

Report to the Joint Standing Committee on Natural Resources

Second Session of the 123rd Maine Legislature

Second Biennial Report on Progress toward Greenhouse Gas Reduction Goals



Submitted by the
Maine Department of Environmental Protection
in accordance with P.L. 2003 Chapter 237

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EXECUTIVE SUMMARY

Maine continues to make significant progress toward its goal of reducing greenhouse gas (GHG) emissions by 2020 sufficient to reach the target of 10% below 1990 levels. During the period 2005-2007, implementation of the eleven most important policy actions (the top 20% of activities, modeled to account for more than half of target GHG reductions) proceeded well in all but two cases.

Of particular note:

- Maine continued to lead regional efforts toward establishment of the Regional Greenhouse Gas Initiative (RGGI), becoming the first state to adopt rules to implement the program. In addition to directly reducing GHG emissions in the electrical power sector, the program will generate significant new funds for electrical efficiency investments.
- The Maine Legislature enacted an increase in the Renewable Portfolio Standard for electrical energy production.
- Maine adopted the California Tailpipe Greenhouse Gas Emission Standards to promote the use of cleaner emission vehicles.
- The Legislature passed, and Governor Baldacci signed, a wide range of legislation implementing *Climate Action Plan 2004* proposed actions in the areas of energy conservation, use of solar power, development of alternative fuels, etc.
- State government implemented several "lead by example" initiatives to make state fleets more efficient, use alternative fuels in state buildings, and make efficiency improvements in state-owned buildings.
- Market forces produced positive steps toward greenhouse gas reductions in the areas of landfill gas, bio-mass energy production, and agriculture.
- Voluntary action by Maine businesses, municipalities and institutions participating in "The Governor's Carbon Challenge" program produced measurable GHG savings throughout the state.

Maine is doing even better in meeting our statutory and Governor's greenhouse gas reduction goals judged from a regional perspective: more of the regional electrical generation capacity and generation is shifting into Maine. Maine has permitted two utility-scale wind-power projects with one fully operational in Mars Hill. Maine's five gas-fired combined cycle electrical generators are considerably cleaner and more efficient than the regional power mix, so that increased use of Maine's natural gas electrical generation capacity will result in substantially lower regional greenhouse gas emissions due to their smaller greenhouse gas footprints. This shift into Maine's cleaner generation mix means cleaner air in Maine and the region, and is very encouraging for combating climate change.

COMPLETE REPORT

Background

Maine citizens, the Legislature, and the executive branch, through the Maine Department of Environmental Protection (DEP), have prepared and are implementing a plan for Maine to actively reduce its emissions of greenhouse gases (GHGs). The DEP issued its first report on GHGs in 1990, and subsequently revised its Emission Statement Regulation to include the reporting of GHGs. In 1998, the State Planning Office (SPO) released a draft report, *Responding to Climate Change*, and later (2000) issued a State of Maine Climate Action Plan. This suggested a set of options for reducing emissions, but did not commit the State to specific actions. As a result, no implementation occurred.

Legislative history

The 121st Maine Legislature enacted Public Law 2003, chapter 237, "An Act to Provide Leadership in Addressing the Threat of Climate Change" (38 M.R.S.A. §574-579).¹ The law set goals (§576) for the reduction of greenhouse gas emissions within the state, adopting targets proposed by the New England Governors' / Eastern Canadian Premiers' (NEG/ECP) conference. These targets, the first in the nation to be established in a state statute, call for a reduction to 1990 levels by 2010, to 10% below 1990 levels by 2020, and in the long term, "sufficient to eliminate any dangerous threat to the climate."

To accomplish these goals, this law identifies two primary areas of action: state government lead by example initiatives (§575), and the development of a climate action plan by the DEP (§577). §578, as subsequently amended by Public Law 2004, ch. 144, calls on the DEP to evaluate the State's progress toward meeting the reduction goals, review the cost-effectiveness of the actions, and submit a report to the Legislature's Natural Resource Committee matters by January 1, 2006, and by that date every two years thereafter. This report is presented pursuant to that obligation.

Development of the Climate Plan

Development of *A Climate Action Plan for Maine 2004* (the *Plan*) by a 50+ member facilitated stakeholder process occurred during 2003-04, with the final *Plan* delivered by Governor Baldacci to the chairs of the Natural Resources Committee on December 1, 2004. The *Plan* lists 54 options² in decreasing order (from highest to lowest) of expected GHG savings. Almost half of the options would reduce carbon at a negative or negligible overall cost to Maine citizens and Maine's overall economy.³ If all 54 options are ultimately implemented as

¹ The section references that follow are keyed to this section of the statute.

² The stakeholder group developed the *Plan* as a list of options for implementation, and each proposed/potential action is referred to in this manner.

³ A "negative" overall cost means that the option would produce a net savings.

projected, the statutory goals in the original legislation will be met. This report summarizes activities undertaken to implement the *Plan* since the last biennial report in 2006.

Implementation of A Climate Action Plan for Maine, 2005-2007.

As noted in the *Plan*

[e]ach of the recommended options contains assumptions about the “best case” for speed of implementation: that is, the option would be put in place and begin to save emissions as soon as possible given the technical requirements of the option. Each year of delay in implementing an option, for whatever reason, slows its impact. Since a number of the most important options are already expected to take longer to implement than others, and several would require an extended period of time before their effects were fully realized, the actual timetable for implementation will have a direct effect on whether or not the projected carbon savings are realized by 2010 and 2020. ... A number of the options that are most significant (in terms of potential for carbon reduction) either depend upon, or have effects that would be enhanced by, the actions of other jurisdictions. The implementation and effectiveness of several others, particularly those involving the development of, and demand for, renewable electricity supplies, will be affected by similar actions taking place in other New England states. (7, 17ff.)

Implementation of each option presents unique circumstances, and may require legislation, rule-making, voluntary action, executive order, support of regional and/or federal activity, or some combination of these. With these considerations in mind, we report here on those actions and activities that have occurred during 2005-2007. A complete list of the options, with notes on the current implementation status of each, is found in Appendix A.

Highlights by Sector

The enabling legislation required the *Plan* to “address reductions in each sector,” referring to the NEG/ECP *Climate Change Action Plan* (2001) categorization of transportation, commercial, industrial, institutional and residential economic sectors. The Stakeholder Advisory Group (SAG) that drafted the *Plan* chose to organize its proposed actions into categories of Energy and Solid Waste; Buildings, Facilities, and Manufacturing; Transportation and Land Use; and Agriculture and Forestry as providing a more coherent framework for Maine’s purposes.⁴ Since §577 specifies that the *Plan* should particularly take into account ways in which natural resource activities could be used to sequester GHG emissions, the SAG created a specific category for that purpose. We report here significant achievements and challenges for each of the categories and

⁴ Thus, for example, GHG reduction actions related to electricity demand management in commercial, industrial, institutional and residential sectors were consolidated in the Buildings, Facilities, and Manufacturing category.

some of the options within them.

Energy and Solid Waste

The *Plan's* recommended actions for energy and solid waste include six options⁵ that, taken together, account for more than 30% of the expected carbon savings by 2020, and thus are of particular importance in evaluating progress toward the statutory goals.

