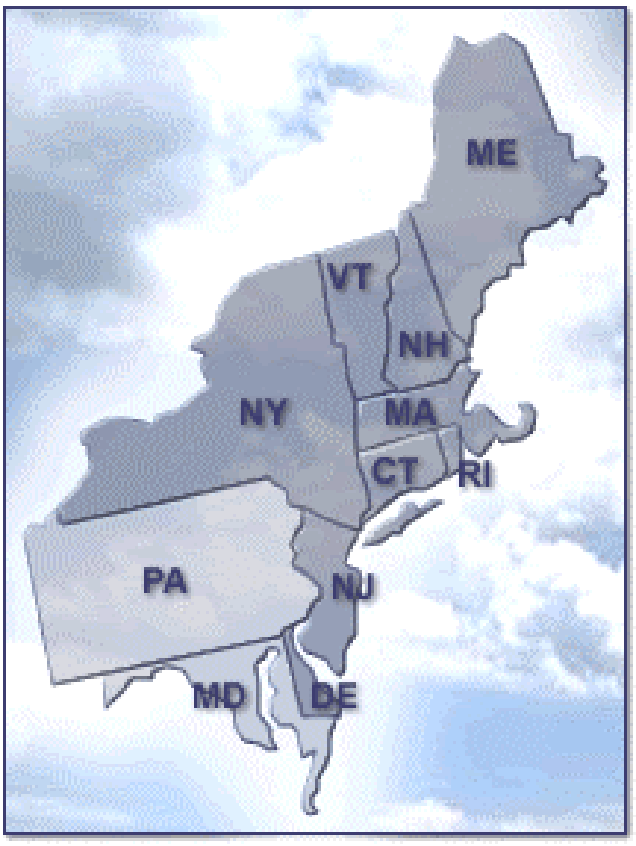
THE NORTHEAST REGIONAL GREENHOUSE GAS COALITION



Regional Greenhouse Gas Initiative

Policy Recommendations

May 2005

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Executive Summary

This report provides the Northeast Regional Greenhouse Gas Coalition's (GHG Coalition) policy recommendations for the design of the Regional Greenhouse Gas Initiative (RGGI). The participants in the GHG Coalition are major energy, technology, pharmaceutical and waste management companies with significant operations in the northeastern U.S.[1]

The GHG Coalition policy recommendations focus on five key areas:

1. CO_2 cap levels and timing,
2. allowance allocations,
3. flexibility mechanisms,
4. electricity imports and leakage, and
5. compliance and enforcement.

The GHG Coalition believes that programs to address climate change should be national in scope. In developing these recommendations, the objective of the GHG Coalition has been to develop a set of recommendations that provide a model for a national program that would have a reasonable likelihood of adoption. Finally, the GHG Coalition strongly contends that when a mandatory national climate change program is implemented, the RGGI program must be superseded with a smooth transition for RGGI affected sources and related programs.

It is important to keep in mind that RGGI is a regional program, which presents unique considerations, and that electricity markets in the Northeast have particular characteristics, which should influence the program's design. The impact of RGGI on the wholesale electricity markets will be determined in large measure by the stringency of the CO_2 cap, timing of the emission reductions, allocation methodology and the flexibility provided. A stringent cap, regardless of the

[1] The GHG Coalition members are BP America, Inc.; Calpine Corporation; Consolidated Edison, Inc.; Pfizer, Inc.; Public Service Enterprise Group, Inc.; United Technologies Corporation; and Waste Management, Inc.

flexibility or allocation methodology, will have a significant impact on the asset value and economic viability of some electric generating units (EGUs) in the region.

To minimize distortions in the wholesale electricity market, the GHG Coalition recommends:

- a gradual declining regional CO_2 cap over an extended timeframe,
- a consistent approach to allowance allocations to EGUs across all of the RGGI states,
- ample flexibility mechanisms, and
- a solution to the "leakage" problem associated with imported power.

For a variety of reasons, including a history of relatively more stringent air pollution regulation, CO_2 emissions and emissions intensity in the Northeast are lower than in many other areas of the United States and in the country as a whole. While national CO_2 emissions from the electric generating sector were 24 percent above their 1990 levels in 2003, in the RGGI states (full participants), emissions were three percent below 1990 levels. The average CO_2 emission rate in the RGGI region is around 900 lbs/MWh. The national average is around 1,400 lbs/MWh. With this in mind, the RGGI program should be reasonable to make it possible for other states to join RGGI and achieve the required emission reductions of the program.

CO_2 Cap Levels and Timing

The choice of actual cap levels and timing will depend in large measure on the approaches that RGGI takes to mitigating leakage due to electricity imports and to the scope of the flexibility mechanisms included in the program. In the near term, the level of the regional cap should increase relative to current emission levels to account for growth in demand and then begin a gradual decline over an extended timeframe, rather than a series of sharp declines.

Allowance Allocations

The GHG Coalition recommends a *fossil fuel neutral, updating, output-based allocation* methodology for affected EGUs implemented consistently across all of the RGGI states in order to avoid distortions in the electricity markets. The GHG Coalition also recommends an *updating, output-based* methodology for the apportionment of the region wide CO_2 cap to the RGGI states.

The apportionment methodology should be based on the state's percentage share of RGGI region electricity generation in order to fully realize the advantages of an output based allowance allocation to EGUs and to maximize equity among the RGGI states. Finally, we suggest further discussion regarding the treatment of new and incremental non- and net zero-CO_2 emitting EGUs within the RGGI program.

Flexibility Mechanisms

Fossil fuel-fired power plants have fewer opportunities to reduce CO_2 emissions, in part because there are no commercially available end-of-pipe emission control devices for CO_2. To increase the cost-effectiveness of reducing CO_2 emissions, RGGI should be designed with ample flexibility including:

- emission trading linkages with emerging programs around the world especially the European Union Emission Trading Scheme,
- a minimum three-year compliance and true-up periods,
- use of quantifiable carbon offsets or project-based emissions reductions of any of the six GHGs from other sectors of the economy,
- unrestricted banking of CO_2 allowances,
- crediting of early GHG emission reduction actions, and
- the inclusion of a "circuit breaker" mechanism.

Electricity Imports and Leakage

Because capping CO_2 emissions from EGUs in the RGGI region will increase the price of electricity in the region—which is already higher than in surrounding areas—the region is likely to see an increase in the import of less expensive, higher CO_2 emitting power. Leakage risks undermine the RGGI program in two ways:

1. CO_2 emission reductions achieved in the RGGI region will be offset as power is imported from surrounding areas that are not subject to CO_2 emission limits.

2. Electricity imports will create a competitive disadvantage for companies in the RGGI region.

The GHG Coalition recommends that the RGGI program be designed so as to minimize leakage. The GHG Coalition further recommends that additional modeling be undertaken, both to understand more fully the potential for leakage and the market designs and rules for addressing the problem. Finally, because leakage is a significant issue, the RGGI initiative should not be fully implemented until this issue is addressed either by further modeling or adoption of another mitigation method such as centralized State procurement of allowances.

Compliance and Enforcement

Under the RGGI program, compliance and enforcement activities will be the responsibility of the individual RGGI states. The GHG Coalition recommends that RGGI rely on 40 CFR Part 75 and the existing infrastructure within EPA's Clean Air Markets Division to obtain the necessary CO_2 emissions data from affected EGUs. RGGI could include monetary penalties for noncompliance and require that emissions be offset in the following compliance period. The state enforcement authorities should have discretion to adjust financial penalties and offset requirements on a case-by-case basis.

The Regional Greenhouse Gas Registry (RGGR) should function as the CO_2 allowance tracking registry for RGGI. RGGR should track similar information to that tracked by EPA's NOx Allowance Tracking System. RGGR should also serve as the centralized administrator of the carbon offset protocol development. Finally, RGGR should facilitate public access to CO_2 emissions data.

Introduction

As a stakeholder in the Regional Greenhouse Gas Initiative (RGGI), the Northeast Regional Greenhouse Gas Coalition (the GHG Coalition) has been evaluating options for designing a CO_2 program in the Northeast. The participants in the GHG Coalition are major energy, technology, pharmaceutical and waste management companies with significant operations in the northeastern U.S.[2] This report provides a comprehensive policy framework outlining our recommendations for the design of the RGGI program. In crafting this framework, our objective has been to develop a set of recommendations that could serve as a model for a national climate change program.[3]

[2] The GHG Coalition members are BP America, Inc.; Calpine Corporation; Consolidated Edison, Inc.; Pfizer, Inc.; Public Service Enterprise Group, Inc.; United Technologies Corporation; and Waste Management, Inc.

[3] The principles and recommendations should not be interpreted to mean that any or all companies of the GHG Coalition endorse a mandatory CO_2 emission cap imposed upon the electric generating sector as an effective or appropriate measure to address climate change.

I. Key Principles for the Design of the RGGI Program

All of the GHG Coalition companies recognize the inevitability of regulating greenhouse gases (GHGs) in order to address climate change. RGGI is of immense significance as it may serve as a model for other areas of the country and even for the United States as a whole. The GHG Coalition is committed to playing a role in designing a program that will deliver real reductions in GHG emissions, provide incentives for identifying least-cost reductions, interface with existing GHG emissions reduction programs, provide a model for a national program, and send a financial signal to all sectors of the economy relative to the costs of GHG emissions reductions.

This section of the GHG Coalition's RGGI Policy Recommendations sets forth the principles that the GHG Coalition considers fundamental to the design of RGGI. The sections that follow outline in greater detail the GHG Coalition's view of some of the critical design issues facing the program.

RGGI as a National Model. The GHG Coalition believes that programs to address climate change should be national in scope with clear linkages to international climate change programs to maximize cost effective GHG emission reductions. The GHG Coalition believes that measures to address climate change that are focused on a single sector of the economy and imposed on a state-specific basis or in a small group of states will have minimal, if any, impact on climate, at the risk of placing the region at an economic disadvantage relative to other regions of the country. With this in mind, the GHG Coalition supports the development of a regional initiative that can serve as a model for a national program.

RGGI can send a price signal as to the costs of GHG reductions, and serve as a laboratory for the development of approaches to identifying least-cost reductions. RGGI can showcase flexibility mechanisms, including but not limited to carbon offsets, emission trading linkages with other cap and trade programs, banking, multi-year compliance periods, and the use of a circuit breaker mechanism. RGGI and the Regional Greenhouse Gas Registry (RGGR) can develop model protocols for, e.g., allowance tracking, and for the quantification and verification of emissions reductions associated with offset projects from other sectors of the economy.

A National Program Must Supersede RGGI. The GHG Coalition strongly contends that when a mandatory national climate change program is implemented, RGGI must be superseded. To the maximum extent possible, RGGI should be designed for a smooth transition to a national program. The regulatory elements of the RGGI program (including implementing regulations at the state level) must be superseded by national regulatory elements so as not to have redundant and possibly conflicting programs. Furthermore, affected sources in the RGGI region should not be disadvantaged by their "first mover" status. RGGI states should commit to providing credit for sources that reduce their emissions prior to the adoption of a national program.

Market-Based Compliance Options. To the extent that mandated reductions of CO_2 in the form of an emissions cap are instituted in the electricity sector, then a cap-and-trade approach provides a flexible option, which the GHG Coalition supports. Over the past 15 years, market-based compliance options have proven to be the most cost-effective way to reduce emissions in the power sector. As an example, the Acid Rain Program, established by the 1990 Amendments to the Clean Air Act, has allowed companies to seek the most efficient path to SO_2 emissions reductions.

