Testimony of William E. Dornbos

Senior Attorney & Advocacy Director

Acadia Center

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Acadia Center
Advancing the Clean Energy Future

Before the Environment Committee

Honorable Co-Chair Sen. Kennedy, Co-Chairs Sen. Miner and Rep. Demicco, Vice Chairs Sen. Flexer, Sen. Somers, and Rep. Gresko, Ranking Member Rep. Harding, and Committee Members:

Acadia Center appreciates this opportunity to provide written testimony to the Environment Committee regarding S.B. 7, An Act Concerning Climate Change Planning and Resiliency. Acadia Center is a nonprofit research and advocacy organization committed to advancing the clean energy future. Acadia Center is at the forefront of efforts to build clean, low carbon, and consumer-friendly economies.

Senate Bill No. 7, An Act Concerning Climate Change Planning and Resiliency.

Position: Acadia Center supports this bill, with modifications that would ensure that the new 2030 greenhouse gas ("GHG") emissions reduction target is enforceable.

Acadia Center supports Senate Bill No. 7 because it is a key step toward a climate-safe Connecticut. As demonstrated by previous Acadia Center analysis (attached to this testimony), GHG emissions have been increasing in Connecticut since 2012.[1] GHG emissions currently appear to be on track to continue to exceed the existing 2020 reduction target set by the Global Warming Solutions Act,[2] as they have for the past several years, barring sudden acceleration over the next two years in the deployment of energy efficiency and clean energy in our state.

Establishing a 2030 reduction target for GHG emissions of 45% – as S.B. 7 does - will help set a reasonable carbon-reduction path for the long term. This is an important benchmark. Acadia Center recently modeled the energy system to the 45% by 2030 reduction target and found that it would be achievable for Connecticut and the region, as long as energy efficiency and clean energy markets are strengthened beyond existing levels. A full assessment of Connecticut's progress towards a low-carbon 2030 across four major market sectors – electric generation, transportation, grid modernization, and buildings – is attached to this testimony.

Acadia Center supports passage of S.B. 7 and also recommends that it be modified to ensure that the new 2030 GHG emissions reduction target will be enforceable. Current experience with the existing 2020 target under the Global Warming Solutions Act suggests that an unenforceable target, by itself, will not be sufficient to achieve necessary reductions in GHG emissions.

For more information:

William E. Dornbos, Senior Attorney & Advocacy Dir., wdornbos@acadiacenter.org, (860) 2460-7121 ext.202

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[1] *See* Acadia Center, Updated Greenhouse Gas Emissions Inventory for Connecticut: Recent Increases and Underlying Factors (June 13, 2016) (available online: http://acadiacenter.org/wp-content/uploads/2016/06/CT-GHG-Emissions-Inventory-Report-2.pdf).

[2] Based on Acadia Center analysis of most recent GHG emissions data for Connecticut; publication is pending.

Acadia Center | EnergyVision 2030

Connecticut: Pathway to 2030

EnergyVision 2030 describes in detail how seven Northeast states can be on a pathway towards a reliable, consumer-oriented clean energy future that meets a goal to reduce climate pollution at least 45% from 1990 levels by 2030. Reducing climate pollution 45% by 2030 is needed to keep Connecticut on track for an 80% reduction from 2001 levels required by 2050 under the Global Warming Solutions Act. Using a data-driven approach, EnergyVision 2030 sets technology-specific targets in four key clean energy markets—grid modernization, electric generation, buildings, and transportation—and proposes supporting policies to achieve those goals.

Connecticut is achieving respectable middle of the road performance in many areas, but it also significantly trails leading states. The summary tables below detail policies that can be used to reach the clean energy benchmarks presented in EnergyVision 2030. They show Connecticut's current levels of implementation for specific policies and technologies in each of the four key areas compared to the best practice levels needed to meet emissions targets.

While some states like Massachusetts and Rhode Island are clear leaders in individual areas, a more uniform and consistent approach is needed across all Northeast states, including Connecticut. EnergyVision 2030 shows that a goal to reduce greenhouse gas emissions by 45% can be achieved if all states adopt the best practices of each leading state.

Electric Generation

Solar and wind power are emerging as cost-effective alternatives to traditional fossil-fueled generation sources. Across the United States, solar prices have dropped dramatically and installed capacity has grown exponentially. New York and New England have vast untapped solar and on- and off-shore wind resources. Harnessing this clean, low-cost generation is critical to meeting the 2030 emissions target. Connecticut's progress toward this goal is represented below.

