

Massachusetts Takes On Climate Change

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I.

INTRODUCTION

Climate change is the most serious environmental challenge of our time. After years of inaction, bold solutions are needed. Efforts to lower the greenhouse gas (GHG) emissions that contribute to climate change must focus on reducing our demand on carbon-intensive electricity generation and fuels, and on increasing our supply of renewable energy.

Massachusetts has been a leader in the fight against climate change by implementing a unique set of policies and groundbreaking legislation that will significantly reduce GHG emissions through early deployment of energy efficiency, renewable energy and new technology measures. By closely integrating energy and the environment in all climate initiatives, Governor Deval Patrick, in partnership with the state legislature, has established a strong and comprehensive framework to tackle the immediate need to reduce GHG emissions and, at the same time, promote a clean and green energy economy. Massachusetts' proactive programs and hands-on experience will be highly relevant as the new Obama Administration and Congress design a comprehensive national program to address climate change.

The increasing concerns about the consequences of climate change, volatile fuel prices and the carbon dependency of the electricity sector led Governor Patrick to take a fresh approach to environmental protection, especially the intersection between energy and the environment. In January 2007, upon taking office, Governor Patrick took a bold step to make Massachusetts the first state to recognize the interdependence of energy and the environment, combining the state's environmental agencies and energy agencies into one cabinet level secretariat, the reconstituted Executive Office of Energy and Environmental Affairs.¹

In 2008, five key environmental laws were approved by the state legislature and signed by the Governor: the Green Communities Act, the Global Warming Solutions Act, the Oceans Man-

1. The Secretary of Energy and Environmental Affairs is Ian Bowles. The reorganization brought together the departments of Environmental Protection, Coastal Zone Management, Agricultural Resources, Conservation and Recreation, Energy Resources, Fish and Game, Public Utilities and the Environmental Policy Act Office. About Us - Energy and Environmental Affairs, http://www.mass.gov/?pageID=eoeeautilities&L=1&sid=Eoeea&U=Eoeea_about_us (last visited Mar. 24, 2009).

agement Act, the Clean Energy Biofuels Act and the Green Jobs Act. Each of these laws, together with several new groundbreaking policies, brings together the state's energy and environmental agencies to help Massachusetts achieve its goal of addressing climate change.

In addition to these state initiatives, Massachusetts is participating in several regional partnerships to reduce GHG emissions. Most notable is Massachusetts' participation in the Regional Greenhouse Gas Initiative (RGGI), a voluntary, ten-state cap-and-trade program for CO₂ emissions that launched in 2008 the first-in-the-nation auction of carbon emission allowances.² Massachusetts has also initiated a regional effort to develop a low-carbon fuel standard with eleven northeastern and mid-Atlantic states.³ Massachusetts' strong state, local and regional initiatives serve as excellent examples of what is possible for a federal climate change program in partnership with the states.

II.

A CHANGE IN THINKING: INTEGRATING ENERGY AND THE ENVIRONMENT IN THE SAME SECRETARIAT

Massachusetts has always been a leader when it comes to innovative energy and environmental policy. But now Massachusetts is looking at the energy consequences of environmental choices and the environmental consequences of energy choices. Two years ago, Massachusetts was the first state in the nation to bridge the gap between energy and environmental agencies. Since then, we have fundamentally transformed the way we operate.

Traditionally, energy agencies have focused on energy reliability, fuel diversity and electricity rates without considering the emissions impacts. Environmental agencies have focused on setting emission limits that push new technologies that reduce air pollution without full consideration of the energy impact. Climate change has forced us to look at the nexus between energy

2. The other nine states participating in RGGI are: NH, ME, VT, RI, CT, NY, NJ, DE and MD. Regional Greenhouse Gas Initiative, <http://www.rggi.org/states> (last visited Mar. 24, 2009).

3. Letter of Intent from Northeast and Mid-Atlantic States on Low Carbon Fuels Standard (Dec. 31, 2009), *available at* http://www.mass.gov/Eoeea/docs/pr_lcf_s_attach.pdf [hereinafter Low Carbon Fuels Standard].

and the environment and how encouraging reductions in energy demand will benefit the environment and the economy.

Since the reorganization, there has been unprecedented coordination between the state's energy agencies—the Department of Energy Resources and the Department of Public Utilities—and the state's environmental agencies—the Executive Office of Energy and Environmental Affairs and the Massachusetts Department of Environmental Protection (MassDEP)—in developing climate-related legislation, regulations and policies that put Massachusetts on the cutting edge. Instead of competing for resources and attention, MassDEP and the Department of Energy Resources are working together to achieve the same broad policy goals.

Massachusetts' goals for energy and climate change are ambitious. Our climate goals are:

- (1) to implement new and continued programs that will achieve sizable reductions in GHG emissions;
- (2) to help consumers and business with their energy costs by removing the hurdles to energy efficiency;
- (3) to encourage early investment in energy efficiency and renewable energy to reduce demand; and
- (4) to promote new technologies to fight climate change as the economy grows by using less energy.

Collaboration on this front is already occurring at multiple levels—in municipalities, at the state level, and across the region.

III.