CO_2 lends itself extremely well to a trading program, since the effects of CO_2 are global in scope: it matters little whether reductions occur in one locale or another, as long as the reductions occur. A robust trading market will ensure that the lowest cost options will be pursued.

The Avoidance of Creating Artificial Distortions in the Wholesale Electricity Market. The impact of RGGI on the wholesale electricity markets will be determined in large measure by the stringency of the CO_2 cap, timing of the emission reductions, allocation methodology and the flexibility provided. A stringent cap, regardless of the flexibility or allocation methodology, will have a significant impact on the asset value and economic viability of some electric generating units in the region. To minimize distortions in the wholesale electricity market, the GHG Coalition recommends a gradual declining regional CO_2 cap over an extended timeframe, a consistent approach to allowance allocations to affected units, flexibility mechanisms across all of the RGGI states and a solution to the "leakage" problem associated with imported power as a prerequisite to implementation.

Regional CO_2 Cap State Apportionment Methodology. The GHG Coalition recommends an *updating output based* methodology for the apportionment of the region wide CO_2 cap to the RGGI states. The apportionment methodology should be based on the state's percentage share of RGGI region electricity generation in order to fully realize the advantages of an output-based allocation to individual electric generating units and to maximize the equity between RGGI states.

While the GHG Coalition recommends that the region wide cap be apportioned among the RGGI states to reflect changes in the competitive electricity markets since 1990, we also recommend crediting early actions that have resulted in GHG emission reductions since 1990.

Electric Generating Unit (EGU) Allowance Allocation Methodology. The GHG Coalition favors a *fossil fuel neutral*, *updating, output-based* allocation methodology, with a set-aside for new sources. The allocation methodology should also encourage cogeneration by recognizing steam output as well as electricity output.

The GHG Coalition recommends a consistent approach to allocations across all of the RGGI states in order to avoid distortions in the electricity markets. RGGI should avoid a patchwork of allocation methodologies, which may lead to states seeking to advantage their own domestic generating facilities creating an unfair advantage in the market place.

The Coalition believes that there is no evidence that the direct allocation of allowances to sources will result in a windfall for sources and, therefore, opposes inclusion in RGGI of a large public benefit allocation. A large public benefit allocation, which would effectively create an auction approach to allocation, would aggravate competitive concerns, creating further economic disadvantages for power companies in the RGGI region versus those outside the region.

Finally, we suggest further discussion regarding the treatment of incremental non- and net zero-CO_2 emitting EGUs within the RGGI program (i.e., nuclear, wind, and other renewables, etc.). This decision on allowance allocations must be coordinated with the offset and new source set aside provisions of the RGGI program in addition to renewable portfolio standards in the region.

Flexibility Mechanisms. Because there are fewer options currently available for reducing CO_2 emissions from the electricity sector than for reducing emissions of other pollutants, and because of the relative cost-effectiveness of reduction opportunities in other sectors, RGGI should offer a reasonable menu of flexibility mechanisms. These should include the use of early reductions and offsets, unrestricted banking, multi-year compliance and true-up periods, and a circuit-breaker mechanism.[4]

Electricity Imports. RGGI should be designed so as to solve or mitigate the "leakage" problem associated with imported power. Since capping CO_2 emissions from electric generating units (EGUs) in the RGGI region will increase the price of electricity in the region—which is already higher than in surrounding areas—the region is likely to see an increase in the import of less expensive, higher CO_2 emitting power. Leakage risks undermine the goal of the RGGI program in two ways. First, any CO_2 emission reductions achieved in the RGGI region will be offset, as power is imported from surrounding areas that are not subject to CO_2 emission limits. Second, electricity imports will create a competitive disadvantage for companies in the RGGI region.

In order to address leakage on a regional level, the RGGI stakeholders have discussed the inclusion of an emission portfolio standard (EPS) on retail electricity suppliers that sell electricity to customers in the RGGI region or the allocation of allowances to retail suppliers, along with a cap on RGGI region EGUs. However, this could create an undue incentive for bi-lateral contracts for low emission resources, limit wholesale market competition, and place an additional financial burden on load serving entities (LSE's) in the RGGI region. The Coalition recommends that additional modeling be done, both to understand more fully the potential for leakage and the alternative opportunities available to mitigate it such as offsets that could be purchased by a centralized State procurement authority.[5]

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[4] A "circuit breaker" is a predetermined allowance price point that would trigger a pause in the decline of the regional emissions cap. The declining emissions cap schedule would resume once prices had fallen below the circuit breaker level.

[5] This would be similar to how New York State has implemented its renewable portfolio standard. Instead of imposing requirements on retail suppliers to meet this standard, the State designated the New York State Energy Research and Development Authority ("NYSERDA") as a central procurement authority to enter into contracts with renewable developers to increase the amount of generation produced from such sources.

Linkages with other Emerging Programs. RGGI should be linked with programs such as the European Union's Emission Trading Scheme (EU ETS) and similar programs as they emerge in Canada, Japan, Australia, New Zealand and other nations. Domestic programs, such as one that may result from the Western Governors' Global Warming Initiative, are also candidates for reciprocal trading arrangements. Since climate change is truly a global issue, it only makes sense that RGGI be linked with other programs domestically and internationally to maximize cost effective GHG emission reductions.

II. The RGGI Region in Context

RGGI stands to serve as a model for other regional GHG initiatives and for a national program. By the same token, it is important to keep in mind that RGGI is a regional program, and that electricity markets in the Northeast have particular characteristics, which should influence the program's design.

This section frames the data that inform GHG Coalition key design principles and recommendations. For electric generation data, the most recent data year publicly available is 2002. For CO_2 emissions data, the most recent data year publicly available is 2003. See Appendix A for an explanation of the data sources and methodologies employed.

CO_2 Emissions in the RGGI Region as Compared to Emissions in other Areas. For a variety of reasons, including a history of relatively more stringent air pollution regulation, CO_2 emissions and emissions intensity in the Northeast are lower than in many other areas of the country and in the country as a whole.

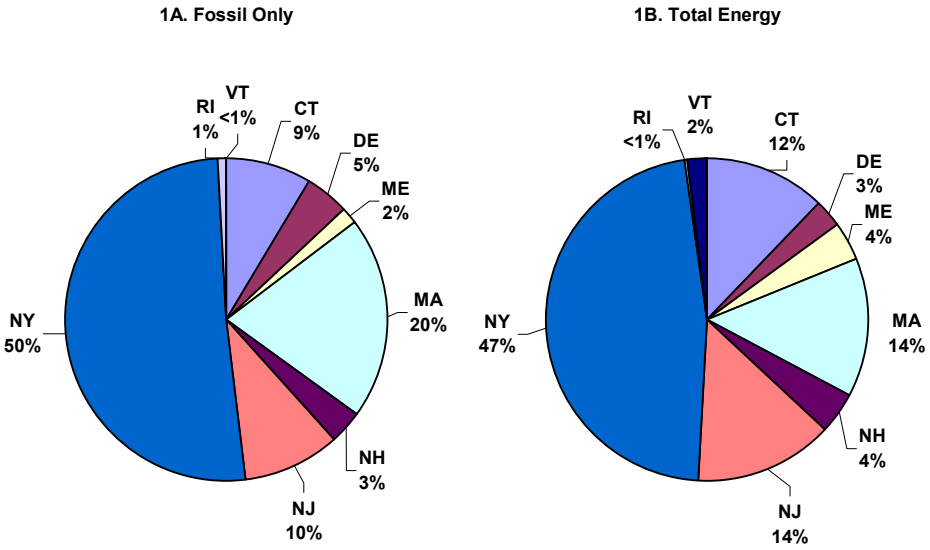
- Power plants in the RGGI region account for approximately 5 percent of national electric industry CO_2 emissions and close to 9 percent of national electric power production.
- While national CO_2 emissions from the electric generating sector were 24 percent above their 1990 levels in 2003, in the RGGI states (full participants), emissions were three percent below 1990 levels.
- The average total energy CO_2 emission rate in the RGGI region is around 900 lbs/MWh. The national average is around 1,400 lbs/MWh. The RGGI region average is close to that of a high efficiency, natural gas combined cycle facility. CO_2 emission rates in several RGGI states are well below this average.

These facts are significant for a number of reasons. First, the region's relatively low CO_2 emissions profile indicates that there are many lower-cost opportunities for reductions outside of the region, which is one of the reasons that flexibility mechanisms, such as offsets (addressed in *Section V*), should be included in the initiative, and leakage issues would accordingly need to be addressed

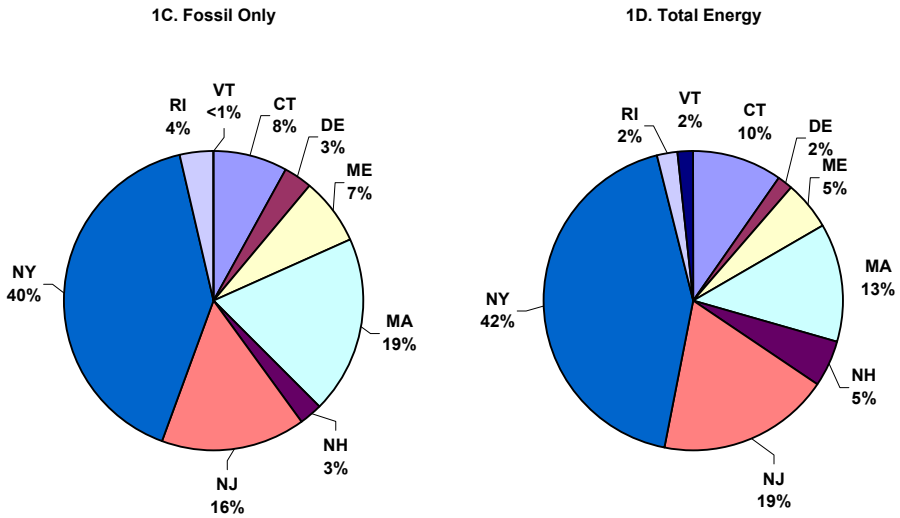
prior to the implementation of the initiative.

Change in Share of Regional Electricity Generation Among RGGI States. Since 1990, some RGGI states (full participants) have experienced substantial growth in their share of RGGI region fossil electricity generation output (such as New Jersey and Maine) while others have experienced decreases (such as New York and Massachusetts). Figures 1A and 1B illustrate the percentage share of RGGI region generation in 1990 (fossil only and total energy). Figures 1C and 1D show the percentage share of RGGI region generation in 2002.

Figures 1A and 1B: State Share of RGGI Region Electric Generation (1990)



Figures 1C and 1D: State Share of RGGI Region Electric Generation (2002)



Change in Share of Regional CO_2 Emissions Inventory. Since 1990, some RGGI states (full participants) have experienced an increase in their share of RGGI region CO_2 emissions (such as New Jersey, Maine and New Hampshire) while others have experienced decreases (such as New York and Connecticut). Figure 2A illustrates the percentage share of RGGI region CO_2 emissions in 1990 and Figure 2B shows the percentage share of RGGI CO_2 emissions in 2003.

