaining banked allowances shall not be used for compliance or exchanged for value in any existing or future federal program. When developing future state programs, the legislature may recognize the existence of these remaining banked allowances when determining the future compliance obligations of PSNH.

#### 125-O:25 Set Aside for Voluntary Purchase of Renewable Energy Certificates.

I. The department shall reserve from auction, for retirement purposes, a quantity of budget allowances, not to exceed one percent of the annual budget, equivalent to the CO<sub>2</sub> emissions reductions associated with renewable energy certificates recognized under RSA 362-F and purchased voluntarily by electricity customers and not resold.

II. Budgeted allowances reserved under paragraph I not retired at the end of each year shall be auctioned the following calendar year.

#### 125-O:26 Auction of Budget Allowances. Any rules adopted by the department relative to auctions, pursuant to RSA 125-O:8, I(d), shall provide that they:

I. Shall be conducted based on the schedule and frequency adopted by the department in consultation with other entities participating in the RGGI program;

II. Shall include the sale of allowances for current and future years to promote transparency and price stability in a manner to be determined by the department in coordination with the regional organization;

III. Shall include auction design elements that minimize allowance price volatility, guard against bidder collusion, and mitigate the potential for market manipulation;

IV. Shall include provisions to address, and to the extent practicable minimize, the potential for allowance market price volatility during the initial control period of the RGGI program;

V. Shall include provisions to ensure the continued market availability of allowances to entities regulated under a greenhouse gas emissions allowance trading program, taking into account the outcomes of auctions and monitoring of the allowance market, which may include the adoption of a flexible process that allows for ongoing modification of auction design and procedures in response to allowance market conditions and allowance market monitoring data, provided that the process allows for public comment and input; and

VI. May be open to all qualified participants, and all qualified participants may sell or otherwise agree to transfer any or all allowances to any eligible entity.

125-O:27 Review of the New Hampshire RGGI Program. At the time of the 2012 comprehensive review by the signatory states as required in the MOU, the commission and the department shall concurrently review New Hampshire specific elements of the RGGI program, in particular 125-O:23, IV and 125-O:25, and include the results of such review in the agencies' annual report under RSA 125-O:21, VI.

125-O:28 Cost Recovery. If the owner of an affected CO<sub>2</sub> source is a public utility pursuant to RSA 362:2 that provides electric distribution service pursuant to RSA 374-F, the owner may recover through the utility's default service charge all prudently incurred costs of complying with the requirements of this subdivision in a manner approved by the commission. In the event PSNH sells an affected CO<sub>2</sub> source, any cost recovery associated with this chapter shall be governed by RSA 369-B:3-a.

182:3 Carbon Dioxide Cap. Amend RSA 125-O:3, III(d) to read as follows:

(d) 5,425,866 tons annually applicable to total carbon dioxide (CO<sub>2</sub>) emissions from the affected sources until December 31, ~~[2010, and after December 31, 2010, a lower cap to be recommended by the department no later than March 31, 2004, with timely consideration by the legislature expected by July 1, 2005]~~ **2008**.

182:4 Emissions Trade and Banking. Amend RSA 125-O:6, I to read as follows:

I. Develop a trading and banking program to provide appropriate compliance flexibility in meeting the emission caps established under RSA 125-O:3, III **and allowance requirements of RSA 125-O:21 and RSA 125-O:22**, and to encourage earlier and greater emissions reductions and the development of new emission control technologies in order to maximize the cost-effectiveness with which the environmental benefits of this chapter are achieved.

182:5 Rulemaking Authority. Amend RSA 125-O:8 to read as follows:

125-O:8 Rulemaking Authority.

I. The commissioner shall adopt rules under RSA 541-A, commencing no later than 180 days after the effective date of this section, relative to:

~~[I.]~~ **(a)** The establishment of trading and banking programs as authorized by RSA 125-O:6, I.

~~[II.]~~ **(b)** The establishment of a method for allocating allowances and other emissions reduction units or mechanisms as authorized by RSA 125-O:3, II and III.

[~~III~~] (c) Emissions **and allowance** monitoring, **tracking**, recordkeeping, reporting, and other such actions as may be necessary to verify compliance with this chapter.

*(d) The method and requirements for auctioning budget allowances under RSA 125-O:21, which may use regional organizations.*

*(e) Defining eligible projects for early reduction allowances under RSA 125-O:21, IV, and establishing criteria to quantify and grant such allowances.*

*(f) Defining eligible projects for offset allowances under RSA 125-O:21, V, and establishing criteria to quantify and grant such allowances, including the accreditation of third-party verifiers.*

*(g) The forms and information required on applications for a temporary or operating permit required under RSA 125-O:22.*

*II. The public utilities commission shall adopt rules, under RSA 541-A, to administer the greenhouse gas emissions reduction fund pursuant to RSA 125-O:23.*

182:6 Compliance Dates Amend RSA 125-O:9 to read as follows:

125-O:9 Compliance Dates. The owner or operator of each affected source shall comply with the provisions of this chapter, excluding the subdivision on mercury emissions, RSA 125-O:11 through 125-O:18, **and the subdivision for CO<sub>2</sub> emissions, RSA 125-O:19 through RSA 125-O:28**, by December 31, 2006.

