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A Primer for Maine: Regional Greenhouse Gas Initiative

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A Primer for Maine: Regional Greenhouse Gas Initiative

Muskie School of Public Service
University of Southern Maine

Margaret Chase Smith Policy Center
University of Maine

Revised edition

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by

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Introduction

Over the next few years, you will be hearing much about the Regional Greenhouse Gas Initiative (RGGI, pronounced “Reggie”), the first regional mandatory program to address climate change in the United States.

This primer is designed to provide Maine citizens with a basic understanding of the program and the key decisions Maine must make in its implementation. RGGI’s success will require continued leadership, thoughtful discussion and creative solutions.

Background

In 2001, at a meeting of the New England Governors and Eastern Canadian Premiers, the New England states and Atlantic provinces of Canada agreed to work together on a plan to address global warming. For Maine, this agreement reflected work of the Maine Climate Action Plan, which identified a cap-and-trade program for emissions reductions as one of the state’s highest priorities. The 2003 Maine Greenhouse Gas Initiative built further on this commitment.

Over time, the concept of RGGI for the Northeastern United States (Canada had joined the Kyoto Protocol) took shape. The goal was to reduce carbon dioxide (CO₂) emissions from power plants in participating states and create the impetus for a national plan while:

- allowing flexibility, to encourage innovation in meeting the goals;
- maintaining energy affordability and reliability;
- accommodating the diversity of individual state’s policies and programs;
- emphasizing uniformity to facilitate interstate allowance trading;
- being expandable so other states can join;
- supporting other national, state or regional emissions trading programs.

In late 2003, an interstate working group, mostly from the New England state environmental 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 issues with experts and look at economic models, which led to the development of the RGGI program. In December 2005, the governors of seven states signed a 20-page Memorandum of Understanding adopting a plan for RGGI.

In March 2006, the participating states released a draft model rule outlining regulations for state governments to use in adopting RGGI. Public input was received from more than 100 organizations. After revisions, the model rule was finalized and released in August 2006.

The basic provisions and next steps for RGGI are the focus of this primer.

1. RGGI Basics

What is RGGI?

Regional Greenhouse Gas Initiative (RGGI) is an agreement to implement a flexible, market-based program to reduce carbon dioxide (CO₂) emissions—the major cause of global warming—from power plants in the Northeast and Mid-Atlantic states.

The governors of Maine, New Hampshire, Vermont, Connecticut, New Jersey, New York and Delaware signed a Memorandum of Understanding (MOU) adopting RGGI in December 2005. The District of Columbia, Massachusetts, Pennsylvania, Rhode Island, the Eastern Canadian Provinces, and New Brunswick were observers in the process. Maryland has since passed legislation to join the program, and Massachusetts has agreed to sign the agreement early in 2007. Rhode Island has not agreed to implement the program, but may do so in the future.

In October 2006, California Governor Arnold Schwarzenegger, at a meeting with Governor Pataki of New York, (the convener of the original meeting in 2001), announced that California would join RGGI as well.

RGGI's bottom line: Total emissions in the RGGI states may not increase from 2009 to 2014, and then must fall by 2.5% per year through 2018, so that by 2019 they must be at least 10% below the 2009 level. Modeling forecasts suggest that without RGGI, emissions

RGGI's Key Provisions

- RGGI utilizes a cap-and-trade system: The states have agreed to set limits (caps) on emissions and then auction, sell, or give away tradable allowances, one for each ton of CO₂ allowed by the cap.
- RGGI applies to all fossil fuel-fired electrical generating plants with a rated capacity equal to or greater than 25 megawatts. The individual states will decide on the CO₂ emission limits for each regulated plant, which will then buy and sell allowances to cover its emission limit.
- Each state is required to sell or auction a minimum of 25% of its allowances and use the proceeds for strategic energy or consumer benefit purposes such as energy efficiency, rate-payer rebates, or new clean energy technologies.
- Some portion of the emission reductions can be gained from other sources. RGGI specifies a number of categories of offset allowances, such as planting trees to absorb carbon.
- If allowance prices exceed certain defined limits, RGGI has a "safety-valve" that allows greater use of offset allowances and an extension of the compliance period.

from power plants in the region would grow by 7% from 2009 to 2019. Thus, compared to “business as usual,” RGGI is designed to cut emissions by around 17%.¹

The MOU sets the number of allowances budgeted to each state, the timetable for emission reductions, and criteria for acceptable offsets. RGGI is a regional plan, but each state must, by the end of 2008, adopt its own regulations or laws for RGGI to come into effect. The model rule, released by the RGGI interstate workgroup, forms the framework of individual state regulatory and/or statutory proposals to adopt and implement the program.² Each state will go through its own decision-making process, with the legal requirements varying among states.