The principal progress made during the biennium is the continuing implementation of the Regional Greenhouse Gas Initiative (RGGI), *Plan* Option 3, currently a ten-state consortium working to establish a cap-and-trade system for electrical generation GHG emissions in the northeastern states. **In 2007, Maine became the first state to adopt rules to implement the program, which is on schedule to conduct the initial auction of allowances in the second half of 2008. This schedule will allow advance planning and purchasing by affected sources in the region prior to full implementation in early 2009. Preliminary calculation of carbon savings likely to result from RGGI suggests that while Maine's target may not be reached in 2010, due to increased use of Maine's lower-GHG gas-fired utilities after 2009, it will likely exceed original projections by 2020.**⁶ Moreover, increased use of Maine's natural gas electrical generation capacity will result in substantially lower regional greenhouse gas emissions due to their smaller greenhouse gas footprints and less emissions of mercury and ozone precursors. In short, this shift to increased use of Maine's natural gas plants means lower overall greenhouse gas emissions and cleaner air in Maine and the region.

Options 1 and 7 (Offset Requirements and Emissions Standards), which would require electricity generators to (a) offset a given percentage of carbon dioxide (CO₂) through projects that reduce emissions; and (b) meet output-based CO₂ emissions limits. These were originally modeled based on best available estimates of RGGI implementation, since they are linked to its requirements. That said, there is at present no effort to create a statutory offset requirement for Maine's electricity facilities; therefore the carbon savings associated with this option may have to be accounted for elsewhere.⁷ In a sense, however, Maine may be considered to have accomplished its goal in this arena, as **Maine's current and anticipated electrical generation mix already produces lower carbon dioxide emissions *per* kilowatt-hour than would have been achieved by a regulatory limit.**

Options 11 and 5 (Renewable Portfolio Standard, or RPS, and System Benefit Charge, or SBC) are closely linked, since each is an effort to expand the

⁵ Options 1, 3, 5, 7, 8 (including 18), and 9 (including 27).

⁶ As RGGI takes effect, higher-emitting facilities elsewhere in the region will become less competitive. Maine's facilities will then increase their output. However, since current output is probably lower than the target modeled in the original calculations, increased production may not exceed the goal. In addition, there would still be a net regional gain against GHG emissions.

⁷ The DEP expects to re-calculate this and related estimates after 2010, when a more complete picture of actual emissions changes will be available.

production of renewable electricity in order to displace fossil-fuel based generation. **After several years of effort, an increase in the RPS was enacted in 2007, and will reach the original goal of a 10% increase in 2017 instead of 2020, thus producing greater carbon savings than originally projected.**

No increase in the SBC has occurred. However, as can be seen in the next section, the sale of RGGI allowances will create a very large additional pool of funds similar to those currently disbursed by the Public Utility Commission's (PUC's) "Efficiency Maine" program. This may be able to replace the funding for energy projects that Option 5 was designed to supply (*e.g.*, wind farms and methane recovery). Furthermore, market forces have produced needed capital, so that by 2010, much of the additional wind, solar, and landfill gas capacity modeled in this section is likely to have been, or is projected to be, built *without* the need for subsidies.

Buildings, Facilities, and Manufacturing

The Buildings, Facilities, and Manufacturing initiatives seek to affect the demand side of energy use in the attempt to lower GHG emissions, and thus include actions in the industrial, commercial, residential, and institutional (including municipal) sectors of Maine's economy. Almost all efforts here seek to manage energy more efficiently, since energy efficiency is by far the most cost-effective carbon "in the market," and produces cost savings over a rapid pay-back period.

The *Plan* options in this group generally fall into two groups for purposes of implementation: those in the private sector, either voluntary or supported by programs such as Efficiency Maine; and those in the state government sector. While Efficiency Maine has increased its activity level substantially since 2004, potential emissions savings in Options 19, "Improve Electrical Efficiency in Commercial and Institutional Buildings," and 22, "Manufacturing Electrical Efficiency Measures," were modeled on the basis of an increase in funds available for energy efficiency beyond the projected Efficiency Maine baseline. As of its most recent report, Efficiency Maine has not yet reached the baseline funding level. Funds from the sale of RGGI allowances designated for energy efficiency may make up the difference beginning as early as 2008, but at present, these options are performing below target levels.

In the particular sub-area of residential energy use, 2007 saw the launch of the PUC's Carbon Free Homes program to educate residential customers about supply options and Renewable Energy Credits (RECs). The program's website offers customers the opportunity to learn about their home energy use, identify appropriate energy efficiency options through Efficiency Maine and other residential State Energy Programs, and sign up for a clean energy product. This program represents the PUC's first effort to provide residential customers with a comprehensive menu of energy options. A small amount of funding allowed development of a public awareness media campaign through the summer of 2007. Partnerships with other Maine organizations, including the Governor's Carbon Challenge, further promoted consumer awareness of clean energy options. **As of early December, 2007, the Carbon Free Homes program had achieved moderate success as measured by 4,600 unique hits to the website, and**

had registered 224 new users by December 15. The program will see further expansion in 2008.

In the public sector, as will be noted in the section on legislative initiatives, significant progress was made toward the use of renewable energy in state-owned buildings.

Transportation and Land Use

The transportation sector accounts for roughly 40% of Maine's GHG emissions, and as a result, the *Plan* recommended several actions with very large potential impacts in the transportation sector. Two of these, Options 2 (Tailpipe GHG Emissions, also known as "Pavley" Standards) and 32 (Advanced Technology Component of LEV 2 Standards, to promote zero-emission vehicles) were adopted by rule during the biennium, putting Maine squarely on track to meet its goals in this area. While final implementation is still subject to the legal challenge of EPA's denial of California's waiver for the California standards by Maine and other states, it appears that Maine consumers are already purchasing low-emissions vehicles at rates above the market penetration level that was assumed in the original modeling of this option. **This option, the second most important in reducing carbon, will almost certainly produce gains exceeding its original share in Maine's carbon reduction equation.**

The *Plan* includes several actions to increase the availability and use of lower-GHG fuels such as bio-diesel and ethanol. Maine is well-positioned to become a leader in producing such fuels, primarily from forest resources, and the most recent legislature enacted several bills to promote this. **At the same time, Maine distributors, supported by the Governor's office, are increasingly making both fuels available in response to demand by Maine consumers.** A draft Bio-fuels Policy Report pursuant to Resolves 2007, ch. 51 identifies the renewable fuels standard [Option 6] as "the most effective State policy for encouraging bio-fuels production and consumption, followed closely by State use [Option 24]...."

Agriculture and Forestry

The agriculture sector, while a relatively small contributor to Maine's climate efforts, is achieving real successes toward its climate-related goals. Since the inception of the *Plan*, positive forces in the market are driving implementation of Option 33, "Support Purchase of Locally Grown Produce," to levels that, if continued, will exceed projected carbon savings. As recommended by stakeholders, Option 39, "Increase Soil Organic Carbon," now includes Options 51, "Organic Farming," and 54, "Nutrient Management," since all three recommend similar actions to increase carbon storage on agricultural lands. Farm acreage being managed in this way is steadily increasing with the support of State and federal agencies.

