Chapter 5: Summary of Actions

Each action recommended by the Task Force to support the 10 overarching strategies is summarized below in cluding an overview of short-term and mid-term implementation steps. It is clear from these summaries that a significant amount of resources will be required to develop these recommended actions and to coordinate the various parties involved in implementation. The first steps in this development process will be to determine those parties responsible for coordinating the implementation of the entire plan and its individual recommendations and to obtain the resources necessary to support this process. This broader implementation process is detailed in Chapter 6, and, as can be observed from the recommended actions below, will require the collaborative effort of government, business, non-profit and educational entities.

OVERARCHING STRATEGY 1: MAXIMIZE ENERGY EFFICIENCY IN BUILDINGS

Actions recommended by the Task Force:

◆ ***Maximize Efficiency in New Construction (RCI Action 1.1)***

Develop a program to maximize energy efficiency and minimize net CO_2 output in new residential, commercial, institutional, and industrial building construction with a phased-in goal for new buildings to use produce as much energy as they consume. New construction should incorporate state-of-the art energy efficiency and renewable energy systems into the design of the building envelope, operating systems (e.g., heating, ventilating, and air conditioning (HVAC)), and energy consuming appliances and devices. This action could be developed in conjunction with the national level Architecture 2030 initiative, which targets similar energy use goals for new buildings.

Overall Implementation:

- Develop probable legislation for building codes, zoning regulations, and possible tax code incentives.
- Develop program details, create financial incentives, and begin state outreach and education.
- Develop sustainable funding mechanisms.

Timeframe:

- Implementation can begin immediately.
- Scaling up will continue into the future.

◆ Maximize Energy Efficiency in Existing Residential Buildings (RCI Action 1.2)

Develop a program to retrofit existing New Hampshire housing stock to minimize or eliminate net CO_2 output, and further, to ensure that current and future investments minimize embedded CO_2 output with a phased-in goal to retrofit 30,000 homes annually in order to reduce their net energy consumption by 60 percent. Program elements should include: 1) building shell and window upgrades, including instrumented air sealing and thermographic inspections; 2) space conditioning equipment upgrades/replacements, including ductwork and duct sealing; 3) domestic hot water system upgrades; 4) Energy Star lighting upgrades/replacements; 5) water saving measures; 6) Energy Star appliances upgrades/replacements; and 7) use of renewable energy systems.

Overall Implementation:

- Develop program details, create financial incentives, and begin state outreach and education.
- Develop sustainable funding mechanisms.
- Legislation likely needed to enact these measures.

Timeframe:

- Implementation can begin immediately.
- Scaling up will continue into the future.

◆ Maximize Energy Efficiency in Existing Commercial, Industrial, and Municipal Buildings (RCI Action 1.3)

Develop a program to retrofit existing commercial, industrial, and municipal buildings in New Hampshire to minimize or eliminate net-CO_2 emissions, and further, to ensure that current and future retrofit projects maximize the use of the "embodied energy" in buildings with a phased-in goal to reduce existing buildings net energy consumption by 50 percent by 2030. Program elements should cover the following: 1) lighting; 2) heating, ventilating and air conditioning (HVAC) systems; 3) processes (e.g., air compressor equipment and variable frequency drives); 4) control equipment and technologies; 5) refrigeration equipment; 6) building shell and windows; 7) hot water systems; 8) water usage; and 9) renewable energy systems.

Overall Implementation:

- Develop program details, create financial incentives, and begin state outreach and education.
- Develop sustainable funding mechanisms.
- Legislation likely needed to enact these measures.

Timeframe:

- Implementation can begin immediately.
- Scaling up will continue into the future.

◆ Install Higher-Efficiency Equipment, Processes, and Systems (RCI Action 2.1)

Create incentives to increase the installation of higher-efficiency equipment and the adoption of higher-efficiency processes. Commercial, industrial, and municipal processes can reduce net-CO_2 output by properly designing process lines and using high-efficiency lighting and equipment. Currently, the CORE Programs offered by the electric utilities provide these services for electricity-saving measures, and the gas utilities have comparable services for reducing natural gas consumption. Programming should be expanded to cover all cost-effective measures that reduce CO_2 emissions regardless of fuel type, including the use of renewable generation and use of combined heat and power, also called cogeneration. A combination of targeted and comprehensive energy audits could be used to identify efficiency improvements and opportunities to reduce CO_2 emissions from manufacturing processes. Incentives could be offered to retrofit inefficient processes and equipment and to help offset the additional costs of premium efficiency equipment in new construction.

Overall Implementation:

- Develop program details, create financial incentives, and begin state outreach and education.
- Develop sustainable funding mechanisms.
- Legislation likely needed to enact these measures.

Timeframe:

- Implementation can begin immediately.
- Scaling up will continue into the future.

◆ Increase the Use of Combined Heat and Power (EGU Action 1.3)

Develop mechanisms to promote the use of combined heat and power (also known as CHP and cogeneration) systems for use as an on-site power plant or boiler to generate both electricity and useful heat simultaneously. This technology may be applicable where a thermal load (e.g., for space heating or

industrial process heat) already exists or is planned. Combined heat and power would be appropriate for new boilers and for retrofits of existing boilers using cleaner-burning fuels that are not already co-generating electricity. For consistency with the goal of reducing overall emissions, any program designed around combined heat and power would need to define the allowable emission limits and might also specify allowable fuels for program eligibility. Mechanisms could include regulatory changes, incentives and portfolio standards.

Overall Implementation:

- Consider incentives to promote voluntary development of combined heat and power installations.
- Consider implementing a renewable portfolio for combined heat and power (separate from the existing RPS – see EGU Action 2.1) requiring utilities to obtain a fraction of their energy supply from this technology, with flexibility to meet requirements through a market-based trading program.
- Determine eligibility requirements and necessary emission limits to ensure that the desired emission reductions would be achieved.
- Provide funding to establish and administer the program.
- Develop outreach, education and training programs required to support the integration of combined heat and power into siting and planning, building designs and operation.

Timeframe:

- Enactment could be as early as 2009 with implementation in 2010.

◆ **Consider Alternative Rate Design (EGU Action 1.1)**

To the extent that it reduces or does not raise electricity costs and manages the risk to the utilities, consider identifying and implementing appropriate alternative rate designs (e.g., decoupling) for utilities in order to remove obstacles to increasing energy efficiency. Existing rate structures may conflict with the State's energy efficiency and alternative energy goals, in that traditional rate design is based upon "throughput" incentives for utilities to sell more energy (e.g., kWh, therms) in order to increase their annual profits. Advocates of alternative rate structures believe that these mechanisms are a necessary ingredient to obtain strong utility support for energy efficiency and would complement other demand side management programs. Consumer advocates have raised issues regarding rate impacts and the potential for customers unfairly bearing all risks related to providing electricity. New Hampshire should explore these issues and develop a fair approach to new rate mechanisms that protect consumers and provide appropriate incentives to utilities to promote energy efficiency.

Overall Implementation:

- Evaluate and establish an alternate rate design as part of the existing PUC open docket investigating decoupling and other rate mechanisms (DE 07-064).
- Alternative rate designs either as general policies, or on a utility-specific basis.

Timeframe:

- Consideration of possible mechanisms could be developed in the current PUC docket.
- Full implementation of a changed rate structure would likely take several years due to the complexity.

◆ **Upgrade Building Energy Codes (RCI Action 1.4a)**

Update New Hampshire's building energy code to require improved energy efficiency in new construction and building renovations. Building energy codes represent one of the more cost-effective ways to reduce energy use and related carbon emissions. The state should participate in the International Energy Conservation Code (IECC) update process, either on its own, or by providing input through other regional partners that do participate such as Northeast Energy Efficiency Partnerships (NEEP). There is considerable evidence that if New Hampshire is to achieve deeper greenhouse gas emission reductions, the state's building energy code should be more stringent than the current IECC. In addition to updating its mandatory building energy code, the state could define a preferred "stretch code" that sets even higher, but voluntary, "green" building energy performance standards to advance the state's policy objectives.

Overall Implementation:

- Adopt latest revision to IECC.
- Begin consideration of higher performance standards in the near term for either mandatory or "stretch" codes to support RCI Actions 1.1 – 1.3.
- Legislation likely needed to enact these measures.

Timeframe:

- The latest revision to the IECC may be available for adoption in January 2009.
- The code development community appears to have adopted a three-year cycle as reasonable for code updates.

◆ **Increase Building Energy Code Compliance (RCI Action 1.4b)**

Consider mechanisms that would result in stricter enforcement of energy codes. Building energy codes – either mandatory or voluntary – are among the more cost-effective ways to reduce energy use and related carbon emissions. Mandatory energy codes can be used to set minimum requirements for energy use in both new construction and major building renovations. However, any effort to capture savings from mandatory energy codes is only as good as compliance with the codes. Consideration should be given to creating a system to promote stricter enforcement of the state's building energy code to ensure compliance in all affected structures, including those in rural communities where resources are often lacking. Such programming could include required third party certification, the fee for which could be included as a cost of construction. The state should consider a formal certification process for inspectors beyond the current voluntary process offered through the International Code Council (ICC).

Overall Implementation:

- Evaluate current barriers to effective enforcement of building energy code; begin state outreach to municipalities to improve code compliance rates.
- Legislation likely needed to require mandatory training and certification of all municipal building inspectors on the state building energy code.
- Consider revenue sources to support the inspector certification program and local enforcement of the state's energy code.

Timeframe:

- Initiatives to enhance energy code compliance can begin immediately.

◆ **Establish an Energy Properties Section in Real Estate Property Listings (RCI Action 1.5)**

Establish an energy section in the Multiple Listing Service (MLS) real estate listings. This measure would create a specific, defined set of energy-related criteria/ratings for properties presented in the MLS listings. The concept behind an MLS energy section is to reinforce the fact that energy is a major factor in home buying and to provide the consumer with a means for comparing energy usage between homes. Presumably, properties that are energy-efficient would be favored, and market pricing would reflect this advantage.

Overall Implementation:

- Adopt building energy rating standards.
- Design and implement an energy section for MLS listings of New Hampshire properties.
- Perform outreach to build awareness of this new feature available to buyers and sellers.

Timeframe:

- Design and implementation of an energy section for MLS listings can begin immediately.

◆ **Conserve Embodied Energy in Existing Building Stock (RCI Action 1.8)**

Develop state-wide policies and programs that recognize, quantify, and encourage the conservation of the energy embodied in the New Hampshire's older building stock. "Embodied energy is the total expenditure of energy involved in the creation of the building and its constituent materials,"[1] and the energy invested in it throughout its use. Embodied energy is a key component of life-cycle analysis, which examines the environmental impact of building materials and systems from raw materials, through use within a building, to demolition and disposal. A typical house in New Hampshire contains about 1.5 billion Btu of embodied energy, enough to power the family vehicle for about 25 years. When older buildings are preserved or reused their embodied energy is conserved, new material needs are minimized, and massive carbon emissions from new construction are avoided (in addition to the unspecified historical value that is retained). The concept of embodied energy is not widely recognized, even among professionals in the building and construction industries. If the potential energy savings and reductions in carbon emissions are to be realized, the proposed action will require education, research, and incentive programs.

