Stopping Global Warming Begins at Home

The Case Against the Use of Offsets in a Regional Power Sector Cap-and-Trade Program

Written by:
Tony Dutzik and Rob Sargent

NATIONAL ASSOCIATION OF STATE PIRGS

SEPTEMBER 2004

Acknowledgments

The authors thank Derek Murrow of Environment Northeast, Dale Bryk of the Natural Resources Defense Council and Seth Kaplan of the Conservation Law Foundation for their insightful review of this paper. Thanks also to Jasmine Vasavada, Elizabeth Ridlington and Susan Rakov for their editorial assistance.

The National Association of State PIRGs thanks the Pew Charitable Trusts for their financial support of this project.

The views and opinions expressed here are those of the authors and do not necessarily reflect the views of our funders or those who provided editorial input. The recommendations are those of the National Association of State PIRGs. Any factual errors are strictly the responsibility of the authors.

The state Public Interest Research Groups (PIRGs) are a national network of state-based, nonprofit, nonpartisan public interest advocacy organizations working on consumer, environmental and good government issues. The National Association of State PIRGs provides research and policy development assistance to state PIRGs nationwide.

For more information about the state PIRGs, visit www.pirg.org.

Cover photo: Smokestacks of Brayton Point power plant in Somerset, Mass.
Design and Layout: Kathleen Krushas, To the Point Publications.

Table of Contents

Executive Summary

At the direction of their governors, representatives of nine Northeast states (Connecticut, Delaware, Maine, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island and Vermont) are currently working to develop a regional cap-and-trade system designed to limit emissions of carbon dioxide (the leading global warming gas) from power plants in the region. The process, known as the Regional Greenhouse Gas Initiative (RGGI), holds the promise of significantly reducing the Northeast's contribution to global warming.

A number of stakeholders in the RGGI process have suggested that the region allow owners of power plants to purchase "offsets" (reductions in global warming emissions made at other facilities outside the region or at facilities other than the fossil fuel power plants regulated under the program) to ease compliance with the program or to help achieve further reductions. Supporters of this approach claim that allowing the use of offsets will reduce the cost of global warming emission reductions while achieving similar environmental benefits and broadening the reach of the program to other sectors of the economy.

However, allowing offsets to be used to comply with a regional power-sector emission cap could undermine otherwise significant gains in reducing carbon dioxide emissions from power generating facilities. There are three main reasons for the Northeast to resist a liberal approach to offsets in setting rules for the cap-and-trade program:

1. Offsets reduce the certainty of achieving real emission reductions.

- Rules for the use of offsets typically require that offsets deliver emission reductions that are real, surplus, permanent, quantifiable and enforceable. Assuring that offsets meet these criteria is very difficult. For example:
  - Emission reductions may not be "real" if reductions claimed in one location are simply shifted elsewhere. (For example, as a result of a manufacturer reducing production in one location but increasing it in another location).
  - Emission reductions may not be "surplus" if the reductions would have occurred anyway. (For example, through the planned replacement of aging equipment with a more energy-efficient model.)
  - Emission reductions are not easily enforceable if they occur outside the region or in a sector of the economy that is not vigorously regulated.

- Assuring compliance with these criteria through aggressive monitoring and verification efforts drives up the administrative costs of the program. Failing to do so reduces the certainty of achieving environmental benefits.

2. Offsets reduce the associated benefits of achieving emission reductions within the region.

- Requiring that emission reductions be achieved at power plants within the region (as opposed to through the purchase offsets from elsewhere) would encourage the renovation, repowering or closure of some of the region's oldest, dirtiest and least-efficient power plants.

- In 2000, approximately half of all carbon dioxide emissions from power plants in the RGGI region came from just 20 power plants. These plants produced twice as much carbon dioxide per unit of power produced as the regional average. They also emitted:
  - 38 percent of the region's power-sector emissions of mercury – a neurological toxicant that has triggered fish consumption advisories nationwide
  - 64 percent of the region's power-sector emissions of sulfur dioxide, which causes acid rain
  - 47 percent of the region's power-sector emissions of smog-forming nitrogen oxides

While other air pollution control programs mandate reductions in emissions of these pollutants, the renovation, repowering or retirement of these plants could reduce the overall need for and thus cost of installing emission controls.

- A strong regional carbon cap without offsets could provide further momentum in the region's efforts to achieve a cleaner, more reliable electric system by making greater use of renewable energy and improved energy efficiency. One recent study by Synapse Energy Economics found that such an approach – if

adopted nationally – would reduce carbon dioxide emissions while generating $36 billion annually in savings by 2025.

3. Offsets will dull, not enhance, momentum for emission reductions in other sectors of the economy.

- Supporters of offsets claim that allowing other sectors of the economy to participate in the power-sector program will create the foundation for future emission reduction efforts in those sectors. However, cap-and-trade systems may not be the most appropriate means to reduce emissions in some portions of the economy with large climate impacts and could delay other policies that would be more effective – further limiting the precedent-setting potential of an offset program. Indeed, providing financial rewards to entities outside of the power sector that reduce their greenhouse gas emissions could create a disincentive for those entities to accept a mandatory emissions cap later on.

- Achieving real, quantifiable emission reductions in the electric sector in the Northeast would set a powerful example that such reductions are achievable – and encourage the development of programs that produce similar results in other regions and other sectors of the economy.

The Northeast should tread carefully before allowing the use of offsets to comply with a power-sector carbon dioxide emission cap. Specifically:

- The Northeast governors and their staff involved in the RGGI process should stick with their originally stated goals and principles by not incorporating the use of offsets until after the core cap-and-trade program is designed and the model rule is adopted. As the original Action Plan for the process sets forth, offsets should be considered simultaneously with expansion of the cap to other sources.

- States should first determine the cap level they can achieve without the use of offsets. Offsets should only be considered if the carbon dioxide cap adopted through the RGGI process is strong – requiring emission reductions of at least 10 percent below current levels by 2010 and 25 percent below current levels by 2020.

- Should offsets eventually be included in a later phase of the program, the Northeast should adopt a conservative approach, requiring that:
  - Offsets be generated only within states participating in the cap-and-trade program. Offsets from outside RGGI will be difficult to enforce and allowing them will reduce the incentive that other states have to join the program. In addition, dollars paid by consumers in the RGGI states should go towards emissions reductions and investments here at home.
  - Strong provisions be established to assure that offsets represent real, surplus emission reductions.
  - Nuclear power projects and other environmentally damaging technologies not be eligible for offsets or otherwise obtain a market advantage for being zero emitting in any cap-and-trade system.
  - Offsets be limited to no more than 5 percent of the total number of emission allowances issued. This would allow for demonstration of the viability of an offsets program while limiting the potential damage that a poorly designed program could inflict.
  - The benefits of offsets be shared equally between those covered by the cap and the environment. For example, a decision to allow 10,000 tons of offsets should be paired with a reduction in the cap of 5,000 tons.

