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RGGI Allowances: How to Use the Revenues?

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The Regional Greenhouse Gas Initiative (RGGI, pronounced "Reggie") is the first regional mandatory program to address global warming pollution from power plants in the United States. In December 2005, after two years of planning, the governors of seven states (Maine, New Hampshire, Vermont, Connecticut, New Jersey, New York and Delaware)* signed a 20-page Memorandum of Understanding (MOU) adopting a plan for reducing carbon dioxide (CO_2). A year later, the states released a draft model rule outlining regulations for participating state governments to use in RGGI's adoption and implementation at the state level. RGGI will take effect in 2009, and mandate that total emissions in the RGGI states may not increase from 2009 to 2014, and then must fall by 2.5% per year through 2018.

What are emission allowances?

Emission allowances are the currency of the emissions trading market set up by RGGI's cap and trade system. One emission allowance equals one ton of CO_2 emissions. Maine's total emissions level is capped at 5.95 million tons, or 5.95 million allowances. Each regulated power plant must have sufficient allowances to meet its CO_2 compliance levels. The state can auction or give away emission allowances, and power plants are free to buy and sell excess allowances under the cap. RGGI specifies that each state

* Since then, Maryland, Massachusetts and Rhode Island have joined as well.

must sell or auction at least 25% of the allowances, with the proceeds used for public benefit, but can decide individually whether to auction a greater percentage.

After a series of roundtable discussions across the state, the Maine Department of Environmental Protection (DEP) developed a bill for the 123rd legislature to authorize implementation of the rule. One of the major provisions of this bill requires Maine to auction 100% of the emission allowances with an exception for co-generation plants (see below).

This paper examines the following question: When the allowances are auctioned, how should the funds be used?

How much revenue for public benefit will be generated?

The amount of funds available for public benefit depends on 1) the total number of allowances auctioned and 2) the cost of an allowance.

The bill (LD 1851) before Maine's legislature supports the intent of generating a large pool of resources for public benefit programs, while acknowledging cost concerns of the regulated generators, specifically, the two plants within Maine that are combined cycle co-generation plants. 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 called combined heat and power (CHP), they are among the most efficient of electric generators. Under LD 1851, DEP would set aside a portion of the state's annual allowances (lowering the number of allowances available for sale) to cover that portion of CHP emissions related to electricity generated for the manufacturing facility itself, and not transmitted to a distribution utility.

Even at the lowest estimated cost of allowances, the RGGI program will create a substantial new market. Maine's allocation under RGGI is approximately six million emission allowances; cost on the open market is projected between $1 – $10 per allowance. If 85% of Maine's six million allowances are auctioned (with approximately 15% set aside for co-generation plants[1]), at an average price of $2 – $5 an allowance, the state could conservatively expect between $10.2 – $25.5 million per year in new funds for public benefits.

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How should the proceeds be used?

Options for use of these new funds, and an understanding of their benefit to cost ratio, are integral components of RGGI's future success. Proceeds from the sale of allowances can be used for energy efficiency programs, renewable energy development, and direct consumer rebates that will protect electricity consumers against the possible costs of RGGI.[2] The following are possible options for use of public benefit funds:

Energy Efficiency Programs

Reduction of greenhouse gases appears particularly likely to occur through investment in energy efficiency programs. By increasing spending on energy efficiency, RGGI could assist electricity customers in cutting their monthly bills by lowering electricity consumption without lowering services (installing energy saving light bulbs, high-efficiency refrigeration or motors, etc.).

RGGI modeling has examined impacts from doubling current spending on efficiency programs in the nine original RGGI states (as is approximately projected to be the case in Maine). The analysis found that if such doubling were 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.[3] For New England, the RGGI modeling suggests that efficiency programs could achieve electricity savings 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 growth in electricity demand.[4]

Efficiency Maine

A look at Efficiency Maine, a program of the Maine Public Utilities Commission, provides an example of what might be expected from investments in energy efficiency. After four years of operation, Efficiency Maine is now a key partner for residential and business customers, fostering cost-effective electricity savings, reducing greenhouse gas emissions, and helping Maine businesses stay economically competitive. In essence, Efficiency Maine is now the statewide "efficiency utility" and has cumulatively, since 2004, saved 1,231,241 megawatt hours (MWh) of lifetime savings, equivalent to the annual electrical consumption of 180,000 Maine homes.