Option 44, "Farmland Protection," requires actions that parallel the need for forestland protection. **There has been a significant increase since 2004**

in farm acreage protected by permanent conservation easements, and in acreage enrolled in farmland and open space tax programs.

The forestry sector, long thought to have the potential to offset some of Maine's GHG emissions through carbon sequestration, has yet to realize real gains toward its *Plan* goals. This is due, in part, to the fact that while all other options are expected to produce actual gains by 2020, forests and forestry achieve their results over a longer period of time.⁸ In addition, calculating progress for the options depends on information from the Forest Inventory, an annual survey of Maine's forest lands collected by the Maine Forest Service (MFS) that functions as a "trailing indicator." As a result, the first usable data will not be available until 2010.

That said, there is still an apparent need to provide incentives for Maine's forest landowners to adopt the management practices that the *Plan* proposed to increase carbon storage while also protecting the viability of the forest industry.⁹ **In one current initiative, the Maine Forest Service, in collaboration with DEP, Environment Northeast, the Manomet Center for Conservation and the USDA-Forest Service, has been asked by the RGGI Directors to propose additional categories for offsets available to RGGI emission sources. These have the potential to produce revenue incentives for forest landowners to adopt the practices noted above.** MFS expects to report its proposal to RGGI in late 2008.

Prevention of forest loss (Option 14, "Forestland Protection") is a matter of real significance to Maine's climate efforts. So-called "avoided deforestation" serves a two-fold purpose: it maintains or increases forest carbon storage; and it provides an important economic benefit through the increase in biomass available for wood products and energy production. The MFS group is including this as one of the proposed offset categories, particularly since loss of forest land to development in the lower Penobscot basin has been identified by The Nature Conservancy as a particular challenge.

Legislative Initiatives: Actions of the 122nd Legislature, Second Session, and 123rd Legislature, First Session

A number of significant pieces of legislation related to implementing the *Plan* were introduced in 2006 and 2007.

In 2006, "An Act Concerning Energy Conservation in Schools (L.D. 1902) and "An Act Regarding Energy Efficiency Standards for Residential Rental Properties" (L.D. 2074) were enacted. **Both can be expected to produce GHG emissions savings in the residential and institutional sectors, thus implementing actions proposed in Options 35, "Efficient Use of Oil and**

⁸ The forest options assumed a regeneration cycle of 58 years in calculating carbon savings.

⁹ Options 10, "Increased Stocking;" 16, "Early Commercial Thinning;" and 20, "Timber Harvesting to Capture More Anticipated Mortality."

Gas: Home Heating," and 19, "Improve Electrical Efficiency in Commercial and Institutional Buildings."

Several bills important to implementation of the *Plan* were not passed. Of particular note, an attempt to extend the tax credit for clean fuel infrastructure,¹⁰ specifically proposed in Option 53, failed, as did efforts to increase the system benefit charge (Option 5) for electrical efficiency expenditures,¹¹ and a sales tax exemption for clean vehicles (Option 46).¹²

The first session of the 123rd saw substantial progress on carbon emission reduction initiatives:

- LD 785, "An Act to Promote Green Power Use at State Buildings" (enacted as P.L. 2007, ch. 52) requiring 100% of State energy purchases to be renewable by 2010, was enacted. **This will implement Option 34, requiring State government to meet a minimum percentage of their power needs with renewable energy, ten years earlier than projected in the *Plan*.**¹³
- LD 1180, "An Act to Promote Transportation Planning, Increase Efficiency and Reduce Sprawl," (enacted as P.L. 2007, ch. 208) will assist in the implementation of Option 17, "Lowering the Growth of VMT." It establishes a program within the Department of Transportation, funded on a pilot project basis, to provide technical assistance and incentive grants to municipalities to prevent new development along state highways.
- LD 1159, "Resolve, To Encourage Increased Use of Biodiesel Fuels in Maine" (enacted as Resolves, ch. 79) directs the Office of Energy Independence and Security (OEIS) to establish a pilot program for ethanol refueling stations, directly supporting implementation of Options 6 and 53. Option 6 would require a minimum low-GHG fuel content in all fuel sold in the state; Option 53 provides incentives for the development of low-GHG fuel infrastructure.
- LD 1347, "An Act To Establish Alternative Fuel Incentive Grants To Stimulate the Production, Distribution and Use of Biofuels" (enacted as Resolves, ch. 51) directs OEIS to study and make policy recommendations regarding the establishment of an alternative fuel incentive program in the State to stimulate the production, distribution and use of bio-fuels.

There was also progress in the area of energy efficiency:

- LD 645, "An Act to Promote Municipal Energy Conservation" (enacted as P.L. 2007, ch. 66) responds to Option 19 ("Improve Energy Conservation

¹⁰ LD 308.

¹¹ LD 1931, as proposed, would have increased the amount of the assessment on the transmission and distribution utilities, among other things. As enacted (PL 2007, ch. 569), this provision was removed. The final bill did include provisions for encouraging energy efficiency in schools, and required the PUC to consider peak demand conservation programs

¹² LD 275, "An Act to Promote Energy Conservation and a Cleaner Environment."

¹³ The original Option included the universities in this requirement, and while there is evidence of voluntary action on the part of some, there is no overall university policy in place at present.

- in Commercial and Institutional Buildings”) by providing for energy audit financing in municipal and local school buildings. To the same end,
- LD 1666, “Resolve, Directing the Public Utilities Commission To Amend its Rules To Increase the Amount of Energy Conservation Funds for School Administrative Units” (enacted as Resolves, ch. 55) directs the Public Utilities Commission to develop a plan to increase energy efficiency and conservation in school facilities in the State and to promote opportunities for school administrative units to participate in the PUC’s Efficiency Maine programs.
 - The successful solar energy rebate program enacted in 2005 (Options 38, “Solar Water Heat Rebate,” and 55, “Solar Photovoltaic Buy Down Program”) was extended by LD 795 (enacted as P.L. 2007, ch. 158) until 2010.
 - LD 1655, “Resolve, To Improve the Energy Efficiency of Residential and Commercial Buildings” (enacted as Resolves, ch. 93) directs the PUC and the Maine State Housing Authority to study the feasibility of, and make recommendations for, State policies or programs designed to increase compliance with the Maine Model Building Energy Code, thus implementing, in part, Option 37, “Improve Enforcement of Commercial Energy Codes.”

Most importantly, LD 1920, “An Act to Stimulate Demand for Renewable Energy” (enacted as P.L. 2007, ch. 403) establishes portfolio requirements for *new* renewable capacity resources, beginning at 1% for calendar year 2008 and increasing by one percentage point per year, ending at 10% in 2017. This has the effect of fully implementing the recommendation of Option 11, and does so three years sooner than originally proposed.

