

**A Description of the Regional Greenhouse Gas Initiative (RGGI)  
Implementation in New Hampshire  
Prepared by the New Hampshire Department of Environmental Services  
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**1. What is the Regional Greenhouse Gas Initiative (RGGI)?**

The Regional Greenhouse Gas Initiative (RGGI) is an agreement of ten Northeastern and Mid-Atlantic States to establish a flexible, market-based “cap and trade” program to reduce carbon dioxide (CO<sub>2</sub>) emissions from the region’s power plants. CO<sub>2</sub> is a greenhouse gas which contributes significantly to global warming. The governors of Maine, New Hampshire, Vermont, Connecticut, New Jersey, New York, Delaware, Maryland, Massachusetts, and Rhode Island have signed the RGGI Memorandum of Understanding (MOU).

RGGI is a regional plan, but each state must adopt its own laws and regulations by the end of 2008 for RGGI to be in effect. A model rule, developed by a RGGI interstate workgroup, forms the framework of individual state regulatory proposals to adopt and implement the program. Each state will go through its own decision-making process, with the legal requirements varying among states.

**2. Why worry about global warming?**

A strong consensus now exists within the scientific community that the earth is warming as a result of emissions of CO<sub>2</sub> and other greenhouse gases that are produced by human activities, such as the burning of fossil fuels for energy and changes in land use. Many New Hampshire cities, towns, and voters have expressed their support for actions to address global warming through town resolutions and the formation of energy committees.

The most notable evidence on a global level is provided by the Intergovernmental Panel on Climate Change (IPCC). The IPCC was established in 1988 by the World Meteorological Organization and the United Nations Environment Programme to assess scientific, technical and socio-economic information relevant for the understanding of climate change, its potential impacts, and options for adaptation and mitigation. The fourth and most recent IPCC report *Climate Change 2007: The Physical Science Basis - Summary for Policymakers* is the result of the efforts of over 800 contributing authors and 2,500 scientific expert reviewers from 130 countries. The report concludes that “*Warming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice, and rising global average sea level*” and further states that “*Most of the observed increase in globally averaged temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic greenhouse gas concentrations.*”

On a regional level, the Northeast Climate Impacts Assessment (NECIA) is a collaboration between the Union of Concerned Scientists (UCS) and a team of independent experts to develop and communicate assessments of climate change and associated impacts on key climate-sensitive sectors in the northeastern United States. The NECIA report published in July 2007 states, “*Changes consistent with global warming are already under way across the Northeast. Since 1970, the region has been warming at a rate of nearly 0.5°F per decade. Winter temperatures have risen even faster, at a rate of 1.3°F per decade from 1970 to 2000.*”

Research by the University of New Hampshire provides evidence that New Hampshire is already experiencing impacts from global warming. These impacts include increased average summer and winter temperatures, less snow cover, earlier river ice-out and spring high flow, and greater frequency of intense rain events. In fact, New Hampshire has experienced three 100-year flood events in two years resulting in over \$35 million damage to roads, bridges, and private property. The 2007 NECIA Report predicts that if greenhouse gas emissions continue to increase, by late in the century the Northeast will see the winter snow season cut in half, sea-level rise up to nearly three feet, and more than 60 days with temperatures over 90°F in most cities, including 14 to 28 days with temperatures over 100°F (compared with one or two days per year historically). These impacts will affect many aspects of New Hampshire's economy, including the forest industry and tourism, and additional significant infrastructure costs for cities and towns. Increased summer high temperatures exacerbate air pollution and create health concerns for all citizens especially children, the elderly, and those with respiratory ailments.

### **3. What is the background leading up to legislation to implement RGGI in New Hampshire?**

In 2001, the New England Governors and Eastern Canadian Premiers (NEG/ECP) agreed to work together on a plan to address global warming and reduce greenhouse gas emissions. Governor Shaheen, and subsequently Governors Benson and Lynch, endorsed the NEG/ECP Climate Change Action Plan which set a regional midterm goal of a 10 percent reduction in greenhouse gas emissions from 1990 levels by 2020. One of the primary action items in the plan was to reduce greenhouse gas emissions from the electricity generating sector.

