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August 1, 2018

Chairman Bill Dornbos
Connecticut Energy Efficiency Board
Ten Franklin Square
New Britain, CT 06051

Commissioner Robert Klee
Department of Energy and Environmental Protection
10 Franklin Square
New Britain, CT 06051

Re: Connecticut 2019-2021 Conservation and Load Management Plan

Dear Chairman Dornbos and Commissioner Klee,

On behalf of Northeast Energy Efficiency Partnerships (NEEP)¹, I am pleased to submit comments relative to the 2019-2021 Conservation and Load Management (C&LM) Plan for the State of Connecticut. NEEP is a non-profit with a mission to accelerate regional collaboration to promote advanced energy efficiency and related solutions in homes, buildings, industry, and communities. With the goal to assist the region's leaders to reduce building sector energy consumption three percent per year and carbon emissions 40 percent by 2030, our vision is that the region's homes, buildings, and communities will be transformed into efficient affordable, low-carbon, resilient places to live, work, and play.

We thank the Energy Efficiency Board (EEB) for the opportunity to provide input on what should be included in the 2019-2021 C&LM Plan and key issues to consider. Ranked number six in ACEEE's state scorecard, Connecticut has much to be proud of in terms of policies and programs offered that continue to make Connecticut a leader in energy efficiency. NEEP applauds Connecticut's commitment to regional collaboration to advance policies and programs to lower the cost of reliable energy while meeting environmental and resiliency goals in an expedient and equitable manner.

Introduction

Connecticut is an energy efficiency leader with over thirty years of policy and program successes to achieve cost-effective savings. In addition, the State has committed to achieving aggressive greenhouse gas (GHG) mitigation goals through the Global Warming Solutions Act, including the following carbon dioxide (CO₂) emission reductions goals:

- 10 percent below 1990 levels by 2020
- 45 percent below 2001 levels by 2030
- 80 percent below 2001 levels by 2050

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.



In developing the 2019-2021 C&LM Plan, EEB has an important opportunity to work towards these carbon reduction goals by prioritizing the use of energy efficiency along with strategic electrification and demand response to decarbonize building sector energy use.

Building Sector Decarbonization with Efficiency and Strategic Electrification: NEEP’s 2017 *Northeast Regional Opportunity Assessment of Strategic Electrification*² found that while important progress is being made to reduce carbon emissions of electricity generation in New England, achieving the carbon reduction goals, such as those adopted by CT, requires significant reductions in carbon emissions associated with home and building use of direct use of fossil fuels (heating oil, propane and natural gas) for space and water heating. Residential, industrial, and commercial uses of energy – primarily for heating and cooling buildings – constitute 35 percent of GHG emissions.³ Over 80 percent of the building stock is heated with fossil fuels. In 2017, 44 percent of Connecticut’s households used oil to heat their homes.⁴ By improving building efficiency, CT can reduce the use of carbon-intensive fuels. Specifically, thermal efficiency (i.e., improved efficiency and energy performance in building and home envelopes through insulation and air sealing) accompanied by the use of high performance heat pumps (cold-climate ASHPs and ground source heat pumps (GSHP)) can play a significant role to reduce these emissions while improving the health, comfort, productivity, and energy affordability of Connecticut’s homes and buildings. Improved thermal efficiency also reduces the amount of energy needed to keep homes and buildings comfortable during prolonged periods of extreme heat or cold that otherwise drive peak use of gas and electricity.

NEEP’s more recent Action Plan to Accelerate Strategic Electrification in the Northeast⁵ lays out a series of nine key action areas for regional stakeholders to help drive. State and local policy makers, as well as program administrators have key roles to play.

One way Connecticut’s 2019-2021 C&LM Plan can address this challenge is by setting clear goals/targets for both thermal efficiency and electrification targets in homes, buildings, and industry. These goals will help put Connecticut on the necessary trajectory to achieve state carbon emission reduction goals. Very significant increases in heat pump installations (for space and water heating) are necessary if Connecticut hopes to meet its long term reduction goals. Similar acceleration is necessary on the thermal efficiency side to ensure this thermal electrification has minimal impact on the peak loads. Connecticut can build market certainty by establishing market adoption targets for these areas. Without these kinds of market signals, these important pathways to building decarbonization may fall well short of Connecticut’s ultimate goals.