Bond issues and financial incentives for bio-refineries and other alternative energy projects failed to pass, as did tax credits for alternative fuel vehicles, small wind generators, and renewable energy. **While several bills related to wind power failed to pass, the establishment of the Governor’s Task Force on Wind Power Siting is moving this issue forward.**

Finally, **Maine is proceeding with implementing the Regional Greenhouse Gas Initiative (“RGGI”) with a goal of participating in the first auction of carbon allowances during the second half of 2008.** This follows the Legislature overwhelmingly passing LD 1851, “An Act To Establish the Regional Greenhouse Gas Initiative Act of 2007” in the 1st Session of the 123rd Legislature (2007).¹⁴ That act authorizes Maine to participate in the RGGI initiative along with nine other eastern U.S. states (New Hampshire, Vermont, Massachusetts, Connecticut, Rhode Island, New York, New Jersey, Delaware and Maryland). RGGI’s initial success has spawned similar agreements between western and mid-western U.S. states to undertake regional greenhouse gas reduction regulatory programs, and substantial interest from Canadian provinces in joining with U.S. states in these programs.

Following passage of Maine’s implementing law, Maine became the first of the RGGI states to adopt implementing RGGI program rules which built on the

¹⁴ The final legislation had a total of 56 co-sponsors of both parties and independents.

greenhouse gas requirements already in place under Maine's Chapter 137 air inventory requirements. Maine is working very intensively with other states to set up the regional RGGI infrastructure through a newly formed regional organization and to put the pieces in place for states to participate in a single regional auction process. The details of implementing a multi-state greenhouse gas regime without federal assistance are receiving substantial attention from the environmental and energy commissioners of the 10 RGGI states.

As the 2007 law envisions, Maine is participating in a regional non-profit organization (RGGI Inc.) with DEP Commissioner David Littell and PUC Commissioner Sharon Reishus serving as directors among a total of 20 directors, and Commissioner Littell also serving as vice-chair. A common architecture is being developed through RGGI Inc. not only for the carbon allowance auction process but also for carbon offset project administration and software for states to cooperate in tracking carbon allowance sales, trading, inventory and emissions. Considerable attention between air and energy staffs of the ten RGGI states is devoted to setting up the details of a multi-state carbon cap-and-trade system to ensure it is a fully functional system that will withstand any potential legal challenge.

One area of particular attention we note for the Legislature is that the multitude of legislation pending in Congress to regulate greenhouse gases should clearly address how state greenhouse gas programs put in place in advance of a federal greenhouse gas system are to be treated under federal legislation once passed. It is not clear in the multiple federal bills pending whether RGGI in general and Maine's requirements specifically would be preempted in whole or in part by the pending federal legislation. If this is not clarified as federal legislation advances, we expect it will create substantial and unnecessary market and regulatory uncertainty.

Rule Making

As noted above, in 2007 Maine became the first state in the RGGI area to fully adopt rules needed to bring the Initiative into effect.

Stakeholder Activity

In completing the *Plan*, the Stakeholder Advisory Group (SAG) recognized that there were some options with a strong consensus in principle, but for which specific implementation steps were not immediately clear. The SAG agreed that the DEP should convene additional stakeholder groups with the task of reviewing these options and recommending actions to the DEP. During 2006-7, three such groups were active:

- Workgroup on Option 17, "Lowering the Growth of Vehicle Miles Travelled." Composed of some members of the original Transportation Working Group, plus new members, this group is staffed by DEP, Maine Department of Transportation, and the Maine State Planning Office. It has agreed to focus on ways to promote healthy transit-oriented development in some of Maine's key geographical transportation corridors, and is working with the Center for

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Clean Air Policy, supported by foundation grants, to gather and analyze Maine-specific data in order to assure that any recommendations will meet the desired level of GHG reductions. In 2007, DOT secured funding for a research project, "Transportation Impacts of Transit-Oriented Development in Maine" that will produce additional policy recommendations to move this option forward.

- Forestry Management workgroup. This group, co-convened with the Maine Forest Service (MFS), reviewed the six forest management options originally included in the *Plan* in order to choose the most practicable. The group presented a report, "Meeting Maine's Climate Action Plan Goals: The Role of the Forest Sector in Reducing Greenhouse Gas Emissions," to the Natural Resources Committee, and Agriculture, Conservation, and Forest Committee, in January 2007. The MFS has taken co-responsibility for continued implementation of these options. In addition, DEP is providing staff support to MFS as it develops a proposal for additional forestry offsets as part of RGGI.
- An agriculture workgroup met briefly during 2006, in conjunction with the activities of the Maine "Eat Local Foods Coalition." Their recommendation to consolidate Options 51, "Organic Farming," and 54, "Nutrient Management" into Option 39, "Build Up of Soil Organic Carbon" has been adopted by the DEP.

Other Actions

In contrast with a number of other states that have adopted similar GHG reduction plans, the *Maine Plan* has an unusually large number of recommended actions, proposed by the stakeholders, for which implementation lies outside the control of state government. **During 2006-7, market and regional forces proved that adoption of these measures were reasonable, and were responsible for faster than anticipated implementation of several actions, and at an apparently lower cost.**

Options particularly worthy of note in this regard are

- ❖ Option 8 (combined with Option 18 in the *Plan*), "Biomass Generation." As originally designed, this Option assumed that a production tax credit or similar vehicle would be needed to re-start underutilized plants and subsidize others to ensure continued operation, at a cost of \$15-17 *per* unit¹⁵ of carbon saved. As it happens, the expansion of markets elsewhere in the region for renewable energy certificates has brought Maine's biomass generation industry to full production, with several new plants under development. It may be noted, however, that the biomass industry's performance is unpredictable, dependent as it is on factors such as the global demand/supply dynamics of biomass, electricity transmission constraints, the availability of revenues from Renewable Energy Credit (RECs), and other factors. This option will need to be reevaluated regularly to see if long-term carbon savings are occurring.

¹⁵ The standard unit of measure for saved carbon is one metric ton of carbon dioxide equivalent.

- ❖ Options 9, 27 [now consolidated]: “Landfill Gas Management.” While it’s too early to claim full implementation, it would appear that development of landfill gas-to-energy projects is moving ahead more rapidly than modeled, particularly with the expected opening of such a facility in Hampden in early 2008, and the announcement of a large facility under development in West Old Town. In both cases, emerging economic forces made possible management decisions to invest in such projects, without the need for financial incentives.
- ❖ Option 4, “Clean Diesel Technologies.” In this case, regional distribution in 2006 of low-sulphur diesel fuel in advance of EPA’s 2007 heavy-truck vehicle technology standards is likely to achieve the goals of this Option without the need for support funding to offset vehicle modification expenses.

Assessment of Overall Progress

As can be seen from Appendix A, **the DEP believes that the bulk of the actions proposed in the initial *Plan* are on track to produce expected results by 2020; and that, taken together, Maine will meet, or come close to, the 2010 and 2020 emissions reduction goals.** However, since actual calculation of GHG savings and costs will not be available until after 2010, confirmation after the fact will be needed to verify this.

The DEP would also note that **in the three years since completion of the *Plan*, actions in the private sector, in markets, and internationally have begun to produce GHG savings beyond those considered in developing the *Plan*.** This was to be expected. As a result, Maine as a state is likely to meet or exceed the 2010, and particularly, the 2020 carbon savings goals outside the specific actions included in the *Plan*. For example, wind energy generation in Maine will almost certainly exceed the most optimistic estimates of its contribution to the Renewable Portfolio Standard, while the emerging technology of tidal power is being tested in Maine’s coastal waters. Since the core goal is to precipitate national and international action to eliminate any dangerous threat to the climate, these developments are encouraging.