Overall Implementation:

- Establish a technical committee to conduct research and quantify potential energy savings and emission reductions associated with the conservation of embodied energy in New Hampshire's building stock.

- Develop outreach and education to promote the concept of embodied energy conservation and to dispel myths about the use and reuse of materials.
- Prepare a list of best practices and implement demonstration projects.
- Consider creation of incentives at the state and local levels to preserve/reuse existing building stock.
- Provide funding to establish and administer the program.

Timeframe:

- A study commission could be created in the current legislative session.
- Research and education programs could be initiated at the same time.

OVERARCHING STRATEGY 2: INCREASE RENEWABLE AND LOW-CO_2-EMITTING RESOURCES IN A LONG-TERM SUSTAINABLE MANNER

Actions recommended by the Task Force:

◆ ***Promote Renewable Energy through the Electric Portfolio Standard (RPS) (EGU Action 2.1)***

Implement New Hampshire's Renewable Portfolio Standard, enacted in 2007, which mandates that 23.8 percent of retail electricity sales to in-state customers be provided by renewable energy sources by 2025. The potential renewable generation capacity in New Hampshire alone is 4,447 megawatts (MW) with a generation potential of 12,819,000 megawatt-hours (MWh) by that date. The Renewable Portfolio Standard would capture nearly 3.5 million MWh of this potential with the following mix of renewable sources of in-state retail electricity sales: existing small hydro, 1 percent; existing biomass and landfill methane, 6.5 percent; new solar, 0.3 percent; and new other (wind, geothermal, tidal, etc.), 16 percent.

Overall Implementation:

- Program development complete and ongoing.

Timeframe:

- Program has commenced and will run through 2025.

◆ ***Increase Renewable Energy and Low-CO_2-Emitting Thermal Energy Systems (RCI Action 3.1)***

Create an incentive program to promote the expanded use of renewable and low-CO_2-emitting thermal energy systems to reduce fossil fuel use and greenhouse gas emissions. In New Hampshire, the energy used for space heating, hot water, and process conditioning makes up about one-third of total energy consumption. This proposal would provide incentives and attractive financing for the use of cost-effective, renewable energy resources and high-efficiency/low-CO_2-emitting thermal systems. The incentive levels and financing would be directly tied to the magnitude of the efficiency improvements and energy savings. Other considerations would include the potential of particular new systems for market transformation and peak demand reduction.

Overall Implementation:

- Identify new thermal energy systems worthy of special consideration in this program.
- Evaluate potential current and new funding sources to support incentives and project financing.
- Develop incentive program details and create sustainable funding mechanisms.
- Legislation likely needed to establish stable funding streams.

Timeframe:

- Program could start ramping up in 2009.
- Incentives and financing could continue until maximum penetration of thermal renewable systems is achieved.

◆ ***Address Barriers to Low- and Non-CO_2-Emitting Electric Generation (EGU Action 2.4)***

Identify and remove obstacles to siting and constructing low- and non-CO_2-emitting energy facilities and transmission infrastructure in the state. These actions would better facilitate the development of new low- and non-CO_2-emitting facilities in the state, to enable the state to move away from carbon-based supply-side resources (i.e., fossil-fuel-fired power plants) while offsetting the impact of any potential load growth. The development of the new low-and non-CO_2-emitting facilities could enable older high-CO_2-emitting facilities to be gradually retired and facilitate the achievement of New Hampshire's Renewable Portfolio Standard targets and the goal to meet 25 percent of the state's energy from renewable power by 2025. However, to do so it is imperative that electrical transmission capability within the state also be enhanced to enable power to be exported from those areas where hydro, solar photovoltaic, wind, geothermal, tidal and biomass technologies could best be deployed in order to serve

the New England load. These two goals could be accomplished by seeking methods to expedite the ISO-NE interconnection application review and approval for these types of facilities, and by establishing appropriately streamlined state and local permitting processes. In addition, New Hampshire's planning efforts cannot stand in isolation and should be coordinated with other states and Canada.

Overall Implementation:

- Influence ISO-NE to expedite interconnection application review and approval for these types of facilities.
- Establish streamlined state and local permitting processes.
- Include siting standards to protect environmental quality and siting procedures that provide for appropriate public participation in state process.

Timeframe:

- Policy development could begin in 2009

◆ ***Identify and Deploy the Next Generation of Electric Grid Technologies (EGU Action 2.8)***

Work at the state and Regional level to facilitate the adoption of the next generation of electric grid standards, technologies, and practices through a *phased-in approach* in order to increase the efficiency of the grid and expand the integration of renewable distributed power generation to reduce total greenhouse gas emissions from the electric generation. This transition will include the modernization of the electricity transmission and distribution system to incorporate digital information and controls technology, deployment of energy storage devices, and sharing of real-time pricing information with electricity customers and "smart" technologies in homes and businesses. Deployment of the technology and adoption of standards would occur in a step-wise fashion in which initial investments would first exploit the current most cost-effective technologies while more advanced technologies would be employed as they become more cost-effective. This transition would occur across New Hampshire and the entire ISO-NE grid to the point of general adoption and ongoing market support in the electric generation sector. Such action would lead to the creation of a self-monitoring, adaptive system capable of semi-automated restoration and higher energy efficiency through reduced line losses and better integration of renewable resources through energy storage capacity and the deployment of end use technologies that are able to shift electric use to times when renewable generation is greatest.

Overall Implementation:

- Coordinate efforts at the state and regional levels to facilitate the adoption of smart grid standards, technologies, and practices.
- Assess the current state of smart grid technology market penetration and any obstacles to smart grid development.
- Identify needed legislation, NH Public Utilities Commission orders, and incentives to initiate smart grid development.
- Identify sustainable funding mechanisms.
- Require that electric utility rates be aligned with incentives for the delivery of cost-effective energy efficiency (i.e., consider rate decoupling to promote energy efficiency).
- Require electric utilities, before investing in conventional grid technologies, to demonstrate that investments in advanced grid technologies have been considered.
- Require electric utilities to provide customers with direct access to daily information regarding prices, usage, intervals and projections, and sources.
- Perform demonstration projects using advanced technologies for the power grid, including integration of demand-side resources into grid management.
- Address transmission infrastructure limitations.

Timeframe:

- The required technology already exists and could be deployed within a year.

◆ ***Promote Low- and Non-CO_2-Emitting Distributed Generation (EGU Action 2.9)***

Encourage the development of customer-sited low- and non-CO_2-emitting distributed generation (DG) through a combination of regulatory changes and incentives as begun with the passage of Senate Bill 451 (SB 451) in the 2008 Session. These distributed generation resources can include renewable power sources such as solar photovoltaic systems, wind power systems, biogas and landfill gas-fired systems, geothermal generation systems, and systems fueled with biomass, as well as extremely efficient fossil fuel fired cogeneration or combined heat and power. The distributed electricity generating systems provide electricity system benefits such as avoided capital investment and avoided transmission and distribution losses, while also displacing fossil-fueled generation and thus reducing greenhouse gas emissions. SB 451 authorizes rate

recovery for electric public utilities investments in distributed energy resources located on the premises of a retail customer of the electric public utility. Additional policies designed to encourage and accelerate the implementation of customer-sited renewable distributed generation could include direct incentives for system purchase, market incentives, including "net metering," education and training, state goals or directives, and favorable rules for interconnecting renewable generation systems with the electricity grid.

Overall Implementation:

- Assess the current state of renewable distributed generation in New Hampshire.
- Identify regulatory and institutional opportunities and obstacles affecting expansion of this network.
- Develop appropriate legislation and rules to expand the use of renewable distributed generation.
- Develop an outreach and education program with provisions for technical assistance.
- Develop a financial incentive program.
- Provide sustainable funding mechanisms.

Timeframe:

- The required technology already exists and is currently being implemented. More widespread implementation would occur once the necessary regulations, programs, and incentives have been put into place.

◆ *Encourage the Use of Biogenic Waste Sources for Energy Generation (AFW Action 2.4)*

Create incentives for the development of facilities and processes that utilize biogenic waste streams as energy sources to reduce New Hampshire's reliance on fossil fuels. These wastes, which may be generated in municipal, residential, agricultural, institutional, or industrial settings, can provide heat, power, and fuel through any number of applications. Examples include: anaerobic digesters, microbial fuel cells, and direct conversion of organic wastes to fuel. Among the possible energy sources are sludge, septage, municipal and industrial wastewater, brown grease, residential and institutional food waste, leaf and yard waste, and manure. Development incentives could be provided by means of 1) a loan program to assist livestock and industrial operations, and 2) modification of existing municipal funding mechanisms to cover the higher initial costs of these projects, to be offset by long-term reductions in operating costs and fossil fuel consumption.

Overall Implementation:

- Assess the viability of a regional approach to biogenic waste-to-energy projects and the attendant economies of scale.
- Develop incentive program details and create sustainable funding mechanisms.
- Legislation likely needed to enact these measures.

Timeframe:

- Program development can begin immediately.
- Implementation could begin as early as 2010.

Actions recommended by the Task Force with majority support:

◆ *Implement Regional Greenhouse Gas Initiative (RGGI) (EGU Action 2.2)*

Implement the Regional Greenhouse Gas Initiative, beginning in 2009, to stabilize CO_2 emissions from power plants at 188,076,976 tons (regional three-year average) through 2014. Reduce CO_2 emissions by an additional 2.5 percent per year for four years (10 percent total) through 2018. In 2012, evaluate the feasibility of further reductions after 2018.

Overall Implementation:

- Complete RGGI rulemaking process.
- Continue to participate on regional implementation workgroup with other states.
- Continue to implement program.

Timeframe:

- Implementation is on-going.

◆ *Enable Importation of Canadian Hydro and Wind Generation (EGU Action 2.6)*

To the extent that it reduces or does not raise electricity rates to the consumer, high voltage transmission lines should be built to import clean power generated from Canadian hydro and wind sources as a complementary policy to developing non-CO_2-emitting generation in New Hampshire. Canada is developing vast new hydro and wind generation resources, which are greater than their local needs. This creates an opportunity for New Hampshire and the entire Northeast to obtain clean power. This could provide new power sources to offset future local and regional growth and facilitate retiring or curtailing the operation of fossil fuel-fired plants in New England. Contracts made for this renewable energy should be developed with consideration for the broader environmental

impacts of the power sources as well as the impacts that this imported power would have on the development of in-state renewable resources.

Overall Implementation:

- Begin administrative and legislative procedures to clarify issues and enable construction of a new transmission system.
- Identify program developers to find and align potential sellers and buyers for clean Canadian power. A positive regulatory or legislative signal would be essential.

Timeframe:

- This action could be implemented soon after 2012, following necessary review and approval.