In 2002, New Hampshire passed the Clean Power Act (Revised Annotated Statutes 125-O), which placed a Phase I cap (or limit) of 5,425,866 tons (equal to 1990 emissions) on CO<sub>2</sub> emissions – a major cause of global warming – from existing power plants, namely the fossil fuel-fired units owned by Public Service of New Hampshire (Bow, Portsmouth, Newington). The Clean Power Act required DES to recommend a more stringent Phase II cap on CO<sub>2</sub> emissions by March 31, 2004. DES recommended lowering the cap by 25 percent to establish a new cap of 4,069,400 tons beginning with calendar year 2011. This recommendation was under consideration by the legislature as the RGGI agreement was unfolding in the participating states.

The RGGI agreement was initiated in 2003 when the existing New York Governor George Pataki called on the Eastern states to work on developing a cap and trade program for fossil fuel-fired power plants to help address greenhouse gas emissions. By late 2003, an interstate working group of staff from the New England state environmental and public utility agencies, and a 25-member body of stakeholders, including representatives of electricity generators, electric utilities, other businesses, residential consumers, and environmentalists, began to discuss the structure of a regional cap and trade program which led to the development of RGGI. By 2007, ten states had signed a 20-page Memorandum of Understanding (MOU) adopting a plan for RGGI (Maine, Vt., N.H., Conn., N.Y., N.J., Del., R.I., Mass., and Md.).

In August 2006, a RGGI interstate working group released a model rule outlining regulations for state governments to use in implementing RGGI. The proposed 2008 legislation will generally consider the significant provisions in the RGGI MOU and RGGI model rule in lieu of the Phase II Clean Power Act cap as recommended by DES in 2004, and give DES the authority to adopt rules to implement RGGI in New Hampshire.

#### **4. What is a “cap and trade” program?**

A cap and trade program is a market-based system that places a limit (or “cap”) on emissions. Under RGGI, a regional CO<sub>2</sub> emissions cap is set for large fossil fuel-fired power plants beginning in 2009. Allowances are issued equal to the total cap and apportioned to the participating states. An allowance is an authorization to emit one ton of a pollutant. Regulated power plants must acquire via purchase, “trade,” or allocation enough allowances to cover their emissions for a specified compliance period. Thus, a plant can emit as much as necessary, as long as it obtains sufficient allowances to cover their total emissions. A cap and trade program allows regulated power plants to bank allowances for later use. Because the number of allowances is limited by the regional cap, overall emission reductions are assured.

Cap and trade systems create a financial incentive for emission reductions by assigning a cost to emissions and a benefit to emission reductions. Those that are able to reduce emissions at a low cost can sell their extra allowances to companies facing high costs. Cap and trade systems set a clear limit on emissions and give companies flexibility in the manner in which they may achieve their emission targets.

#### **5. Why is RGGI focused primarily on the electric sector?**

Releases of CO<sub>2</sub> account for four-fifths of global warming pollution. The power sector is the largest single source of industrial emissions, accounting for 38 percent of U.S. global warming gases, second only to the transportation sector in the Northeast. Power plants are a relatively straightforward sector to address through state and regional policies for two reasons. First, most state governments have regulatory authority over electricity generation, while the federal government has most of the authority over pollution from cars and other transportation. Second, most electricity is generated at a fairly small number of plants that are easy to identify. In contrast, the other sources of global warming emissions, such as oil and natural gas to heat buildings and run industrial processes, are far smaller, more numerous, and harder to directly regulate.

#### **6. What are the greenhouse gas reductions goals (emissions caps) established in RGGI?**

Average annual emissions in the RGGI states over a three year period may not increase above 188,076,976 tons of CO<sub>2</sub> from 2009 to 2014, and then must fall by 2.5 percent per year through 2018, so that by 2019 they must be at least 10 percent below 188,076,976 tons or 169,269,278 tons. The regional cap of 188,076,976 tons of CO<sub>2</sub> was established based on average emissions over the 2000-2002 time period, with some adjustments for state specific conditions (e.g., new plant additions).

Modeling forecasts suggest that without RGGI, emissions from power plants in the region would grow by 7 percent from 2009 to 2019. Thus, compared to “business as usual,” RGGI is designed to cut emissions by around 17 percent.

