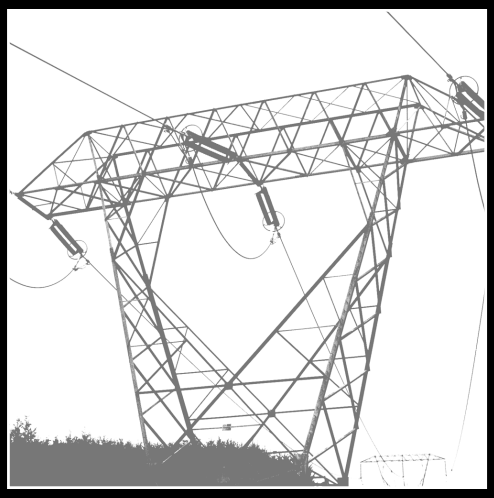

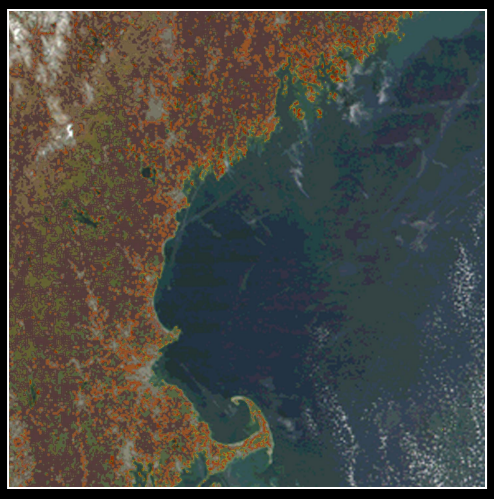

GETTING ON TRACK

New England's Rising Global Warming Emissions and How to Reverse the Trend

NEW ENGLAND CLIMATE COALITION

February 2005

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Written By Dave Algoso and Michael Goggin
State Public Interest Research Groups (PIRGs)
for the New England Climate Coalition

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Executive Summary

More than three years after the region's governors adopted a landmark agreement to reduce New England's contribution to global warming, emissions of the leading global warming gas – carbon dioxide – continue to increase in the region. While many of the New England states have taken positive steps to limit global warming emissions, the most recent trends in energy use and emissions suggest the region has much more to do.

New England's emissions of carbon dioxide, the leading global warming gas, declined slightly between 2000 and 2001, but more recent trends in energy consumption suggest that carbon dioxide emissions have risen since then.

Carbon dioxide emissions in New England in 2001 (the last year for which full data are available) were 0.6 percent below 2000 emission levels. However, the decline was likely due to that year's economic recession and not to any permanent shift in energy use patterns in the region. In addition, the decline experienced in New England was smaller than the rate of decline in the United States as a whole (1.1 percent).

New England is consuming more of the fossil fuels that represent the bulk of the region's contribution to global warming. In the most recent 12 months for which data were available, fossil fuel consumption in the region had increased from 2001 levels in six of seven categories studied. (See Table 1.) Because carbon dioxide emissions are directly related to fuel consumption, this suggests that the region has increased its overall global warming emissions since 2001.

Among the seven categories of fossil fuel use addressed here, the most significant trends are the continued increase in emissions in the transportation sector (primarily from cars, light trucks and SUVs) and the increase in fuel consumption for electric power generation.

Given the recent increases in emissions, the region will need to reduce carbon dioxide emissions significantly over the next five years to meet the regional goal of reducing emissions to 1990 levels by 2010.

Several New England states have adopted strong policies and approaches to reduce global warming emissions, but serious shortcomings remain.

- **State global warming plans:** Since 2001, four of the six New England states have developed or adopted plans to reduce global warming emissions (Maine, Massachusetts, Connecticut, and Rhode Island) and two states have formally adopted the regional goals through legislation (Maine and Connecticut). However, two states, New Hampshire and Vermont, have not yet developed comprehensive plans for reducing emissions.

- **Regional Greenhouse Gas Initiative (RGGI):** Representatives of New England and other Northeastern states have been meeting in an effort to develop

Table 1. Consumption of New England's Major CO_2 Sources Is Rising

Major Sources of Emissions	2001 Emissions (MMTCE)	Change in Fuel Consumption from 2001 to 2003-04
Transportation: Gasoline	14.73	8.6%
Residential Heating: Oil[1]	6.16	3.0%
Electric Power: Coal	4.98	1.7%
Electric Power: Natural Gas	4.00	26.2%
Electric Power: Petroleum	3.35	-23.7%
Transportation: Diesel[2]	3.11	39.7%
Residential Heating: Natural Gas	2.64	12.1%

a cap-and-trade program to limit global warming emissions from the electric power sector. The RGGI effort holds the potential to help the region attain its goals – but only if it includes a strong carbon cap that drives significant reductions in emissions from power generators within the region.

- **Transportation:** In the last year, three more New England states have moved toward full adoption of California's vehicle emission standards. As a result of the advanced technology requirement in the new standards, they will likely result in modest reductions in global warming emissions and will set the stage for adoption of California's forthcoming standards for global warming emissions. However, no state has yet launched a coherent strategy to reduce the growth in vehicle travel, which is a primary cause of increasing emissions from cars and light trucks.

The New England states should prioritize the following steps in the year ahead:

1) Achieving a strong carbon cap within the RGGI process that will guarantee emission reductions of at least 10 percent below current levels by 2010 and 25 percent below current levels by 2020.
2) Adopting California's standards for vehicle global warming emissions once they are finalized.
3) Developing a coherent strategy to reduce growth in vehicle travel.
4) Adopting other policies (such as stronger building energy codes and appliance efficiency standards) to improve the energy efficiency of the region's economy.

Introduction

When the New England governors and the eastern Canadian premiers signed the Climate Change Action Plan in 2001, they made a bold commitment to reducing the region's emissions of gases that cause global warming. In the three years since, the effort in New England has paved the way for similar state-based initiatives on the West Coast and in other regions of the U.S., and has attracted attention from around the globe – especially given the continued refusal of the U.S. federal government to take meaningful action on global warming.

No one said that achieving the goals of the regional plan – which require emissions to be reduced to 1990 levels by 2010, to 10 percent below 1990 levels by 2020, and eventually to levels consistent with stabilizing concentrations of global warming gases in the atmosphere – would be easy. But, the goals are achievable, though every year the states delay in taking decisive action, the harder they will be to achieve. To their credit, the New England states have pursued several strong initiatives to reduce global warming emissions from the region's economy. But ultimately, New England's efforts will be judged on whether they succeed in achieving the emission levels required under the regional agreement.

Seen in this context, recent trends in fossil fuel consumption in the region underscore the challenges the region faces in hitting its goals. These data suggest that emission trends – particularly in important sectors such as transportation and electricity – are heading in the wrong direction. By focusing on emission trends in the sectors responsible for the greatest global warming emissions, the region can arrive at a strategy that is more likely to achieve its goals.

The success that the New England governors and the eastern Canadian premiers have in hitting the targets in the Climate Change Action Plan will set the tone for other initiatives on global warming. By following through and hitting the targets that have been set, the New England states will set a standard for what can be done when a few states decide to reduce their contribution to global warming and see that commitment through.

Carbon Dioxide Emissions in New England

Emissions of carbon dioxide from energy use are the leading cause of global warming. While other activities contribute to global warming, energy-related activities (a category dominated by the burning of fossil fuels) were responsible for 89 percent of New England's global warming emissions in 2000.[3]

In 2001, the most recent year for which comprehensive data are available, regional emissions of carbon dioxide were down 0.6 percent from 2000, though that year's economic recession likely was the major factor in the decrease. More recent data on energy consumption suggest that emissions have increased since 2001.

The New England/Eastern Canada Regional Goals

In August 2001, the Conference of New England Governors and Eastern Canadian Premiers (NEG/ECP) adopted a Climate Change Action Plan with the following goals for reduction of global warming emissions:

- **Short-term**: Reduce regional global warming emissions to 1990 emissions by 2010.
- **Mid-term**: Reduce regional global warming emissions by at least 10 percent below 1990 emissions by 2020, and establish a five-year process, commencing in 2005, to adjust the goals if necessary and set future emissions reduction goals.
- **Long-term**: Reduce regional global warming emissions sufficiently to eliminate any dangerous threat to the climate; current science suggests this will require reductions of 75 to 85 percent below current levels.[4]

Emissions Through 2001

The most recent comprehensive data on carbon dioxide emissions in New England, for 2001, shows that emissions in 2001 were 50.7 MMTCE, a decline of 0.6 percent from the 51.0 MMTCE emitted in 2000.

Note on Units

There are several ways to communicate quantities of global warming emissions. In this report, we communicate emissions in terms of "carbon equivalent" – in other words, the amount of carbon that would be required to create a similar global warming effect. Specifically, we use million metric tons of carbon equivalent (MMTCE). Other studies frequently communicate emissions in terms of "carbon dioxide equivalent." To translate the latter measure to carbon equivalent, one can simply multiply by 0.273.

While this decline is good, it must be put in perspective. The decline appears to have been largely due to the economic recession that took hold in 2001, with the largest decline taking place in emissions from the commercial sector, and a mild drop in emissions from the transportation sector. (See Table 2.) Nationwide, carbon dioxide emissions declined by 1.1 percent in 2001, nearly twice the rate of decline experienced in New England.[5] In more recent years, carbon dioxide emissions nationwide have increased, by 0.8 percent from 2001 to 2002 and by a further 0.8 percent from 2002 to 2003.[6] If New England's trends mirror those at the national level, the decline in 2001 would appear to be a temporary blip and not representative of a significant long-term change in energy consumption patterns.