² NEEP, Strategic Electrification Regional Assessment, Available at: <http://neep.org/sites/default/files/Strategic%20Electrification%20Regional%20Assessment.pdf>

³ See page 8 of the CES, http://www.ct.gov/deep/lib/deep/energy/ces/2018_comprehensive_energy_strategy.pdf

⁴ United States Energy Information Administration, “Connecticut State Profile and Energy Estimates”, 2017, <http://www.eia.gov/state/data.php?sid=CT#ConsumptionExpenditures>

⁵ NEEP, Action Plan to Accelerate Strategic Electrification in the Northeast, Available at: <http://neep.org/reports/strategic-electrification-action-plan>



Buildings as Grid Assets with Efficiency and Demand Response: Connecticut's Comprehensive Energy Strategy (CES) recommends a strategy to ensure interoperability of demand response communications between buildings and the grid. With the integration of energy efficiency, energy storage, and renewable energy, buildings can be used as grid assets to manage peak demand. Thermally efficient buildings coupled with demand response (e.g., via smart thermostats or other direct load control technologies) can meet customer needs for heating and cooling while also providing grid flexibility to reduce peak energy use and improve overall transmission and distribution system (T&D) capacity factors. We encourage EEB and DEEP to consider the following strategies to help bring this forward in the development of the 2019-2021 C&LM Plan.

Electric and Gas Energy Efficiency Resource Standards

The 2007 Electricity and Energy Efficiency Act (Public Act 07-242)⁶ recognized the value of energy efficiency by requiring utilities to achieve resource needs through "all available energy efficiency resources that are cost-effective, reliable and feasible. To date, the EERS has been based on the equivalent treatment of energy efficiency with energy supply sources and in the efficiency goal set and currently enforced through implementation of the C&LM Plan.⁷ Connecticut's commitment to incremental savings of 1.51 percent of retail electric sales and 0.6 percent for retail gas sales from 2016-2018 trails behind most of the neighboring states' savings goals⁸. Connecticut may benefit from increasing the saving level goals to be more on par with surrounding states (Massachusetts achieved 3 percent, Vermont achieved 2.52 percent, and Rhode Island achieved 2.85 percent electric savings in 2016) to uphold commitments to procure all cost effective energy efficiency. In the 2019-2021 C&LM Plan, EEB should, likewise, consider electric savings targets of two percent and gas savings over one percent. On average it costs about two to three time less to meet demand with energy efficiency as opposed to new energy resources.⁹ NEEP's Regional Energy Efficiency Database¹⁰ provides results from efficiency programs in other Northeast states that can might help Connecticut assess higher electric and gas energy savings goals.

Renewable Thermal Technologies

Renewable thermal technologies (e.g., high performance cold climate air source heat pumps) offer new opportunities to reduce overall home and building energy use and meet carbon emission reduction goals. In addition to setting goals for energy savings from improved thermal efficiency in homes and buildings, NEEP encourages EEB to consider goals for the increased adoption of renewable thermal technologies in the next three year plan, especially since the scope of the 2018 Integrated Resource Plan includes the development of a thermal efficiency standard. The C&LM Plan is an opportunity to establish programs that incentivize the transition to renewable thermal technologies, such as air and ground source heat pumps. NEEP's 2016 ASHP

⁶ CT Public Act No. 07-242, <https://www.cga.ct.gov/2007/act/pa/2007pa-00242-r00hb-07432-pa.htm>

⁷ *Supra* note 3, at 18

⁸ See NEEP's Policy Snapshot, pg. 6: <http://neep.org/sites/default/files/resources/EE%20Snapshot%20Summer%202018.pdf>

⁹ See ACEEE Study: <http://aceee.org/research-report/u1402>

¹⁰ REED available at: <https://reed.neep.org/>



Market Transformation Strategies Report¹¹ includes a series of strategies that are aimed at driving accelerate uptake of this technology. We encourage EEB to incorporate these strategies into its next three-year plan.