Evaluation of Cost Effectiveness

The DEP was charged in the enabling legislation with adopting a plan, with input from stakeholders, that proposed “reduction in each sector in cost-effective ways....” The final *Plan*’s 54 options were approved by the stakeholders using this and other criteria. Subsequent evaluation of cost effectiveness is an assessment of whether a given action item actually produces the expected (modeled) outcome at the expected cost. Thus, an action is more cost-effective if it results in GHG savings at a *lower* cost than anticipated, and vice-versa.

In summary, the DEP has reviewed the cost-effectiveness of the actions, and reports:

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- Among those implemented or initiated thus far, insufficient time has passed to allow meaningful calculation of either GHG savings, or costs. *Example:* Passage of legislation providing a pilot program of rebates for solar hot water and photo-voltaic systems will need several years of actual implementation and data generation in order to assess cost-effectiveness.
- Qualitative assessment of a few options indicates full implementation at substantially less cost than projected. (*Examples:* biomass electricity generation, landfill gas-to-energy, and wind power deployment.)

Of those qualitative assessments done, none indicates that actions implemented in the last two years are *less* cost-effective than anticipated. Several are almost certainly *more* cost-effective than as originally modeled.

Calculation of Carbon Savings and Costs

Although many of the recommended options are in the initial stages of implementation, there can only be a maximum of two years of data (for 2005 and 2006) available to calculate carbon savings resulting from the recommended action. The DEP regards this as insufficient to allow for solid conclusions regarding trends or for rigorous mathematical analysis. However, specific examples of carbon savings and costs based on a "snapshot" of activities are listed in Appendix A.

The *Plan* uses 2010 as the intermediate point for determining how well any and all of the recommended actions are proceeding toward carbon savings, and all of the actions were modeled for an estimated amount of carbon saved in that year. The DEP recommends that once quantitative data for 2010 are available, the entire group of options should be re-modeled to demonstrate progress or its lack, assuming that sufficient resources are available to conduct this analysis. The Committee may thus expect that the fourth biennial report, due in January 2012, will provide a fuller analysis of progress and recommendations for any changes to the goals of the *Plan*. As a consequence, the DEP does not, at this time, recommend any changes to the targets established in the original legislation, and allowed under §578.

As will be noted, some of the original options do not currently appear to have a reasonable chance of implementation/success, among the most significant of which are an increase to the System Benefit Charge (Option 5) and "Pay as you Drive Insurance" (Option 13). The carbon savings associated with these, roughly calculated as 9.3% of the 2020 goal, must now be made up elsewhere. **Based on current review, the DEP believes that a number of options, including Option 3, "Regional Cap and Trade" [RGGI]; Option 8, "Biomass Electricity Generation," and Option 9, "Landfill Gas to Energy," are likely to produce carbon savings above the original estimates. In addition, GHG reduction efforts not included in the *Plan*, such as increased renewable energy production beyond that modeled for the RPS, will by 2020 be producing carbon savings that may gain greater carbon reductions than would be lost from measures not implemented.** The DEP ex-

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pects to model these activities as part of the post-2010 analysis, again assuming that sufficient resources to complete this are available.

Progress on other requirements of Public Law 2003, chapter 237

Voluntary agreements (Governor’s Carbon Challenge)

The “Lead by Example” initiative in Maine’s Climate Change law, 38 M.R.S.A. § 575 sub-§2, directs the DEP to develop 50 voluntary agreements with businesses and non-profit organizations to reduce greenhouse gases.

As of December 2007, DEP has implemented this directive as “The Governor’s Carbon Challenge (GCC)” and has entered into 66 agreements with businesses and private non-profits. The program consists of:

- Participants signing a one page agreement and submitting annual progress reports. (The reports include progress to date, reduction methods, activity production index, and future plans for reduction.)
- DEP providing assistance throughout the entire process.
- Participants, with the DEP’s help, using their first year in the program to calculate their base year emissions (1990 or first full year of available data).
- Participants calculating their actual emissions from report years and report this information to the DEP each July.

The DEP website contains the full program description, agreement forms, and participant list and is available at www.maine.gov/dep/innovation/gcc

Participants as of December 1, 2007:

1. Accent Dry Cleaners	2. American Lung Association
3. Augusta Water & Sanitary District	4. Baldwin Apple Ladders
5. Bath Iron Works	6. Bowdoin College
7. Casella Waste Systems, Inc.	8. Chewonki Foundation
9. City of Gardiner	10. City of Hallowell
11. City of Portland	12. City of Saco
13. Colby College	14. College of the Atlantic
15. Commercial Paving & Recycling	16. Correct Building Products, LLC
17. Eastern Maine Medical Center	18. Fairchild Semiconductor
19. Guinness & Porcelli’s	20. Hannaford (53 facilities)
21. Interface Fabrics	22. Lamey-Wellehan (9 facilities)
23. Laughing Stock Farm	24. Lee Toyota
25. Lyman Morse Boatbuilders	26. Maine Energy Investment Corp.
27. MaineGeneral Health	28. Maine Organic Farmers & Gardeners Association
29. Maine State Housing Authority	30. Maple Hill Farm, Inc.

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31. Moody's Collision Centers #1	32. Moody's Collision Centers #2
33. Moody's Collision Centers #3	34. Morningstar Marble & Granite
35. Moss Inc.	36. National Semiconductor
37. Natural Resource Council of Maine	38. NorDx Laboratories
39. Oakhurst Dairy	40. Poland Spring Water
41. Portland Color	42. Portland Press Herald
43. Pratt and Whitney	44. Quarterdeck Restaurant
45. Reny's #1	46. Reny's #2
47. Reny's #3	48. Reny's #4
49. Safe Handling, Inc.	50. Sea Coast Management Co.
51. Sea-Ward on the Ocean Front	52. State of Maine
53. The Nature Conservancy	54. Town of Camden
55. Town of Yarmouth	56. Unity College
57. University of Maine-Orono	58. University of Southern Maine
59. Washboard Laundry	60. Waterfront Maine, Fort Andross
61. West Gardiner Beef	62. Wick Joe Coffee Roasting Co.
63. Winthrop Congregational Church	64. Wright-Ryan Construction
65. York Hospital	66. ZF Lemforder

Since the 2005 inception of the Governor's Carbon Challenge, participants have reported a total reduction of 90,317 metric tons of carbon. Eleven of these participants have achieved an individual reduction of 20% or more. DEP is partnering with other state service providers such as Efficiency Maine and the Maine Energy Program to conduct energy audits and find funds to assist eligible projects proposed by GCC participants.

Next steps planned for 2008 include development of a data base to track progress, participant training events, and a recognition program for high achievers. A potential federal grant would allow expansion of outreach to additional municipalities.