Introduction

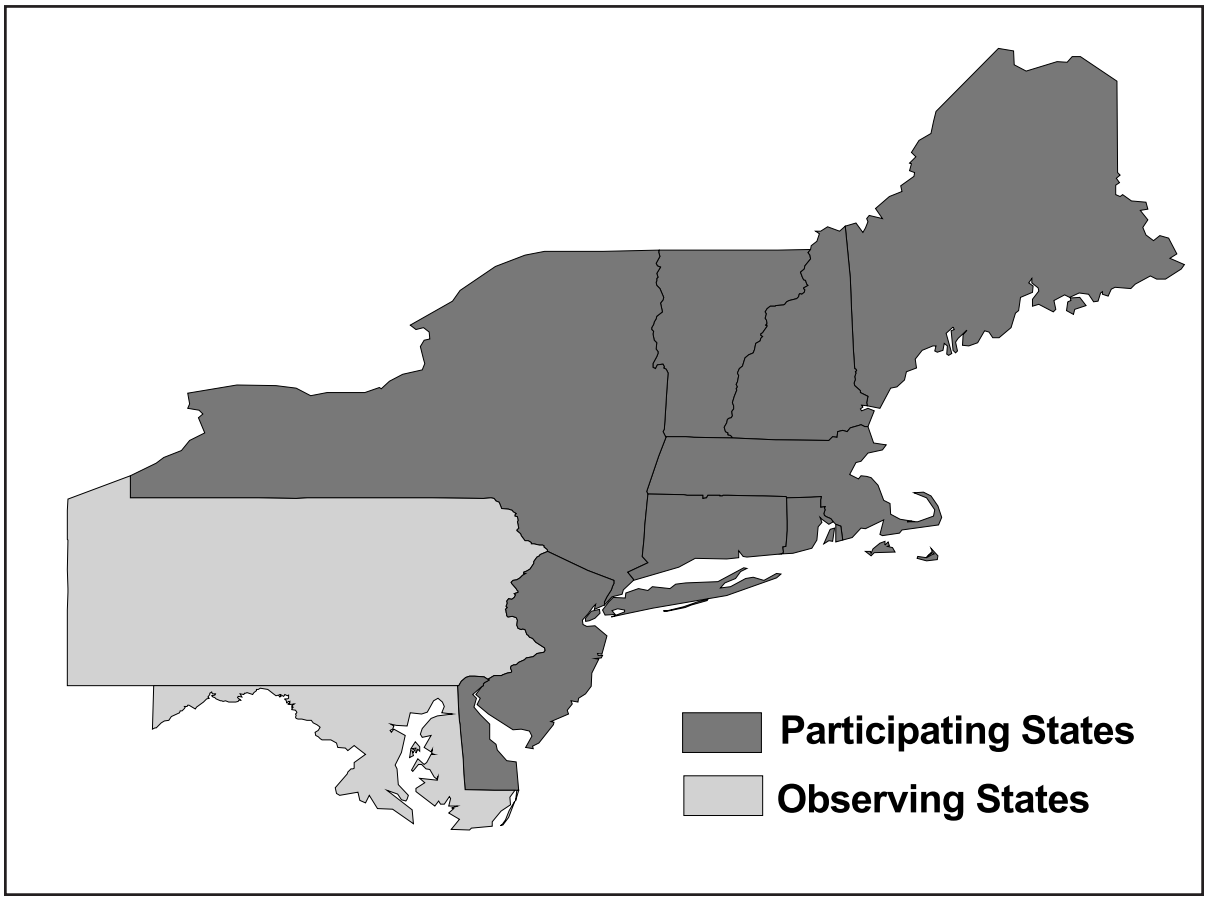
Global warming poses a serious threat to the environment, the economy, and public health in the Northeast and elsewhere in the United States. Yet, at the federal level, efforts to reduce global warming emissions have largely been frustrated. The U.S. has not ratified the Kyoto Protocol, has not adopted concrete goals for reducing global warming emissions, and has even refused to adopt measures – like stronger energy efficiency standards for cars and appliances – that would reduce global warming emissions at little to no cost to the economy.

With leadership from Washington, D.C. largely absent, the Northeast states have begun to take the lead in dealing with the global warming threat. In recent years, public officials in several Northeast states have set goals for the reduction of global warming emissions, devised plans to achieve those goals, and embraced cutting-edge public policies to improve the energy efficiency of our economy and move toward cleaner sources of energy.

A key step toward achieving the region's climate change goals is reducing carbon dioxide emissions from the electric sector. The generation of electricity is responsible for approximately one-third of the nation's emissions of global warming gases.[1] Without an effective program to reduce emissions from electricity generation, it will be far more difficult for the region to achieve meaningful reductions in its overall contribution to global warming.

At the direction of their governors, representatives of nine Northeast states (shown in Fig. 1) have set out to meet this challenge by engaging in negotiations toward the creation of a cap-and-trade program for power-sector carbon dioxide emissions. The process, known as the Regional Greenhouse Gas Initiative (RGGI), is the first program of its kind directed at global warming emissions in the United States. As such, it has drawn a great deal of interest from a variety of stakeholders and the rules adopted through the process could come to be

Fig. 1. Regional Greenhouse Gas Initiative Participants



seen as precedent-setting for future efforts in other regions or at the federal level.

As a result, there is a great deal riding on the Northeast states' "getting it right" as they move forward in the RGGI process. In laying out the framework for the discussions about a cap, the state participants called for a cautious approach – starting only with carbon dioxide emission sources in the power sector and excluding the consideration of emission reductions from other sources – by declaring that "the program shall start simply and develop over time. The initial phase of the cap-and-trade program will entail the allocation and trading of carbon dioxide allowances to and by sources in the power sector only."[2]

Despite this narrow initial focus, some stakeholders have urged the RGGI states to expand the cap-and-trade system to include the use of "offsets" – emission reductions achieved in other locations or other sectors of the economy that can be used to reduce the need for emission reductions by power plants in the Northeast. The use of offsets, supporters claim, would not only reduce the cost of complying with a cap on carbon dioxide emissions, but could also serve as a model for strategies to reduce emissions in other regions and other sectors.

However, there are several important reasons that the Northeast should take a "go slow" approach to offsets. Depending on the breadth of projects allowed to qualify for offsets and the rules governing the program, allowing offsets could reduce the amount of emission reductions generated by the program, reduce the ancillary benefits the Northeast region would gain by limiting power plant emissions, and fail to set a positive example for future global warming reduction efforts.

By first focusing on cleaning up the region's electric sector, the RGGI states can achieve real, tangible emission reductions – not paper reductions that generate little public enthusiasm or confidence. In so doing, the Northeast can show the rest of the nation – and the world – that we *can* succeed in addressing global warming.

Trading, Offsets and Environmental Policy

Cap-and-Trade: A Primer

Traditionally, environmental goals have been achieved through what are known (often derisively) as "command and control" methods. Regulators established limits on emissions or required facilities to adopt certain technologies to reduce pollution. These rules were then enforced through civil or in some cases criminal penalties.

Beginning in the 1970s, economists and government officials began to experiment with market-based approaches to environmental protection. These market-based approaches made pollutant emissions a tradeable commodity, allowing facilities to generate credits for emission reductions that go above and beyond legal requirements. These credits can then be sold to companies that wish to build new facilities, increase their emissions, or reduce the expense of complying with environmental safeguards.

Cap-and-trade programs are among the market-based approaches with the greatest track record of success in reducing emissions at reasonable cost. In a cap-and-trade system, government first establishes an overall limit on pollutant emissions within an economic sector (the "cap"). This total amount of pollution is then converted into "allowances" to emit a given quantity of the pollutant, which are either distributed or auctioned to regulated facilities. Facilities that reduce their emissions are required to hold or purchase fewer allowances, enabling them to sell their excess allowances to other facilities that may be having a harder time achieving emission reductions. Such trading allows the economic sector covered by the cap-and-trade program to achieve the desired emission reductions at lower aggregate cost. It also allows for government to reduce the amount of pollution over time by withdrawing or buying back allowances.

Cap-and-trade programs are inappropriate for dealing with some environmental problems – particularly those in which emissions have a disproportionate local impact. In such a situation, the ability to trade allowances could lead to the creation of localized pollution "hot spots." Carbon dioxide, on the other hand, appears to be well-suited for control through cap-and-trade since it is a pollutant at the global, not local level.

Some market-based approaches to environmental protection also allow for the use of "offsets." ***Offsets*** allow regulated facilities to reduce the burden they face in complying with environmental regulations by paying for pollution reductions that occur at other facilities that are not subject to the same regulations. In the federal program for nitrogen oxide (NOx) offsets, for example, new facilities wishing to operate in an area that does not meet federal clean air standards must offset the emissions they plan to produce by bringing about emission reductions elsewhere in the polluted area.[3]

Under a cap-and-trade program for carbon dioxide that permits the use of offsets, owners of electric power plants could reduce their obligation to curb pollution by purchasing credits generated by other facilities that reduce their emissions. In theory, the impact on total emissions would be the same, but the cost of compliance would be lower than if the emissions were reduced at the power plants themselves.

