

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.

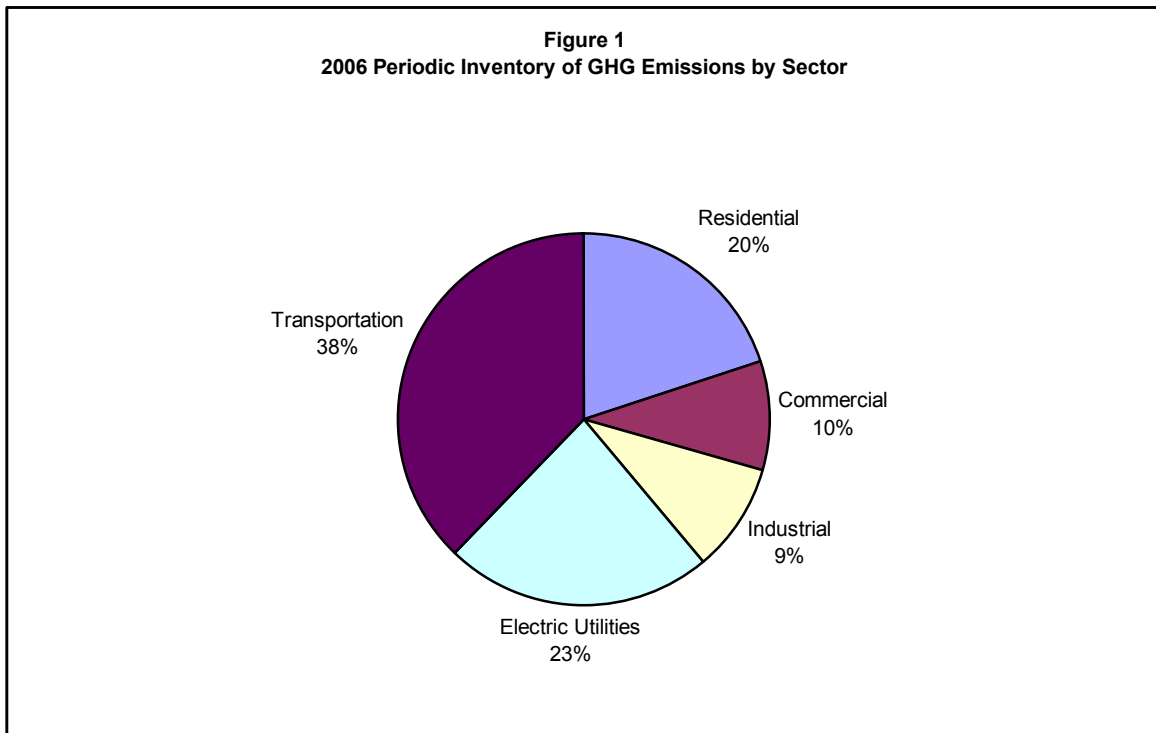
In 2006 the General Assembly adopted Public Act 06-161, which required the Departments of Environmental Protection (DEP) and Motor Vehicles (DMV) to develop a clean car labeling program and also required the DEP, in consultation with the GSC, to conduct a study to determine the motor vehicle GHG reductions 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

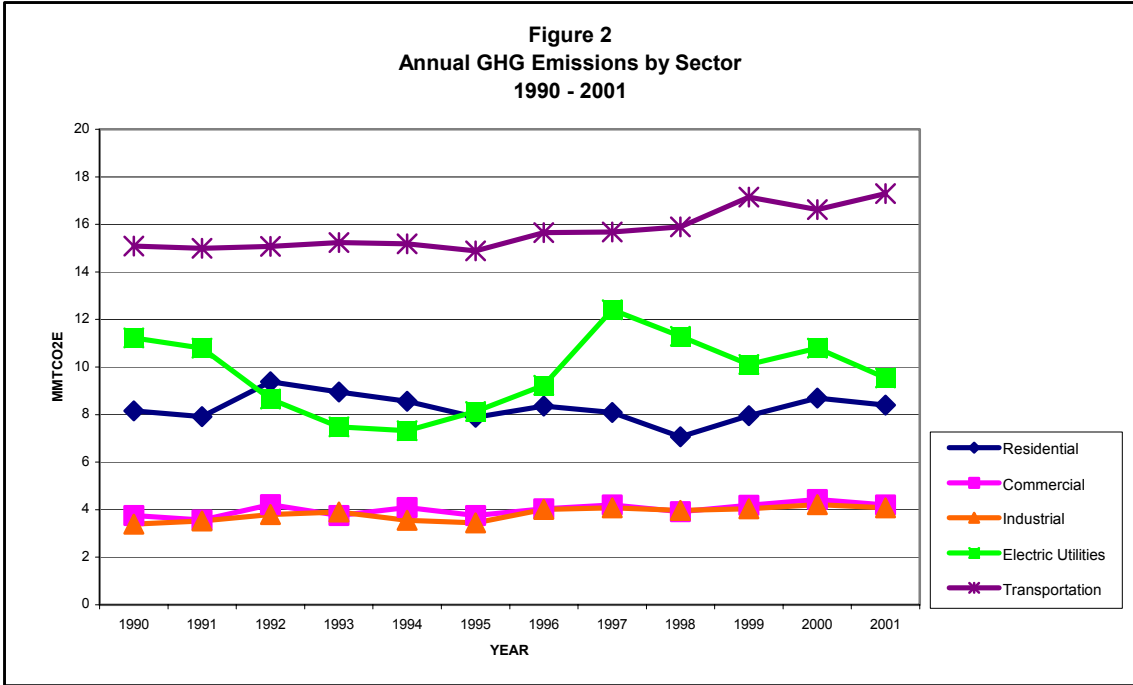
In accordance with Conn. Gen. Stat. Section 22a-200b(f) the Connecticut DEP prepared a comprehensive inventory of GHG emissions in Connecticut, including estimates of the quantity of such emissions for the last three years in which data is available².

