**Comments of Northeast Energy Efficiency Partnerships (NEEP)**
**To the Massachusetts Energy Efficiency Advisory Council (EEAC)**
**Regarding the 2016-2018 Joint Statewide Plans**
**January 20, 2015**

On behalf of Northeast Energy Efficiency Partnerships, I am pleased to offer input on the next three-year energy efficiency plans for 2016-18.[1] NEEP is a regional non-profit whose mission is to serve the Northeast and Mid-Atlantic to accelerate energy efficiency in the building sector through public policy, program strategies and education. Our vision is that the region will fully embrace energy efficiency as a cornerstone of sustainable energy policy to help achieve a cleaner environment and a more reliable and affordable energy system.

We congratulate Massachusetts for its continued leadership in energy efficiency programs, and note that we often cite the state in terms of regional best practices in programs and policies and in the administration of the Energy Efficiency Advisory Council itself. While the Commonwealth has had some of the most ambitious program savings goals in the nation, there is always more to be done, as technologies and best practices advance. This is clearly most true of commercial and industrial programs, where programs have fallen short of goals in recent years.

The program administrators (PAs) have made great strides in recent years to integrate their offerings and learn from each other to drive cost-effective energy savings and wring more out of each ratepayer dollar. We encourage the electric and gas PAs and the Department of Energy Resources (DOER) to continue to leverage resources and opportunities to work regionally through NEEP's various stakeholder working groups, including NEEP's Regional Evaluation, Measurement & Verification (EM&V) Forum.

Our comments include some key concepts that are the focus of NEEP's various project teams, including those that focus on Market Strategies, Policy Outreach and Analysis, and Building energy efficiency. Of particular interest to the Council may be which products areas NEEP recommends be considered for inclusion in future programs, as well as comprehensive building energy strategies.

All of these recommendations are made in the spirit of helping the state reach its savings goals, which the PAs have fallen short of in recent years. We've seen some good work by the PAs in terms of market strategies to meet the customers where they are, in particular, the small to medium C&I customers. We believe a continuation down this road will help with realizing program goals.

[1] These comments are offered by NEEP staff and do not necessarily represent the view of NEEP's Board of Directors, sponsors or underwriters.

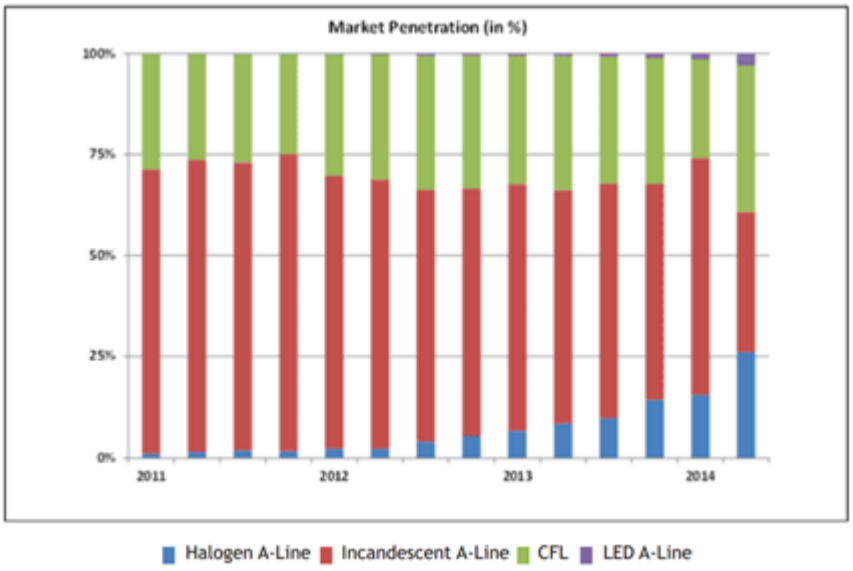
## I. ENERGY EFFICIENT PRODUCTS

### Residential Lighting

Based on the research and analysis from NEEP's most recent 2014-2015 Residential Lighting Strategy Update, we have found that:

- The Residential Lighting Market is *not* yet transformed as a high penetration of both traditional incandescent and halogen incandescent lamps continue to be available in the market. In Massachusetts' next three-year plan, the state should support continued and aggressive residential lighting programs.