Offsets are one type of "flexibility mechanism" used in market-based environmental programs. Other mechanisms such as "opt-in" provisions, credit banking, and set-asides can be used to expand the universe of sources covered by the program, generate early emission reductions, or encourage particular technologies or emission control approaches.

Why Consider Offsets?

Economic Efficiency

If the trading of carbon allowances brings about the least-cost reductions in emissions *within* an economic sector, it stands to reason that enabling the use of offsets would – in theory at least – allow for least-cost reductions in emissions *across* sectors of the economy.

Because carbon dioxide is a pollutant at the global scale (unlike nitrogen oxides, for example, which create smog in particular regions) and because there are many emitters, there is no inherent reason why projects qualifying for carbon dioxide offsets should be limited geographically or to a single sector of the economy. If the planting of a tropical rainforest in Brazil achieves the same net carbon dioxide savings as would reducing emissions at a

power plant in New York – and does so at a lower price – the economic efficiency argument holds that we should encourage the lower cost option.

The potential economic savings that could result from offsets are significant. The European Union estimates that a limited program for the recognition of offsets in its greenhouse gas emission trading scheme (which initially covers power plants and large industrial emitters) will reduce compliance costs by approximately 20 percent.[4]

Co-Benefits

The use of offsets could also support projects that result in environmental, economic or social "co-benefits." For example, the Kyoto Protocol's Clean Development Mechanism (CDM) is designed to allow governments and companies to use offsets generated in developing countries to meet their own emission reduction targets. However, the CDM is also intended to encourage the transfer of energy efficiency, renewable energy and other sustainable technologies from industrialized countries to the developing world – an economic and social co-benefit.[5] In addition, offsets could be used in an effort to reverse deforestation and other land-use changes with potentially catastrophic local and global environmental consequences.

Closer to home, the owner of a power plant might choose to generate offsets by supporting local programs to improve the energy efficiency of homes. Such a program might reduce emissions stemming from oil or natural gas consumption as well as the use of electricity. Allowing such a program to qualify for offsets would provide direct economic savings for both the owner of the power plant and participants in the program, as well as indirect savings for society through reduced demand for scarce fossil fuels, improved environmental quality and better public health.

Expansion to Non-Regulated Sectors

Global warming gases are emitted by a wide variety of sources as a result of a wide variety of activities. An electric utility, an automobile commuter, a farmer raising livestock, and a homeowner who plants a tree in the front yard all influence – to varying degrees and in different ways – the concentration of greenhouse gases in the atmosphere. In order to achieve the 75 to 80 percent reductions in global warming emissions that scientists believe will be needed to prevent dangerous threats to the climate, we will eventually need to reduce the climate impacts of all our activities.[6]

The development of systems to quantify and certify emission reductions in other sectors of the economy could provide a means to include these sectors in future emission reduction programs. Potentially, the cap-and-trade program itself could be expanded to include additional states and additional facilities, allowing for greater overall control over emissions of carbon dioxide and other global warming pollutants. Offsets could represent a way to lay the groundwork for such a more comprehensive system and assure a smoother transition to carbon dioxide regulation for other sectors of the economy.

The Dangers of Offsets

Lower Certainty of Emission Reductions

Exchanging offsets for allowances within a cap-and-trade program is like trading apples for oranges. An allowance represents a discrete amount of pollution that can either be emitted or not. If it is emitted, the emitter must hold an allowance. If it is not emitted, that allowance can be sold to someone else. The total number of allowances is set in advance and does not change (except by design), regardless of what else is happening at the regulated facilities or in society.

An offset, however, does not represent a unit of emissions, but a unit of pollution *not emitted*. Proving that emissions *would have* happened, but did not, is far more difficult and prone to error than confirming that an emission did or did not actually take place. Thus, entities that allow offsets to be exchanged for allowances must exercise great care – often at great expense – to ensure that the emission reductions generated by the "oranges" are as real and as beneficial as those generated by the "apples."

Typically, offsets must meet several criteria in order to be certified for use in a cap-and-trade program. In Massachusetts' carbon dioxide regulations for older power plants, for example, any offsets must deliver emission reductions that are:

- Real
- Surplus
- Permanent
- Quantifiable
- Enforceable[7]

Ensuring that these criteria are met is very difficult. Offsets that fail to meet them provide no environmental benefit, thus undermining the goal of the emission cap. To fully understand the challenge, let us review the criteria individually.

Real

It seems axiomatic that only measures that provide real reductions in emissions should qualify for credit in any offset program. Yet, determining when emission reductions are "real" can be very challenging.

An emission reduction can only be considered "real" if emissions are reduced *in the aggregate* – not just at the location seeking credit for the offset. Consider a decision to reduce production at an industrial facility or to protect a forest from development – both valid ways to reduce the concentration of carbon dioxide in the atmosphere. However, if the owner of the factory merely shifts production to another facility in another country, or if the proposed development merely levels a different forest, nothing has been gained.

These examples illustrate the problem of "leakage" – the substitution of an emission reduction used to generate offset credits with an increase in emissions elsewhere.

Leakage is a real problem, particularly because of the nature of carbon dioxide as a global pollutant. Any cap-and-trade program that intends to deliver real environmental results must ensure that emission reductions used to generate offsets do not "leak." If there is leakage, the program must include protocols for quantifying the lost emission reduction and reducing the amount of offset credits issued.

Surplus

Surplus emission reductions are those that go beyond "business as usual." They are reductions that would not have occurred but for the presence of offsets.

Determining whether emission reductions are surplus (or "additional") requires crystal ball-gazing. Consider a situation in which rising natural resource prices bring an industrial facility to the verge of shutdown – a step that would reduce carbon dioxide emissions. A utility might agree to pay the factory owner if she shuts down the facility, thus generating credits that the utility can use to expand its operations.

The key question in the above scenario becomes: Would the factory have shut down anyway in the absence of the compensation from the utility? If the answer is yes, no surplus emission reductions have been gained. Indeed, by allowing credits generated from an illusory emission reduction to be used to increase emissions from the power plant, the offsets program results in an *increase in overall emissions versus business as usual.*

Additionality has been a major problem in early carbon dioxide offset programs. In the Kyoto Protocol's CDM program, for example, 14 of the first 15 project methodologies proposed were rejected based on their failure to deliver additional emission reductions.[8]

Generally, assessing the amount of emission reductions that are surplus requires the creation of a baseline projection that estimates what would have happened under "business as usual" conditions. Any offset program must include standards for developing those baselines and ensuring that they are applied consistently.

Permanent

Projects qualifying for offsets must deliver emission reductions for the entire lifetime for which the offset has value. Assuring permanence is a particular problem in forestry and land use projects. The planting of a forest may be intended to act as a permanent carbon "sink," withdrawing and storing carbon dioxide from the atmosphere. But the carbon stored within the forest will inevitably be released sooner or later through forest fire, pest infestation, or other means. Thus, such projects can never be considered "permanent."

Quantifiable

The emission reductions generated from a given project must be able to be quantified using generally accepted and replicable techniques. The primary problem in quan-

tification is determining what would have occurred in the absence of the offset and/or assessing the degree of potential leakage. Quantification issues also become more complex when projects that reduce emissions of other global warming gases (in addition to carbon dioxide) are allowed to receive credit as offsets. While the global warming impacts of many emissions are fairly well understood, ongoing scientific research continues to refine that understanding. For example, recent research has suggested that emissions of "black carbon" from diesel trucks and coal combustion may have a significant warming effect. However, the scientific understanding is not yet sufficient to allow for the accurate quantification of the global warming benefits from reducing particular black carbon emissions.