Inventory and Registry (\$575 sub-\$4)

Greenhouse Gas Point Source Emission Inventory

In its January 2002 report to the Legislature, the DEP proposed to incorporate the reporting of GHG emissions into its Emission Statement regulation, DEP Chapter 137. This approach utilized an existing emission inventory infrastructure, thereby minimizing the additional reporting requirement on both the reporting facilities and on departmental resources. In addition, under this scenario, the universe of reporting facilities is well defined and the reporting facilities are generally experienced in the reporting procedure. Under Chapter 137, facilities whose emissions of criteria pollutants trigger the reporting requirements of Chapter 137 would also be required to report emissions of the six greenhouse gasses.

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Rulemaking to amend Chapter 137 to include GHGs was initiated before the final adoption of this *Plan*, and upon its adoption by the Board of Environmental Protection in that year, **Maine became the first state to require licensed air sources to report all six GHGs.**

The implementation of the changes to Chapter 137 has proceeded relatively smoothly. This is due in large part to the efforts made by the emission inventory staff to ease the transition into GHG reporting, but is also due to the growing recognition within the regulated community of the need to gain a better understanding of their GHG emissions. Maine's point source inventory for GHG currently includes data from 204 reporting facilities for the calendar years 2003, 2004, 2005, and 2006 (data for each year is reported within the following year; *i.e.*, data reported for 2006 are reported in 2007).

Voluntary Greenhouse Gas Emission Registry (§575 sub-§3)

Maine has a long record of participation in regional meetings with non-governmental organizations (NGOs), industry representatives, and other states to explore issues and scenarios associated with GHG reduction projects and emission registries. These groups include the NESCAUM¹⁶ Demonstration Project, the Natural Resources Defense Council-sponsored Greenhouse Gas Registry Collaborative, and the NEG/ECP Climate Change Action Plan. In 2003, Maine participated with the northeast states in developing a proposal for a regional voluntary greenhouse gas registry which came to be known as the Regional Greenhouse Gas Registry (RGGR); RGGR was supplanted by the Eastern Climate Registry which in turn gave way to the multi-state Climate Registry. Each iteration of the GHG emission registry broadened participation among the states in terms of both geography and population. In 2007, Maine became a founding member of The Climate Registry, a collaboration among states, provinces and tribes aimed at developing and managing a common GHG emissions reporting system. It will support various GHG emission reporting and reduction policies for its member states, tribes and reporting entities, and will provide an accurate, complete, consistent, transparent and verified set of greenhouse gas emissions data from reporting entities, supported by a rigorous accounting and verification infrastructure. To date, 40 U. S. states, 2 Mexican states, and 4 Canadian provinces have joined The Climate Registry.¹⁷

The Climate Registry is policy-neutral, supporting the voluntary reporting of GHG emissions, mandatory GHG reporting programs, and regulatory GHG emissions reduction programs, and will establish a high level of environmental integrity in emissions accounting, reporting, and verification. To accomplish its stated mission, The Climate Registry will create a common standard for tracking and measuring GHG emissions, standardize best practices in GHG emissions reporting, and promote the full and public disclosure of GHG emissions.

¹⁶ North East States for Coordinated Air Use Management.

¹⁷ The remaining Canadian provinces have indicated their intention to join the Registry.

The Climate Registry is in the process of reviewing the comments received during the public comment period for the Climate Registry's General Reporting Protocol (GRP). At its next meeting in early 2008, their board of directors will be considering policy modifications to the GRP as a result of the public comment. The draft General Verification Protocol (GVP) is scheduled for release for public comment in February 2008, and several public workshops will be held across the country to discuss both the GRP and GVP. The Climate Registry's GRP will be finalized in mid-March of 2008 (co-incident with the close of the public comment period for the GVP), and the GVP will be finalized at the end of April, 2008. The Climate Registry is expected to be fully operational with the launch of its software programs on June 30th, 2008.

3. Greenhouse gas emissions inventory for state-owned facilities and state-funded programs (§575 sub-§1)

The Office of Energy Independence and Security (OEIS) has developed an inventory, and tracks usage of State motor fuels (including central fleet, the Department of Transportation, and paid employee mileage); state facility electricity use; and state heating fuels use. These numbers are reported annually.

Recommendations

§ 578 allows the committee of jurisdiction to report out legislation related to this and subsequent reports to the second regular session of any Legislature. The DEP does not recommend any legislative changes to implement Maine's *Climate Action Plan* in the 2nd session of the 123rd Legislature, nor does it recommend any changes to the reduction goals. However, the following recommendations would benefit from future legislative action:

1. The DEP will support legislation to effect technical changes to the RGGI rules resulting from the need to harmonize with other states' efforts that are currently in process.
2. Option 13, "Pay as You Drive Insurance," by which a vehicle's insurance premiums are based directly on how much it is driven, is in the upper quartile of actions in terms of potential GHG savings. GrowSmart Maine has identified the need for statutory change to allow Maine's insurance carriers to offer this as an option.
3. Improvements to "Energy Efficient Appliance Standards," Option 26, have been attempted in several legislative sessions without successful passage. While improved federal standards have produced some of the gains proposed in this option, the federal standards are incomplete. Since these actions are almost universally understood to be cost-negative, a further legislative attempt may be considered.

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4. Revisions to the Farmland and Open Space Property Tax Program to reimburse towns for land enrolled in these two current-use property tax programs would directly support the group of Agriculture options that are already making significant progress toward GHG reduction goals.

In addition, there are several options in the *Plan* that would benefit from additional action in the form of Governor's Executive Orders or other directives:

1. Option 24: Low-GHG Fuel use in state fleets. LD 197 (introduced in 2005) would have implemented this option, but it died in committee. While DOT instituted a pilot program for a few of their vehicles in the same year, no significant implementation has occurred. The increasing availability of such fuels could make it possible for the Governor to mandate a higher level of use.
2. Option 45: Energy savings in state buildings. Working with the OEIS, existing mechanisms could be more fully utilized. There is a performance contract for the prison in Warren, and actions of this sort could be mandated, perhaps with an aggressive timeline.

Appendices

- A. Options Implementation Summary Table

Summary Table of Recommended Options: Implementation

Green = On track Olive = Probably on Track Yellow = Needs Attention Red = To be Replaced