RGGI’s progress is being closely watched. Although a modest first step, RGGI’s cap-and-trade program will provide important learning experiences for policymakers in other states, in Washington, D.C. (where Congress is considering the design of a national response), as well as internationally, where efforts such as the Kyoto Protocol (an international treaty on climate change) and the European Emission Trading System are already underway. It also provides a testing ground for development of new technologies and markets.

Considerable experience has accumulated with the design and operation of cap-and-trade systems for more traditional pollutants, including the highly successful U.S. programs to reduce sulfur dioxide—the main cause of

acid rain—and nitrous oxides which are a major factor in causing ground-level ozone or smog. Using this approach to control greenhouse gases is breaking new ground in the United States.³

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 CO₂ and other greenhouse gases that are produced by human activities such as the combustion of fossil fuels (coal, oil, natural gas) and changes in land use.

Global warming gases are associated with, but different from, local air pollutants that cause smog or particulate emissions. They have diverse sources and reductions anywhere have a positive global impact.

According to the Pew Center on Global Climate Change, the continuation of historical trends of greenhouse gas emissions will result in additional warming, with current projections of a global increase of 2.5°F–10.4°F by 2100 and warming in some parts the U.S. expected to be even higher.⁴

Global warming of this magnitude is likely to be accompanied by other changes (many of which will have a direct impact on Maine), including:

- increased frequency and severity of storms, floods, and droughts;
- melting of glaciers, ice sheets, and the polar sea-ice, raising sea levels to cover shoreline and low-lying land;
- increases in infectious diseases, such as the West Nile Virus;

- changes in distribution and abundance of native tree, plant, and animal species;
- disruption of agriculture, forestry, and recreational industries.⁵

RGGI will not only reduce the region's emissions, it is designed to be a component of a national and international response to the extremely rapid increases in greenhouse gases of recent decades. Climate scientists broadly agree that the heat-trapping pollution from all sectors of the economy must eventually be cut substantially, if we are to limit the harmful effects of continued warming of our planet.

Why focus on power plants?

Releases of CO₂ account for four-fifths of global warming pollution. The power sector is the largest single source of industrial emissions, accounting for 38% of U.S. global warming gases,⁶ although in the Northeast they are now second to transportation.

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.

What is RGGI's expected effect on electricity costs and the economy?

Available evidence from modeling done by the RGGI states and by independent organizations indicates that RGGI will have little impact on the cost of doing business or on the overall economy in the Northeast. This is because the goals of RGGI are fairly modest and are stretched out over more than a decade, regulated power plants are allowed to use offsets to meet part of their emission reductions, and electricity use is only a small portion of the economy.⁷

The maximum increases in retail electric rates projected by the RGGI models are about 0.5% to 0.66% per year—a rate-of-change that would be barely noticeable to consumers. By 2021, residential and commercial rates could rise between 1% and 5%, with industrial rates rising between 1% and 10%. The impact of RGGI is small compared to other factors that might affect rates, such as changes in fuel prices (note the 25% or greater rate increases during the winter of 2005–2006 as gas and oil prices skyrocketed).

Electric rate increases could be reduced by instituting efficiencies that shrink demand. Rising demand for electricity drives costly investments in power plants and transmission lines. Improved energy efficiency (such as installing energy saving light bulbs and home insulation) can reduce the need for these investments, lower electricity rates by reducing peak demand, and minimize pressure on strained natural gas supplies.

2. RGGI's "Nuts and Bolts"

What is cap-and-trade and how does it work?