MASSACHUSETTS' ACTIONS TO REDUCE GHG EMISSIONS AND INCREASE ENERGY EFFICIENCY: NEW LEGISLATION

A. *Green Communities Act*

In 2008, the Massachusetts legislature enacted the Green Communities Act (GCA), a massive overhaul of the state's energy laws to increase energy efficiency and renewable energy.⁴ In addition to confirming the state's participation in RGGI, GCA establishes a new framework in which energy efficiency and clean energy can compete with fossil-fuel electricity generation. Least-cost procurement, expanded net-metering, reimaged contracts

4. Green Communities Act of 2008, available at <http://www.mass.gov/legis/laws/seslaw08/sl080169.htm> (last visited Mar. 24, 2009).

and greener building codes will help remove barriers to clean energy installations, stimulate technology innovation and help consumers reduce electric bills.

The GCA establishes the following energy goals:

1. By 2017, reduce total energy consumption by 10 percent through Green Communities programs that utilize renewable energy, demand reduction, conservation and energy efficiency.
2. By 2020, meet 20 percent of electricity load through renewable and alternative energy.⁵
3. By 2020, reduce fossil fuel in buildings by 10 percent from 2007 levels.

The GCA adopts a number of different strategies to achieve these goals, summarized below.

1. Increased Energy Efficiency

The GCA creates unconstrained markets for energy efficiency to compete with supply by making utilities purchase all cost-effective energy efficiencies and demand-reduction resources. Under the GCA, utility companies will be required to purchase all available energy efficiency improvements that cost less than generating power, ultimately saving money on consumers' electricity bills. Under the least cost procurement requirement, utility companies will put efficiency in competition with power generation to meet electricity needs at the lowest possible cost. Existing efficiency programs cost three cents per kilowatt-hour, compared to eight cents per kilowatt-hour for power generation. Least-cost procurement makes efficiency the "first fuel" to look at. Utility companies will offer rebates and other incentives for customers to upgrade lighting, air conditioning and industrial equipment to more efficient models. Customers who take advantage of these incentives will save money as they reduce how much energy they use. The incentives will encourage more efficient energy use, lowering overall demand for traditional electricity and reducing GHG emissions.

5. By 2020, 15% from renewable energy and 5% from alternative energy. Green Communities Act of 2008 § 116(2) (2008), available at <http://www.mass.gov/legis/laws/seslaw08/sl080169.htm> (last visited Mar. 24, 2009).

2. Renewable Energy

Clean, reliable renewable energy is the cornerstone for shifting our dependence on fossil fuel-generated electricity. Renewable sources such as wind and solar historically have been costly and difficult to finance because of the uncertainty of permitting and returns on long-term investment. The governor's goals of meeting 20 percent of electricity demand with renewable and alternative energy by 2020 can be enhanced by creating regulatory incentives for new renewable energy.⁶

The GCA helps create those market incentives for creating more renewable energy and alternative forms of energy in Massachusetts. By expanding renewable energy capacity and investing in innovative energy technologies, Massachusetts will move toward a cleaner energy future. In order to accomplish this goal, GCA sets up a pilot project that requires utilities to enter into long term contracts (ten to fifteen years) for renewables capped at 3 percent of utility load. This will be a key factor in helping renewable energy (especially wind) developers obtain financing for their projects and to give certainty to renewables that they can compete with traditional generation and make a return on their investment. Utilities may also own or operate solar facilities up to 25 percent by 2009 (up to fifty megawatts) and recover costs. Utility ownership of solar photovoltaic cells placed on their customers' roofs will create a partnership between utilities and the growing solar manufacturing and installation industry in Massachusetts.

The GCA also requires utility companies and electricity sellers to double the rate of new renewable energy certificates (RECs) they must purchase under the "renewable portfolio standard" (RPS) program. Current RPS technologies include wind, solar, tidal, fuel cells and landfill gas. The statute adds geothermal, hydro- and hydrokinetic power and creates a new Class II category for renewable energy projects built prior to 1997. Under the existing RPS program, electricity suppliers must purchase the requisite percentage of RECs or pay into the Alternative Compliance Account. Each REC equals one megawatt-hour of renewable energy generated. RPS RECs are currently worth

6. In early 2009, the Governor set a goal of developing 2,000MW of wind power capacity by 2020 and 250 MW of solar power by 2017. Press Release: Governor Patrick Sets New Goals for Wind Power (Jan. 13, 2009), available at http://www.mass.gov/?pageID=gov3pressrelease&L=1&L0=Home&sid=Agov3&b=pressrelease&f=090113_Goals_Wind_Power&csid=Agov3.

approximately \$50 per megawatt-hour. The new requirements increase the RPS requirement on utilities and other electricity suppliers, who must procure a certain percentage of power from Class I renewable sources by an additional 1 percent of sales each year, starting from 4 percent in 2009 and reaching 15 percent by 2020 and 25 percent by 2030. The increase in RPS requirements means an increase in revenue to renewable generation that will help offset the cost of building new, clean renewable energy.