Enforceable

Entities that purchase fraudulent or illusory offsets (and/or the providers of those offsets) must be held accountable by the government enforcing the carbon dioxide cap. Since, for the near future at least, these governments will be state or regional entities, offsets would have to be either limited to those jurisdictions, or some system would need to be created to allow, for example, the Massachusetts Department of Environmental Protection to verify and take action affecting an emission reduction project in California ... or possibly Cameroon. Some suggest that third-party verification could resolve the enforceability problem, but even in that case, the states would need to create an entity to "watchdog the watchdogs."

Complexity and Administrative Costs

Each of the above problems with offsets can be resolved or mitigated – but at a price. The price is administrative complexity, bureaucracy, and high "transaction costs" that reduce the economic benefits of offsets.

To ensure that offsets deliver emission reductions that are of the same quality as those achieved within the bounds of a cap-and-trade program, one might take several steps – requiring the calculation of "business as usual" baselines using economic models, the completion of analyses of potential leakage, the application of statistical tools to assess the probability that emission reductions will be permanent, the retention of third-party verification agencies that certify emission reductions using "generally accepted carbon accounting principles," etc.

The flip side is that the more stringent the tests, the higher the cost of participating in the program and the fewer trades that will be completed. Thus, there is a direct trade-off between the success of the trading program in economic terms and its success in delivering real emission reductions that inspire a high degree of public confidence.

Two recent papers analyzing pollutant trading programs in the U.S. illustrate this trade-off. The Environmental Law Institute, in a 2002 paper, praised the Clean Air Act offset program – which requires new pollution sources in areas that do not meet clean air standards to offset pollution elsewhere within the region – as "function[ing] effectively to create environmental benefits."[9] By contrast, a 2003 report prepared for the Pew Center on Global Climate Change dubbed the Clean Air Act offset program and other efforts under the EPA's Emission Trading program "disappointing" due to the large administrative burdens they imposed on potential participants to ensure the integrity of emission reductions.[10]

Transaction costs for carbon dioxide reduction projects can be significant. The World Bank estimates that the average transaction cost for projects seeking to qualify for the Clean Development Mechanism of the Kyoto Protocol is approximately $265,000 (not including small-scale projects, which have lower, but still significant transaction costs).[11] These costs reduce the potential economic benefit to be gained as a result of trading and discourage potential projects from seeking to qualify for offsets.

Administrative complexity does not just increase costs, but it also presents additional opportunities for participants to "game" the system. As recent accounting scandals at Enron and other corporations demonstrate, administrative complexity provides ample opportunities to create or conceal mischief. (Indeed, prior to its collapse Enron was a leading advocate of emission trading and participant in emissions markets.) Considering that the financial accounting scandals occurred under the watchful eyes of the Securities and Exchange Commission, hundreds of journalists and market analysts, and millions of investors, it appears quite likely that "carbon accounting" fraud could occur in carbon markets that are certain to be far less aggressively scrutinized.

Support for Environmentally Destructive Practices

Global warming is not the only problem facing the environment. An offsets program that encouraged the use of technologies or practices with the potential to create severe environmental harm would be of dubious value.

For example, renewable energy projects that take place outside the region could qualify for carbon offsets if it can be shown that they reduce emissions below what would have occurred under business as usual conditions. But not all forms of power production that emit zero carbon are environmentally benign. New or expanded nuclear power plants also fall under the "zero-carbon" umbrella (not counting emissions over the entire fuel cycle) and could theoretically become eligible for offsets.

The blurring of the line between truly renewable sources of energy and nuclear power has already occurred in at least one case locally. In 2003 the state of New Hampshire determined that the Seabrook nuclear power plant would be eligible to receive credit under the state's NOx control program as a "non-emitting" power source for a proposed capacity uprate.[12] (See case study below.) Indeed, the prospect of nuclear projects qualifying for carbon offsets is sufficiently real that the international agreement governing climate change mitigation projects in developing countries states that industrialized countries should not use credits generated from nuclear power projects toward compliance with their own emission targets.[13]

Nuclear power poses environmental, health and safety risks that are unacceptable, and these risks are not necessarily limited to the area immediately surrounding the plant. The risk of catastrophic radiation release due to accident or sabotage, the dangers posed by routine emissions of radiation, and the as-yet-unresolved problems surrounding the long-term storage of nuclear waste mean that nuclear power cannot be considered an environmentally acceptable solution to the problem of climate change.

Case Study: The Seabrook Nuclear Power Plant and New Hampshire's NOx Set-Aside Program

New Hampshire is among a number of Northeast states that take part in a regional cap-and-trade program for summertime nitrogen oxide (NOx) emissions. The NOx trading program was created under the auspices of the Ozone Transport Commission (OTC) – a body established by Congress to coordinate smog reduction efforts in the interconnected Northeast airshed.

In order to further protect air quality, New Hampshire has set its NOx emission cap below the levels established through the OTC process. To provide a greater incentive for the construction of new renewable generation in the state, New Hampshire had set aside a portion of the allowances issued under the program for renewable energy and energy efficiency projects. Under the set-aside program, efficiency and renewables projects could sell their allowances to power plants subject to the emissions cap, thus receiving a financial reward for their investment.

In 2003, however, New Hampshire broadened eligibility for the set-aside program to include "non-emitting generating systems" – in other words, nuclear power plants. The effect of the changes was to allow the Seabrook nuclear power plant to potentially receive allowances if the plant's application to increase its capacity by 70 megawatts is approved by federal regulators. The nuclear industry expects that Seabrook could receive as much as one-third of the allowances set aside to encourage cleaner forms of electric generation.[14]

By allowing Seabrook to receive NOx allowances, New Hampshire has effectively used the cap-and-trade program to subsidize nuclear power. This action sets a potentially dangerous precedent, both for future regulation of conventional pollutants and for the treatment of nuclear power should offsets be included in any Northeast power-sector carbon dioxide cap-and-trade program.

Nuclear power is not the only environmentally destructive technology or practice that could be supported through offsets. The potential also exists for forestry or land use programs created to generate offsets being used to promote maximum sequestration of carbon dioxide and not the overall health of ecosystems. In addition, a 2004 report by the Organization for Economic Cooperation and Development found that, among projects thus far proposed for credit under the Kyoto Protocol's Clean Development Mechanism, 12 percent of credits would be generated from hydroelectric projects, which often damage the environment and wildlife.[15]

Reduced Co-Benefits

Just as offsets can create co-benefits by encouraging emission reductions elsewhere in the economy or in the world, so can offsets reduce co-benefits that result from the cleanup of power plants. We will address this topic in further detail in the next section, but electric power plants are among the largest sources of many health-threatening pollutants in the Northeast. Many of the steps that can be taken to reduce carbon dioxide emissions from power plants (such as efficiency improvements, repowering, or curtailment of operations) also reduce emissions of other pollutants or the overall cost of complying with pollution limits – providing potentially significant local co-benefits.

Navigating the Tradeoffs

Allowing offsets to qualify for credit under a cap-and-trade program could bring economic benefits to participants in the program at the possible expense of attaining the promised level of emission reductions. Yet, the decision as to whether to allow offsets in a carbon dioxide trading program is not a black-or-white, all-or-nothing affair. It is possible to construct a program that allows offsets from some sources, but not others; allows some offsets, but not too many; or disallows them now but keeps the door open for allowing them later on. In addition, it is possible to create flexibility through other mechanisms – such as credit banking – while disallowing other mechanisms, such as offsets.

In the section that follows, we make three arguments for excluding offsets from consideration in a regional cap-and-trade program. It is important to note that these arguments are conditional on the broader context surrounding the program. With a very strong carbon cap that drives significant reductions in carbon dioxide emissions from power plants, it may make sense to allow some additional flexibility through a limited, well-regulated offset system. With a weak cap, the case for offsets is much less strong. In any case, achieving carbon dioxide emission reductions within the Northeast would bring important benefits both to the region and to the overall effort to slow global warming. That, and not the achievement of less-certain emission reductions in other sectors or far-distant lands, should be the primary target of the states in the RGGI process.