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.

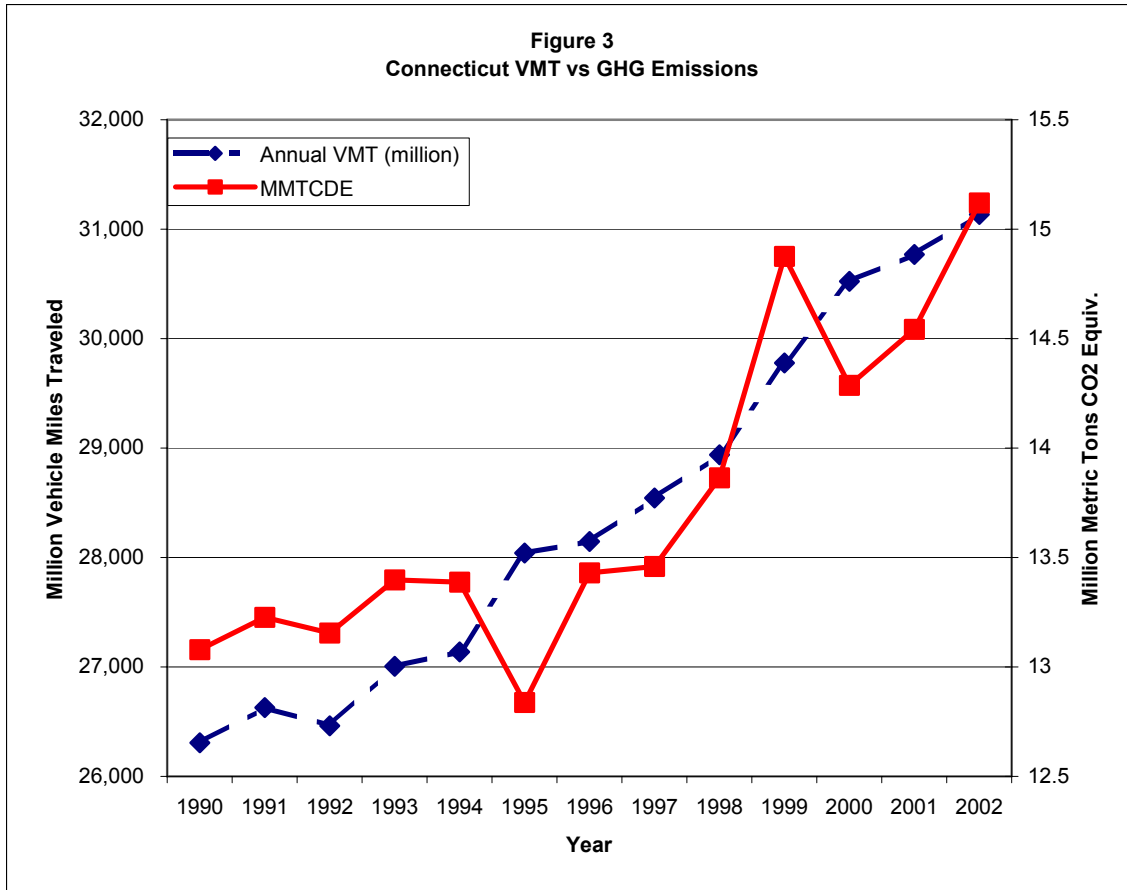
² This analysis is based on data collected between 1990 and 2001. The analysis was performed on data beginning in 1990 and is based on the GHG Inventory Tool provided by the United States Environmental Protection Agency (EPA), with the inclusion of additional data and adjustments performed by the Northeast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