The new Alternative Energy Portfolio Standard (APS) supports other innovative energy technologies that, while not renewable, advance clean energy goals by means of efficiency and reduced fossil fuel-based energy generation, while meeting strict environmental standards. Eligible nonrenewable technologies include coal gasification, flywheel energy storage, combined heat and power, paper-derived fuel and energy-efficient steam. Although nonrenewable energy technology still emits GHGs, it is steering utility companies away from the old, outdated forms of electricity generation, and the APS standard will encourage research and development into other forms of low-emitting technologies.

Finally, the GCA creates new incentives for smaller-scale renewable energy projects by allowing the owner of small wind turbines, e.g. two megawatts, to sell excess electricity back to the grid at favorable rates. The GCA also allows neighborhoods or other organizations to aggregate the excess electricity and take advantage of economies of scale, without losing the right to sell the electricity back to the grid. These new “net metering” provisions are already showing signs of promise, as many municipalities, landowners, and others are bringing forth plans to construct small solar and wind energy projects to take advantage of these financial incentives.

3. Building Codes

Existing building codes are outdated and new buildings are not necessarily built with energy efficiency measures. Developers and architects need to incorporate such measures—such as double-pane windows and highly efficient heating, ventilating and air conditioning (HVAC) systems—at the design phase. Under GCA, the state adopted the set of international building codes for residential and commercial development—with automatic updating every three years, inspector training and certifica-

tion. This will bring Massachusetts up-to-date with more modern standards and keep Massachusetts at the forefront of energy efficiency in new buildings. In addition, the state is considering a proposal that would allow municipalities to go beyond the new state building code to develop more stringent codes called "stretch codes" that encourage energy efficiency.

4. The Green Communities Program

The GCA established the Green Communities Program, which is a state-municipal partnership to help municipalities increase their use of renewable and energy-efficient measures. Many cities and towns would like to reduce energy costs, but cannot afford the price tag for implementing energy-efficient and renewable energy measures. The goal of the Green Communities Program is to provide technical and financial assistance to municipalities for energy efficiency and renewables that will reduce electricity bills. Providing funding to offset the cost of implementing those measures will have a huge impact on those communities choosing to participate in the program. Massachusetts will make at least \$10 million per year available through the RGGI auction proceeds and the sale of NO_x Budget Trading Program allowances, System Benefit Charge money, and RPS alternative compliance payments.

To qualify as a Green Community, the municipality must meet requirements related to siting and permitting of renewable or alternative energy generation facilities. This means that municipalities must adopt laws that make "siting as-of-right", and expedited permitting for renewable projects or related businesses. Easing permitting and siting will invite renewables into the community. To qualify, municipalities must also implement energy efficiency measures that will reduce energy consumption by 20 percent within five years from the established baseline, and must purchase only fuel-efficient vehicles.

B. *The Global Warming Solutions Act*

In 2008, the Massachusetts Legislature also adopted landmark climate legislation called the Global Warming Solutions Act (GWSA).⁷ Building on the major energy reforms achieved by

7. Chapter 298 of the Acts of 2008, the Massachusetts Global Warming Solutions Act (GWSA), was passed by the legislature and signed into law by Governor Patrick in August 2008. GWSA, available at <http://www.mass.gov/legis/laws/seslaw08/s1080298.htm>.

the Green Communities Act, the GWSA is comprehensive in scope, making it a game changer in how the Commonwealth addresses carbon in the first half of this century. The Act requires Massachusetts to establish an economy-wide cap on carbon emissions, beginning with a 10–25 percent reduction below 1990 levels by 2020 and culminating with an 80 percent reduction below 1990 levels by 2050.

GWSA envisions using flexible market mechanisms to limit GHG emissions, such as a cap-and-trade program. Other types of mechanisms to be considered include placing an aggregate limit on electric generation sources, direct emission reduction requirements on other sectors of the economy, and monetary and nonmonetary incentives. A thorough review of these and other approaches will help identify the least expensive ways to reduce emissions, whether through gas-saving vehicles, new efficient oil furnaces, solar energy, or new technologies that have yet to be invented. The GWSA provides a comprehensive approach for setting stringent, but cost-effective emissions limits that will result in a clean energy marketplace as we move beyond the era of fossil fuels.

The first step under GWSA is to create an inventory of GHG emissions. This will require mandatory reporting of GHG emissions from all facilities that are required to report under Title V of the Federal Clean Air Act and any other facilities that emit greater than the equivalent of 5,000 tons of CO₂ per year. Mandatory reporting of GHG emissions is essential because, very simply, we can't reduce what we can't measure. The reporting requirements include traditional stack emissions, GHG emissions from manufacturing processes, and on-road and off-road motor vehicles owned or leased by the facility. Retail electricity sellers must also report GHG emissions based on total megawatt-hours of electricity consumed by Massachusetts customers, minus any megawatt-hours of green energy supplied to its customers.

