via e-mail - June 16, 2016

Comments of Northeast Energy Efficiency Partnerships (NEEP)
On Connecticut's Draft Comprehensive Energy Strategy

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Dear Ms. Morrell,

On behalf of Northeast Energy Efficiency Partnerships (NEEP)[1], thank you for the opportunity to provide comments relative to the updated Comprehensive Energy Strategy (CES) for the State of Connecticut, as developed by the Department of Energy and Environmental Protection (DEEP). These comments follow the oral testimony we delivered at the May 24 technical meeting in New Britain.

NEEP is a regional non-profit organization that works to accelerate energy efficiency in homes, buildings and industry across the Northeast and Mid-Atlantic states. We are one of six Regional Energy Efficiency Organizations (REEOs), as designated by the U.S. Department of Energy, which works in cooperation with the DOE to provide guidance to states. Our Policy Outreach and Analysis group serves as an information resource for policymakers and program administrators to support the adoption and implementation of public policies and programs that advance the efficient use of energy. As such, our comments address primarily the energy-efficiency related questions posed by DEEP at the technical meeting.

Much to laud, more to do

First, we congratulate Connecticut for its nation-leading energy efficiency efforts and for looking to efficiency as first order resource in the state's energy mix. Both in terms of policies and in programs offered through DEEP and under the EnergizeCT banner, Connecticut has much to be proud of. We also applaud Connecticut's commitment to working regionally on programs and policies. This can lead to cost-efficiencies and better end results. Still, as was acknowledged by DEEP staff at the input session, there is room for improvement — particularly in terms of the level of investments in efficiency, and the fact that the state had never lived up to the promise of all cost-effective efficiency. Per Public Act No. 07-242, An Act Concerning Electricity and Energy Efficiency (2009), Section 51: "Resource needs shall first be met through all available energy efficiency and demand reduction resources that are cost-effective, reliable and feasible."

[1] These comments are offered by NEEP staff and do not necessarily represent the view of the NEEP Board of Directors, sponsors or partners. NEEP is a 501 (c)(3) non-profit organization that does not lobby or litigate.

As you can see in NEEP's recent analysis,[2] at 1.5 percent of retail electric sales and 0.6 percent for retail gas sales, Connecticut trails most of its neighboring states in savings goals. As analysis has proven, on average it costs about two to three times less to meet demand with energy efficiency as opposed to new energy resources.[3]

Support Climate and Environmental Goals

To reflect the state's commitment to addressing climate change and its other environmental objectives, the policies and strategies laid forth in the next Comprehensive Energy Strategy should align with and complement Connecticut's goals relative to greenhouse gas reductions and renewable power generation, as described fully on DEEP's website, under "Connecticut Laws & Executive Orders on Climate."[4] In particular:

Governor's Executive Order 46: Which establishes a new Governor's Council on Climate Change to monitor the state's greenhouse gas emissions and make recommendations to meet the 2050 GWSA target.
Governor's Executive Order 32: Which requires Connecticut to purchase renewable energy in increasing amounts, leading to 100 percent renewable energy by 2050; and,
Public Act 13-298: "An Act Concerning Implementation of Connecticut's Comprehensive Energy Strategy and Various Revisions to the Energy Statutes," which sets forth a framework for development of these Plans.

In addition to remaining a cornerstone of Connecticut's climate and clean energy strategy, energy efficiency is also an important tool for residents, businesses and communities to build resiliency in the face of climate change. Any and all efforts to that end should be closely coordinated with the EnergizeCT programs offered by the regulated gas and electric utilities, which include technical support, expertise, education, incentives and more. This need is particularly acute given a number of community-based climate or clean energy initiatives that have emerged in recent years and that, while well intentioned, may not be coordinated effectively with the EnergizeCT programs or other state efforts, resulting in confusion for community leaders and residents.

