

## Executive Summary

### The First Market-Based Program to Reduce Greenhouse Gas Emissions

In 2008, ten states – Connecticut, Delaware, Maine, Massachusetts, Maryland, New Hampshire, New Jersey, New York, Rhode Island, and Vermont – launched the first market-based regulatory program to reduce greenhouse gas (GHG) emissions in the United States. Through the Regional Greenhouse Gas Initiative (RGGI), each participating state caps carbon dioxide (CO<sub>2</sub>) emissions from power plants, auctions CO<sub>2</sub> emission allowances<sup>1</sup>, and invests the proceeds in strategic energy programs that further reduce emissions, save consumers money, create jobs, and build a clean energy economy. Each RGGI participating state has developed its own plan for investment of CO<sub>2</sub> allowance proceeds. This analysis translates the investment plans of the ten RGGI participating states into common, comparable terms to identify regional trends and demonstrate the benefits of RGGI participating state investments.

### The Value of CO<sub>2</sub> Allowances

A key design element of RGGI is the distribution of CO<sub>2</sub> allowances through quarterly, regional CO<sub>2</sub> allowance auctions. Building on the experiences of earlier cap-and-trade programs, which distributed allowances to regulated entities for free, the RGGI participating states each chose to auction the majority of their CO<sub>2</sub> allowances and invest the proceeds in consumer benefit programs. Table 1 (below) shows the percentage of CO<sub>2</sub> allowances offered through auction by each state, as well as the percentage of CO<sub>2</sub> allowances offered for sale directly to certain qualifying emitters at a fixed price of \$2.00 per allowance, as specified in each state's regulations. Across all ten RGGI states, approximately 86 percent of CO<sub>2</sub> allowances are offered at auction<sup>2</sup> and approximately 4 percent of CO<sub>2</sub> allowances are offered for sale at a fixed price.

**Table 1: CO<sub>2</sub> Allowance Allocation By State**

STATE	Initial Annual CO <sub>2</sub> Allowance Budget	Percent Offered through Auctions	Percent Offered for Sale at a Fixed Price
Connecticut	10,695,036	77%	13%
Delaware <sup>3</sup>	7,559,787	60%	n/a
Maine	5,948,902	80%	n/a
Maryland	37,503,983	80%	n/a
Massachusetts	26,660,204	98%	n/a
New Hampshire	8,620,460	69%	n/a
New Jersey <sup>4</sup>	22,892,730	74%	25%
New York	64,310,805	94%	n/a
Rhode Island	2,659,239	99%	n/a
Vermont	1,225,830	99%	n/a
<b>Total</b>	<b>188,076,976</b>	<b>86%</b>	<b>4%</b>

<sup>1</sup> A CO<sub>2</sub> allowance is a limited authorization to emit one short ton of CO<sub>2</sub> from a regulated power plant.

<sup>2</sup> The percentage of CO<sub>2</sub> allowances offered at auction may increase as participating states allocate CO<sub>2</sub> allowances remaining in set-aside accounts, as specified in state CO<sub>2</sub> Budget Trading Program regulations.

<sup>3</sup> In Delaware, the percentage of CO<sub>2</sub> allowances distributed through auctions will increase by 8 percent per year from 2009-2014, such that 100 percent of CO<sub>2</sub> allowances will be auctioned in 2014.

<sup>4</sup> For New Jersey, percentages shown here are based on actual percentages of CO<sub>2</sub> allowances distributed through auction and direct sale in 2009. Pursuant to New Jersey CO<sub>2</sub> Budget Trading Program regulations, a combined 99 percent of the annual New Jersey CO<sub>2</sub> allowance budget is offered through both auction and a fixed-price sale to qualifying industrial cogeneration facilities. The number of CO<sub>2</sub> allowances offered through direct sale is based on recent CO<sub>2</sub> emissions from qualifying industrial cogeneration facilities. CO<sub>2</sub> allowances that are offered through direct sale and not sold through such offers are offered through auction. In 2010, 99 percent of New Jersey's CO<sub>2</sub> allowance budget was offered through auctions.