Three Arguments Against Carbon Offsets in the Northeast

1. Offsets Reduce the Chance of Achieving Real Carbon Dioxide Emission Reductions

Offsets Add Unnecessary Complexity and Uncertainty to the Cap-and-Trade Program

Assuring real carbon dioxide emission reductions from a power-sector cap-and-trade program would be a straightforward task in the absence of offsets. In the nine RGGI states plus Pennsylvania, Maryland and the District of Columbia, there are approximately 1,000 boilers used for the generation of electricity that are of sufficient size to be included in the cap-and-trade system.[16] The number of facilities in each state ranges from a low of three in Vermont to a high of more than 300 in New York.

A program that encompassed that number of facilities would be relatively simple to administer by the partici-

Case Study: The Opt-In Provision of the U.S. Acid Rain Trading Program

The U.S. acid rain cap-and-trade program is considered by many as a success story for using market mechanisms to achieve environmental results. The program has succeeded in reducing emissions of sulfur dioxide from participating power plants by 35 percent since 1990 at a cost estimated to be as much as 57 percent below a control scenario that did not include trading.[17]

The range of sources covered by the acid rain program is similar to those that would be covered by an electric-sector carbon cap without offsets. Phase I of the acid rain program applied to large coal-fired power plants and ended in 1999. Phase II of the program applies to a larger range of electric generators, with more than 3,000 generating units covered by the program nationwide in 2002.[18]

However, the acid rain program also included an "opt-in" provision that allowed electric generators not covered until Phase II of the program to enter the program early. Industrial sources, which are not covered by the program at all, were also permitted to participate voluntarily. By choosing to participate voluntarily, these facilities could register their emission reductions, thus freeing up allowances that could be traded to other facilities.

The opt-in program, however, faced serious problems with gauging the additionality of emission reductions made by sources that chose to participate. As a 2003 paper issued by the Pew Center for Global Climate Change noted:

> [O]pting in became attractive for facilities whose emissions would have fallen below baseline levels anyway ... In such cases, the difference between the defined baselines and actual emissions created "anyway emission reductions" and an associated incentive to opt-in to Phase I to obtain valuable allowances that would not be required to cover actual emissions.[19]

The Pew Center report suggested that the negative environmental impact of these errors in the opt-in program was small – less than 2 percent of total emissions over the first 10 years of Phase II. However, participation in the opt-in program was limited – both by the relatively limited number of emitters of sulfur dioxide and by the high transaction costs faced by industrial emitters who, unlike electric utilities, would have been required to undertake additional emission monitoring efforts to participate in the program.

In any case, the opt-in portion of the acid rain program detracted from the impressive environmental results of the overall cap-and-trade effort.

pating states. Carbon dioxide emissions at power plants are easily tracked and validated and opportunities to game the system or evade compliance would be few. Such a program would engender a high degree of confidence among the public that the promised emission reductions are actually being achieved.

A liberal program for the inclusion of offsets, however, could expand the universe of potential program participants to millions of emitters of carbon dioxide both inside and outside the region. As noted above, verifying that offsets are delivering emission reductions of equivalent quality to those secured inside the region would impose large transaction costs either on the states, program participants or both. And even with aggressive verification programs, the public would still have reason to question the validity of the emission reductions claimed under the program.

Given the status of RGGI as a first-of-its-kind interstate cap-and-trade program for carbon dioxide emissions, erecting clear, simple rules for the program appears to be the proper strategy for the time being. Doing so would not preclude experimentation with offsets at a later date, but would create a solid basis of action from which further expansion of the program could proceed.

Other Jurisdictions Have Adopted a Prudent Approach to Offsets

The European Union (EU) is one example of an entity that has allowed offsets to qualify for credit in a regional global warming emission trading system. The EU program is different from the RGGI effort in several important respects: the EU nations have ratified the Kyoto Protocol (the U.S. has not), and the EU program covers both electric utilities and large industrial emitters of global warming gases, while the proposed northeastern program would cover only power plants at the outset.

In 2003, the EU opted to allow "Joint Implementation" (JI) projects (which industrialized nations undertake in concert with former communist countries) and projects certified under the Kyoto Protocol's Clean Development Mechanism (CDM) to be used as offsets.

However, the EU has placed significant restrictions on the use of JI/CDM credits in the trading program, specifically:

- JI/CDM credits can only be used for up to 6 percent of the total number of carbon allowances before triggering an automatic review by the European Commission.
- The EU has explicitly prohibited "double counting" of emission reductions.
- Nuclear, land use or forestry projects are prohibited from being used to generate offsets.[20]

Even with these restrictions, some environmental organizations have questioned the ability of CDM projects to deliver real emission reductions, and have argued for stronger standards for projects seeking CDM certification. The World Wildlife Fund (WWF), for example, has developed a "gold standard" to ensure the quality of JI and CDM credits, which includes the following restrictions:

- Only renewable energy and end-use energy efficiency projects may qualify.
- The projects must produce bona fide emission reductions that meet a rigorous additionality standard.
- The project must be deemed to support sustainable development goals.[21]

To maintain some semblance of confidence in the environmental integrity of any offsets, it is likely that the RGGI states would need to adopt restrictions on offsets that are as strong or stronger than those implemented by the EU or recommended by WWF. Such limitations would reduce the flexibility of the offset program and its potential economic benefits to participants.

2. The Northeast Would Miss Out on Important Benefits

A strong regional carbon cap without offsets has the potential to bring significant environmental, public health and economic benefits to the Northeast. To understand why, one must first understand the sources of carbon dioxide emissions within the region's power sector.

A Strong Carbon Cap Could Ease the Way for Reductions in Other Pollutants

Within the RGGI region, most carbon dioxide emissions from the electricity sector come from a handful of large, fossil fuel-fired power plants. According to data from the EPA's Emissions and Generation Resource Integrated Database (eGRID) system, about half the region's electric-sector carbon dioxide emissions in 2000 came from just 20 power plants. Of these 20 plants, 12 used coal as their primary fuel source, three used oil, and five used natural gas.[22] (See Table 1.)

While these 20 power plants created more than half of the region's electric-sector carbon dioxide, they produced only about *one-quarter of the electricity* generated in the region. In other words, the top 20 plants created carbon dioxide at twice the rate of the rest of region's electricity generators.

Not all of the power plants listed below produce disproportionate amounts of carbon dioxide – indeed, two of the 20 plants have rates of carbon dioxide production per megawatt-hour that are near or below the regional average. However, the majority of plants – particularly those fueled by coal or petroleum – produce carbon dioxide at rates significantly higher than average. These are the plants that would face the greatest financial incentives to improve their efficiency, repower with cleaner fuels, or curtail operations with a strong power sector carbon cap.

These plants also happen to be major sources of other health-threatening pollutants. In 2000, according to eGRID data, the 20 power plants listed above were also responsible for:

- 38 percent of power-sector mercury emissions in the RGGI region

Table 1. Top 20 CO_2 Emitting Power Plants in RGGI Participating States, 2000

State	Plant	CO_2 Emissions (metric tons)	CO_2 Emission Rate (lb/MWh)	Coal (%)	Oil (%)	Nat. Gas (%)
MA	BRAYTON PT	7,188,623	1942	97	0	3
NY	NORTHPORT	5,867,828	1973	0	74	26
NY	RAVENSWOOD	4,654,772	2029	0	17	83
NY	AES SOMERSET LLC	4,619,869	1989	100	0	0
MA	CANAL PLANT	3,845,861	1712	0	100	0
NY	HUNTLEY GENERATING STATION	3,813,027	2184	100	0	0
NJ	HUDSON GENERATING STATION	3,498,730	2333	94	2	4
NY	DUNKIRK GENERATING STATION	3,368,708	1938	100	0	0
MA	SALEM HARBOR	3,222,751	2326	67	33	0
DE	INDIAN RIVER	3,178,418	2505	98	2	0
NH	MERRIMACK	3,152,244	2234	100	0	0
NJ	MERCER GENERATING STATION	3,084,029	2324	93	0	7
NY	SITHE INDEPENDENCE STATION	2,959,451	828	0	0	100
NY	ROSETON	2,744,101	2070	0	94	6
NY	DANSKAMMER	2,525,123	2050	91	2	8
NY	POLETTI	2,336,934	1547	0	43	57
NY	AES CAYUGA	2,281,724	2171	100	0	0
NY	ASTORIA GENERATING STATION	2,137,268	1597	0	21	79
NY	LOVETT	2,112,648	2278	93	0	7
NJ	LINDEN COGEN PLANT	1,809,755	930	0	2	98