Traditional environmental regulations require each regulated facility, such as an industrial company or a power plant, to use "best available technology" to reduce air or water pollution, or to cut emissions by a certain amount regardless of economics at the plant level.

With RGGI, CO₂ emissions from the electricity generating sector are capped within each state at approximately 2006 levels. The state then sets compliance requirements for each regulated power plant. The regulated plant is given or buys emission allowances, which it can save (i.e. bank), trade or sell to meet compliance levels. Some plants will be able to cut emissions more inexpensively than others. Those that can do so will be able to sell their surplus allowances to those whose costs of compliance are higher, or whose initial allocation proves insufficient. Trading can take place within a state or across state lines within the RGGI region.

Offsets are a new market that can potentially provide economic opportunities for Maine.

Power companies can also cut their CO₂ emissions by making their operations more efficient, by switching from higher emitting to lower emitting fuels (from coal to natural gas or to renewable sources such as biomass or wind), by shutting down older, less efficient plants in favor of more modern, lower emitting plants, encouraging and enabling consumers to use less electricity through demand management programs, or potentially by using carbon sequestration technologies currently in development to capture CO₂ and store it permanently underground before it enters the atmosphere.

RGGI's cap-and-trade program is flexible in that it includes several alternatives to allow regulated power plants options for meeting their emissions cap and some safety features to limit the price of allowances.

What are "offsets"?

In addition to the different possibilities for meeting the cap listed above, RGGI also allows offsets—alternative means of reducing greenhouse gas emissions, other than cutting CO₂ emissions at power plants themselves. CO₂ is emitted from other sectors of the economy, mainly through the burning of fossil fuels. Some pollutants, including methane gas, produce a more powerful global warming effect per pound than CO₂ (though they tend to be emitted in far smaller quantities). It is from these other sectors of the economy and

these other greenhouse gases that offsets are typically drawn. Permitting offset allowances from other sectors to achieve compliance expands the reduction possibilities and provides more flexibility and the likelihood of lower costs. The Memorandum of Understanding (MOU) specifies that the types of offsets listed on this page will be allowed.

Electricity generators would be allowed to cover up to 3.3% of their total emissions by buying offset allowances. This is estimated to be approximately 50% of the reductions required by RGGI from their “business as usual” emissions.

To be eligible for inclusion in RGGI, offsets would have to meet a strict five-point set of standards: that the offsets are “real, surplus, verifiable, permanent, and enforceable,” as stated in the MOU. Offset projects can take place anywhere in the U.S. as long as that state has entered into a memo of understanding with the RGGI states that ensures the credibility of the offsets.

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 are a new market that can potentially provide economic opportunities for Maine businesses.

Types of Allowable Offsets

- Capturing methane gas that would normally be emitted from landfills and agriculture, and then burning the methane as an energy source (the burning releases CO₂, but this is much less significant than if the methane were released directly to the atmosphere).
- Capturing and recycling sulfur hexafluoride (SF₆) gas, a potent greenhouse gas used in electrical transformers.
- Planting trees (which absorb CO₂ and release oxygen).
- Improving the efficiency of non-power generation uses of natural gas and heating oil, such as heating buildings and hot water.
- Reducing methane emissions from natural gas transmission and distribution.
- Additional offset allowances, such as forest management, may be added later.

For example, a landfill that does not currently capture methane gas could begin to do so and flare it, consuming the methane gas and reducing its impact. The methane reduction, net the additional CO₂ from flaring, would qualify as an offset allowance that could be sold to anyone looking for an offset allowance either to meet their compliance needs or for investment. The same would be true for a cattle feedlot that now might gather manure and used an anaerobic digester to prevent methane emissions from going into the air.

What is the “safety valve”?

RGGI’s MOU sets two “safety valves” to limit prices for emission allowances.

If the average market price for allowances exceeds \$7/ton of CO₂, regulated power plants could use offset allowances to cover up to 5% of their emissions instead of 3.3%. If the average market price for allowances exceeds \$10/ton of CO₂, offset allowances can be used to cover 10% of emissions. Regulated power plants would be allowed to extend by up to one year their compliance with the emission levels set by the MOU. The safety valve prices are adjusted upward by the Consumer Price Index plus 2% per year, beginning in 2006.