MassDEP's initial mandatory GHG reporting regulations⁸ to meet the January 1, 2009 statutory deadline rely, in large part, on the calculation methods published in The Climate Registry Gen-

8. Emergency Regulation for Greenhouse Gas Reporting, 310 Mass. Code Regs. 7.71 (Dec. 29, 2008), available at <http://www.mass.gov/dep/service/regulations/771mkup.pdf>. Amendments to the regulations to address verification, voluntary reporting and reporting by retail sellers of electricity will be issued by July 2009. Mass. Dep't of Env'tl. Prot., Amendments to 310 CMR 7.71: Reporting of Greenhouse Gas Emissions for February 3rd 2009 Stakeholder Meeting, (Feb. 2, 2009), available at <http://www.mass.gov/dep/service/regulations/proposed/771draft.pdf>.

eral Reporting Protocol.⁹ Since some of the entities cited under GWSA are already tracking their fuel use and CO₂ emissions, the reporting requirements should not create a new burden for them.¹⁰ The mandatory reporting program will ensure a rigorous and consistent accounting of emissions and provide reporting tools and formats for the collection of data necessary to develop the reduction plans required by GWSA for 2020, 2030, 2040 and finally 2050. All information will be reported to a regional registry.

The second step is to set an economy-wide GHG emissions target for 2020 that is 10–25 percent below 1990 emission levels. GWSA requires the secretary of energy and environmental affairs to publish a plan setting a specific target by January 1, 2011. In setting the 2020 target and the measures to achieve it, the secretary must consider the total potential costs and economic and non-economic benefits to the economy, environment, and public health.

To achieve those limits, the state is planning to create a GHG reduction plan for each ten-year milestone that will include all sectors: electricity generation, commercial, industrial, manufacturing, residential and transportation. The plan must also provide certainty to the regulated community and encourage advanced market-based solutions that reveal the least cost solutions and encourage entrepreneurs to advance innovative ideas and technologies.

9. Facilities will calculate emissions using The Climate Registry's General Reporting Protocol. Massachusetts is using TCR's General Reporting Protocol because it is a generally accepted means among government agencies and facilities calculating GHG emissions. WCI has signaled its intent to use TCR, and the U.S. Environmental Protection Agency (U.S. EPA) has a specific mandate to consider TCR's system in developing a federal reporting system. Thus, TCR's General Reporting Protocol provides a consistent means of calculating GHG emissions in North America. THE CLIMATE REGISTRY, GENERAL REPORTING PROTOCOL: ACCURATE, TRANSPARENT AND CONSISTENT MEASUREMENT OF GREENHOUSE GASES ACROSS NORTH AMERICA (2008), available at <http://www.theclimateregistry.org/downloads/GRP.pdf>.

10. The 1990 Clean Air Act Amendments created Title IV (the Acid Rain Program), 42 U.S.C. § 7651 (1997). Congress required large power generation sources to monitor CO₂ to ensure accurate reporting of SO₂ emissions. Clean Air Act Amendments of 1990, 101 Pub. L. No. 549, 104 Stat. 2399 (codified as amended at 42 U.S.C.S. § 7651k (1997)).

C. *Massachusetts Environmental Policy Act (MEPA)
Greenhouse Gas Footprint*

One of the most cost-effective ways to curb the growth of GHG emissions is to require developers of new projects to calculate expected GHG emissions from the proposed project and implement energy efficiency measures before the project is ever built. It is more cost-effective to do it correctly from the beginning rather than require developers to replace outdated systems with modern, more efficient systems.

In 2007, Massachusetts announced a MEPA greenhouse gas policy and became the first state in the nation to require developers of major projects to analyze the greenhouse gas emissions of their projects as part of the environmental impact review process before receiving permits.¹¹ The policy requires that environmental impact reports for these projects quantify the amount of carbon dioxide (and other GHGs on a case-by-case basis) from (1) direct emissions; (2) indirect emissions from the use of electricity and (3) indirect emissions from transportation. The reports also must include a discussion of measures to avoid or minimize these emissions to the maximum extent feasible, and quantify how much GHG reduction can be expected from alternative mitigation measures.

Final environmental impact reports have included GHG mitigation measures such as installation of high-efficiency heating, ventilating and air conditioning systems, duct sealing, extra roof and ceiling insulation, energy management systems to control heating, cooling and lighting, and installation of solar panels on the roof. Through this policy, the state has gained a much better understanding of the GHG emissions associated with major development projects, and has prompted developers to put forth creative measures to minimize those emissions.

In 2008, the legislature essentially codified this policy in the Global Warming Solutions Act by requiring that all state agencies that issue permits consider the greenhouse gas emissions of the project under review.¹²

11. Mass. Env'tl. Prot. Agency Greenhouse Gas Emissions Policy and Protocol, available at <http://www.mass.gov/envir/mepa/pdf/files/misc/GHG%20Policy%20FINAL.pdf> (last visited Mar. 24, 2009).

12. Global Warming Solutions Act of 2008 § 7 (2008), available at <http://www.mass.gov/legis/laws/seslaw08/sl080298.htm>.

D. *The Oceans Management Act*

The 1,500-mile Massachusetts coastline and rich ocean waters have shaped the state's history, economy and cultural identity. Historically, the ocean has supported recreational activity and tourism, fishing and shellfishing, shipping and trade, scientific research and many other endeavors. More recent ocean uses in Massachusetts include aquaculture, offshore liquefied natural gas offloading facilities and high-speed ferries. Due to high wind speeds and ample space, coastal waters offer Massachusetts and other New England states their best opportunity to meet a substantial amount of electric need with renewable energy.