Efficiency Maine's 2006 annual report (budget of $9.2 million) lists the following accomplishments:

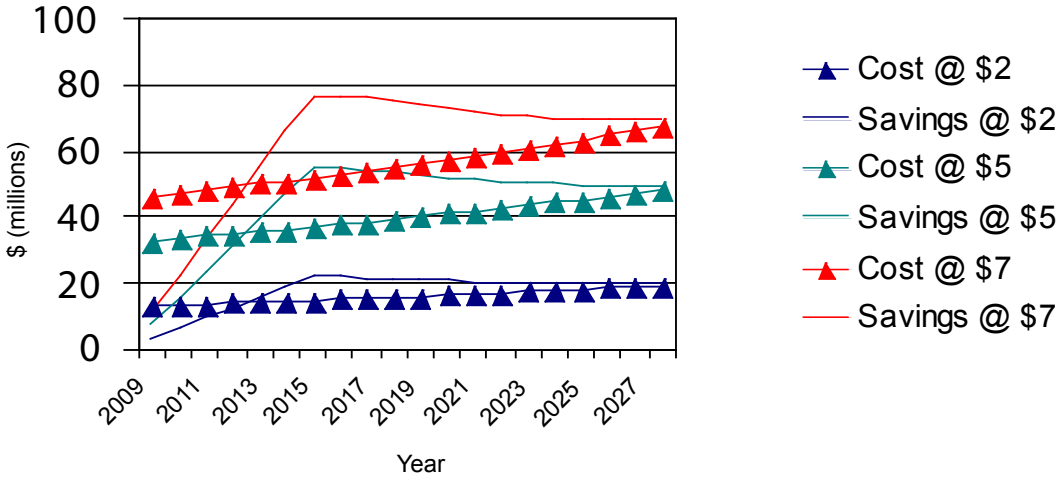
- ✓ 74,759 MWh annual savings
- ✓ $53.9 million lifetime economic benefits for installed equipment
- ✓ 2.7 to 1 program-wide benefit-cost ratio
- ✓ $0.029 per kilowatt hour (kWh) for efficiency savings
- ✓ 700,000 compact fluorescent lightbulbs (CFLs) rebated
- ✓ 320,849 metric tons of lifetime carbon dioxide (CO_2) emission reductions last year.

In addition to the regional forecasts for efficiency spending, initial data is available from the Maine Public Utilities Commission (PUC), and presumably more analysis can be developed during the course of rulemaking proceedings that will supply the RGGI implementation details. Taking as a price

Figure 1: RGGI Energy Cost Increase and Efficiency Savings

Cost based on marginal CO_2 @ 1,100 lbs./MWh

100% of allowance value used for efficiency



basis the marginal cost of generating excess power (which reflects how prices are currently set), the Maine PUC shows the relative expected increases in energy efficiency at different costs per carbon allowance over the next 20 years (Fig. 1). Although this is only illustrative and does not necessarily reflect actual prices, it is a reasonable approach that attempts to show the relationship between cost per megawatt and the effect of that price (and the dollars it would generate) on energy efficiency activity.[5] The PUC analysis shows that, over a 20-year period, energy savings and electrical cost increases roughly cancel each other out. For example, if allowances cost $2 per ton, savings will be greater than cost increases for most of the 20-year period, and this effect will peak in 2016. If allowances cost $5 or $7 per ton, a similar pattern is observed but the cost is larger by a factor of roughly 2.5 or 3, respectively.

Tailored to Maine's energy policy context, these data reinforce RGGI modeling results and suggest that, at several possible initial auction prices, investments in energy efficiency programs will lower costs for all customers and will deliver additional savings to individual program participants over time.

Other (Non-electric) Energy Efficiency

Another potential use of RGGI auction proceeds is investment in non-electric energy efficiency opportunities, which would reduce consumption of other forms of energy by the end-user, such as natural gas, fuel oil, kerosene, propane. Cost-effective energy efficiency opportunities include home weatherization, upgrading commercial and industrial heating and cooling systems, and promoting high-efficiency furnaces and boilers.

The benefit to cost ratio of these non-electric efficiency programs in other states is typically higher than that experienced by electric efficiency programs, delivering between $3 and $4 of benefit for every $1 invested. Increased efficiency in the economy's consumption of natural gas can also help dampen price spikes for that commodity

which, to the extent it is used in power plants that set the marginal price in the New England power pool, will also keep electric wholesale prices lower. Non-electric energy efficiency projects also deliver very significant reductions in greenhouse gas emissions. However, it should be noted that there is no direct link between the beneficiaries of the non-electric projects and the source of the RGGI funds (electricity customers), nor will the resulting reduction in demand for these non-electric energy supplies help drive down the cost of RGGI allowances.