Table 2. Change in Emissions from 2000 to 2001, by Sector (MMTCE)

	2000 Emissions	2001 Emissions	Percent Change
Residential	9.61	9.62	0.2%
Commercial	4.44	3.98	-10.3%
Industrial	5.09	5.14	0.9%
Transportation	19.76	19.59	-0.8%
Electric Power	12.08	12.33	2.1%
TOTAL	50.97	50.66	-0.6%

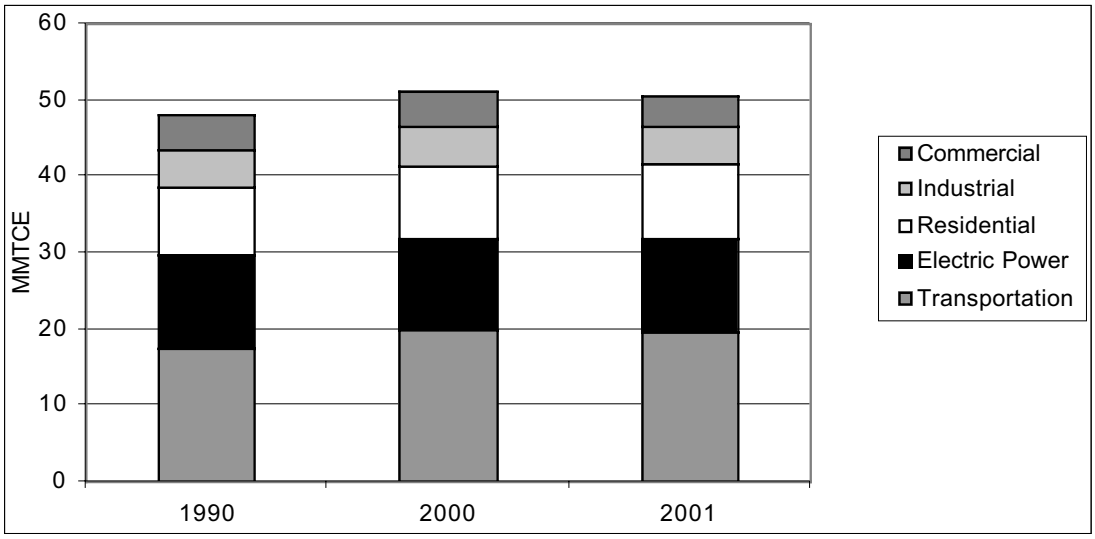
Although emissions from the commercial and transportation sectors declined region-wide, the trends varied within each state. (See Table 3.) Likewise, few states showed declines in all sectors (the electric power sector is omitted from this comparison, because electricity demand in one state is frequently met with generation in another).

Table 3. Change in Emissions from 2000 to 2001, by State

	CT	MA	ME	NH	RI	VT
Residential	-3.3%	2.2%	0.0%	-2.4%	2.6%	0.2%
Commercial	-5.2%	-15.3%	-18.2%	-9.5%	2.3%	0.3%
Industrial	-4.2%	16.6%	-14.7%	-2.0%	-17.0%	-2.0%
Transportation	1.7%	-1.4%	-10.8%	0.2%	0.9%	0.2%
State Total (Excluding Electric Power)	**-1.2%**	**0.1%**	**-10.2%**	**-1.7%**	**-0.1%**	**0.0%**

When compared to the regional goals, carbon dioxide emissions in 2001 remained 5.1 percent above 1990 levels, the regional target level set for 2010. (See Figure 1.)

Figure 1. Region-wide Emissions by Sector (MMTCE)



The major contributors to global warming in the region stand out:

- The most polluting sector by far was transportation (38.7%), followed by electric power (24.3%) and residential (19.0%). (See Figure 2.)
- Predictably, the most populated states contributed more of the region's pollution, with Massachusetts emitting 44 percent (excluding emissions from electric power). (See Figure 3.)

Figure 2. Each Sector's Contribution to 2001 Carbon Dioxide Emissions in New England

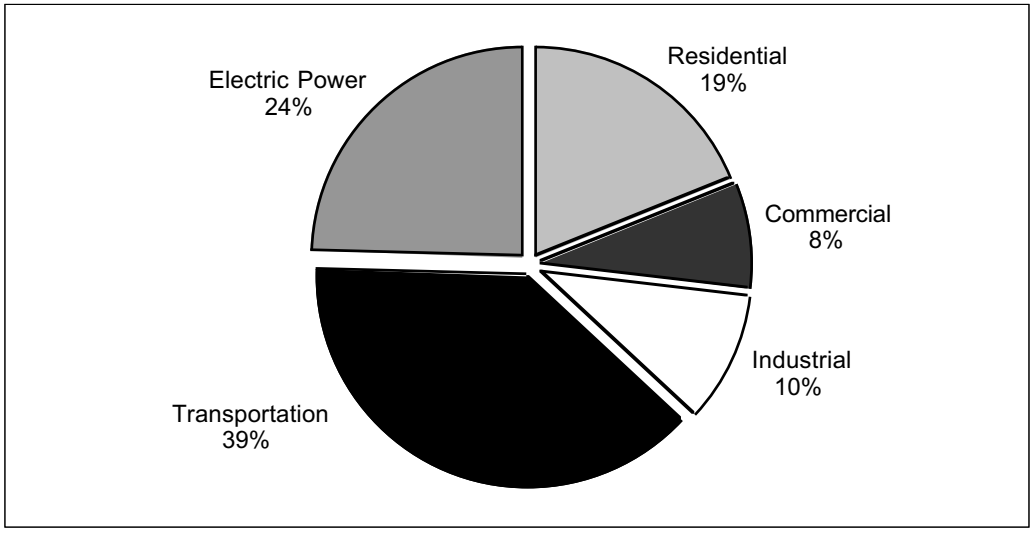
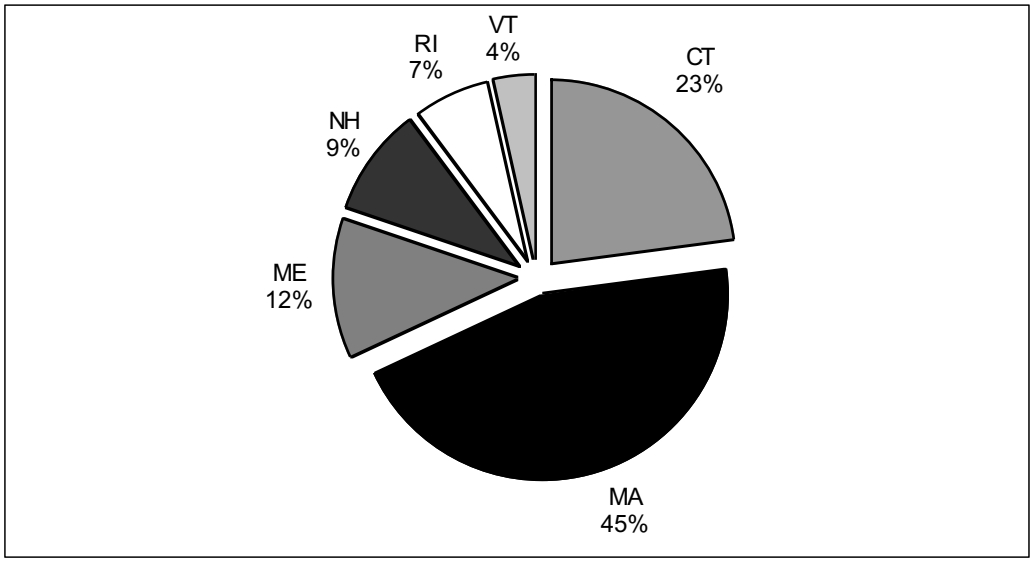


Figure 3. Each State's Contribution to 2001 Carbon Dioxide Emissions in New England (Excluding Electric Power)



Updates to 1990 and 2000 Emission Estimates

Since the publication of the New England Climate Coalition's last region-wide report (*Global Warming and New England*, September 2003), the Energy Information Administration (EIA) has updated its state-by-state estimates of energy consumption for 2000 and previous years. The new data reflect major changes to EIA's methodology for estimating energy use, resulting in significant shifts in the overall emission results.

The revised EIA data produce carbon dioxide emission estimates of 48.2 MMTCE in 1990 (compared to 45.8 MMTCE in the previous report) and 51.0 MMTCE in 2000 (compared to 51.9 MMTCE in the previous report). As a result, whereas emissions were estimated to have increased by 13 percent between 1990 and 2000 in the earlier report, the revised estimate suggests that emissions increased by 6 percent.

Emissions Since 2001

Based on fuel consumption data from the Energy Information Administration (EIA), it is clear that New England's emissions have increased significantly since 2001.

The burning of fossil fuels to power automobiles, generate electricity, and heat homes accounted for 76.9 percent of New England's total carbon dioxide emissions in 2001. (See Figure 4.) Table 4 compares the amount of each fuel consumed during the most recent 12-month period for which data is available (September 2003-August 2004) to the amount of each fuel consumed in 2001.[7] In all but one of the seven categories of fuel use examined – petroleum consumption for electric power – consumption has increased.

