

Implementing Connecticut's Climate Change Action Plan 2006 Progress Report

By the Governor's Steering Committee on Climate Change

January 2007



Connecticut Climate Change

www.ctclimatechange.com

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I. Introduction

This report, produced by the [Governor's Steering Committee on Climate Change](#) (Steering Committee), details the progress made in 2006 towards implementing the recommendations embodied in the [Connecticut Climate Change Action Plan](#) (Action Plan). Portions of this report, submitted in accordance with the provisions of Section 22a-200a of the Connecticut General Statutes, are only available at www.ctclimatechange.com. These portions include success stories from 2006 and specific updates on each of the 55 recommended actions outlined in the Action Plan.

A. Public Awareness of Climate Change Goes Mainstream

Two years ago, the Steering Committee submitted the Action Plan to the General Assembly. The four committees having cognizance over the issue of climate change supported or endorsed the plan's goals and objectives. Since then, the Steering Committee has focused on implementing the recommended actions. Last year the [Report on Progress 2005](#) centered on new legislation supporting the goals of the Action Plan, several new policy initiatives, and educational opportunities. This year, 2006, has been a breakthrough year for raising awareness about climate change among Connecticut citizens and the actions needed to reduce greenhouse gas (GHG) emissions. Al Gore's documentary, *An Inconvenient Truth*, helped bring the issue of climate change to the general public on a scale that no state agency could. Several other mass media efforts - like Time Magazine's polar bear front cover, National Geographic's climate change issue, articles in the New York Times and Hartford Courant, and a host of television specials - also helped to raise public awareness about climate change. A new phrase, "minimize your carbon footprint", received great attention through mainstream media campaigns by BP p.l.c. (British Petroleum).

Connecticut residents have accepted climate change as undebatable; approximately 600 people participated in a public opinion poll on their current knowledge and attitudes about climate change, clean energy, and related issues. The results showed that the importance of climate change is increasing in the minds of Connecticut residents, with seven out of ten believing they can take action to reduce the impacts. More and more communities also continue to get involved, mainly through the clean energy "20% by 2010" campaign. The number of towns that choose to purchase clean energy has more than doubled since last year, with 30 now in the program.

B. Climate Change Science Remains Compelling

In addition to the recent poll, a report by the Northeast Climate Impact Assessment collaboration, [Climate Change in the U.S. Northeast](#), released in October 2006, affirms that climate change is already impacting the Northeast and those impacts could be severe unless we begin to reduce GHG emissions by approximately 2-3% each year. The report heightened public awareness and fostered a greater understanding of climate impacts on our region that will help inform decision makers and the public as we implement the

Action Plan and also plan for the deeper long-term reductions that will be needed to stabilize the climate and avoid dangerous climate change.

Two other reports released in the last half of 2006 brought focus to the economic issues associated with climate change. Sir Nicholas Stern's report¹ to the UK Treasury highlighted the positive economic growth opportunities possible from a transition away from a carbon-intensive economy and explained the significant risks to economic health from our continued reliance on fossil fuels. CERES² issued a report, with a forward by both the Nebraska and Washington Insurance Commissioners, that underscores the significant economic harm the United States faces from climate change and provided many examples of new businesses and products now available to address climate risk, many of which could be acted upon today by Connecticut's insurance companies and financial institutions.

C. Connecticut's Leaders Continue Strong Commitment on Climate Change

Through 2006 both the Governor and the General Assembly continued to demonstrate their strong support of efforts to address climate change in Connecticut. The Governor took several steps this year, including: issuing an executive order, a vision for Connecticut's Energy future, and supporting continued efforts toward the adoption and implementation of several regulatory initiatives. The Governor's support extended to the issuance of [Executive Order No. 15](#), the *Creation of an Office of Responsible Growth within the Office of Policy and Management (OPM)*, the issuance of an energy plan, [CT's Energy Vision for a Cleaner, Greener State](#); and the development or implementation of critical regulatory programs to reduce GHG emissions from motor vehicles and electric power plants.

The General Assembly continued to support the goals of the Action Plan during the 2006 legislative session, and passed several key pieces of legislation, including clean car labeling requirements, raising energy efficiency standards for most state building construction of \$5 million or greater and providing tax exemptions on certain hybrid motor vehicles and weatherization products for homeowners. Continued legislative support of the policies contained in the Action Plan is critical if Connecticut is to meet the GHG emission reduction goals set forth in Section 22a-200a of the Connecticut General Statutes.

D. Top Accomplishments

The Action Plan is the product of many people, groups, and companies in the state of Connecticut. It is not a state agency plan or a legislative plan; it is the state's plan. Its success depends on a broad base of support for implementation. The Steering Committee

¹ "Stern Review: The Economics of Climate Change" is available at http://www.hm-treasury.gov.uk/independent_reviews/stern_review_economics_climate_change/stern_review_report.cfm

² CERES (pronounced "Series") is a group of US companies that promote sustainable business development and growth, some of whom are located in Connecticut. Report located at <http://www.ceres.org/>

remains committed to this challenge and welcomes continued input on how best we can work together to achieve the goals of the Action Plan as soon as possible.

The 2006 Report on Progress reflects the significant progress that occurred throughout the five sectors³ this year, with a special emphasis on the Transportation and Electricity Sectors, the largest contributors of GHG emissions in the state. Actions completed this year complement those begun in 2005, building momentum for climate change solutions that reduce GHG emissions. While GHG emissions decreased from 2000 to 2001, overall GHG emissions in Connecticut have increased from 1990 through 2001, the last year for which complete data is available.

Top Accomplishment of 2006

Policy Initiatives

- *Public Act 06-161, An Act Concerning Clean Cars*, establishes a GHG labeling program for new motor vehicles weighing 10,000 pounds or less sold or leased in Connecticut beginning with the 2009 model year and requires a related public outreach and education program.
- *Executive Order No. 15* creates an Office of Responsible Growth and takes a major step forward to address sprawl.
- *Connecticut's Energy Vision* establishes a framework for bold actions to reduce energy consumption and create additional incentives for renewable energy.
- *Connecticut's Solid Waste Management Plan* establishes a goal to increase the amount of recycling and source reduction to a significantly higher goal.

Implementation Milestones

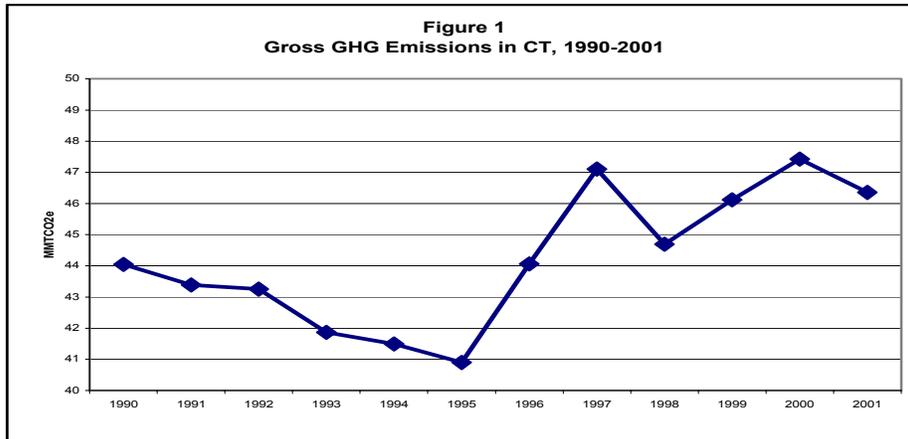
- Issued a model rule through the Regional Greenhouse Gas Initiative (RGGI) proposing to cap power plant GHG emissions; DEP begins developing a rule based on the model rule applicable to power generators in Connecticut.
- Doubled the number of Clean Energy Communities, each committed to purchasing 20% clean energy by 2010.
- Awarded the first set of annual climate change awards to five individuals or organizations for innovative actions to reduce GHG emissions in Connecticut.
- Increased public awareness on climate change and solutions; 97% of residents are aware of climate change, 70% believe individual actions can help.
- Provided funding for 122 MW of power for clean Combined Heat and Power projects under the *Act for Energy Independence*, Public Act 05-1, June Sp Session.
- First state to explore measuring progress on specific actions to reduce greenhouse gas emissions with stakeholder participation.

E. Connecticut Greenhouse Gas Emissions Profile

Despite many accomplishments in 2006, there remain significant barriers at the local, state, regional and national level that impede Connecticut's potential progress and affect our ability to achieve the significant GHG reductions in an economically sustainable

³ The five sectors identified in the Action Plan include: Transportation and Land Use; Residential, Commercial and Industrial; Electricity; Agriculture, Forestry and Waste; and Education.

manner so as to protect our environment and move towards energy independence. These barriers, discussed in Parts IV and V of this report, will require time and resources to develop a comprehensive measurement system to evaluate progress on reducing statewide GHG emissions to meet our goals.



F. A Call to Action

Based on the most recent available data, GHG emissions in Connecticut have increased by approximately 5.25% since 1990. If not for the commitment of many organizations and individuals, this increase would surely be greater. Nonetheless, this is cause for concern and the Steering Committee is issuing a call to action for everyone in Connecticut to take steps to reduce their “carbon footprint.” Here are some ideas:

- **Support clean energy.** Customers of CT Light and Power and United Illuminating can choose clean energy. Through the [CTCleanEnergyOptions](http://www.ctcleanenergyoptions.com) program (www.ctcleanenergyoptions.com), your energy dollars pay for electricity production from cleaner sources such as wind and small, low-impact hydropower. You may also be helping your city or town qualify for a free solar electric system for a public building if your community has joined the [Connecticut Clean Energy Communities](#) program.
- **Use energy efficiently.** Given recent increases in the cost of electricity, everyone should be using energy more efficiently! There are too many opportunities to list, so go to www.ct-energyinfo.com and plug into Connecticut’s energy answer center. Simple steps can save money and reduce GHG emissions.
- **Get out of your car.** Use public transit, walk, or ride a bicycle. Figure out the number of miles you drive in an average month and try to reduce that amount by 5%, then 10% and you will be making a difference.
- **Choose cleaner alternatives.** In the market for a new appliance or even a new car? Consider purchasing EnergyStar appliances or the vehicle that gets the highest in-class mileage. Also consider supporting clean energy through your electric distribution company.
- **Reduce, reuse, recycle.** Simply reducing the amount of trash you generate will also reduce GHG emissions.

- **Measure what you manage.** While we know that GHG emissions have increased, we cannot accurately measure the GHG reductions from many of the steps taken to reduce GHG emissions. We are working to address this, but must redouble our efforts and be granted access to necessary data in a timely fashion.
- Visit www.ctclimatechange.com for more ideas

II. 2006 Focus: Measuring and Monitoring GHG Emissions in Connecticut

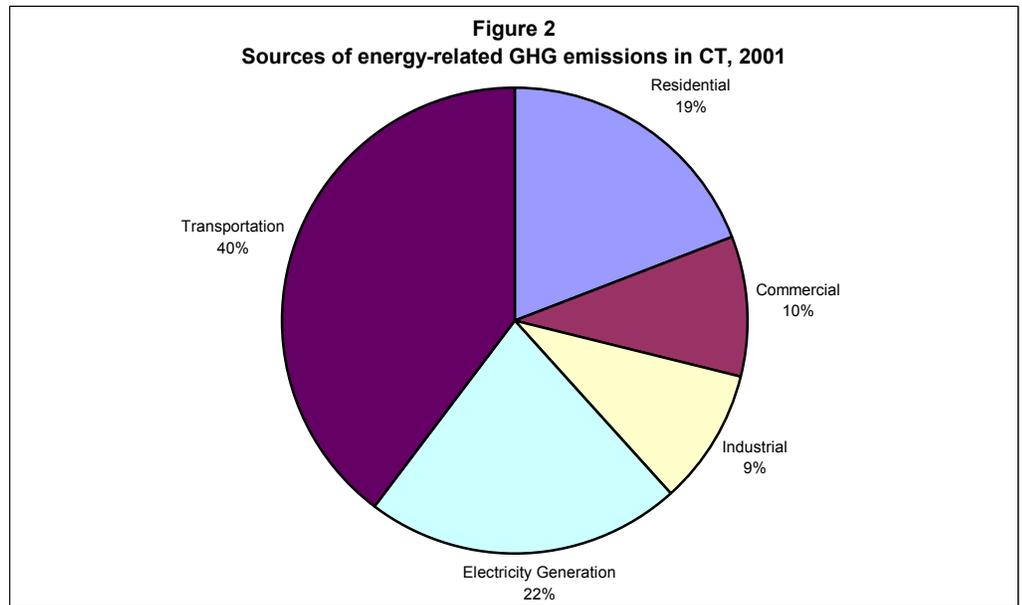
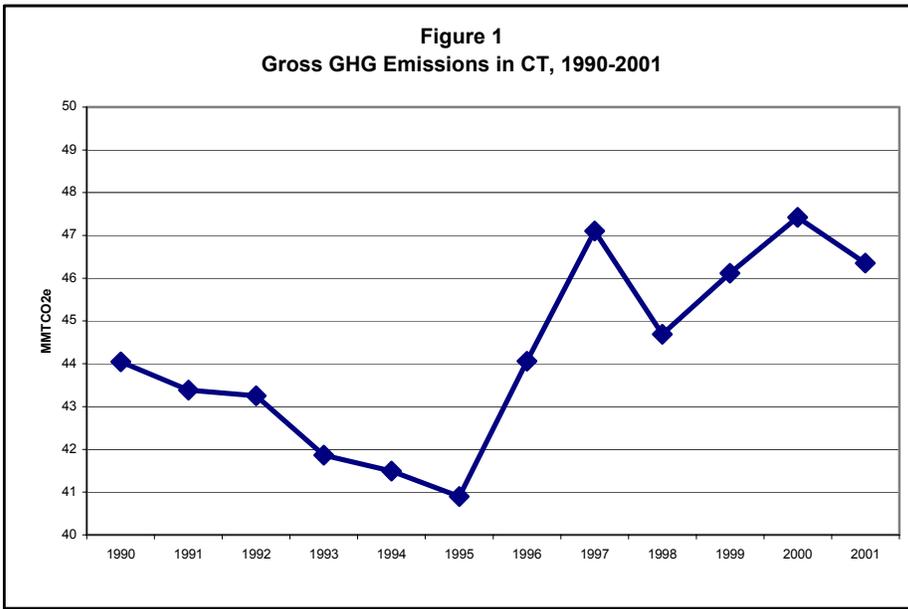
There is an old business adage that states, *you can't manage what you don't measure*. This is true in business, but it also holds true for Connecticut's ongoing efforts to reduce our state's contribution towards global climate change. Connecticut cannot begin to consider claiming success in reaching our near-term goal of stabilizing GHG emissions at 1990 levels by 2010, unless and until we have identified the measurement metrics that will gauge our effort. Making matters more challenging, Connecticut must measure and quantify GHG emission reductions from a multitude of activities across dynamic sectors of the economy that have, to date, never been measured for these purposes. This section details three such efforts that occurred last year.