Energy and sequestration research

Funds could also be directed to other programs with potential to reduce greenhouse gas emissions or increase sequestration of carbon—such as support for renewable energy start-up firms and research in new alternative energy technologies. 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. Funding for research on the carbon sequestration function of forests and agricultural lands and possible ways to establish eligible carbon "offsets" for improved management practices on these lands could similarly achieve carbon reductions and deliver financial benefits to the local economy.

Rebates

A portion of revenues generated from the sale of allowances could also be allocated to directly reduce impacts from the RGGI program on electricity bills. This approach could be designed to credit all customer classes in proportion to the amount of electricity they consume. It is also possible to target rebates only for the most vulnerable customer groups, although this can be difficult to implement. Electricity rates send signals to consumers (lower rates or rebates tend to increase usage), so care must be taken not to undermine the conservation incentives that are a critical aspect of RGGI. Another option 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.

However, because there is a finite supply of funding from an auction of RGGI allowances, every dollar spent on a rebate is one less dollar that can be spent on energy efficiency. A dollar allocated to rebates saves some customers one dollar, but delivers no additional benefit in the form of reduced energy consumption, no lowered demand for RGGI allowances, nor any additional greenhouse gas reductions.

Combined approaches

States may make their own decisions of how much of the revenue generated should be spent on which option. One hybrid option is threshold pricing. In this model, auction proceeds are allocated to energy efficiency programs up to a certain price per ton, and any additional proceeds are allocated to one or more of the other options. For example, in Maine, LD 1851 from the Department of Environmental Protection (DEP) suggests that up to an auction price of $5 a ton, 100% of the proceeds be spent on efficiency programs, and

any amount obtained at auction prices over $5 a ton will be spent on rebates to electric ratepayers based on usage. This strategy attempts to protect the consumer from possible cost increases brought on by the higher cost of emission allowances.

Conclusion

When implemented, RGGI will reduce greenhouse gases, produce new funds for the public benefit, and provide an opportunity to help shape Maine's economic future. As described above, RGGI auction proceeds, based on current analysis and past efforts, will most productively be invested in energy efficiency projects. There appears to be ample room for increased energy efficiency that will:

- Reduce overall demand for electricity (which in turn will reduce demand for, and cost of, RGGI allowances, benefiting all customers) and
- Encourage consumers to reduce their carbon emissions, so that any increase in energy prices could be more than offset.

To date, analyses of energy efficiency measures have focused on their affect on electricy costs and CO_2 reduction. They do not address the question of whether any portion of the proceeds allocated to research in new renewable energy technologies, or to customer rebates, would produce a comparable reduction in greenhouse gas emissions.

Whether threshold pricing is approved or not, policymakers should require an analysis from the PUC of whether rebates—and other possible uses of auction proceeds—do, over time, achieve the public purposes intended.

The RGGI states are being closely watched[6] and standards are being set for the country to follow. Keeping the public benefits of RGGI at the forefront of upcoming policy discussions will be critical in helping Maine and other states adapt to the changing economy in a carbon-constrained world. At the same time, using the RGGI funds wisely can help the state manage and reduce energy costs while lowering total greenhouse gas pollutants.

Endnotes

1. This is currently proposed in LD 1851, in order to incentivize energy efficiency at cogeneration plants.

2. See, for example, slide 4 of L. Petraglia and D. Breger, "REMI Impacts for RGGI Policies based on the Std REF & Hi-Emission REF". November 17, 2005. (www.rggi.org/docs/remi_stakeholder_presentation_11_17_05-final.ppt)

3. Lifetime economic benefits and the benefit-cost ratios are calculated by estimating the total lifetime electricity reductions of the efficient products multiplied by future avoided energy costs and adjusted for total program and participant costs all discounted to the present year.

4. The average Maine residential customer consumes 6,817 kWh per year. Energy Information Administration, 2004. http://www.eia.doe.gov/cneaf/electricity/esr/table12.xls.

5. Data from the Maine Public Utilities Commission, April 2007.

6. As one example, on June 20-21 2007 there will be a "Renewable Energy Finance Forum" on Wall Street, during which finance analysts, entrepreneurs, and state policymakers from around the country will discuss RGGI as a potential model for other groups of states to follow, and prospects for a national versus a regional cap and trade market. (http://www.euromoneyenergy.com/default.asp?page=13&eventid=ECK162&site=energy)