Policy	Best Practice Status	Connecticut Current Status	2030 Recommendations
Renewable Portfolio Standard (RPS)	New York – 50% by 2030[1] Rhode Island – 38.5% by 2035	Class I 20% by 2020 and total 28% by 2020	42% by 2030, primarily wind and solar
Distributed Solar Annual Installation Rate	Vermont – 118 watts per capita (2016) Massachusetts – 56 watts per capita (2016)	26 watts per capita (2016)	48 watts per capita through 2030

Transportation

Transportation is the largest source of emissions in the Northeast and traditionally the most difficult emissions sector to address, but rapidly evolving technology offers deep reduction potential. Electric vehicles (EVs) and innovations in mobility options can help improve transportation efficiency and reduce emissions. In cities and towns of all sizes and in the state's more rural areas, increased transit options like buses, trains, and carpools can grow. See how much Connecticut needs to do in this area to meet emissions targets below.

Policy	Best Practice Status	Connecticut Current Status	2030 Recommendations
EV Sales Annual Growth	Vermont – 42% (average, 2013–2016) Massachusetts – 41% (average, 2013–2016)	38% (average, 2013–2016)	40% annually through 2030
EV Incentive Level	Connecticut – up to $3000	Up to $3000 ($5000 for fuel cell vehicles)	Market levels needed to achieve growth targets
Stable Funding Source?	Colorado – $5000	No	Yes
California ZEV Standard Adoption	Several states have adopted	Yes	Yes
EV Chargers			
DC Fast Chargers per 1000 Miles of Highway	Massachusetts – 17	9	
L2 Chargers per Billion VMT	Vermont – 18	9	
EV Charging Rate/Demand Management Program	New York – EV time of use rates and demand management program pilots	Limited – Utilities offer opt-in whole-house time of use rates	Easy to understand time-varying rates for energy supply, transmission and distribution
Annual Transit Trips per Capita (Buses, Trains, and Subways)	New York – 195	12	
Percentage of Workers 16+ Carpooling	Maine – 10.6%	8.3%	
Emissions Pricing for Transportation Fuel	California – $13/ton	No	Yes – market-based price

Grid Modernization

To take full advantage of opportunities to benefit consumers and advance emissions-reducing technologies, the rules and regulations governing the electric grid need to be comprehensively updated. The present grid was designed at a time when centralized power generators exclusively controlled a one-way flow of electricity to consumers. A modern grid needs to accommodate greater consumer control and two-way flows of power. Grid modernization will provide the backbone that supports the carbon-cutting changes in all sectors. See how grid modernization processes in Connecticut are progressing below.

Policy	Best Practice Status	Connecticut Current Status
Distribution System Planning to Consider Clean Local Alternatives to Infrastructure	Rhode Island – System Reliability Procurement Plan and Power Sector Transformation New York – Reforming the Energy Vision (REV) proceeding Vermont – Renewable Energy, Efficiency, Transmission, and Vermont's Energy Future Act	No
Regulatory Proceeding or Other Process Underway to Align Utility Business Models	New York – REV proceeding Rhode Island – Power Sector Transformation	No
Regulatory Proceeding Underway to Modernize Grid	New York – REV proceeding Rhode Island – Power Sector Transformation	Limited: Small number of utility-proposed pilot projects.
Consumer-Friendly Rate Design **Limited Reliance on Fixed Charges** **Easy to Understand Time-Varying Rates for Energy Supply, Transmission and Distribution (T&D)**	Several states have utilities with residential fixed charges in the $5 to $10 range Green Mountain Power (VT) offers three options for highly differentiated bundled residential rates. Several New York utilities offer residential rates with differentiated energy and transmission/distribution components. United Illuminating (CT) offers a residential rate with differentiated transmission and energy components.	**Fixed Charges** UI: $10.04 Eversource: $19.25 (Active rate case could modify this) Statute limiting costs that can be included in fixed charge. **Time-Varying Rates** UI: Supply and transmission Eversource: Supply
Shared Solar or Virtual Net Metering	New York, Massachusetts, and Vermont	Limited shared solar pilots; VNM capped at low amount.
Distributed Generation Compensation	Monetary crediting, with initial reforms to align credit structures with value	Retail rate up to net-zero production in a year. Production in excess of this compensated at the average wholesale price.
Storage Mandate	California – 1325 MW by 2020	No

Buildings

Buildings offer significant energy efficiency investment opportunities that can be combined with clean heating technologies to provide deep emissions reductions. The Northeast is a national leader in investing in energy efficiency. Massachusetts filled a record 3.3% of its electricity needs with cost effective energy efficiency installed in 2016 alone, more than double Connecticut. Recent legislative budget sweeps of efficiency funding will cause Connecticut to fall farther behind in the next two years. Not only is efficiency the lowest cost and cleanest energy choice, it provides enormous economic gains, creates jobs, and saves consumers money. Increasing investments in efficiency has made nearly $500 million of expensive transmission line upgrades no longer necessary in New England. More information about current efficiency efforts in Connecticut below.