Option #	Option Name	Type(s) of Implementation (as originally proposed)	Additional Information	Implementation Status (1/08)	Next Steps (lower performing options)
1	Offset Requirements	Statutory	Volume of GHG savings depends on extent of #3 implementation.	Market activities to date may be producing fewer opportunities than modeled, even to meet the difference between RGGI gains and additional savings through offsets.	May have to be re-framed to account for voluntary markets instead of regulatory imposition.
2	Implement Tailpipe GHG Emissions Standards	Minor technical rule	Dependent on regional market for vehicles of this sort, and multi-state action.	Adopted by rule, 12/1/05. EPA has refused to grant the CA waiver required to put this into effect in 2009; however, market penetration of these vehicles already exceeds original estimates. Due to rise in fuel prices, cost savings will be greater than originally modeled.	
3	Regional Cap and Trade	Regional. In Maine, major substantive rule	If adopted, lowers the reductions needed in #1, #7	Implementation on target for 2009 start-up. There may be a short-term loss against Maine's original target due to increased regional need for Maine's lower-GHG output after 2009. 2020 reduction gains are likely to be greater than originally forecast, thus offsetting likely losses against the target in #1. Cannot be quantified with existing resources.	
4	Clean Diesel/Black Carbon	Statutory	Related to #41, "Anti idling"	Regional distribution (2006) of low-sulphur diesel in advance of EPA 2007 heavy-truck standards will require vehicle technology changes likely to meet a significant portion of this goal. As of late 2006, almost all diesel fuels in the Northeast meet the 15 ppm standard for sulphur.	
5	Renewable System Benefit Charge	Statutory	Aims to produce results similar to #11, "Renewable Portfolio Standard," using a different mechanism.	Depends to some extent on actions related to Option 11. No legislative action to date. Unlikely to be met, and some losses (\$2.6M p.a.) to funding enacted 2007 (RGGI): expect loss against target. However, all the modeled 2010 gains from wind, LFG, solar that this would have paid for are likely to be met without subsidy. A small voluntary program at the PUC, the "Renewable Resources Fund," expends about \$300,000 p.a. for small energy efficiency projects.	If the policy choice were made to institute an SBC to promote renewables, it should be separate from the EE efforts of Effic. Maine
6	Set a Low GHG Fuel Standard	Statutory	Could be implemented at either regional or federal level.	Identified as future priority by New England Governors' Conference. Section 1501 of the Energy Policy Act provides the statutory basis for the RFS program which requires EPA to establish a program to ensure that the pool of gasoline sold in the contiguous 48 states contains specific volumes of renewable fuel (or low GHG fuel) for each calendar year starting with 2006. In Maine, ~1% of all motor fuels meet the E-10 standard, with an expectation of at least 2% in 2008. Goal is likely to be met.	
7	Emission Standards	Existing rule	Volume of GHG savings depends on extent of #3 [RGGI] implementation.	No regulatory action needed. Maine emitters have already lowered emissions below the standard of 900 lb/Mw originally modeled, with a state average of 780 in 2007, when co-generation is taken into account. Will offset losses in #1.	
8	Biomass Generation: Existing Units	Statute: tax credit	May be affected by other states' RPS needs. Related to #11. Paired with #18; influenced by forestry options	Proposed mechanism not currently needed, as all existing biomass plants are in full production on market basis. Goal is considered accomplished, at negative cost; will likely exceed goal for 2010 and 2020.	
9, 27	Landfill Gas Management: Energy Production, and Flaring to Avoid Emissions	Voluntary: market driven; subsidy may be needed.		One LFG-to-energy facility due to go online January, 2008; 2 more likely by 2009. Flaring on track overall. Avoided emissions will likely exceed original projections by 2010 and thereafter.	
10	Increased Stocking With Faster Growing Trees	Voluntary on the part of landowners	Part of forestry options group: 14, 16, 20, 25, 28	Measurement of this activity is a trailing indicator, so no data available until 2010. At present, no additional data.	May require more specific outreach to forest landowners.
11	Renewable Portfolio Standards	Statutory	Aims to produce results similar to #5, "System Benefit Charge," using a different mechanism.	Legislation approved 2007. Original called for 5% by 2010; 10% by 2020. Legislation changes this to 3% by 2010, 10% by 2017. Accomplished. Re-calculation needed to account for new gains 2017-2020 against losses 2008-2010.	

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Option #	Option Name	Type(s) of Implementation (as originally proposed)	Additional Information	Implementation Status (1/08)	Next Steps (lower performing options)
13	Pay as You Drive Insurance	Statutory; market forces	Original implementation proposal was to initiate a pilot project.	No action to date.	Legislation needed to allow Maine's insurance carriers to offer this option.
14	Forestland Protection	Multi-part	Includes land-use planning elements. May be initiated by regional NGO's. May be included in RGGI offset category	Goal is to reduce annual losses by 10% by 2010, 20% by 2020, equivalent to 2,800 acres per year. 2004 reported acreage loss 8,400 acres; 6,200 in 2005; 2006, 6,400. On the other hand, evidence of increasing easements for protection, most recently 48,000 acres York County. Slightly below target rate.	Additional actions/incentives needed.
15	Recycling/ Source Reduction	Expand existing programs	May involve market development for recovered product, improved public information / education.	LD 406 (2006), explicitly affirming goals in option, enacted. For 2005, rate was 36.4%, an increase of 1% from 2004. Goal is 45% by 2010, 50% by 2020. This year, 'single-stream recycling' programs were adopted by communities in the Greater Portland area, and are now expanding outward. Also, with sustained value and strength in recycling markets, and the visibility of 'being green', the commercial sector is becoming a stronger player in collecting and managing recyclables. Uncertain whether 2010 goal will be met. SPO intends a major review in 2009, to determine if additional actions are needed.	No specific action needed at present. However, new incentives or programs may need to be considered following SPO 2009 review.
16	Early Commercial Thinning	Voluntary	Part of forestry options group: 14, 16, 20, 25, 28	See above, Option 10. Subject of Environment Northeast/Maine Forest Service study, 2005.	May require more specific outreach to forest landowners.
17	Slowing VMT Growth	Multi-part, involving DOT, municipalities, etc.	No particular mechanism to implement identified by stakeholders in 2004.	Multi-agency and stakeholder working group began work 6/05. Policy recommendations on promoting transit-oriented development expected 2008. Significant re-thinking and refining of goal needed. Will have data from Center for Clean Air Policy work, DOT, poss. GrowSmart.	Likely to require some legislative action in 2009.
18	Biomass Restart Nonoperating Units		Included in #8 (above).	See #8.	
19	Improve Electrical Efficiency: Commercial / Institutional Buildings	Expand existing programs	Expands current "Efficiency Maine" programs.	Several statutory enactments (2007) to promote this. "Efficiency Maine" program lifetime emissions reductions continue to increase. Significant reductions (voluntary) in both commercial (75 participants) and municipal (5) sectors are saving about 12K MTCO2 per year [2006 data]. However, "Efficiency Maine" kWh savings in this sector have not met intermediate annual targets. RGGI revenues are likely to improve this further, but not until after 2008.	
20	Timber Harvest to Capture Anticipated Mortality	Voluntary	Part of forestry options group: 14, 16, 20, 25, 28	See above, Option 10: similar constraints on data availability. No specific initiatives to date. Some anecdotal evidence that previously underutilized wood waste is being recovered for bio-mass use (see #21).	May require more specific outreach to forest landowners.
21	Biomass Electricity Feedstocks	Voluntary	May have implications for out-of-state RPS, Renewable Energy Certificates (RECs).	Probably on target to reach projected goal.	
22	Electrical Efficiency Measures: Manufacturing	Multi-part	No particular funding mechanism identified by 2004 stakeholders.	"Efficiency Maine" and voluntary efforts related to GCC, etc. are producing significant results. Examples: BIW, Fairchild. However, "Efficiency Maine" kWh savings in this sector have not met intermediate annual targets. RGGI funds may improve this situation, but not until after 2010.	
23	Fossil Fuel Efficiency Measures	Multi-part	No particular funding mechanism identified by 2004 stakeholders.	No specific program in place. Voluntary efforts related to GCC, etc. are producing significant results. Examples: Poland Spring, Z.F. Lemforder	
24	Low-GHG Fuel for State Fleets	Executive order	Would probably require a regional approach to be effective	LD 197 [2005] would have implemented; died in committee. Some trial use by DOT. In pending report to the Legislature, most effective state policies to encourage bio-fuels are a renewable fuel standard (#6, above), followed by state use.	Issuance of an executive order should be explored further.