#### **7. What are the applicable power plants in New Hampshire?**

RGGI applies to fossil fuel-fired power plants that generate more than 25 megawatts of electricity. The following power plants in New Hampshire would be subject to RGGI:

Public Service of New Hampshire (PSNH)

Schiller Station in Portsmouth

Newington Station in Newington

Merrimack Station in Bow

Granite Ridge (natural gas fired plant), LondonderryNewington Energy LLC (natural gas fired plant), Newington**8. How do the applicable power plants comply with RGGI?**

Under RGGI, each power plant must have a sufficient number of allowances (including offset and early reduction allowances) at the end of each three-year compliance period to cover its emissions, beginning with the first compliance period 2009 through 2011.

Multi-year compliance periods are used in RGGI to provide regulated facilities more flexibility to adjust to conditions such as, but not limited to, variations in electricity demand (driven by meteorology and load growth), fuel price spikes, and clean unit outages. A three-year compliance period as opposed to a shorter period may also lead to resource (administrative) savings for the regulated facilities and the states implementing the program. In addition, there are no seasonal or localized effects of CO<sub>2</sub> emissions that would warrant compliance on a shorter basis, as needed for other pollutants such as ozone precursors.

**9. What are the different types of allowances that power plants can use to comply with RGGI?**

The three types of allowances that applicable power plants can obtain to comply with RGGI are: budgeted, early reduction, and offset allowances.

Budgeted allowances are the allowances assigned to New Hampshire out of the regional cap (8,620,469 allowances). New Hampshire can decide to give or sell these allowances directly to the New Hampshire regulated power plants, withhold allowances for special purposes, or sell the allowances at auction (see below for explanation).

Early reduction allowances are awarded to eligible projects taken before the start of RGGI that reduce the emission rate and total amount of greenhouse gas emissions at a regulated source. Early reduction allowances are intended to provide an incentive for facilities to take actions to reduce CO<sub>2</sub> emissions sooner than would otherwise be required. Early reduction allowances are awarded directly to the regulated electric generating plant, are not included in any auction, and are in addition to the cap. To be eligible to receive early reduction allowances under the RGGI program, a CO<sub>2</sub> budget source must submit an early reduction allowance application no later than May 1, 2009 demonstrating:

- An absolute reduction in the mass of CO<sub>2</sub> emitted during the early reduction period (the three years 2006, 2007, and 2008), relative to the baseline period (the three years 2003, 2004, 2005 – the three years immediately preceding the early reduction period); and,
- A reduction in the average CO<sub>2</sub> emissions rate resulting from electric energy output and useful thermal energy output.

Facility shutdowns are not eligible for ERAs. PSNH's Northern Wood Power Project would be eligible for Early Reduction Allowances.

Offset allowances are allowances that are certified emissions reductions or carbon sequestration that take place outside the electric generating sector in specified project areas. In RGGI, offsets may be issued to verified reduction projects to cover up to 3.3 percent of a plant's total emissions. Offset allowances may be obtained from inside or outside the RGGI states as long as they are approved by the state jurisdiction. Offset projects include, but are not limited to, the following projects:

- Landfill gas capture (methane)
- Manure gas capture (methane)
- Sulfur hexafluoride (SF6) gas capture (from electrical equipment)
- Afforestation (growing trees where they wouldn't otherwise grow)
- Natural gas/oil/propane home heating energy efficiency projects

Additional offset types, such as sustainable forestry management, may be added to the program over time, provided that the reductions are real, additional, and verifiable.

**10. What portion of the regional cap is apportioned to New Hampshire and how will New Hampshire distribute its allowances?**

A total of 8,620,460 tons of CO<sub>2</sub> is apportioned to New Hampshire as "budgeted allowances." A minimum of 25 percent of each state's budgeted allowances must be allocated for a consumer benefit or strategic energy purpose, including the use of the allowances to promote energy efficiency, to directly mitigate electricity ratepayer impacts, to promote renewable energy technologies, or to stimulate or reward investment in abatement technologies. The remainder of the budgeted allowances could be given directly to the regulated power plants, withheld for special purposes, or sold at auction.