A. Inventory of Greenhouse Gas Emissions in Connecticut, 1990-2001

An inventory of GHG sources and their associated emissions is necessary to evaluate the efficacy of GHG reduction strategies. The Connecticut DEP compiled the most recent, [Connecticut GHG Inventory: 1990-2001](#), pursuant to section 22a-200b(f) of the Connecticut General Statutes, which requires an update of the statewide GHG inventory every three years beginning July 2006. The data for the inventory were prepared using output from the US Environmental Protection Agency's (EPA's) GHG Inventory Tool.

Gross GHG emissions in Connecticut have shown an overall increase from 1990 through 2001 (Figure 1). Since 1990, Connecticut's GHG emissions have increased 5.25%. Carbon dioxide emissions comprise the majority of Connecticut's total gross GHG. Overall GHG emissions trends are very highly influenced by energy-related emissions trends. Approximately 90% of total annual state GHG emissions are the result of fossil fuel combustion for energy (heat & power) purposes. Other energy-related emissions contribute 2%-3% per year, including methane (CH₄) and nitrous oxide (N₂O) from fossil fuel combustion, and methane from natural gas transmission and distribution. Waste management, industrial production processes and livestock populations account for the balance of total statewide GHG emissions.

Based on emissions in 2001, Transportation accounted for 40% of energy-related CO₂ emissions, followed by Electricity Generation (22%), Residential Heating (19%), and Commercial (10%) and Industrial (9%) energy usage (Figure 2).



B. Measuring Progress on Reducing Greenhouse Gas Emissions

The Action Plan represents the joint product of state agencies, stakeholders from many sectors and the General Assembly. It is a different type of plan from those previously developed and implemented, since it covers all environmental media, economic sectors and energy sources. The plan's goals were derived from the regional plan of the New England Governors and Eastern Canadian Premiers, based on the Third Assessment Report of Climate Change by the United Nations. As a result, measuring reductions necessary to meet the goals set forth in the Action Plan requires different approaches, skills, measurement tools and methods.

Connecticut state agencies and technical experts held a three-day workshop in October 2006 that focused on how to measure progress in reducing GHG emissions. The workshop increased our collective understanding of the measurement and verification challenge and helped develop a road map through which technical and information gaps could be identified and addressed. This event brought together stakeholders that were involved in the initial development of the Action Plan, several state agencies, and regional and national experts, including representatives from EPA. The event resulted in the following findings:

- Many of the tools and models used to measure progress and to provide forecasts for traditional air pollutants are often not amenable, accurate or appropriate for assessing GHG emissions reductions;
- Tools and models used to analyze and evaluate New England's electricity markets and its grid are based on generation-centric platforms, which create a bias that either fails to capture the cumulative benefits of energy efficiency or applies economic factors that inappropriately value generation over efficiency and renewable resources; and
- More precise data, when possessed by entities such as the Energy Information Agency, electric distribution companies or the Independent System Operator, is not always easily accessible or the vintage of accessible information is often three or more years old.

During the workshop, the stakeholder group discussed the above constraints, assessed possible ways to develop new or modified tools and methods that would better gauge progress, and made several recommendations to help fill gaps and enable more precise and transparent reporting of progress in the future. The recommendations include:

- Focusing initial efforts on obtaining the most valuable and relevant gross data for reporting efforts which can later be refined as more precise data becomes available;
- Determining the energy and economic benefits, where possible, because such benefits are of considerable interest and importance to policy makers and the public;
- Monitoring and verification does not require exhaustive work or reliance on complicated models. Spreadsheet based tools, such as Microsoft Excel, can be very effective and consistent;
- Working with EPA, regional organizations and stakeholders to fill technical gaps and develop new tools as needed; and
- Coordinating among state agencies and stakeholders to streamline data submission requirements and assure consistent analysis and evaluation.

Some of the results of this workshop are detailed in Appendix A of this progress report. The stakeholders agreed to focus their efforts on eight of the recommended measures, all within the energy sector. Each of these measures represents the product of discussion and consensus among the stakeholders. The stakeholders also agreed that Connecticut is showing leadership in developing an approach to measure progress on GHG reductions, subsequent regional workshops should be held, and Connecticut should convene another workshop focused on the transportation measures included in the Action Plan.

C. Motor Vehicle Greenhouse Gas Emissions Inventory and Related Study

As required by Public Act 06-161, An Act Concerning Clean Cars, the Department of Environmental Protection (DEP) in consultation with the Steering Committee completed a study to determine the motor vehicle GHG emissions reductions necessary to meet the goals laid out in both the Action Plan and state statute. Further information on this study is set forth in Section III.A. of this report and the full study is included in Appendix B.

The study shows that Connecticut has several opportunities to gain ground on GHG reduction goals in the Transportation Sector. The existence of highly successful mass transit systems provides a template for expansion of other systems and construction of new ones. The state's existing technology, industrial, and utility infrastructure is robust enough to develop and implement transportation and fuel alternatives. Further developing the Governor's responsible growth initiatives will also reduce GHG emissions. With the direction provided by the 2006 Governor's Energy Plan, the Governor's Steering Committee on Climate Change, and the combined efforts of State, Federal and Citizen groups, Connecticut can make progress towards meeting established goals. However, our ability to directly control or regulate transportation related GHG emissions is severely constrained by federal law and ultimately meeting our long-term GHG emission reduction targets from the Transportation Sector will require the involvement of the federal government.

III. Actions taken in 2006

A. Implementation of Actions in the Transportation and Land Use Sector

The Action Plan projected reductions of greenhouse gas emissions from the Transportation Sector of 0.35 million metric tons of CO₂ equivalent (MMTCO₂e) by 2010. Over the past year, the Steering Committee made substantial progress on nine recommended actions from the Action Plan.

In October 2006 Governor Rell issued [Executive Order 15](#) (EO 15) concerning the creation of the Office of Responsible Growth within the Office of Policy and Management (OPM) in an effort to help address the issue of sprawl in Connecticut as well as to reduce energy waste and GHG emissions (Recommended Action #7). In addition to the creation of Office of Responsible Growth, EO 15 also created an Inter-agency Steering Council to look at land use, housing and transportation policies and projects with the goal of promoting transit-oriented development that provides commuters with bus or rail alternatives and encourages walkability of Connecticut's communities. Criteria will be established so that state funds are targeted for uses that are consistent with responsible growth; economic incentives will also be targeted to support development in designated Responsible Growth areas.

**Transportation Actions in the
Connecticut Climate Change Action
Plan 2005:**

1. California LEV II standards
2. GHG feebate program
3. Fleet vehicle incentives
4. Tailpipe GHG standards
5. Public education initiative
6. Hydrogen infrastructure research
7. Transit, smart growth, VMT reductions
8. Multistate intermodal freight initiative
9. Clean diesel and black carbon

a. Reducing Vehicle Emissions

Connecticut adopted the California Low Emission Vehicle standards program (LEV II) and put regulations in place so that new vehicles sold in the state beginning in 2008 will meet strict emissions standards (Recommended Action #1).

State legislation passed during the 2006 session calls for an education campaign on the environmental impacts of motor vehicles (Recommended Action #2). The goal of the legislation (PA 06-161) is to encourage Connecticut citizens who

purchase new vehicles to choose those with the lowest greenhouse gas emissions. All new and leased cars and trucks beginning in 2009 will be labeled to identify their greenhouse gas emissions in an easy to read format. In addition, this Act requires research to determine whether the labeling program is actually affecting purchasing decisions. Informed consumer choice for lower GHG emitting vehicles will eventually drive manufacturing decisions and lead to the manufacture of lower emitting vehicles. The law also extends the sales tax exemption for the most fuel-efficient hybrid cars through 2008.

State government has continued to take steps to reduce emissions from its fleet (Recommended Action #3). The Department of Administrative Services (DAS) fleet has been switching over to gasoline/electric hybrids and alternative fuel vehicles. Currently, about 140 of the active fleet vehicles are hybrid models -- Toyota Prius, Honda Civic and Ford Escape. From January to September 2006, these vehicles resulted in the reduction of approximately 44,000 gallons of gasoline (saving the state over \$100,000 in fuel costs alone) and 390 tons of GHGs. These vehicles use about ½ the amount of gasoline of those that they replaced. The remainder of the light duty vehicles in the fleet will be made up of Alternative Fuel Vehicles capable of running on gasoline or E85.

b. Reducing Vehicle Miles Traveled

A number of actions taken in 2006 are helping to reduce vehicle miles traveled in Connecticut (Recommended Action #7). This effort is closely aligned with the goals and recommendations put forward by the Transportation Strategy Board (TSB). While the TSB is primarily interested in stimulating sustainable economic growth by easing the mobility of people and goods within the state, the strategies the TSB seeks to employ have a direct and beneficial impact on the climate⁴. In addition, Public Act 06-136, *the Roadmap for Connecticut's Economic Future*, allocates an additional \$1.3 billion for public transit projects. The focus is on improving rail, including passenger cars, rail stations, and parking areas, and on enhancing service and ridership along Shore Line East (SLE) and New Haven Line Branch Lines. Other projects include:

- Performing an Environmental Assessment as the next step for rail service from New Haven to Springfield;
- Capital improvements to the Danbury Branch;
- Evaluating the additional needs of the Danbury, Waterbury, and New Canaan Branch Lines;
- Completion of the Norwich transportation hub; and
- The implementation of a freight rail link to the port of New Haven.

Telecommute Connecticut, a Connecticut Department of Transportation (DOT) initiative operated through brokerage companies, has the potential to take many cars off the road. This program promotes working from home and is increasing in popularity in Connecticut. Currently, 173 employers are participating with a total of 4,091 telecommuters. Nine Chambers of Commerce and the Connecticut Business Industries Association (CBIA) are participating. Eighty-six percent of the targeted companies are located in the counties of Fairfield, New Haven, and Hartford. A marketing campaign, which includes radio advertisements, is being used to attract greater participation.

In March of 2006, Governor Rell announced the “2 Million Mile Rideshare Challenge,” using the NuRide program, an online matching program to arrange ridesharing trips. Currently 3,271 people have registered as NuRiders; 68 % of these are completely new to carpooling and public transit. As of October 2006, over 2.8 million passenger miles were

⁴ For example, the TSB supports efforts to develop land use policies to promote vibrant town and city centers, minimize congestion through smart growth and expanding the reach of mass transit. The TSB also recognizes that the 1 car, 1 driver behavior of most Connecticut commuters must be changed.

eliminated from Connecticut's roadways through this program, with GHG reductions estimated to be more than 1,250 tons.

Bus ridership in Connecticut increased 3.7% during 2006; some of this can be attributed to the rise in gasoline prices. Other contributing factors include increased employment levels, additional transit service hours targeting employment sites, continued analysis and realignment of the bus routes by CTTransit, and more accessible vehicles (low floor) that make service more convenient to all passengers (especially the elderly and/or handicapped). Bike racks are now installed on all Stamford and New Haven division buses. DOT is also planning to install bike racks on Hartford division routes in 2007. DOT data from the Stamford division showed a substantial increase in the number of bikes meaning that many commuters are taking advantage of the intermodal transportation opportunities and using their bikes, rather than their cars, for commutes to park and ride facilities. As part of a demonstration project in the Hartford area, CTTransit anticipates delivery of a fuel cell powered transit bus in early 2007.

To further enhance carpooling, vanpooling and bus ridership, a Commuter Parking Working Group, organized by DOT and comprised of representatives from DOT, the Department of Motor Vehicles (DMV) and the Department of Public Safety (DPS), evaluated the needs of the state commuter Park-and-Ride facilities and addressed user needs, maintenance, regulations, and enforcement.

Rail ridership increased each month from January 2006 through August 2006 on both the Shore Line East and New Haven Line. Shore Line East carries approximately 1,700 riders per day (Monday-Friday service only) and transported its five millionth passenger during 2006. The New Haven Line is one of the busiest commuter lines in North America, carrying over 115,000 total commuters each day. Of those, approximately 80,000 commuters are starting or completing their trip in Connecticut. The number of riders starting and ending their trip in Connecticut has also increased. AMTRAK ridership in Connecticut has increased steadily over the last six years, rising from 884,860 passengers in Federal Fiscal Year (FFY) 1999 (July 1999 to June 2000) to 1,459,068 passengers in FFY 2005 (July 2005 to June 2006) at 12 rail stations in Connecticut.