Policy	Best Practice Status	Connecticut Current Status	2030 Recommendations
Electric Energy Efficiency Annual Savings Level	Massachusetts – 2.9% (2017 plan)	1.4% (2017 plan) [2]	3.0% [3]
Natural Gas Energy Efficiency Annual Savings Level	Massachusetts – 1.2% (2016)	0.7% (2016)	1.2%
Residential Heat Pump Conversion Rate	Maine – 0.8% (2016)	0.1% (2015)	1.0% through 2030
Fossil Fuel or Carbon-based Incentive Funding for Heat Pumps	Massachusetts – MassCEC's $30 million Clean Heating and Cooling program	No	Yes

Conclusion

Connecticut's progress toward a clean energy future has been mixed so far. To build a low-carbon energy system, the state must excel across all policy areas. To reach EnergyVision 2030 goals, the state should strengthen efforts to modernize the grid through current regulatory proceedings and proposed legislation; expand the Renewable Portfolio Standard; avoid creating new barriers to adoption of solar PV; adopt all cost-effective energy efficiency savings levels; avoid new investments in fossil fuel infrastructure; increase support for switching to heat pumps; and continue to incentivize and remove barriers to purchasing and using electric vehicles. If Connecticut follows these policy recommendations, it will be on its way to a clean energy future.

References

1 Eligible resources vary by state. New York's Clean Energy Standard includes large-scale hydro, which is not included in the EnergyVision 2030 recommended minimum target.

2 Connecticut's energy efficiency programs suffered a setback in 2017 when the General Assembly diverted $127 million in future energy efficiency funds and additional RGGI funds for unrelated budget purposes. This will likely reduce annual savings in 2018 and 2019 to levels below 1.0%.

3 EnergyVision 2030 calls for an average of 2.5% annual electric savings through 2030. Because Massachusetts and other states have demonstrated that savings of 3% or more are currently achievable and lower total electric costs, Acadia Center is currently recommending that states aim for higher near-term levels.

acadiacenter.org • info@acadiacenter.org

Boston, MA 617-742-0054 • **Hartford, CT** 860-246-7121 • **New York, NY** 212-256-1535
Providence, RI 401-276-0600 • **Rockport, ME** 207-236-6470

Acadia Center

Updated Greenhouse Gas Emissions Inventory for Connecticut

Recent Increases and Underlying Factors

June 13, 2016

Acadia Center

Advancing the Clean Energy Future

Introduction

Connecticut's climate and energy policymaking is at a critical juncture. With both the Governor's Council on Climate Change and the 2016 Comprehensive Energy Strategy aiming for final recommendations by the end of this year, Connecticut will be making crucial decisions in the next six months that will set the state's primary direction on climate and energy issues for years to come – with potentially lasting consequences for the state's economy, public health, and the environment.

This unique policymaking moment also has legal significance; the first mandatory greenhouse gas (GHG) emissions cap established by Connecticut's Global Warming Solutions Act – a 10% reduction from 1990 levels by 2020[1] – is only three and a half years out. With so much at stake, it is imperative that Connecticut's upcoming policy decisions are grounded in the latest data and analysis on GHG emissions and trends.

Analysis

Toward that end, Acadia Center constructed an updated GHG emissions inventory for Connecticut from 1990 through 2015 using the best available data from public sources.[2] The inventory's methodology matches the approach to be taken by Connecticut in future GHG emissions reporting. The Governor's Council on Climate Change has recently indicated that the state will switch from a traditional inventory approach – one where only GHG emissions produced within the state are counted – to a hybrid approach that estimates the total GHG emissions caused by the electricity consumed in the state.[3]

Acadia Center supports this decision. The hybrid approach can provide a more accurate sense of Connecticut's actual GHG emissions footprint and should therefore better inform and shape policy solutions. Figure 1, below, shows the results of Acadia Center's updated inventory for Connecticut.