Auctioning CO<sub>2</sub> allowances provides three important benefits in the context of a cap-and-trade system. First, auctions ensure all parties have access to CO<sub>2</sub> allowances under uniform terms. Second, auctions realize the value of CO<sub>2</sub> allowances for investment in strategic energy programs that reduce CO<sub>2</sub> emissions, save consumers money, and create jobs. Third, reinvestment of auction proceeds in energy efficiency and renewable energy programs allow cap-and-trade programs to address CO<sub>2</sub> emissions at both the supply side (power plants) and the demand side (energy use), delivering emission reductions at lower cost.

Table 2 shows the total amount of proceeds yielded from the sale of RGGI CO<sub>2</sub> allowances for each state and for the entire 10-state RGGI region, through December 31, 2010.

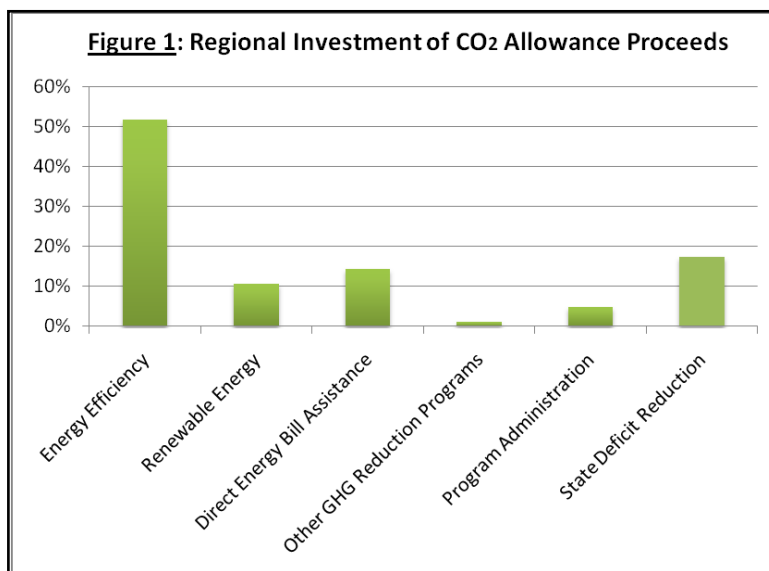
**Table 2: CO<sub>2</sub> Allowance Proceeds by State through Dec 31, 2010**

STATE	Proceeds – Auctions 1-10	Proceeds – Direct Sale ('09-'10)	Total Allowance Proceeds
Connecticut	\$44,900,580	\$441,094	\$45,341,674
Delaware	\$18,858,578	n/a	\$18,858,578
Maine	\$23,544,204	n/a	\$23,544,204
Maryland	\$147,530,363	n/a	\$147,530,363
Massachusetts	\$123,229,478	n/a	\$123,229,478
New Hampshire	\$28,215,274	n/a	\$28,215,274
New Jersey	\$90,913,275	\$11,310,356	\$102,223,631
New York	\$282,272,683	n/a	\$282,272,683
Rhode Island	\$12,340,209	n/a	\$12,340,209
Vermont	\$5,701,535	n/a	\$5,701,535
<b>REGION</b>	<b>\$777,506,180</b>	<b>\$11,751,450</b>	<b>\$789,257,630</b>

## Investing in a Clean Energy Economy

Each RGGI participating state has developed its own plan for investing its share of CO<sub>2</sub> allowance proceeds. While each state directs its own investment strategy, overall, states have allocated proceeds as follows:

- **52 percent** to improve energy efficiency;
- **11 percent** to accelerate the deployment of renewable energy technologies;
- **14 percent** to provide energy bill payment assistance, including assistance to low-income ratepayers;
- **1 percent** for a wide variety of greenhouse gas reduction programs, including programs to promote the development of carbon emission abatement technologies,



efforts to reduce vehicle miles traveled, and programs to increase carbon sequestration. For regional comparison purposes, climate change adaptation measures are also included in this category.