The Central Connecticut Bicycle Alliance, the Capitol Region Council of Governments, the DEP, the Connecticut Department of Public Health, and the Connecticut DOT efforts to promote biking to work continues to grow, both in number of commuters and avoided GHG emissions. Over 300 individuals participated in 2005 resulting in over 171,000 pounds of GHG emissions. The Bike to Work program encourages workers in the greater Hartford area to leave their cars at home at least one day per month and commute by bicycle. This simple step alone reduces VMT, and its associated GHG emissions by 5%. Biking two days per month would reduce VMT and GHG 10% and so on. In 2006, the coordinator of the Bike to Work program was honored with a Connecticut Climate Change Leadership Award. A Statewide Bicycle and Pedestrian Advisory Committee exists to address bicycle and pedestrian concerns. The Committee will assist in updating the Bicycle and Pedestrian Plan and develop a new Bike Route Map.

The Connecticut DOT submitted an application to the Federal Highway Administration seeking funds to conduct a statewide study to determine the viability and feasibility of implementing a Value Pricing strategy (Recommended Action #7). This concept is intended to reduce vehicle miles traveled through behavioral changes (i.e., high occupancy vehicles pay less than single occupancy vehicles). While new to the Northeast, the concept has been piloted in several US metropolitan areas, including Los Angeles, Denver and Northern Virginia. A value pricing concept was considered for the I-95 Branford-Rhode Island Needs Study. The consideration of a value pricing concept will also be incorporated into both the I-84 Corridor Waterbury-Danbury Environmental Impact Statement and the I-84/Route 8 Interchange Study.

c. Gaining Efficiencies in Intermodal Freight Transport

The Bridgeport Port Authority has continued to implement a pilot initiative to transport containers by barge between the Ports of New Jersey and New York instead of via truck freight along the expressway. Also, Port Security construction activities are underway for the Bridgeport Regional Maritime Complex, which is the home base for the barge container service. These multi-state intermodal freight initiatives (Recommended Action #8) will help alleviate highway congestion along the Interstate 95 Corridor and, in turn, reduce GHG emissions. In addition, the I-95 Corridor Coalition “Northeast Rail Operations Study” (NEROps) is identifying “chokepoints” along rail service within the I-95 corridor and the opportunity for enhanced use of rail to transport freight. DOT is participating in this study, along with numerous other agencies⁵. A final report should be available in early 2007.

The Transportation Sector offers many opportunities to reduce GHG emissions. However, the challenges to realizing these opportunities differ from those in other sectors. Unlike the Electricity Sector, substantial improvement requires regional and national cooperation. Connecticut represents just 1% of the national vehicle market. As a result, Connecticut has collaborated with other states along the I-95 corridor to adopt and implement the California GHG emissions standards. Beginning with the 2009 model year, these standards will cover over 30% of the total national motor vehicle market. Connecticut has several existing or planned initiatives that can reduce GHG emissions, provide for local economic development and reduce our reliance on imported fossil fuel. These initiatives include: mass transit systems that provide a template for expansion and new construction; the state’s existing robust educational, technology, industrial, and utility infrastructure and the [Governor’s Energy Plan](#), which provides a comprehensive vision for achieving energy independence in the state over the next 15 years. These efforts, along with those of the Steering Committee and the combined efforts of State, Federal and Citizen groups will provide additional direction and allow for progress towards meeting both the short and long term GHG reduction goals.

⁵ Participating agencies can be found at http://www.i95coalition.org/members_list.html

B. Implementation of Actions in the Electricity Sector

There has been substantial progress on several recommended actions within the Action Plan's Electricity Sector during 2006. Since this sector contributes approximately one-quarter of the state's GHG emissions, the successful implementation of these actions will result in short, medium, and long-term reductions of GHG emissions. Reductions from the Electricity Sector are projected to be 3.07 MMTCO₂e by 2010, and 6.89 MMTCO₂e by 2020. The Action Plan identifies a variety of mandatory and voluntary measures, as well as incentive programs to support implementation.

In 2005, Connecticut signed a Memorandum of Understanding (MOU) with six other states to implement the Regional Greenhouse Gas Initiative (RGGI), the first cap-and-trade emissions program for carbon dioxide (CO₂) in the country. Connecticut is also one of ten Northeast and Mid-Atlantic states that are collaborating to develop the Eastern Climate Registry (ECR). In a related initiative, 30 states including Connecticut are currently looking for ways to harmonize GHG reporting and have begun to discuss the development of a Multi-State Registry (MSR) for GHG emissions. The ECR and/or the MSR will provide a GHG emissions platform that supports state voluntary and mandatory GHG reporting programs and will provide the technical platform for additional state and regional climate change initiatives. A registry platform that can accommodate many states is important as jurisdictions across the nation develop and implement their own climate change action plans. A company with facilities in several states could use this regional platform to register all of its GHG emissions and track its overall GHG reduction efforts. This tracking ability and knowledge of historical baseline GHG emissions will provide an added value to companies if and when national climate change policies and programs are developed.

a. Reducing Power Plant Emissions

In 2006, Connecticut continued its participation in the RGGI process (Recommended Action 53) along with six other northeast and Mid-Atlantic States. Maryland joined the RGGI process

during 2006 and California Governor Schwarzenegger held talks in October 2006 to explore potential ways that California could link with the program. Environmental and energy agency heads and staff from these states have participated in numerous meetings and conference calls throughout 2006 to finalize RGGI program elements. RGGI is intended to cap CO₂ emissions from large power plants at "current" levels beginning in 2009 and achieve a 10% reduction from these levels by 2019.

A RGGI Model Rule was released in August 2006, and now individual RGGI states are working to develop state rules to implement the program. The DEP will conduct a series of RGGI Workgroup meetings beginning in December 2006 and continuing through the

Electricity Generation Actions in the Connecticut Climate Change Action Plan 2005:

45. Renewable energy strategy
46. Renewable portfolio standard
47. Government clean energy purchase
49. Clean Energy Choice
50. Renewable Energy Certificates
51. Restore Clean Energy Fund
52. Energy efficiency & CHP (including clean distributed generation)
53. Regional cap-and-trade program

spring of 2007. These meetings will be used to discuss Connecticut’s adoption of the Model Rule and to seek informal input on a variety of issues such as the size of the consumer benefit set-aside, uses for the consumer benefit set-aside and allocation methodology. Connecticut should complete the rule making process and adopt the RGGI program in late 2007.

b. Increasing Clean Energy

Connecticut’s continued national leadership on renewable portfolio standards (RPS) (Recommended Action #46) was reaffirmed in 2005 with the passage of Public Act 05-01 (June Special Session), *An Act Concerning Energy Independence*. This act creates a mandatory Class III requirement for energy efficiency and combined heat and power (Recommended Action #30) making Connecticut’s RPS a national model for clean, renewable, and efficient energy utilization (see chart below). Public Act 06-74 further amended the qualification of biomass resources. The Department of Public Utility Control (DPUC) is currently working on the 2005 RPS compliance report and estimates that approximately 495,000 MWhs of Class I RECs were purchased to comply with the program requirements.

Year	Class I⁶	Class II⁷	Class III⁸	Total
2004	1.0%	3.0%	-	4.0%
2005	1.5%	3.0%	-	4.5%
2006	2.0%	3.0%	-	5.0%
2007	3.5%	3.0%	1.0%	7.5%
2008	5.0%	3.0%	2.0%	10.0%
2009	6.0%	3.0%	2.0%	11.0%
2010	7.0%	3.0%	4.0%	14.0%

⁶ “Class I renewable energy source” means (A) energy derived from solar power, wind power, a fuel cell, methane gas from landfills, ocean thermal power, wave or tidal power, low emission advanced renewable energy conversion technologies, a run-of-the-river hydropower facility provided such facility has a generating capacity of not more than five megawatts, does not cause an appreciable change in the river flow, and began operation after July 1, 2003, or a sustainable biomass facility with an average emission rate of equal to or less than .075 pounds of nitrogen oxides per million BTU of heat input for the previous calendar quarter, except that energy derived from a sustainable biomass facility with a capacity of less than five hundred kilowatts that began construction before July 1, 2003, may be considered a Class I renewable energy source, or (B) any electrical generation, including distributed generation, generated from a Class I renewable energy source.

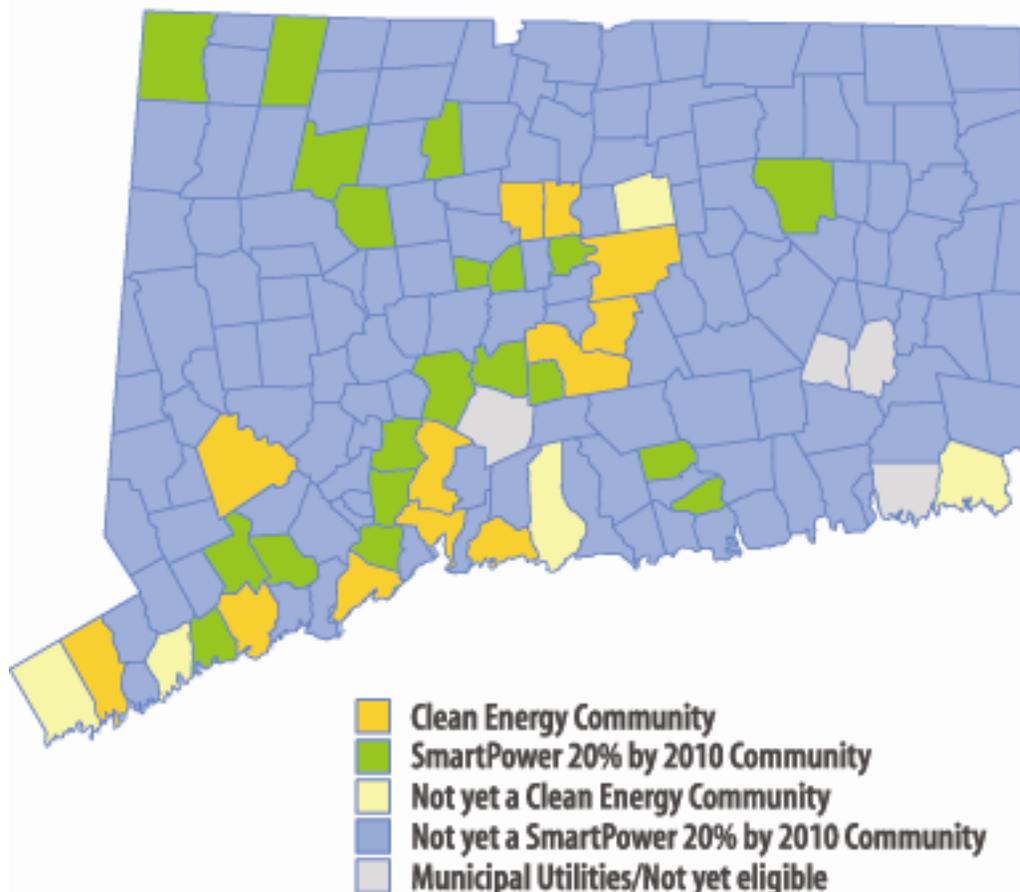
⁷ Energy derived from a trash-to-energy facility; or biomass facility that began operation before July 1, 1998, provided the average emission rate for such facility is equal to or less than .2 pounds of nitrogen oxides per million BTU of heat input for the previous calendar quarter, or run-of-river hydropower facility provided such facility has a generating capacity of not more than five megawatts, does not cause an appreciable change in the river flow and began operation prior to July 1, 2003.

⁸ Electricity output from combined heat and power systems with an operating efficiency level of no less than fifty per cent that are part of customer-side distributed resources developed at commercial and industrial facilities in this state on or after January 1, 2006, or the electricity savings created at commercial and industrial facilities in this state from conservation and load management programs begun on or after January 1, 2006.

Through this act and the implementation of Project 100 (Recommended Action #48), there are significant incentives for locally generated clean energy resources that will serve as part of a multi-pronged approach towards alleviating grid congestion in Southwest Connecticut while mitigating electricity costs to ratepayers. Not only are reliability, fuel diversity and rising electricity costs being addressed by this public policy, but local economic development is a focus as well by encouraging new job creation within Connecticut's widely recognized fuel cell industry.

Connecticut began its efforts to become a national leader in voluntary clean energy markets through the implementation of the CTCleanEnergyOptionssm (CCEO) program (Recommended Action #49). Since 2005, this program, designed through a public process overseen by the DPUC, allows customers in Connecticut Light & Power and United Illuminating territories to support clean energy by signing-up with either Community Energy or Sterling Planet. In calendar year 2005 there were over 6,600 enrollments and currently there are over 10,000 enrollments in the CCEO. The DEP and DPUC signed-up all of their facilities for this program (Recommended Action #47) thereby further supporting the state's commitment to clean energy.

CTCleanEnergyCommunities



The year also saw the continuance of SmartPower's 20% by 2010 Clean Energy Campaign in communities throughout the state and an incentive program from the Connecticut Clean Energy Fund called the Connecticut Clean Energy Communities Program. This program provides no-cost clean energy systems to qualifying communities. Through a recently launched small grants program called the Community Innovations Grants provided by the Connecticut Clean Energy Fund, local citizens are demonstrating their support for clean energy through local awareness and education programs and activities. Through ongoing opinion polling research conducted by Nexus Market Research, Connecticut is showing increased support for clean energy in comparison to the nation as a whole as the issues of climate change and energy independence come to the forefront of the public debate.

Providing customers with options to support clean energy will lead to voluntary reductions of greenhouse gas emissions, reduced energy costs resulting from a more reliable, secure and efficient energy system, and more local jobs within the emerging clean energy technology sector.

Governor Rell further demonstrated her support for clean and efficient energy use through "Connecticut's Energy Vision – For a Cleaner, Greener State."⁹ The successful implementation of this proposed energy plan would result in:

- 20% of all energy used in Connecticut coming from clean and renewable resources by 2020; and
- A 20% reduction in electric-peak consumption by 2020.