Figure 4. Major Contributors to 2001 Emissions in New England

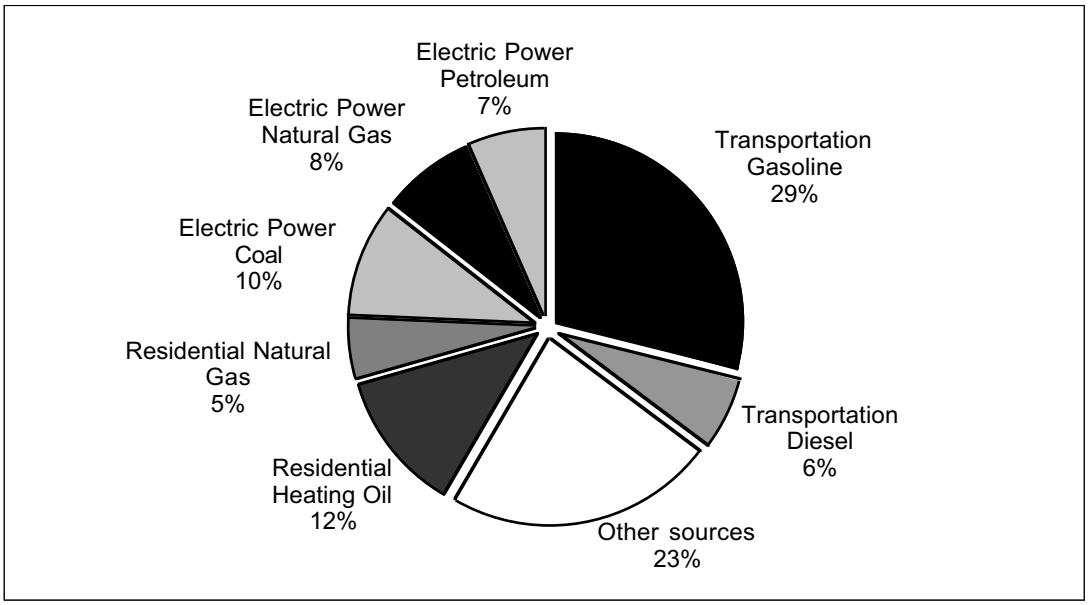


Table 4. Major Contributors to Carbon Dioxide Emissions: Growth in Consumption Since 2001

Category	Change
Transportation: Gasoline	8.6%
Residential: Heating Oil	3.0%
Electric Power: Coal	1.7%
Electric Power: Natural Gas	26.2%
Electric Power: Petroleum	-23.7%
Transportation: Diesel	39.7%
Residential: Natural Gas	12.1%

Transportation: Gasoline and Diesel

Motor fuel consumption is growing – a testament to the fact that the region has not made real progress in reducing the total number of miles that cars are driven (vehicle-miles traveled, or VMT), a necessary part of reducing transportation sector emissions.

New England transportation gasoline consumption in the most recent 12 months for which data is available was 8.6 percent higher than consumption in 2001. (See Table 5.) Transportation diesel consumption was 39.7 percent higher. The degree of this increase in diesel consumption is likely due to a temporary spike: consumption in January 2004 and the surrounding months rose drastically in several states, before returning to approximately what it was the prior fall. In the long term though, annual usage levels for both fuels are on the rise. (See Figures 5 and 6.)

The increase in transportation fuel use is largely due to increases in vehicle-miles traveled, coupled with continued stagnation in vehicle fuel economy. (See Table 6.) More miles are being driven in each year in every state – and not just because of population growth. VMT per capita is also rising. (See Figure 7.) If unchecked, this trend could outweigh any benefits of per-mile emissions reductions resulting from cleaner cars, as well as emissions reductions made in other sectors.

Table 5. Growth in Transportation Fuel Consumption Since 2001

	Gasoline	Diesel
Connecticut	1.7%	41.8%
Maine	0.9%	34.1%
Massachusetts	11.0%	40.9%
New Hampshire	16.2%	42.2%
Rhode Island	19.9%	33.8%
Vermont	9.3%	46.6%
Region-wide	**8.6%**	**39.7%**

Figure 5. Transportation Gasoline Use (Billion Gallons)

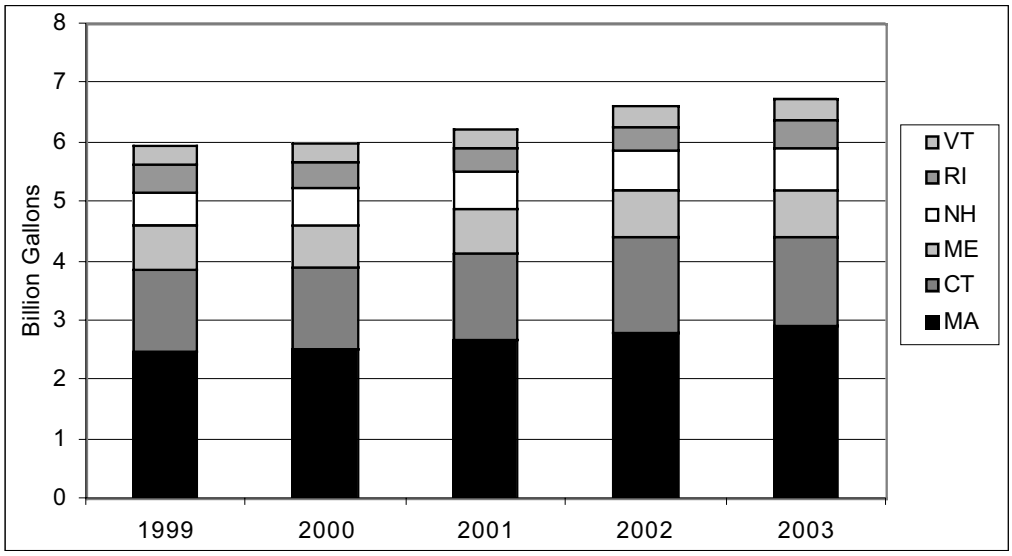


Figure 6. Transportation Diesel Use (Billion Gallons)

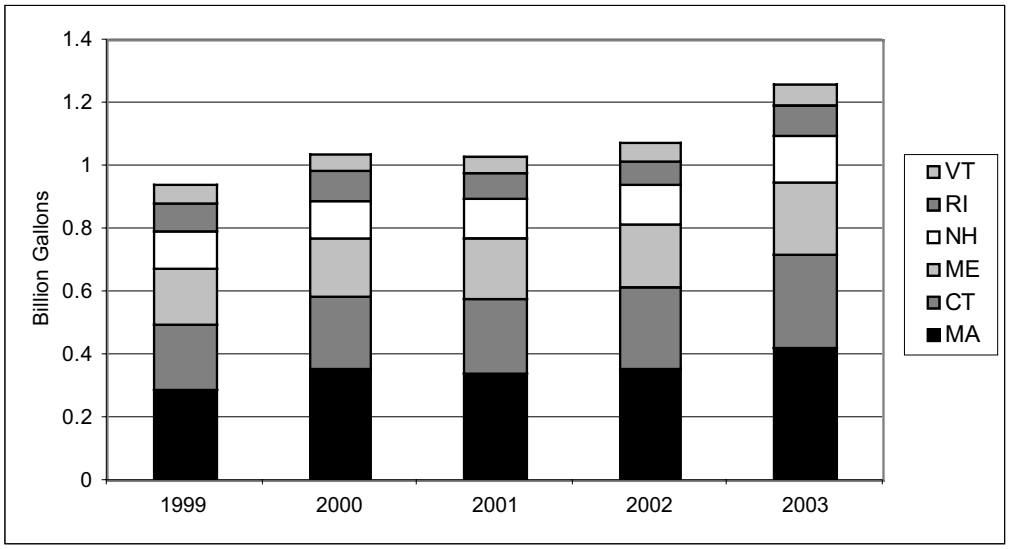
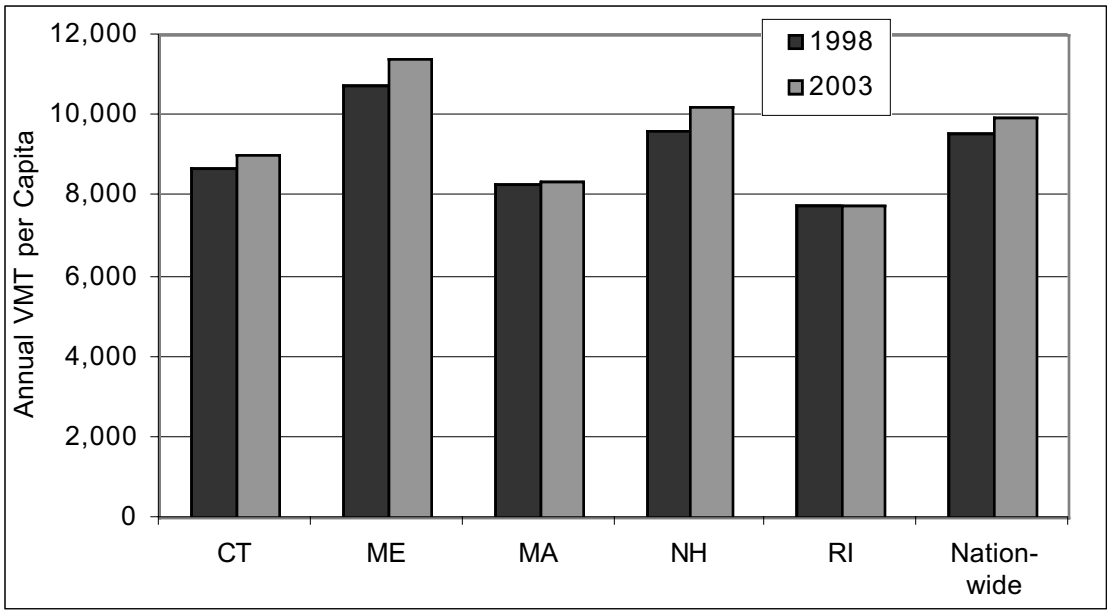


Table 6. Percentage Increase in Vehicle-Miles Traveled (VMT), 1998-2003[8]

State	Growth
Connecticut	7.2%
Maine	10.1%
Massachusetts	3.6%
New Hampshire	13.9%
Rhode Island	4.8%
Vermont	N/A[9]
National Average	10.0%