- 64 percent of the region's power-sector sulfur dioxide emissions

- 47 percent of the region's power-sector nitrogen oxide emissions[23]

These and other power plant pollutants have major environmental and public health impacts in the Northeast. For example:

- Fine particle pollution is estimated to shorten the lives of more than 2,500 people in the nine-state RGGI region each year, as well as cause thousands of additional hospitalizations and cost hundreds of thousands of lost work days.[24]

- Every Northeast state except Vermont includes areas in which air quality does not meet EPA health standards for ozone smog.[25] Nitrogen oxide emissions contribute to the formation of smog, which reduces lung function and aggravates asthma.[26]

- Acid rain – triggered by emissions of sulfur dioxide and nitrogen oxides – has had an especially heavy impact in the Northeast, particularly in the highlands of New York and New England.[27] (A cap-and-trade program for sulfur dioxide emissions, however, has reduced emissions substantially in recent years.)

- Several Northeast states have warned against consumption of fish from all inland waters due to mercury contamination.[28]

Existing and proposed environmental programs are aimed at reducing emissions of nitrogen oxides, sulfur dioxide and mercury from older power plants. But by encouraging the renovation, repowering or retirement of power plants responsible for large portions of these emissions, a strong regional carbon cap could obviate the need for many investments in pollution control equipment that would be required to keep those plants running under tighter restrictions on health-threatening pollutants. The efficiency of dealing with emissions of health-threatening pollutants and carbon dioxide simultaneously is recognized by the "four pollutant" approach to the cleanup of older power plants embraced by Massachusetts and New Hampshire. A liberal policy for the use of offsets would reduce the economic incentive to reduce carbon dioxide emissions from the region's most inefficient and polluting power plants, and would represent a missed opportunity for the Northeast to apply a comprehensive remedy to the problem of air pollution from these sources.

A Strong Carbon Cap Complements Other Clean Energy Policies

Requiring that reductions in power plant carbon dioxide emissions occur within the region would complement other policies that move the region toward a cleaner, more sustainable and more reliable electric system in the years to come.

Among the rationales typically given for the liberal use of offsets is the notion that power plant owners have limited options to reduce their emissions of carbon dioxide. Unlike technological controls that exist for other pollutants, there are no scrubbers or other emission controls that can reduce carbon dioxide emissions. Instead, power plant owners may improve the efficiency of their plants (a step that can yield 3 to 5 percent efficiency improvements in older coal-fired power plants); switch to lower-carbon fuels (such as natural gas); or curtail operations.[29]

The rapid increase in natural gas prices over the last four years, however, has made fuel-switching a much less attractive option. And concerns have been raised by some (such as the regional electric system operator in New England) about the impact on electric reliability of plant retirements that might result from imposition of a carbon cap.[30]

A number of policies that have recently been adopted in the RGGI states minimize the potential negative impacts of achieving in-region emission reductions by encouraging efficiency improvements and investment in renewable energy that will reduce demand for fossil fuel-generated electricity. Among those policies are:

- **Renewable portfolio standards** – Five of the nine states in the RGGI region (CT, MA, ME, NJ, RI) currently possess renewable portfolio standards that require that a percentage of the electricity sold in the state come from renewable resources. The standards vary to a large degree in their aggressiveness, with the most aggressive requiring increases of 1 to 1.5 percent per year in the share of power coming from new renewable sources.[31]

- **Energy efficiency standards** – Following the example of Maryland and Connecticut, a number of north-

eastern states (including New Jersey and Massachusetts) are considering the adoption of minimum energy efficiency standards for a variety of residential and commercial products. Northeast Energy Efficiency Partnerships estimates that regionwide adoption of similar standards in 10 northeastern states would save as much peak demand for electricity as ten 300-megawatt power plants.[32]

- **Energy efficiency programs** – All states in the RGGI region except for Delaware have energy efficiency funds supported by ratepayers through charges on electricity bills. Savings from energy efficiency improvements implemented through those programs in 2002 eliminated at least 785 MW of demand – about the size of a large power plant.[33]

- **Renewable energy programs** – Six states (DE, MA, RI, CT, NY, NJ) assist renewable energy projects through funds supported by electricity ratepayers. Renewable projects supported by those funds are generally intended to produce renewable power above and beyond the requirements of renewable portfolio standards.

The Economic Benefits of a Regional Carbon Cap and Clean Energy Strategy

A power-sector carbon cap is typically considered to be a potential economic burden on electric generators and, by extension, electricity consumers. But there is growing evidence that the doomsday economic scenarios often predicted for a carbon cap are exaggerated – particularly if a carbon cap is complemented with other policies to reduce electricity demand and to satisfy more of that demand with local or renewable generation.

- A 2001 study by Resources for the Future estimated that a $25 per ton tax on carbon dioxide emissions from electricity generation (which, like a carbon cap without offsets, could not be escaped by utilities) would generate approximately $12-$14 per ton of ancillary economic benefits through reduced public health expenditures and reduced need for utilities to invest in emission control equipment. The ancillary benefits are estimated to be about equal to the anticipated marginal cost of reducing carbon dioxide emissions.[37]

- A 1999 study by the Tellus Institute estimated that a series of policies to reduce carbon dioxide emissions (including measures in the electric sector) could enable the United States to reduce emissions by 14 percent below 1990 levels by 2010, while creating nearly a million net new jobs, and achieving an overall net economic benefit.[38]

- A variety of studies have pointed to the job creation benefits of renewable energy – which could play a significant role in reducing power-sector emissions. A 2001 study by the Renewable Energy Policy Project estimated that wind and solar power offer 40 percent more jobs per dollar spent than coal.[39] Because the Northeast produces relatively little of the fossil fuel it consumes for electricity generation, the region would likely benefit strongly from this job-creation phenomenon.

- Shifting to a less carbon intensive electric system could also reduce (rather than increase) costs for electricity consumers, particularly if paired with policies that encourage energy efficiency. A 2004 study by Synapse Energy Economics estimated that such a balanced energy strategy would reduce electric system costs by $36 billion annually by 2025 – not including environmental or other co-benefits of the policies.[40]

In addition to the quantifiable benefits of a combined carbon cap/clean energy strategy for the Northeast, such a policy direction would tend to insulate the region's economy from fossil fuel price volatility, encourage the location of renewable energy and energy efficiency companies within the region, and establish the region as an exporter of technology and expertise to other regions and the world. Only a carbon cap that drives substantive changes in electric generating and consumption patterns in the region, however, would contribute to the achievement of these goals.

- **Utility-based efforts** – In the wake of wholesale (and, in most northeastern states, retail) electric restructuring, efforts are underway in some areas to remove barriers impeding cost-effective investments in energy efficiency and clean distributed generation. Efficiency improvements and demand-response efforts can frequently save electricity at a lower cost than it can be generated and transmitted at times of peak demand. Energy efficiency measures have been estimated to have the capacity to reduce demand growth in New England by 30 to 50 percent, while demand-response programs could reduce growth in peak demand by a similar amount.[34] Efficiency, renewables and distributed generation also represent good long-term investments when considered against the expense of constructing new generators or transmission lines. The independent electric system operator in New England has begun to implement measures to allow demand-side resources to compete with peak generation at times of high demand, and ISOs in neighboring regions are considering similar measures.