NEEP maintains a cold climate ASHP (ccASHP) specification¹² that may be used for program promotion of ASHPs and may also align the state with several other Northeast programs. One of the challenges states are facing in acceleration the adoption of ASHPs is workforce development. NEEP has developed ASHP installer guides¹³ that Connecticut may benefit from making available to utility contractors and disseminating to the appropriate workforce. These guides provide information on installing, sizing, and selecting ASHPs, which will provide job opportunities, economic growth, and fuel the transition from fuel oil to renewable thermal technologies.

Another opportunity lies in establishing statewide systems that require utilities to support the installation and operation of renewable thermal technologies. Connecticut can learn from best practices in Massachusetts, which has established an Alternative Portfolio Standard (APS)¹⁴ under the Green Communities Act of 2008. The APS enables Massachusetts businesses, institutions, and governments to receive an incentive for installing eligible alternative energy systems that contribute to the State's clean energy goals by increasing energy efficiency and reducing the need for conventional fossil fuel-based power generation (e.g. combined heat and power, renewable thermal). New Hampshire and Vermont have similar mechanisms that have successfully driven installation of renewable thermal technologies.

Home Energy Solutions Program

Close to one million homes in Connecticut were built before 1970 and comprise a significant portion of the housing stock. To drive deep home energy retrofits, the market value of energy efficiency needs to be made visible and accounted for in the real estate transaction. Connecticut has been a leader in offering U.S. Department of Energy's (U.S. DOE) Home Energy Score via the CT Home Energy Solutions Program, completing over 30,000 scores. This program is geared towards existing homes and provides a detailed report on the savings opportunities available through utility weatherization programs. The Program Administrators has since taken the step to add opt-in language to this program, allowing the scores to be shared with stakeholders in the real estate transaction process. EEB should continue this effort and offer the Home Energy Score to utility customers.

To drive a greater opt-in rate, workforce development should be a priority for the 2019-2021 C&LM Plan. Developing trainings and educational campaigns for assessors and homeowners about the value of energy efficiency and return on investment if it is captured in a future real estate transaction will help ensure the success of the program going forward. Adding workforce development to the Home Energy Solutions Program

¹¹ NEEP, *Northeast/Mid-Atlantic Air-Source Heat Pump Market Strategies Report 2016 Update*, (January 2017) http://www.neep.org/sites/default/files/NEEP_ASHP_2016MTStrategy_Report_FINAL.pdf

¹² The specification list is continuously updated. For the most recent, please visit: <http://www.neep.org/initiatives/high-efficiency-products/emerging-technologies/ashp/cold-climate-air-source-heat-pump>

¹³ NEEP, *Guide to Installing ASHP in Cold Climates*, and, *Guide to Sizing and Selecting ASHP in Cold Climates*, (2017), Both available at: <http://www.neep.org/initiatives/high-efficiency-products/air-source-heat-pumps/air-source-heat-pump-installer-resources>

¹⁴ MA APS rulemaking, <https://www.mass.gov/service-details/alternative-portfolio-standard-rulemaking>



will also enforce the CES recommendation to integrate energy efficiency with real estate market forces. By partnering with NEEP's Home Energy Labeling Information eXchange (HELIX)¹⁵, DEEP enables the value of energy efficiency to be visible to the real estate market by populating the Multiple Listing Service with home energy information. This increases buyers' and sellers' knowledge about the energy cost and performance of listed properties, and supports market valuation of home energy retrofits.