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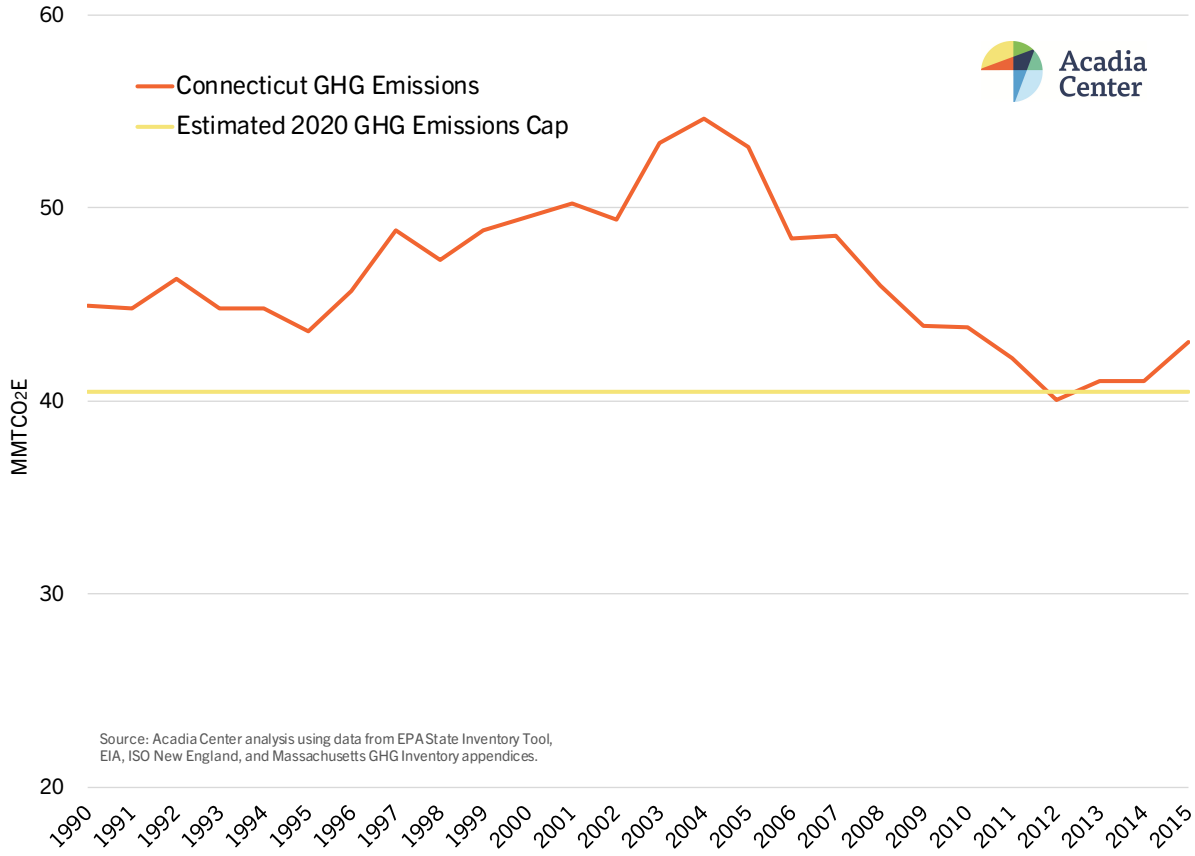
[1] *See* Public Act 08-98, An Act Concerning Connecticut Global Warming Solutions, §2(a)(1) ("The state shall reduce the level of emissions of greenhouse gas…[n]ot later than January 1, 2020, to a level at least ten percent below the level emitted in 1990").

[2] Acadia Center has published multiple GHG emissions inventories for Connecticut beginning in 2003. The most recent used a traditional inventory approach through 2014. This analysis is an update using a hybrid approach and 2015 data.

[3] *See* GC3 Exploratory Report, pp. 33-34.