Figure 7. Growth in Annual Vehicle-Miles Traveled per Capita



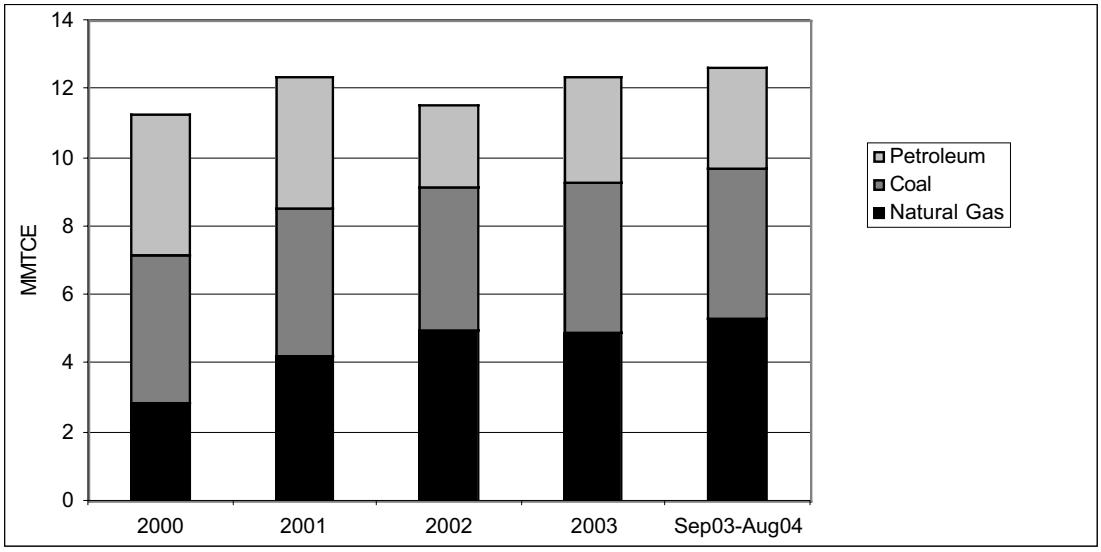
Electric Power: Coal, Oil, and Natural Gas

Global warming emissions from the electric power sector have increased since 2001, up 2.2 percent during the most recent 12-month period for which data is available. The electric power sector contributed nearly a quarter of New England's carbon emissions in 2001, second only to the transportation sector, meaning that reining in emissions from electricity generation will be important to hitting the region's targets.

The amount of carbon dioxide emissions from electric power production depends on two variables: the amount of power produced (which is related to demand within the region) and the type of fuel used to produce that power. In 2002, for example, power production declined and a greater share of power was produced with low-carbon natural gas, leading to an overall decrease in carbon dioxide emissions from the electric sector in that year. (See Figure 8.)

But more recent experience suggests that these two variables are not unrelated – that is, that changes in demand can have an outsized effect on emission levels by altering the mix of fuel used for electricity generation.

Figure 8. Electric Power Emissions (MMTCE)



The increase in emissions from 2002 to 2003 (and apparent continuation of the trend into 2004) was driven primarily by an increase in demand. In 2003, electricity demand in both commercial and industrial sectors (which had experienced declines in 2002) was on its way back up (See Figure 9); comparing the most recent twelve months to 2001, demand is up 3.8 percent. (See Table 7.)

Figure 9. New England Electricity Consumption by Sector (Million Megawatt-hours)

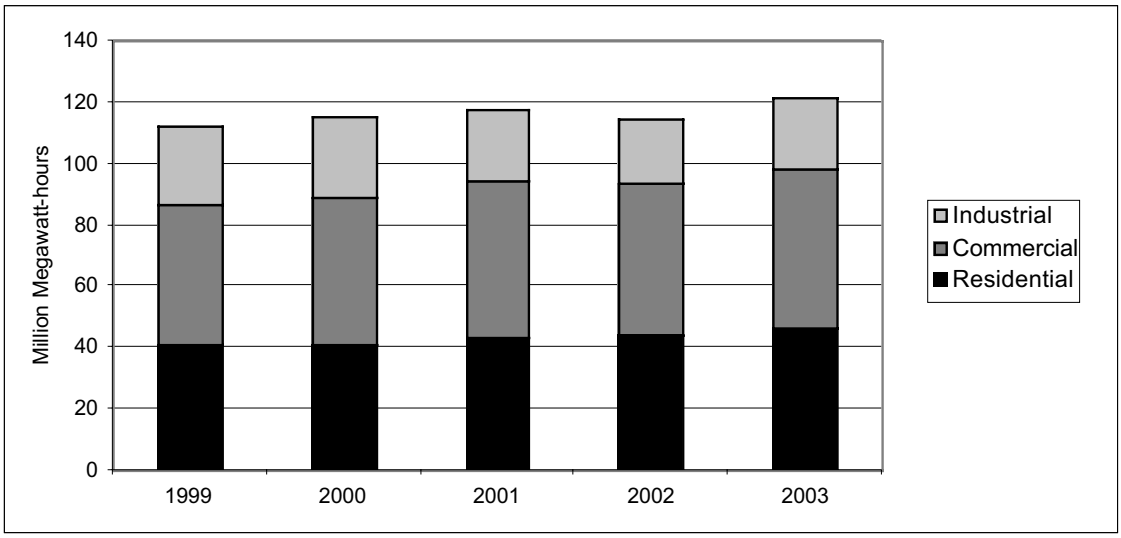


Table 7. Growth in Electricity Consumption: Most Recent 12 Months Available (Sept. 2003-Aug. 2004) Versus 2001[10]

By state	Growth Rate
Connecticut	5.8%
Maine	-1.7%
Massachusetts	4.5%
New Hampshire	5.9%
Rhode Island	-0.6%
Vermont	1.8%
By sector	
Residential	7.6%
Commercial	2.3%
Industrial	3.7%
Across states and sectors	**3.8%**

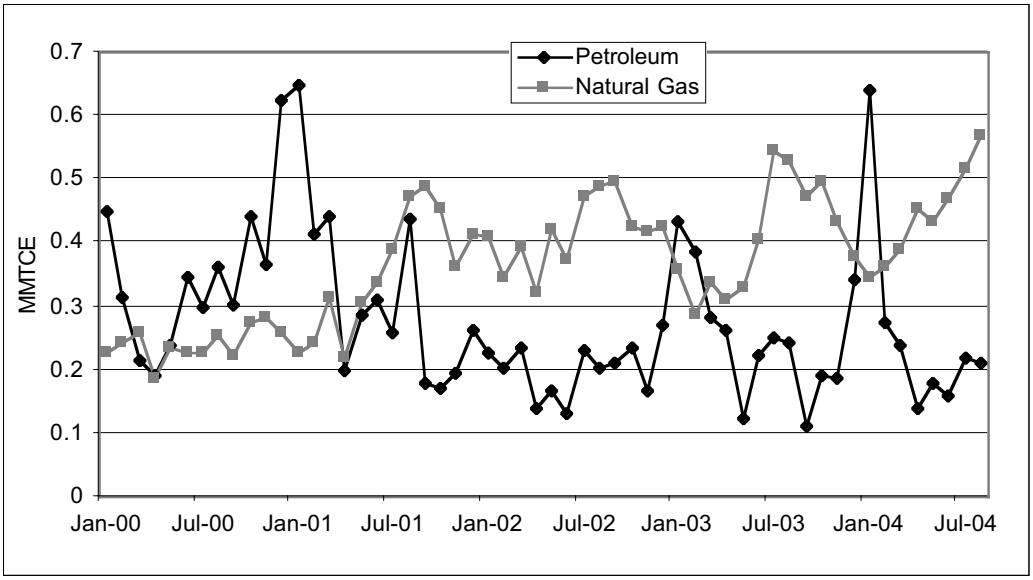
The increase in demand has the potential to shift fuel use patterns in the electric generation sector. Overall, the trend in New England has been toward reduced use of high-carbon petroleum, and increased use of low-carbon natural gas. (See Table 8.) However, rising natural gas prices have created incentives for the use of petroleum, rather than natural gas, during periods of extreme cold when overall demand for natural gas is high.

Table 8. Fossil Fuel Consumption by Electric Power: 2001 Versus the Most Recent 12 Months Available (Sept. 2003-Aug. 2004)[11]

Fuel	Change
Coal	1.7%
Petroleum	-23.7%
Natural Gas	26.2%

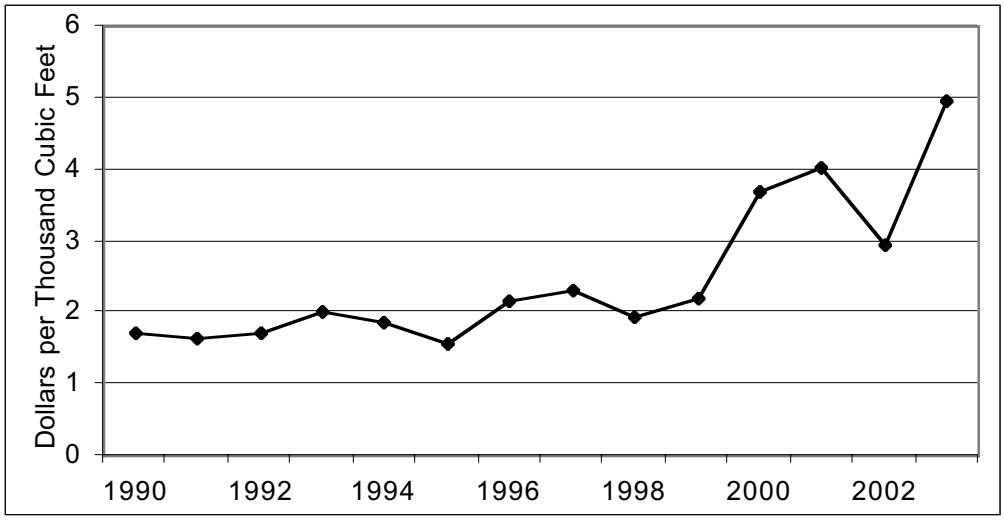
This shift from natural gas to petroleum occurred twice in recent years, during the winters of 2003 and 2004. (See Figure 10.) In January 2004, for example, carbon dioxide emissions from petroleum use in electricity generation spiked dramatically – with the 0.64 MMTCE released from petroleum generation that month representing about 5 percent of *all* electric sector emissions in 2003 as a whole.