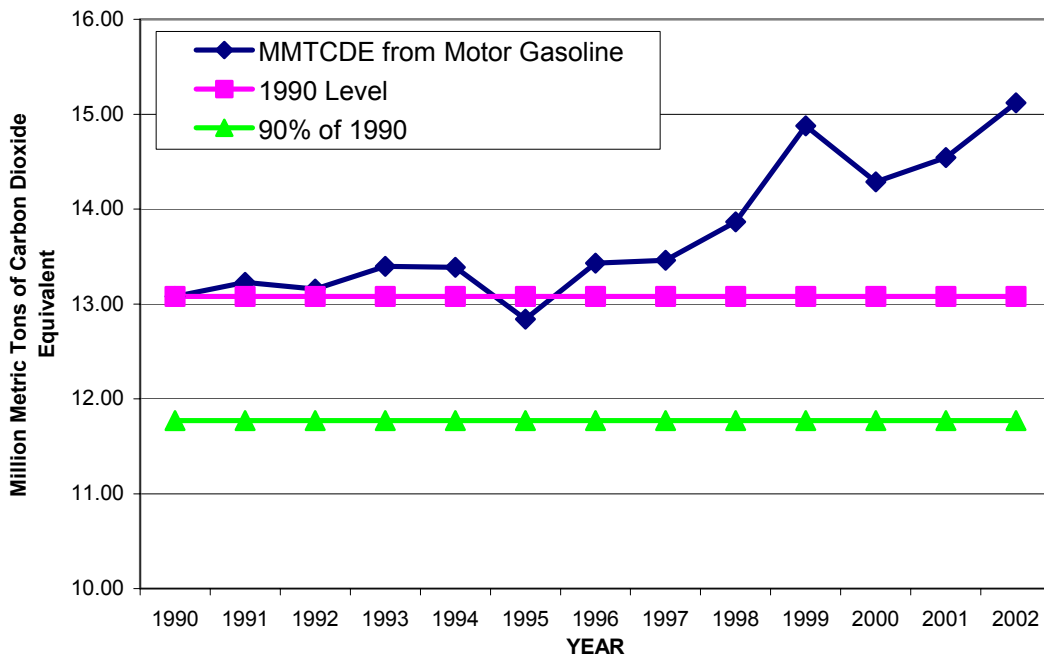
Motor Vehicle GHG Reduction Efforts

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

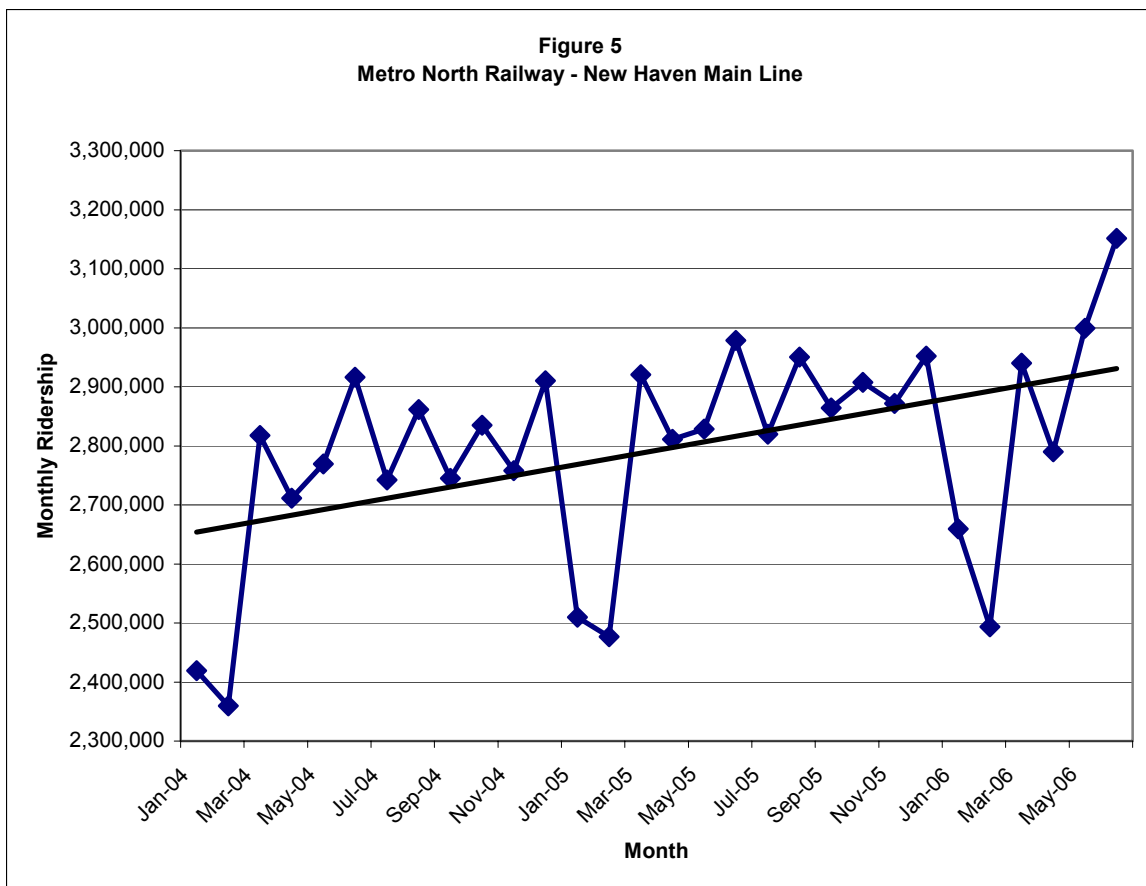
passenger coaches.

- 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.