What is “leakage”?

Leakage addresses the issue of electrical generating plants outside RGGI, with no costs of compliance, selling power into RGGI states. Since CO₂ 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, negating 40% or more of the emission reductions from RGGI. Such a result would effectively prevent RGGI from reaching its goal of cutting emissions 10% by 2019. Addressing leakage issues is an implementation priority.

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. Other solutions, such as requiring imported power to meet emissions requirements, introduce certain legal complications. Recognizing the complexity, the 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 and will report in December 2007.

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 and by Canada’s compliance with Kyoto targets. Nonetheless, leakage remains a serious issue.

3. Decisions for Maine

RGGI's Memorandum of Understanding (MOU) is a set of policies that have already been accepted by the signing states. The state regulations implementing RGGI can be modified, in some limited respects, from the model rule, as long as they remain consistent with the MOU. Maine and other states will develop their own regulations to meet their unique needs.

Each state has a budget for the tons of CO₂ that its power plants can emit. By January 2009, the Maine Department of Environmental Protection (DEP) must determine each regulated power plants emission limit.

RGGI affects only fossil fuel-fired electricity generating units having a rated capacity equal to or greater than 25 megawatts. In Maine, this applies to six electrical generating plants. Smaller generating plants, as well as non carbon dioxide-emitting generation plants that rely on nuclear, hydro, wind, or renewable sources are not regulated.

Five out of the six regulated power plants in Maine are new natural gas fired turbines. Two are natural gas fired combined cycle co-generation plants, and are the lowest emitting plants technologically available. By co-locating with an industrial plant (two paper companies in Maine's case), steam produced as a by-product of the industrial process becomes an additional source of power. Often

Decisions Maine Must Make

ALLOWANCES

- Who gets allowances to emit CO₂ and how much will they cost?
- Will emission allowances be sold, auctioned, or given away?
- If allowances are given away, what are the criteria?
- How will allowances be put aside for new entrants?

PUBLIC BENEFIT FROM REVENUES

- What percentage of revenues should be dedicated to public sector benefits and how should they be used?

THE PROCESS

- What is the role of Maine's legislature and Department of Environmental Protection?
- How can interested parties get involved?

called combined heat and power, they are among the most efficient generators in the country, so options for reducing CO₂ emissions are limited.

Decisions about how Maine implements RGGI will be made throughout 2007. The basis for allocating CO₂ limits, whether allowances are given, sold or auctioned, and how much revenue should be set aside for public benefit and for what use, are some of the key issues that will be informed by the public process set up by the Maine DEP.

ALLOWANCES

Allowances are the trading mechanism assigned to emissions for the purposes of cap-and-trade. One emission allowance equals one ton of CO₂ emissions. Maine's total emissions allocation is 5.95 million tons,⁸ or 5.95 million allowances. Each regulated power plant will need a sufficient number of allowances to cover its CO₂ emission limit. The penalty for failing to have sufficient emission allowances at the end of the compliance period will be a deduction of three times the excess emissions from the regulated power plants future allocation of allowances.

Who gets allowances to emit CO₂ and how much will they cost?

According to the MOU accepted by Maine and the other RGGI states, each state must sell at least 25% of its allowances, with the

money used for consumer benefit or strategic energy purpose. Buyers will predominantly be the regulated power plants, but anyone can purchase allowances—individuals, environmental groups or investors within or outside of the RGGI area. Each state may allocate the remaining 75% of the allowances as it wishes, including giving them to regulated power plants, retaining some for new plants, or selling them and using the revenues to enhance energy efficiency or to provide public benefits.

Regulated power plants can buy allowances and sell excess allowances in an open market spanning the RGGI states. The price for an allowance will be set by supply and demand, influenced by what it costs to reduce emissions or purchase offsets. Modeling done as part of the RGGI process, using a wide variety of assumptions, estimated that CO₂ allowances are expected to sell for between \$1/ton to above \$10/ton, depending on modeling assumptions and energy prices.⁹ Allowance prices will be influenced by energy costs, technological innovation, electricity demand, and the availability of efficiency improvements in existing generators, among other factors.

Will emission allowances be sold, auctioned or given away?