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Option #	Option Name	Type(s) of Implementation (as originally proposed)	Additional Information	Implementation Status (1/08)	Next Steps (lower performing options)
25	Expanded Use Of Wood Products	Voluntary	Part of forestry options group: 14, 16, 20, 25, 28	No specific program in place. Maine Forest Service continues to explore implementation options.	
26	Appliance Standards	Legislation	May be affected by Federal pre-emption.	No Maine standards adopted. Some gains in this area due to improved Federal standards.	A further legislative effort is needed.
27	Landfill Gas Management: Flaring	Rule: revisions required	Revisions to Ch. 401 rules needed (minor technical)	Essentially accomplished. Incorporated with #9.	
28	Active Softwood Increase	Voluntary	Part of forestry options group: 14, 16, 20, 25, 28	Dropped by stakeholder group as unlikely to produce gains as modeled; will need to be accounted for.	Recommendations for how to account for this gap will need to wait until after 2009 Forest Inventory.
29	Increase Public Expenditures for Electrical Efficiency		See 19, 22, 37, for which this would be the mechanism	Existing funding mechanism has produced a slight increase over baseline, but not sufficient to meet proposed target. However, RGGI funds directed to this same end will produce more than twice the original projection. Will lag behind 2010 goal, but likely exceed 2020.	
30	Improve Residential Building Energy Codes	Major substantive rule		P.L. 2005 ch. 88 was enacted 6/05 and became effective on the same date. An additional law, P.L. 2005 ch. 350, refined the procedures associated with codes, became effective 9/17/05. P.L. 2006 ch. 534 created new efficiency standards for rental properties. Task completed.	
31	Voluntary Partnerships and Recognition Programs	Voluntary	Broaden participation in existing programs, including new industries	Governor's Carbon Challenge is fully implementing this Option; accomplished.	
32	Add ZEV Mandate to LEV II Standards	Major substantive rule		Implemented by Resolves 2005, ch. 66. Accomplished. 26% of the vehicles delivered to dealers to Maine in 2005 were partial zero emission vehicles (PZEVs).	
33	Locally Grown Produce	Voluntary	Outreach program	Has been accomplished by market forces. Like to produce greater GHG savings than originally projected.	
34	State Green Power Purchases	Executive order	Responds directly to NEG/ECP "Lead by Example" standard.	P.L. 2007 ch. 34 requires 100% renewable power by 2010, thus reaching the original goal a decade earlier than projected. 2007: 100% renewable energy certificates being purchased for core state government; not all state universities participating.	
35	Efficient Use of Oil and Gas: Home Heating	Expand existing programs; new legislation	Implements #23; May require identification of specific subsidy or other support mechanism	Will need further work with Energy Office to identify best opportunities and design a pilot program. P.L. 2005 ch. 110 (natural gas conservation) enacted.	
36	Combined Heat and Power Incentive Policy	Multi-part	May require changes to utility regulations	Requires development of a separate implementation plan, probably involving PUC, etc. No policy action to date. One project [EMMC] installed; several others in planning/development stages.	
37	Enforce Commercial Building Energy Code	Legislation	PUC proposed the ASHRAE/IESNA 90.1-2001 standards in rule.	Outreach program will be needed to implement. Some progress Resolves 2007 cc. 46,93.	Additional action to mandate an enforcement mechanism may be needed.
38	Solar Hot Water Heater Program	Legislation	Would be implemented by tax credit or revolving loan	LD 1586 implements this and Option 55. Enacted and subsequently (2007) extended.	Uncertain whether, at current rates, expected market penetration will occur.

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Option #	Option Name	Type(s) of Implementation (as originally proposed)	Additional Information	Implementation Status (1/08)	Next Steps (lower performing options)
39	Soil Carbon Buildup, including Increase Organic Farming (#51) and Nutrient Management (#54)	Expand existing programs	Options consolidated to better reflect related implementation approaches.	A wide range of activities through Dept. of Ag, MOFGA, SWCD, are actively engaged in this.	
40	Green Campus Initiatives	Expand existing programs	Enhance outreach and education efforts	Probably accomplished, and will likely produce greater savings than anticipated.	
41	Encourage Anti-Idling Measures: Freight	Multi-part	Some funding efforts may be needed to create necessary infrastructure.	No action as yet; LD 2056 (2008) would begin implementation. Some local and voluntary activity (Freeport) already in place.	
42	Voluntary Green Building Design Standards	Voluntary	Promotion / outreach / education activities	No specific program in place. Some gains due to actions by Maine State Housing Authority, independent voluntary activities.	
43	Waste-to-Energy	Upgrade existing facilities	Some implications for reception of out-of-state waste, landfilling residues	Economics and local concerns make this unlikely to advance. Will need to be re-evaluated and replaced. Possible waste-to-fuel facility (Biddeford) would meet this goal; too soon to evaluate.	
44	Agricultural Land Protection	Multi-part	Requires some form of pro-active "smart growth" program	Farms acres in conservation easement have increased by almost 200% since 2004, and actual farm acreage has increased over same period by 1%. All metrics indicate that this measure will probably exceed original goal.	
45	Energy Savings in State Buildings	Executive order	Would expand existing program.	Work with BGS/DAFS to set more aggressive timelines and implement existing mechanisms. See LD 711 submitted to 122nd: died in committee. A performance contract for the prison in Warren is an example of action toward meeting this goal.	Additional Executive Order needed.
46	GHG Feebates (state or regional)	Legislation	Low consensus among 2004 stakeholders	LD's 2, 302 in 123rd killed.	Additional effort needed.
47	Procurement Preference for Concrete Containing Slag	Executive order	Would apply to state procurement; could be extended on a voluntary basis to non-public sector construction	No specific action presently needed. Goal will likely be met as a result of Executive Order requiring LEED certification for new and renovated state buildings.	
48	Promote energy efficiency buildings	Voluntary	Primarily education effort	No specific program as yet.	
49	Specification C150 Portland Cement	Rule		Department of Transportation action. No action to date.	
50	Reduce HFC Leaks from Refrigeration	Rule (existing)	Primarily education effort toward voluntary compliance	Outreach program through DEP Bureau of Air Quality.	
52	Maine Biodiesel (on farm use)	To be determined		Needs stakeholder action to identify specific implementation. LD 1534 (122nd; Rep. Judd Thompson) would have promoted this; KILLED.	
53	Low-GHG Fuel Infrastructure (CNG, LPG)	Multi-part	Due to high costs, identification of possible funding sources needed	Continued DEP / DOT discussion. LD 308 to extend current tax exemption (2005) killed. City of Portland has implemented CNG infrastructure to support public and school bus fleet. Limited FAME funds for infrastructure grants.	Additional state support needed.
55	PV Buy Down Program	To be determined	Would need financial incentives	See Option 38: enacted and extended (2007).	Uncertain whether, at current rates, expected market penetration will occur.