182:7 Non-Severability. Amend RSA 125-O:10 to read as follows:

125-O:10 Non-Severability. No provision of **RSA 125-O:1 through RSA 125-O:18** of this chapter shall be implemented in a manner inconsistent with the integrated, multi-pollutant strategy or **RSA 125-O:1 through RSA 125-O:18** of this chapter [~~in its entirety~~], and to this end, the provisions of **RSA 125-O:1 through RSA 125-O:18** of this chapter are not severable.

182:8 New Subparagraph: Application of Receipts; State Treasurer. Amend RSA 6:12, I(b) by inserting after subparagraph (268) the following new subparagraph:

(269) Moneys deposited in the greenhouse gas emissions reduction fund established in RSA 125-O:23.

182:9 New Section; Energy Conservation and Efficiency Board. Amend RSA 125-O by inserting after section 5 the following new section:

125-O:5-a Energy Conservation and Efficiency Board.

I. An energy conservation and efficiency board is hereby created to seek opportunities to coordinate energy efficiency and demand response programs in the state. The board's duties shall include but not be limited to:

(a) Review available energy efficiency and conservation programs and incentives and compile a report of available efficiency and conservation resources in New Hampshire.



- (b) Develop a plan to achieve the state's energy efficiency potential for all fuels, including setting goals and targets for energy efficiency that are meaningful and achievable.
- (c) Provide written advice at least annually to the public utilities commission on the administration and allocation of energy efficiency funds under the commission's jurisdiction.
- (d) Explore opportunities to coordinate programs targeted at saving more than one fuel resource, including coordination between the natural gas and other programs or projects which seek to reduce the use of other fuels.
- (e) Develop tools to enhance outreach and education programs to increase knowledge about energy efficiency among New Hampshire residents and businesses.
- (f) Expand upon the state government's efficiency programs to ensure that the state is providing leadership on energy efficiency, reducing its use of energy, and reducing the state's fuel costs.
- (g) Encourage municipalities to increase investments in energy efficiency through financing tools, and to create municipal energy committees.
- (h) Work with community action agencies and the office of energy and planning to explore ways to ensure that all customers participating in programs for low-income customers and the Low Income Home Energy Assistance Program (LIHEAP) have access to energy efficiency improvements in order to reduce their energy bills.
- (i) Investigate potential sources of funding for energy efficiency and delivery mechanisms for such programs, coordinate efforts between funding sources to reduce duplication and enhance collaboration, and review investment strategies to increase access to energy efficiency.

II. The members of the board shall be as follows:

- (a) The chairman of the public utilities commission, or designee.
- (b) The director of the office of energy and planning, or designee.
- (c) The consumer advocate, or designee.
- (d) The commissioner of the department of environmental services, or designee.
- (e) The commissioner of the department of resources and economic development, or designee.
- (f) The president of the Business and Industry Association of New Hampshire, or designee.
- (g) The executive director of the New Hampshire Municipal Association, or designee.
- (h) A representative of energy services companies delivering energy efficiency services to residential and business customers, appointed by the chairman of the public utilities commission.
- (i) The executive director of New Hampshire Legal Assistance, or designee.
- (j) The president of the Homebuilders and Remodelers Association of New Hampshire, or designee.

(k) Two members of the house science, technology and energy committee appointed by the speaker of the house of representatives.

(l) One member of the senate energy, environment and economic development committee, appointed by the president of the senate.

(m) Three representatives from groups representing energy, environmental, consumer, and public health issues and knowledgeable in energy conservation policies and programs, appointed by the chairman of the public utilities commission.

(n) One representative from the investment community with expertise in efficiency investments and financing, appointed by the chairman of the public utilities commission.

(o) One representative from each of the utility-administered electric and natural energy efficiency programs, appointed by the chairman of the public utilities commission.

(p) The executive director of the New Hampshire Housing Finance Authority, or designee.

(q) The state fire marshal, or designee.

III. The chairman of the public utilities commission shall call the first meeting of the board. The board shall elect a chairperson from among its members. The board shall make an annual report on December 1 to the governor, the speaker of the house of representatives, the president of the senate, the house science, technology and energy committee, the senate energy, environment, and economic development committee, and the public utilities commission, to provide an update on its activities and recommendations for action.

IV. No member of the board shall vote on a matter in which the member, or the organization or entity represented by or employing the member, has a direct financial interest.

182:10 Repeal. RSA 125-O:5, III, relative to emissions allowances to PSNH for energy efficiency, new renewable energy projects, or conservation and load management projects, is repealed.

182:11 Contingency. If HB 1561 of the 2008 legislative session becomes law, section 9 of this act shall not take effect. If HB 1561 does not become law, section 9 of this act shall take effect October 1, 2008.

182:12 Effective Date.

I. Section 9 of this act shall take effect as provided in section 11 of this act.

II. The remainder of this act shall take effect upon its passage.

Approved: June 11, 2008

Effective Date: I. Section 9 shall take effect as provided in section 11.

II. Remainder shall take effect June 11, 2008.

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