
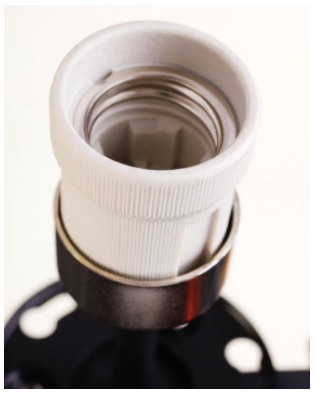

Northeast Residential Lighting Strategy: 2012-2013 Update

Northeast Energy Efficiency Partnerships

December 2012

Northeast Residential Lighting Strategy: 2012-2013 Update
December 2012

Primary Author:

ENERGY FUTURES GROUP

With Critical Analysis & Support From:

Optimal ENERGY

Integrated Energy Resources

About NEEP

NEEP is a regional non-profit organization founded in 1996 whose mission is to promote the efficient use of energy in homes, buildings, and industry throughout the Northeast and Mid-Atlantic through strategies and policies that increase the use of energy efficient products, services and practices, and help achieve a cleaner environment and a more reliable and affordable energy system. Our vision is that the Northeast will fully embrace energy efficiency as a cornerstone of sustainable energy policy, a vibrant economy, and a healthy environment.

Acknowledgements

This Northeast Residential Lighting Strategy was published to address the role of high efficiency lighting products in capturing all cost-effective energy efficiency in the region while also providing broad energy, economic and environmental benefits. This document provides regional and national updates to the original document finalized in March 2012.

This report reflects the invaluable contributions of multiple individuals. Linda Malik, NEEP's Residential Program Manager, served as the report's project manager. Glenn Reed from Energy Futures Group is the report's primary author of its contents, guided by critical analysis and support from the project team:

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The industry experts listed below provided important input into the creation of this document.

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Introduction

Why Update the Regional Residential Lighting Strategy?

NEEP's initial Northeast Residential Lighting Strategy (RLS) was published in March of 2012. However, the findings and recommendations in that report reflect technology evolution and efficiency program administrator (PA) plans and current implementation strategies as of early fall 2011. To inform program plans for 2013, this document provides a necessary update of the residential lighting landscape in the Northeast and Mid-Atlantic (New England, New York, and Washington, D.C.) and highlights changes that have occurred since the fall of last year. In response to those changes, we have updated our projected savings assumptions with minor modifications to the overall recommended regional strategy to maximize cost-effective savings available from high efficiency residential lighting products through 2020.

The continued goal of the RLS is to provide timely information to PAs, regulators and others to inform lighting program planning for 2012 and beyond. The original RLS[1] is a comprehensive document that still provides pertinent and useful information exclusive of the changes noted within this RLS Update, which is designed to supplement—not replace—the original strategy. To guide states, PAs and other stakeholders in their implementation of RLS recommendations, the Update provides new and updated information, including a review of relevant program efforts across the region.

What is Covered in this Update?

In response to the changes in the residential lighting landscape since last fall, this report:

- Highlights and discusses recent developments in current and planned directions in the efficiency program design for residential lighting in the Northeast and Mid-Atlantic region.
- Reviews developments regarding relevant regulatory policies and evaluation, measurement and verification (EM&V) activities.

1 Northeast Residential Lighting Strategy. Northeast Energy Efficiency Partnerships. Prepared by Energy Futures Group, D&R International, Ecova and Optimal Energy. March 2012. http://neep.org/uploads/initiatives/NEEP_Residential_Lighting_Strategy_2012.pdf

- Provides updated estimates of regional lighting savings potential and associated estimates of efficiency program incentive costs.
- Gives a revised trajectory of lighting technology introduction.
- Expands the region covered by the RLS to now also include the District of Columbia, which is served by the recently established District of Columbia Sustainable Energy Utility (SEU).

