



## Cap and Invest

### How a Cap-and-Trade Program Can Reduce Energy Costs, Create Jobs, and Improve Energy Security

In 2007, the Nobel Prize–winning Intergovernmental Panel on Climate Change found that, if left unchecked, global warming will subject communities to worsening heat waves, more frequent drought, rising sea levels, and more extreme weather over the course of this century. Recent studies show that we may already be feeling the effects of global warming, in the form of more intense storms and increases in vector-borne diseases. To avoid the worst impacts of climate change, the United States must reduce its emissions at least 30 percent by 2020, and 80 percent by 2050.

Fortunately, we can tackle this challenge while expanding our economy, strengthening our energy security, and putting Americans back to work—if we create a comprehensive national climate policy that accelerates deployment of existing energy efficiency and clean energy technologies and develops new ones. Along with higher standards for energy efficiency and stronger incentives for renewable energy, the nation needs a strong federal cap-and-trade program that limits global warming pollution, auctions “allowances” to emit carbon, and reinvests the proceeds for public benefit.

In creating such a program, national policy makers can learn much from the Northeast’s successful Regional Greenhouse Gas Initiative, a cap-and-trade system that went into effect this year.

#### Crafting a “Cap-and-Invest” Program

A cap-and-trade program establishes a limit on emissions of global warming pollution, lowers that limit over time, and uses the power of the market to reduce emissions at the lowest cost. Owners of facilities such as electric power plants and oil refineries must buy a carbon “allowance” for every ton of pollution they emit. If companies find ways to reduce their pollution at a lower cost than the allowances, they can sell any surplus allowances to companies that cannot. The resulting market creates an incentive to implement cost-effective cuts in global warming emissions, and encourages investments in new low-carbon technologies.

To ensure that this market is fair and efficient, the federal government should auction all carbon allowances rather than give any to polluters for free. Auctioning allows the market to set the appropriate price for pollution (and avoided pollution), and steers the government clear of handing windfall profits to polluters. Revenues from the auction—which may amount to hundreds of billions of dollars each year—can be directed to:

- Investment in clean, renewable energy technologies and energy efficiency measures
- Energy assistance targeted to low-income families
- Transition assistance for workers in sectors disproportionately affected by the program
- Adaptation assistance to help communities and ecosystems cope with the unavoidable effects of global warming

Investing auction revenue in energy efficiency and clean energy is the essential policy counterpart to the auctioning itself, because advances in both help reduce global warming pollution—thus lowering demand for allowances and enabling the cap-and-trade program to achieve its goals at the lowest possible cost. We significantly increase our chances of achieving an 80 percent reduction in emissions by 2050 if we invest auction proceeds to develop clean energy and energy efficiency technologies and overcome barriers to their private adoption.



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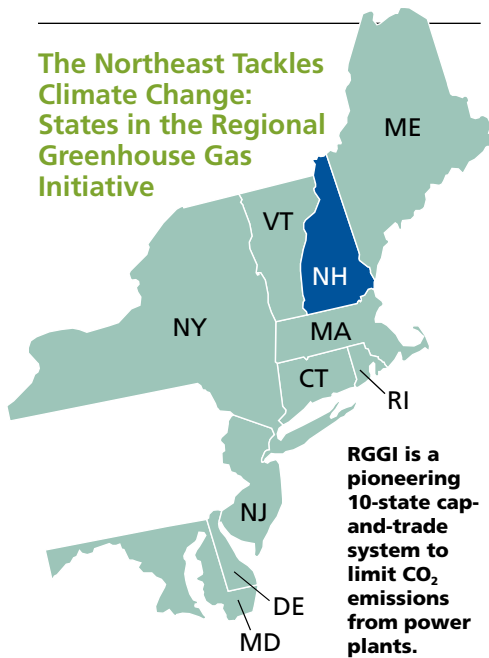


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## A Working Model of Cap and Invest

The Northeast's Regional Greenhouse Gas Initiative (RGGI, pronounced "reggie") is the nation's first and only cap-and-trade program for global warming pollution. RGGI—which caps global warming pollution from 233 electric power plants in 10 states from Maine to Maryland—

### The Northeast Tackles Climate Change: States in the Regional Greenhouse Gas Initiative



went into effect on January 1, 2009. All 10 RGGI states have chosen to auction nearly all their carbon allowances, and to invest the proceeds in energy efficiency and renewable energy.