Move towards "Next Generation Energy Efficiency"

In our 2016 policy report, *The Regional Roundup,*[5] NEEP describes a number of trends we see as key to harnessing energy efficiency as an integral and integrated part of our clean energy future. At its most basic, we believe Next Generation Energy Efficiency includes:

- Deep and comprehensive cost-effective energy savings for all fuels.
- Controls and other intelligent efficiency technologies; data analytics to maximize savings and optimize building energy performance via systems-level approaches; advanced building designs and cutting-edge installation, operation and maintenance of energy systems.

[2] See NEEP's Policy Snapshot, pg. 5:
http://www.neep.org/sites/default/files/resources/Energy%20Efficiency%20Snapshot%20Spring%202016_FINAL_0.pdf
[3] See ACEEE Study: http://aceee.org/research-report/u1402
[4] http://www.ct.gov/deep/cwp/view.asp?a=4423&q=530290
[5] For more on Next Generation Efficiency, see our recent report: http://www.neep.org/2016-regional-roundup

- Integration of energy efficiency with demand side and distributed resources, including energy storage solutions, combined heat and power (CHP) and electric vehicles (EVs).
- Strategic electrification and geo-targeting to defer or limit the need for further investments in distribution and transmission system assets.
- Engagement and animation of private markets to deliver high efficiency products and solutions.

Also in NEEP's 2016 *Regional Roundup*[6] is our view on what state energy offices, regulators and legislators can do to ensure that their states keep advancing on efforts to capture all cost-effective efficiency and move to Next Generation Energy Efficiency. While Connecticut is already making progress on a number of these areas, we urge DEEP to consider what we see as best practice in energy efficiency policy:

1. **Put consumers at the center of the energy/utility relationship**, thoughtfully integrating new technologies and policies to so that price signals, information and behavior aligns to advance the efficient use of energy.
2. **Via law or regulation, establish binding policy directives for utilities to capture all cost-effective energy efficiency, and provide a regulatory framework to allow for the integration of these programs with other demand side resources,** including demand response, storage, on-site renewable generation, combined heat and power and electric vehicles.
3. **Create utility rate structures aligned with broader public policy goals**, including mitigating the need for new infrastructure, lowering peak and overall energy use, supporting carbon reduction goals, fostering climate resiliency, growing the clean energy economy, and helping consumers save energy and reduce costs.
4. **Ensure adequate, stable, long-term funding for efficiency programs**, with private financing to complement but not supplant ratepayer program funding.
5. **Allow for robust stakeholder input and engagement** — ideally through a standing advisory board with expert consultants — to help states plan, deliver and evaluate methods to achieve long-term savings goals.
6. **Advance policies and programs that promote comprehensive all-fuel strategies,** including building energy and operational savings en route to "zero energy buildings."
7. **Support complementary public policies** such as building energy codes, building energy rating and disclosure, appliance efficiency standards, and state and local governments "leading by example" through progressive energy efficiency strategies in schools and other public buildings.
8. **Integrate energy efficiency into long-range state energy and air quality planning**, and ensure that energy efficiency and other demand resources are fully accounted for and considered equally through robust and comprehensive analyses whenever new infrastructure investments are contemplated.
9. **Foster a flexible regulatory framework to address the opportunities and challenges of new information and communication technologies** and continue supporting transparency and consistency in evaluation, measurement and verification of program savings.

[6] Ibid, page 44

10. **Highlight and share regionally and nationally energy efficiency success stories and learn from best practices** to ensure continued progress in capturing cost-effective efficiency and moving towards Next Generation Energy Efficiency policies and programs.

Focus on Strategic Electrification

The 2013 Comprehensive Energy Strategy contains an extensive examination of fuel switching in the heating and transportation sectors, largely focused on conversions to natural gas.[7] Since publication of the 2013 strategy however, Connecticut has experienced extensive growth in renewable electric supply, as well as concerns over a constrained supply of natural gas.[8] Accordingly, an enhanced focus on strategic electrification—rather than gas conversion—in the transportation and home heating sector may provide a cost-effective option for energy savings, cost savings, and emission reductions. Strategic electrification can create value for a variety of stakeholders, as described in Table 1 below.