◆ ***Allow Regulated Utilities to Build Renewable Generation (EGU Action 2.7)***

To the extent that it increases New Hampshire's overall renewable energy capacity and the rate at which those resources are brought online and helps to reduce CO_2 emissions, regulated utilities should be provided with limited authority to construct and/or acquire renewable generating assets. The only regulated electric utility that currently owns generation is Public Service of New Hampshire (PSNH), and under existing law PSNH and other utilities* are only specifically authorized to invest in or own new small-scale distributed generation under a new 2008 law. As noted in the summary below, this issue has been an area of intense debate within the Legislature and a wide range of opinions exist among the various stakeholder groups across the state. However, in the interest of reducing greenhouse gas emissions and reducing vulnerability to global energy price volatility, New Hampshire's energy planning efforts should consider the significant resources and experiences that utilities can provide in the development of new renewable generation, in conjunction with a strategy of aggressively encouraging new low-CO_2 generation sources so that ultimately less fossil fuel generation plants are needed in New England. The key element to achieve the greenhouse gas reductions is to adopt legislation that gives regulated utilities the authority to construct and/or acquire renewable generating assets. This authority should be provided with consideration to the impact that it will have on the benefits of market competition provided by non-utility owned merchant generating plants.

* This excludes the New Hampshire Electric Cooperative and municipal electric utilities, which are not subject to the restrictions placed on other utilities in the state.

Overall Implementation:

- Establish clear legislation authorizing regulated utilities to construct or acquire generation facilities that are based exclusively on renewable energy resources.
- Address obstacles to speedy and efficient project review at the state and local levels by:
  - o Considering an expedited permit process for smaller generation facilities using renewable resources.
  - o Providing for an expedited PUC proceeding schedule so that project review may begin prior to project commencement.
- Address transmission infrastructure limitations, including the Coos County loop in northern New Hampshire.

Timeframe:

- This action can be implemented during the 2008-2009 legislative session.

OVERARCHING STRATEGY 3: SUPPORT REGIONAL AND NATIONAL ACTIONS TO REDUCE GREENHOUSE GAS EMISSIONS

Actions recommended by the Task Force:

◆ ***Support Stricter Corporate Average Fuel Economy Standards (TLU Action 1.A.1)***

Support more stringent, near-term Corporate Average Fuel Economy (CAFE) standards for all passenger vehicles and light trucks up to 10,000 lbs. gross vehicle weight rating (GVWR). CAFE is the sales-weighted average fuel economy, in miles per gallon, of a manufacturer's light-duty vehicles and light-duty trucks. Current standards apply to vehicles manufactured for sale in the United States with a GVWR of 8,500 lbs. or less. The higher limit would allow for inclusion of large sport utility vehicles and pick up trucks in these standards. In addition, the state should support the adoption of CAFE standards for vehicles greater than 10,000 lbs. GVWR in the near term. New standards recently proposed by the National Highway Traffic Safety Administration (NHTSA)[2] would raise the required corporate average to 35 mpg by model year 2020, up from the current 27.5 mpg for light cars and 22.2 mpg for light trucks. Existing analyses indicate that higher fuel economy is achievable with currently available technology and that significant improvements could be made by model year 2015.

Overall Implementation:

- Support more stringent fuel efficiency standards through New Hampshire's Congressional Delegation. (Fuel economy standards may be established only by the federal government.)
- Continue public outreach and education to build public support for more fuel-efficient vehicles.
- A legislative resolution could be passed to demonstrate support.

Timeframe:

- Immediate efforts are needed as, under current rules, manufacturers would be required to meet the new standards within three years after their adoption.
- NHSTA is required to review the existing standards periodically. As new technology is developed, the standards should be made increasingly stringent.

◆ ***Support Fuel Economy Standards for Heavy-Duty Vehicles (TLU Action 1.A.2)***

Support fuel economy standards for all new vehicles greater than 8,500 lbs. gross vehicle weight rating (GVWR) to achieve greater CO_2 reductions from future vehicles. Also, support programs such as EPA's SmartWay Transport Partnership program to increase the fuel economy of existing heavy-duty vehicles. Tractor-trailers consume about two-thirds of all truck fuel consumed in the U.S. today. Tougher fuel economy standards for new trucks would have a significant impact on fuel consumption, but those standards are probably 10 or more years away from implementation. On the other hand, using available technology to improve the fuel economy of existing trucks would have an immediate impact. The current truck fleet can be made more fuel-efficient through aerodynamic retrofits, low-rolling-resistance tires, and idling reduction technology. Actions taken to improve the fuel economy of existing and future trucks would provide both short- and long-term CO_2 emission reductions.

Overall Implementation:

- Support more stringent fuel efficiency standards through New Hampshire's Congressional Delegation. (Fuel economy standards may be established only by the federal government.)
- A legislative resolution could be passed to demonstrate support.
- Consider legislative action to initiate an EPA SmartWay Transport partnership/financing program.
- Identify potential funding sources and staffing requirements for such a program.

Timeframe:

- Retrofit improvements to the existing fleet can begin immediately.
- Federal Fuel Economy Standards would require10 or more years to implement.

◆ ***Adopt a Low-Carbon Fuel Standard (TLU Action 1.C.1)***

Adopt a Low-Carbon Fuel Standard (LCFS) to reduce vehicular greenhouse gas emissions. This action would establish an emission standard measured in CO_2-equivalent mass per unit of fuel energy sold. The standard would be based on lifecycle analysis to account for all emissions deriving from fuel production, distribution, and consumption. This approach recognizes that the "upstream" emissions associated with production and distribution – not just those from fuel combustion – are significant contributors to the overall climate impact of transportation fuels.

Overall Implementation:

- Work with Northeast states and eastern Canadian provinces to develop a regional standard.
- Adopt the regional standard by legislation or executive order.
- Identify potential funding sources and staffing requirements to enable participation in planning, administration, and enforcement of the fuel standard.

Timeframe:

- Work should begin now to ensure that a standard is available for adoption by the region in the next 3 to 5 years.
- Phase-in of the standard would occur over the next 10 to 15 years.

◆ ***Promote Alternative Fuel and Advanced Technology Vehicles and Supporting Infrastructure (TLU Action 1.C.2)***

Promote development and deployment of alternative fuel vehicles, advanced technology vehicles, and associated fueling and powering infrastructure in order to speed market penetration of such vehicles and reduce transportation related greenhouse gas emissions. Alternative fuel vehicles (AFV), which will require adequate fueling infrastructure, include vehicles powered by fuels such as natural gas, propane, ethanol and biodiesel. Advanced technology vehicles, such as hybrid elec-

tric vehicles (HEV), plug-in hybrids (PHEV), advanced electric vehicles, and fuel cell vehicles (FCV), will require infrastructure in the form of electric plug-in ports, pricing and load signals from the grid. While these technologies promise dramatic reductions in greenhouse gas emissions associated with the transportation sector, planning across energy sectors will be needed to ensure that emission reductions in the transportation sector are not offset by increases elsewhere. For example, plug-in hybrid vehicles could increase peak electrical loads that draw from high-CO_2-emitting generators. Use of "Smart Grid" technology would allow plug-in hybrids to be recharged at optimal times. Although government is well positioned to promote the use of alternative fuel and advanced technology vehicles, the demand for these vehicles will continue to be driven at least in part by the economy. New Hampshire can hasten their deployment by investing in research and development where needed, seeking early adoption for state vehicle fleets, and providing financial resources and incentives to develop the required refueling infrastructure.

Overall Implementation:

- Seek federal funding to support infrastructure development.
- Commit the state fleet to new technology.
- Develop and deploy smart-grid technology.
- Continue to work with stakeholders and regional entities to develop market.

Timeframe:

- The Granite State Clean Cities Coalition has been promoting these vehicles and fuels since 2002, with growing interest each year.
- The timing of public acceptance and demand will be affected by market forces.
- PHEVs are expected to be on the market in 2010 to 2012.
- The timing for FCVs is unknown and would occur against stiff competition from PHEVs.

◆ ***Support Strong Climate Action at the Federal Level (GLA 1.6)***

The Task Force endorses strong national climate legislation to complement state efforts to reduce greenhouse gas emissions and prepare for the projected impacts of climate change. Such action could include increased vehicle fuel economy standards, appliance energy efficiency standards, investment in regional transportation networks and a national cap and trade mechanism for greenhouse gases. The national legislation should also support comprehensive adaptation planning that integrates the enhancement of the state's significant existing built and natural infrastructure. In the event that legislation results in a cap and trade program, the national program should return a significant portion of any collected pollution allowance revenues to New Hampshire to fund the emission reduction, clean energy, energy efficiency, and adaptation priorities contained in this Climate Action Plan. Adaptation priorities would include protecting natural systems, which provide significant ecosystem services to the state, as well as maintaining and enhancing built infrastructure affected by extreme storm events. Properly structured national climate legislation could provide the needed funding to implement many of the capital-intensive, higher-impact priorities identified in this plan. Funds generated by passage and enactment of a national climate law could drive the large emissions reductions needed while growing the New Hampshire economy if directly returned to the states and properly targeted.

Overall Implementation:

- Pass a legislative resolution to support efforts by the New Hampshire congressional delegation to encourage passage of a national climate bill that would:
  - o Complement efforts at the state level.
  - o Return generated revenue to the states in order to support the implementation of state Climate Action Plans.
- State level funding resulting from national legislation should be directed towards:
  - o Tax credits to support residential and business investment in measures consistent with this Plan.
  - o State and local government, non-governmental organizations, and privately-administered matching grant and loan funds.
  - o Direct grants or tax rebates to low-income households least able to adjust to potentially higher energy prices and designed to migrate participants as rapidly as possible to greater energy efficiency.
  - o Loans and grants for student and worker green jobs training.

Timeframe:

- A legislative resolution could be passed in the 2009 session.
- It is anticipated that a national climate bill will be intro-

duced in Congress in the 2009 Legislative session with passage likely in the next two years. The incoming Obama administration has made a national climate bill one of its top priorities.

OVERARCHING STRATEGY 4: REDUCE VEHICLE EMISSIONS THROUGH STATE ACTIONS

Actions recommended by the Task Force:

◆ ***Adopt California Low Emission Vehicle (CALEV) Standards (TLU Action 1.A.3)***

Adopt California Low-Emission Vehicle (CALEV) standards, including the tailpipe greenhouse gas emissions standards. Under the Clean Air Act, Section 209, states may not develop their own vehicle emission standards. The exception to that rule is the state of California, which may set its own standards provided they are at least as stringent as federal standards. California standards are typically more stringent than federal standards. The remaining 49 states have the option of either following federal emission standards or adopting the CALEV standards. The CALEV requirements include a tailpipe greenhouse gas emission standard that does not exist for federal emission standards. CALEV also includes a zero-emission-vehicle requirement (e.g., electric vehicles). States that adopt CALEV standards may choose to include the greenhouse gas and zero-emission-vehicle requirements or not. CALEV states allow only the sale of vehicles certified to CALEV standards. Unlike states that operate under federal vehicle emission standards, where the standards are enforced by EPA, any state that adopts CALEV is responsible for enforcing the program provisions by itself.