Until recently, management of ocean resources has been piecemeal, not only in Massachusetts, but also nationwide. In 2003 and 2004 respectively, the Pew Commission on Oceans and the U.S. Commission on Ocean Policy each issued reports calling for significant reform of state and federal policy on management of ocean waters off the U.S. coast.¹³ At the same time, Massachusetts began looking at the challenge of balancing competing uses of state waters and resource preservation.

Under the recently enacted Oceans Management Act of 2008,¹⁴ Massachusetts is moving away from that direction by launching the first-in-the-nation effort to establish a comprehensive ocean plan to manage development in its state waters. The plan will balance natural resources preservation with traditional and new uses, including renewable energy. The comprehensive, science-based planning will be used to assure long-term protection and sustainable use of ocean resources. Following a scientific review and a stakeholder process, the plan will set specific guidelines for development projects in state waters and provide safeguards for the health and preservation of the ocean.

The most significant component of the Oceans Management Act of 2008 is to allow for the siting of "appropriate scale" offshore renewable energy facilities in state waters—except for the Cape Cod Ocean Sanctuary—provided that they are consistent with the ocean plan. Prior to this act, renewable energy genera-

13. PEW OCEANS COMM'N, AMERICA'S LIVING OCEANS: CHARTING A COURSE FOR SEA CHANGE (2003), available at http://www.pewtrusts.org/our_work_report_detail.aspx?id=30009; U.S. COMM'N ON OCEAN POLICY, AN OCEAN BLUEPRINT FOR THE 21ST CENTURY (2004), available at http://www.oceancommission.gov/documents/full_color_rpt/000_ocean_full_report.pdf.

14. The Oceans Act, Chapter 114 of the acts of 2008 (2008), available at <http://www.mass.gov/legis/laws/seslaw08/sl080114.htm>.

tion facilities were not clearly allowed in most of Massachusetts' coastal waters. Thus, the act encourages, for the first time, offshore renewable energy facilities as long as there is an ocean management plan in place that designates appropriate locations and performance standards for such facilities. This act removes a major barrier to the development of wind, wave and tidal energy.

E. *The Clean Energy Biofuels Act*

The goal of the Global Warming Solutions Act, as noted above, is to reduce GHG emissions 80 percent by 2050. In order to meet this goal, we cannot focus solely on reductions from electricity generation; we must move to cleaner-burning fuels.

Massachusetts consumes about 4.5 billion gallons of petroleum per year, costing roughly \$10 billion and accounting for one-third of the state's GHG emissions. Recognizing the significant GHG emissions from the fuel sector, the state has taken major steps to support the use of cleaner forms of fuel, like biofuels, over traditional fossil fuel. Biofuels are substitutes for fossil fuels—like gasoline, diesel, and heating oil—and are derived from renewable organic matter such as corn, soy, switchgrass, agriculture waste, wood and waste vegetable oil. “Advanced” biofuels are generally derived from non-food-based feedstocks and are defined in federal law as those that yield a lifecycle reduction in greenhouse gas emissions of at least 50 percent compared with fossil fuels. The goal is to find alternatives to petroleum-based fuels for powering cars and heating homes, which are less carbon-intensive.

The Clean Energy Biofuels Act of 2008 will encourage the growth of an advanced biofuels industry as part of the growing clean energy technology sector in Massachusetts.¹⁵ While Massachusetts plays little roles in corn-based and soy-based biofuels, it will play an important role in fostering biochemical research, technological advancement and feedstocks that can be grown locally. Massachusetts is considering using other sources for biofuel, such as forest and agricultural waste—including leftovers from cranberry production—and even algae.

The act gives preferential tax treatment to companies that develop gasoline substitutes made from fibrous (cellulosic) matter of feedstocks that are non-corn-based alternatives to ethanol.

15. The Clean Energy Biofuels Act (2008), available at <http://www.mass.gov/legis/laws/seslaw08/sl080206.htm>.

Massachusetts is the first state in the country to offer this incentive. It also requires all diesel and home heating fuels sold in Massachusetts to contain a minimum percentage of biofuels starting with 2 percent in 2010 and ramping up to 5 percent by 2013. In order to qualify, all biofuels will have to meet high standards for reduction of GHG emissions over their entire lifecycles (growing, processing and combustion). Finally, it requires the development of a low-carbon fuel standard that will reduce GHG emissions from cars and trucks by 10 percent and look to form an agreement with other Northeastern states to implement the standard on a regional basis.¹⁶

It is estimated that pushing for cleaner fuel will help the state's economy by creating more "green jobs" and increasing state revenues, while at the same time reducing the state's dependence on fossil fuel.

F. *The Green Jobs Act*

In recent years, there has been a surfeit of proposals by state and local governments promoting a green economy. These include investment in green technologies like wind and solar, subsidies for green startups, and investment in green collar jobs and training. For example, the development of wind energy technology is one of the largest and fastest growing industries in Massachusetts. Demand for these new technologies—as well as for energy efficiency measures in homes, businesses and municipalities—is increasing, but a lack of trained, qualified workers is constraining the industry's ability to meet that demand. To meet this challenge, Massachusetts passed the Green Jobs Act in 2008 to support advancement in public works projects, job training, research and development, fostering entrepreneurial energies and support for nonprofits and community groups.