Table 1. Benefits of Strategic Electrification by Stakeholder

Benefits of Strategic Electrification	
Stakeholder	**Benefit**
Utilities	**Revenue Stability** – Revenue base expansion due to electrification of the transportation and heating sectors enables opportunities for creating shareholder value while still incentivizing the proliferation of behind-the-meter distributed generation. **Cross-Fuels Energy Efficiency** – After accounting for conversion factors, strategic electrification of the heating and transportation sectors could result in a source of potential claimed savings for energy efficiency program administrators that exceed even the recent revolution in LED lighting.
Ratepayers	**Lower Electric Rates, Lower Overall Energy Bills** – Growing electric energy usage during strategic hours of the day and times of the year will spread fixed capacity costs (MW) over more usage hours (MWhs), resulting in a higher system load factor, improved system efficiency, and lower T&D costs per kWh consumed. Pairing this impact with savings resulting from cross fuels energy efficiency can result in lower overall energy bills across fuels. **Operations and Maintenance** – Heat pumps and other connected devices often have self-commissioning capabilities that can identify required maintenance. Electric vehicles are projected to require far less maintenance than internal combustion vehicles.
Grid Operators	**Load Shifting** – Demand flexibility and insights into the distribution grid provided by connected devices can mitigate challenges associated with integration of high penetrations of variable renewable resources.
Society	**Emission Reduction** – Assuming compliance with state-level mandates for high penetrations of renewable resources, electrification of the transportation and heating sectors would reduce petroleum usage in favor of a low-to-no emission renewable generation.
Vendors	**Market Growth** – Connecting more devices to the electric grid and providing greater visibility into a devices' usage patterns will grow a market for both software and equipment vendors.

[7] 2013 Connecticut Comprehensive Energy Strategy. Pages 119-194. Available at: http://www.ct.gov/deep/lib/deep/energy/cep/2013_ces_final.pdf

[8] Hladky, G. Hartford Courant. "State Ranks 2nd in Region in Solar Jobs, Generating Capacity." February 2016. Available at: http://www.courant.com/news/connecticut/hc-ct-solar-jobs-survey-20160210-story.html; and Serreze, M. MassLive. ISO New England: Natural Gas Pipeline Constraints Threaten Reliability. (January 2016) Available at: http://www.masslive.com/news/index.ssf/2016/01/iso_new_england_natural_gas_pi.html

Several states within the region are beginning to support policies that embrace widespread strategic electrification. Typically, the policy first emerges as part of a state energy plan, with the state's utility regulators or legislature taking actions to determine the details of program implementation. Table 2 describes key states and how they are leveraging strategic electrification to reach their energy and climate goals.

Table 2. Overview of State Actions on Strategic Electrification

State Climate Goals and Action on Strategic Electrification	
Energy and Climate Goals	**Actions to Date On Strategic Electrification**
New York, By 2030: • **600 trillion Btu increase in energy efficiency** • **40% reduction in GHGs below 1990 levels** • **50% of energy generation from renewable sources**	• NY PSC Order Adopting Distribution System Implementation Plans (DSIPs) - "The Supplemental DSIPs also present the opportunity for the utilities to collaborate in the development of initiatives that will have the effect of reducing carbon emissions, including de-carbonizing the transportation system." • Order Adopting a Ratemaking and Utility Revenue Model Policy Framework - "We encourage utilities to propose programs and strategies to enable and facilitate the beneficial conversion of end-uses." • Con Edison's Energy Storage RFI mentions plans to issue an RFI relating to transportation electrification in 2016.
Vermont, By 2025: • **15% reduction in per capita total energy consumption** • **40% reduction in GHGs below 1990 levels (2030)** • **25% of energy generation from renewable sources**	• Vermont's Act 56 established an RPS-type avoided compliance payment framework for "Energy Transformation" projects that distribution utilities must procure, including projects facilitating electrification of the transportation and delivered fuels sector. • Regulatory stakeholders have developed a project planning tool to compare MMbtu savings across energy systems, including transportation and delivered fuels. The savings are screened under the societal cost test.
Rhode Island, By 2035: • **20% reduction in electricity and thermal energy use** • **20% reduction in unregulated fuel use** • **40% reduction in transportation energy use** • **45% overall reduction in GHGs below 2013 levels**	• In comments on the Rhode Island Public Utility Commission's Scoping Solicitation for their "Changing Distribution System" Docket (No. 4600), the Energy Efficiency and Resources Management Council (EERMC) (Comments) and RI Office of Energy Resources (OER) (comments) both pushed extensively for inclusion of all fuels (transportation and heating) within the auspices of the current least cost procurement process. Since filing comments, RI OER Commissioner Marion Gold was appointed to the Public Utility Commission. • The state energy plan and Systems Integration Rhode Island (SIRI) initiative also invoke strategic electrification as a key tenet.