Figure 2A: State Share of RGGI Region CO_2 Emissions (1990)

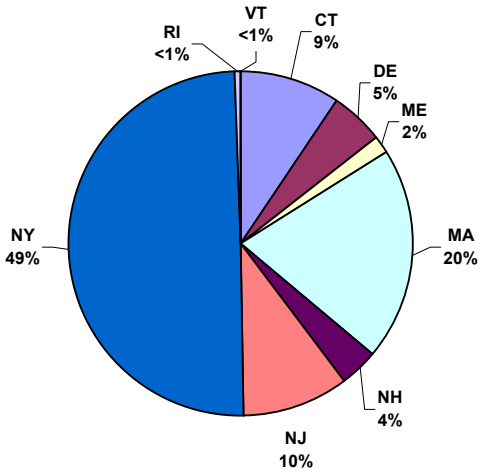
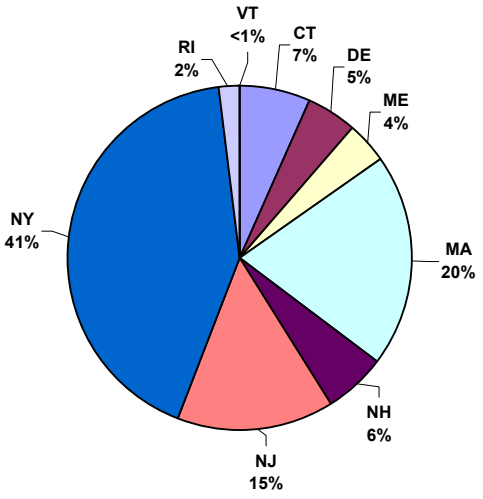


Figure 2B: State Share of RGGI Region CO_2 Emissions (2003)



Differences in Carbon Intensity. The historic carbon intensity of the electric generating sector in the RGGI states also varies. The CO_2 emission rates from 1990 and 2002 are summarized below for fossil electric generation only (Figure 3) and total electric generation (i.e., fossil, nuclear, hydro and other renewables) (Figure 4).

Figure 3: CO_2 Emission Rates by State (Fossil Only)

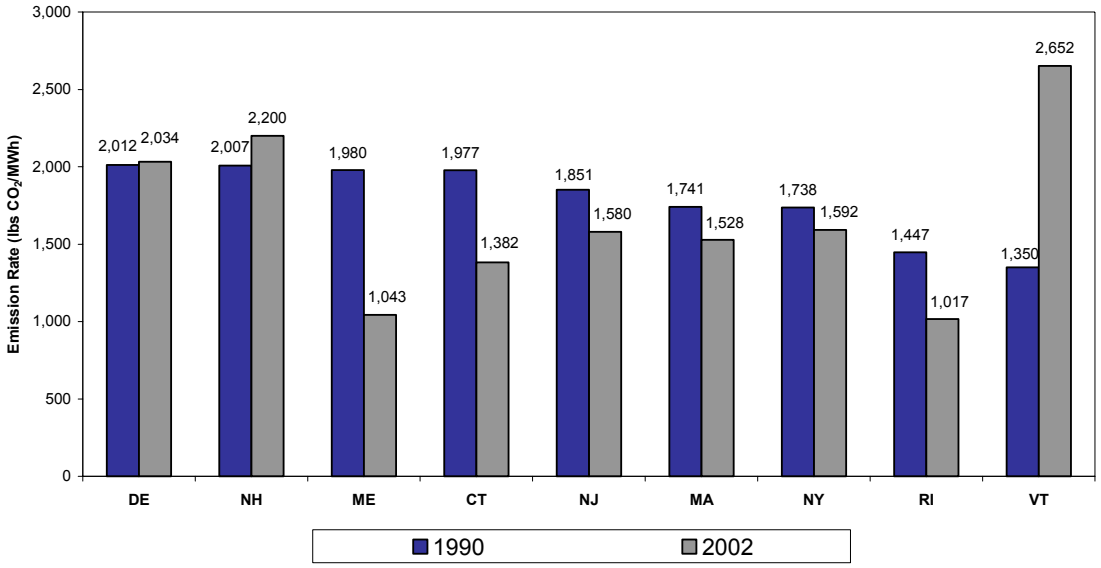
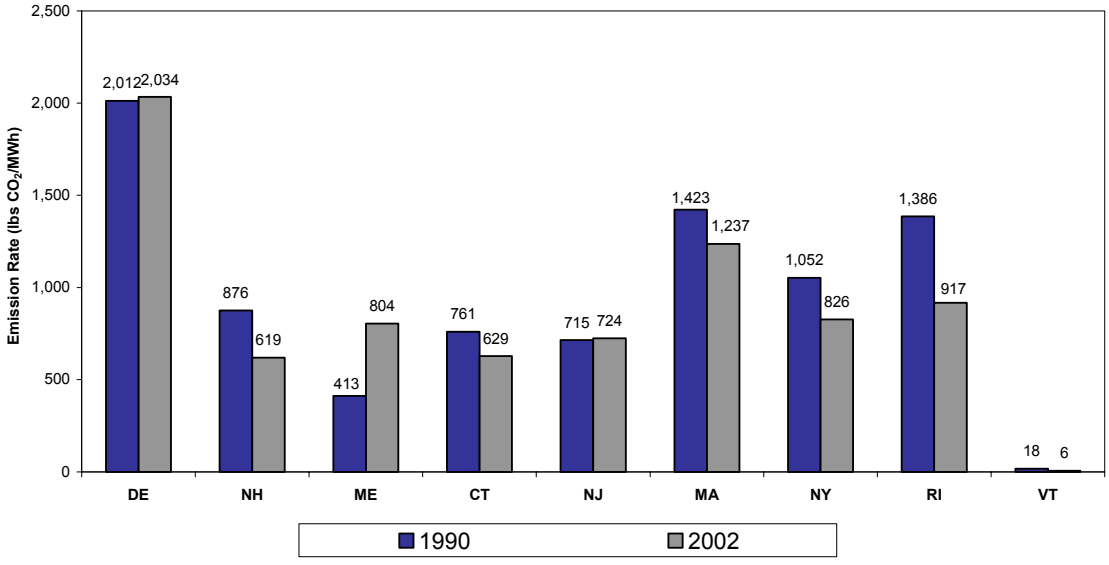


Figure 4: CO_2 Emission Rates by State (Total Energy)



Variability in Emissions Trajectories. Looking back at the past decade of electricity generation and CO_2 emissions data reveals a high degree of variability in the year-to-year trends within the RGGI states. According to data compiled by the Department of Energy, electric industry CO_2 emissions in the region were 14 percent below 1990 levels in 1996, only to increase to just above 1990 levels in 1998.[6] As indicated above, emissions were reported to be three percent below 1990 levels in 2003. This regional variability is a result of the collective changes that have taken place within each of the individual states.

Table 1 summarizes the absolute and percentage changes in electric industry CO_2 emissions within each RGGI state (1990 vs. 2003). These data highlight the large differences in each state's share of the region wide cap that would result from apportioning the cap based on historical emissions, if this is the strategy selected.

Table 1. Change in CO_2 Emissions from 1990 to 2003

State	Change in CO_2 emissions 1990 to 2003, tons	Percentage change in CO_2 emissions 1990 to 2003, percent
Connecticut	-4,277,031	-32%
Delaware	-752,128	-11%
Maine	2,956,477	125%
Massachusetts	-247,503	-1%
New Hampshire	2,763,590	52%
New Jersey	6,050,558	43%
New York	-11,977,537	-17%
Rhode Island	1,774,772	241%
Vermont	-17,799	-39%

Figures 5 through 13 show a state-by state breakdown of the information summarized in Table 1. They show trends in electricity generation fuel mix (1990 through 2002), CO_2 emissions (1990 through 2003), electricity sales by sector (1990 through 2003) and electricity imports and exports

[6] All electric industry emissions are based on data provided by the Energy Information Administration (EIA) in a spreadsheet entitled 1989-2003 Estimated Emissions by State and Fuel Type. See Appendix 1 for information on the data sources and methodology.

(1990 through 2002) for each RGGI state. The figures show that some states have increased their electric industry CO_2 emissions relative to their historic 1990 levels while others have decreased their emissions.

Figure 5. Connecticut Summary of Fuel Mix, Emissions, Electricity Sales and Imports and Exports

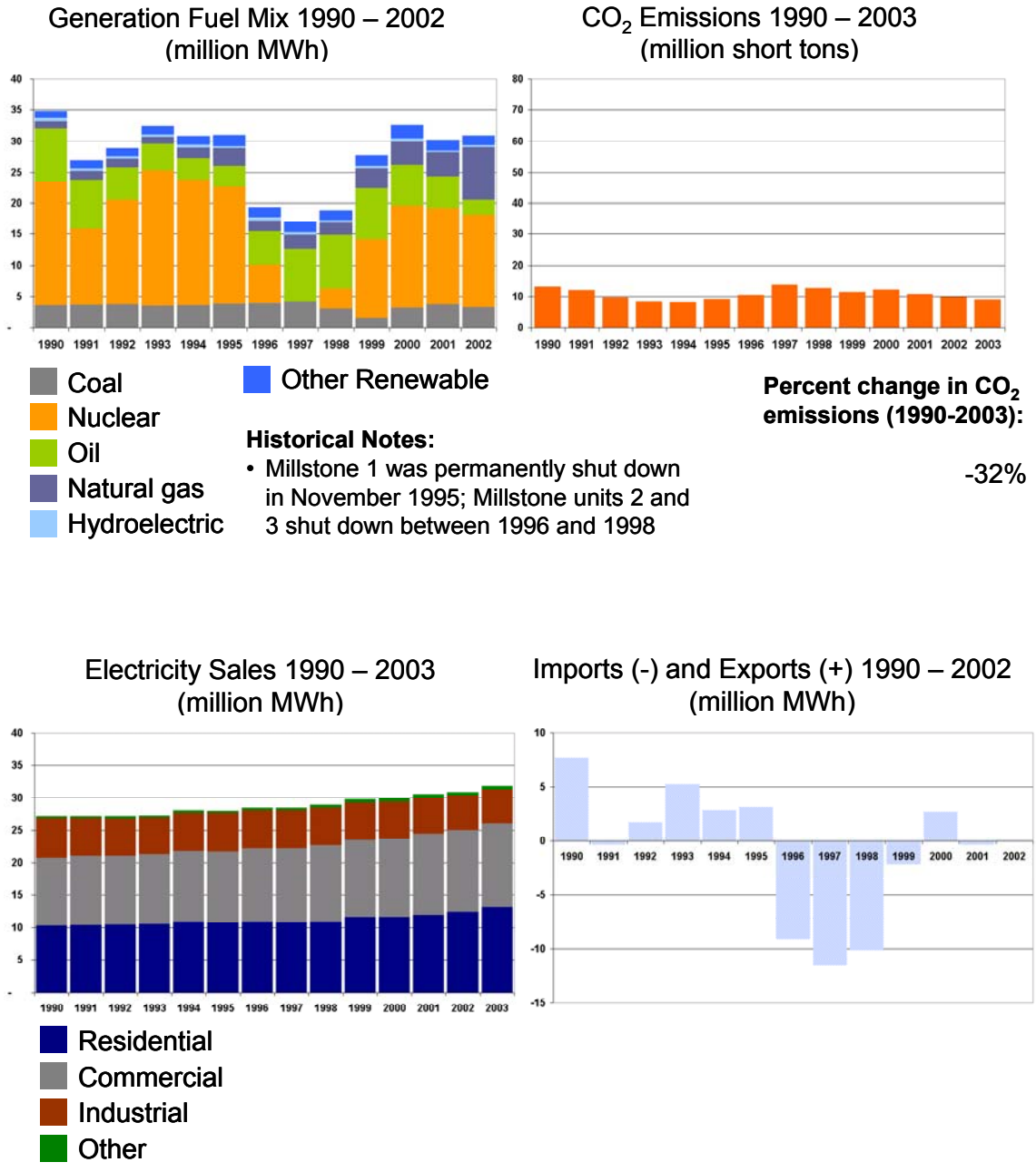
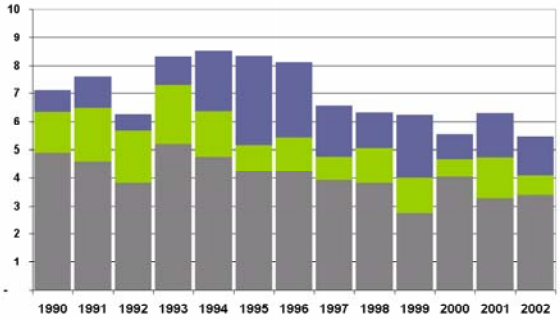
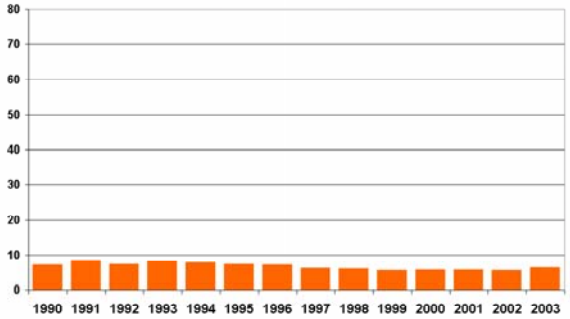