Figure 10. Electric Power Petroleum and Natural Gas Emissions (MMTCE)



The potential for such fuel-switching behavior to impact carbon dioxide emissions could grow in the years ahead. New England is increasingly dependent on natural gas for electricity generation and home heating. Natural gas prices have fluctuated wildly in recent years (see Figure 11), and could experience even greater fluctuations if, as the EIA projects, natural gas demand rises by another 54 percent from 2001 to 2025.

Figure 11. Average Annual Wellhead Price of Natural Gas[13]



This recent experience suggests that policy tools that reduce natural gas consumption – particularly during periods of peak demand – can produce outsized benefits for reducing global warming emissions. Efficiency measures (such as building energy codes, weatherization programs, and efficiency standards for furnaces) not only reduce energy use in and of themselves, but they free up natural gas for use in the electric generating sector, reducing the temptation to generate power with high-carbon petroleum. But the experience also suggests that, in the long-term, a shift completely away from fossil fuels and toward zero-carbon renewable energy will be necessary to deliver sustainable reductions in power sector emissions. A regional carbon cap-and-trade program should encourage these types of long-term shifts, while discouraging the use of high-carbon fuels in the near term.

Residential Heating: Natural Gas and Heating Oil

Trends in fuel use for residential heating are highly dependent on weather; as a result, year-to-year trends may be less meaningful than for other types of fuel use. Still, residential natural gas consumption for the most recent 12 months for which data is available (September 2003-August 2004) was 12.1 percent higher than consumption in 2001. Heating oil consumption in 2003 was 3.0 percent above the level in 2001. An examination of the five-year trend supports the conclusion that the overall trend in fuel use is increasing. (See Figures 12 and 13.)

Figure 12. Residential Heating Oil Use (Million Gallons)

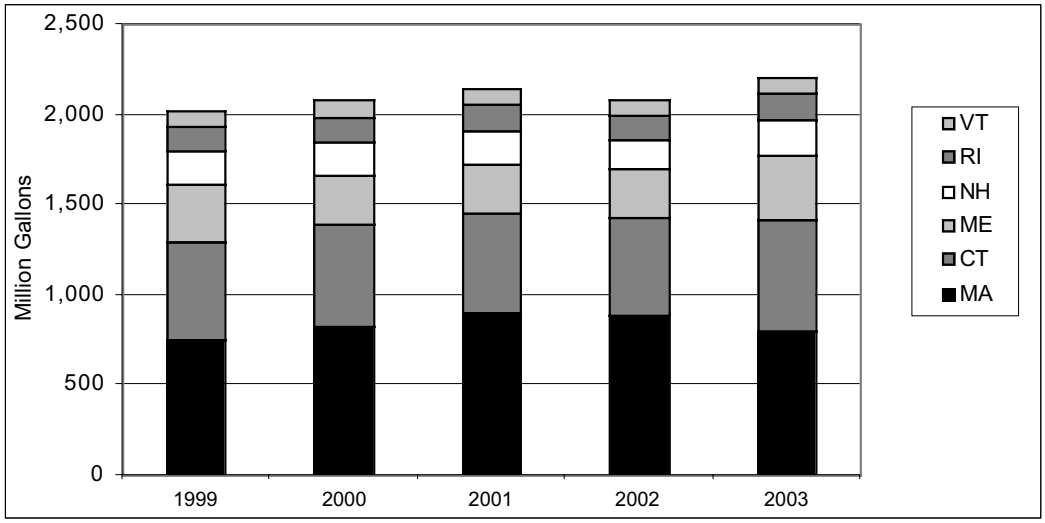
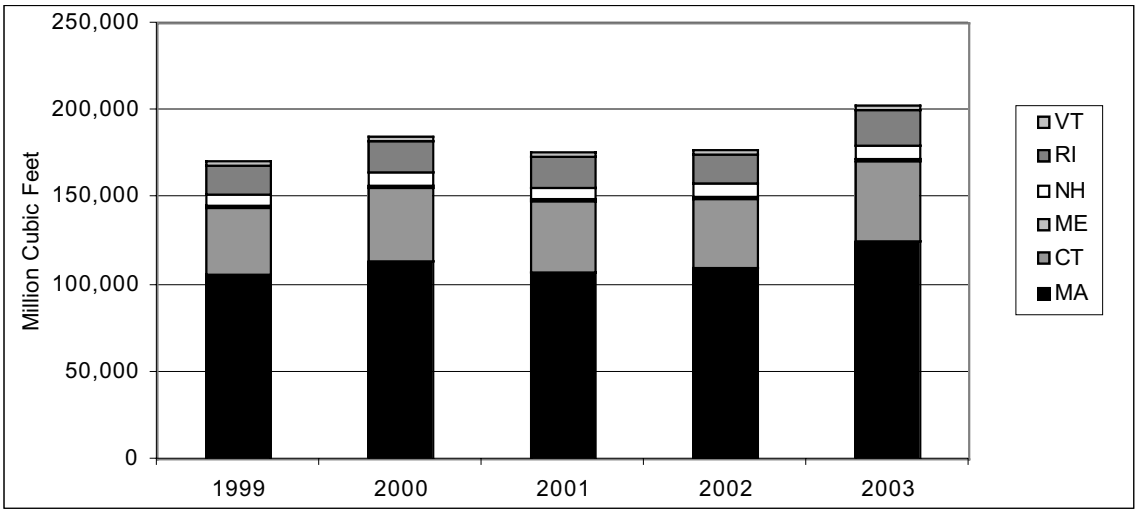


Figure 13. Residential Natural Gas Use (Million Cubic Feet)



Lessons from the Trends

Trends in fuel use in the New England region are heading in the wrong direction. The region must achieve substantial reductions in fossil energy consumption – particularly among more carbon-intensive fuels such as oil and coal – in order to achieve its global warming emission reduction goals, but the use of fossil fuels in the region continues to increase.

The first lesson evident from the trends, therefore, is that the region has much more work to do in order to reach its goals.

The trends also suggest areas that the region must focus on in order to achieve those goals. The continued growth in transportation fuel use – even in an atmosphere of spiking gasoline prices – suggests that efforts to produce cleaner cars and trucks must be coupled with coherent efforts to reduce the growth in vehicle travel. Trends in electric-sector emissions suggest that energy efficiency – in both the electric and home heating sectors – must be combined with a strong regional carbon cap in order to achieve substantial and sustained emission reductions.

The story of the past few years, as evidenced by the data presented above, is not a happy one for those concerned about reducing global warming emissions in the region. However, the data also clearly establish the challenges the region faces and point the way toward workable solutions. We now turn to the efforts states have undertaken over the past three years to identify and act on those challenges.

The regional Climate Change Action Plan called on each of the states to evaluate its current carbon dioxide emission levels and develop a plan for achieving required global warming emission reductions.

Connecticut

In December 2003, the Connecticut Climate Change Stakeholder Dialogue (CCSD) – a process involving representatives from businesses, government, academia, and non-profits – recommended 55 policies to the Governor's Steering Committee on Climate Change.[20] In March 2004, then-Governor Rowland accepted for implementation 38 of the recommendations, expected to achieve over 50 percent of the reductions needed to reach the 2010 goal.[21] As part of this, the governor also signed an executive order requiring state government and universities to use an increasing percentage of green power, reaching 20 percent by 2010, 50 percent by 2020, and 100 percent by 2050.[22]

The state legislature followed up in April 2004 by passing two major bills to tackle the state's emissions. The first set efficiency standards for a range of commercial and residential appliances, ranging from commercial clothes washers to torchiere lamps. The second adopted the California Clean Car standards. The state is currently implementing the first phase of this, known as LEV II, which will likely deliver reductions in carbon emissions by requiring the sale of advanced technology vehicles such as hybrids. This also sets the stage for the state to adopt California's upcoming tailpipe emission standards for global warming gases, which are scheduled to take effect in model year 2009.

The next major steps for Connecticut come from another bill passed during the 2004 legislative session that codified the state's commitment to the regional targets. The Governor's Steering Committee recently submitted a draft Connecticut Climate Change Action Plan to the Legislature, which will implement the policies formulated by the stakeholder process. Specifically, the state should:

- Restore and expand the Conservation and Load Management Fund (the state's ratepayer-supported

Regional Greenhouse Gas Initiative

The six New England states (along with Delaware, New Jersey and New York) are taking part in the Regional Greenhouse Gas Initiative (RGGI), a process to design a multi-state cap-and-trade program covering global warming emissions from power plants. The model rule is scheduled to be designed by April 2005, at which point the states would have to ratify it.

The RGGI process is important for two reasons. First, it can be used to drive significant reductions in emissions from power plants in the region – reductions that will be necessary if the region is to meet its overall emission reduction goals. Second, RGGI can provide valuable lessons and could ultimately be expanded to include additional sectors of the economy or even additional states.

The most important decisions RGGI participants will make are over the level of the carbon cap and the integrity of the program. The power-sector carbon cap adopted under RGGI should require emission reductions of at least 10 percent below current levels by 2010 and 25 percent below current levels by 2020. Such goals are clearly achievable with a sound clean energy strategy that includes efforts to promote energy efficiency and the use of renewable sources of energy.

To be effective, however, the carbon cap-and-trade must also have integrity. RGGI participants should, at least in the early stages of the program, resist efforts to allow "offsets" (in which emission reductions outside the region or in other economic sectors are allowed to substitute for in-region power sector reductions) to count toward compliance with the carbon cap.[14]

In the event that the RGGI process does not produce significant reductions in emissions, states also retain the option of pursuing in-state limits on carbon dioxide emissions from power generation, as has been achieved in Massachusetts.

The Dangers of Nuclear Power

For the last several decades, New England has relied upon nuclear power for a significant share of its electricity. However, between now and 2026, the operating licenses of all of New England's nuclear reactors are scheduled to expire. For environmental and public health reasons, neither the relicensing of existing nuclear reactors beyond their original 40-year life spans nor the construction of new nuclear facilities should be considered as a means to reduce global warming emissions.