The Green Jobs Act will provide support for the growth of a clean energy technology industry and help the state meet the goals required under GWSA and GCA for reducing GHG emissions.¹⁷ The Green Jobs Act created the Massachusetts Clean Energy Technology Center to serve as the state's leading agency on the green economy. The Center will work to stimulate job creation in the green energy sector, promote workforce training and conduct market research. The Green Jobs Act also estab-

16. Low Carbon Fuels Standard, *supra* note 3.

17. See *supra* Part III.a–b.

lishes the Alternative and Clean Energy Investment Trust Fund. Starting with \$38 million in funding over five years, the Act provides \$5 million in Renewable Energy Trust funding and \$1 million as seed money to be used to fund the following projects:

1. A seed grant program for clean energy companies, institutions or nonprofit organizations.
2. A workforce development grant program to award grants to universities and colleges, vocational technical schools or community-based organizations with existing or potential workforce development programs in clean energy.
3. A pathway-out-of-poverty initiative to award five competitive grants to clean energy companies, community-based nonprofit organizations, educational institutions or labor organizations for training programs that lead to economic self-sufficiency.

According to the New England Clean Energy Council, full implementation of this legislation could create twenty-one new clean energy companies and create more than 10,000 new jobs. It may also attract up to a billion dollars in venture capital over the next four to five years,¹⁸ resulting in a raise of \$50 million in new annual income tax revenue.

IV.

MASSACHUSETTS' ACTIONS TO REDUCE GHG EMISSIONS AND INCREASE ENERGY EFFICIENCY: POLICY INITIATIVES

A. *Making a Difference at the Local Level*

Municipalities are a great starting point for promoting reductions in electricity demand and new alternative forms of electricity. When municipalities make a change, it has an immediate impact on the community it is serving and sets an example for the community to follow. One model for this leadership is our Energy Management Pilot Project for Wastewater and Drinking Water Facilities.

MassDEP, the Department of Energy Resources, the U.S. Environmental Protection Agency, academic groups, nonprofits and

18. *Report: New England Clean Tech Economy Could Bring \$1 billion in Investment by 2012*, BOSTON BUS. J., June 12, 2008, available at <http://boston.bizjournals.com/boston/stories/2008/06/09/daily40.html>.

private investor-owned electric and gas utility companies¹⁹ launched the pilot project in December 2007 at fourteen wastewater and drinking water plants. The pilot project was developed because wastewater and drinking water facilities tend to be energy hogs. The pilot project allowed the program partners to look at energy use in proportion to the total cost of the municipal service. Massachusetts cities and towns spend approximately \$150 million per year in electrical costs to treat 662 billion gallons of wastewater and drinking water. About 35–40 percent of a treatment plant's operating budget is just for energy to treat drinking water or wastewater. Approximately 30 percent of municipal energy use in Massachusetts is for water treatment. Our project goal is to reduce annual electric consumption, costs and GHG emissions by 20 percent.

MassDEP worked hand-in-hand with state and federal counterparts to offer an integrated package of technical expertise and assistance services to the pilot plants. This included conducting initial EPA Energy Star benchmarking²⁰ at all seven wastewater facilities. The first step to saving money on energy bills is to assess a plant's current performance. The free Energy Star Portfolio Manager Benchmarking tool helped our pilot facilities track their energy use, which was then integrated into the energy audit and renewable assessment phases of the project.

Comprehensive energy audits were performed on all fourteen pilot facilities, identifying ways in which a facility could be more energy efficient and/or integrate clean, renewable energy into its operations. For example, one facility is installing a 195 kW biomass (sludge) cogeneration system for onsite electric power generation, while another will install a second hydroelectric turbine and solar photovoltaic to help provide 100 percent of the electricity demands from the water treatment plant. In total, the energy saving opportunities identified during the audits, could reduce annual energy use by 20 million kWh, resulting in annual potential savings of \$2 million and the reduction of approximately 15,000 tons of CO₂ emissions.

19. MassDEP is leading the pilot project effort in partnership with the Department of Energy Resources, EPA New England, the University of Massachusetts at Amherst, the Massachusetts Renewable Trust, the Consortium for Energy Efficiency, and every major gas and electric utility in the Commonwealth.

20. U.S. EPA, Boston Ranks Eleventh in EPA's Top 25 U.S. Cities with the Most ENERGY STAR Buildings, <http://www.epa.gov/region1/eco/energy/es-labeled-buildings.html> (last visited Mar. 24, 2009).

MassDEP is continuing this energy pilot initiative with a second phase, the goal of which is to have all 350 wastewater and drinking water treatment facilities in Massachusetts proactively assess their energy use, take steps to improve their energy efficiency, and incorporate renewable energy into their daily operation. This is an excellent example of how a public-private partnership can achieve a win-win for both the environment and a municipality's fiscal bottom line.

B. *State Leading by Example*

States must also show leadership if they want citizens and the private sector to follow. In Massachusetts, that leadership is seen in Governor Patrick's Executive Order 484, which commits all state agencies to GHG reduction targets of 25 percent by 2012, 40 percent by 2020 and 80 percent by 2050. Massachusetts is leading by example by purchasing hybrid and alternative fuel vehicles, contracting for energy management services and considering efficiency and renewable energy for construction and renovation projects.