New Hampshire is considering distribution of allowances as follows:

Conversion of Unused Clean Power Act Allowances

Under the existing New Hampshire Clean Power Act (RSA 125-O), PSNH can receive additional bonus allowances for undertaking energy efficiency and renewable energy projects such as construction of the Northern Wood Power Project. In addition, PSNH may have unused Clean Power Act allowances if their emissions for 2007 and 2008 are below the Clean Power Act cap. The proposed bill would provide to PSNH an amount of RGGI budgeted allowances equivalent to the Clean Power Act unused allowances.

Under the proposed bill, 25 percent of budgeted allowances would be granted to PSNH per year until all the converted Clean Power Act unused allowances have been accounted for.

This allocation will meet the RGGI requirement for allocating 25 percent of New Hampshire's budget for a strategic energy purpose for at least the first two years of the program.

74 percent of budget allowances would be sold in a regional auction.

RGGI allows an innovative approach to state allocation of allowances to regulated power plants. Historically, cap and trade programs have allocated allowances directly to regulated emissions sources. Under RGGI, instead of giving allowances directly to

electric generators for free, states may sell a significant portion or all allowances through a regional auction or other sales mechanism. RGGI takes this approach to mitigate the increased cost of implementing RGGI on the wholesale competitive market. In a competitive wholesale market, electric generators pass the value of allowances through to the price they bid into the market, since allowances can be traded to other parties and therefore have a market value. Electric generators expend an asset – emission allowances – when generating electricity. They therefore pass on the “cost” of allowances as a cost of generating electricity, whether allowances were received for free or were purchased.

The states using this approach will use the revenues from the sale of allowances to provide incentives for end-use energy efficiency and other energy efficiency measures, thus lowering the impact of the program on electricity consumers. All RGGI states are planning to auction their allowances to support consumer benefit programs.

1 percent of budgeted allowances would be withheld.

The withheld allowances would be retired permanently (never distributed) to account for sale of voluntary New Hampshire renewable energy credits by state businesses or individuals. Buying voluntary renewable energy credits is one way businesses or individuals can reduce their carbon emissions. This mechanism will support sale of renewable energy credits in the voluntary carbon market, otherwise, New Hampshire voluntary energy credits will not be “certified” and will have little or no value.

**11. Why was the use of offsets limited to 3.3 percent of a regulated power plant’s compliance obligation (i.e., emissions) at the start of the program?**

One of the primary purposes of RGGI is to achieve emission reductions in the electric sector itself. Policy makers recognize that energy efficiency is the most cost-effective method of achieving reductions from the electric sector and by allowing the use of offsets means that reductions would not be made solely in the electric sector. However, concerns over the lack of cost-effective in-stack controls on power plants to reduce CO<sub>2</sub> emissions at this time led to the inclusion of a limited amount of offsets as a cost-effective compliance alternative.

Because the pool of potential emission reductions is not limited to power plant improvements or to RGGI states, offsets can create a large pool of additional emission reductions that can help maintain a well-functioning market. Offsets offer a new market that can potentially provide economic opportunities for New Hampshire businesses.

**12. What are the “safety valves” built into RGGI to moderate the price of allowances?**

RGGI sets two “safety valves” to limit prices for emission allowances. If the average market price for allowances exceeds \$7/ton of CO<sub>2</sub>, regulated power plants could use offset allowances to cover up to 5 percent of their emissions, instead of 3.3 percent.

If the average market price for allowances exceeds \$10/ton of CO<sub>2</sub>, offset allowances can be used to cover 10 percent of emissions. In addition, regulated power plants would be allowed to extend by up to one year their compliance with the emission levels set by the RGGI agreement.

The safety valve prices are adjusted upward by the Consumer Price Index plus 2 percent per year, beginning in 2006. Based on the UNH economic analysis (see #14 below), allowance prices are projected to range from \$2 in 2009 to \$8 in 2018.

### 13. What is “leakage”?

Leakage addresses the issue of electrical generating plants outside the RGGI region, with no cap on emissions and no subsequent costs of compliance, selling power into RGGI the states. Since CO<sub>2</sub> emissions are a global problem, shifting the location of emissions would undermine the program and provide no benefit to the climate. RGGI modeling forecasts that, in the absence of controls on leakage, imported power could expand greatly into the border states of New Jersey and Maryland, negating 40 percent or more of the emission reductions from RGGI. Such a result would effectively prevent RGGI from reaching its goal of cutting emissions 10 percent by 2019.