These policies reinforce one another and point toward a vision of the region's energy future in which consumers use less electricity, with more of that electricity coming from renewable or clean local sources. A strong cap on carbon dioxide emissions from the electric sector is a critical piece of this larger vision. A carbon cap would promote the replacement or repowering of older fossil fuel-fired power plants at the same time that renewables and efficiency policies are restraining the need for new fossil fuel power plants to serve additional load. Such a strategy would reduce the need for new natural gas or other fossil fuel-fired power plants to replace existing capacity and alleviate the electric reliability challenges posed by the renovation or closure of several large baseload power plants.

Recent evidence suggests that a clean energy strategy could bring economic benefits as well. A 2004 report by Synapse Energy Economics projects that a shift to a balanced electricity system that relies more on energy efficiency, renewable resources and distributed generation could reduce carbon dioxide emissions from the electric sector nationwide to below 1990 levels by 2025, while saving up to $36 billion annually.[35] The Synapse analysis found that such a shift could be undertaken while substantially reducing generation from coal and nuclear sources and limiting the growth in consumption of natural gas. Meanwhile, another 2004 report estimated that the Mid-Atlantic region could generate approximately twice as many jobs through an aggressive program to develop wind power than by meeting anticipated growth in electricity demand with natural gas-fired power plants.[36] (See text box, previous page.)

In sum, the imposition of a strong regional carbon cap *without offsets* would create additional incentives to reduce emissions of health-threatening pollutants from power plants, reinforce a broader move toward sustainable, clean energy sources in the region, and create long-term economic benefits. While it is possible to incorporate mechanisms within a cap-and-trade program to encourage this broader clean energy vision (such as set-asides of carbon allowances for renewable energy or energy efficiency projects), there are already effective policy efforts underway to pursue these goals. The missing piece of the puzzle is the development of policies that can reduce the attractiveness of maintaining a fleet of aging, polluting power plants with a disproportionate impact on the climate and public health. A strong regional carbon cap without offsets has the potential to fill that gap.

3. Allowing Offsets Will Dull, Not Enhance, Momentum for Further Emission Reductions in Other Sectors of the Economy

The Northeast Must Fulfill Commitments to Achieve Emission Reductions Within the Region

Among the most important reasons for the Northeast to achieve emission reductions within the region is the simplest one: we said we would.

Many of the states involved in the RGGI process have made strong commitments to reduce global warming emissions within their borders. In 2001, for example, the governors of the six New England states and the premiers of the eastern Canadian provinces adopted a Climate Change Action Plan that committed the region to reducing global warming emissions to 1990 levels by 2010 and to 10 percent below 1990 levels by 2020.[41] New Jersey had earlier adopted a goal of reducing emissions to 3.5 percent below 1990 levels by 2005.[42]

Achieving aggressive goals for the reduction of overall global warming emissions in the region will require significant reductions from the electric power sector. In the six New England states, for example, electricity gen-

eration was responsible for about one-fifth of total carbon dioxide emissions in 2000, with only transportation making a larger contribution to the region's emissions.[43] Unlike transportation – for which policy tools are relatively undeveloped and state action in many areas is preempted by the federal government – there are ample opportunities for states to drive significant reductions from electricity generation, many of which produce significant economic and environmental co-benefits.

In other words, it will be difficult for the Northeast states to achieve significant reductions in overall global warming emissions within their own borders without calling upon the electric power sector to at least make its share of the reductions. For states that have already made specific commitments for in-state or in-region emission reductions, meeting those goals is a key test of the seriousness with which future climate protection efforts will be taken. A liberal program of offsets – particularly one in which a large share of emission reductions are made outside the region – will not help to achieve that objective.

Cap-and-Trade Is Not a "One-Size-Fits-All" Solution

Supporters of offsets rightly claim that a cap-and-trade program for electric sector emissions will not achieve the emission reductions that are needed to avoid dangerous threats to the climate in the future – reductions scientists now estimate at 75 to 80 percent below current emission levels. Allowing offsets into a power-sector cap, it is argued, will help us to develop the expertise needed to expand carbon caps to other sectors and generate new ideas for achieving emission reductions in other portions of the economy.

However, the prospect of foregoing real reductions in carbon dioxide emissions that are achievable locally in favor of designing a program that can serve as a template for future efforts puts the cart before the horse.

The arguments in favor of using offsets as a foot in the door for regulation of emissions from other sectors proceed from a common premise – that market-based solutions in general, and cap-and-trade programs in particular, are the best way to reduce global warming emissions in all sectors of the economy and must be expanded to cover the entire economy if we wish to meet the challenge posed by global climate change. While the motivations behind this strategy are laudable, it may not be the correct strategy to pursue.

A cap-and-trade program is potentially a superior policy mechanism for driving emission reductions in the electricity sector – and would also likely be appropriate for large industrial emitters of carbon dioxide, such as those included in the EU trading program. In these sectors, a small but not insignificant number of emitters exist and emissions are easily tracked and verified. The experience of the acid rain cap-and-trade program in the U.S. demonstrates that a cap-and-trade system operating under such circumstances can achieve strong environmental results at low cost without the creation of cumbersome bureaucracies or the imposition of prohibitive transaction costs.

But cap-and-trade is not a "one-size-fits-all" approach to the reduction of emissions from all sectors of the economy. The EPA, for example, acknowledges that emissions trading "is not appropriate in all situations or for all environmental problems."[44]

The transportation sector is one in which a cap-and-trade approach may have limited utility. Unlike the electric power sector, the transportation sector encompasses millions of emitters in the Northeast alone. Moreover, automakers, energy companies and individual drivers all make decisions that affect transportation-sector emissions, and it is not immediately obvious which set of entities should be required to obtain allowances under a cap-and-trade approach.

The prospects for creating an effective and efficient cap-and-trade system that encompasses the transportation sector – particularly one that could be linked to a similar electric-sector system (allowing effective trading across sectors) – appear dim. Nor is transportation the only sector in which a very large number of small emitters are responsible for the bulk of the emissions. In these sectors, other policy tools – such as energy efficiency standards for cars, appliances and buildings and various types of economic incentives – may be far more appropriate for encouraging reductions in carbon dioxide emissions.

Creating a cap-and-trade system that can easily be expanded to include other major industrial emitters is a worthwhile goal – and one that likely can be achieved without a great deal of experimentation with offsets (as

the EU has already done through the inclusion of large emitters in its emission trading program). But attempting to create a one-size-fits-all cap-and-trade program is not a worthwhile use of effort, particularly when policy solutions that *can* reduce emissions from other sectors – in many cases, cost-effectively – are permitted to languish. Government officials and other stakeholders should focus their intellectual energy on surmounting the hurdles that block implementation of these policies rather than using the RGGI process as a platform to devise an entirely new regulatory framework.

A Successful Effort to Limit Power Plant Emissions Would Set a Powerful Example

It is often assumed that designing the perfect cap-and-trade process would set a powerful example for other sectors and regions to follow in their own efforts to limit greenhouse gas emissions. But the most powerful example the Northeast states could set in the effort to reduce global warming is not to design the perfect policy, but to achieve *real results* in reducing global warming emissions within the region.

There is ample reason to believe that the Northeast region can reduce global warming emissions from electricity generation while generating significant co-benefits and perhaps – in conjunction with other policies to promote improved energy efficiency and renewable energy – delivering benefits to the regional economy. Demonstrating that such emission reductions can be achieved *without* major damage to the economy and *with* improvement in environmental indicators would provide a much more powerful positive example to other sectors and other regions than any process-based achievement.

Policy Conclusions

The Northeast states should stick to the original ground rules of the Regional Greenhouse Gas Initiative and not consider the implementation of offsets until Phase II of the program, after the Model Rule is complete and at the same time that states turn their attention to expanding the cap to cover all stationary sources.

It is critical that the Northeast states "get it right" with relation to reducing greenhouse gas emissions from the electric sector. The RGGI states made the correct decision when they decided to limit the program only to electric-sector emitters in its earliest phase. The states should stick with that decision until an effective cap-and-trade program has been designed and implemented.