  ***The chart below shows a decline in incandescent lamps in recent years, and that LEDs are still just a tiny fraction of market share.***[2]




- Cost-effective savings from the promotion of efficient lighting still exists throughout 2018, and the significant drops in LED pricing means the cost to achieve savings is decreasing as well. Massachusetts should work to allow programs flexibility to adjust incentive levels as necessary to maintain relevance in the market.
- Massachusetts programs should support strong promotion of LED technology in near-term and develop transition strategies away from standard CFLs to LEDs to be implemented as soon as 2016. Within this portfolio mix, Massachusetts should move specialty promotions away from CFLs and towards specialty LEDs, as LED technology is better suited for specialty applications and the prices of specialty LEDs continue to fall.

[2] Graph source: http://www.nema.org/news/Pages/Incandescent-A-Line-Lamps-Decline-Sharply-in-Second-Quarter.aspx

**Home Energy Management Systems**

The emergence of Home Energy Management Systems (HEMS) represent an exciting new opportunity for programs to leverage. NEEP started a Home Energy Management Systems working group in 2014 out of program administrator interest in the potential of this measure. In 2015, NEEP is undertaking a research project that Massachusetts is helping to fund through its EM&V forum. This project will help to characterize the HEMS market and begin to identify the savings opportunity of HEMS in the region. NEEP strongly encourages interested parties to actively investigate these technologies through demonstrations, pilots and through the HEMS Working Group and research project. Promotion of select HEMS should be considered as a key strategy for efficiency savings in the 2016-2018 timeframe.

While "smart" and wifi-connected thermostats are a key component of Home Energy Management Systems, these systems extend beyond HVAC to help homes control the energy use of lighting, plug load and appliances. There also exists the opportunity for HEMS to be used as a demand response tool should that be necessary. HEMs may also be employed in conjunction with behavioral programs to extend savings and target customers with key messages to increase efficiency. NEEP is a resource for Massachusetts to explore HEMS technologies and encourages a significant push for HEMS to be included in the 2016-2018 plans.

**Business and Consumer Electronics**

NEEP supports the continuation of cost-effective rebates for electronics. Based on our report, *Business and Consumer Electronics: A Strategy for the Northeast* report, we see opportunities for programs to increase their promotion of Advanced Power Strips (APS), both Tier 1 and Tier 2 products. NEEP encourages Massachusetts to consider including these technologies in the 2016-2018 plan. NEEP can be a regional resource for any questions or assistance needed regarding APS. Additionally, there are other electronics measures (such as televisions and desktop computers) that other New England states are including in their program portfolios that we encourage Massachusetts to consider as well. NEEP's 2013 Business and Consumer Electronics Report is a resource for developing these other programs.

**Air-Source Heat Pumps (ASHPs)**

As described in the Northeast/Mid-Atlantic ASHP Market Strategy Report, ASHPs offer a major opportunity for homes across the Northeast/ Mid-Atlantic region to reduce home heating energy consumption, costs and greenhouse gas (GHG) emissions.

A new generation of ASHPs have come to market that provide not only highly efficient space cooling but space heating as well. Heat pumps for heating and cooling can cost half as much to operate as a conventional HVAC systems, while generating 60 percent less $CO_2$. This is an exciting technology gaining greater customer awareness and market penetration.

Performance metrics have not kept pace with the changing capabilities of ASHPs. Programs should continue to promote heat pumps, but should consider new technical specifications aimed specifically at identifying products that heat efficiently at low temperatures. NEEP believes that the PAs should

review the two important resources as they contemplate program design for ASHPs: the Ductless Heat Pump Meta-study and the Cold climate ASHP Specification.

*NEEP recommends requiring a product's listing to be part of the incentive requirements.*

In many installation scenarios, ASHPs offer a pathway to displace significant amounts of fossil fuels (home heating oil and propane in particular). We recommend to the Council that these fossil fuel savings be recognized and that electric PAs be allowed to claim some degree of savings.

We strongly support the development of the Massachusetts Clean Energy Center's (CEC) renewable thermal incentive program that includes ASHPs, and encourage the PAs to think about how to best align offerings between the PA's program and the CEC program.

The long-term viability of the market for cold climate heat pumps will depend on the ability to meet or exceed consumer expectations, especially as most consumers are experiencing this technology for the first time. The Massachusetts programs should only promote those products that will ensure positive experiences and increase the likelihood that this measure will provide savings for a long time. Energy savings may not be available through this technology in the long term if measures aren't taken in the short term to ensure positive customer experiences. NEEP's Northeast/Mid-Atlantic ASHP Working Group provides a useful venue for the PAs to join a regional effort to accelerate the uptake of this new technology.