Figure 6. Delaware Summary of Fuel Mix, Emissions, Electricity Sales and Imports and Exports

Generation Fuel Mix 1990 – 2002
(million MWh)



CO_2 Emissions 1990 – 2003
(million short tons)



Coal
Oil
Natural gas

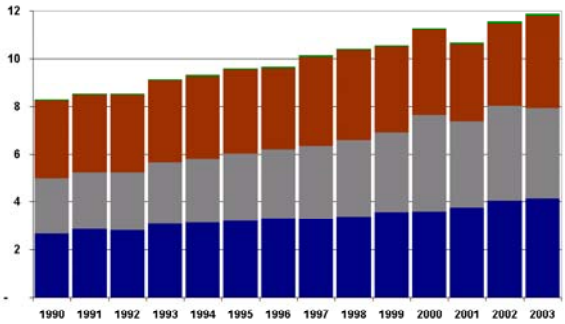
Historical Notes:

- Between 1990-2002, total power production decreased 23%; natural gas generated power increased 79%; coal generated power decreased 31%

Percent change in CO_2 emissions (1990-2003):

-11%

Electricity Sales 1990 – 2003
(million MWh)



Residential
Commercial
Industrial
Other

Imports (-) and Exports (+) 1990 – 2002
(million MWh)

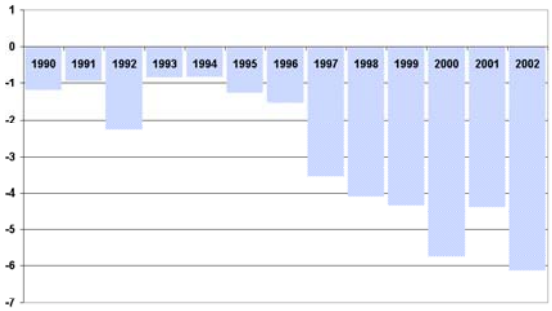
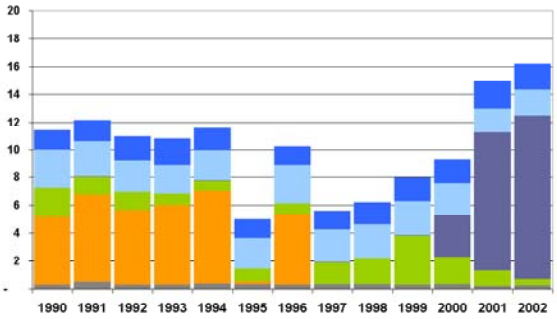
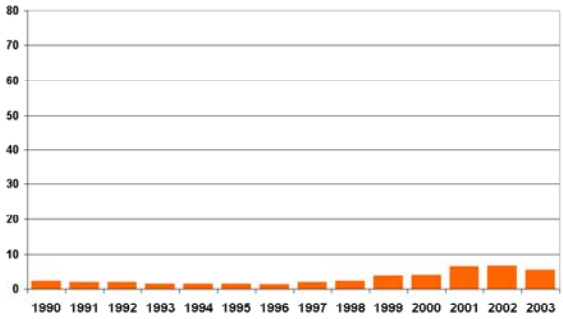


Figure 7. Maine Summary of Fuel Mix, Emissions, Electricity Sales and Imports and Exports

Generation Fuel Mix 1990 – 2002
(million MWh)



CO_2 Emissions 1990 – 2003
(million short tons)



Coal
Nuclear
Oil
Natural gas
Hydroelectric
Other Renewable

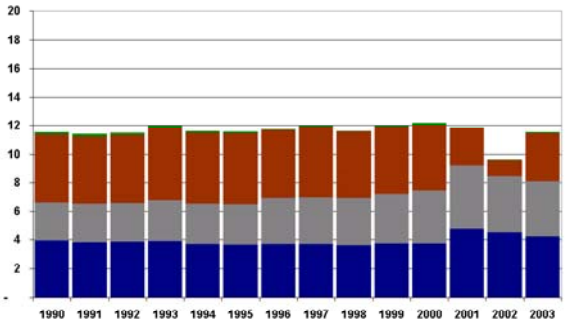
Historical Notes:

- Maine Yankee Nuclear closed in 1995 for repairs; closed permanently in 1997
- Natural gas units increased from 0.1% of total power in 1990 to 82% in 2002

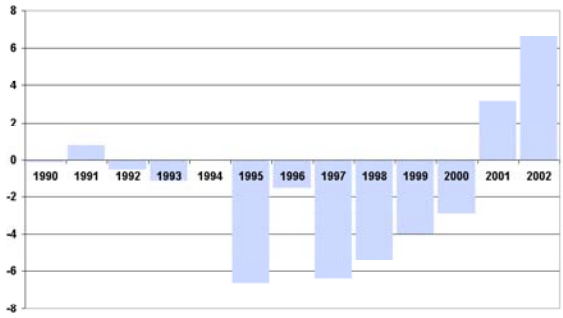
Percent change in CO_2 emissions (1990-2003):

+125%

Electricity Sales 1990 – 2003
(million MWh)



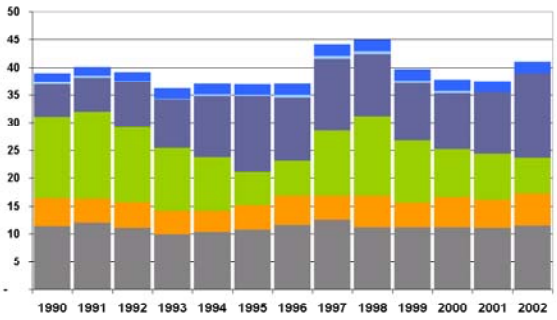
Imports (-) and Exports (+) 1990 – 2002
(million MWh)



Residential
Commercial
Industrial
Other

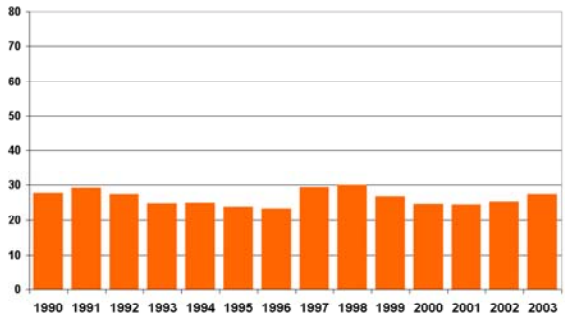
Figure 8. Massachusetts Summary of Fuel Mix, Emissions, Electricity Sales and Imports and Exports

Generation Fuel Mix 1990 – 2002
(million MWh)



Coal
Nuclear
Oil
Natural gas
Hydroelectric
Other Renewable

CO_2 Emissions 1990 – 2003
(million short tons)



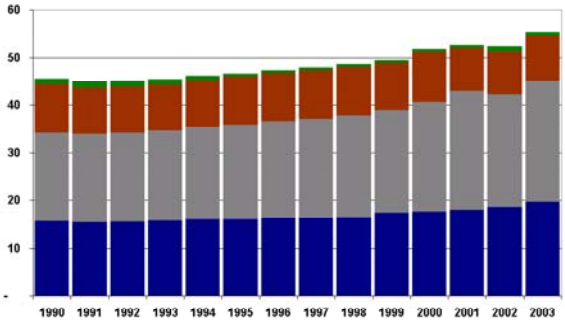
Historical Notes:

- Between 1990 and 2002, hydroelectric power decreased 98%; natural gas generated power increased 160%

Percent change in CO_2 emissions (1990-2003):

-1%

Electricity Sales 1990 – 2003
(million MWh)



Residential
Commercial
Industrial
Other

Imports (-) and Exports (+) 1990 – 2002
(million MWh)

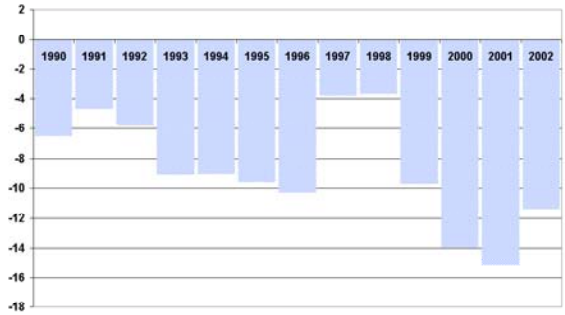
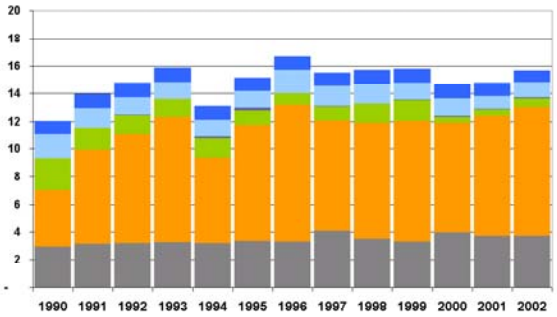


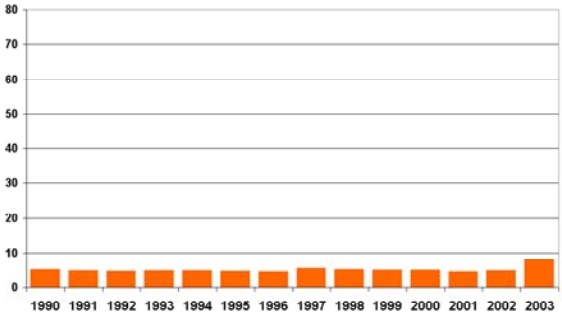
Figure 9. New Hampshire Summary of Fuel Mix, Emissions, Electricity Sales and Imports and Exports

Generation Fuel Mix 1990 – 2002
(million MWh)



Coal
Nuclear
Oil
Natural gas
Hydroelectric
Other Renewable

CO_2 Emissions 1990 – 2003
(million short tons)



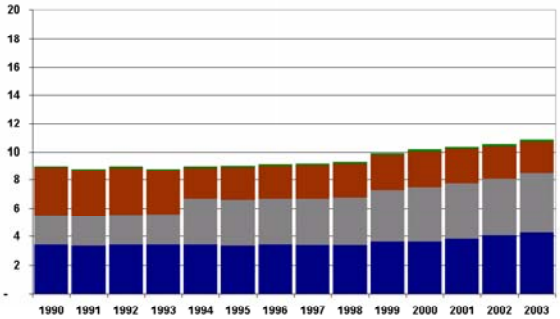
Percent change in CO_2 emissions (1990-2003):