- **Accident risk** – In the short history of nuclear power, the industry has experienced two major accidents – at Three Mile Island and Chernobyl – that endangered the health of millions of people. The United States has also suffered numerous "near-misses." For example, in 2002, workers discovered a football-sized cavity in the reactor vessel head of the Davis-Besse nuclear reactor in Ohio. Left undetected, the problem could have eventually led to the leakage of coolant from around the reactor core.

- **Terrorism and sabotage** – The security record of nuclear power plants is far from reassuring. In tests at 11 nuclear reactors in 2000 and 2001, mock intruders were capable of disabling enough equipment to cause reactor damage at six plants.[15] A 2003 Government Accountability Office report found significant weaknesses in the Nuclear Regulatory Commission's oversight of security at commercial nuclear reactors.[16]

- **Spent fuel** – Nuclear power production results in the creation of tons of spent fuel, which must be held safely for tens of thousands of years without contaminating the environment or the public. Nearly all U.S. nuclear reactors store waste on site in water-filled pools at densities approaching those in reactor cores. The cost of the disaster that would occur should coolant from the spent-fuel pools be lost has been estimated at 54,000-143,000 extra deaths from cancer and evacuation costs of more than $100 billion.[17] Centralized waste repositories, on the other hand, would require the transport of high-level nuclear waste across highways and rail lines within proximity of populated areas.

- **Cost** – Nuclear power has often proven to be expensive in market terms, due to the high cost of building, maintaining and decommissioning nuclear reactors. But looking only at market costs obscures the more than $100 billion spent by U.S. taxpayers for research and development, protection against liability from accidents, and other subsidies for nuclear power.[18] Without these subsidies, the nuclear industry likely could not have survived.

- **Aging** – Continued operation of nuclear reactors beyond their initial projected 40-year lifespan could lead to unforeseen safety problems. In 2001, the Union of Concerned Scientists identified eight instances in just the previous 17 months in which nuclear reactors were forced to shut down due to age-related equipment failures.[19]

For these reasons and others, nuclear power should remain off the table as a potential means to reduce global warming emissions in New England, and the region should advocate for, and begin to plan for, the orderly retirement of New England's nuclear reactors.

energy efficiency fund), which was raided during the 2003 legislative session and lost one-third of its funding,
- Create natural gas and fuel oil conservation funds, building on the success and experience in the electricity sector, to cost-effectively reduce the use of these fuels, and
- Strengthen the state's renewable energy standard.

Maine

Maine has enacted several important policy solutions in various sectors, and the Climate Action Plan recently released by the Department of Environmental Protection (DEP) could provide a good foundation for future efforts to reduce its emissions.[23] The DEP projects that the plan's actions, if all implemented, would make "significant progress" toward the 2010 emission targets and would meet the target by 2020. There are more than 50 policies, which are ranked based on the emissions reductions expected in 2020, and the plan also estimates their cost per ton of emissions reduction, noting that many of the options will save money in the long term.

In the transportation sector, for example, the DEP projects that implementing tailpipe greenhouse gas emissions standards would save money for the state's economy. This would be in addition to the Board of Environmental Protection's recently approved rules for the Cleaner Cars Sales Goals program, part of California's LEV II (low-emission vehicle) Clean Car standards.[24]

In order to curb transportation sector emissions, the state must go beyond setting stronger emissions standards, and also find ways to stop the growth of vehicle-miles traveled. The DEP's plan suggests policies to increase the availability of mass transit, encourage transit-oriented development and urban infill development, and protect open space. The DEP also suggests recruiting a volunteer insurance provider to set up a pilot pay-as-you-drive auto insurance program, whereby insurance premiums are based directly on how much you drive. By 2020, the DEP projects that these policies will save 0.67 MMTCE, or 10.7 percent of the state's total 2001 emissions.

The plan also makes recommendations for efficiency measures in sectors ranging from manufacturing to home heating. This is especially important because, between 2001 and the most recent 12 months of available data (September 2003-August 2004), residential natural gas use in Maine increased by 22.9 percent, more than in any other New England state, and heating oil use increased by 27.3 percent (though this is likely at least partially the result of the extreme cold spell during the winter of 2004). Thus, stronger appliance efficiency standards and building codes are a necessary step. In fact, the state leads by example in this regard, due to an executive order signed in November 2003 by Governor Baldacci that enforces the U.S. Green Building Council's Leadership in Energy and Environmental Design building standards for new and renovated state buildings.[25]

On the generation end of electricity, Maine has a renewable energy standard, but it is currently met by environmentally damaging energy sources such as trash burning, fossil fuel cogeneration and hydroelectric dams. In the town of Mars Hill a wind developer is moving toward building the state's first major wind farm, but setting a clean energy standard for wind and solar would be a great way to further increase the state's renewable generation.[26]

The important task for Maine will be to move forward on the policies listed in the DEP's action plan, many of which have short-term reductions but most of which (like vehicle emission standards) will have their greatest impact in the long term.

Massachusetts

Reducing carbon dioxide emissions in Massachusetts is especially important because it is the most populous state in the region and the biggest contributor to global warming – the state emitted 45 percent of the region's carbon dioxide in 2001. Since 2001, overall electricity consumption in the state has been rising – along with transportation gasoline, transportation diesel consumption, and residential natural gas use – indicating that overall emissions in the state are going up.

In May 2004, the governor's office released the Massachusetts Climate Protection Plan (CPP), the culmination of a planning process that started in 1998.[27] It offers policy options for reducing emissions, including strong lead-by-example provisions for government agencies to reduce their contributions to global warm-

ing. Unfortunately, the CPP offers little in the way of accountability or a timeline for implementation, and fails to quantify expected global warming pollution reductions, leaving the state no way of knowing whether the implemented policies will actually hit the targets.

In the electric power sector, the state has already implemented several policies that will result in significant reductions in global warming emissions. The renewable energy standard will require that 15 percent of the state's electricity come from new, clean renewable resources by 2020, and a systems benefit charge on electricity bills generates funding for energy efficiency and renewable energy programs. These two policies will result in cleaner power generation and in a reduction in the rate of growth of electricity demand. Unfortunately, due to a ban on long-term contracts, the renewable energy standard is not as effective as it could be; allowing long-term green power buying contracts, a policy that has already been pursued in Connecticut and Rhode Island, would help developers overcome the upfront costs of wind and other forms of renewable generation.

In 2001, Massachusetts was the first state in the nation to propose limits on power plant emissions of carbon dioxide (in addition to mercury, nitrogen oxides and sulfur dioxide) for the six most polluting power plants, which emit the lion's share of power plant pollution in the state. Since then, however, the Department of Environmental Protection has failed to finalize the carbon dioxide section of those regulations and has expressed reluctance to do so until after the Regional Greenhouse Gas Initiative has made its proposals (see "Regional Greenhouse Gas Initiative," page 17).[28] Regardless of the outcome of RGGI, the state should ensure that it follows through on its original commitment to cap carbon dioxide emissions from the state's dirtiest power plants.

In the transportation sector, the state has already implemented the California LEV II (low-emission vehicle) Clean Car standards, and the CPP reiterated the state's commitment to enacting California's new global warming emissions tailpipe standards once they are finalized. Also, the CPP recommended rebates for buying fuel-efficient vehicles, as well as transit-oriented development and pay-as-you-drive automobile insurance as methods for reducing vehicle-miles traveled.

New Hampshire

Though New Hampshire has taken several steps in the right direction, it has not made serious plans for how it will reduce its contributions to global warming. The closest it has come was *The Climate Change Challenge*, a December 2001 report by the Department of Environmental Services.[29] It contained over 70 recommendations for ways that cities, businesses and individuals can reduce greenhouse gas emissions and energy use. Most of these actions would be voluntary, and the report makes no assessment as to whether the actions would achieve New Hampshire's portion of the required emissions reductions. Developing a plan and quantifying how the state will hit the targets should be a priority for the state.

As in most states, the transportation sector is New Hampshire's largest contributor to global warming emissions – 42 percent of statewide emissions in 2001. Even worse, the state's transportation sector emissions in 2001 were up 39 percent from 1990 levels, a larger change than in any other New England state. Since 2001, both gasoline and diesel use in New Hampshire have continued to rise.

However, the state has done little to address how much vehicles emit or how much they are driven. A strong first step would be to adopt California's LEV II (low-emission vehicles) Clean Car standards, and to adopt California's forthcoming limits on vehicle global warming emissions once they are finalized. However, the state must also act to promote alternatives to vehicle use in the state's increasingly sprawling suburban areas. Efforts to promote mass transit, including rail transportation links to the Massachusetts Bay Transportation Authority and AMTRAK systems, should continue and expand.

In the electric power sector, one positive step was the 2002 Clean Power Act, which set caps on emissions of carbon dioxide (in addition to other pollutants) from the state's three older fossil-fuel power plants, with the goal of stabilizing carbon dioxide emissions at 1990 levels by the end of 2006.[30] Because the law also allows for compliance through regional trading programs, the outcome of the Regional Greenhouse Gas Initiative will be important (see "Regional Greenhouse Gas Initiative," page 17).

New Hampshire has also had a greater increase in electricity consumption since 2001 than any other state in the region (5.9 percent). The state should include policies to improve appliance and building efficiency when it plans how it will meet the emission targets.

New Hampshire took a positive step in establishing a greenhouse gas reduction registry to help businesses and industries establish a baseline against which future mandated emission reductions would apply.[31] This increases the likelihood that a facility would voluntary reduce emissions. Unfortunately, less than a half-dozen businesses and organizations have registered.

Rhode Island

In 2001, shortly after the adoption of the regional Climate Change Action Plan, the state initiated a stakeholder dialogue process. This planning process has gone beyond simply listing policy options, and has included issues of program design and implementation. In July 2002, this group released a list of 52 options to reduce greenhouse gas emissions in the state, and some of the group's major recommendations have already been implemented.