Moving forward to implement Connecticut's Energy Independence Act of 2005 (PA 05-01, June Special Session), has set the stage for developing new programs and incentives for energy efficiency and on-site electricity generation. This past year, many actions were taken in the Electricity Sector. The program design for Class III renewable energy resources was developed, 16 Combined Heat and Power projects were awarded funding in the DPUC's distributed generation grant program, totaling over 122 MW of power, the DPUC joined the DEP in purchasing 100% clean energy for their energy consumption, and the Clean Energy Fund helped install over 600 kilowatts of solar photovoltaic systems in Connecticut, with over 1,000 kilowatts of new systems under development.

The Governor proposes to not only restore the Connecticut Energy Efficiency Fund (Recommended Action #51), but to also "Lead by Example" by recommitting the state to purchasing clean energy for state facilities to 20% by 2010 (Recommended Action #47), and requiring that all publicly-supported state and school construction projects incorporate energy efficiency technologies (Recommended Action #19).

⁹ <http://www.ct.gov/governorrell/lib/governorrell/ctenergyvisionsept19.pdf>

c. Reducing Demand and Increasing Efficiency

A significant focus of the Office of Policy and Management (OPM) has been directed toward energy improvements at state facilities through efforts to encourage facility participation in Demand Response (DR) programs. As part of their Energy Roundtable Educational Series for state facilities, OPM has held a session on demand response programs and achieved commitments from approximately 60 state facilities. This successful initiative has enrolled approximately 30 MW of capacity in the DR program. Incentive payments resulting from participation in this program will be targeted to efficiency improvements at participating state agencies.

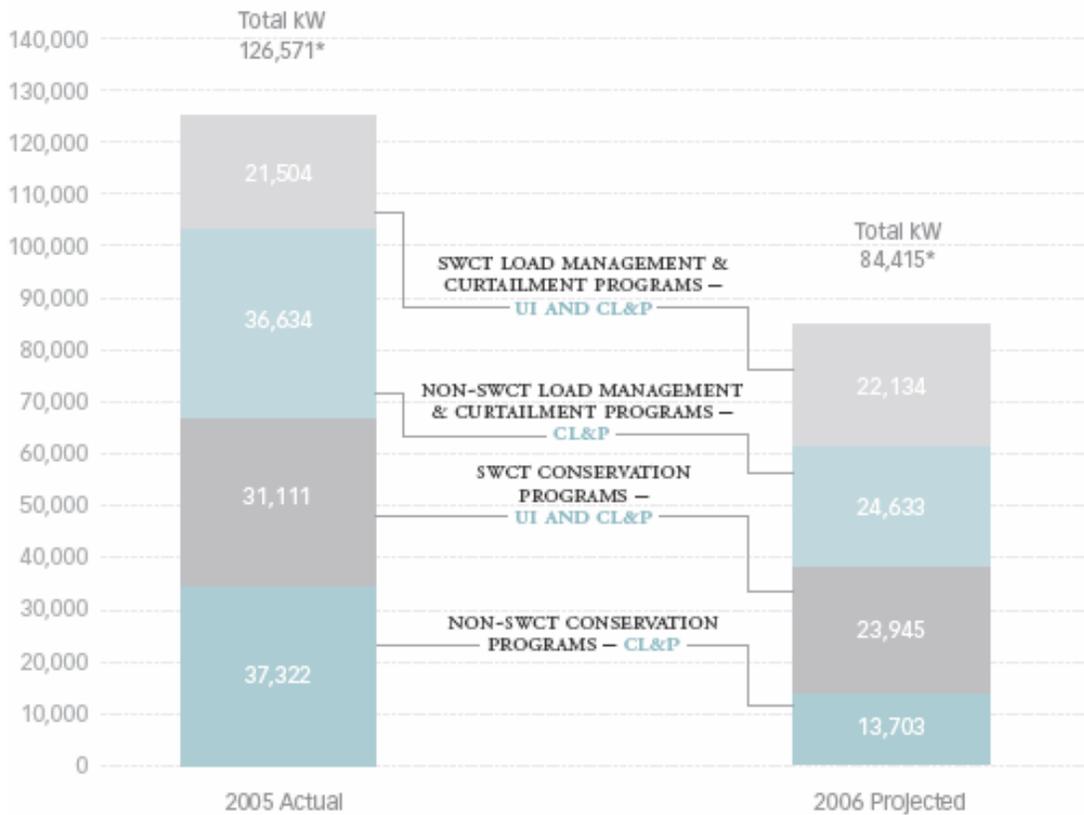
The Steering Committee continued to work closely with the Connecticut Energy Conservation and Management Board (ECMB) through implementation of recommendations related to energy efficiency. The ECMB is statutorily charged with administering the Connecticut Energy Efficiency Fund (CEEF). The CEEF is funded by the conservation charge on customers' electric bills. In 2005, the last year for which data is available, these customers contributed almost \$65 million to the CEEF. The DPUC reviews and approves all CEEF programs each year.

By reducing overall energy demand and load during periods of critical peak demand, CEEF programs mitigate adverse environmental impacts. In 2005, CEEF programs resulted in peak energy demand savings by over 126,000 kW (Figure 3). In addition to reducing the emission of criteria air pollutants, CEEF programs reduced Connecticut GHG emissions in 2005 by nearly 200,000 tons.¹⁰

¹⁰ See: ECMB 2005 Annual Report, *Energy Efficiency: Investing in Connecticut's Future* at page 4 and 13 (March 1, 2006)

Figure 3

Peak Demand Savings Available from CEEF Programs (In kW)



*2006 projected savings represents a 33% decrease in 2006 funding.

In summary, Connecticut has set the foundation through public policies, voluntary actions, and leading by example to reduce GHG emissions within the Electricity Sector. Connecticut’s focus is now to continue to successfully implement these policies through cross-sector collaboration, steadfast leadership, and continuous monitoring and evaluation.

C. Implementation of Actions in the Residential, Commercial and Industrial Sector

Energy Information Administration¹¹ data indicates that residential, commercial and industrial consumers in Connecticut account for 72% of the state’s end-use energy consumption, with transportation accounting for the remainder. Energy efficiency is

¹¹ Part of the US Department of Energy

therefore an important and cost-effective factor in reducing GHG emissions in Connecticut's Residential, Commercial, and Industrial Sectors. To this end, the Action Plan identified twenty-five specific actions in this area. Several recommended actions are in the process of being implemented and will result in considerable GHG and criteria pollutant¹² emissions reductions. Other benefits include improved public health and safety and reduced energy bills. Many of the activities within this sector involve cooperation and coordination among several state agencies.

a. Increasing Appliance Efficiency

Consumer electronics and other appliances make our lives easier or more enjoyable everyday. However, these products can, in aggregate, result in considerable added demand for electricity as new products and technologies come to market or penetrate deeply into existing markets. For example, each high definition plasma television in use can add up to ½ kW demand to the electricity grid. Today, most homes are air-conditioned. The increased use of residential air conditioning adds considerable demand during daytime peak periods. These peak periods coincide with unhealthy air quality days in the summer. To address this area, the General Assembly enacted efficiency standards for a group of consumer products in 2004 (Recommended Action #10). In 2006, the DPUC established regulations for the targeted products while OPM continues to work with California and other states, on a multi-state compliance website to certify approved products [www.appliancestandards.org].

Governor Rell has also announced plans to issue an Executive Order to require that future equipment purchases for state agencies are Energy Star compliant, where Energy Star® specifications exist (Recommended Action #27).

b. Improving Building Efficiency

In the 2006 legislative session the General Assembly adopted Public Act 06-187. Section 70 of this Act requires most state funded building construction costing more than \$5 million to be built to LEED (Leadership in Energy and Environmental Design) Silver standards or equivalent. The Department of Public Works (DPW), OPM and DEP are now developing regulations to implement these requirements. Given that there is momentum to include public schools in the near future and that Governor Rell's Energy Plan targets schools for energy efficient

Residential, Commercial, Industrial Actions in the Connecticut Climate Change Action Plan 2005:

10. Appliance standards
11. Appliance swapping
12. Heat pump water heater replacement
13. Bulk purchasing of appliances
14. Upgrade building energy codes
15. Energy efficient/improvement mortgages
16. Energy Conservation Loan Program
17. Weatherization Assistance program
18. Energy Star Homes program
19. High-performance buildings (state-funded)
20. High-performance buildings (private funded)
21. Shared savings program
22. Training of building operators
23. Green campus initiative
24. Energy benchmarking
25. Pilot fuel-switching
26. Third-party load-management
27. Environmentally preferable purchasing
28. New England Demand Response Initiative
29. Voluntary programs and actions
30. Clean combined heat and power
31. Conservation & Load Management Fund
32. Create heating oil conservation fund
33. Create natural gas conservation fund
34. Reduce high-global-warming-potential gases

¹² Criteria air pollutants include air pollutants such as nitrogen oxides, sulfur oxides and fine particulate matter.

technologies, state agencies are developing the regulations with the expectation that they will be flexible enough to be applicable to schools (Recommended Action #19).

The state residential and commercial building energy codes were upgraded to the 2003 International Energy Conservation Code (IECC) and took effect on December 31st, 2005 (Recommended Action #14). The DPS Building Inspector's Office is working with the Institute for Sustainable Energy to provide energy code trainings to building professionals (Recommended Action #22). Five training sessions on the new code took place in the fall of 2006. The Northeast Energy Efficiency Partnership (NEEP) estimated the energy savings per square foot for training session attendees. Based upon the 35 Connecticut building operators that participated, energy savings based on improved heating oil and natural gas efficiency for the associated buildings where they have responsibility or equivalent to 4,398 pounds of CO₂.

Efficiency in state buildings is a priority. In 2006 over 40 buildings in three state agencies were benchmarked (Recommended Action #24). To date, over 100 state buildings have been benchmarked. Benchmarking is a tool used to compare the energy performance of similar facilities. Benchmarking is a useful activity in energy management because it can be used to identify best energy management practices and develop energy efficient measures. Benchmarking also aids DPW in prioritizing which buildings should be audited for energy use and helps monitoring and verification efforts by allowing more accurate quantification of GHG reductions from energy-related projects. Since 2000 approximately two dozen state facilities have participated in the energy-auditing program. As of December 2006, energy saving projects were completed at ten state facilities resulting in an estimated reduction of 1,338.8 kW or 5,866,604 kWh of electricity and 3,995,900 cubic feet of natural gas.

An Energy Roundtable was launched for state facilities personnel in late 2005. The series is designed to address three areas: (1) education of state personnel on energy efficiency issues, (2) peer exchange among different facilities and agencies, and (3) facilitation of energy projects at state agencies. Three Roundtables were held in 2006 on the following subjects: Demand Response Initiatives, State Procurement and Energy Incentives, and Lighting. OPM plans to continue offering Energy Roundtables for state personnel.

Training and education are also a key component of building improvement. A variety of seminars and workshops were held in 2006. They include: a Demand Response workshop for municipalities, sponsored by Rebuild America and OPM and a workshop for industry on Combined Heat and Power, co-sponsored by CONNSTEP and OPM. Two eight-session Building Operator Certification (BOC) courses were held in 2006, and more are planned for 2007 and 2008. The BOC workshops will target three populations: state facilities personnel, municipal facilities personnel, and small commercial personnel.

c. Greening Colleges and Universities

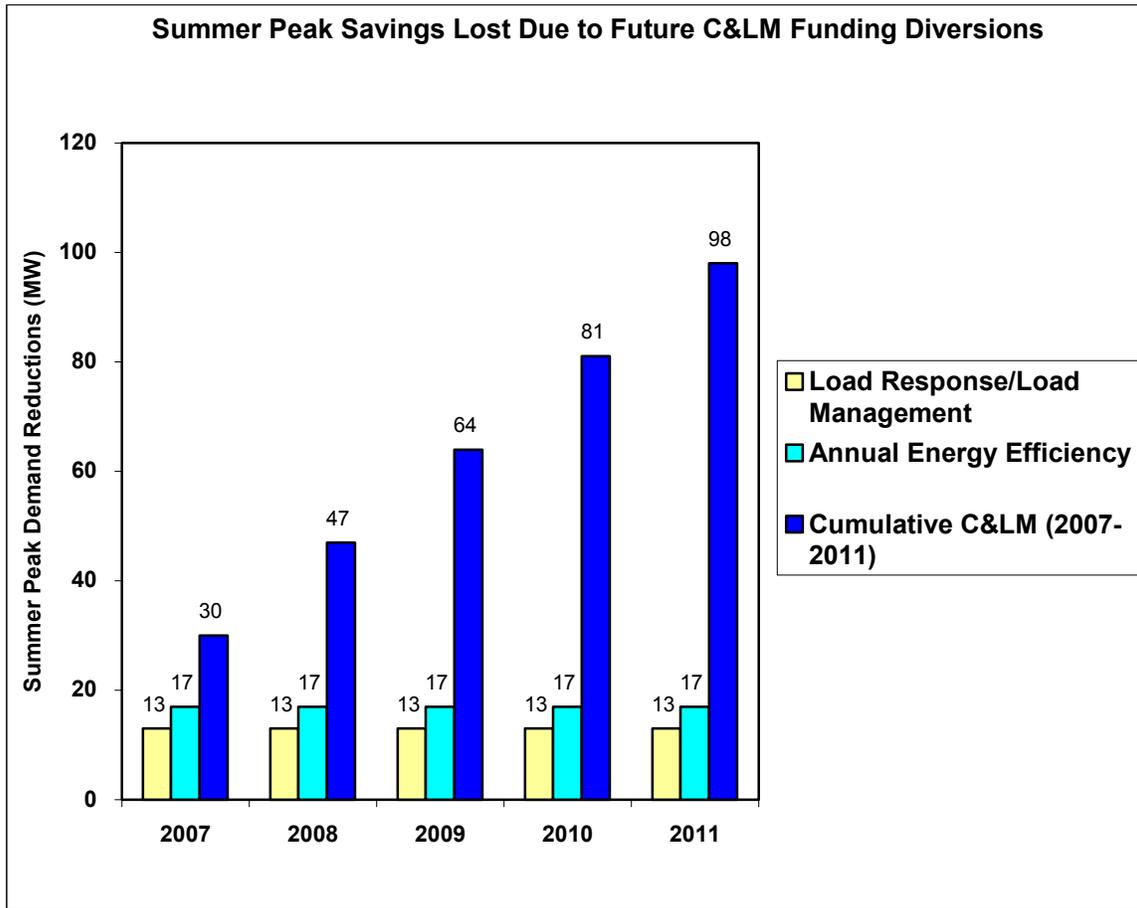
College campuses are also making progress on the energy front (Recommended Action #23). In academic year 2005-2006, Yale students reduced energy consumption in their residence halls by more than 10%. Yale has constructed two buildings designed to Leadership in Energy and Environmental Design (LEED) standards and is planning to construct several more. The Chancellor of the State University system signed onto a campus sustainability plan that commits each of the four state universities to a series of steps that will reduce their carbon footprint. The commitment also extends to a curricula development program that will provide the necessary skills for students to help transform the state from a fossil fuel-based economy to a zero-carbon economy. Southern, Western, and Eastern Connecticut State Universities have also recently constructed buildings that meet LEED standards for energy efficiency. Central Connecticut State University has installed two highly efficient natural gas Combined Heat and Power (CHP) units, which provide 3 MW, or two thirds of the campus' normal electricity load, while also providing steam and hot water for the campus. Western Connecticut State University participated in a load response program and for 2006 shed 2.5 MW on peak days. Eastern Connecticut State University installed two 2.5 kW photo-voltaic power systems on two of its dormitories to power emergency lighting.