Figure 1 – Connecticut GHG Emissions Inventory, 1990-2015



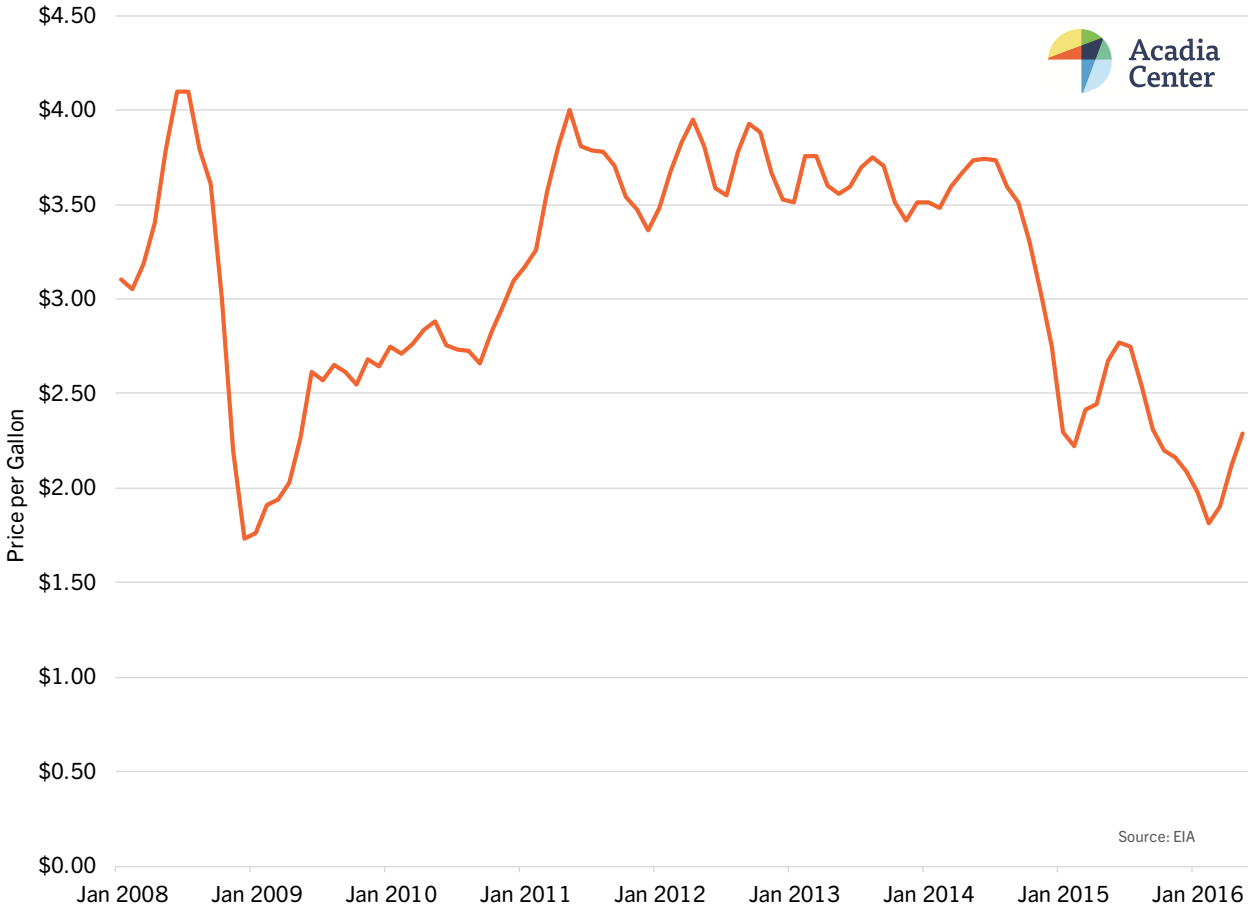
Non-electric sector data for 2013 and earlier is based on the U.S. Environmental Protection Agency's State Inventory Tool.[4] 2014 was estimated using available preliminary, but largely complete, data. 2015 was estimated using partial and some preliminary data. Electric sector emissions are based on Connecticut's consumption share of electricity produced in the region and imported into the region.[5] An estimate of the 2020 emissions cap set by the Global Warming Solutions Act – 10% less than 1990 emissions – was calculated using the hybrid inventory approach. Connecticut has not yet officially calculated and set the 2020 cap using this new approach, nor has a public proceeding been initiated to do so at this time.

Discussion

The analysis results show a clear trend of GHG emissions increasing since the 2012 low. This trend is probably not unique to Connecticut or unexpected. Connecticut's most recent GHG emissions forecast for 2013 and beyond predicts a similar near-term trajectory.[6] Year over year changes in emissions can be attributed to many factors – fuel prices, the economy, and weather, to name a few. Prices for oil and natural gas have dropped significantly in recent years, as demonstrated in Figure 2 below, and are likely large contributors to this trend.

[4] The State Inventory Tool is available online: https://www.epa.gov/statelocalclimate/state-inventory-and-projection-tool.
[5] Differences in New England state Regional Portfolio Standards were not included in this analysis.
[6] *See* GC3 Exploratory Report, p. 35, Figure 7.

Figure 2 – New England Retail Price for Regular Gasoline



The dramatic drop in gasoline prices has likely resulted in increasing consumption both from more driving, Figure 3 below, and a shift away from more efficient vehicles by consumers, Figure 4 below. Increased consumption of gasoline and diesel fuel leads to corresponding increases in GHG emissions from the transportation sector.