Executive Summary

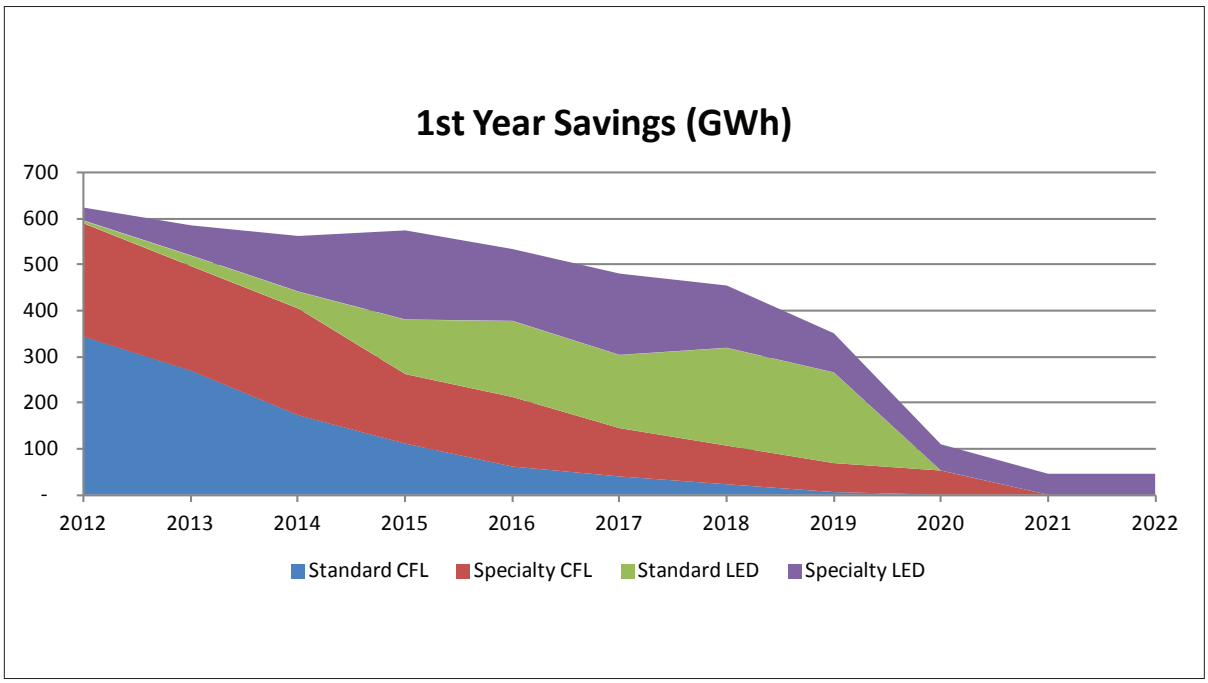
Savings Remain Large, Cost Effective and Cost Efficient

The most important conclusion presented in the initial RLS was that substantial opportunities remain for PAs to continue pursuing residential lighting savings through retail products programs and other residential efficiency programs that promote efficient lighting. These opportunities include continued promotion of both standard and specialty compact fluorescent lamps (CFLs) as well as a ramp-up of support for light emitting diodes (LEDs). **This key conclusion and recommendation remains unchanged. Lighting will and should continue to be a major component of all residential efficiency portfolios.**

Further, these savings will continue to be both cost effective and cost efficient through most, if not all, of the decade. However, higher incentives for LEDs and specialty CFLs, and potentially lower per unit net savings due to lower net to gross ratios (NTGRs), are predicted to raise the cost per saved kWh and overall budgets of lighting programs. Some of these higher costs will be offset by the continued decline in LED prices and, by extension, lower LED incentives. However, even with higher costs per saved kWh, efficient lighting will continue to be an important and cost efficient resource in PAs' residential portfolios.

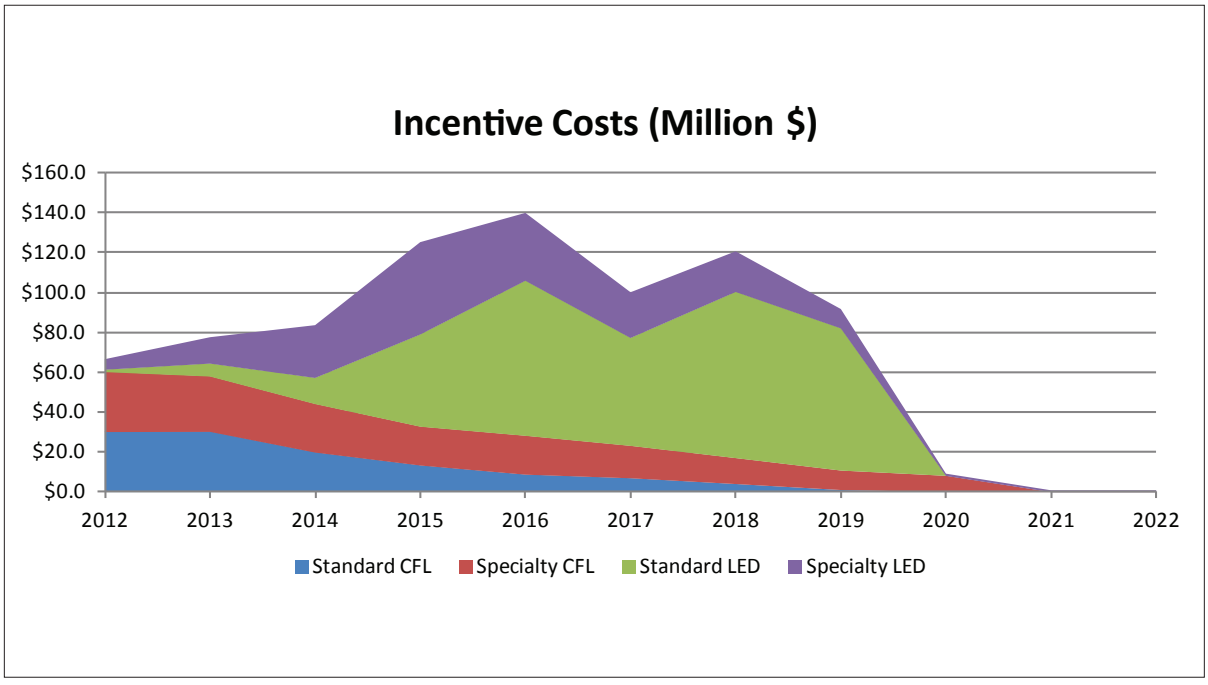
Figures ES-1 and ES-2 illustrate the estimated net savings potential from PA residential lighting programs and the estimated associated incentive budgets. The estimated savings potential presented below is significantly higher than that presented in the initial RLS. The total cumulative first year GWh savings through 2022 are estimated to be 42 percent higher largely due to increased promotion of CFLs—primarily standard CFLs—and LEDs to increase socket saturation of high efficiency lamps - compared to the March 2012 RLS projection. While savings increase considerably compared to the initial RLS, estimated PA incentive budgets remain largely unchanged; decreasing one percent compared to the March 2012 RLS projection. The RLS Update assumes lower LED incentives reflecting continued reductions in product pricing and a higher proportion of standard CFLs to specialty CFLs than in the March 2012 RLS. Figure ES-3 presents the number of lamps that are projected to be promoted by PA programs in each year to yield the estimated energy savings shown in Figure ES-1.The total number of bulbs to be promoted by PA programs is estimated to increase by 34 percent - with higher activity in the near-term, particularly for standard CFLs - compared to the March 2012 RLS. As discussed below, aggressive promotion of CFLs – both standard and specialty – have not always resulted in the expected increase in residential socket saturations. As a result, the remaining opportunities for PA promotion of standard CFLs are likely to be larger than previously estimated.