The region should only consider the use of offsets if it adopts a carbon cap with strong limits on emissions. At minimum, such a cap should reduce emissions by at least 10 percent below current levels by 2010 and 25 percent below current levels by 2020.

Emission reductions at these levels are achievable and would likely generate significant environmental, public health and economic co-benefits for the region – particularly if undertaken as part of a regional clean energy strategy that emphasizes energy efficiency and the development of renewable sources of power. Offsets could be considered as a means to allow flexibility if the region were to set goals that go beyond these aggressive targets.

Should the region decide to allow offsets, only those that meet the highest standards of environmental integrity should be allowed. Any allowable offsets must:

- Be generated within the states covered by the cap.
- Emphasize renewable energy and energy efficiency projects, possibly through set-asides.

In addition, the percentage of allowances that can be met through offsets must be strictly limited – ideally to 5 percent or less, and any use of offsets must be accompanied by a cap reduction in order to evenly divide efficiency gains between the environment and power generators.

Notes

1. U.S. Department of Energy, Energy Information Administration, *Emissions of Greenhouse Gases in the United States 2002*, October 2003.

2. Regional Greenhouse Gas Initiative, *Goals & Guiding Principles*, downloaded from www.rggi.org/goals.htm, 19 July 2004.

3. Environmental Law Institute, *Emission Reduction Credit Trading Systems: An Overview of Recent Results and an Assessment of Best Practices*, September 2002.

4. Commission of the European Communities, *Proposal for a Directive of the European Parliament and of the Council Amending the Directive Establishing a Scheme for Greenhouse Gas Emission Allowance Trading Within the Community, in Respect of the Kyoto Protocol's Project Mechanisms*, 23 July 2003.

5. See Kyoto Protocol to the United Nations Framework Convention on Climate Change, Article 12.

6. Based on emission reductions required globally to stabilize long-term carbon dioxide concentrations in the atmosphere at approximately 450 parts per million per Intergovernmental Panel on Climate Change, *Climate Change 2001: Synthesis Report*, Summary for Policymakers. Stabilization of carbon dioxide concentrations at that level is projected to lead to significant warming of the climate, but less than is predicted should emissions continue to increase for the remainder of this century.

7. 310 CMR, 7.00, Appendix B.

8. World Wildlife Fund, *The Gold Standard: Premium Quality Carbon Credits*, downloaded from www.panda.org/downloads/climate_change/goldstandard.pdf, 20 July 2004.

9. See note 3.

10. A. Denny Ellerman, Paul L. Joskow, David Harrison, Jr., Pew Center on Global Climate Change, *Emissions Trading in the U.S.: Experience, Lessons and Considerations for Greenhouse Gases*, May 2003.

11. Jane Ellis, Jan Corfee-Morlot, Harald Winkler, Organization for Economic Cooperation and Development, *Taking Stock of Progress Under the Clean Development Mechanism*, 15 June 2004.

12. Dan Gorenstein, New Hampshire Public Radio, *Seabrook Gets Air Pollution Credits*, 2 June 2003.

13. United Nations Framework Convention on Climate Change, *Issues in the Negotiating Process, Kyoto Protocol Mechanisms: "Joint Implementation," The Clean Development Mechanism and Emissions Trading*, downloaded from unfccc.int/issues/mechanisms.html, 20 July 2004.

14. Scott Peterson, Nuclear Energy Institute, *Nuclear Energy as an Environmental Answer* [PowerPoint presentation], downloaded from www.nei.org/documents/Speech_ Peterson_9-19-03_EA-slides.ppt, 27 July 2004.

15. See note 11.

16. Regional Greenhouse Gas Initiative, *Draft Lists of Electric Generating Units Potentially Subject to RGGI Program*, downloaded from www.rggi.org/draftlists.htm, 9 July 2004.

17. Emission reductions from U.S. Environmental Protection Agency, *Acid Rain Program: 2002 Progress Report*, November 2003; Cost savings estimate from A. Denny Ellerman, Paul L. Joskow, David Harrison, Jr., Pew Center on Global Climate Change, *Emissions Trading in the U.S.: Experience, Lessons and Considerations for Greenhouse Gases*, May 2003.

18. U.S. Environmental Protection Agency, *Acid Rain Program: 2002 Progress Report*, November 2003.

19. See note 10.

20. See note 4.

21. See note 8.

22. Based on data from U.S. Environmental Protection Agency, *Emissions & Generation Resource Integrated Database* (eGRID) spreadsheets, year 2000 data, 1 August 2003.

23. Ibid.

24. Clear the Air, *Connecticut's Dirty Power Plants* [fact sheet] and similar fact sheets for Delaware, Maine, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island and Vermont, downloaded from cta.policy.net/regional/, 20 July 2004.

25. U.S. Environmental Protection Agency, *8-Hour Ground-level Ozone Designations: State Designations*, downloaded from www.epa.gov/ozonedesignations/statedesig.htm, 21 July 2004.

26. U.S. Environmental Protection Agency, *Ozone and Your Health*, downloaded from www.epa.gov/airnow/ozone2.html, 21 July 2004.

27. U.S. Environmental Protection Agency, *Effects of Acid Rain: Lakes & Streams*, downloaded from www.epa.gov/airmarkets/acidrain/effects/surfacewater.html, 21 July 2004.

28. See note 24.

29. "3 to 5 percent" from U.S. Environmental Protection Agency, Clean Air Markets Division, *Review of Potential Efficiency Improvements at Coal-Fired Power Plants*, 17 April 2001.

30. For example, ISO-New England rejected a request by the owners of the Salem Harbor power plant in Massachusetts to meet new air pollution regulations by shutting down the plant because it judged that the plant's output was needed to guarantee the reliable operation of the region's electric system.

31. Interstate Renewable Energy Council, North Carolina Solar Center, *Database of State Incentives for Renewable Energy*, downloaded from www.dsireusa.org, 21 July 2004.

32. Northeast Energy Efficiency Partnerships, *Initiatives: Minimum Efficiency Standards*, downloaded from www.neep.org/Standards/, 21 July 2004.

33. Based on Martin Kushler, Dan York and Patti White, American Council for an Energy-Efficient Economy, *Five Years In: An Examination of the First Half-Decade of Public Benefits Energy Efficiency Policies*, April 2004.

34. Richard Cowart, Regulatory Assistance Project, *Dimensions of Demand Response: Capturing Customer Based Resources in New England's Power Systems and Markets*, PowerPoint presentation to Connecticut Energy Conservation Management Board, 13 April 2004.

35. Bruce Biewald, David White, Geoff Keith, Tim Woolf, Synapse Energy Economics, *A Responsible Electricity Future: An Efficient, Cleaner and Balanced Scenario for the U.S. Electricity System*, 11 June 2004.

36 Dave Algoso, Nathan Willcox, PennEnvironment Research and Policy Center, *Renewables Work: Job Growth from Renewable Energy Development in the Mid-Atlantic*, Spring 2004.

37 Dallas Bertraw, et al, Resources for the Future, *Ancillary Benefits of Reduced Air Pollution in the United States from Moderate Greenhouse Gas Mitigation Policies in the Electricity Sector*, December 2001.

38. Stephen Bernow, et al, Tellus Institute, *America's Global Warming Solutions*, August 1999.

39. Virinder Singh, Renewable Energy Policy Project, *The Work that Goes Into Renewable Energy*, November 2001.

40. See note 35.

41. Conference of New England Governors and Eastern Canadian Premiers, *Climate Change Action Plan 2001*, August 2001.

42. New Jersey Department of Environmental Protection, *Sustainability Greenhouse Action Plan*, December 1999.

43. New England Climate Coalition, *Global Warming and New England*, September 2003.

44. U.S. Environmental Protection Agency, *Tools of the Trade: A Guide to Designing and Operating a Cap and Trade Program for Pollution Control*, June 2003.