As part of this effort, the Patrick Administration recently announced its Zero Net Energy initiative, a bold vision in which the state catalyzes a long-term transformation of the building sector.²¹ This initiative will lead to interim energy use standards for state-owned construction that are significantly more stringent than the Massachusetts "LEED (Leadership in Energy and Environmental Design) Plus" benchmark. This policy will also put the private sector on a path toward broad marketability of zero net energy commercial and residential buildings by 2020, and universal adoption of zero net energy practices for new construction by 2030.

One example is the renovation project at MassDEP's Wall Experiment Station in the city of Lawrence that will upgrade the country's oldest state testing laboratory into a LEED certified building. MassDEP is spending \$22 million on a two-year project to expand and upgrade the building that will include photovoltaic cells, rainwater recycling, stormwater management systems,

21. ZERO NET ENERGY BUILDINGS TASK FORCE, FINAL REPORT OF THE MASSACHUSETTS ZERO NET ENERGY BUILDINGS TASK FORCE 1 (2009), available at http://www.mass.gov/Eoeea/docs/eea/press/publications/zneb_taskforce_report.pdf.

“green roof” design, efficient new heating and ventilating systems, and “day-lighting” efforts.²²

C. *Decoupling Electricity Rates from Sales*

Massachusetts took another significant step to accomplish energy efficiency goals through “decoupling,” or separating, the direct link between utility rates and sales volume. Typically, utilities collect more revenue by selling more electricity or gas, and lose revenue when their customers use less through efficiency measures. This approach provides a disincentive for the utilities to encourage their customers to institute energy efficiency options. Under decoupling, a utility would continue to be profitable, even as it sells less power. Thus, utilities are encouraged to participate in conservation and efficiency programs without risking profit.

In July, 2008, the Massachusetts Department of Public Utilities issued an order establishing an overall framework for decoupling utility rates from sales volume for all of the state’s electric and natural gas distribution utilities.²³ Utilities are expected to file decoupled rate plans with the department as existing rate plans expire, but no later than 2012. Decoupling has been successfully implemented in over 30 states across the country.

D. *Regional Initiatives to Reduce Greenhouse Gas Emissions*

Global warming is a worldwide problem, but local, state and regional initiatives that result in the reduction of GHG emissions or the use of cleaner fuels can make a significant difference. Many state and local climate change initiatives have already begun to reverse the growth of fossil fuel-fired electricity. States are also working cooperatively on regional initiatives to achieve even broader scale GHG emission reductions.

In January 2007, one of the first things Governor Patrick did upon taking office was to rejoin nine other Northeast and mid-Atlantic states implementing the Regional Greenhouse Gas Initiative (RGGI). The ten states, acting voluntarily through a memorandum of understanding, created the nation’s first market-based, cap-and-trade program to reduce carbon dioxide emis-

22. Mass. Dep’t of Env’tl. Prot., Wall Experiment Station Renovation, <http://www.mass.gov/dep/public/publications/1006wall.htm> (last visited Mar. 24, 2009).

23. Dep’t of Pub. Utilities Order 07-50-A (2008), available at <http://www.mass.gov/Eoeead/docs/dpu/electric/07-50/71608dpuord.pdf>.

sions from power plants. The goals of RGGI are to stabilize GHG emissions using 2000–2002 baseline emissions, create a market for carbon and demonstrate state leadership. In the past two years, the ten states have finalized regulations, exhibited unprecedented cooperation across energy and environmental agencies, created a professional and predictable auction platform, and generated tens of millions of dollars to invest in energy efficiency and renewable energy in their states. RGGI allows the regulated facilities to meet market demand for electricity, continue to grow our clean economies and, at the same time, lower regional GHG emissions.

By joining RGGI, Massachusetts transitioned from a regulation that limited CO₂ emissions from six power plants²⁴ into a regional program that covers twenty-eight Massachusetts power generating plants. RGGI covers power plants that are twenty-five megawatts and larger—approximately 225 such plants regionwide. The cap is set at 188 million tons for the region. Under the RGGI program, carbon dioxide emissions are stabilized from 2009 through 2014, and then the cap lowers by 2.5 percent a year, resulting in an emissions reduction of 10 percent by 2018. Each compliance period is three years to address potential weather, fuel price and economic fluctuations, and allow compliance entities ample time to purchase enough allowances to cover each ton of CO₂ emitted. The first compliance period began on January 1, 2009.

In promulgating its RGGI regulations, first among the ten states, Massachusetts decided to auction 100 percent of its share of the CO₂ allowances. The benefits of auctioning all of the allowances are that (1) it puts all facilities on a level playing field regardless of fuel use, (2) states can apply the auction revenues directly to energy efficiency measures and new renewable energy and (3) it forces power plants to compare the cost of business as usual to the cost of implementing energy efficiency measures or switching fuels. Having a successful and professional auction sends consistent signals to market participants to help build a viable carbon market.