The first three quarterly auctions, held in September 2008 and January and March 2009, yielded a total of \$262.3 million for the states, including \$9.4 million for New Hampshire. Policy makers in the Northeast know that re-investing these proceeds in aggressive and innovative energy efficiency and clean energy measures will cut the electricity bills of consumers and businesses by \$2 to \$3 for every dollar spent. They base that knowledge on more than a decade of experience with ratepayer-funded energy efficiency and demand-reduction programs run by utilities such as National Grid and Unitil, government agencies such as the New York State Energy Research and Development Authority and the New Jersey Board of Public Utilities, and nonprofit organizations such as the Vermont Energy Investment Corp.

In fact, revenues from the RGGI auctions are an important source of fund-

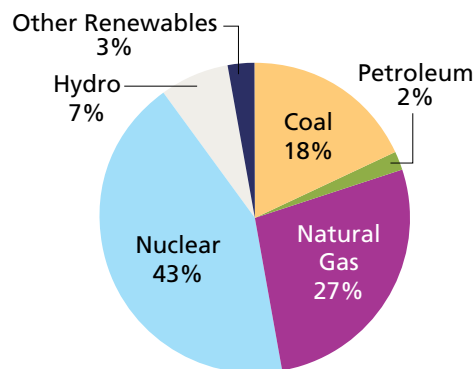
ing for the ambitious energy efficiency, clean energy development, and global warming emissions reduction goals that nearly every Northeast state—including New Hampshire—has set. For example, New Hampshire's Renewable Energy Act of 2007 calls for generating 24 percent of the state's electricity from clean, renewable sources by 2025.

## Bold State Action

In December 2007, Governor John Lynch convened a 29-member Climate Change Policy Task Force composed of heads of state agencies, members of the legislature, municipal officials, and representatives from business, industry, environmental groups, and academia, who deliberated and conducted numerous public hearings around New Hampshire throughout 2008. With the additional involvement of more than 125 stakeholders in six topical workgroups, the task force developed a comprehensive and detailed set of policy, regulatory, and voluntary measures to advance energy efficiency and clean energy in the state. In mid-March 2009, the governor endorsed and released the plan, which aims to reduce New Hampshire's global warming pollution 80 percent by 2050.

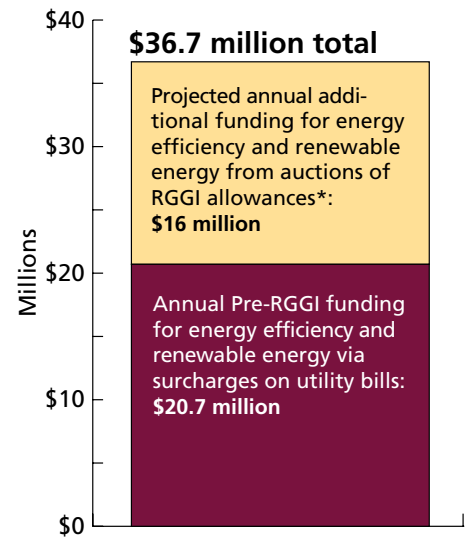
When the legislature authorized the state's participation in RGGI and the auctioning of its allowances, it also estab-

## Pollution to Spare



**Electricity generators in New Hampshire produce 180 percent of the amount actually used within the state, making it the largest electricity exporter (by percentage) in the Northeast. However, 18 percent of that supply comes from a 40-year-old coal-fired plant (located in the heart of the state) that is New Hampshire's single largest source of global warming pollution.**

## Energy Investment Gets a Boost



\* Based on December 2008 and March 2009 auction results.

lished an Energy Efficiency and Sustainable Energy (EESE) Board to examine the present state of energy efficiency and clean energy development in New Hampshire, and recommend the best uses of the auction proceeds to the Public Utilities Commission. The legislature further charged the board with developing a plan to fulfill the state's energy efficiency potential for all fuels.

In response, the board commissioned an analysis by GDS Associates (a firm with long experience in energy efficiency work) of the state's potential over a 10-year period. The analysis estimated that cost-effective efficiency measures could reduce projected demand for electricity in 2018 by more than 20 percent, and cut projected demand for heating fuels such as natural gas, oil, and propane by more than 15 percent (GDS Associates 2009).

While awaiting that study, the board learned that some 16,000 low-income households are on a waiting list to receive energy efficiency services through utility-run programs, and that limited funding and staffing have prevented those programs from reaching some 87,000 low-income households statewide.