d. Energy Efficiency as a Resource

Several factors converged during 2006 that highlight the significant and cumulative benefits from energy efficiency (EE). A New England Governors/ Eastern Canadian Premiers (NEG/ECP) white paper adopted in May 2006 encourages states and provinces to treat EE as a resource of first choice – the reasoning is simple: ***there is no unit of energy that is less expensive or cleaner than the one not produced!*** The model rule developed under RGGI provides mechanisms that allow EE to be used to help satisfy compliance obligations and contains a consumer benefit provision to generate additional funding for EE. ISO-NE began two parallel efforts to develop reliable long-term energy capacity for the region. The transition rule, covering the period from December 2006 through the end of May 2010, and the forward capacity auction, covering from June 2010, provide equal treatment for all resources. Under these regional ISO rules, EE will be valued the same as those resources from generation. The Governor's Energy Vision also strongly supports EE by focusing on policies to reduce peak electricity demand, enhance low-income weatherization, require school construction projects to be efficient and, most importantly, to restore funding to the Connecticut Energy Efficiency Fund. The latter effort alone will help achieve significant reductions in GHG. As shown in Figure 4 below, each year from 2003, when the funds were taken from the EE Fund, Connecticut has lost significant opportunities to reduce electric demand. Each year, 13 MW of load response and 17 MW of annual energy efficiency improvements are lost. The higher bar represents the cumulative projection of lost EE related MWs. According to the ECMB¹³ each \$1 invested in EE reduces energy bills by \$4. The lack of a fully funded EE program over the last three years has negatively affected ratepayers.

¹³ See: *Energy Efficiency: Investing in Connecticut's Future* at page 15, 27 and 28 (March 1, 2006)

Figure 4



D. Implementation of Actions in the Agriculture, Forestry and Waste Sector

Greenhouse gas emissions and sinks from the Agriculture, Forestry and Waste Sector account for less than 4 percent of the state’s total emissions. Projected reductions from this sector are expected to be 1.22 MMTCO_{2e} by 2010 and 1.28 MMTCO_{2e} by 2020. This sector covers a wide range of activities, including both GHG emissions and “sinks” (practices that sequester or remove carbon dioxide from the atmosphere, such as planting trees and managing forest health). Over the past year, Connecticut has made steady progress in implementing the actions in this sector moving the state forward in achieving the anticipated GHG reductions.

a. Supporting Connecticut Farmers

The implementation of PA 05-228 began in 2006. This act created a permanent fund to,

Agriculture, Forestry and Waste Actions in the Connecticut Climate Change Action Plan 2005:

35. Centralized manure digesters
36. Reduce non-farm fertilizer use
37. Buy local produce
38. Forest management and carbon offsets
39. Urban tree planting
40. Forest/agricultural land preservation
41. Durable wood products
42. Landfill gas-to-energy projects
43. Increase recycling, source reduction
44. Voluntary carbon offset program

in part, preserve farmland (Recommended Action #40) and provide additional funding for programs to support Connecticut farmers. The Connecticut Department of Agriculture (DAG) is using some of this funding to encourage the sale of Connecticut Grown food to schools, restaurants, retailers, and other institutions and businesses in the state (Recommended Action #37). In addition, the Agricultural Viability Grants Program offers two grants. The Farm Viability Grant is for towns to develop additional farmers' markets and to incorporate planning tools that will promote agriculture sustainability. The Farm Transition Grant is for producers, non-profits, and agricultural cooperatives to increase the economic viability of their businesses and agricultural production in general. \$500,000 is allocated each fiscal year for the Farm Viability Program; \$500,000 for the Farm Transition Program; \$75,000 for Farm Link; and an estimated \$4,000,000 for the Farmland Preservation Program.

In July 2006, Governor Rell announced the first of the state's grant awards provided by the provisions in PA 05-228. A total of \$842,000 in grant funding was awarded to 16 agricultural producers, six non-profit agricultural organizations and eleven municipalities from throughout the state.

Farm Reinvestment Grants totaling \$488,390 were also awarded in the Fall of 2006. This support is expected to help existing agricultural operations throughout the state. Approved projects include expansion of farms through building of greenhouses, dairy and beef facilities, equine enterprises, processing facilities and wineries. The grants were awarded on a first-come, first-served basis and require a match by the applicant. The DAG's share of the budget is capped at \$40,000 in matching funds. These grants must go through the bonding process each year. In a separate effort, the Department of Economic and Community Development (DECD) will provide \$2 million in low interest loans for energy conservation, machinery and equipment and farm diversity to the farm community.

Governor Rell released [CT's Energy Vision](#) in the Fall of 2006. This comprehensive plan promotes the use of biofuels and renewable forms of energy and includes incentives for Connecticut farmers to cultivate agricultural crops for biofuels. The Connecticut Agricultural Experiment Station also began investigating the production of oilseed crops in Connecticut. During the past summer, scientists at the Connecticut Agricultural Experiment Station have grown field plots at the Lockwood and Windsor farms located in Hamden and Windsor, Connecticut to determine crop yields per acre planted of both soybean and canola/rapeseed. A primary goal of this research is the conversion of these oils to biodiesel fuel to be used to power diesel motors or as an additive to home heating oil.

b. Preserving Forest and Agricultural Land

The state continued to preserve forest and agricultural land in 2006, enabling carbon sequestration and preventing more energy intensive development of these lands (Recommended Action # 40). The state has now achieved 71% of its goal of preserving

21% of Connecticut's land as open space. Other significant accomplishments from this year include:

- \$478,750 allocated to protect 250 acres of prime and important farmland located in Woodstock and Lebanon. With the permanent protection of these two farms, the Connecticut Farmland Preservation Program has protected 31,275 acres on 224 farms. More than half of these acres are classified as prime and important farmland soils. The state goal is to protect 130,000 acres.
- Acquisition of 88 acres of State Forest Land in 2006 through the Recreation and National Heritage Program

A variety of local land trusts in Connecticut as well as national preservation organizations continue to work to acquire open space, including the Connecticut Forest and Parks Association's recent purchase-and-sale agreement to buy 80 acres of hemlock and hardwood forest along the Fenton River in Willington.

c. Buying Connecticut-Grown Foods

The purchase of locally grown foods not only supports our local farm economy and the continued farming of productive land, but it also decreases the GHG emissions associated with transportation of food grown far from our homes (Recommended Action #37). The average distance that food travels from its origin to its sale at the grocery store is about 1600 miles. Large institutions, both public and private, continue to purchase increasing amounts of locally grown produce. The DAG is working with other agencies such as Department of Administrative Services (DAS), Department of Public Health (DPH), as well as other organizations like the Connecticut Food Policy Council, Hartford Food Systems, Connecticut Apple Marketing Board, 5-3-1, and Food Land and People to increase the purchase of locally grown foods.

Following through on its pledge to utilize Connecticut Grown produce whenever possible, and in partnership with the DAG's ("Connecticut Grown" program) the DAS has kept Connecticut farmers busy during the summer and fall growing seasons. The Connecticut Department of Correction ("Connecticut Comes First" program) and Departments of Mental Health and Addiction Services, Children & Families, Veterans Affairs, Mental Retardation, Public Safety and Department of Education have been purchasing thousands of pounds of state crops. In addition, a portion of eggs and milk consumed by these agencies are purchased from local farms. While metrics for the 2006 growing season are not yet available, in 2005, Connecticut state agencies purchased a total of 451,200 pounds (\$154,500) of fruits and vegetables from local farmers, including apples, cabbage, corn, cucumbers, eggplant, green peppers, and squashes.

The DAG Farms-to-School also program grew significantly during 2006. A statewide program, farmers and wholesalers are selling more and more locally grown fresh fruits and vegetables in schools' cafeteria meals and snacks. Currently there are over 50 school districts buying from more than 45 local farms, representing an increase of 15 new farms in 2006. Two very large school systems -- Bridgeport and Fairfield -- are now actively participating in the program. The Farms-to-Schools program helps kids understand the

connection between our food system and a healthier lifestyle. The Department of Education received one of only six \$1 million grants to be used by 25 schools across our state to buy Connecticut Grown produce. The schools were given consideration if they participated in the Farm-to-School Programs.

The number of farmers markets established each year has increased steadily. In 2006 there were 82 farmers markets throughout Connecticut (compared to 72 in 2005). In addition, the Connecticut Farmers' Market Nutrition Program, jointly funded by the State of Connecticut and the United States Department of Agriculture – Food and Nutrition Service, provides a supplemental source of fresh fruits and /or vegetables for clients of the Women, Infants and Children (WIC) program and low-income seniors who are judged to be “nutritionally at risk” and to stimulate demand for Connecticut Grown fresh, unprocessed fruits and vegetables at farmers' markets. In addition to the WIC program and through the combined efforts of DSS and DAG, sixteen farmer's markets now accept food stamps. Based on this success, DSS representatives were invited to present at a national conference on steps taken to encourage farmer's markets acceptance of food stamps.

d. Reducing Synthetic Fertilizer Use

A number of initiatives are helping to reduce synthetic fertilizer use on non-farm land, and thus nitrous oxide emissions (Recommended Action #36). In September 2006, the DEP released a newly produced video that provides information for municipalities on organic land care. The 7-minute video defines organic land care and describes its benefits and potential challenges, including the experience of two Connecticut towns (Cheshire and Granby) implementing organic land care on their playing fields. Also featured is footage from the University of Connecticut's Research Farm where different fertilizer formulations are being tested. The DEP and the Connecticut Northeast Organic Farmers Association (CT NOFA) will work with an interested municipality in 2006 to pilot alternative/organic land care practices on a school or municipal recreation field.

CT NOFA continues to promote organic land care practices and train land care professionals and others. There are currently 71 accredited organic land care professionals (up from 63 in 2005) in Connecticut, and each year more towns are beginning to use organic land care on their fields and are encouraging residents to voluntarily stop using chemical and synthetic fertilizers on their lawns and gardens. Middletown launched a “Project Green Lawn” campaign in the spring of 2006 for residents. The towns of Cheshire, Essex, Greenwich, Guilford, Granby, Milford, Plainville, Middlefield, Redding, and Westport are all participating in “Freedom Lawn” campaigns or similar programs to reduce fertilizers and pesticides.

e. Increasing Recycling

The current recycling rate is estimated to be 25 – 30% of the waste generated in the state. The DEP has developed a new Solid Waste Management Plan for Connecticut and anticipates its formal adoption by the end of 2006. One of the main goals set forth in the

proposed plan is to significantly reduce the amount of Connecticut generated solid waste requiring disposal through increased source reduction, reuse, recycling, and composting (Recommended Action # 43). The proposed plan outlines strategies to significantly increase the MSW disposal diversion rate. Legislation will be needed to support the goals of this plan and to achieve an increased recycling rate by expanding the list of mandated recyclables and developing a program for electronics waste. Once adopted, implementing the Plan will involve all the citizens of Connecticut to address the solid waste issues facing the state and will require not only changes in personal and business practices, but also legislative changes and increases in funding at the state, regional, and local levels to support new programs. The waste diversion and recycling measures in the plan complement greenhouse gas emission reduction strategies from waste handling, transport, and disposal and provide additional support in meeting the state's recycling and source reduction goals.

Connecticut is making steady progress in reducing emissions in the Agriculture, Forestry and Waste Sector, but increased support and funding will be needed to continue implementation of these voluntary actions.

E. Implementation of Actions in the Education Sector

2006 was a pivotal year in Connecticut for rising public awareness of climate change science and solutions. Connecticut residents are highly aware of climate change and believe that Connecticut's leaders and individuals should take action. The public is embracing growing opportunities to learn how to reduce greenhouse gas emissions. Connecticut organizations have developed a strong foundation of resources and programs to teach students and the public about climate change, including the launch of a new competition for students and a statewide awards program. These initiatives will help further engage the public and highlight the actions of many champions throughout the state.

a. Raising Awareness in Connecticut

According to research done in 2006, Connecticut residents are highly aware of climate change, the importance of climate change is increasing, and most residents feel empowered to take action. Specifically, 97% of those who responded indicated their awareness of climate change. This is an increase in awareness from 2005 and is higher than awareness nationwide. Based on this survey, over 50% of Connecticut residents believe that climate change has already impacted our state. In addition, a growing number of residents view climate change as the single most important environmental issue.¹⁴ American public opinion has also shifted dramatically over the past year to elevate climate change to the most important environmental issue facing the nation.¹⁵ Over two thirds of Connecticut residents feel empowered to take individual action to address climate change and nearly three quarters believe that Connecticut leaders can do

¹⁴ From "[Comparative Assessment of Consumer Awareness of Clean Energy in Connecticut and the United States](#)," June 27, 2006, research done for CT Clean Energy Fund by Nexus Market Research, Inc.