The straightforward way to prevent leakage would be for all states to function under a common system, and that is what advocates of a national policy hope to achieve. If a national program does not develop in the near future, other solutions may be sought to address leakage. Other solutions, such as requiring imported power to meet emissions requirements, introduce certain legal complications. Recognizing the complexity, the RGGI MOU says that the states will “pursue technically sound measures to prevent leakage from undermining the integrity of the program.” An interstate working group is actively considering options for addressing leakage.

One promising option is to reduce the demand for electricity generation. By reducing demand, less electricity will be imported into New England and, hence, there will be less opportunity to export carbon generation. Leakage is also reduced by neighboring states adoption of carbon reduction measures.

### 14. What is the economic impact of RGGI on New Hampshire?

New Hampshire-specific analyses on the economic impact of RGGI were conducted by the University of New Hampshire and are presented in detail separately.

Overview of the analyses:

- **It is in the economic interest of the state of New Hampshire to participate RGGI.** Electricity costs will increase in New Hampshire even if the State does not participate in RGGI. This is because all of the utilities in the State purchase competitively generated power from the New England marketplace, a marketplace which includes the other states already participating in RGGI. If New Hampshire does not join RGGI, it will not receive the economic value from the allowances allocated to it under RGGI, but will still experience the increased cost of RGGI in regional wholesale power prices.
- **The costs of RGGI will primarily be borne by ratepayers no matter how carbon allowances are allocated, but will be offset by the revenue expected from auctioning the allowances.** Comparing the cost of not joining RGGI versus joining RGGI shows that without RGGI customers will pay more in electricity costs than they would otherwise (\$7 million compared to \$3 million in 2009 and \$36 million compared to \$26 million in 2018). Cumulative costs would be minimized if 100 percent of allowance revenue went to energy efficiency.

Not Joining RGGI		Joining RGGI			
	Net Cost (no revenue from allowances)	Gross cost	Allowance Revenue	Net Cost	Cost Benefit of RGGI
Cost in 2009	<b>\$7 million</b>	\$20 million	\$17 million	<b>\$3 million</b>	<b>\$4 million</b>
Cost in 2018	<b>\$36 million</b>	\$88 million	\$62 million	<b>\$26 million</b>	<b>\$10 million</b>

### 15. How does RGGI compare to the NH Clean Power Act?

	NH Clean Power Act	RGGI
CO <sub>2</sub> Allowances	5,425,866 tons	8,620,460 tons
Applicability	PSNH fossil fuel-fired units (Merrimack, Portsmouth, Newington)	PSNH fossil fuel-fired units and 2 gas plants (Granite Ridge, Londonderry & Newington Energy LLC)
Compliance Period	Annual, beginning in 2007	Three year periods beginning in 2009
Trading	No trading program	Trading with nine other states
Allocation Method	Allowances given to PSNH	Proposed legislation would sell at auction as many allowances as possible
Special Provisions	Incentive for investment in energy efficiency and renewable energy	Proposed legislation would use revenues from auction for energy efficiency and conservation

### 16. How is RGGI being administered and what actions are being taken to ensure continued program evaluation and review?

Signatory states agreed to create and maintain a Regional Organization (RO) that will have the following functions: deliberative forum for signatory states, emissions and allowance tracking, offsets development and implementation, and program monitoring. An Executive Director of the RO will report to a Board of Directors which will consist of an environmental and energy agency head from each state. The RO was incorporated in the summer of 2007 with Commissioners Thomas Burack of DES and Clifton Below of the PUC named as New Hampshire's Directors.

The program will undergo a comprehensive review in 2012 to assess program price impacts, the viability of additional reductions after 2020, the extent to which the program has caused increases in imports and associated emissions leakage, and the status of federal programs.

Should the situation arise, a signatory state may upon 30 days written notice withdraw its agreement to the RGGI MOU.



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## Glossary

**Allowances**, sometimes incorrectly called credits, are a trading unit used in cap and trade (see below) systems. One allowance authorizes the emission of up to one short-ton of CO<sub>2</sub> (2000 pounds). In RGGI, as in other cap and trade systems, there are a predetermined number of allowances that are budgeted for each region and assigned to each state. Allowances are then auctioned, sold or given away to regulated power plants to cover their emissions. Regulated power plants can sell excess, or buy additional allowances, but must have enough allowances to cover their emissions.