+52%

Historical Notes:

- Between 1990-2002, oil-fired generation decreased 74%; coal increased 26%

Electricity Sales 1990 – 2003
(million MWh)



Residential
Commercial
Industrial
Other

Imports (-) and Exports (+) 1990 – 2002
(million MWh)

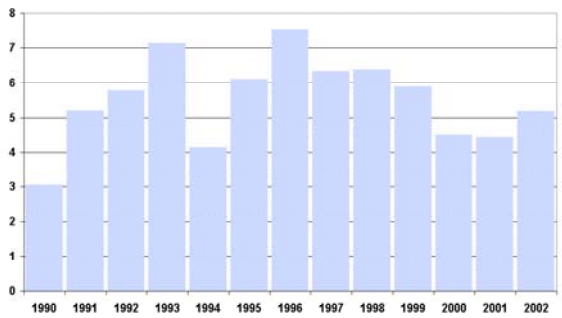
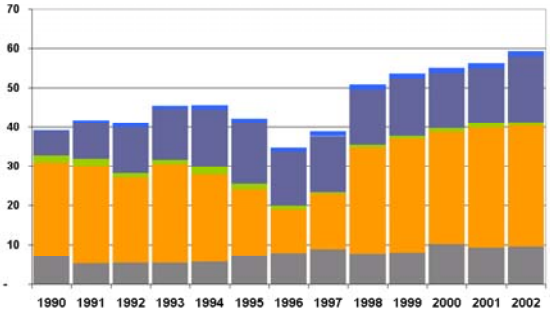
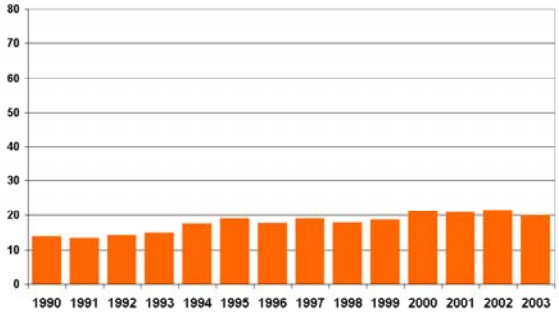


Figure 10. New Jersey Summary of Fuel Mix, Emissions, Electricity Sales and Imports and Exports

Generation Fuel Mix 1990 – 2002
(million MWh)



CO_2 Emissions 1990 – 2003
(million short tons)



Coal
Nuclear
Oil
Natural gas
Hydroelectric
Other Renewable

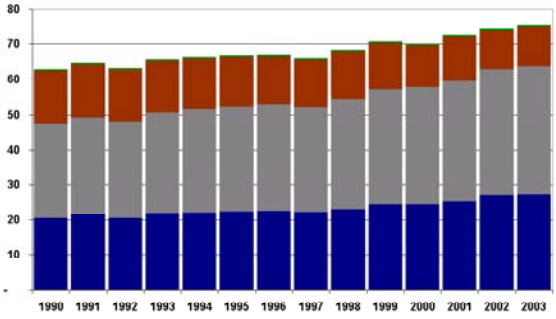
Historical Notes:

- Between 1990 and 2002, total power generation increased 51%; output increased 30%; natural gas increased 176%; coal increased 36%

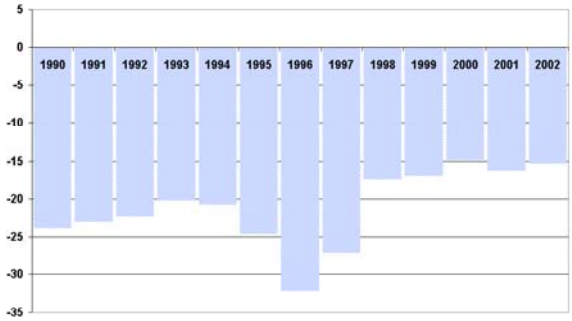
Percent change in CO_2 emissions (1990-2003):

+43%

Electricity Sales 1990 – 2003
(million MWh)



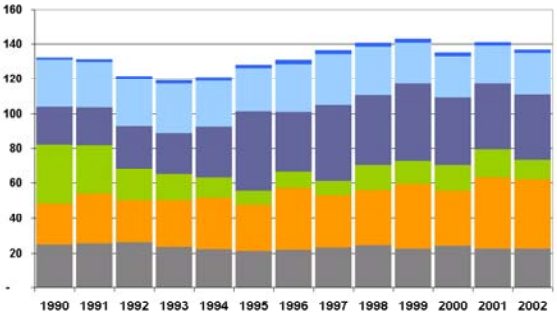
Imports (-) and Exports (+) 1990 – 2002
(million MWh)



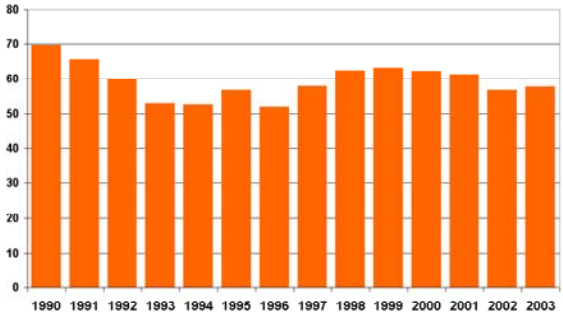
Residential
Commercial
Industrial
Other

Figure 11. New York Summary of Fuel Mix, Emissions, Electricity Sales and Imports and Exports

Generation Fuel Mix 1990 – 2002
(million MWh)



CO_2 Emissions 1990 – 2003
(million short tons)



Coal
Nuclear
Oil
Natural gas
Hydroelectric
Other Renewable

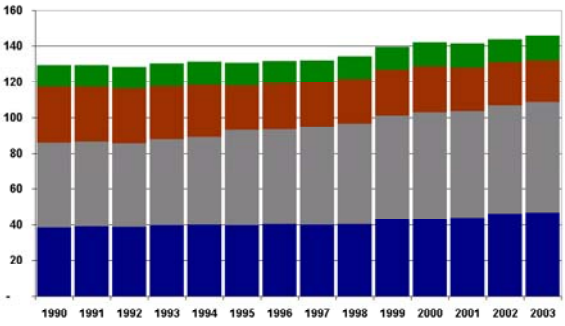
Historical Notes:

- Between 1990 and 2002, natural gas fired generation increased 70%; nuclear power generation increased 68%; and oil-fired generation decreased 66%

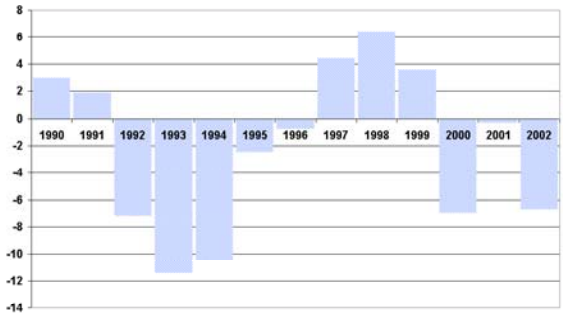
Percent change in CO_2 emissions (1990-2003):

-17%

Electricity Sales 1990 – 2003
(million MWh)



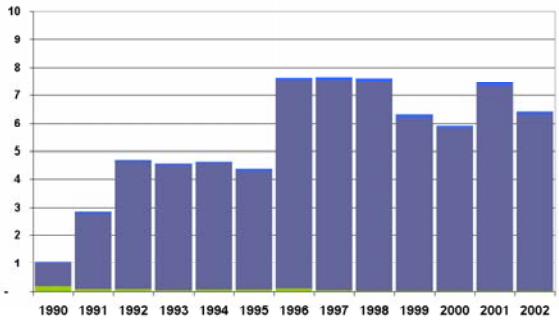
Imports (-) and Exports (+) 1990 – 2002
(million MWh)



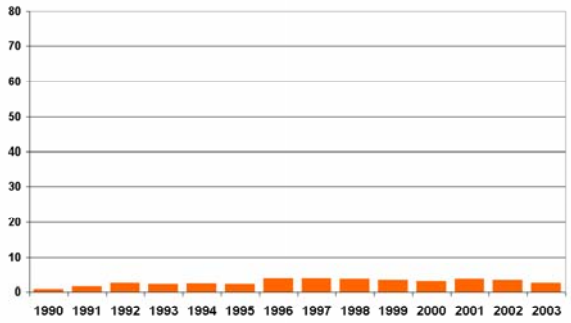
Residential
Commercial
Industrial
Other

Figure 12. Rhode Island Summary of Fuel Mix, Emissions, Electricity Sales and Imports and Exports

Generation Fuel Mix 1990 – 2002
(million MWh)



CO_2 Emissions 1990 – 2003
(million short tons)



Oil
Natural gas
Other Renewable

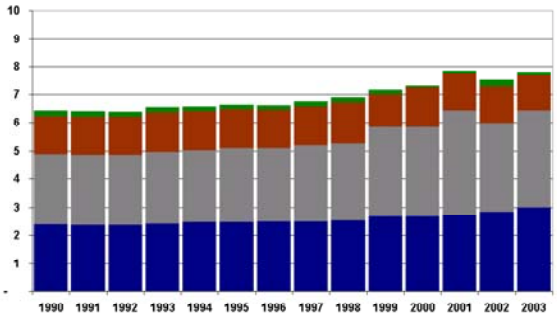
Historical Notes:

- Between 1990 and 2002, natural gas-fired power generation increased 632%

Percent change in CO_2 emissions (1990-2003):

+241%

Electricity Sales 1990 – 2003
(million MWh)



Residential
Commercial
Industrial
Other

Imports (-) and Exports (+) 1990 – 2002
(million MWh)

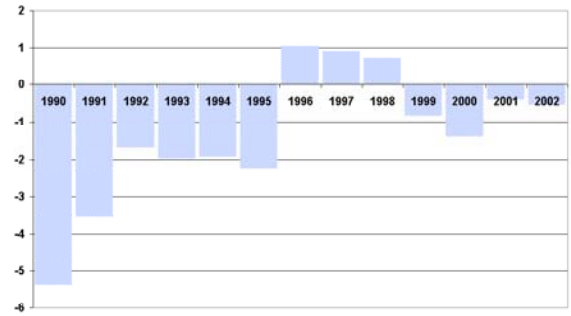
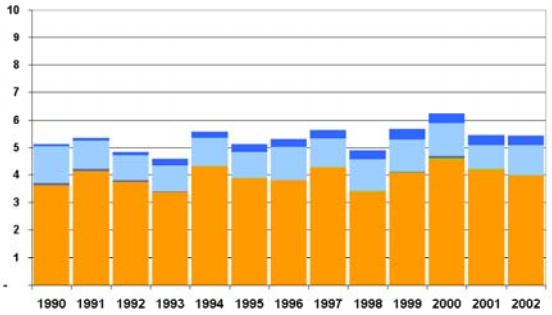
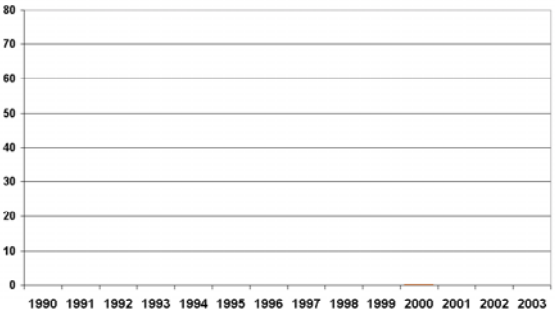


Figure 13. Vermont Summary of Fuel Mix, Emissions, Electricity Sales and Imports and Exports

Generation Fuel Mix 1990 – 2002
(million MWh)



CO_2 Emissions 1990 – 2003
(million short tons)



Nuclear
Oil
Natural gas
Hydroelectric
Other Renewable

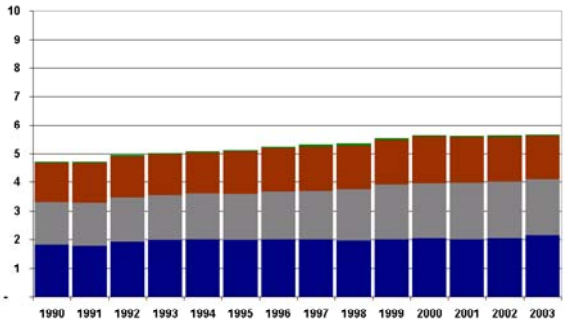
Historical Notes:

- Between 1990 and 2002, renewable generation experienced a large percentage increase; other fuels remained relatively constant.