The most recent data on Rhode Island's fuel use for transportation, electricity generation, and home heating provide a strong indication that the state's global warming emissions have increased significantly in recent years. Transportation gasoline use in Rhode Island during the most recent 12 months of available data was up 19.9 percent from 2001 levels – the largest increase of any New England state over that period.

Rhode Island has taken steps recently to reduce carbon emissions from the transportation sector. In January 2004, the City of Providence passed an ordinance requiring the municipal government to purchase more fuel-efficient vehicles. In May 2004, the state adopted the California LEV II (low-emission vehicle) Clean Car standards. The state should move to adopt California's global warming tailpipe standards once the regulations are finalized.

Rhode Island has also made a great deal of progress towards reducing carbon emissions from the electricity generation sector in recent months. In June 2004, the state enacted a renewable energy standard that requires that 3 percent of the state's electricity come from renewable sources by the end of 2007 and 16 percent by the year 2019. The use of tax incentives to encourage the residential development of renewable energy has also been effective.

Vermont

Vermont has done little so far to reduce its contributions to global warming, and does not have a plan for how it will do so. On its current policy track it will be unable to do its part to reduce region-wide emissions. Much of the state's energy planning occurs through its 20-year energy plan, but the state has struggled to complete the most recent version of the report.[32] The recent drafts of the plan have not taken aim at global warming emissions, lacking specific plans for action and leaving the state on generally the same path.[33]

In September 2003, Governor Douglas issued an executive order that nominally strengthened the Climate Neutral Working Group created by former Governor Dean in August 2002.[34] However, the Climate Neutral Working Group – chaired by the commissioners of the Departments of Environmental Conservation, Buildings and General Services, and Public Service – does not appear to be on track to issue its report, nor has it requested input from businesses, environmental organizations, and other stakeholders as directed in the executive order. On the other hand, the executive order did contain several strong "lead by example" provisions, aimed at cutting energy use by government agencies, offices and departments. This will lead to more efficient vehicles in state fleets, and state buildings that use less energy.

Although Vermont contributes less than any other state to the region's global warming emissions, its 2001 emissions (excluding the electric power sector) were 23 percent above the 1990 levels. In fact, every sector in Vermont emitted more in 2001 than in 1990.

The state is potentially headed for an even bigger increase in emissions from the electric power sector. In 2015, the state's contract will expire with HydroQuebec, which currently supplies about 30 percent of the state's electricity; whether the contract

will be renewed, and at what level, remains uncertain. Additionally, the operating license on Vermont's Yankee nuclear reactor expires in 2012; for environmental and public health and safety reasons, state officials should support its on-schedule retirement (see "The Dangers of Nuclear Power," page 18). Replacing these major power sources without causing a jump in global warming emissions will require smart planning, and policies like a renewable energy standard to require that more of the electricity used in Vermont be generated from clean sources such as wind and solar.

Vermont's electricity consumption continues to rise, though not as rapidly as the regional average. The state has made a notable advance in efficiency with the establishment in 2000 of the first efficiency utility, Efficiency Vermont. Run by the non-profit Vermont Energy Investment Corporation, it provides advice and financial assistance to families and businesses on reducing electricity use, and its programs saved 51.2 million kWh in 2003.[35] In May 2003, Efficiency Vermont won the prestigious Innovations in American Government Award from Harvard University's Kennedy School of Government. This award included $100,000 to help other states develop similar programs.[36] Continuing this program is an important tool for the state to reduce electricity consumption.

In the transportation sector, which contributed well over half of Vermont's carbon dioxide emissions in 2001, it is heartening that Vermont's Department of Environmental Conservation has adopted the California LEV II (low-emission vehicle) Clean Car standards. Further progress could be achieved by adopting California's new global warming emission tailpipe standards once they are finalized. However, the state must also take major steps to address growth in vehicle-miles traveled. The state needs to address this problem by increasing access to mass transit and discouraging suburban sprawl.

Conclusion

With fuel use continuing to go up, it is more important than ever for the New England states to make sure their efforts at reducing global warming emissions are directed in the right places. Doing this right means each state needs a strong plan that will get them to the targets, and a clear sense of how to implement it.

The trends in fuel use also reveal what issues each state's plan will need to address.

States should immediately commit to significant emissions reductions from the electric power sector by establishing a cap on carbon dioxide emissions from fossil fuel burning power plants. With the Regional Greenhouse Gas Initiative underway, the states have an opportunity to establish a program that results in real and quantifiable reductions from fossil fueled power generators. This will require a strong cap, and delaying the consideration of offsets until after the core cap-and-trade program is in place. A carbon cap can achieve greater reductions – likely at lower cost – if it is paired with a clean energy strategy in the states that includes policies such as strong renewable energy standards, enhanced building and appliance efficiency codes and standards, and consistent funding for energy efficiency programs.

Efforts to address global warming emissions in other sectors cannot obscure the pressing need to begin addressing the growth in vehicle-miles traveled. Public policy needs to provide people with transportation options other than driving, and incentives to choose those options. This means increased access to mass transit and communities that allow people to live near shops and jobs. Otherwise, even with the adoption of aggressive policies to promote cleaner vehicles, growth in vehicle-miles will ultimately overwhelm those gains and reduce the possibility that the region will achieve its overall emission reduction goals.

The New England states have already set a positive example for the rest of country by squarely facing the threat global warming poses to the region and acting to address it. The region has shown further leadership through the adoption of forward-thinking policies to promote energy efficiency and reduce carbon dioxide emissions from the regional economy.

The rest of the nation – and much of the world – will be watching to see if New England can follow through on its commitments. The path forward is clear. It is now time for the region to once again rise to the challenge.

Methodology

To document the New England region's current global warming emissions, this report relies primarily on information supplied by the Department of Energy's Energy Information Administration (EIA). This analysis also focused exclusively on carbon dioxide emissions from energy use, and does not include emissions of other global warming gases.

Carbon Dioxide Emission Trends Through 2001

Data on energy consumption was obtained from the EIA at www.eia.doe.gov/emeu/states/sep_fuel/notes_fuelnotes_multistate.html. The comma-delimited files provide consumption data by fuel category for all years 1960 through 2001. The data is broken down by state, economic sector, and specific fuel.

To calculate carbon dioxide emissions, energy use for each fuel in each sector (in BTU) was multiplied by carbon coefficients used in EIA, *Emissions of Greenhouse Gases in the United States 2002*.

Several additional assumptions were made:

- Carbon dioxide emissions due to electricity imported into New England were not included in regional emission estimates.
- Combustion of wood was excluded from the analysis, per EIA, *Documentation for Emissions of Greenhouse Gases in the United States 2002*, 241. The exclusion is justified by EIA on the basis that wood and other biofuels obtain carbon through atmospheric uptake and that their combustion does not cause a net increase or decrease in the overall carbon "budget."
- Electricity generated from nuclear and hydroelectric sources was assumed to have a carbon coefficient of zero.
- Carbon emissions from the non-combustion use of fossil fuels in the industrial and transportation sectors were derived from estimates of the non-fuel portion of fossil energy use and the carbon storage factors for non-fuel use presented in U.S. EPA, *Comparison of EPA State Inventory Summaries and State-Authored Inventories*, downloaded from yosemite.epa.gov/oar/globalwarming.nsf/UniqueKeyLookup/JSIN5DTQKG/$File/pdfBcomparison1.pdf, 31 July 2003. To preserve the simplicity of analysis and to attain consistency with future-year estimates, industrial consumption of asphalt and road oil, kerosene, lubricants and other petroleum, and transportation consumption of aviation gasoline and lubricants were classified as "other petroleum" and assigned a carbon coefficient of 20 MMTCE per quad BTU for that portion that is consumed as fuel.

In recent years, EIA has revised its methods for estimating energy consumption to reflect changes in the structure of the electric industry and to improve overall data quality. EIA's revised estimates for state-level energy consumption were first issued in the 2001 version of the State Energy Data reports. These new data also include revised energy consumption figures for previous years, including the 1990 and 2000 baseline years, which are substantially different than the prior estimates used in the New England Climate Coalition's 2003 report, *Global Warming and New England*. The estimate for 1990 went from 45.8 MMTCE in the previous report to 48.2 MMTCE in this report. The 2000 estimates decreased slightly, from 51.9 MMTCE to 51.0 MMTCE.

Carbon Dioxide Emission Trends Since 2001

This section gives a sense of how carbon dioxide emissions have changed since 2001 by looking at recent trends in major fuel uses. The percentage of each fuel use's contribution to 2001 emissions (Figure 4, page 10) is based on calculations made from EIA data (see above).

The most recent month for which fuel use data is available is August 2004. In order to minimize the influence of seasonal variation, and take advantage of the most recent data available, we compare the calendar year of January-December 2001 with September 2003-August 2004. To ensure that a three-year time period was not too short to identify trends in carbon emissions, we also give annual data back to 1999. While any precise analysis of trends over this time period would have a significant margin of error, our approach gives an accurate sense of how consumption has changed.

We also assume that sales of a fuel are equal to consumption of that fuel. Although some fuels are sold

but not burned – for example they may be spilled and therefore do not contribute to carbon emissions – the discrepancy between sales and consumption is likely to be uniform across time and proportional to the magnitude of sales, and would therefore not affect calculations of rates of change.

Transportation

Data on gasoline and diesel fuel sales for each New England state came from the EIA's *Monthly Time Series of Transportation Fuel Sales*, downloaded from www.eia.doe.gov/emeu/states/_oilsales_trans_ts.html.

Electricity Generation

Monthly data on the amount of coal, petroleum liquids, and natural gas used for electricity generation came from the EIA publication *Electric Power Monthly*, which can be found at www.eia.doe.gov/cneaf/electricity/epm/epm_sum.html. In many instances revised data are published one year after the initial publication, so revised data were used when available. For the months January 2002 to August 2004, data on the consumption of fossil fuels for electricity generation were taken directly from Chapter 2 of *Electric Power Monthly*. For the period prior to January 2002, monthly data were obtained by adding the figure for New England found in the "U.S. Electric Utility Consumption of Fossil Fuels" section of *Electric Power Monthly* to the New England figure from the "U.S. Electric Nonutility Consumption of Fossil Fuels" section.