Even at the low expected cost of allowances, the RGGI program will create a substantial new market. Maine's allocation of 5.95 million tons and an estimated allowance price of \$5/ton would yield a total value of Maine's

allocation at about \$30 million per year. Given the value of this market, it is not surprising that one of the most difficult issues is determining a fair and equitable way to determine allowance allocations.

The argument for giving allowances to regulated plants is that it eases the transition to a new regulatory regime with new pollution control liabilities. How plants choose to utilize these allowances, such as using all of them to cover their existing emissions, or instead to reduce emissions through efficiency techniques and then sell the excess allowances, is left up to competitive pressures and individual firm decision making. This is the method used in the European Emission Trading System (ETS). Giving allowances to regulated power plants in Maine and other RGGI states may also help keep the RGGI state power plants competitive with non-RGGI power plants that sell and buy electricity to and from the RGGI region.

At the same time, there are justifications for auctioning more than 25% of the state's allowances. The revenues from allowance sales can be used to fund energy efficiency programs, provide for consumer rebates, support development of renewable energy projects, or otherwise lower the costs to consumers from rate hikes associated with increased costs of electricity generation due to the new regulations.

Some evidence from the European ETS and from studies of the proposed RGGI system

and a national carbon trading system suggests that when allowances are given away, the result is higher generator profits and possibly less incentive to reduce emissions.^{10 11 12}

These same studies find that charging generators for their allowances will not cause the prices to rise compared to giving the allowances away. They note that in deregulated electricity markets, such as those in the Northeast, electricity prices are based not on the average cost of producing power, but on the incremental cost of additional power needed to meet demand at any given time. While the average cost may rise if generators must buy their allowances, the last dispatched price is based on the cost of available power to meet additional demand, not average price. This is true whether the electricity is generated within the Northeast or imported from states or countries neighboring the RGGI region.

If allowances are given to regulated power plants, what are the criteria?

In the past, regulators have used either the level of average historical emission rates as the basis for allocations ("grandfathering") or allocation emission rates implied by the best available technology ("benchmarking"). Another method, output-based allocations, awards allowances in proportion to current electricity generation, updated each year to reflect changes in generation at that facility.

Grandfathering on the basis of historic emissions rates tends to reward the most polluting plants and discriminates against firms that have already taken action to reduce emissions. Benchmarking tends to favor the plants that have effectively reduced their ratio of carbon emissions per unit output. Output-based allocations tend to level the playing field and allow for new entrants to gain market share. As noted previously, some of Maine's operating facilities are older, less efficient plants, but others are quite efficient already.

What are the rules for allocation of permits to potential new entrants?

Another key implementation question will be how to structure allocations to accommodate new market entrants. If all fossil fuel-powered electric generation has to function under a cap, some provision must be established to create room under the cap for new generators. Under the U.S. Acid Rain Trading Program, for example, the Environmental Protection Agency holds aside a small percentage of each year's total allowance pool and puts it in a "bank" that can then be tapped to accommodate new entries to the electric generating market. Because the allowances were culled from the total pool, the new emissions represented by the new generation do not exceed the yearly emissions budget.

PUBLIC BENEFITS FROM REVENUES

What percentage of revenues should be dedicated to public sector benefits and how will they be used?

According to the MOU, at least 25% of a state's allowances are to be dedicated to strategic energy or consumer benefit purposes, such as rate-payer rebates, energy efficiency, and new clean energy technologies. Maine will have to decide if it wants to keep or raise that percentage. It is also up to each individual state to decide on the process and procedure for determining the specific use of those revenues for the public benefit.

Some to-be-defined portion of the revenues generated from the sale of allowances could be allocated to directly offset impacts from the RGGI program on electricity bills, a strategy that could be effective in helping low income households. At the same time, electricity rates send signals to consumers (lower rates tend to increase usage), so care must be taken not to undermine the conservation incentives that are a crucial aspect of the program. One way to do this is to target the rebates only at the most vulnerable households. Another is to provide a fixed rebate per household (not a rebate that rises with consumption level) so that the consumer can pocket any savings achieved from reduced consumption.