Percent change in CO_2 emissions (1990-2003):

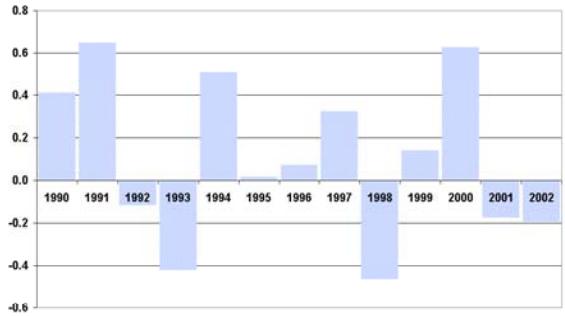
-39%

Electricity Sales 1990 – 2003
(million MWh)



Residential
Commercial
Industrial
Other

Imports (-) and Exports (+) 1990 – 2002
(million MWh)



III. GHG Coalition RGGI Policy Recommendations

This section and the remaining sections of this document address the key policy recommendations that the GHG Coalition advocates for RGGI. The GHG Coalition policy recommendations focus on five key areas:

1. CO_2 cap levels and timing,
2. allowance allocations,
3. flexibility mechanisms,
4. electricity imports and leakage, and
5. compliance and enforcement.

A. CO_2 Cap Levels and Timing

Decisions as to the levels and timing of a regional CO_2 cap for the electric generating sector need to be made in context. For example, related state and regional policies are already in place, electricity prices are already relatively high in the region, wholesale electricity markets in the northeast presently provide a competitive playing field for various power generation configurations, and regional CO_2 emissions and emissions intensity are relatively low. Also, cap levels cannot be chosen without consideration of the scope of the flexibility mechanisms that will be available. The GHG Coalition does not provide a specific recommendation for the level and timing of the cap at this time. The IPM modeling currently under development should help inform this decision, and we will revisit it when we have had an opportunity to review the modeling results. In the meantime, we offer the following general recommendations.

Reasonable CO_2 Cap to Attract Other States. As stated in *Section II*, RGGI states (full participants) electric industry CO_2 emissions were three percent below 1990 levels in 2003. Most other parts of the country have seen an increase in CO_2 emissions relative to 1990 levels in the power sector. With this in mind, the RGGI cap should be reasonable to make it possible for other states to join RGGI and achieve the required emission reductions of the program.

CO_2 Cap on the Electricity Sector in the Context of Economy Wide GHG Goals. The RGGI CO_2 cap on the electricity sector will have to be chosen with existing regional and state GHG reduction goals in mind. Most New England states have adopted the Conference of New England Governors and Eastern Canadian Premiers' economy wide GHG emission reduction goals: 1990 emission levels in 2010, ten percent below 1990 levels by 2020, and 75 to 85 percent below current levels over the long term. New York and New Jersey have state GHG economy wide reduction goals as well.[7] Massachusetts and New Hampshire have mandatory CO_2 emission reduction requirements for electric generating facilities.[8] Until the outcome of the economic modeling scenarios has been analyzed, RGGI should exercise caution on development of the mechanisms to achieve the goals. The level of the cap and the compliance mechanisms should not involve more stringent requirements than current regulations already promulgated at the state level.

Moreover, the obligation of the electricity sector to reduce emissions should be established with reference to the burdens that will need to be imposed on other sectors of the economy as RGGI is expanded in subsequent phases. The electricity sector should bear its share of the burden but, clearly, not the burden of the entire economy wide goal. The GHG Coalition supports the expansion of RGGI over time—to additional states and sectors of the economy. Thus, the program should start with a cap on CO_2 emissions from EGUs in the RGGI region, but be designed with the expectation of expansion soon thereafter. RGGI should develop a timeline for inclusion of additional sectors of the economy.

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[7] The New York State Energy Plan of 2002 sets an economy wide GHG reduction policy goal of five percent below 1990 levels by 2010 and ten percent below 1990 levels by 2020. This is not a legally binding requirement on New York State. Under New York State law, the only requirement is that actions of state agencies be "reasonably consistent with" the State Energy Plan. New York State Energy Law, § 6-104(3)(b). New Jersey Administrative Order 1998-09 establishes an economy wide GHG emission reduction goal of 3.5 percent below 1990 levels by 2005.

[8] Massachusetts' regulation (310 CMR 7.29) requires that by January 30 of the year following the earliest applicable compliance date for an affected facility, and January 30 of each calendar year thereafter, an affected facility shall demonstrate that emissions of carbon dioxide from units located at the affected facility did not exceed historical actual emissions. By January 30 of the year following the latest applicable compliance date for the affected facility under 310 CMR 7.29(6)(c), and January 30 of each calendar year thereafter, any person who owns, leases, operates or controls an affected facility shall demonstrate to the Department that the average emission rate of carbon dioxide from Part 72 units located at the affected facility did not exceed an emission rate of 1,800 lbs./MWh in the previous calendar year. New Hampshire's legislation (HB 284) sets a 1990 emission level requirement by 2006, with a commitment to develop an additional reduction requirement for 2010.

Definition of RGGI Affected Electric Generating Unit. The GHG Coalition recommends defining a RGGI affected EGU generally consistent with the definition of an affected unit under the Acid Rain Program (40 CFR Section 72.2). The RGGI affected EGU should include fossil fuel fired utility and non-utility units serving generators with an output capacity of greater than 25 megawatts. A unit that co-generates steam and electricity should not be included as a RGGI affected EGU unless the unit has an electric output capacity greater than 25 megawatts.

Structure of the Program. In light of concerns about leakage (see *Section III.D.I*), RGGI stakeholders have discussed different approaches to program design, including an EPS for retail electricity suppliers, allocation of allowances to retail suppliers, allocation of allowances to EGUs, and a hybrid approach that combines regulation of retail suppliers and EGUs. However, the GHG Coalition recommends that additional modeling be done, both to understand more fully the potential for leakage and the opportunities available to mitigate it. And as is detailed in *Section III.C.*, the GHG Coalition supports RGGI's use of a range of flexibility mechanisms, including the banking of allowances and inclusion of project-based reductions, or offsets, in the program. The choice of actual cap levels and timing will depend in large measure on the approaches that RGGI takes to mitigating leakage and to the scope of the flexibility mechanisms included in the program.

Gradually Declining CO_2 Cap. The GHG Coalition supports a gradual declining regional cap over an extended timeframe, rather than a series of sharp declines. In the near term, the level of the regional cap should increase relative to current emission levels to account for growth in demand and then begin a gradual decline. This will avoid disrupting existing wholesale electric markets and contract obligations, negotiated in the absence of a CO_2 mandate, while allowing companies time to become familiar with the operations of the program.

Base Year/Baseline Year(s) for Cap Purposes. The regional CO_2 cap level should be set in reference to 1990 to coincide with international, regional and state level GHG reduction goals. The concept of "regional base year" should be separated from the choice of "facility baseline year(s)" for allowance allocation purposes**.**

Regional CO_2 Cap State Apportionment Methodology. The GHG Coalition recommends an *updating output based* methodology for the apportionment of the region wide CO_2 cap to the RGGI states. The apportionment methodology should be based on the state's percentage share of RGGI region electricity generation in order to fully realize the advantages of an output based allocation to individual electric generating units and maximize the equity between RGGI states.

While the GHG Coalition recommends that the region wide cap be apportioned among the RGGI states to reflect changes in the competitive electricity markets since 1990, we also recommend crediting early actions that have resulted in GHG emission reductions since 1990.

B. Allowance Allocations

One of the more controversial aspects of a cap-and-trade program is the methodology used for distributing allowances to individual states and individual EGUs. The RGGI state regulators have only a discrete pool of allowances to dispense, and the choices they make about their distribution have important economic consequences for the affected companies. The discussion that follows outlines the Coalition's recommended approach for distributing allowances under RGGI.

The Need for Transparency. The allocation system should be transparent. Transparency will assure the identification of errors in the data in advance of final allocation decisions, and will facilitate efficient asset management and planning. The underlying data, formulas, total state allocations and individual source allocations should be made publicly available well in advance of the applicable compliance period. Similarly, there should be an opportunity for public input prior to any major changes in allocation policies.

Allocation Methodology. The GHG Coalition favors a *fossil fuel neutral*, *updating, output-based* allocation methodology, with a set-aside for new sources. An output-based allocation relies on energy production, or output, as the basis for determining the number of allowances that an affected source receives. For example, if an existing fossil-fuel facility generates ten percent of the electricity produced by the universe of affected sources, it will receive ten percent of the available allowances. An updating, output-based allocation alters the distribution of allowances based on changes in a facility's share of total generation output over time. This approach has at least two

advantages: it creates incentives for companies to operate their facilities as efficiently as possible and sends a signal to the market regarding the construction of higher efficiency plants.

The allocation methodology should use gross rather than net electricity generation. Gross output from an electric generating unit would be the gross electric generation (MWh) that comes directly from the electric generator terminals before any electricity is used internally at the plant. This avoids the imposition of an additional economic burden on those generators who are adding or have added control technology for SO_2 and NOx and/or mercury emissions.

In order to encourage cogeneration, the allocation methodology should recognize useful steam output as well as electricity output. Efficient cogeneration delivers heat and electricity with lower net CO_2 emissions than result from separate boilers and power plants. The thermal output of a unit can be converted to the MWh equivalent and added to the unit's electricity output for the purpose of calculating allocations.

Finally, we suggest further discussion regarding the treatment of incremental non- and net zero-CO_2 emitting EGUs within the RGGI program (i.e., nuclear, wind, and other renewables, etc.). This decision on allowance allocations must be coordinated with the offset and new source set aside provisions of the RGGI program in addition to the renewable portfolio standards in the region.

Timing of Allocation Distribution. The GHG Coalition suggests distributing allowances at least three years in advance of the applicable compliance period, which will facilitate business planning. For example, vintage 2015 allowances would be allocated no later than 2012. With an updating allocation, this can be done on a rolling basis.