**Heat Pump Water Heaters**

As this market develops, we encourage the programs to continue strong incentive amounts, marketing promotion as well as more contractor education on how and where to install heat pump water heaters. We emphasize the need for additional research on installation location conditions and how the performance and efficiency of various water heaters are affected by varying conditions. It is important at this early stage of market development that we identify and promote only products that perform up to consumer expectations, including those installations that might not be in ideal conditions.

We note that ENERGY STAR may not be sufficient to differentiate which products perform best during Massachusetts' heating season. The programs should utilize information like low temperature cut off information that ENERGY STAR has available. Please see NEEP's Northeast/Mid-Atlantic Heat Pump Water Heater Market Strategy Report for more recommendations.

**Clothes Dryers**

"Next-generation" clothes dryer technology has come to the North American market, offering PAs a new measure through which to achieve energy savings. ENERGY STAR will be offering two tiers for clothes dryers in 2015, their base ENERGY STAR level, as well as the 2014 Emerging Technology Award (ETA). They expect only two products to meet the 2014 ETA specification, both employing heat pump drying technology.

We encourage Massachusetts to work with NEEP and the national Super-Efficient Dryer Initiative (SEDI) initiative to explore new dryer programs. We encourage Massachusetts to continue supporting

this work into 2016 as there are outstanding challenges that need to be addressed (i.e. improved test procedures).

**Appliance Standards**

Building codes and appliance standards represent a relatively new source of savings for programs to pursue, as the PAs' ability to claim savings from these initiatives is still not a formal element of programs in Massachusetts. Researching, developing, and advocating for state level appliance standards offer the PAs a new opportunity to achieve energy savings. The Mass. PAs have been working to better understand the processes involved over the past few years and stand ready to begin implementing some limited efforts in 2015, including the promotion of a package of state based standards. Significant research and analysis done by NEEP[3] and others provides helpful guidance and models for creating such a program paradigm in Massachusetts. NEEP's Appliance Standards Project strongly supports the continuation of this initiative to realize the time and resources the PAs have invested in this endeavor to date.

**Improving Online Customer Engagement**

The shopping journey of today's consumer is evolving and efficiency programs need to be relevant to these changes. Much of that change is related to the online space as consumers use online resources to research, compare, and purchase products.

NEEP has gained many insights through our experience on TopTen USA's Board. The Mass. PAs have been strong supporters of TopTen USA, an online tool that provided consumer-friendly information about the very most efficient products on the market. The tool connected customers with program incentives. New online tools offered by vendors such as Enervee[4] offer improved automation and closed-loop marketing to follow consumers through their online shopping journey.

Energize Connecticut's Efficient Product Finder provides an example of a program that has deployed these tools and are excited to share results throughout 2015. The program administrators should include a placeholder for the implementation of new online shopping tools geared to promote efficient consumer choices, connect consumers with program offerings and develop more targeted marketing opportunities for further program engagement.

**Commercial Advanced Lighting Controls (CALC) Project**

Commercial Lighting Controls — especially "Advanced Lighting Controls5 — continue to be a greatly underutilized opportunity for PAs. A number of barriers persist in the market including: market knowledge and experience, uncertainty of savings and benefits, lack of standardization, high costs, etc. NEEP's regional CALC project aims to bring order to this chaos through a number of activities which will ultimately enable programs to achieve the savings opportunity.

[3] http://www.neep.org/attributing-building-energy-code-savings-energy-efficiency-programs

[4] http://enervee.com/

[5] Lighting control systems that are networked, addressable, and employ multiple control strategies via software or Intelligent Controller.

Project activities include:

- ALC Technology Inventory & Assessment → Qualified Products List (QPL)
- Development of ALC Savings Calculator
- Demonstration Projects
- Educational Resources for Designers and Installers
- New ALC EE Program Offerings
- Support Industry Standards

The project was awarded $500,000 from U.S. DOE as part of a three-year grant to support these activities. Massachusetts PAs have been engaged from the beginning of the CALC project and should remain engaged. The new resources coming out of the project should inform Mass. programs as they develop program offerings associated with CALCs.