24. In May 2001, Massachusetts became the first state in the country to adopt a multi-pollutant regulation that set emissions cap and emission rates for the six oldest and highest emitting plants in the state. 310 Mass. Code Regs. § 7.29 (2008). In addition to setting emissions standards for NO_x, SO₂ and Hg, the regulations capped the power plants historical CO₂ emissions in October 2006 and required the facilities to meet a CO₂ emission rate of 1800 lbs./MWh starting in October 2008. 310 Mass. Code Regs. § 7.29(5)(a)(5)(b).

RGGI held its first two “pre-compliance” auctions on September 25, 2008 and December 17, 2008 respectively, and its first quarterly auction for the three-year compliance period on March 18, 2009. RGGI’s independent market monitor reported that the first two auctions were seamless, professional and successful.²⁵ In addition to auctioning allowances for the 2009 vintage, RGGI states also auctioned a percentage of 2012 vintage allowances for the second three-year control period. RGGI’s market monitor again found the auction results to be “consistent with competitive expectations.”²⁶

When the revenue was disbursed following these first auctions, Massachusetts had the laws and policies in place to put the funds to work immediately. The revenue is now being applied to support electric utility companies’ energy efficiency programs, helping cities and towns with the costs of integrating energy efficiency and renewable energy measures into their operations, and helping low-income households to become more energy efficient, thereby reducing their electric bills. The money will also be used by the Department of Energy Resources to provide funds promised as grants under the Green Communities Act.

RGGI has just begun, but in the absence of federal climate and energy policy, the existence of a disciplined, professional cap-and-trade program conceptualized and run by ten states makes a profound statement that this can be done. Consistent with the goals of their RGGI memorandum of understanding, as well as their own state climate laws and action plans, the RGGI states are already looking at ways to address other sectors on a regional basis.

Massachusetts has led the RGGI states, together with Pennsylvania, in a commitment to create a model regional low-carbon fuel standard by the end of 2009 to reduce GHG emissions in fuels used for vehicles and other uses.²⁷ A low-carbon fuel stan-

25. REGIONAL GREENHOUSE GAS INITIATIVE, RGGI STATES’ FIRST CO₂ AUCTION OFF TO A STRONG START (2008), *available at* http://www.rggi.org/docs/Auction_1_Release_MM_Report.pdf; Memorandum from David Patton to Regional Greenhouse Gas Initiative (Dec. 18, 2008), *available at* http://www.rggi.org/docs/Auction%202%20Post_Auction_Report_Market%20Monitor_b.pdf; REGIONAL GREENHOUSE GAS INITIATIVE, STATES RELEASE RESULTS OF THIRD AUCTION FOR RGGI CO₂ ALLOWANCES (2009), *available at* <http://www.rggi.org/docs/Auction%203%20News%20Release%20MM%20Report.pdf>.

26. POTOMAC ECONOMICS, RGGI AUCTION 3 ON MARCH 18, 2009 1 (2009), *available at* http://www.rggi.org/docs/Auction_3_News_Release_MM_Report.pdf.

27. Low Carbon Fuels Standard, *supra* note 3.

dard is a market-based, technology-neutral policy to address the carbon content of fuels by requiring reduction in the average life-cycle GHG emissions per unit of useful energy. Such a standard is applicable not only in transportation, but also for fuel used for heating buildings, for industrial processes and for electricity generation. The standard would apply to the entire Northeast region, which has different stocks of biomass than other parts of the country, and would create a larger market for cleaner fuels, thus reducing GHG emissions and supporting development of clean energy technologies.

V.

CONCLUSION

We are proud that Massachusetts is a leadership state in climate change solutions. In the context of impending federal legislation, what is unique about the Commonwealth's approach is its close integration of energy and environmental agencies and their respective disciplines. This integrated approach takes the challenge of climate change and turns it into opportunity for innovative and sustainable solutions. This is the unleashed potential of the energy/environmental nexus that Massachusetts has learned to tap, with determined and marked success.

Under the new Obama Administration and the new Congress, we hope to see strong federal leadership to establish an aggressive national program that will tackle GHG reductions and unleash the technology innovation and investment we need for a clean energy economy. Early action states, like Massachusetts, are demonstrating every day that bold climate change programs are making a difference in energy consumption, efficiency and new options for consumers to better manage their energy budgets and save money. Through economy-wide caps and enforceable goals, they are demonstrating that new solutions in all sectors do exist or can be developed to reduce GHGs. Through firm targets and incentives, they are proving that integrated energy and climate policies lead to real business growth and job creation. In sum, states are once again, raising the bar to demonstrate what is possible.

The federal government will do well to not only learn from states' experience, but also to sustain and not stifle this positive momentum at the state and local levels. After all, it is at the state level that many of the greenhouse gas reduction goals will be implemented, as states play the leading role in regulating util-

ity companies and driving utility-sponsored energy efficiency programs; issuing building permits to push green buildings, and making myriad land use and other regulatory decisions that directly affect greenhouse gas emissions across the economy. A robust national climate program should be premised on a close federal-state partnership, one that permits rather than preempts states to go beyond federal minimum standards. In addition to the traditional roles for states in monitoring and enforcement, a strong federal program should support continued innovation and experimentation by states. This model has worked in the past for many of our more successful federal environmental laws, and has ensured a level playing field of compliance while promoting continuous improvement in pollution control strategies and technologies.