The Creation of an Incentive for New Generation. The program should include a new source set-aside in order to remove a potential barrier to the construction of new CO_2 emitting facilities that would otherwise be required to acquire allowances from the market and that would typically have lower CO_2 emissions than existing facilities. New sources would subsequently be integrated into the program. Also, there should be further discussion of allocating to new non-emitting sources such as wind, hydro and nuclear. This design feature of a cap-and-trade program provides an

opportunity to encourage investment in specific types of electric generating facilities. Any excess set-aside allowances should be re-allocated to existing sources on a pro-rata basis, during the subsequent compliance period.

Consistency in the Market. The GHG Coalition recommends a consistent approach to allocations across all of the RGGI states in order to avoid distortions in the electricity markets. RGGI should avoid a patchwork of allocation methodologies, which may lead to a "race to the bottom" as states seek to advantage their own domestic generating facilities.

The Avoidance of Creating Artificial Distortions in the Market. The allocation methodology should not be treated as an opportunity to pick winners and losers in the market by, for example, blunting the financial impact of the policy on the highest emitting facilities, which are also the power plants with the highest compliance costs. The impact of RGGI on a company's economic performance will be determined in large measure by cap levels and timing and by the types of assets that it owns and operates. A stringent cap, regardless of allocation methodology, will have a significant impact on the asset value and economic viability of a high emitting facility.

Advocates of an allocation methodology that favors higher emitting sources argue that the highest emitters should receive the bulk of allowances because they incur the highest compliance costs. Owners of lower emitting facilities reject this argument, pointing out that they are already paying the higher costs associated with operating less carbon- intensive facilities. We discourage policymakers from becoming embroiled in this debate, and urge that they focus instead on the policy objectives of the program by developing fossil fuel neutral output based allocation methodologies.

Opposition to a Large Public Benefit Allocation. While the GHG Coalition believes that investments in cost effective energy efficiency in the RGGI region is valuable, the GHG Coalition is opposed to establishing a public benefit allocation. Some stakeholders have recommended the establishment of a public benefit allocation to create funds for in region energy efficiency and renewable energy investment, based on the erroneous assumption that the electric generating sector in the Northeast will enjoy economic benefits as a result of the CO_2 cap. Establishing a CO_2

cap in the Northeast while neighboring states remain unregulated creates important competitive concerns. A public benefit allocation, which would effectively create an auction approach to allocation, would aggravate these concerns, creating further economic disadvantages for power companies in the RGGI region.

C. Flexibility Mechanisms

Existing cap-and-trade programs for NOx and SO_2 have been highly effective in delivering cost-effective reductions because of the availability of emission control technologies and low sulfur coal supplies. Fossil fuel-fired power plants have fewer opportunities to reduce CO_2 emissions, in part because there are no commercially available end-of-pipe emission control devices for CO_2. The options these facilities have include: (i) switching to lower carbon fuels, an option limited by the cost and availability of alternative fuel supplies and other factors; (ii) improving power plant efficiency, a strategy made more difficult by the installation of advanced pollution control systems, which actually reduce a plant's efficiency and increases PSD/NSR concerns; and (iii) shutting down operations, an option that may not be available for a number of reasons, including the need to maintain electric system reliability.

This situation is exacerbated by the fact that CO_2 emissions from EGUs in the Northeast are already relatively low, while electricity prices are high as compared to other areas of the country. Thus, owners of affected sources in the region will need access to a reasonable menu of flexibility mechanisms that will encourage them to identify and allow them to take advantage of lower cost emissions reduction opportunities. The GHG Coalition recommends that the following flexibility mechanisms be included in the RGGI Model Rule.

Reciprocity with Other Cap-and-Trade Programs. Climate change is a global concern that requires a coordinated global response. The European Union, Canada, and Australia are all designing CO_2 cap-and-trade programs. To increase the cost-effectiveness of reducing CO_2 emissions, RGGI should be designed to allow reciprocity with these emerging programs. Linkages with other programs will provide access to a larger pool of allowances and emissions reduction opportunities, increasing flexibility for RGGI sources while delivering credible GHG reductions.

The EU ETS Linking Directive includes language allowing for the "mutual recognition" of allowances between the EU scheme and programs in states and provinces in Annex B countries that have not ratified Kyoto (namely the United States and Australia) that implement mandatory GHG emissions cap-and-trade programs. While mandatory schemes in the U.S. and Australia would not be able to sell allowances into the EU scheme, until those countries ratify, the Linking Directive introduces the potential one-way flow of allowances from the EU ETS to U.S. and Australia systems. This serves as a formal recognition of state, provincial, and regional efforts in the U.S. and Australia, which sends a signal of support for these actions to the U.S. and Australian national governments. The background to the Linking Directive directly references the Western Governor's Global Warming Initiative and Regional Greenhouse Gas Initiative, naming "10 to 12 States around New York in the Northeast of the U.S. and for the three U.S. States on the West Coast: California, Washington and Oregon." The European Commission acknowledges that it must develop the technical details as to how such linking of emission trading in different regions of the world is possible. [9]

It is critical that RGGI consider and understand the detailed market designs presently used in other regions of the world. The buying and selling of CO_2 allowances in the EU has begun, and is the first of its kind in the world. Allowance allocations, offsets, caps and allowance registries, among other factors, should be understood, and considered when developing the RGGI program.

Compliance Period/True-up. The GHG Coalition recommends three-year compliance and true-up periods. NOx and SO_2 cap-and-trade programs have annual compliance requirements and true-up periods largely because of the much shorter lifespan of these chemicals in the atmosphere as compared to CO_2. Allowances could still be allocated on an annual basis, but companies would compare their three-year emissions totals against their aggregated three-year allowance holdings to determine compliance. Among other things, this would reflect such industry realities as extreme weather events and facility outages.

[9] See http://europa.eu.int/comm/environment/climat/emission/pdf/dir_2004_101_en.pdf

Carbon Offsets. Offsets, or project-based emissions reductions, should be allowed for use in complying with the RGGI CO_2 cap, such that an offset is equivalent to an allowance. An offset program would allow generating companies to acquire reductions from sources not subject to the cap, from within and outside the RGGI region, opening up a much wider array of compliance options and thereby increasing the cost-effectiveness of the program. Since climate change is a global issue, the geographical applicability carbon offsets should not be limited to the RGGI region.

The GHG Coalition recommends a 2002 start date for defining the eligibility of carbon offsets in RGGI. All GHG emission reduction projects that commenced in 2002 and later should be eligible to create carbon offsets as long as they meet the criteria and utilize the standardized protocols for monitoring, reporting and verification specified in the RGGI Model Rule. This start date is reasonable given the clear indication that the majority of the RGGI region was intent on capping GHG emissions based on the goals established in the Conference of New England Governors and Eastern Canadian Premiers, Climate Change Action Plan of 2001.

The issue of "additionality" is often an area of debate when establishing the specific eligibility criteria for carbon offsets. The GHG Coalition recommends that RGGI take a reasonable and standardized approach to the issue of additionality by focusing on two related elements – regulatory additionality and environmentally additionality. Using this approach to additionality, any emission reduction/sequestration action that 1.) exceeds regulatory requirements and 2.) results in real environmental benefits (i.e., reduction of greenhouse gas emissions) relative to business as usual are eligible to create carbon offsets. The GHG Coalition does not believe that financial additionality is a reasonable approach. Given the extremely low cost per ton of CO_2 offsets in current markets, the financial value of a future offset stream will not (in and of itself) make a bad capital investment into an economically beneficial one. Furthermore, different companies have different financial payback requirements for capital investments, making the standardized use of a financial additionality test all the more unreasonable.

The RGGI Model Rule should identify priority categories of offset projects as well as clear offset criteria, for immediate use in business planning decisions. The priority projects should include, at a minimum:

- combustion-related emissions reductions from industrial and commercial stationary and mobile sources;
- process-related emissions reductions from manufacturing sources;
- fugitive emissions reductions from natural gas systems, electricity systems, air conditioning and refrigeration systems, fire suppression equipment and landfills; and
- carbon sequestration from forest and agricultural projects.

Reductions of any of the six GHGs should be eligible for inclusion as offsets. Not only are the GHGs other than CO_2 important in terms of their climate impact, but they also offer some of the most cost-effective control options. Because of their radiative strength and atmospheric life, reductions of these gases can be hundreds or even thousands of times more effective in addressing global warming than equivalent reductions of CO_2 emissions. According to an MIT analysis, inclusion of non-CO_2 abatement options in a GHG reduction program would reduce by two-thirds the costs associated with stabilizing U.S. GHG emission at 2000 levels by 2010.[10]

The RGGI Model Rule should include a process for adding quantification protocols and detailed monitoring, reporting and verification protocols as the project goes forward, to ensure that the reductions from offset projects are real and highly credible.

Banking of Allowances. The RGGI trading system should allow for unrestricted banking of CO_2 allowances. Unlike NOx emissions, which have local impacts warranting flow control, CO_2 emissions have no local impacts and, therefore, there is no rationale for a limitation on banking of allowances.

Early Reductions. Investments that RGGI affected sources have made in reductions should be entitled to credit as long as they meet the criteria and utilize the standardized protocols for

[10] Pew Center on Global Climate Change, Multi-Gas Contributors to Global Climate Change: Climate Impacts and Mitigation Costs of Non-CO_2 Gases, February 2003.

monitoring, reporting and verification specified in the RGGI Model Rule. Affected sources have made investments that have not only reduced emissions at their own facilities but that have also reduced or sequestered emissions off-site at other locations. For example, some sources have achieved emission reductions (e.g., increased natural gas use and/or fuel switching, etc.) in the absence of participation in a voluntary state or federal program. In addition, some companies with affected sources have also reduced GHG emissions as part of the Department of Energy's Climate Challenge Program and the U.S. Initiative On Joint Implementation.[11] These include investments in carbon offset projects through such industry initiatives as UtiliTree Carbon Company. Additionally, voluntary EPA programs (e.g., Natural Gas STAR, the Landfill Methane Outreach Program, WasteWise, and the SF_6 Emissions Reduction Partnership for Electric Power Systems) have resulted in GHG emissions reductions within the electric generating sector.[12] Many owners of affected sources have registered these and other activities with the Energy Information Administration's Voluntary Reporting of Greenhouse Gas Program (section 1605(b)).[13]

Circuit Breaker Mechanism. The GHG Coalition supports the inclusion in the RGGI program of a "circuit breaker," which would stop the decline of the cap when the average annual allowance price exceeded a predetermined level. The decline of the cap would continue when allowance prices fell below the circuit breaker level. Such a mechanism provides certainty for the regulated entities that the costs of the program will be capped at a predetermined amount, which would provide predictability to wholesale electricity markets.

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[11] For more information on USIJI see http://www.gcrio.org/usiji/index.html

[12] For more information on the Landfill Methane Outreach Program see http://www.epa.gov/lmop/

For more information on WasteWise see http://www.epa.gov/wastewise/

For more information on Natural Gas Star see http://www.epa.gov/gasstar/

For more information on the SF_6 Partnership see http://www.epa.gov/highgwp/electricpower-sf6/index.html

[13] For more information on the 1605b program see http://www.eia.doe.gov/oiaf/1605/frntvrgg.html

D. Electricity Imports and Leakage

GHG Coalition members and other stakeholders in the RGGI process have raised the concern, based on initial modeling efforts[14], that the usual approach to a trading regime, in which generators are regulated on a regional basis, will lead to "leakage." As we have discussed, *electricity prices* in the RGGI region are *higher* than in the contiguous area, while as described in *Section II* electricity CO_2 *emission rates* are *lower*. Additionally, the RGGI region is already a net power importer. The concern is that the imposition of CO_2 emissions limits would exacerbate this situation, making generation within the region even more expensive relative to generation outside the region than it is at present. In response, the region would tend to import lower priced higher emitting power from surrounding areas. The risk that reductions in CO_2 emissions within the region will be substantially offset by an increase in imported higher emitting power threatens RGGI's fundamental goals. Moreover, an increase in power imports at the expense of local power raises competitive concerns for electricity generators within the RGGI region. Leakage is one of the many reasons why a *national* CO_2 program is the preferred approach.