## **Triple Benefits: for the Environment, Consumers and the Economy**

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Investments by RGGI participating states in energy efficiency and renewable energy reduce greenhouse gas emissions and generate important consumer benefits, including energy bill savings, greater electric system reliability, and new jobs.

### **◆ Environmental Gains**

#### **Investments Reduce Emissions**

Investments in energy efficiency and renewable energy reduce reliance on fossil fuels, lowering emissions of CO<sub>2</sub> as well as other harmful pollutants, including sulfur dioxide (SO<sub>2</sub>) and nitrogen oxides (NO<sub>x</sub>), which cause acid rain. Investments that improve energy efficiency and increase renewable generation capacity in the electricity sector (e.g. incentives for the deployment of solar electric generation systems on homes and businesses) complement the RGGI CO<sub>2</sub> emission cap, helping to reduce power sector CO<sub>2</sub> emissions at least cost. Investments that improve energy efficiency and increase use of renewable energy outside the capped electricity sector (e.g., incentives for improving the efficiency of oil and natural gas space heating) generate additional emission reductions beyond those achieved through the RGGI CO<sub>2</sub> emission cap.

### **◆ Consumer Savings**

#### **Investments Save Consumers Money**

At the household and business level, energy efficiency investments enhance consumers' control over their energy use, typically reducing energy bills by 15 to 30 percent.<sup>i</sup> On a regional level, energy efficiency investments drive down peak and overall electricity demand, which works to depress wholesale electricity prices, improve electric system reliability, and mitigate the need for investment in new or expanded electric generation facilities, transmission lines, and distribution systems.

### **◆ Economic Benefits**

#### **Investments Create Jobs**

Investments in energy efficiency and renewable energy drive demand for new products and services and stimulate the economy with energy bill savings, thereby creating jobs. A 2010 analysis by Environment Northeast estimates that energy efficiency programs funded with CO<sub>2</sub> allowance proceeds through December 2010 are projected to create nearly 18,000 job years – that is, the equivalent of 18,000 full-time jobs that last one year.<sup>ii</sup> Employment benefits result from state program investments and from the reinvestment of consumer energy bill savings in the wider economy. While there has not yet been a similar analysis of RGGI-funded renewable energy programs, data from the Renewable Energy Policy Project shows every \$1 million invested in renewable energy systems creates about six full-time manufacturing jobs, as well as additional jobs in construction and facility maintenance.<sup>iii</sup>

#### **Investments Create Business Opportunities**

Investments in energy efficiency and renewable energy create business opportunities in the clean energy sector. The RGGI CO<sub>2</sub> emission cap sends a long-term price signal for a more efficient, cleaner energy supply. At the same time, the investment of CO<sub>2</sub> allowance proceeds in energy efficiency and renewable energy projects helps emerging technologies achieve economies of scale, accelerating widespread adoption and facilitating growth of the clean energy sector.

#### **Investments Generate Economic Returns**

Investments in energy efficiency and renewable energy are economically beneficial. Evaluations of several energy efficiency and renewable energy programs in the RGGI participating states indicate that these programs provide \$3-\$4 in savings for every dollar invested.<sup>iv</sup> When macroeconomic benefits are considered, the benefits are even greater.<sup>v</sup>

## Driving Policy Innovation

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Innovative elements of RGGI's design are influencing the development of other cap-and-trade programs, such as the Western Climate Initiative and the European Union Emissions Trading System. Two key design elements – CO<sub>2</sub> allowance auctions and reinvestment of proceeds in strategic energy programs – have demonstrated how market-based programs can harness the value of a CO<sub>2</sub> emission cap to deliver emission reductions at low cost.