Using heat content figures provided in the appendix to the *Annual Energy Review 2003* (EIA, available at www.eia.doe.gov/emeu/aer/append.html), the quantity of each fossil fuel consumed per month was converted to Btu (British thermal units). Because 2004 conversion figures are not available, we used 2003 conversion figures for January-August 2004.

Calculating the carbon emissions from fuel use was done in the same manner as for the comprehensive emissions in 2001 and prior years (see section above), using carbon coefficients used in EIA, *Emissions of Greenhouse Gases in the United States 2002*. Because petroleum falls into either the category of "distillate fuel" (19.95 MMTCE/Btu) or "residual fuel" (21.49 MMTCE/Btu), but the EIA's consumption figures for the recent years do not distinguish between the two, we weighted the two coefficients according to their share of the petroleum consumed for electricity generation in 2001 (97.75 percent residual fuel), to reach a carbon coefficient of 21.46 MMTCE/Btu.

Data on electricity consumption for September 2001 to April 2004 came from the report *Current and Historical Monthly Retail Sales, Revenues, and Average Revenue per Kilowatthour by State and by Sector*, available at www.eia.doe.gov/cneaf/electricity/page/sales_revenue.xls. The data on electricity consumption for May-August 2004, which were rounded to the nearest thousand MWh by the EIA, came from Table 5.6.A in *Electric Power Monthly*.

Heating Oil

Monthly data on residential heating oil was not available. Instead, we use the annual data provided in the EIA's *Fuel Oil and Kerosene Sales: Historical*, downloaded from www.eia.doe.gov, 19 December 2004.

Natural Gas

Monthly data on natural gas sales to the residential sector came from the EIA's *Monthly Time Series of Natural Gas Production and Sales,* available at www.eia.doe.gov/emeu/states/ngsales.

There were several months for which data on residential natural gas sales were not available, which made it necessary to estimate the value for that month to obtain the yearly total for that sector. Data were not available for the following months in these states: December 2003 in Massachusetts, July 2004 in Massachusetts, December 2003 in New Hampshire. The data for these months were not available because the EIA does not report data when the response rate to the surveys that it uses to generate its figures falls below 75 percent.

To generate estimates for the natural gas sales in these months, a ratio was generated for the average relationship between the previous month's sales and that month's sales over the previous four years. This ratio and the value of the preceding month's sales were then used to interpolate the sales for the month in question.

NOTES

1. Monthly data on residential heating oil use is not available, so we compare 2001 emissions to 2003 emissions. See methodology for more details.

2. The degree of this increase in diesel consumption is likely due to a temporary spike during the months surrounding January 2004. See section on "Emissions Since 2001" for more detail.

3. Northeast States for Coordinated Air Use Management, *Greenhouse Gas Emissions in the New England and Eastern Canadian Region*, March 2004.

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

5. U.S. Department of Energy, Energy Information Administration, *Emissions of Greenhouse Gases in the United States 2001*, 20 December 2002.

6. Ibid.

7. Data are not yet available for September-December 2004. We chose September 2003 to August 2004 to minimize seasonal variation.

8. U.S. Department of Transportation, Bureau of Transportation Statistics, *Summary: State Transportation Profile*, December 2003.

9. The Vermont Agency of Transportation changed its methodology in 2001, resulting in a large discontinuity in the state's vehicle-miles traveled. See www.aot.state.vt.us/techservices/documents/highresearch/publications/avmthist.pdf, downloaded 5 January 2005.

10. U.S. Department of Energy, Energy Information Administration, *Current and Historical Monthly Retail Sales, Revenues, and Average Revenue per Kilowatt-hour by State and by Sector*, November 2004; see Methodology for more details.

11. U.S. Department of Energy, Energy Information Administration, *Electric Power Monthly*, November 2004; see Methodology for more details.

12. U.S. Department of Energy, Energy Information Administration, *U.S. Natural Gas Markets: Recent Trends and Prospects for the Future*, May 2001.

13. U.S. Department of Energy, Energy Information Administration, *U.S. Natural Gas Prices*, downloaded from tonto.eia.doe.gov/dnav/ng/ng_pri_sum_dcu_nus_m.htm, 31 January 2005.

14. For further discussion of offsets, see Tony Dutzik and Rob Sargent, National Association of State PIRGs, *Stopping Global Warming Begins at Home: The Case Against the Use of Offsets in a Regional Power Sector Cap-and-Trade Program*, September 2004.

15. Union of Concerned Scientists, Nuclear Reactor Security, downloaded from www.ucsusa.org/clean_energy/nuclear_safety/page.cfm?pageID=176, 18 December 2004.

16. U.S. General Accounting Office, *Nuclear Regulatory Commission: Oversight of Security at Commercial Nuclear Power Plants Needs to Be Strengthened*, September 2003.

17. Robert Alvarez, Jan Beya, et al, "Reducing Hazards from Stored Spent Power-Reactor Fuel in the United States," *Science and Global Security*, 2003, 11:1-51.

18. Cumulative subsidies for nuclear power over the period 1947-1999 have been estimated at $145.4 billion, based on Marshall Goldberg, Renewable Energy Policy Project, *Federal Energy Subsidies: Not All Technologies Are Created Equal*, July 2000.

19. David Lochbaum, Union of Concerned Scientists, testimony before the Clean Air, Wetlands, Private Property and Nuclear Safety Subcommittee of the U.S. Senate Committee on Environment and Public Works, 8 May 2001.

20. For more information on the Governor's Steering Committee on Climate Change, see www.ctclimatechange.com.

21. Jed Thorp, Clean Water Fund, *2004 Report Card on Climate Change Action*, June 2004.

22. Governor John Rowland, *Executive Order 32*, 22 April 2004.

23. Maine Department of Environmental Protection, *A Climate Change Action Plan for Maine*, 1 December 2004.

24. "BEP OKs Clean-Air Regulations After Carmakers Seek Delay," *Associated Press*, 2 December 2004.

25. Office of Governor of Maine, *Maine Adopts Leadership in Energy and Environmental Building Standards* (press release), 24 November 2003.

26. Rachel Rice, "Mars Hill Vote Moves Windmill Project Forward," *Bangor Daily News*, 17 November 2004.

27. Governor Mitt Romney, Lieutenant Governor Kerry Healey, and Secretary Douglas I. Foy, Commonwealth of Massachusetts, *Massachusetts Climate Protection Plan*, downloaded from www.mass.gov/ocd/climate.html, 1 December 2004.

28. Cindy Luppi, Clean Water Action, personal communication, 21 January 2005.

29. New Hampshire Department of Environmental Services, *The Climate Change Challenge*, December 2001.

30. New Hampshire Department of Environmental Services, *Overview of HB 284: The New Hampshire Clean Power Act*, November 2002, downloaded from www.des.state.nh.us/ard/CleanPowerAct.htm, 2 December 2004.

31. New Hampshire Department of Environmental Services, *New Hampshire Greenhouse Gas Registry*, downloaded from www.des.state.nh.us/ard/climatechange/ghgr.htm, 2 December 2004.

32. Nancy Remsen, "Critics: Energy Proposal Lacks Backup Plans," *Burlington Free Press*, 4 December 2004.

33. Vermont Department of Public Service, *2004 Vermont Comprehensive Energy and Electric Plan – Final Draft*, 4 December 2004.

34. Office of Governor of Vermont, *Climate Change Action Plan* (executive order 14-03), 16 September 2003.

35. Efficiency Vermont, *A Vermont Tradition of Excellence: Efficiency Vermont 2003 Report*, downloaded from www.efficiencyvermont.com, 18 December 2004.

36. Efficiency Vermont, *Vermont Takes Top Honor from Harvard's Kennedy School* (press release), 8 May 2003.

The New England Climate Coalition

The New England Climate Coalition (NECC) is a coalition of state and local environmental, public health, municipal and religious organizations concerned about the effects of global warming. NECC supports reductions in emissions of global warming gases sufficient to protect the region's environment and economy from the dangers posed by global warming.

For more information about NECC visit our Web site at www.newenglandclimate.org, or contact the following NECC organizations:

Connecticut

- Clean Water Fund, 645 Farmington Avenue 3rd Floor, Hartford, CT 06105, 860-232-6232, www.cleanwateraction.org/ct
- ConnPIRG Education Fund, 198 Park Road, 2nd Floor, West Hartford, CT 06119, 860-233-7554, www.connpirg.org

Maine

- Natural Resources Council of Maine, 3 Wade Street, Augusta, ME 04330, 207-622-3101, www.nrcm.org
- Environment Maine Research & Policy Center, 39 Exchange Street #301, Portland, ME 04101, 207-253-1965, www.environmentmaine.org

Massachusetts

- Clean Water Fund, 36 Bromfield Street, Suite 204, Boston, MA 02108, 617-338-8131, www.cleanwateraction.org/ma
- MASSPIRG Education Fund, 44 Winter Street, Boston, MA 02108, 617-292-4800, www.masspirg.org

New Hampshire

- Clean Water Fund, 163 Court St., Portsmouth, NH 03801, 603-430-9565, www.cleanwateraction.org/nh
- NHPIRG Education Fund, 80 North Main Street, Concord, NH 03301, 603-229-3222, www.nhpirg.org

Rhode Island

- Clean Water Fund, 741 Westminster St., Providence, RI 02903, 401-331-6972, www.cleanwateraction.org/ri
- RIPIRG Education Fund, 11 South Angell Street #337, Providence, RI 02906, 401-421-6578, www.ripirg.org

Vermont

- Vermont Public Interest Research & Education Fund, 141 Main Street Suite 6, Montpelier, VT 05602, 802-223-5221, www.vpirg.org