Overall Implementation:

- Draft and pass legislation to adopt CALEV standards.
- Provide funding for economic and air quality analyses to support legislative action.
- Allocate staffing and financial resources to develop, implement, and administer the program.

Timeframe:

- Approximately three years would be required to pass legislation and an additional one to two years to develop and implement the state program.
- Fleet saturation with CALEV vehicles would occur in about 10 years.

◆ ***Create a Point-of-Sale Financial Incentive for High-Efficiency Vehicles (TLU Action 1.B.1)***

Create a new vehicle point-of-sale "feebate," which would provide financial incentives to purchase vehicles that are high in fuel-efficiency and low in greenhouse gases emissions, accompanied by financial disincentives to purchase low-efficiency, high-CO_2-emitting vehicles. A buyer of a new high-efficiency vehicle would be rewarded with a rebate, but a buyer of a low-efficiency vehicle would have to pay a fee or surcharge (hence the name "feebate"). An effective feebate would be about 5 percent of the vehicle price. The feebate could be administered in either of two ways: 1) at the point of sale (e.g., at the automobile retailer), or 2) at the initial vehicle registration. The program could be made virtually revenue-neutral by using the surcharges paid on low-efficiency vehicles to cover the rebates on high-efficiency vehicles.

Overall Implementation:

- Pass legislative amendment to RSA 261 (Registration of Vehicles).
- Revise NH Department of Safety Rules pertaining to registration (Chapter Saf-C 500 Vehicle Registration Rules).
- Provide resources to support program administration.
- Provide outreach and education before and during program rollout.

Timeframe:

- The feebate program would require one year to pass legislation, followed by six to 12 months to begin program implementation.
- Full benefits of emission reductions would be realized in about 10 years.

◆ ***Install Retrofits to Address Black Carbon Emissions (TLU Action 1.C.3)***

Install retrofit technologies on diesel trucks with a model year of 2006 and older, or retire diesel trucks and replace them with new technology and cleaner operating engines for the purpose of reducing black carbon particulate matter (PM). Similarly, install retrofit technologies on diesel non-road equipment, including construction equipment, diesel generators, and the like. Black carbon is formed through the incomplete combustion of organic fuels and is a major component of PM, or soot, produced by diesel engines. This substance has been identified as having a large and fast-acting warming effect on

the atmosphere. Diesel trucks built after model year 2006 include technology that dramatically reduces PM emissions and do not need retrofitting.

Overall Implementation:

- Establish executive order to require retrofits for all state vehicles and for all equipment working on state contracts, as feasible.
- Provide outreach and education to promote voluntary retirement or retrofits of other pre-2007 diesel trucks and non-road equipment.
- Provide funding to implement program.

Timeframe:

- This action can begin immediately using available diesel retrofit technologies and funding.
- Emission reduction benefits will accrue through 2025, by which time most of the pre-2007 diesel truck fleet will have been retired.

◆ ***Implement Commuter Trip Reduction Initiative (TLU Action 2.A.1)***

Establish a state-supported initiative to increase the number of employers implementing commuter trip reduction programs. These programs use a variety of strategies to promote commuting and work options that reduce greenhouse gas emissions in comparison with single-occupancy-vehicle travel. Possible strategies include parking "cash-out," car/van pooling, flex time, and telecommuting. The proposed state initiative would use mechanisms such as targeted education and outreach, awards and recognition, and business tax incentives to promote more widespread availability of commuter trip reduction programs.

Overall Implementation:

- Provide resources to develop informational materials and market the program.
- Evaluate obstacles to implementation, especially lack of alternative travel options.
- Consider possible tax credits for participating businesses.

Timeframe:

- Commuter trip reduction programs could be implemented immediately.

◆ ***Increase Highway Automobile Efficiency (TLU Action 1.D.1)***

Explore ways to maximize efficiency in highway vehicle travel, including mechanisms to reduce average travel speeds on state and interstate highways and to improve driving habits to improve overall vehicle fuel efficiency. This could occur through enforcement of existing speed limits and through driver education programs to increase driver awareness of the potential fuel savings from changes in driving behavior. Evaluation of a lower speed limit should also be conducted.

Overall Implementation:

- Establish and implement driver education programs.
- Increased enforcement of speed limits.
- Evaluate attitudes and impacts of a lower speed limit.

Timeframe:

- Development and implementation of driver education programs could begin immediately.
- Increased enforcement is dependent on state resources.

◆ ***Address Vehicle Idling (TLU Action 1.D.2)***

Implement a robust idling reduction program for all motor vehicles. Vehicle idling wastes fuel, damages engines, and results in excessive emissions. The program would set an overall idling reduction target of 80 percent by 2010 for all vehicle classes, but a specific idling reduction target of 100 percent by 2020 for heavy trucks. Anti-idling program options for cars and light-duty vehicles include public education, fines for unnecessary idling, and targeted enforcement in designated areas or locations. Program options for freight haulers and other heavy-duty vehicles include outreach, technology retrofits to the existing fleet, and fines based on vehicle type. Special consideration would be given to truckers who sometimes need to run their engines to maintain comfortable cabin conditions during work breaks or to keep refrigerated cargo cold.

Overall Implementation:

- Pass legislation to establish an anti-idling program.
- Develop program details and issue anti-idling program regulations.
- Provide outreach and education to promote the program.
- Provide staff and financial resources to implement the program, including funds for enforcement and possible loans or incentives to assist with the necessary vehicle retrofits.

Timeframe:

- An anti-idling program can be implemented immediately for light-duty vehicles.
- A reasonable time limit should be imposed for heavy-duty

trucks requiring retrofit technology to reduce idling.

◆ ***Improve Traffic Flow (TLU Action 1.D.3)***

Revise state guidance and policies to promote the use of appropriate measures to reduce congestion, improve traffic flow, and reduce greenhouse gas emissions associated with motor vehicle travel. Although the New Hampshire Department of Transportation and local municipalities have control of intersection design and coordination, the public maintains a vital role in the development of traffic management solutions. Practical measures could include modern roundabouts at intersections, coordination of signalized intersections, and reduction of access points through improved access management. Policy options available to the state to promote improved traffic flow include outreach and education, issuance of technical guidance documents, and provision of funding assistance for the best examples of publicly supported projects. Selected actions would be developed with input from the professional planning/design community.

Overall Implementation:

- Provide outreach and education to the general public to explain modern design concepts for improved traffic flow and to foster community involvement in project planning.
- Revise state guidance on best traffic management and design practices; disseminate this information to planning/design professionals and municipal officials.
- Provide staff and financial resources to implement outreach, education, and technical support.
- Consider funding assistance for qualified traffic flow improvement projects.

Timeframe:

- Outreach and education can begin immediately.
- On average, intersection/signal coordination projects require two to three years to design, approve, and construct.
- On average, four to five traffic signalization projects on state roads are constructed each year. Most new signalized intersections are the result of new commercial development projects.

OVERARCHING STRATEGY 5: ENCOURAGE APPROPRIATE LAND USE PATTERNS THAT REDUCE VEHICLE-MILES TRAVELED

Actions recommended by the Task Force:

◆ ***Assess Greenhouse Gas Emission Impact Fees (TLU Action 2.C.1.a)***

For any new development project seeking a state permit, assess a state impact fee based on the estimated greenhouse gas impact of the project, and/or enable municipalities to adopt similar programs. The size of the impact fee would be determined from the estimated transportation demand generated by the project and would be administered through a statewide permit program. The new impact fees would encourage development that has lower greenhouse gas impacts, e.g., projects designed around compact, mixed-use, walkable environments in existing community centers. Funds raised through impact fees could be used to support public transit or promote other greenhouse offsets with the goal of achieving "carbon neutrality" or, at the very least, reduced carbon footprints for new state-permitted development projects.

Overall Implementation:

- Conduct feasibility study.
- Pass enabling legislation to require a transportation-based greenhouse gas emission permit for projects that will generate above a certain vehicle-miles-traveled threshold.
- Develop rules to establish greenhouse gas emission impact fees and to determine how the revenues may be used.
- Make appropriate revision to RSA 674:21, if impact fees are to be reduced or waived for developments within existing community centers.
- Provide funding for development and initial implementation of the program - After setup, the program would be self-funded through permit fees.

Timeframe:

- Appropriate legislation could be introduced in the next legislative session.
- Rulemaking, permit program setup, and project implementation could begin by 2010.
- Municipalities would be expected to take appropriate actions within 2 to 5 years thereafter.

◆ ***Streamline Approvals for Low-Greenhouse-Gas Development Projects (TLU Action 2.C.1.b)***

Adopt new policies to streamline permit review processes, apply alternative requirements, or otherwise reduce barriers

for development projects in *existing* community centers with low-greenhouse-gas footprints. Conduct a broad evaluation of state permit processes and requirements to identify barriers that now deter development from locating in low-greenhouse-gas impact areas – including existing downtowns and community centers – and develop practical solutions to removing such barriers. Encourage municipalities to adopt similar strategies in their development ordinances and permit processes.

Overall Implementation:

- Pass legislation to establish a greenhouse gas program within the NH Office of Energy and Planning or the NH Department of Environmental Services to coordinate with existing permit programs and create rules for the new permit review process.
- Revise applicable state agency administrative rules to allow expedited permit review under the new program.
- Conduct a broad evaluation of state permit processes and requirements to identify barriers that now deter development from locating in low-greenhouse-gas impact areas.
- Provide funding for development and initial implementation of the program. After setup, the program would be self-funded through permit fees.

Timeframe:

- Appropriate legislation could be introduced in the next legislative session.
- Rulemaking, permit program setup, and project implementation could begin by 2010.
- Municipalities would be expected to take appropriate actions within two to five years thereafter.

◆ ***Develop Model Zoning to Support Bus/Rail Transit (TLU Action 2.C.2)***

Develop a model zoning ordinance governing land use around bus/rail service access points to promote ridership and reduce greenhouse gas emissions. Encourage, assist, or require municipalities to adopt and implement this zoning around bus/rail stations. The model language would define criteria for minimum development density; mix of land uses; and interconnected, walkable street patterns. Grants for specific technical assistance to support implementation of the model zoning ordinance could be awarded to communities, and/or incentives could be provided to encourage adoption.

Overall Implementation:

- Prepare a model zoning ordinance under the direction of the NH Office of Energy and Planning or the NH Department of Environmental Services, with input from other entities.
- For a voluntary program: Begin outreach and education to promote the model ordinance; consider grants and financial incentives.
- For a mandatory program: Issue an executive order or pass legislation requiring adoption of the model ordinance; this action would be tied to investment in rail and bus service extensions.
- Provide resources to develop the model zoning ordinance and implement the program.

Note: The mandatory program would also require capital and operating funds to implement an expanded rail and bus system as a separate action.