Figure 3 – Vehicle Miles Traveled in Connecticut

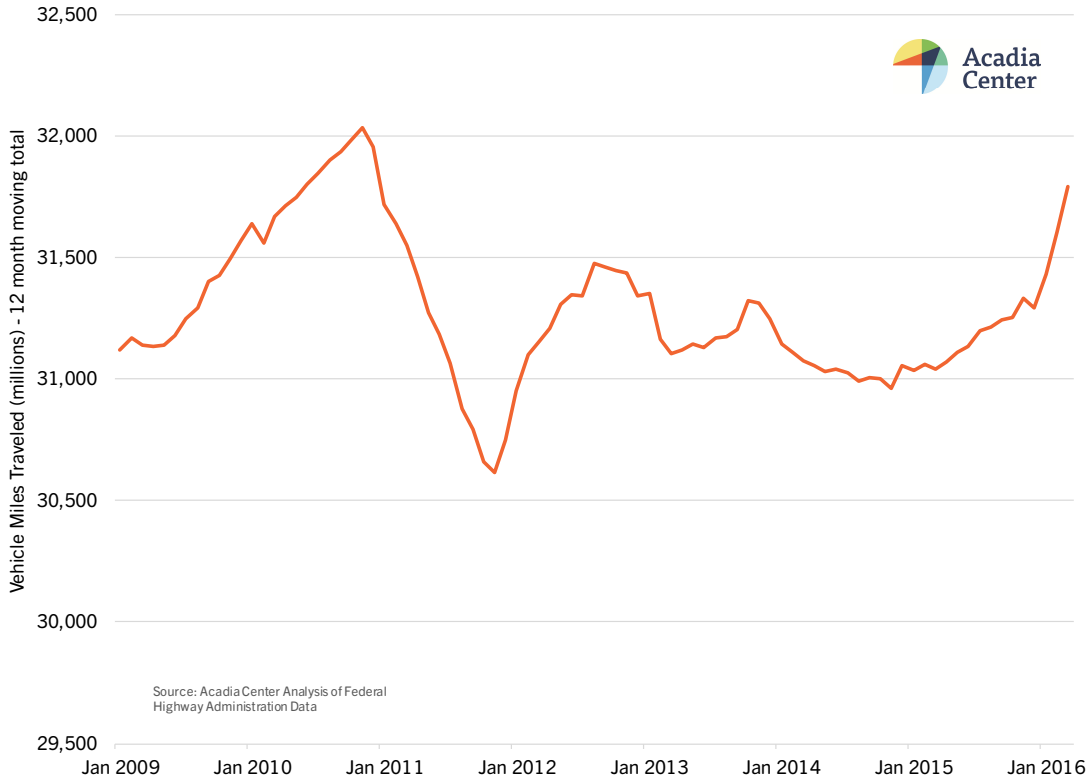