Building Codes and Appliance Standards

The C&LM Plan helps build momentum in market transformation. Building codes and product standards should be considered to advance progress toward mainstreaming efficiency as the standard practice for buildings, industrial processes, and commercial products. Building codes and product standards not only keep buildings safer and healthier, but allow them to operate more cost-effectively. This can also give them a competitive edge in the real estate market and provide a more consistent expectation of their impact on the grid and environment. Additionally, building codes can help set the infrastructure for modernizing the grid through the inclusion of electric vehicle charging stations in the building code for new construction. The CES identifies building codes as a mechanism to advance market transformation.

EEB should consider code compliance for the C&LM Plan and establishing attribution for code compliance so utilities can claim savings. Massachusetts and Rhode Island have compliance enhancement training programs that are conducted by the utilities and third party trainers. By implementing a similar program with classroom, webinar, and on-sight trainings, the utilities can implement circuit rider programs, compliance pocket guidelines, field guides, technical bulletins, and case studies. This would fulfill the CES recommendation to train professionals on code compliance and efficient building design and constructions. Connecticut can learn from the attribution methodology chosen by National Grid in MA and RI for the CCEI Attribution program¹⁶ where various benefits have been realized:

- New opportunities for claimed savings
- Increased code compliance rates
- Increased participation in beyond-codes programs, contributing to carbon reduction goals

National Grid measures the compliance rate annually to claim savings using the attribution methodology chosen and this has helped improve code enforcement.

NEEP offers technical assistance directly on adoption and compliance of energy codes and through online tool kits. Currently, NEEP is conducting a statewide construction best practices field study. The study, when complete in 2018, will provide important information to assist the state in understanding how to attribute energy savings from energy code compliance. Additionally, the information gleaned from the study will inform state carbon reduction plans, utility energy savings programs, code official and design professional training on code implementation. The state's steady rise as a leader in energy efficiency is assured through rigorous code

¹⁵ HELIX, Available at: <http://www.neep.org/initiatives/energy-efficient-buildings/green-real-estate-resources/helix>

¹⁶ NMR Group, Inc. Rhode Island Code Compliance Enhancement Initiative Attribution and Savings Study: <http://rieermc.ri.gov/wp-content/uploads/2018/03/ri-ccei-attribution-and-savings-final-report-12-12-17-clean.pdf>



compliance and attribution. NEEPs forthcoming paper, *Building Energy Codes for a Carbon Constrained Era: A Toolkit of Strategies and Examples*¹⁷, will provide a roadmap for zero energy buildings within the next decade.

The CES also states that DEEP will actively supporting federal appliance efficiency standards that provide cost-effective energy savings. The current lack of U.S. DOE initiative to comply with congressionally mandated schedules to update or adopt federal appliance efficiency standards increases the imperative for state action to encourage strong federal standards as well as to adopt state efficiency standards for products not pre-empted by federal standard setting. Fortunately, CT State Law [CGS § 16a-48]¹⁸ provides authority for DEEP to set state appliance efficiency standards – giving Connecticut an opportunity to achieve additional energy savings, serve as a state leader for appliance standards and improve its ranking in the ACEEE State Energy Efficiency Scorecard.

Many other Northeast states, including Massachusetts, Rhode Island, and New York, are considering new appliance standards for a range of products, particularly those identified in a 2017 report from the Appliance Standards Awareness Project (ASAP).¹⁹ These new standards would not be subject to federal preemption and in general offer great consumer benefits. Vermont legislatively adopted many of these new standards earlier this year²⁰ offering Connecticut the opportunity to follow suit to reap energy efficiency savings benefits without having to “go it alone.” For Connecticut, annual savings from a package of new appliance standards are in the order of 400 GWh of electricity, 1,000 BBtu of Gas, and 125 million metric tons of carbon savings from ASAP’s 2018 model package of new efficiency standards.²¹ Having been authorized by the legislature to adopt appliance standards, DEEP has the opportunity to move quickly to set and promulgate specific product standards and should work with EEB to do so. The C&LM Plan could include the opportunity for the Connecticut utilities to receive credit for energy savings associated with state appliance standards supported by their research, analysis and implementation assistance. We note that the Connecticut utilities recently joined the ENERGY STAR Retail Products Platform enabling the efficiency programs to leverage smaller incentives for retailers who make a concerted effort to increase stocking, assortment, and sales of highly efficient products. This, coupled with Connecticut support for more stringent ENERGY STAR product efficiency specifications provides a long-term strategy to increase product efficiency and support future federal and state appliance efficiency standards.