¹⁵ Research done by MIT Laboratory for Energy and the Environment, October 2006.

something about it.¹⁶ These extremely high levels of awareness in Connecticut coupled with state policy leadership and grass roots action provide a tremendous opportunity to further engage community leaders, students, and the general public in action.

b. Growing Public Involvement in Action and Solutions

The Steering Committee launched the [Connecticut Climate Change Leadership Awards Program](#) in 2006. The program seeks to give recognition to individuals and organizations that have taken exemplary action to promote the goals of the Action Plan and reduce GHG emissions. The first five recipients of this annual award reduced over 21,140 tons of GHG emissions, the equivalent of taking over 4,500 cars off the road for a year, and were honored at a ceremony with the Steering Committee on April 18, 2006. They serve as role models to demonstrate that individuals and organizations play a vital role developing and implementing climate change solutions.

Over 5,800 Connecticut residents attended community screenings of “An Inconvenient Truth” in October 2006. The movie, shown at over 150 congregations in the state, presents the science of climate change. Faith communities followed the movie with discussion forums. This initiative, coordinated by the Interreligious Eco-Justice Network, provided an opportunity for many citizens to learn more about climate science and discuss the issues in their local communities.

Thirty towns have shown leadership by committing to buy clean energy. Under the [Connecticut Clean Energy Communities](#) program, town residents and community leaders are working together to increase participation in the Connecticut Clean Energy Options program. This program is building a critical mass of municipal leaders who are addressing climate change and encouraging other towns to follow their lead.

c. Increasing Outreach to Future Generations

CT Energy Education, unveiled in 2006, is a valuable resource for teaching climate change to high school students. Developed by the Institute for Sustainable Energy, the [CT Energy Education](#) web site includes free information, lessons, labs, and activities in the fundamentals of energy, climate change, and energy efficiency. It has been reviewed by 300 teachers and is aligned with the Connecticut Department of Education’s Science Frameworks.

[Cool It! The Climate Change Challenge](#) is a new competition on climate change solutions for middle and high school students from Connecticut. The program was officially launched in September 2006. Students who participate in *Cool It* will learn about the science of climate change and then create real solutions in their local communities. Local competitions will be held at twelve participating science centers. Winners will move on to a statewide competition. *Cool It* is an initiative of the Connecticut Science Center Collaborative supported by the Emily Hall Tremaine Foundation. This annual

¹⁶ From “Comparative Assessment of Consumer Awareness of Clean Energy in Connecticut and the United States,” June 27, 2006, research done for CT Clean Energy Fund by Nexus Market Research, Inc.

competition will build the competence of our youth in understanding climate science and inspire them to involve their schools and communities in actions to reduce greenhouse gas emissions.

d. Strengthening Collaboration on Climate Change Education

The [Climate Change Education Committee](#), coordinated by the DEP, has been meeting monthly since 2003 and stimulates vital networking and collaboration among the many organizations involved in climate change education and outreach in Connecticut. The Committee continues to grow and attract new participants. During 2006, the Committee participated in many outreach events, including the Sustainable CT Expo; helped develop the “Smart Energy Game,” a mobile exhibit on energy efficiency; and was trained in effective communication and messaging on climate change.

Connecticut DEP initiated the first meeting of New England state environmental agencies on climate change outreach and education in March 2006. The participants continue to be in touch regularly and meet quarterly to share information on education programs and collaborate on regional public outreach initiatives. The group has agreed to partner to develop a broad regional public awareness campaign on energy efficiency. Through regional collaboration, this initiative can make a significant contribution to consistent messaging throughout New England and to broader and more effective public awareness on climate change solutions.

IV. Barriers to Meeting 2010 GHG Reduction Goals

The 2005 Action Plan provided a path to achieve the 2010 and 2020 GHG reduction goals provided for in both the New England Governors/Eastern Canadian Premiers (NEG/ECP) regional action plan and codified in section 22a-200a of the Connecticut General Statutes. If all the recommendations were implemented, the 2005 Action Plan demonstrated that the state would achieve both goals. Due to a number of factors, explained in greater detail below, achieving the 2010 target will be difficult. Furthermore, data availability and transparency issues will preclude verification of whether the 2010 goal is achieved until 2013 or 2014.

Reducing Connecticut’s contribution to global climate change will require the transformation of the statewide motor vehicle fleet, housing stock, and electricity production infrastructure. The turnover rate in each of these sectors affects the degree to which greenhouse emissions reductions are achieved. Car and truck fleets require 10-15 years to turnover; power plants require 40-50 years; and homes and buildings last even longer. Cost effective opportunities in this sector need to focus on the existing industrial, housing and building stocks. Otherwise, delay will make it more difficult and more expensive to achieve Connecticut’s proportional GHG emission reduction goals by reducing the timeframe in which the required emissions reductions must occur.

Stakeholders in the climate change dialogue must continue to work with and strengthen partnerships across all sectors and assess all cost-effective emission reduction strategies. The SmartPower campaign is one example and the commercial/industrial sector planning committee on Connecticut's Energy Efficiency Fund is another. Others include: connecting with national efforts such as the US Conference of Mayors endorsement of the zero energy home by 2030, working with Connecticut companies to explore and develop business opportunities.

Other barriers are less obvious. The seemingly simple administrative task of reporting progress on reducing GHG emissions has itself become increasingly difficult. Data that was once readily available from the Federal government on a timely basis, is either no longer available or its publication is significantly delayed. The stated reasons for this delay relate to national security concerns, but the effect is that the most recent quality assured data set for power plant emissions is now over three years old. State agencies have had similar experiences regionally, as the New England Independent System Operator declines to publish power plant data, even though its New York counterpart makes the same information easily accessible on its web site.

Stakeholders who possess relevant regulatory authority must evaluate avenues for more timely information as a placeholder. All stakeholders must continue to work through regional and national organizations to encourage greater data transparency and availability.

The third barrier relates to the very tools and analytical methods used to assess current and future GHG emissions reductions. Some methods now in use are either not appropriate or very accurate when used to measure GHG emission reductions. This is due in part because the tools and methods developed to assess direct GHG emissions reductions either do not adequately account for indirect reductions (especially those for energy efficiency) or the assumptions used to verify the reductions are not as precise.

The workshop on measuring progress and other related conferences have highlighted this issue. Stakeholders must work towards the development of assessment tools that can appropriately and accurately capture the direct and indirect benefits of the recommended actions. These efforts include working with organizations such as the Northeast States for Coordinated Air Use Management (NESCAUM) to seek broader application of their NE-MARKAL model. Stakeholders should also work with the USEPA to develop consistent monitoring and verification protocols and actively participating in the several ISO-NE dialogues on energy capacity, long-term resource planning and encouraging energy efficiency as a resource of first choice.

V. Future Plans: the Path to Achieve 2020 GHG Reduction Goals

To avoid both dangerous climate change and substantial negative economic impacts, scientific and economic reports published over the last year emphasize the importance of reducing GHG emissions immediately and in a manner that would result in significant

emissions reductions by the middle of this century. The United Nations Fourth Assessment Report, to be published during 2007, will likely re-iterate and re-emphasize the scientific consensus that the climate is already changing; there is a need to stabilize the climate by mid-century; and society must transform to a largely zero carbon based economy. While no state, including Connecticut, now knows how this will occur, stakeholders have begun to think about it and offer several recommendations on how to achieve significant GHG emissions reductions by mid-century.

Financial/insurance markets: The markets can act to address the risks posed to corporations, businesses and consumers by assessing which are most vulnerable to climate change and then provide appropriate incentives to help balance the risks. Efforts of Connecticut State Treasurer, Denise L. Nappier, several re-insurance companies, and, more recently, the property and casualty insurance markets are important initial steps. The markets may also develop new products and business lines, such as guaranteeing the performance and persistence of energy efficiency measures over time to make energy efficiency as reliable a resource as power generation. Doing so could help flatten load growth in Connecticut by 2010 prevent the GHG emissions associated with the displaced load growth. Existing programs, such as those overseen by the Connecticut Energy Efficiency Fund should also seek to capture the benefits of reduced risk, and work with insurance companies and financial institutions to integrate these factors into the Connecticut Energy Efficiency Fund's review process.

Colleges/ universities: Connecticut must continue to take advantage of its intellectual capital and build upon the measures already begun by the state university system, Yale University, Connecticut College and others. The State should support the development of new curricula to support the development and training of solar and other zero emission energy installation and maintenance workers. A broad spectrum of educational opportunity is needed to assure that Connecticut's labor force will possess the skills necessary to transform the State to a zero carbon future and to educate students on the importance of doing so.

Energy efficiency: Connecticut has an excellent record in implementing cost-effective programs that achieve significant results. Restoration of the funding to the Connecticut Energy Efficiency fund, which is part of Governor Rell's Energy Vision, will help the state to flatten electricity load growth. So too will implementing other aspects of the Governor's energy plan that by 2020 will lead to Connecticut meeting 20% of our electric demand with renewable resources, reducing our peak demand for electricity by 20%, reducing our fossil fuel consumption by 20%, and using 20% alternative fuel in our heating oil. This is clearly a vision for the future as average overall energy efficiency in the United States is less than 10%, and only 7% of Connecticut's households have one or more compact fluorescent lights (CFLs). This is most disturbing given that the installation of CFLs is the easiest step anyone can take to reduce energy consumption. Through efforts like the ISO New England long-term planning process, the National Action Plan for Energy Efficiency, and the NEG/ECP, Connecticut will work to assure that energy efficiency is a resource of first-choice. Programs like whole building design, which encourage an integrated approach to building energy usage, can improve energy

efficiency by 40-70%. Assuring building performance also, as mentioned above, provides new business opportunities to Connecticut's insurance industry.

Transportation: Transportation will be the most significant and locally important issue to address over the next several decades. Connecticut's emphasis on town development creates, in effect, 169 competitors for tax revenue, jobs and economic development. This competition drives sprawl in Connecticut. The State must address the issue of sprawl and look now for ways to encourage regional co-operation and regional planning. This is necessary to improve transportation efficiency necessary to meet long-term GHG goals, and to also maintain the state's character, so that our towns look like, or can look like, the New England village concept that continues to be the most important reason that people note on why they live and work here. The Steering Committee must continue to work closely with the Transportation Strategy Board to advocate for a long-term transportation system that provides a viable alternative to the single passenger commute. In the near term, a specific area for consideration is as basic as where to locate our schools. Surveys reflect strong support for locating schools so that students can walk to them. This not only decreases the need to use buses, with their associated diesel emissions and other safety and health concerns, but also can help to address the child obesity issue, which is quickly becoming a significant and expensive public health problem.

VI. Conclusion

The problem of climate change did not arise over night. Likewise, the solutions necessary to address climate change will require a long-term commitment and planning horizon of decades or more and we will not get there alone. Connecticut will need the full cooperation and participation of the federal government and our sister states to fully implement our portion of a global solution. However, the steps we take today can help assure that the transformation of vehicles, electricity service infrastructure and housing/building stock occurs, at least in Connecticut, in an orderly fashion that helps our state economy grow.

Despite progress made over the past few years, addressing this important environmental issue is a huge undertaking that requires continued support. There are major challenges to successful implementation of the Action Plan. Funding remains an important issue in the state's ability to implement meaningful climate change solutions. Up to this point, there has been no dedicated source of funding, about one third of the Connecticut Energy Efficiency Fund was cut in 2003 to help balance the state's budget, and towns are faced with a lack of resources to deal with rising energy prices and energy-consuming buildings. Major cultural change on the part of all Connecticut citizens is also needed if driving habits are to change; land use development decisions and purchasing preferences must also be climate friendly. In the upcoming year, the Governor's Steering Committee on Climate Change will continue to look for support from the state legislature; we will work with a variety of partners, including NGOs, municipalities, businesses, utilities, and citizens to reduce GHG emissions; and we will become more skilled on how best to

communicate about climate change so we can continue Connecticut's leadership on this issue.

VII. Web-based Documents

Action Plan Success Stories

Many individuals and organizations in Connecticut have taken action to address climate change. Their [success stories](#) are available for all to learn more about these champions and to provide proven ideas for others to act upon:

<http://ctclimatechange.com/SuccessStories.html> .

Detailed Update on 55 Recommended Actions

Detailed progress on the 55 actions set forth in the Action Plan is available at:

<http://ctclimatechange.com/RAProgress2006.html>

Appendix A, Measurement and Verification Data

Table 1
Estimated Carbon Dioxide Emissions Avoided
Categorized by Applicable Recommended Action

RA	Description	Estimated CO2 Tons Avoided	Metric Used
7	Transit. Smart Growth, VMT Reduction	1,300	NuRide
10	Appliance Efficiency Standards	22,000	State/Federal Efficiency Programs
13	Bulk Purchase of Appliances	36,000	Residential Appliance retirement/replacement
18	Energy Star Homes Program	1,000	New Home Construction/AirCon
19	High Performance Buildings: Schools and State Funded Buildings	1,100	State LEED
21	Government Agencies – Demand Response	50	PC Energy Mgt, HVAC
22	Training of Building Operators	2010	Building Op Survey
23	Green Campus Initiative	350	CSU Savings
24	Energy Benchmarking, Measurement, and Tracking Program for Municipal Buildings	1,600	State Facility Surveys
25	Pilot Fuel-Switching Projects	1000	State Fleet Vehicles
46	Renewable Portfolio Standards (RPS)	200,000	1% of Aggregate RPS
47	Government Clean Energy Purchase	500	CT Gov't Share of CTCEO
49	Connecticut Clean Energy Option	37,000	Clean Energy Option Participation
52	Efficiency and Combined Heat and Power (CHP)	160.000	SBEA, C&I, Energy Opportunities, Energy Conscious Blueprint,

Measuring Reductions in GHG Emissions

An integral part of the 54 Recommended Actions (RA's) established in the Action Plan is measuring the effects of their implementation in terms of GHG emissions avoided or reduced. When an RA is implemented it is assumed to have a direct GHG reduction benefit, and/or a co-benefit in the economic, public health, environmental quality, or energy supply sectors. Direct measurement of benefits is possible in the form of measurable reductions in energy consumption, or reductions in direct GHG emissions. Additionally, reductions may be measured in terms of estimated savings based on forecasts of utilization of a technology, or consumption of a resource. Co-benefit analysis may be performed with the use of a model, such as the EPA's COBRA model if the reductions of criteria air pollutants are known.