Timeframe:

- A model zoning ordinance could be developed within one year.

◆ ***Develop Model Zoning for Higher-Density, Mixed-Use Development (TLU Action 2.C.3)***

Develop a model zoning ordinance to promote and facilitate higher-density, mixed-use, walkable development (including affordable housing) in designated areas of a community. Encourage, assist, or require municipalities to adapt and implement the model zoning. The model ordinance would specify what "smart growth" means to the state and would provide for the designation of compact "growth centers," which have lower greenhouse gas impacts than other forms of development. A growth center program could be either 1) a voluntary program with incentives to encourage designation of municipal growth centers at locations deemed to be desirable, or 2) a mandatory state-legislated process requiring that communities (perhaps of a certain minimum size) designate municipal growth centers. Grants for specific technical assistance to support implementation of the model zoning ordinance could be awarded to communities, and/or incentives could be provided to encourage adoption.

Overall Implementation:

- Prepare a model zoning ordinance under the direction of the NH Office of Energy and Planning and the NH Department of Environmental Services, with input from other

entities.

- For a voluntary program: Begin outreach and education to promote the model ordinance; consider grants and financial incentives.
- For a mandatory program: Issue an executive order or pass legislation requiring adoption of the model ordinance.
- Provide resources to develop the model zoning ordinance and implement the program.

Timeframe:

- A model zoning ordinance could be developed within one year.
- For a mandatory program, the necessary legislation, associated rulemaking, and initial program implementation would take two to three years.

◆ ***Continue/Expand Funding, Education, and Technical Assistance to Municipalities (TLU Action 2.C.8)***

Support/expand technical assistance and funding made available through existing programs to promote: 1) coordinated local planning for land use, transportation, and the environment; and 2) associated policy changes that result in reduced greenhouse gas impacts. This action would include updating existing publications to incorporate greenhouse gas considerations and preparation of new materials as appropriate. This action would also provide increased coordination among, and expansion of, existing programs now implemented by various government agencies such as the NH Office of Energy and Planning, the NH Department of Environmental Services, the University of New Hampshire Cooperative Extension, the Regional Planning Organizations, and other organizations such as the New Hampshire Planners Association, the Local Government Center, and Clean Air-Cool Planet.

Overall Implementation:

- Establish a clearinghouse of available resources including, but not limited to, publications, fact sheets, planning tools, model ordinances, geographic information system (GIS) data, grant programs, and educational programs.
- Develop a system to facilitate easy access to this information.
- Continue/expand outreach and education on the connections among land use, transportation, and environmental planning; begin targeted outreach designed to jump start local greenhouse gas planning initiatives.
- Legislation likely needed to enact these measures.

Timeframe:

- It will take one to two years to evaluate existing resource materials, educational opportunities, and grant programs; identify needed changes; and implement those changes.

OVERARCHING STRATEGY 6: REDUCE VEHICLE-MILES TRAVELED THROUGH AN INTEGRATED MULTI-MODAL TRANSPORTATION SYSTEM

Actions recommended by the Task Force:

◆ **Improve Existing Local/Intra-Regional Transit (Bus) Service (TLU Action 2.B.1.b)**

Improve local bus service within New Hampshire on *existing* routes by providing more frequent service, better passenger amenities and facilities, and increased marketing to expand ridership. This action would 1) increase the frequency of service on *existing routes* to reduce wait times and provide greater flexibility for passenger travel; 2) provide additional passenger amenities; and 3) expand marketing and provide easier access to schedules and service information to attract additional ridership.

Overall Implementation:

- Identify and implement service improvements and education/outreach efforts likely to increase ridership most significantly.
- Develop outreach/ marketing plan.
- Coordinate assistance and grant funding.
- Legislative action is likely required to provide for increased funding.

Timeframe:

- Outreach and education efforts could begin immediately.
- Improved services and amenities could be phased in over time beginning in 2010-2012 as state/local funding becomes available with an initial focus on increasing/ improving service for higher-population areas (e.g., Manchester, Nashua, and Seacoast).

◆ ***Expand Local/Intra-Regional Transit (Bus) Service (TLU Action 2.B.1.a)***

Expand the service areas of existing local and intra-regional transit (bus) systems and create new systems to: 1) provide

service for all communities with 20,000 or more population; 2) provide service connections for all communities having 10,000 or more population *and* a defined, walkable, mixed-use central area (of at least 100 acres); 3) provide connections to smaller satellite communities by extending existing local/intra-regional transit systems serving New Hampshire's largest cities and population centers (Manchester, Nashua, Concord and Seacoast); and 4) identify and implement additional local transit options over time.

Overall Implementation:

- Create a task force, under the guidance of the NH Department of Transportation, to investigate opportunities and develop recommendations for expanded local and intra-regional bus service.
- Quantify potential capital and operating costs of expanded service and identify sustainable funding mechanisms (with the realization that any system is likely to require public subsidies).
- Provide resources for initial planning studies and technical assistance to local communities.

Timeframe:

- Expanded service could be phased in, starting in 2010-2012, as funding becomes available; initial focus would be directed toward higher-population areas that currently lack fixed-route transit (especially the Salem-Derry area and the regions surrounding Manchester and Nashua).

◆ ***Improve Existing Inter-City Bus Service (TLU Action 2.B.2.h)***

Improve the quality of facilities and increase the frequency of service on current inter-city bus routes in New Hampshire to increase ridership levels and reduce vehicle-related carbon emissions. Enhancements would include 1) higher-quality bus stops and terminals with additional services and amenities; 2) improved and additional public intermodal facilities, shared by local and inter-city transit providers to facilitate connections; 3) increased frequency of service; and (4) better connections to surrounding areas through improved walkability and easier access to local transit.

Overall Implementation:

- In a collaborative effort of the NH Department of Transportation and commercial bus companies, investigate opportunities and develop recommendations for expanded local and inter-city bus service.
- Quantify potential capital and operating costs of expanded service and identify sustainable funding mechanisms.
- Provide resources for initial planning studies.

Timeframe:

- Expanded service could be phased in, starting in 2010-2012, as funding becomes available; initial focus would be directed toward higher-population areas that currently lack fixed-route transit (especially the Salem-Derry area and the regions surrounding Manchester and Nashua).

◆ ***Expand and Improve Bicycle and Pedestrian Infrastructure (TLU Action 2.B.1.c)***

Improve and expand bicycle and pedestrian infrastructure to increase the viability of these travel modes as options for shorter-distance local trips, particularly within existing community centers, around transit-access points, and in other areas of higher-density, compact, mixed-use development. Improving the availability of biking and walking as a viable travel option would help reduce single-occupancy vehicle use and total vehicle miles traveled, particularly for short-distance, local trips within compact areas and around transit-access points.

Overall Implementation:

- Expand existing bike-ped program, along with implementing "complete streets" approaches that ensure that all modes of travel are accommodated and supported.
- Assistance and grant funding could be coordinated by the Metropolitan Planning Organizations (MPOs) or Regional Planning Commissions (RPCs), together with NHDOT.
- Legislative action is likely required to provide for increased funding and technical assistance to identify and implement appropriate actions.

Timeframe:

- On-going beginning in 2010-2012 as state/local funding becomes available with an initial focus on increasing facilities in higher-population areas (e.g., community centers within southern New Hampshire) and where roadway/streetscape improvements are planned.

◆ ***Maintain and Expand Passenger Rail Service (TLU Action 2.B.2.a)***

Maintain and expand passenger rail service within New Hampshire as part of a balanced, state-wide, multi-modal transportation system that keeps the state competitive with

and accessible to the region. Initial actions would focus on sustaining and improving existing passenger rail service. Near- to mid-term actions would focus on improving and expanding New Hampshire's primary travel corridors (I-93 from Salem through Manchester to Concord, and the full traverse of I-95 on the Seacoast). Long-term actions would address the goal of expanding passenger rail service throughout New Hampshire.

Overall Implementation:

- Sustain and improve existing passenger rail service and plan for future service immediately through dedicated, long-term financial support, strategic improvements to service, and protection of active/inactive rail corridors.
- Study and implement additional extensions and restorations of service with the goal of establishing a state-wide passenger rail system.
- Improve/restore lost rail connections to support both freight and passenger service to Canada.
- Develop the legislation, zoning ordinance changes and regional coordination necessary to develop a regionally integrated rail system.

Timeframe:

- Immediate actions can be taken to sustain and improve existing service.
- Service extensions now under study can/should be implemented within 10-20 years.
- State-wide passenger service will take 20-30 years to restore.

◆ ***Maintain and Expand Freight Rail Service (TLU Action 2.B.2.b)***

Maintain and expand freight rail service within New Hampshire as part of a balanced, state-wide, multi-modal transportation system that keeps the state competitive with and accessible to the rest of the region. Initial actions would focus on sustaining and improving existing freight rail service. Near- to mid-term actions would include strategic improvements and expansions to increase freight rail usage – for example, track upgrades and restoration of lost rail connections to Canada, New Hampshire's major trading partner. Long-term actions would address the goal of expanding freight rail service throughout the state. Because any substantial improvements to rail service will almost certainly require expenditure of public monies, attention to sustainable funding sources will be a priority.

Overall Implementation:

- Protect active/inactive rail corridors.
- Provide resources for initial planning studies and consider options for long-term financial support.
- Conduct an economic study for expanded rail service (consider a 10-year rail investment plan).
- Make strategic improvements to existing service, e.g., increase tunnel clearances for freight passage, improve intermodal facilities, and make track upgrades to support higher speeds.

Timeframe:

- Improvements to freight rail service could begin immediately and be expanded over time.

◆ ***Implement a Stable Funding Stream to Support Public Transportation (TLU Action 2.B.2.c)***

Identify and implement a stable funding stream to support significant expansion of public transportation in New Hampshire. Public transportation is essential to establishing a balanced, less carbon-intensive transportation system within the state. Public transportation also complements, promotes, and supports low-greenhouse-gas-impact development. However, the current lack of adequate funding is a major impediment to the expansion and operation of public transportation. A dedicated funding stream to support this purpose could be established by implementing or enabling one or more of several possible funding mechanisms. Options include an increase in the state gasoline tax, local gasoline taxes dedicated to public transportation, increases in vehicle registration fees, and revenues from a statewide feebate program or a carbon fuel surcharge. Any of these actions would require legislative action. An amendment to Article 6-a of the New Hampshire Constitution would be required to remove current restrictions on the use of gas tax revenues for public transportation.

Overall Implementation:

- Conduct a study to identify and evaluate possible mechanisms for dedicated funding.
- Initiate legislative action, if indicated, to establish a dedicated funding stream or to amend Article 6-a.
- Provide resources to support the required studies and legislative action.

Timeframe:

- The timeframe for implementation will be tied to the

legislative process.

- Legislation for a study could be introduced in the next legislative process.