NEEP is prepared to provide technical assistance to help DEEP assess and adopt new state appliance standards as well as support federal appliance standard setting, and urges prioritization of appliance standard setting and the inclusion of ratepayer-funding to support analysis and adoption of new cost-effective appliance standards.

¹⁷ NEEP, *Building Energy Codes for a Carbon Constrained Era: A Toolkit of Strategies and Examples*, available at: <http://www.neep.org/reports/building-energy-codes-for-a-carbon-constrained-world>

¹⁸ CT State Law, Sec. 16a-48. Energy efficiency standards for products, available at: https://www.cga.ct.gov/current/pub/chap_298.htm#sec_16a-48

¹⁹ ASAP, <https://appliance-standards.org/document/states-go-first>

²⁰ VT legislature, H410, <https://legislature.vermont.gov/bill/status/2018/H.410>

²¹ ASAP, <https://appliance-standards.org/state-savings-state-standards>



Cost-Effectiveness

Connecticut may benefit from adopting the principles in the National Standard Practice Manual (NSPM)²², particularly transparency and symmetry, when evaluating energy efficiency and other demand-side programs. The NSPM, while developed for energy efficiency, can be applied to other types of programs, including electrification, demand response and other building-integrated distributed energy resources. Connecticut currently uses the utility cost test (UCT) as its primary test. Building on the presentations and discussion at or Regional Cost-Effectiveness Workshop in June 2017 host by DEEP²³, we encourage Connecticut to develop a roadmap, informed by stakeholder input, to move beyond the current utility cost test framework to better align demand-side resource economic analysis with relevant public policy goals addressed by these resources (e.g., air pollution and carbon emission reduction, economic development, improved occupant health and safety, energy resiliency) and to include all costs and associated benefits including participant and societal benefits. See for example, the process and recent cost-effectiveness test adopted by the Rhode Island Public Utility Commission specific to that state's policies and carbon and energy goals.²⁴ NEEP's report, *Non-Energy Impacts Approaches and Values: an Examination of the Northeast, Mid-Atlantic, and Beyond*²⁵, provides an overview of the NSPM and a survey of different approaches and values of NEIs included in cost-effectiveness testing across the country.

Conclusion

The 2019-2021 C&LM Plan provides the opportunity for Connecticut to turn the recommendations in the CES into actionable programs that will help the state achieve its carbon reduction and clean energy goals. NEEP is pleased to assist DEEP, EEB, the utilities, and other Connecticut state agencies and stakeholders to realize the full value of energy efficiency to meet the State's efficiency, clean energy and carbon emission reductions goals. In particular, we offer to Connecticut the opportunity to increase the impact of efficiency programs and policies through our regional market transformation initiatives, technical assistance, public policy tracking, best practice guidance, tools and resources, workshops and participation in our advanced efficiency leadership network.

Sincerely,

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²² NSPM, available at: https://nationalefficiencyscreening.org/wp-content/uploads/2017/05/NSPM_May-2017_final.pdf

²³ See the event page here: <http://neep.org/events/emv-forum-summer-workshop-cost-effectiveness-testing-next-generation-energy-efficiency>

²⁴ Docket 4600: Stakeholder Working Group Process: Report to the RI PUC, (April 2017), available at: <http://www.raabassociates.org/Articles/RI%204600%20Final%20WVG%20Report%204-5-17.pdf>

²⁵ NEEP, *Non-Energy Impacts Approaches and Values: An Examination of the Northeast, Mid-Atlantic, and Beyond*, (June 2017), Available at: <http://www.neep.org/non-energy-impacts-approaches-and-values-examination-northeast-mid-atlantic-and-beyond>