In late February 2009, the Public Utilities Commission and EESE Board released a request for proposals (RFP) to use proceeds from New Hampshire's RGGI auctions to accomplish any or all of the following:

- Energy audits
- Weatherization of residential housing and commercial buildings
- Energy efficiency-related workforce training and development
- Revolving loan funds for efficiency-related investment
- Energy efficiency-related industrial process and control systems
- Integration of passive solar heating and ventilation
- Programs to increase compliance with the state's energy code for buildings
- Programs to improve the electric and thermal efficiency of new and existing residences and commercial buildings
- Programs to foster the development and retrofitting of highly efficient affordable housing
- Education and outreach programs to promote energy efficiency, conservation, and demand-response programs (through which large commercial and industrial users agree to cut their electricity use during high-demand periods) that will reduce the state's peak electric load

**"The strong response to our RFP clearly indicates tremendous demand in New Hampshire for energy efficiency, conservation, and demand response programs—and tremendous opportunity to reduce energy costs and create jobs while driving down emissions of greenhouse gases."**

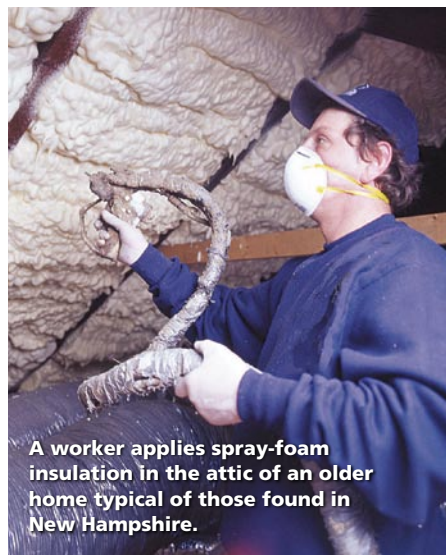
**JACK RUDERMAN**

Director of the Public Utilities Commission's Sustainable Energy Division

The RFP attracted 84 proposals, with total requested funds approaching \$50 million, giving the EESE Board ample choice in its selection process. This also foreshadows a highly competitive ongoing effort to identify and deliver valuable energy and cost savings and cost-effective reductions in global warming pollution well into the future.

**Numerous Studies, Same Conclusion**

Studies conducted during RGGI's planning stages consistently showed that auctioning allowances and dedicating the revenue to energy efficiency and



A worker applies spray-foam insulation in the attic of an older home typical of those found in New Hampshire.

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clean energy measures would lower electricity costs and boost state economies. These studies—which included thorough modeling of the Northeast electric power system and careful analysis of RGGI's potential economic impact—helped guide the design of this groundbreaking initiative, and gave policy makers confidence to proceed with it.

**1.** On behalf of the RGGI working group, the Massachusetts Department of Energy Resources commissioned runs of a model of the Northeast's system for generating, transmitting, and distributing electricity, using various levels of energy efficiency, demand for power, and prices for allowances. The department then commissioned runs of a widely respected economic model using results from the first model.<sup>1</sup>

The results showed that a doubling of energy efficiency from investing RGGI revenues in efficiency programs and tightening energy codes would *reduce* the average household electricity bill by a few dollars a month, even if demand for allowances—and thus their price—rose. Even *without* higher energy efficiency, the model predicted that RGGI would raise the average household electric bill by just \$1.25 per month by 2015 (Petraglia 2005).

**2.** New Hampshire officials commissioned their own analysis of various policy choices, including not participating in RGGI at all. Economists at the University of New Hampshire examined a range of scenarios—including a low and a high price for carbon allowances—over the nine-year RGGI timeframe. The study examined proj-

ected auction revenues; different uses of the funds, ranging from direct rebates to tax offsets to investments in energy efficiency (including combinations); and the impact on electricity bills of small and large businesses and residents.

The analysis found that directly rebating auction revenue from the auctions to households and businesses would not help the economy. However, devoting 100 percent of auction revenue to investments in energy efficiency had a small positive impact on employment and the overall economy, and was the only scenario that cut electricity bills for all utility customers (Gittell and Magnuson 2008).

**3.** The University of Maryland's Center for Integrative Environmental Research examined the potential effects of spending 25 percent, 50 percent, and 100 percent of RGGI revenue on energy efficiency. The researchers found that devoting 100 percent would reduce electricity use more than 11 percent per capita by 2015. Electricity bills would also drop as much as 7 percent, saving the average household more than \$72 annually by 2020. The study predicted that the 100 percent scenario would have the greatest impact on gross state product, employment, and wages (Ruth et al. 2008).