◆ ***Expand Park-and-Ride Infrastructure (TLU Action 2.B.2.e)***

Expand and improve New Hampshire's park-and-ride infrastructure to support public bus transit and carpooling. In our rural/suburban state, park-and-ride lots are essential to providing effective inter-city bus service and increasing the incidence of car/van pooling to reduce the number of single-occupancy vehicle trips. The proposed action would 1) create park-and-ride lots in new locations, 2) expand existing facilities nearing capacity, 3) improve the services provided at these facilities (e.g., better shelters and restroom facilities, greater security, walkable connections to adjoining developed land uses), and 4) strengthen education and outreach efforts to increase the use of park-and-ride facilities.

Overall Implementation:

- Expand education and outreach activities to increase the use of underutilized park-and-ride lots.
- Conduct a study to identify and evaluate locations for new and expanded park-and-ride facilities.
- Provide funding to support the site studies and promotional efforts.
- Consider potential funding sources for an expanded park-and-ride program.

Timeframe:

- Education and outreach activities can commence immediately.
- Improvements to existing park-and-ride facilities and the addition of new park-and-ride lots could begin in 2010-2012 as funding becomes available.

OVERARCHING STRATEGY 7: PROTECT NATURAL RESOURCES (LAND, WATER, AND WILDLIFE) TO MAINTAIN THE AMOUNT OF CARBON FIXED AND SEQUESTERED

Actions recommended by the Task Force:

◆ ***Invest in Forests to Maximize Carbon Storage and to Avoid Net Forest Land Conversion (AFW Action 1.2)***

Sustain the natural carbon sink provided by forests and their capacity to remove CO_2 from the atmosphere. Through photosynthesis, New Hampshire's forests take up the equivalent of 25 percent of the state's manmade CO_2 emissions annually[†] . Minimizing forest land conversion to non-forested uses will be a key component of any successful emission reduction strategy. Note that 20 percent of global manmade CO_2 emissions are caused by conversion of forest land to non-forested uses. Public policy objectives should include encouraging forest land owners to manage their forests sustainably for the dual purposes of producing forest products and maximizing carbon storage. Available tools include conservation easements, carbon easements and leases, new forest management strategies, and land use regulation. New Hampshire has had considerable success in conserving large blocks of contiguous forest land through perpetual easements – an important tool in maintaining the carbon sink that New Hampshire's forests presently provide and one which should be aggressively promoted in the presence of growing, competing land use pressures.

Overall Implementation:

- Create a new state initiative to invest public financial resources to protect the carbon storage capacity of New Hampshire forests with perpetual conservation easements.
- Create new incentives for forest landowners to enroll in market certification programs to promote sustainable forestry and to assure access to carbon credit markets.
- Evaluate the benefit of enrolling state forests in a market certification program to facilitate state participation in the carbon credit markets.
- Create a pilot program within the NH Department of Treasury to test the marketability of leases on privately owned forestland with the primary objective of sustaining and expanding the carbon storage capacity of working forests.
- Create new incentives to forest landowners to manage commercial timber over longer rotations.
- Develop a carbon-friendly model zoning ordinance and provide municipalities with statutory incentives to adopt this ordinance.
- Develop sustainable funding sources for these efforts.

Timeframe:

- All program aspects can commence immediately, would be continuous, and could be expanded as funding allows.

[†] EPA State Inventory Tool output using default values for state emissions.

- Develop sustainable funding sources for these efforts.

◆ ***Optimize Availability of Biomass for Electricity and Heating within Sustainable Limits (AFW Action 2.2)***

Develop and maintain the policies and infrastructure necessary to sustainably manage the state's forests as an essential carbon sink, for energy and timber supply, for its recreational value, and for the provision of irreplaceable ecosystem services. The forest industry has long been one of the cornerstones of New Hampshire's economy. Relatively new end-uses, such as the production of electricity from wood chips and the production of wood pellets for heating residential and public buildings, are providing the need for low-grade wood and improved logging infrastructure. It is important to note, the biomass stock necessary to support a growing demand is not unlimited and intact tracts of forest are better able to sustain biological diversity and play a role in the provision of ecosystem goods and services such as water supply. Planners, loggers, timber owners, investors, government officials and regulators, and consumers need a strong understanding of sustainable forest management principles as well as the underlying state of the forests, including growing conditions, soil productivity, tree species composition, and forest age, to make good decisions about the efficient use of the available resource for traditional and new forest products in order to sustainably manage this critical economic and ecological resource.

Overall Implementation:

- Review policies, laws and rules relative forestry practices and revise as needed.
- Inventory of forest resources.
- Develop education and outreach strategies.
- Review wood supply studies and establish state policy.
- Promote third-party green certification.
- Promote voluntary forest management practice.

Timeframe:

- Work in several areas could begin immediately. Inventory of forest resources would be dependent on resources.

◆ ***Promote Durable Wood Products (AFW Action 1.3)***

Create a program to develop a market for durable wood products. When wood is used to make products that have lasting value and are held for long periods of time, carbon is stored and not released into the atmosphere. Consumers often have a choice between a product made from petroleum or mineral base and one made from wood. The purchase decision is often formed around price and a short-term, throw-away mentality. An effective education campaign could be mounted to change consumer thinking that favors durable wood products over other materials when buying homes, building materials, furniture, and other accoutrements of modern living. Durable wood products are often more economical in the long run – if not initially – and, unlike petroleum- or mineral-based products, are environmentally sustainable. The proposed program would provide additional benefits to New Hampshire's economy while improving product manufacturing and transportation efficiency.

Overall Implementation:

- Design a well-researched program to promote the use of locally made wood products.
- Initiate a promotional campaign led by a collaboration of state government and private interests.
- Provide funding for program development and promotional activities.

Timeframe:

- This action can be implemented immediately and continue over time.

◆ ***Protect Agricultural Land (AFW Action 1.1.3)***

Promote policies and practices that preserve existing agricultural land. The conversion of agricultural land to developed land affects its carbon absorption capacity. New Hampshire should place greater emphasis on applying policies and practices that avoid releases of carbon stored in soils, preserve the carbon absorption capacity of existing agricultural lands, and enable continued carbon sequestration from the atmosphere. Available measures include acquiring and preserving open space, reducing sprawl through smart growth measures, and encouraging the reuse of existing infrastructure.

Overall Implementation:

- Continue to fund the New Hampshire Land and Community Heritage Investment Program (LCHIP) and consider increasing the acreage of agricultural land protected biannually through this program.
- Provide education and outreach directed toward preserving existing land as a means to reduce sprawl, encourage smart growth, and reuse infrastructure.
- Develop sustainable funding sources for these efforts.

Timeframe:

- Promotional activities and LCHIP expansion can commence immediately as funding allows.

◆ ***Maximize Source Reduction, Reuse and Recycling (AFW Action 3.1)***

Establish a state-operated revolving loan fund to increase commercial and residential source reduction and recycling programs in New Hampshire municipalities. Source reduction and recycling reduce greenhouse gas emissions by recapturing a high percentage of the embodied energy‡ content of the solid waste stream. A net reduction in emissions occurs when reused or recycled materials displace virgin raw materials in the manufacturing process and when solid waste is diverted from disposal. The current recycling rate in New Hampshire is less than 21 percent, well below the national average of 32 percent. However, for most households, the amount of waste that can be reduced, reused, recycled, or composted is a major portion of the original total waste volume. The revolving loan fund would help to rectify the current imbalance in solid waste practices by providing financing for the initial capital costs of public source reduction and recycling programs. Mechanisms available to communities wishing to increase their reuse/recycling rates include pay-as-you throw (PAYT) programs, resource management contracting with waste haulers, joint municipal ventures for transfer and recycling centers, salvage of reusable building materials, and commercial/municipal composting.

Overall Implementation:

- Conduct outreach and education to promote source reduction and recycling programs in New Hampshire.
- Provide technical assistance to municipalities to establish or expand their own programs. (Some programs and funding arrangements could be established through local ordinances while others would require state-level involvement and legislative action.)
- Create and pass legislation to establish a revolving loan fund for municipal source reduction and recycling programs.
- Revenue for the revolving loan program could be generated from mechanisms such as a one-cent fee on all bottles sold in the state.
- Provide staffing and financial support for outreach/education and technical assistance.

Timeframe:

- Education, outreach, and technical assistance can begin immediately.
- The revolving loan fund and source of monies can be established in the next legislative session.
- Municipalities would follow their own timetables for adopting ordinances and setting up local programs.

‡ Embodied energy in this case refers to the energy that is required to extract, process, package, transport, install, and recycle or dispose of materials and products.

OVERARCHING STRATEGY 8: LEAD BY EXAMPLE IN GOVERNMENT OPERATIONS

Actions recommended by the Task Force:

◆ **Establish an Energy Management Unit to Address State Energy Consumption and Greenhouse Gas Emissions (GLA Action 1.1)**

Form an Energy Management Unit within state government to implement and oversee the recommended actions of the Climate Change Policy Task Force as well as the Governor's Energy Efficiency Initiative. This entity would be responsible for tracking state government efforts to reduce energy use and costs, reduce greenhouse gas emissions, achieve state energy reduction/climate change goals, and provide assistance on energy efficiency matters to local and regional government entities. In addition to the existing State Energy Manager, the proposed Energy Management Unit would consist of a project manager, a data manager, a fleet manager, and an energy education and outreach specialist. This action would also require that the state adopt and implement consistent document and reporting procedures for energy purchases, equipment purchases, and energy usage.

Overall Implementation:

- Establish a project manager position as the highest priority; phase in other positions as resources allow.
- Develop consistent procedures for documentation and reporting of energy purchases, equipment purchases, and energy usage.
- Work plan to include remainder of GLA Actions that were retained for further consideration (Appendix 4.8).
- Legislation likely needed to enact these measures.

Timeframe:

- The establishment of this unit can be taken up in the next

Legislative Session.

◆ ***Establish an Energy Consumption and Greenhouse Gas Emissions Baseline Inventory for State Government (GLA Action 1.2)***

Establish a baseline inventory of energy consumption and greenhouse gas emissions for state government for the year 2005 or other year if more appropriate. The inventory would profile the specific types and sources of energy used and would quantify the amounts of energy consumed and emissions released on a quarterly and annual basis. This baseline inventory would assist in identifying opportunities having the greatest potential to reduce state government's energy consumption and greenhouse gas emissions and would serve as a benchmark by which to track progress in specific energy efficiency and renewable energy projects. The baseline inventory and subsequent updates would be the responsibility of the new Energy Management Unit.

Overall Implementation:

- Design a uniform data collection and reporting protocol for all state agencies to use in tracking energy consumption.
- Provide staffing and financial resources to collect the data, perform quality assurance, undertake the necessary analyses, and generate regular reports.

Timeframe:

- This action can be implemented immediately.