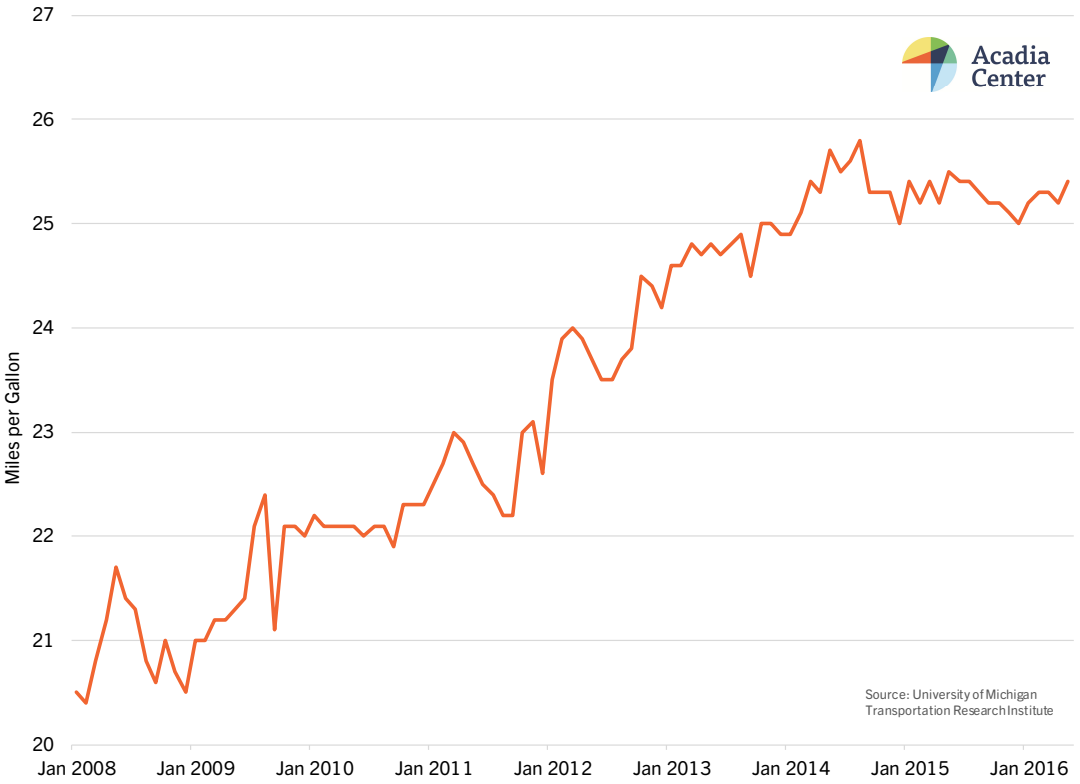
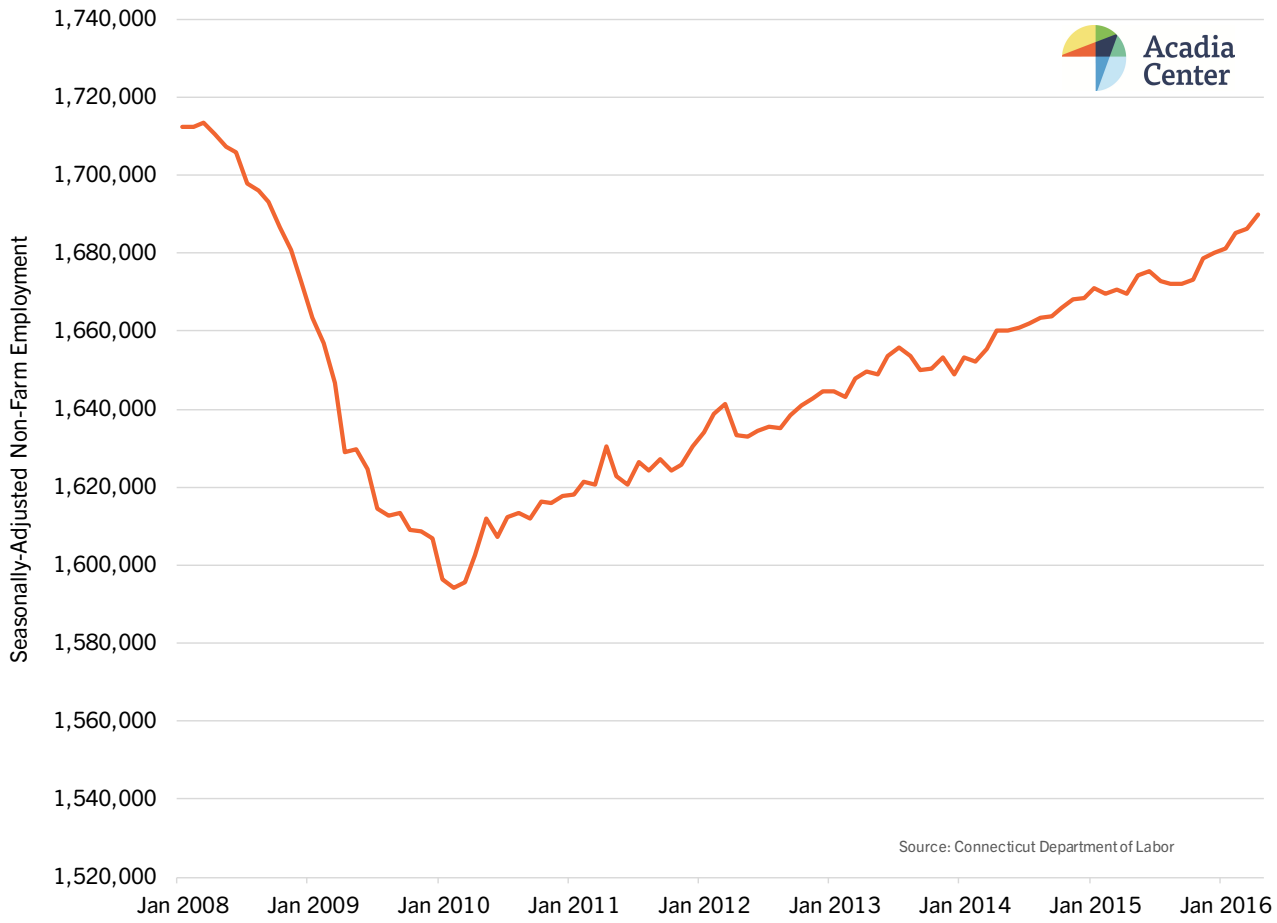