Allowance revenues can also be dedicated towards energy efficiency programs. By increasing spending on energy efficiency with proceeds from allowance sales or other funds, RGGI could assist electricity customers in cutting their monthly bills by lowering electricity consumption without lowering services (installing temperature controls, energy saving lightbulbs, etc.). Modeling performed as part of RGGI's development examined the impacts from doubling current spending on efficiency programs in the nine original RGGI states. The analysis found that if such doubling was continued for 15 years, the average household would see its electric bill fall by about \$100 a year, or roughly 12%. Business customers would gain a similar savings.¹³

The amount of funding available for efficiency and rebates would depend on what percentage of the allowances regulated power plants must buy and the allowance market price. It is unlikely that the necessary funding to double efficiency spending could be obtained if regulated power plants pay for only 25% of their emissions allowances.

Most of the Northeast states already have state-mandated programs that help pay for energy efficiency measures; although in some states the funding is quite limited. Historical evidence shows that over time these programs save consumers more on their electric bills than they cost. For New England, the evidence suggests that efficiency programs could

save electricity for about one third the cost of generating the same amount of power. In coming years, more than enough cost-effective efficiency potential is available to completely cancel out projected increases in electricity demand.¹⁴

Funding clean energy technologies would stimulate or reward investment in the research and development of new innovative carbon emissions abatement technologies and promote renewable or non-carbon emitting energy advances such as wind, solar and geothermal power generation.

**...evidence suggests
that efficiency programs
could save electricity
for about 1/3 the cost
of generating the same
amount of power.**

THE PROCESS

What is the role of Maine’s legislature and Department of Environmental Protection (DEP)?

In some of the RGGI states, the state environmental agencies already have authority under existing laws to require that power plants reduce their carbon dioxide emissions.

However, because of RGGI’s potential impact, state agencies may seek legislative approval even though they do not believe that it is a legal necessity.

In Maine, the legislature must pass new legislation directing Maine DEP to develop rules and regulations for implementing RGGI, including establishing allocation limits, selling or auctioning allowances, collecting and dispersing funds. Certain regulations must be reviewed after adoption by the Maine DEP. Because these are major and substantive actions, the rules will go back to the legislature before they become law.

How can interested parties get involved?

Beginning in October 2006 and continuing through December 2006, Maine DEP held a series of regional roundtable discussions to provide information and solicit comments on how to tailor the model rule to meet Maine’s needs and circumstances.

Maine DEP intends to submit a bill in the 123rd legislative session in early February, 2007 to authorize the implementation of the rule. The legislation will be referred to the appropriate committee which will hold one or more public hearings, followed by one or more working sessions to finalize the proposed legislation. After committee, the proposed legislation would come before the full house and senate, then the governor for approval. This process should be completed before the session ends in June. The bill would take effect 90 days later and includes provisions for Maine DEP to undertake rule-making for implementation.

Once the bill is referred to committee, you can find information on the legislative schedule and the date and location of public hearings, at the Maine State Government website: <http://www.maine.gov/portal/government/legislature.html>. Click on “Public Hearings.” You can also sign up for advance notice of public hearings on this page as well.

4. Looking beyond Maine

What else is happening at the state and federal level?

The federal government has a number of policy measures, financial incentives, and voluntary programs aimed at slowing the growth of greenhouse gas (GHG) emissions and reducing GHG intensity of the U.S. economy. Federal programs, including Climate VISION and Energy STAR, work with industry to reduce emissions voluntarily. These programs and other research and clean energy technology development projects are coordinated by the Federal Climate Change Technology Program.

In addition, the Federal Climate Change Initiative has as its goal to cut the greenhouse gas intensity of the economy by 18% over a period of 10 years, from 2002 to 2012. Greenhouse gas intensity measures the ratio of CO₂ equivalent emissions to economic output. The goal is to reduce the amount of CO₂ equivalent emissions per dollar of Gross Domestic Product. Further reductions in CO₂ emissions are likely from the new “Twenty In Ten” program to reduce the nation’s use of gasoline by 20% in 10 years. Reducing the CO₂ intensity of the U.S. economy and furthering research on low carbon technologies are important steps to reducing national GHG emissions, but these federal programs do not directly cap or reduce the level of U.S. GHG emissions.