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A residential energy efficiency specialist performs an air infiltration (or blower-door) test on a New Hampshire home. The test measures the tightness (or leakiness) of a building; results may indicate the need for sealing of cracks and voids (around doors or windows, for example) where heat is being lost.

4. In a report on the role of green jobs in an economic recovery, researchers at the Political Economy Research Institute at the University of Massachusetts–Amherst identified trades and professions that would see job gains given greater energy efficiency and spending on clean energy development (Pollin 2008).

**“We need to continue to invest in energy efficiency and work to ensure that 25 percent of our energy comes from renewable power by 2025. . . . That is why today I am proposing a new Green Jobs Initiative, funded from part of the proceeds of the Regional Greenhouse Gas Initiative and the Renewable Energy Fund. . . . This Green Jobs Initiative will help create jobs for our people now, and make New Hampshire’s economy stronger for the future.”**

**JOHN LYNCH**

Governor of New Hampshire, inaugural address, January 8, 2009, Concord, NH

**Cap and Invest = Success**

Although RGGI is still in its infancy, all available evidence suggests that auctioning carbon allowances and investing the revenue in energy efficiency and clean, renewable energy provides the best deal for consumers, businesses, workers, and the economy. According to the American Council for an Energy-Efficient Economy and the Alliance to Save Energy (ACEEE 2006), increasing investment in energy efficiency will:

- Reduce carbon emissions
- Reduce energy prices
- Slow growth in demand for electricity
- Boost the region’s economy

**Green Investments and Jobs**

Strategies for Green Economic Investment	Representative Jobs
<b>Building Retrofitting</b>	Electricians, Heating/Air Conditioning Installers, Carpenters, Construction Equipment Operators, Roofers, Insulation Workers, Carpenter Helpers, Industrial Truck Drivers, Construction Managers, Building Inspectors
<b>Mass Transit/ Freight Rail</b>	Civil Engineers, Rail Track Layers, Electricians, Welders, Metal Fabricators, Engine Assemblers, Bus Drivers, Dispatchers, Locomotive Engineers, Railroad Conductors
<b>Smart Grid</b>	Computer Software Engineers, Electrical Engineers, Electrical Equipment Assemblers, Electrical Equipment Technicians, Machinists, Team Assemblers, Construction Laborers, Operating Engineers, Electrical Power Line Installers and Repairers
<b>Wind Power</b>	Environmental Engineers, Iron and Steel Workers, Millwrights, Sheet Metal Workers, Machinists, Electrical Equipment Assemblers, Construction Equipment Operators, Industrial Truck Drivers, Industrial Production Managers, First-Line Production Supervisors
<b>Solar Power</b>	Electrical Engineers, Electricians, Industrial Machinery Mechanics, Welders, Metal Fabricators, Electrical Equipment Assemblers, Construction Equipment Operators, Installation Helpers, Laborers, Construction Managers
<b>Advanced Biofuels</b>	Chemical Engineers, Chemists, Chemical Equipment Operators, Chemical Technicians, Mixing and Blending Machine Operators, Agricultural Workers, Industrial Truck Drivers, Farm Product Purchasers, Agricultural and Forestry Supervisors, Agricultural Inspectors

- Reduce the need for new power plants
- Reduce the cost of carbon allowances

Specifically, doubling investment in energy efficiency will reduce consumer electricity bills by 12 percent and commercial electricity bills by 5 percent.

In addition, extensive modeling by the U.S. Energy Information Administration, the Lawrence Berkeley National Laboratory, the Union of Concerned Scientists, and others shows how increased investment in renewable energy reduces consumers’ energy bills by reducing demand for fossil fuels.

Drawing on years of experience with ratepayer-funded energy efficiency programs *and* thorough modeling, the 10 Northeast states participating in RGGI are providing a practical demonstration of how a federal cap-and-trade policy can work.

**ENDNOTE**

1. The electricity system model was ICF International’s Integrated Planning Model (IPM®), and the economic model was Regional Economic Models Inc.’s (REMI) Policy Insight® model.



Ned Reynolds, Northeast climate policy coordinator at UCS, prepared this fact sheet with input from Lexi Shultz, Nancy Cole, Liz Perera, and Lena Moffitt of UCS, David Farnsworth of the Regulatory Assistance Project, and Larry DeWitt of The Commons. An electronic version of this fact sheet and a list of references can be found on the UCS website at [www.ucsusa.org/capandinvest](http://www.ucsusa.org/capandinvest).

The Union of Concerned Scientists is the leading science-based nonprofit working for a healthy environment and a safer world.