Source: New York, Vermont, and Rhode Island State Energy Plans, Legislation, and Regulatory Filings (Hyperlinked)

We applaud Connecticut's efforts to diversify its transportation and heating fuels in recent years. We also encourage decision-makers to learn from policies being pursued in other states when contemplating the

actions necessary to comply with Connecticut's energy and climate commitments, maximizing the potential for all-fuels energy efficiency.

Building Energy Issues

NEEP commends the utilities and DEEP for their work to advance building energy rating and labeling. Connecticut has some of the most robust data in the region through its Home Energy Score, and we again thank the parties for their involvement and support of the Home Energy Labeling Exchange (HELIX), a project funded by the U.S. DOE that will help catapult the valuation of efficiency in the real estate market. Following are a few other points on buildings:

- **Whole Building Data:** One barrier which still remains for customers with multiple individually metered tenants (such as multifamily, office, retail, and warehouse) is the lack of reasonably accessible whole-building energy data access for the purposes of benchmarking and portfolio energy management. We support efforts by the electric distribution utilities to develop their systems for providing streamlined access for building owners to aggregated whole-building energy data.

- **Schools and Public Buildings** play a critical role in paving the way for zero energy construction in the state. Schools are especially significant because they are often seen as the center of a community at the local level and therefore should be considered as a starting point for the development of zero energy facilities. NEEP recommends the continued support of DEEP's 'Lead By Example' program by creating a plan that puts schools on the pathway to achieving zero energy through the use of NE-CHPS as the means forward[9]. Prioritizing schools in this manner would ensure that all schools are built to the highest standard while incorporating Connecticut's climate, energy code, and educational priorities.

- **Code Adoption**: Updating the state energy code more regularly and to the highest efficiency possible would yield significant energy savings. Connecticut is currently closing in on adoption of the 2012 International Energy Conservation Code (2012 IECC), which should provide a roughly 15 percent boost in energy efficiency for code-built commercial and residential buildings over its previous code. However, this process has taken far longer than that in several states in the region, meaning that the 2012 IECC is now an outdated code – it will likely be *two* versions old by the time it goes into effect in Connecticut. The state stands to forego the opportunity to further improve the efficiency of its code-built commercial buildings by about 8 percent by not adopting the 2015 IECC or even pushing further as Massachusetts has to reflect recent advances in the building industry.

- **Code Compliance**: Connecticut should be commended for its recognition of the importance of verifying energy code compliance as an important opportunity to identify previously untapped sources for energy savings and a means of targeting education and training. DEEP and the utilities will help to ensure energy safety, security, and certainty as well as occupant health, productivity, and comfort by continuing

[9] http://www.neep.org/northeast-collaborative-high-performance-schools-criteria-ne-chps-version-31

to support this process. The state should be encouraged to continue to use a percentage of permitting fees to afford training opportunities for code officials. Rigorous compliance will allow the state to accurately claim energy saving based on building energy code attribution.