**Cap and Trade** is a market-based system that caps (places limits on) emissions and then allows allowance holders to trade (buy and sell) allowances or to bank them for later use. Cap and trade systems create a financial incentive for emission reductions by assigning a cost to emissions and a benefit to emission reductions. Those that are able to reduce emissions at a low cost can sell their extra allowances to companies facing high costs. Cap and trade systems give companies flexibility in the manner in which they may achieve their emission targets and they set a clear limit on emissions.

**Consumer Benefit**, as defined in the RGGI MOU, refers to a proportion of allowances sales that will be directed to “promote energy efficiency, to directly mitigate electricity ratepayer impacts, to promote renewable or non-carbon-emitting energy technologies, to stimulate or reward investment in the development of innovative carbon emissions abatement technologies with significant carbon reduction potential, and/or fund administration of [RGGI].” In RGGI, each state develops its own guidelines on how to administer these funds consistent with the MOU.

**Carbon dioxide (CO<sub>2</sub>)** is a colorless, odorless, and non-flammable gas. Solid CO<sub>2</sub> is known as dry ice. CO<sub>2</sub> is the fourth most-abundant gas in the earth’s atmosphere. Animals and people exhale CO<sub>2</sub> and plants use photosynthesis to convert it to sugars and other forms of energy. The concentration of CO<sub>2</sub> in earth’s atmosphere has increased during the past century as a result of increased combustion of fossil fuels and changes in land use.

**European Emissions Trading System (ETS)** is a cap and trade system to limit CO<sub>2</sub> emissions from large industrial sources within the European Union. Since January 2005, the power sector (all fossil fuel-fired generators over 20 MW), oil refining, cement production, iron and steel manufacture, glass and ceramics, and paper and pulp production must meet targets in line with the implementation of each country’s Kyoto Protocol commitment.

**Greenhouse Gases (GHG)** naturally blanket the earth and keep it about 33 degrees Celsius warmer than it would be without these gases in the atmosphere. This is called the “Greenhouse Effect.” Over the past century, the earth has increased in temperature by about 0.5 degrees Celsius. The main greenhouse gases are CO<sub>2</sub>, methane, nitrous oxide, and fluorocarbons.

**Kyoto Protocol** is an international treaty developed in 1997 on climate change that assigns mandatory targets for the reduction of greenhouse gas emissions to the 39 industrialized nations that have ratified that treaty. The Kyoto Protocol now covers more than 160 countries globally and over 55 percent of global greenhouse gas (GHG) emissions.

**Memorandum of Understanding (MOU)** is the formal agreement to propose a set of policies, signed in 2005 by the governors of Maine, New Hampshire, Vermont, Connecticut, New Jersey,

New York and Delaware and signed at later dates by the governors of Massachusetts, Rhode Island, and Maryland, to move forward with the implementation of RGGI in their states. The terms of the policies set CO<sub>2</sub> limits for each state, a time-table for emissions reductions, criteria for acceptable offsets, and other implementation guidelines.

**Model Rule** outlines in specific detail the provisions necessary to implement the principles and emission targets in the MOU and provides a common framework for individual states' regulations. The model rule was developed by the RGGI interstate working group, with input from a 25-person stakeholder group and public comments, before being finalized and released in August of 2006.

**Offsets** are allowances that are certified emissions reductions or carbon sequestration that take place outside the electric generating sector in specified project areas. In RGGI, offsets may be issued to verified reduction projects to cover up to 3.3 percent of a plant's total emissions.

**Regulated power plant** is any fossil fuel-fired electricity generating unit having a rated capacity equal to or greater than 25 megawatts within the RGGI states.

**Safety Valve** is a term used in cap and trade systems to limit the cost of allowances and protect regulated power plants from being overburdened. If the cost of an allowance rises above a certain average threshold for a sustained period, the safety value is triggered and allows generators an extra year to meet emissions levels, and an increase in the percentage of their emissions that can be covered by offsets.

**Strategic Energy Benefit** (see Consumer Benefit above)