The value of measurement and verification of GHG reduction measures cannot be overstated. While many recent initiatives have measurement protocols as integral to their associated regulation or procedure, many existing programs do not. The quantification of existing GHG reduction programs is an important part of the 2006 Climate Change Progress Report process (Table 1). Most benefits were calculated from estimated electric power consumption savings or from fossil fuel consumption savings. These savings were converted to tons of carbon dioxide (CO₂) with the use of established emissions factors, or verifiable conversion factors.

As GHG reduction programs mature it is expected that the measurement data, and conversion procedures, will mature accordingly. At the present time there are significant gaps in accuracy and completeness. The numbers provided are meant to provide a rough guide to the magnitudes of the current estimation of GHG reductions associated with several RA's. Attention has been paid to the possibility of double counting reductions, as well as the lack of data for large portions of RA's in which limited data is available.

Appendix B

Motor Vehicle Related Greenhouse Gas Emissions in Connecticut

A Report Pursuant to Public Act 06-161

Introduction

The New England Governors/Eastern Canadian Premiers (NEG/ECP) and the Connecticut General Assembly have established forward-looking goals to reduce greenhouse gas (GHG) emissions. In 2001, the NEG/ECP adopted a regional memorandum of understanding with the goal of reducing regional GHG emissions to 1990 levels by 2010 and to further reduce GHG emissions to 10% below 1990 levels by 2020. The Connecticut General Assembly adopted this goal as well in 2004. See Conn. Gen. Stat. Section 22a-200a.

As directed by the General Assembly, the Governor's Steering Committee on Climate Change (GSC)¹, through a robust public stakeholder driven process that involved many representatives from business and industry and several environmental organizations, developed the Connecticut Climate Change Action Plan (CCAP). The CCAP 2005 contains 55 recommended actions to reduce GHG emissions that focus on the following five sectors: Transportation and Land Use; Residential, Commercial and Industrial; Agriculture, Forestry and Waste; Electricity Generation; and Education and Outreach. The GSC submitted the CCAP to several committees within the General Assembly, including the Committees on Transportation, Environment, Commerce and Energy and Technology. Each committee subsequently voted to support or otherwise endorse the CCAP.

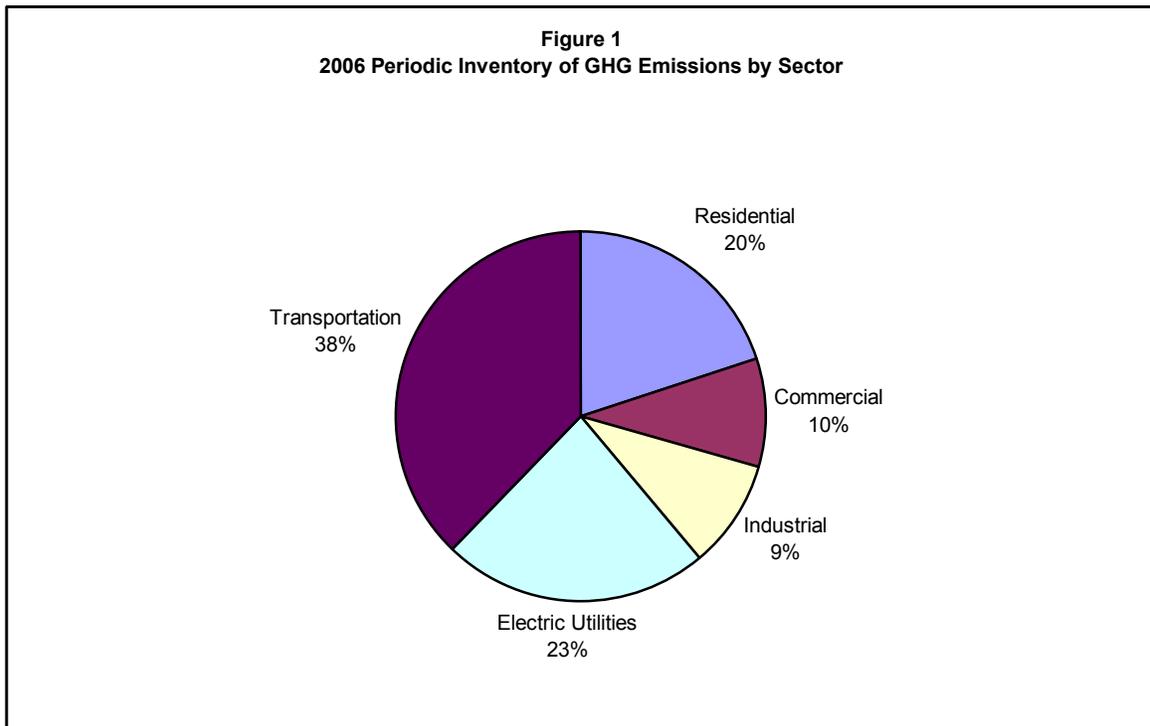
In 2006 the General Assembly adopted Public Act 06-161, which required the Departments of Environmental Protection (DEP) and Motor Vehicles (DMV) to develop a clean car labeling program and also required the DEP, in consultation with the GSC, to conduct a study to determine the motor vehicle GHG reductions necessary to meet the goals established by the NEG/ECP and the General Assembly. The General Assembly directed the DEP to include its findings, accompanied by any recommended legislative revisions, in its 2007 climate change report required by Conn. Gen. Stat. Section 22a-200a(d). The General Assembly provided no additional resources for this report.

¹ The GSC includes the Commissioners of the Departments of Public Utility Control, Transportation, Environmental Protection, Administrative Services, the Secretary of the Office of Policy and Management and the Chair of the Clean Energy Fund.

Background

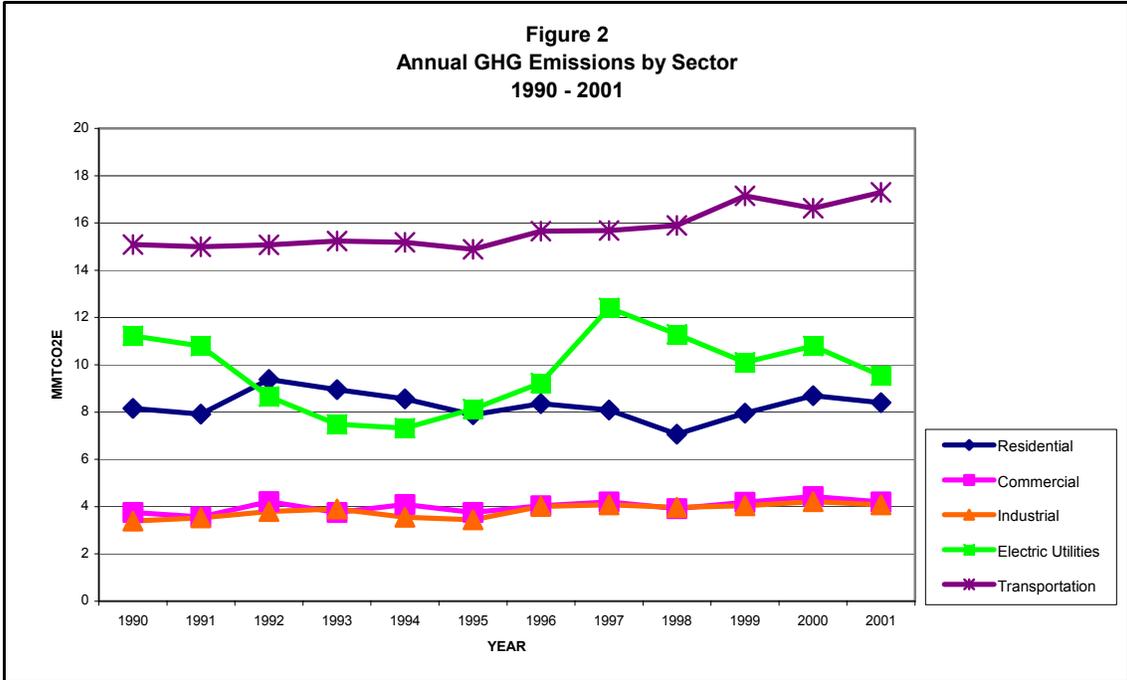
In accordance with Conn. Gen. Stat. Section 22a-200b(f) the Connecticut DEP prepared a comprehensive inventory of GHG emissions in Connecticut, including estimates of the quantity of such emissions for the last three years in which data is available².

The 2006 GHG inventory uses a division of activities by sector paralleling the sectors identified in the CCAP 2005: Transportation; Electric Utilities (emissions from generation); Residential (fossil fuel combustion for heat); Commercial; and Industrial (Figure 1).



Most sectors show an increasing trend of GHG emissions over the period of 1990 through 2001 (Figure 2). Transportation emissions show the strongest upward trend and also comprise the largest portion of the overall statewide GHG emissions by sector. Unlike the Electric Utility Sector, where GHG emissions are influenced by multiple fuel sources used to produce power, in multiple states, Transportation Sector emissions are directly related to the amount of motor fuel consumed within the state.

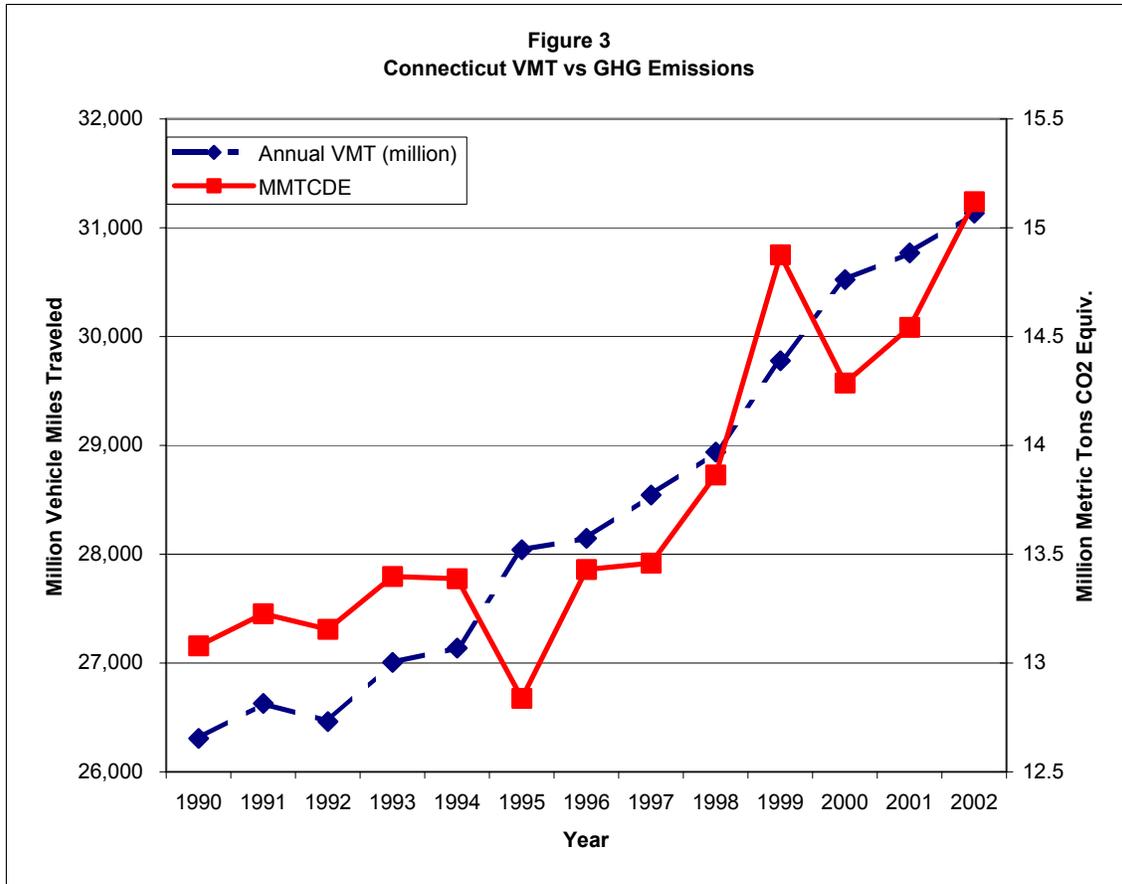
² This analysis is based on data collected between 1990 and 2001. The analysis was performed on data beginning in 1990 and is based on the GHG Inventory Tool provided by the United States Environmental Protection Agency (EPA), with the inclusion of additional data and adjustments performed by the Northeast States for Coordinated Air Use Management (NESCAUM)



Throughout the 1990s, the Transportation Sector accounted for an average of 34% percent of annual GHG emissions. Primary energy consumption in the Residential Sector accounted for an average 18 percent of annual GHG emissions, while energy consumption in the Industrial Sector and Commercial Sector each contributed 7 to 10 percent, respectively. Year to year fluctuations occurred in the Electric Utility Sector, whose contribution to annual GHG emissions varied from about 18 percent to 30 percent, with an average of 22 percent.