◆ ***Establish a Self-Sustaining Fund for Energy Efficiency Projects in State Government (GLA Action 1.3)***

Create a non-lapsing Energy Efficiency Fund, overseen by the Director of Plant and Property Management and the State Energy Manager (unless or until an Energy Management Unit is formed and becomes operational). State agencies could request monies from this fund to cover the costs of their energy efficiency projects. The fund would be financed and replenished with monies equal to 2 percent of each agency's utility budget from the previous year. Monies would be distributed to subsidize requested energy efficiency projects using technologies shown to reduce energy consumption. The Energy Efficiency Fund would boost the efforts of state agencies to find ways to conserve energy and lower their utility bills. By charging a single entity to administer the distribution of these funds, consistent procedures could be maintained for the benefit of small and large agencies alike.

Overall Implementation:

- Prepare and adopt legislation for the Energy Efficiency Fund.
- Develop criteria for allocation and application of funds.
- Prepare administrative and technical guidelines (e.g., calculation of emission reductions and project payback) for fund applications.
- Provide staffing and financial resources to develop and administer the funding program.

Timeframe:

- This action can be implemented during the 2008-2009 Legislative Session.

◆ ***Support the Establishment of Local Energy Commissions (GLA Action 1.4)***

Support the newly forming Local Energy Committees by providing the statutory and programmatic resources needed to make these committees a working part of municipal governance. In March 2007, 164 New Hampshire municipalities passed a historic Climate Resolution that called on state and federal elected officials to address climate change. The resolution also called for the establishment of Local Energy Committees to address greenhouse gas emissions associated with municipalities' activities. Since then, nearly 100 cities and towns have established Local Energy Committees. New Hampshire can support this groundswell of civic action by 1) passing legislation that authorizes municipalities to establish Local Energy Commissions with specific powers, thus formalizing their role and mission; and 2) providing resources to regional planning commissions and state agencies to assist municipalities in setting up Local Energy Commissions.

Overall Implementation:

- Pass legislation to amend RSA 674 to grant New Hampshire towns the authority to establish formal energy committees with specific authority.
- Provide staffing and financial resources to regional planning commissions and designated state agency(ies) to assist municipalities in forming Local Energy Commissions.

Timeframe:

- This action can be implemented during the 2008-2009 Legislative Session.

◆ ***Include Climate Change Adaptation and Mitigation in Programs and Planning (GLA Action 1.5)***

Establish a policy requiring that climate change adaptation and mitigation be considered in all planning and programmatic activities of state government agencies. Climate change has impacts that could affect the entire spectrum of activities (e.g., economic, recreational, agricultural) within the state. Likewise, the vast majority of activities are contributing to climate change in large and small ways. Because New Hampshire state government has the capacity to influence these activities regardless of origin – governmental, residential, commercial, or industrial – all state agencies should take the initiative in seeking solutions to climate change. A logical starting point is to incorporate consideration of climate change into all state planning and programming functions. The state's proactive response to climate change will help to engender climate change action as a necessary and normal part of life in New Hampshire.

Overall Implementation:

- Issue an executive order to require consideration of climate change in all government planning and programs.
- Begin outreach/education activities to build greater understanding of the science of climate change within the ranks of state government and to assist state employees in shaping an effective response to climate change.
- Provide resources to support internal outreach/education efforts.
- Publicize the state initiative to the population at large.

Timeframe:

- This action can be implemented immediately.

◆ ***Promote Public School Siting and Building Aid to Reduce Energy Use (GLA Action 2.6)***

Revise state public school siting and building aid policies to more effectively and cogently encourage the renovation of existing schools and the creation of high performance schools (through renovation or new construction) that both meet current educational standards and further the goals of RSA 9B and similar local and regional smart growth objectives. New emphasis on renovation through comprehensive feasibility studies, meaningful coordination between affected municipal bodies, adequate maintenance, and effective disposition processes can reinforce existing trends, take advantage of new opportunities for energy efficiency upgrades, and help alleviate conflicts in local school construction decision-making. For high performance schools, an additional funding bonus of up to 2 percent (resulting in a total bonus of up to 5 percent) may also entice more school districts into pursuing energy efficiency improvements that are part of major renovation projects or new construction.

Overall Implementation:

- Review existing school siting policies to identify opportunities to strengthen emphasis on renovation.
- Develop resources and support for coordinated planning and feasibility studies to support school construction decision making.
- Pass legislation necessary to expand the CHPS funding bonus.
- Develop the education and outreach necessary to increase awareness of the CHPS program and the expanded funding benefit in order to increase participation.

Timeframe:

- This action can be implemented immediately.

OVERARCHING STRATEGY 9: PLAN FOR HOW TO ADDRESS EXISTING AND POTENTIAL CLIMATE CHANGE IMPACTS

Actions recommended by the Task Force:

◆ ***Develop a Climate Change Adaptation Plan for the State of New Hampshire (ADP Action 8)***

Develop a Climate Change Adaptation Plan to support public and private partners and state agencies in the planning and preparation for the episodic and chronic events in New Hampshire that are projected to result from climate change. This Plan should identify actions that proactively prepare for these incidents and minimize their impacts on human health, the natural environment and the built environment (e.g., homes, businesses, roads, bridges, dams). The Plan should include the methodologies for making sure all necessary data are available to decision makers. There is a general lack of urgency for planning for adaptation to climate change. This Plan should provide the necessary education and information to keep New Hampshire moving in a proactive manner as we continue to face developing climate change impacts. The Plan will help our state and our decision makers identify and implement additional critical adaptation strategies.

Overall Implementation:

- Issue an executive order to establish the necessary body and define the scope of their responsibilities.
- Assemble the necessary bodies to develop the Adaptation Plan including members from various interests including, but not limited to, environmental, natural resources, public health, municipal and regional governance, built infrastructure, academia (UNH) as well as groups gathering data necessary for decision makers.
- Identify data gaps and explore ways to fill those gaps.
- Ensure that the plan is a living document that can change as needed.

Timeframe:

- Development of the Adaptation Action Plan can begin immediately.
- Allow six months for the Plan's development.
- Once completed implementation can occur in a phased-in approach.

◆ ***Develop and Distribute Critical Information on Climate Change (ADP Action 1)***

Invest in the analysis and dissemination of accurate and understandable information about the economic, environmental, and social impacts of climate change to policy makers and decision makers in the public and private sectors. Desired outcomes are policies and decisions that are fact-based, easy to achieve, and effective. This action is critical because of the complexity and volume of the information involved and the need to synthesize and graphically illustrate key concepts and facts to make them understandable and relevant. The action would be implemented through a broadly representative collaboration of public and private entities. Their charge would be to assess existing sources of information to identify data gaps and develop a strategic plan to address those gaps, with a focus on getting the information into the hands of persons responsible for protecting public safety and environmental integrity. Outputs would include maps, reports, modeling tools, data sets, fact sheets, and other information useful to planners, decision makers, and the public.

Overall Implementation:

- Develop a memorandum of understanding among affected interests within and outside government. (The governor could issue an executive order relative to participation of state officials).
- Identify and make available financial and staff resources to support initial efforts.
- Develop and obtain commitments for a sustained program.

Timeframe:

- This action can be implemented over the next one to two years.

◆ ***Promote Policies and Actions to Help Populations Most at Risk (ADP Action 2)***

Target policies and actions to help prepare populations that are most at-risk from the adverse impacts of climate change and related social effects – especially the elderly, low-income, chronically ill, and families with small children. What is currently difficult for at-risk populations is likely to become even more difficult under climate change conditions. Many of these people live in the most vulnerable areas; some will have limited access to communications networks or will be non-English-speaking. Impacts may be associated with the costs and availability of commuting/transportation, energy for heating and cooling homes, "cool shelters," food and potable water, health care, and the need for relocation. The NH Division of Public Health Services and NH Homeland Security and Emergency Management should work together and participate in climate change discussions. The NH Department of Environmental Services should continue its work in the areas of public health outreach and health-related impacts deriving from changes in air quality. Public health agencies at all levels should continue to identify individuals at risk and coordinate their efforts.

Overall Implementation:

- Develop partnership agreements among state and local public health officials, environmental officials, emergency planning officials, and organizations that work with at-risk populations.
- Develop a comprehensive public outreach and education program for at-risk populations.
- Assess the strength of state and local emergency response, recovery plans, and mitigation plans.
- Assess the capacity of the public/private health system to respond to the effects of climate change.
- Assess the mental health consequences and sociological effects of climate change.
- Provide financial and staff resources to support initial efforts.

Timeframe:

- This action can be implemented over the next one to two years.

◆ ***Charge and Empower Public Health Officials to Prepare for Climate Change (ADP Action 3)***

Provide direction and authority to public health officials to increase the state's preparedness against existing and emerging infectious diseases and other health-related conditions as climate change advances. Scientists project a higher incidence of certain diseases and other health affects associated with global warming in the decades ahead. Topics requiring public health action include 1) vector borne infectious diseases, 2) heat-related injuries, and 3) respiratory illnesses. In particular, public health officials need better data/analysis for vector-borne infectious disease forecasting and an understanding of what indicators to track (e.g., weather patterns, mosquito pools, tick populations).

Overall Implementation:

- Create a coalition of state agencies to develop, update, consolidate, and/or integrate, data collection systems for health facts and indicators, health and disease surveillance, demographics, population vulnerability, and resilience.
- Strengthen the ability of local emergency services to respond to heat waves, temperature extremes, and air quality action days.
- Develop an outreach/education program via mass media to prepare the public for climate-related events and provide information on response options.
- Provide financial and staff resources to support initial efforts.

Timeframe:

- This action can be implemented over the next one to two years.

◆ **Strengthen Protection of New Hampshire's Natural Systems (ADP Action 4)**

Strengthen state and local protection of New Hampshire's natural resources to improve resilience to climate change, with particular attention to preservation of agricultural soils, floodplains, wetlands, drinking water supplies, and wildlife habitat connectivity. To help achieve this goal, new development should be directed toward already-built areas, at possibly higher densities, so as to avoid stresses on undisturbed natural areas. Actions items include 1) identification of ecological hubs and corridors, 2) prioritization of places to protect or restore, 3) region-wide examination of the fragmentation of aquatic systems, 4) improved management of groundwater resources and potable water supplies, 5) more comprehensive monitoring to detect environmental responses to climate change, and 6) specific measures to reduce environmental stressors. Implementation of this action would necessitate a greater emphasis on regional planning and development strategies than currently exists.

Overall Implementation:

- Assemble a statewide database inventory of natural systems and resources; develop a method for prioritizing which systems and resources to protect or restore.
- Consider legislation to allow or require changes in environmental and land use regulations as necessary.
- Require climate change impacts to be considered in all state and local planning, zoning, and facility siting.
- Identify and allocate resources to support planning and monitoring activities.

Timeframe:

- This action can be implemented within one to four years.