In particular, the investment of CO<sub>2</sub> allowance proceeds in energy efficiency and renewable energy within the electricity sector reduces the demand for fossil-fuel generated electricity, which reduces CO<sub>2</sub> emissions and the demand for CO<sub>2</sub> allowances. The result is lower CO<sub>2</sub> allowance prices and lower program impacts on wholesale electricity prices.<sup>5</sup> When considering the overall consumer benefits provided through energy efficiency and renewable energy programs — in the form of energy bill savings, demand-induced reductions in wholesale electricity prices, improved electric system reliability, and job creation—economic benefits are expected to outweigh the minimal impact of the RGGI cap-and-trade program on electricity prices.<sup>6</sup>

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<sup>5</sup> On average, in 2009, the cost of CO<sub>2</sub> allowances accounted for 0.4 percent to 1 percent of average residential electricity bills, depending on the state (based on actual or estimated CO<sub>2</sub> component of ISO wholesale electricity prices, state residential retail electricity prices, EIA residential electricity usage data, and a 2009 average CO<sub>2</sub> allowance spot price of \$3.06). Based on typical household electricity usage, this translates into a weighted average of 73 cents per month for residential consumers across the 10-state RGGI region.

<sup>6</sup> Building on data issued by the RGGI participating states, a number of economic, energy, and regulatory policy analysts are working to evaluate the benefits of investments in the electricity sector. See: Derek Murrow and Peter Shattuck, *Economy-Wide Benefits of RGGI: Economic Growth through Energy Efficiency*, Environment Northeast, December 2010; Bruce Biewald, Max Chang, Lucy Johnston and David White, *Electricity Energy Efficiency Benefits of RGGI Proceeds: An Initial Analysis*, Synapse Economics, October 5, 2010.

## Endnotes

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<sup>i</sup> Commonwealth of Massachusetts, Massachusetts Winter Energy Task Force, *Winter Energy Costs Task Force Report*, 2008, pp. 14-15.

<sup>ii</sup> Derek Murrow and Peter Shattuck, *Economy-Wide Benefits of RGGI: Economic Growth through Energy Efficiency*, Environment Northeast, December 2010, p. 2; Tyler Comings, Jamie Howland, Derek Murrow, and Lisa Petraglia, *Energy Efficiency: An Engine for Economic Growth*, Environment Northeast and Economic Development Research Group, Inc., October 2009, pp. 26-28.

<sup>iii</sup> George Sterzinger, et al., *Component Manufacturing: Michigan's Future in the Renewable Energy Industry*, Renewable Energy Policy Project, November 2006, p. 4.

<sup>iv</sup> Multiple sources, including:

- Connecticut Energy Efficiency Fund, *Report on the Energy Conservation Management Board Year 2010 Programs and Operations*, forthcoming March 2011, p. 1.
- Matthew Magnusson and Cameron Wake, *NH Greenhouse Gas Emissions Reduction Fund Year 1 (July 2009 – June 2010) Evaluation*, Carbon Solutions New England and University of New Hampshire, February 2011, pp. 3-4.
- Commonwealth of Massachusetts, Executive Office of Energy and Environmental Affairs, *A Summary of Electric Efficiency Programs Funded by Ratepayers between 2003 and 2005*, Massachusetts Division of Energy Resources, April 2, 2007, p. 1.
- Efficiency Maine, *Efficiency Maine 2010 Annual Report*, December 2010, p. 3.
- New York State, New York State Energy Research Development Authority, *New York's System Benefits Charge Program Evaluation and Status Report: Quarterly Report to the Public Service Commission, Quarter Ending March 31, 2010*, May 2010, pp. 2-13.
- Bruce Biewald, Max Chang, Lucy Johnston and David White, *Electricity Energy Efficiency Benefits of RGGI Proceeds: An Initial Analysis*, Synapse Economics, October 5, 2010, pp. 4, 13.

<sup>v</sup> New York State, New York State Energy Planning Board, *2009 State Energy Plan, Volume I*, December 2009, pp. 49-50. And: Tyler Comings, Jamie Howland, Derek Murrow and Lisa Petraglia, *Energy Efficiency: Engine of Economic Growth; A Macroeconomic Modeling Assessment*, October 2009, pp. 23-30.