The GHG Coalition has convened an Ad Hoc Leakage Working Group to explore options for addressing the higher emissions associated with the power imported into the RGGI region. The options under discussion to date have been an Emission Portfolio Standard (EPS) for retail electricity suppliers and allocation of allowances to retail suppliers. The first option, an EPS, would apply an output-based standard to the portfolios of retail suppliers that provide electricity to customers in the region. The EPS would require that the seller of electricity (which might or might not own power plants) ensure that the average emission rates of all fossil fuel-fired generation sources used to meet its customers' electricity needs not exceed specific output-based performance standards. Any power imported into the RGGI region to serve retail demand would be covered by the EPS, while power that the Load Serving Entity (LSE) purchased from in-region EGUs would instead be subject to the regional CO_2 cap. The second option would involve the allocation of allowances to retail suppliers, also on an output basis.

[14] See the Connecticut Climate Change Stakeholder Dialogue at http://www.ccap.org/connecticut.htm and the results of the New York Greenhouse Gas Task Force at http://www.ccap.org/NYGHG.htm.

Adoption of either one of these approaches might solve or mitigate the leakage problem by addressing the CO_2 emissions from imported power, while the cap on CO_2 emissions from in-region generation would serve to limit local emissions. There are significant obstacles in implementing this option because of the lack of a carbon allowance registry and because ISO market dispatch software doesn't consider emissions when dispatching generation. It is possible that the only implementation method would be bi-lateral contracts, which could result in significant price increases in the RGGI region. However, additional approaches should continue to be explored and considered that might address the leakage issue.

Addressing Leakage. The Coalition principally supports a *national* CO_2 program to address leakage. However, we recommend that the RGGI program be designed so as to minimize leakage on a regional level. The Coalition further recommends that additional modeling be undertaken, both to understand more fully the potential for leakage and the market designs and rules for addressing the problem.

Another possible leakage mitigation option that should be discussed further is the centralized procurement of allowances or offsets to counter the CO_2 emissions increase from an increase in electricity imports. A State authority could be required to offset the CO_2 emission increase outside the RGGI region through the purchase of allowances or carbon offsets. This centralized procurement approach is similar to the implementation of the New York State renewable portfolio standard by the New York State Energy Research and Development Authority (NYSERDA).[15]

Moreover, because leakage is a significant issue, the RGGI initiative should not be fully implemented until this issue is addressed either by further modeling or adoption of another mitigation method.

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[15] See NYPSC, 03-E-0188, Order Regarding Renewable Portfolio Standard ("RPS"), (Sept. 24, 2004). In this Order, the PSC adopted a goal that New York should increase the amount of electricity consumed by retail customers in New York State from approximately 19% of total electric energy consumed to 25% of total electricity consumed by 2013. Instead of imposing requirements on retail suppliers to meet this standard, the State designated the New York State Energy Research and Development Authority ("NYSERDA") as a central procurement authority to enter into contracts with renewable developers to increase the amount of generation produced from such sources.

E. Compliance and Enforcement

Compliance and enforcement provisions are essential for effective implementation of emission cap-and-trade programs. Under the RGGI program, compliance and enforcement activities will be the responsibility of the individual RGGI states. Compliance and enforcement provisions will focus on the following: 1) emissions monitoring and reporting; 2) tracking of allowances with an electronic registry; 3) penalties for noncompliance; and 4) public access to data.

Emissions monitoring and reporting. For existing electricity sector cap-and-trade programs there are detailed requirements for continuous emissions monitors (CEMs) for both SO_2 and NOx. 40 CFR Part 75, which establishes requirements for the monitoring, recordkeeping and reporting of SO_2, NOx, and CO_2 from affected units under the Acid Rain Program, lists three approaches for determining CO_2 emissions: 1) CEMs and a flow monitoring system for measuring CO_2 concentration, volumetric gas flow, and CO_2 mass emissions; 2) a calculation based on the measured carbon content of the fuel; and 3) a flow monitoring system and a CO_2 CEMS that uses O_2 concentration to determine CO_2 emissions. The carbon content method of calculating CO_2 emissions described in Appendix G to 40 CFR Part 75 involves determining the carbon content of the fuel combusted and applying that to the amount of fuel burned to get CO_2 emitted from combustion.

These emissions (including CO_2) are reported electronically to EPA, there are extensive electronic auditing procedures, and there are occasional on-site audits of facilities. RGGI should rely on 40 CFR Part 75 and the existing infrastructure within EPA's Clean Air Markets Division to obtain the necessary CO_2 emissions data. The program should not require so-called "fuel based" reporting and third-party verification of CO_2 emissions data. In the event that RGGI is expanded in the future to include other stationary source sectors, additional monitoring and reporting methods can be developed for those sectors.

Allowance tracking. The Regional Greenhouse Gas Registry (RGGR) should function as the CO_2 allowance tracking registry for RGGI. RGGR should track similar information to that tracked by EPA's NOx Allowance Tracking System. The fields include account information, account holdings, and transfers of CO_2 allowances. RGGR should develop a system of serial numbers to assign to

each CO_2 allowance, that contains identifying data such as information on the facility where the allowance originated and the year ("vintage") in which the allowance was issued. The GHG Coalition recommends making the structure of the serial numbers consistent with the EU ETS in order to facilitate reciprocity.[16]

RGGR should serve as an electronic data tool for RGGI state agencies to ensure that the RGGI CO_2 cap is achieved. RGGR should allow the RGGI state agencies to set up CO_2 allowance accounts, issue CO_2 allowances, retire allowances, and true up at the end of the compliance period. Finally, RGGR should facilitate public access to CO_2 emissions data.

Penalties for noncompliance. Penalties for noncompliance are usually framed in monetary terms and also include requirements that excess emissions be offset in a subsequent compliance period. For example, the EU ETS imposes excess emission penalties and requires installations to offset excess emissions in the following year. RGGI could also include monetary penalties for noncompliance and require that emissions be offset in the following compliance period. The enforcement authorities should have discretion to adjust financial penalties and offset requirements on a case-by-case basis.

[16] For information, see the European Commission's Community Independent Transaction Log at http://europa.eu.int/comm/environment/ets/

Appendix 1: Power Plant Generation and Emissions Data Sources and Methodology

The electricity generation, emissions, sales data used in this report are annually complied by the Electric Power Division, Office of Coal, Nuclear, Electric and Alternate Fuels (CNEAF), Energy Information Administration (EIA), U.S. Department of Energy (DOE). CNEAF regularly reviews and updates these data.

Generation Estimates

The generation data are from the *Electric Power Annual 2003*, published in December 2004. The data can be downloaded through the EIA website.[17] Generation data can be broken out by state and year for 1990 – 2002. Generation data are not currently publicly available for 2003.

Generation data are collected through Form EIA-906, "Power Plant Report." According to EIA, Form EIA-906 "is used to collect monthly plant-level data on generation, fuel consumption, stocks, fuel heat content, and useful thermal output from electric utilities and nonutilities from a model-based sample of approximately 260 electric utilities and 900 nonutilities. The form is also used to collect these statistics from the rest of the frame (i.e., all generators 1 MW or greater) on an annual basis."

EIA has authority to collect the data in Form EIA-906 from the Federal Energy Administration Act of 1974. Form EIA-906 data are collected through the CNEAF Internet Data Collection System. EIA has a detailed data quality assurance procedure outlined in Appendix A of *Electric Power Annual 2003*. Of about 2,600 facilities from which EIA collected data in 2003, some form of estimation was used to adjust data on 803 facilities (representing about 4 percent of generation and about 20 percent of fuel consumption).

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[17] *Electric Power Annual 2003* is available at <http://www.eia.doe.gov/cneaf/electricity/epa/epa_sum.html>. State level data are available through the "Historical Spreadsheets" link.

To calculate generation from RGGI states, M. J. Bradley & Associates (MJB&A) used the publicly available spreadsheet *1990 - 2002 Net Generation by State by Type of Producer by Energy Source (EIA-906)*. MJB&A sorted the data by state and year. No further manipulation of the data was necessary.

Emissions Estimates

The emissions data were collected by EIA and sent to M. J. Bradley & Associates in a spreadsheet entitled *1989-2003 Estimated Emissions by State and Fuel Type*. Emissions data aggregated by electricity sector, year, and state were not available through the EIA website. Alternate forms of emissions data are available through the EIA website.

EIA collects emissions data from Form EIA-767, "Steam-Electric Plant Operations and Design Report," and Form EIA-906 (described above). According to EIA, Form EIA-767 is part of a "mandatory restricted-universe census of all electric power plants with a total existing or planned organic-fueled or combustible renewable steam-electric generator nameplate rating of 10 or more megawatts." About 800 power plants with a nameplate capacity of 100 or more megawatts submit information on plant operations and equipment design. Approximately 600 power plants with a nameplate capacity of less than 100 megawatts provide slightly less detailed information.

As with Form EIA-906, EIA has authority to collect the data in Form EIA-767 from the Federal Energy Administration Act of 1974. Reporting facilities can submit Form- EIA-767 through EIA's Internet Data Collection system beginning in January of each year to report data from the previous calendar year. All submissions must be completed by April 30.

EIA estimates carbon dioxide (CO_2) from electric generating plants using the data from Form EIA-906. CO_2 data are not collected on From EIA-767 since there are no Federal regulations limiting CO_2. The CO_2 estimates are calculated using the coefficients published in *Emissions of Greenhouse Gases in the United States* (DOE/EIA-0573).[18] According to EIA, "calculated emissions are directly proportional to the quantities of fuels consumed." To calculate CO_2

[18] *Emissions of Greenhouse Gases in the United States2003* (DOE/EIA-0573) is available at <ftp://ftp.eia.doe.gov/pub/oiaf/1605/cdrom/pdf/ggrpt/057303.pdf>.

emissions from coal, EIA uses emission factors based on the "rank, amount of coal received, and the state from which the coal originated."

To calculate the emissions from electric generators in RGGI, MJB&A sorted the CO_2 emissions by state and by year. Non-RGGI states were eliminated. MJB&A added the emissions of the EIA-defined Electric Utility, IPP NAICS-22 Cogen, and IPP NAICS-22 Non-Cogen sectors to calculate the emissions from electric generators for every year from 1999 through 2003 for each state in RGGI. This methodology excludes the EIA-defined sectors Commercial Cogen, Commercial Non-Cogen, Industrial Cogen, and Industrial Non-Cogen. Note that this methodology makes no attempt to exclude electric generators less than 25 MW.

Import and Export Estimates

The retail electricity sales data are from the *Electric Power Annual 2003*, published in December 2004. The data can be downloaded through the EIA website as noted above. Total electricity sales data can be broken out by state, sector and year for 1990-2002. Data for 2003 are not currently publicly available.

To estimate state net import and export data MJB&A sorted and summed the retail electricity sales data by state and by year. MJB&A then compared annual in state electricity generation data from all energy sources to total annual retail sales to all sectors. If in state electric generators produced more than the state's total annual retail sales, the state was determined to be a net exporter of electricity. If in state electric generators produced less than the state's total annual retail sales, the state was determined to be a net importer of electricity.