◆ ***Increase Resilience to Extreme Weather Events (ADP Action 5)***

Begin measures to increase the state's resilience to extreme weather events. Because climate change forecasts include more frequent drought punctuated by more intense precipitation events and rising sea level, our built environment may be at increased risk of inland and coastal flooding. More succinctly, today's weather-related problems will be made worse by a changing climate. Future development could put more people and property at risk and could exacerbate the problem if sited in the wrong locations. Consequently, adaptation policies should be established that 1) steer future development away from the most vulnerable flood-prone areas, 2) render the existing built environment more resilient to weather-related impacts, and 3) move existing development out of harm's way where feasible. Mechanisms to accomplish these outcomes focus on municipal ordinances, building codes, land use practices, infrastructure planning, and incentives. Costs of inaction are potential loss of life, property, and economic activity – especially in flood-prone inland and coastal areas.

Overall Implementation:

- Create a legislative commission to study the issue of resilience to climate change and make recommendations.
- Prepare and pass legislation, as necessary, to:
  - o Prohibit development in vulnerable areas.
  - o Improve existing flood plain maps.
  - o Tighten existing regulations regarding floodplains.
  - o Assist communities in creating and enforcing tougher land use requirements and building codes.
- Provide financial and staff resources to support initial efforts.

Timeframe:

- This action can be implemented over the next one to two years.

◆ ***Strengthen the Adaptability of New Hampshire's Economy to Climate Change (ADP Action 6)***

Create policies to support economic development that will reduce or mitigate greenhouse gas emissions, introduce climate considerations into the economic growth model, and attract environmentally responsible employers. The proposed action would help businesses and agricultural interests prepare for and adapt to the impacts of climate change and the potential impacts of its solutions. Sample measures include anticipating the effects of climate change on important current industries (e.g., skiing, tourism, agricultural); assisting businesses with reducing their energy costs, developing "green collar" training and education programs; and attracting alternative energy and other "clean-tech" industries. New Hampshire should embrace this task proactively by taking advantage of any new economic opportunities where the state might create a niche for itself in sustainable economic development. Implementation may require improvements to infrastructure and creation of appropriate tax incentives to support businesses adapting to climate change. Additionally, New Hampshire may need to develop disaster recovery plans in advance of anticipated climate-related events to ensure that assistance will be available throughout the recovery phases of increasingly frequent extrem

Overall Implementation:

- Consider tax incentives to businesses for installation of energy reducing features.
- Consider tax incentives to attract "green" industry involved in the production of environmentally friendly products and climate-change-related goods and services.
- Provide technical assistance to help existing businesses adapt to climate change.
- Provide technical assistance to businesses implementing proven technologies that reduce energy use and greenhouse gas emissions (free energy audits, training, etc.).
- Expand higher education curricula on sustainable development and green energy technologies.
- Provide financial and staff resources to support initial efforts.

Timeframe:

- This action can be implemented over the next two to four years.

OVERARCHING STRATEGY 10: DEVELOP AN INTEGRATED EDUCATION, OUTREACH, AND WORKFORCE TRAINING PROGRAM

Actions recommended by the Task Force:

◆ ***Develop an Overarching Outreach and Education Plan (RCI Action 4.6)***

Implement a comprehensive climate change outreach and education program that elevates the awareness, knowledge and skill in the state in order to support action at all levels and in all sectors. This program would coordinate and develop educational programs in New Hampshire in order to engage residents, students, businesses and industry to take action now, while simultaneously expanding the capacity of the state to develop and implement advanced mitigation and adaptation solutions in a phased-in approach in the future. This broad education program must rely upon, and build partnerships with, existing educational and outreach organizations including, but not necessarily limited to, K-12 schools, colleges and universities, museums and science centers, environmental and climate change focused not-for-profits, state programs, and professional associations and groups (e.g., architects, planners, builders). Critical to this effort would be marketing the existing Climate Action Plan in order to foster the support necessary for wide-spread implementation.

Overall Implementation:

- Inventory existing climate and energy related educational/outreach/training programs and success of those programs.
- Identify working group to consult with responsible parties and develop plan for overall program and integration.
- Invest and enhance existing educational programs that are working (e.g., NH Carbon Challenge, Clean Air-Cool Planet, Local Energy Committees, UNH Cooperative Extension Energy Answers program).
- Collaborate with professional associations to enhance/grow existing professional training programs.
- Identify and pursue resources to support broader, integrated program.

Timeframe:

- Identification of working group should begin immediately.
- Plan framework and development over the next year and initiate implementation in 2010.

◆ ***Include Energy Efficiency and Conservation in School Curricula (RCI Action 4.1)***

Revise New Hampshire's K-12 school curriculum standards to promote development of a citizenry that has a comprehensive understanding of climate change and the opportunities to engage in energy efficiency and conservation measures. Goals would be developed from a multi-disciplinary perspective, including topics in science, mathematics, and social studies. As a short-term goal, partnerships between educators and experts on energy and the environment would be created to develop educator workshops to train New Hampshire teachers in the nuances of climate change and energy efficiency. The long-term goal would be to amend the New Hampshire Curriculum Frameworks at all grade levels with particular emphasis on curricula for grades 9 through 12, including both open enrollment and advanced studies. Greenhouse gas emission reductions would be achieved as students carry their growing knowledge of climate change and sustainable behaviors back to their families and communities. Sustainable behaviors can happen as part of daily habits, life-long decisions, individual advocacy, and community involvement.

Overall Implementation:

- Provide resources to support outreach/education efforts.
- Establish partnerships, assemble resource materials, and develop educator training program. Look to existing programs in other states for guidance in the design of multi-disciplinary teaching modules/workshops on climate change and energy efficiency.
- Begin educator workshops in targeted communities/school districts and extend these workshops to different communities each year. Provide continuing professional development credits to teachers who complete the workshops.
- Create a diverse committee of educators to begin the task of revising the K-12 curricula.
- Provide resources to support program development and curriculum revision.

Timeframe:

- Teaching modules/workshops for educators could be developed by a suggested target date of June 2010. Training in targeted communities/school districts would begin thereafter.
- Amendment of the New Hampshire Curriculum Frameworks and new teacher certification requirements would be longer-term, with a suggested target date of 2015.

◆ ***Increase Energy Efficiency through Building Management Education Programs (RCI Action 4.2)***

Continue and expand energy efficiency education for building maintenance and energy management staff. The industrial, commercial, and government sectors should make use of the many training opportunities provided by utilities, energy companies (e.g., oil and propane distributors), and private consulting firms. Training should focus on energy audits as a proven method for identifying energy efficiency opportunities to minimize or eliminate net CO_2 output in existing buildings. For new construction, "beyond code" certification would assure that buildings produce the lowest possible environmental impacts.

In addition, encourage the creation of building energy manager positions within organizations that are still without these positions. The concept of placing one person in charge of energy efficiency within an organization should be promoted even for small businesses. This action would result in regular reviews of energy use and identification of energy saving opportunities. Building energy managers should be given the responsibility and budgetary tools to implement energy saving measures as they are identified.

Overall Implementation:

- Direct the NH Office of Energy and Planning (or other

state agency) to create, perhaps in conjunction with the energy utilities, an initiative to 1) promote energy efficiency education to facilities management staff and 2) encourage the establishment of building energy managers in government and business.

- Coordinate efforts with the NH Public Utilities Commission and the NH Energy Efficiency and Sustainable Energy Board to investigate funding opportunities to support the program.

Timeframe:

- Action to create initiative can occur immediately.
- Implementation of the initiative would be ongoing.

◆ ***Reduce Residential Energy Demand through Education and Outreach (RCI Action 4.3)***

Develop a community-based outreach and education program aimed at reducing greenhouse gas emissions in the residential sector. Because residential greenhouse gas emissions account for roughly half of all such emissions (when personal vehicles are included), an organized effort to engage residents in voluntary reductions of their household energy use would be effective. This program would provide the needed information, tools, and support to help residents understand how they use energy and how to map out strategies that would reduce their household energy consumption and energy costs. The program should make use of existing networks and communities (e.g., towns, neighborhoods, civic groups, faith-based organizations, businesses, environmental organizations) to maximize participation. Research-based behavioral change strategies targeting the root causes of climate change inaction should be employed through outreach activities that strengthen communities and do not rely solely on information-based campaigns.

Overall Implementation:

- Develop program details; consider adopting the New Hampshire Carbon Challenge. (http://nhcarbonchal-lenge.org) as a platform to reduce residential energy consumption.
- Consider an executive order to encourage all state employees and all New Hampshire citizens to take the challenge.
- Create a database to quantify emission reductions and chart participation rates and progress toward emission reduction goals.
- Publicize progress at the community and state levels.
- Provide resources to support the program.

Timeframe:

- This action can be implemented immediately and would be ongoing.

◆ ***Establish a Comprehensive Energy Efficiency and Renewable Energy Education Program (RCI Action 4.4)***

Establish a comprehensive education program on energy efficiency and renewable energy to help close the tremendous gap that exists between knowledge and practice. It is estimated that just by using current technology correctly and efficiently we could cut building energy consumption and associated greenhouse gas emissions by 30 percent. In the proposed action, state government, utility companies, colleges, professional and building trade organizations, would sponsor ongoing training and offer demonstration sites for energy-efficient and renewable energy practices. The program would provide accessible resources and educational opportunities to any individuals and organizations that design, build, evaluate/rate, maintain, sell, own, and occupy buildings. It would be of particular value to contractors, code officials, and energy raters, and would establish working groups for building managers and real estate agents. The program would be established and administered at various settings throughout the state, including demonstration centers, community colleges, training seminars.

Overall Implementation:

- Create partnership agreements to develop and administer the education program.
- Evaluate existing resources and possible training locations.
- Design the program by building upon existing training programs and/or using successful programs as models. (Experience with the CORE Efficiency Programs could prove useful.)
- Publicize and roll out the program at a limited number of settings; expand and adjust the program as resources become available and experience is gained.
- Develop a sustainable funding mechanism.

Timeframe:

- This action can be implemented immediately and would be ongoing.

◆ ***Create an Energy Efficiency and Sustainable Energy Systems Web Portal (RCI Action 4.5)***

Develop a searchable, web-based clearinghouse to hasten

the adoption of energy efficiency and sustainable energy products and technologies. The portal would serve a range of specific New Hampshire audiences, including local energy committees, city and town managers, business owners, industrial and commercial facility managers, and residents. The portal would provide each specific target audience with the resources needed to make informed decisions concerning the available options to reduce their greenhouse gas emissions (e.g., currently available products/services/technologies, costs, projected savings, installers or contractors, online calculators, and tax and/or rebate incentives). Although numerous websites give information of this sort, there is currently no web-based clearinghouse for those who are evaluating purchasing sustainable energy products and technologies or have decided to buy products or services and need additional information.

Overall Implementation:

- Designate a state agency and a program coordinator within the agency to lead this action. The program coordinator would be responsible for development and maintenance of the portal with assistance from internal and external experts in energy efficiency and sustainable energy systems.
- Issue a request for proposals to create a searchable, web-based clearinghouse for energy-efficient and renewable products and services.
- Publicize the existence of the web portal when ready.
- Provide resources to support development and maintenance of the web portal.

Timeframe:

- This action can be implemented immediately.