Frustration at the lack of a mandatory federal cap on U.S. GHG emissions has led municipalities and states to undertake a broad range of activities to cap and reduce GHG on their own. In June 2005, the U.S. Conference of Mayors unanimously endorsed the U.S. Mayors Climate Protection Agreement that urges U.S. cities to follow the principles of the Kyoto Protocol, despite the fact that the U.S. has not ratified the Protocol. The Agreement has now been signed by 307 mayors representing over 50 million Americans. In 1997, Oregon became the first state to regulate the GHG emissions by requiring that new power plants counter their global warming impact by offsetting approximately 17% of their CO₂ emissions by attaining high efficiency standards in generation or by purchasing offsets.

In 2005, California adopted emission reduction targets that reduce California GHG emissions to 2000 levels by 2010, 1990 levels by 2020 and 80% below 1990 levels by 2050. This is assisted by a low carbon fuel standard, announced in January, which requires fuel providers to ensure that the mix of fuels they sell for passenger vehicles produces 10 percent fewer greenhouse gas emissions by 2020. In addition, California and Oregon are also developing a “load-side cap-and-trade” approach, which focuses on those who purchase electricity, rather than those who generate it. Like RGGI, this load-side cap-and-trade program focuses on the power system, but unlike RGGI, it counts and caps

the carbon associated with power purchases, regardless of where the power originates. The details on the California-Oregon cap-and-trade program have yet to be finalized. Other states, including Arizona and New Mexico, are also in the process of adopting programs to reduce GHG emissions.

State and municipal actions are a collective first step toward a mandatory program for the entire United States. Lessons taken from these efforts should make valuable contributions to future efforts at the national and international levels.

RESOURCES

Climate Change Institute, University of Maine: www.climatechange.umaine.edu

Maine Department of Environmental Protection: www.maine.gov/dep

Maine Greenhouse Gas Initiative:
<http://maineghg.raadassociates.org>

Lee International: www.go-worldlee.com

Pew Center on Global Climate Change:
www.pewclimate.org

Point Carbon: www.pointcarbon.com

Regional Greenhouse Gas Initiative:
www.rggi.org

United Nations Framework Convention on Climate Change: <http://unfccc.int/2860.php>

U.S. Environmental Protection Agency:
www.epa.gov

NOTES

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5. Intergovernmental Panel on Climate Change (2001).
6. U.S. Environmental Protection Agency (2001). "National Emission Inventory. Air Pollutant Emissions Trends."
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8. Memorandum of Understanding on the Regional Greenhouse Gas Initiative, p. 3, 2005.
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14. Economically Achievable Energy Efficiency Potential in New England, Optimal Energy for Northeast Energy Efficiency Partnerships, May 2005; Stopping Global Warming Efficiently, National Association of State PIRGs, 2005.

Glossary

Allowances, sometimes called permits or 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 CO₂ (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 regulated source. Allowances are then auctioned, sold or given away to regulated sources 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. Some cap-and-trade systems also allow allowances to be banked 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 en-

ergy 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 (CO₂) is a colorless, odorless, and non-flammable gas. Solid carbon dioxide is known as dry ice. Carbon dioxide is the fourth most-abundant gas in the earth’s atmosphere. Animals and people exhale carbon dioxide and plants use photosynthesis to convert it to sugars and other forms of energy. The concentration of CO₂ 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 CO₂ emissions from large industrial sources within the European Union. Since January 2005, the power sector (all fossil fuel 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 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 .5 degrees Celsius. The main greenhouse gases are carbon dioxide, methane, nitrous oxide, and fluorocarbons.

Kyoto Protocol is an international treaty 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% of global greenhouse gas (GHG) emissions.

Memorandum of Understanding (MOU) is the formal agreement to a set of policies, signed in 2005, by the governors of Maine, New Hampshire, Vermont, Connecticut, New Jersey, New York and Delaware to move forward with the implementation of RGGI in their states. The terms of the agreement set CO₂ 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 rules necessary to implement the principles and emission targets agreed to in the MOU and provides a common framework for individual states’ regulations. The model rule was developed by the 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 (or credits) 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% 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)

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