Appliance Efficiency Standards

DEEP is one of only *two* states in the country with administrative authority to set its own **appliance efficiency standards**. We urge the Department to use its authority and not only investigate opportunities for setting new state-based standards, but weighing in more forcefully with the U.S. DOE to ensure strong new federal standards to benefit Connecticut ratepayers.

Industrial Efficiency Opportunities

Finding ways to reach and better serve large commercial and industrial customers, in ways that satisfy their business needs, is crucial for many reasons, not the least of which is that if large customers don't feel they get high value from the programs, they are less likely to participate and may seek ways to "opt out." When this happens, decreased budgets risk undermining program offerings for all business customers, and mean that less efficiency happens overall. The following guidance is excerpted from a recent SEE Action Network paper, *Sustained Energy Savings Achieved through Successful Industrial Customer Interaction with Ratepayer Programs: Case Studies*[10]

- **Develop multiple-year relationships** between program administrator and industrial company personnel, involving a steadily evolving program of support and efforts to identify multiple projects over time (rather than a single project).
- **Develop programs that can target energy efficiency gains in manufacturing processes**, in addition to energy used in support systems.
- **Develop programs involving Strategic Energy Management (SEM)** that support internal company platforms for continual identification and implementation of energy savings measures, high-impact and low-cost behavioral changes, and operational and maintenance improvements.
- **Promote smart manufacturing and enhanced metering practices**, such as installing sensors and embedding devices in software that communicate with one another and with other systems through networks.

The use of multi-year MOUs in Connecticut is helping to build relationships and long-term plans for efficiency investments. We are glad to hear the utilities offer Strategic Energy Management programs, and we encourage continued work in this area, including adapting SEM for mid-size customers. SEM represents a very exciting emerging practice that has the potential to greatly reduce energy use in the industrial sector. By teaming with C&I customers to provide powerful tools that help them strategically manage their energy use, utilities can realize significant savings and deepen their customer relationships. NEEP recently completed an Industrial

[10] https://www4.eere.energy.gov/seeaction/system/files/documents/IEE%20Case%20Studies_1002.pdf

Market Assessment and Guidance Paper[11] and has also received funding from the U.S. Department of Energy to conduct research, improve definitions and share best practices related to cost-effectiveness of SEM programs.

Policymaker Understanding and Support is Vital

To further opportunities for success in industrial energy efficiency programs, agencies such as DEEP can:

- Encourage energy efficiency program administrators to set aggressive savings targets;
- Encourage the programs to quantify and claim the numerous non-energy benefits when it comes to Industrial energy efficiency programs;
- Afford flexibility with rolling program budgets;
- Encourage PAs to explore and pilot new program approaches; and,
- Understand that non-measure programs and services, including technical expertise and information systems, deliver valued benefits to customers and help ensure continuous engagement and operational efficiency gains.[12]

Continue Breaking down Silos and Integrate Programs

In closing, we offer a few additional thoughts that will make the programs even stronger and more customer-focused:

1) Keep working to better coordinate programs to ensure efficiency and cost-effectiveness are maximized. For example, require building energy audits when receiving funding support for photovoltaics, so systems are right sized, and ensure that demand response programs are a pathway to energy programs.
2) Financing continues to be an important resource, and the Green Bank seen as a national model to complement the state's successful EnergizeCT portfolio. From a customer's point of view, there is a lot more that could be done to streamline and improve navigation on financing options.

Thank you for considering NEEP's input during this important period of planning for Connecticut's energy future. Again, we are very encouraged by all of the commitments shown by DEEP, and look forward to continued collaboration as the elements of the Comprehensive Energy Strategy move to implementation.

Sincerely,

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[11] http://www.neep.org/sites/default/files/resources/Northeast-MidAtlantic%20Industrial%20Market%20Assessment%20FINAL.pdf

[12] For more ideas, see NEEP's 2016 *Regional Roundup:* http://www.neep.org/2016-regional-roundup