## II. BUILDINGS POLICIES

**Building Asset Rating (BAR) Pilot**

Potential energy savings in existing commercial buildings are often left untapped, as building owners lack sufficient information due in part to the time- and money-intensive nature of currently available building assessment methods. And while tools like ENERGY STAR Portfolio Manager provide analysis based on energy use, asset ratings analyze the energy features of the building to provide an assessment of building energy performance independent of the identities of its tenants and the nature of its operation, which allows for apples-to-apples comparison with other buildings. Asset ratings are also a tool for identifying upgrade opportunities that will provide the best "bang for the buck."

The Massachusetts Building Asset Rating (BAR) pilot[6] is a three-phased project which began in 2011 as a partnership of NEEP and DOER that seeks to develop and test new methods to assess the energy performance of a building's energy features.

The BAR Pilot asks: can we improve building analysis to provide credible, investment-grade information in less time and with decreased cost? After completing Phase 1 of the project, which sampled 11 buildings, in early 2013, we concluded that such assessments were possible, though additional work was needed to standardize the process. This past fall, our team completed work on Phase 2, which boasted a sample of roughly 30 buildings. Our final report on findings from this phase is due to be complete in early in 2015.

*NEEP recommends that the findings from Phase 2 of the pilot be used to help substantiate the potential role for these streamlined rating practices to be used in coordination with disclosure ordinances, such as those legislated in Boston and Cambridge, and in state utility programs.*

[6] http://www.neep.org/BuildingAssetRating

**Residential Building Energy Labeling**

Progress towards a time-of-listing energy labeling program for homes in Massachusetts is vitally important to helping to drive energy efficiency retrofits in the state. Because homes currently come with very little information to inform potential buyers of their energy use, the relative efficiency of a home is rarely considered as part of a home buyer's decision-making process, and, thus, is not valued by the real estate market. By providing basic information on home energy characteristics, markets will come to attach a value to energy use, and, thus, prompt owners to take advantage of opportunities to make their homes more energy efficient. Labeling will lead to higher participation in retrofit programs and deeper levels of savings.

**HomeMPG and U.S. Department of Energy Home Energy Score**

As for what labeling tools exist for use, Massachusetts DOER's pilot HomeMPG program concluded in fall 2014. Just under 4,000 audits/scorecards of homes in western Massachusetts were provided over the two year life of the pilot, with just under 1,600 of these homes (41 percent) completing retrofits. In addition, U.S. DOE's Home Energy Score provides a simple, free to use tool that generates a label including a summary of the building's energy features, a score of total energy use (on a 1-10 scale), and a custom list of recommended upgrades. Home Energy Score is also being considered by home energy labeling initiatives in several neighboring states, with Connecticut and Vermont already deploying the tool in their programs.

*NEEP recommends pursuing a mandatory statewide home energy labeling program based around the HomeMPG and/or Home Energy Score tools. It is expected that state legislation relative to residential rating and disclosure may be introduced this session. We encourage DOER and the program administrators to follow and support these developments.*

**High Performance Schools and Public Buildings**

Public school construction and major renovation present significant opportunities for long-term deep energy savings at low-to-no incremental lifecycle cost. NEEP recommends that new public school construction or substantial renovations meet the criteria established by the Northeast Collaborative for High Performance Schools (NE-CHPS), a regionally developed building and renovation protocol with a specific focus on educational facilities. NE-CHPS is a school design roadmap that streamlines the construction and renovation of healthier, more productive, and less costly schools.[7]

NE-CHPS incorporates the Advanced Buildings New Construction Guide, which most Massachusetts DSM programs already use to guide provision of incentives. The 2013-2015 three-year plan repeatedly recommends outreach and engagement in the classroom. Continuing to provide incentives for high performance school construction will ensure that the school building itself acts as an outreach and engagement platform, for targeted marketing of energy efficiency programs.

[7] http://neep.org/Assets/uploads/files/public-policy/high-performance-schools/NE.CHPS.3.0.Criteria.Final.4.9.14.pdf

**Multifamily Energy Efficiency Program**

In May 2014 NEEP released a white paper: "Increasing Energy Efficiency in Small Multifamily Properties: Recommendations for Policy Action."[8] The paper contains valuable information on market characterization and data analysis, market barriers, current policy and recommendations addressing small, five- to 20-unit, multi-family buildings, and we hope it will be a programmatic and policy resource. We applaud the state's continued focus on multifamily and low-income multifamily housing, in particular, and stand as a resource to connect with best practices across the region and beyond.