Motor Vehicle Related GHG Emissions

Motor vehicle GHG emissions are primarily a function of the amount of carbon in the vehicle’s fuel and the amount of fuel consumed by the vehicle. The amount of fuel consumed is a function of average vehicle efficiency and vehicle utilization, referred to as vehicle miles traveled (VMT). As Figure 3 demonstrates, motor vehicle GHG emissions track very closely with VMT, indicating that motor vehicle GHG emissions are highly dependent on fuel consumption.



Based on current trends (including development patterns), DEP predicts that both VMT and fuel use will continue to increase. Preliminary correlations of the elevated consumer gasoline prices of mid-2006 indicate that increased fuel prices may act to restrain consumption, but the viability of that effect is dependent on the availability of alternate transportation modes. Along with the regulatory approaches discussed below, greater availability of mass transit and transit-oriented development may also help flatten or slowly reverse our motor vehicle GHG emissions.

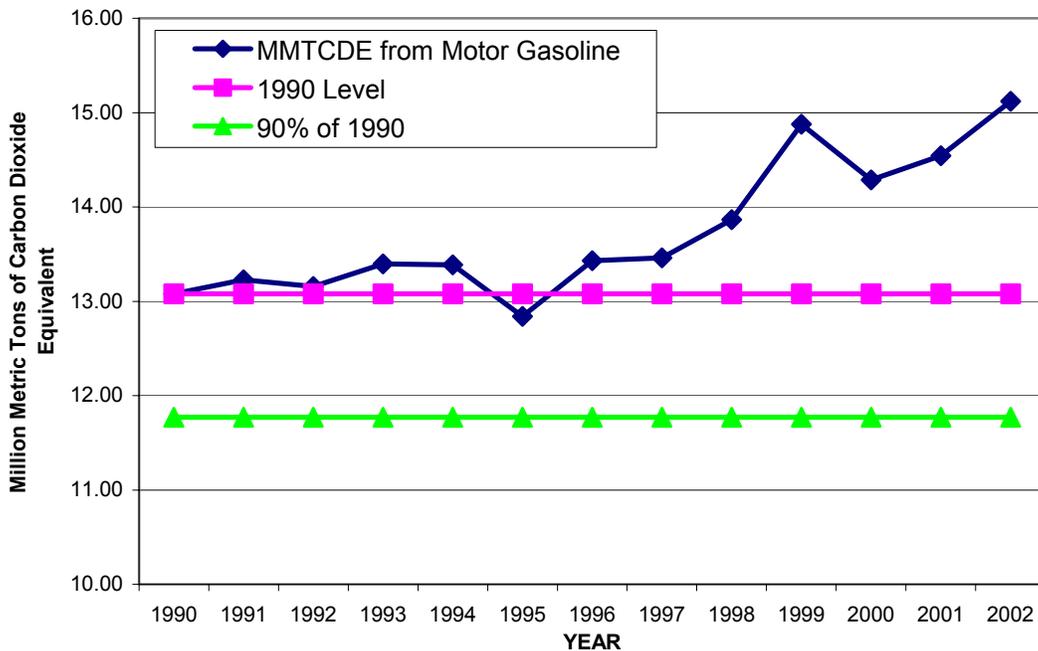
Motor Vehicle GHG Reduction Efforts

Connecticut has done much more than any other state or the federal government to reduce transportation-related GHG emissions, but we still face significant challenges. Absent dramatic changes in Connecticut’s development patterns, transit use, or vehicle/fuel technology, it is unlikely that transportation GHG emissions will be reduced to levels that meet our established goals.

The 1990 baseline for motor gasoline related GHG is estimated at 13 million metric tons of Carbon Dioxide Equivalent (MMTCDE), based on the EPA GHG Inventory tool (Figure 4). With a 2002 level of over 15 MMTCDE the reduction

necessary would be approximately 14%, or 2 MMTCDE. This reduction may be equated to related to 2006, the reductions are likely to be in the range of 20%, or 3 MMTCDE, to achieve 1990 emissions levels. The reduction can be equated to reducing VMT by 20%, reducing fuel consumption by 20%, or offsetting 20% of our current fossil fuel consumption with zero-emission alternatives. Even if such changes were to occur, it remains unlikely, due to significant lead times inherent in improving our transportation infrastructure or bringing new vehicle technology to market in significant quantities, that the resulting GHG emission reductions would be achieved within the desired timeframe (1990 levels by the year 2010).

Figure 4
Emissions from Gasoline use in Motor Vehicles



Regulatory Approaches

The DEP has a number of regulatory approaches both under development and in place that will have the effect of reducing motor vehicle GHG emissions.

Programs now in place include:

- California Low Emission Vehicle II standards: commencing with 2008 model year passenger cars and light duty trucks sold in Connecticut will reduce GHG emissions by 2-3% upon full implementation in 2020.
- California Low Emission Vehicle II GHG emission standards commencing with 2009 model year passenger cars, light duty trucks and medium duty vehicles sold in Connecticut will reduce GHG emissions by up to 30% upon full implementation in 2025.

- State sales tax incentives to promote the purchase of hybrid electric vehicles.
- Use of gasoline blended with 10% ethanol in Connecticut displaced 165 million gallons of gasoline last year. It is generally accepted that a gallon of ethanol produces up to 20% less GHG emissions than a gallon of gasoline resulting in a reduction of almost 293,000 tons of GHG. This is the carbon equivalent to removing over 33,000 cars from Connecticut's highways.
- Along with the federally mandated ultra-low sulfur (15ppm) diesel (ULSD) standard, Connecticut has aggressively implemented a Clean Diesel Program to promote the installation of emissions control devices to reduce the particulate matter and black carbon emissions both voluntarily and as a compliance option in its Indirect Source Permit program.
- Connecticut has been on the forefront nationally to adopt emissions control technologies and to implement the use of ULSD as a way to reduce diesel black carbon emissions on transit vehicles, maintenance vehicles, and construction equipment. DEP also continues to pursue the use of ULSD as a heating fuel for the same reasons.
- A Clean Car labeling program is being developed pursuant to Public Act 06-161 that will better inform consumers as to the GHG impacts associated with their vehicle choices. It is hoped that this information will inform purchasing decisions and result in consumers' consideration of vehicles, within their chosen class, that produce the fewest GHG emissions. Public Act 06-161 includes resources for post-purchase consumer research to determine whether the program impacted final purchasing decisions thereby yielding real GHG emission reductions. Furthermore, consumer choice will eventually drive manufacturing decisions which may lead to the manufacture of vehicles with lower GHG emissions.

Department of Transportation Initiatives:

The Connecticut Department of Transportation's (DOT) implementation of Public Act 06-136, An Act Concerning the Roadmap for Connecticut's Economic Future, is expected to have many GHG emissions reductions co-benefits:

- The restoration of commuter rail service between New Haven and Springfield MA, which will include shuttle bus service to Bradley International Airport.
- The construction of and maintenance of the New Britain to Hartford Busway.
- Efforts to enhance ridership along the Shore Line East (SLE), Branch Lines and the New Haven to Springfield rail lines by rehabilitating rail

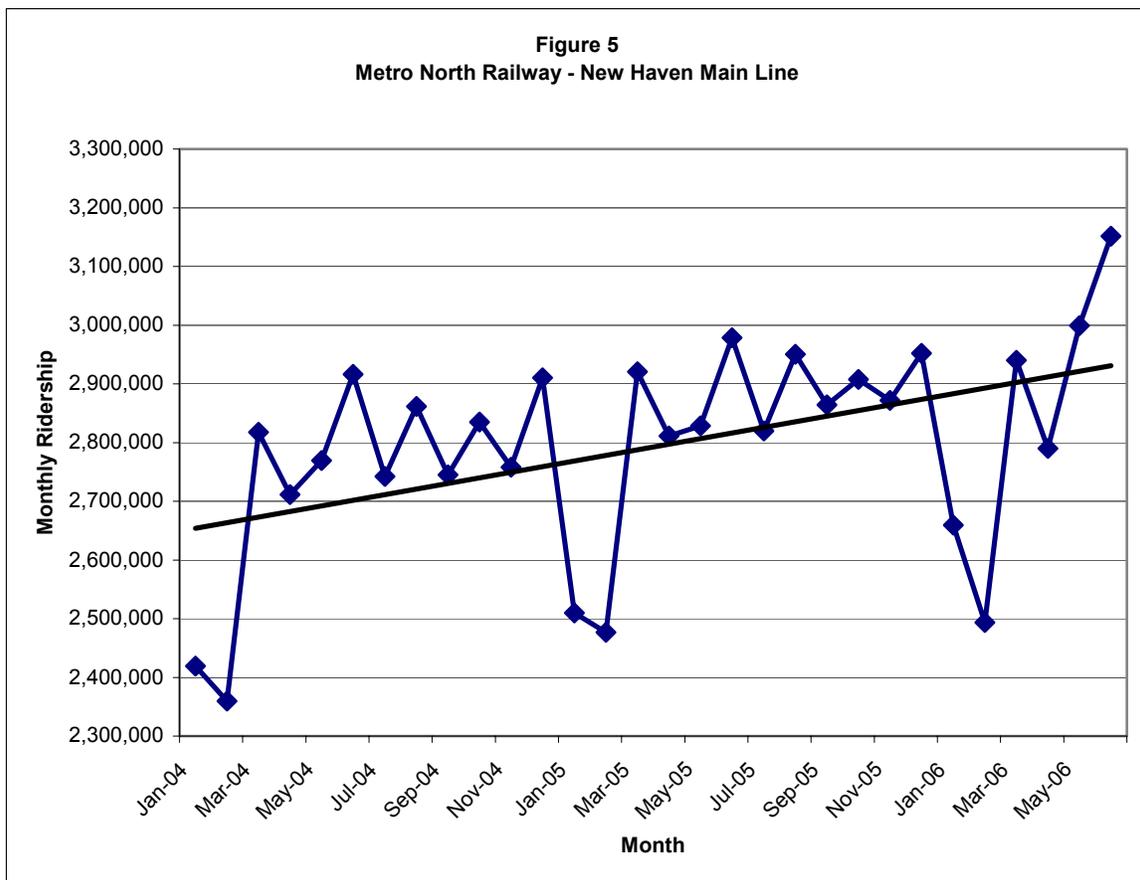
passenger coaches.

- Enhancing access to commuter rail with the addition of a rail station between New Haven and Milford.
- Making capital improvements to the Danbury, Waterbury and New Cannan Branch Lines.
- Making improvements to parking and rail stations to encourage increased ridership on NHL, SLE and Branch Lines.
- Completing the Norwich transportation hub.
- Implementation of a freight rail link to the port of New Haven.
- Consideration of Rail links to other ports.
- Consideration of developing a second rail passenger station between New Haven and Milford.
- Planning to study an Old Saybrook to Hartford Commuter Rail for inclusion with a possible expansion of Route 9.
- Identifying obstacles to improve rail service on SLE (i.e. increase frequency, reverse commute service, weekend operations).
- Implementing a rail station and parking initiative and to include 4 SLE stations east of New Haven.
- Initiate discussions between New York, Massachusetts and Rhode Island on how to enhance rail commuter or freight service.
- Undertake a feasibility study to consider fuel cell power station for New Haven Line.
- Assess and develop plan to study transportation and mobility needs of residents and businesses of Eastern CT.
- Assess and develop a plan to provide commuter rail service between New London and Worcester, MA.
- Perform additional transportation improvement projects:
 - Rail Maintenance Facilities
 - Commuter Lot – Rehab and Expansion
 - Rail station Rehab/Platform Extensions & Amenities
- Consider allowing earlier authorization of bond funds for purchase of rail cars and rail maintenance facilities.
- Consider utilization of Urban Action Bond funds for transit-orientated projects.

Transit Options

Connecticut Mass Transit programs continue to be successful in areas where they provide an alternative to congested highways and main arteries. The Metro North railway has shown increasing ridership (Figure 5) and is currently nearing peak capacity. It parallels the Interstate 95 corridor linking the Connecticut shoreline communities to each other and to Westchester County and the New York City region.

Municipal bus routes in Connecticut's cities provide a reliable alternative to commuting by car, and are economical targets for alternative fuels and alternative technology. In September 2006 the Hartford Transit System announced that it is investing in a hydrogen fuel cell powered bus, providing a zero-emission transportation option to the public.



Commuting options

The primary mode of commuting in Connecticut is the automobile, and many automobile commuters drive alone. Commuters in Connecticut have several options at their disposal. Rail and Bus service is available in most urban regions, with some extension into the surrounding suburbs. Integration with short-haul transit and parking options is one way in which their desirability can be enhanced. Ride sharing services are available to assist commuters in finding fellow commuters with similar routes and schedules. The Easy Street program provides vanpool services including vanpool vehicle ownership incentives. Other programs, such as telecommuting, flexible, or compacted work schedules, could reduce the number of vehicles/commuters on the road. The commuting options benefits include: reducing commuter congestion, reducing GHG Emissions, and helping to improve air quality.

Conclusions

Connecticut has several opportunities to gain ground on GHG reduction goals in the Transportation Sector. The existence of highly successful mass transit systems provides a template for expansion of other systems and construction of new ones. The state's existing technology, industrial, and utility infrastructure is robust enough to develop and implement transportation and fuel alternatives. Further developing the Governor's responsible growth initiatives will also reduce GHG emissions. With the direction provided by the 2006 Governor's Energy Plan, the Governor's Steering Committee on Climate Change, and the combined efforts of State, Federal and Citizen groups, Connecticut can make progress towards meeting established goals. However, our ability to directly control or regulate transportation related GHG emissions is severely constrained by federal law. Meeting our long-term GHG emission reduction targets from the Transportation Sector will require the involvement of the federal government.