Figure 4 – Average MPG Rating of New Car Purchases in the United States



Connecticut's economy has also continued to improve in the past few years, Figure 5 below, resulting in more economic activity, job growth, and associated energy use. While the growth of clean energy and reduced energy waste in the region mean that emissions are no longer as directly tied to economic output as in the past, changes in economic activity can still be a contributing factor to changes in emissions.

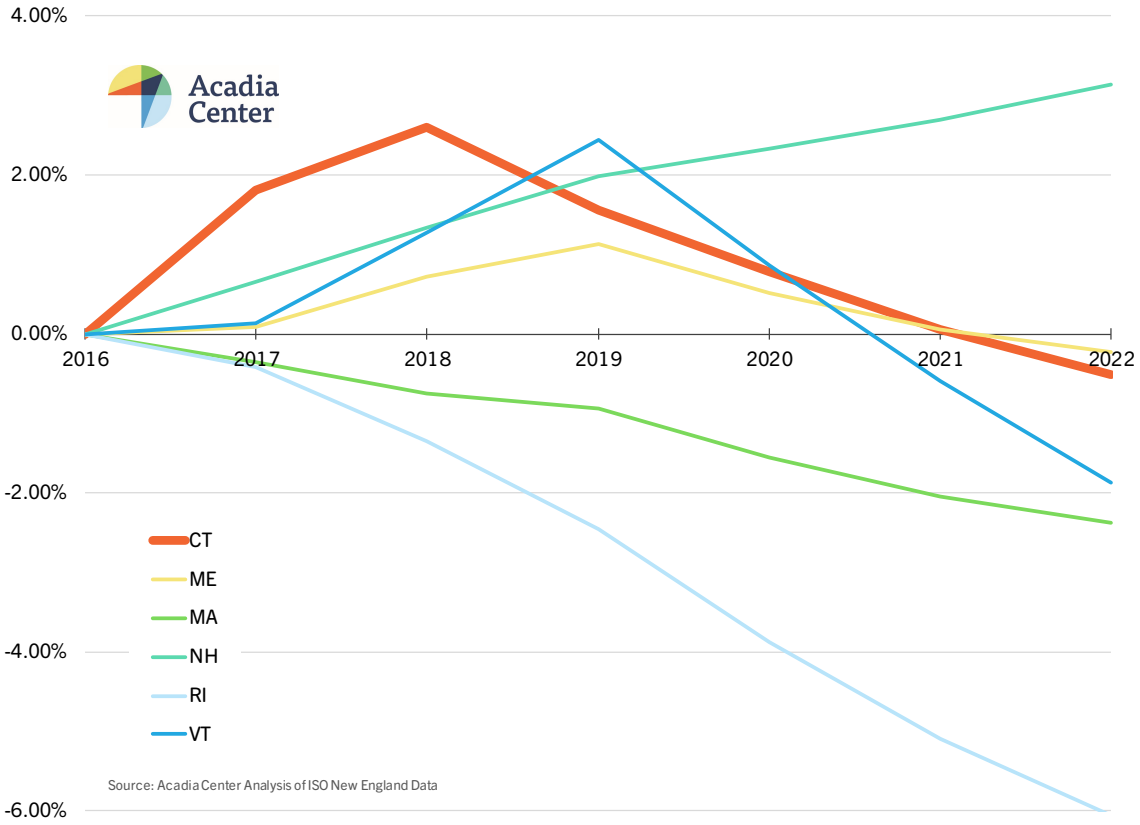
Figure 5 – Seasonally-Adjusted Employment in Connecticut



In addition to factors outside of Connecticut's control, other factors within its control – such as policy development and implementation – also have likely contributed to the recent increase in emissions. Figure 6 below shows how Connecticut's share of the region's electricity consumption is not forecast to decline as quickly as other states in the region, particularly Massachusetts, Rhode Island, and Vermont.

The New England states with bigger reductions in electric load have all implemented more aggressive energy efficiency and/or solar PV deployment policies than Connecticut has in recent years. This means Connecticut will be taking on an increasing share of the region's GHG emissions from electricity consumption over time, which then negatively impacts its carbon profile.

Figure 6 - ISO New England Forecast - Change in Electric Consumption from 2016



Conclusion

The market, economic, and policy factors identified here have all likely contributed to the growth of GHG emissions in Connecticut over the past three years. Many of the identified factors in the 2013 to 2015 timeframe are persisting into 2016. While it is too soon to predict with certainty whether Connecticut will meet its mandatory 2020 GHG emissions cap, implementing additional short term mitigation measures will increase the likelihood of doing so.

Short-term emissions reduction options are available to Connecticut. The most promising opportunities are likely in energy efficiency, distributed solar PV, and electric vehicles. Connecticut has made good progress on each of these options and thus has in place existing programs that could be ratcheted up quickly to enable significant reductions in GHG emissions in the three and a half years leading up to the 2020 emissions cap.

We look forward to working with Connecticut and other stakeholders to explore how the next Comprehensive Energy Strategy and the Governor's Council on Climate Change's final findings can address the need for a strong and effective mitigation effort – not only in the near term, but also for the long term and the state's crucial 2050 GHG emissions target.

For more information:

Jamie Howland, Director, Climate and Energy Analysis Center, jhowland@acadiacenter.org, 860.246.7121 ext.201

Bill Dornbos, Senior Attorney & Director, Connecticut Office, wdornbos@acadiacenter.org, 860.246.7121 ext. 202