**Building Energy Codes**

Adopting new building energy codes provides a source of long term, cost-effective energy savings by setting minimum efficiency requirements for new and renovated buildings. As energy code requirements are advanced, it becomes increasingly important to analyze a building as an interconnected system instead of simply addressing the efficiency of its components. The adoption of newer, more efficient energy codes drives the market towards this whole building performance approach, which is an important step in the path to making zero net energy buildings — buildings that can produce as much energy as they consume — the recognized standard of new construction.

This year, NEEP anticipates that Massachusetts will be adopting the newest model energy code, the 2015 International Energy Conservation Code (2015 IECC).[9] We believe there is an important role for utilities and other program administrators to play in advancing the latest codes, supporting the next iteration of the Stretch Code, and providing training for code compliance efforts.

**Utility Claimed Savings from Code Compliance Support**

As referenced earlier, allowing utilities to claim savings for supporting new building energy codes is an effective means of coordination between ratepayer-funded efficiency programs and complementary public policies that will aid Massachusetts in achieving its energy savings goals. As the evaluation committee helps shape the state's methodology for attributing energy code compliance savings to utility programs, NEEP encourages the continued leveraging of resources that have been developed to support Rhode Island's analogous efforts in order to expedite the attribution model's growth from pilot to full-scale state deployment.

Rhode Island continues to refine its framework and implementation, which was initiated in 2013. In December 2014, National Grid filed its savings report for its code compliance enhancement activities in Rhode Island for the first time.

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[8] http://www.neep.org/Assets/uploads/files/public-policy/multifamily-retrofit/NEEP%20Multifamily%20Report_April%202014.pdf

[9] NEEP is the organization designated by the U.S. Department of Energy (DOE) to provide support to Northeast states on building energy code development, adoption and compliance.

**LED Street Lighting**

Conversion of street lights from legacy high pressure sodium fixtures to light emitting diode provides a relatively large opportunity for energy savings that can be marketed in a targeted fashion directly to a department of public works director. Massachusetts is a national leader in adoption of LED street lighting technologies, and programs should continue to provide strong incentive support for conversion initiatives. In addition to customer incentives, utility cost recovery should be granted for labor hours spent mapping current inventories and associated sunken costs.

Street lighting LED conversion provides a multitude of benefits, including reduced load during winter evening peak hours. Efficiency programs should consider providing additional incentives to any utility choosing to offer a utility-owned LED street lighting tariff, and tier these incentives according to the number of street lighting fixtures converted to LED each year.

**Utility Data Access**

Providing easily accessible utility data should be a key tenet of energy efficiency program implementation. Utilities in the state should be able to recover costs through their efficiency program marketing for implementing of data access initiatives such as the U.S. Department of Energy's Green Button or the U.S. Environmental Protection Agency's Web Services Data Exchange. Streamlining ease of access for utility data will help make energy usage more visible to consumers, and likely provide for greater customer engagement and participation in energy efficiency programs. Additionally, providing interval or real time access to energy usage information could greatly improve behavioral-based demand side management programs.

## III. EVALUATION, MEASUREMENT AND VERIFICATION (EM&V)

Along with its own EM&V efforts, Massachusetts participates in the Regional EM&V Forum hosted by NEEP. The Forum is a collaborative of state energy regulators, efficiency program administrators and expert consultants. Since 2009, the Forum has worked to develop and support state adoption and consistent use of common protocols/guidelines and data to estimate, verify, evaluate, track and report the energy and capacity-related savings, costs and emission reductions resulting from investments in electric and gas energy efficiency resources in New England, New York and the Mid-Atlantic States.

In 2012, the Forum released the Regional Energy Efficiency Database (REED),[10] the first tool of its kind in the nation, helping states to increase transparency in reporting of energy savings data. The Forum will continue to support Massachusetts' energy efficiency goals by promoting appropriate policy and effective EM&V methods.[11]

[10] http://neep-reed.org/

[11] http://neep.org/emv-forum

**CONCLUSION**

Thank you for the opportunity to comment on the 2016-18 three year plan development. Please consider NEEP a resource to provide advice and support to the state as you pursue clean, efficient energy solutions for Massachusetts' long-term future. I am happy to connect you with any of my colleagues at NEEP if you have questions on any of the policy or program strategies mentioned above.

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*A full listing of our team is at www.neep.org/staff*