Figure ES-1



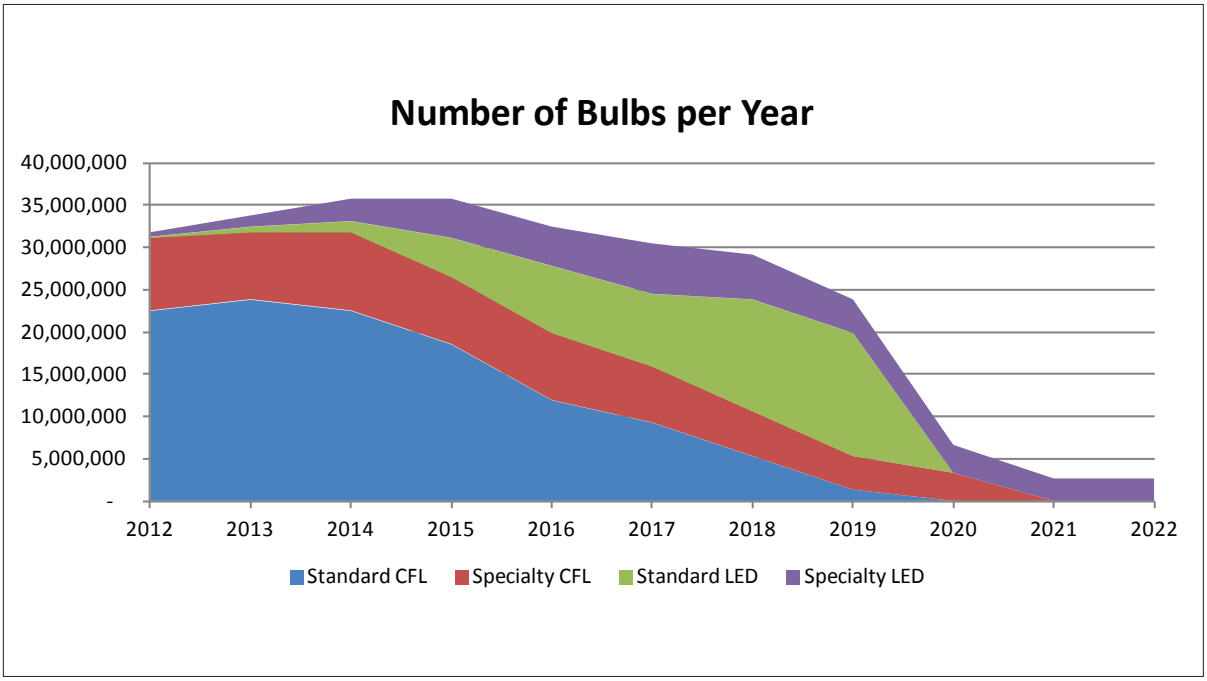
The total cumulative first year GWh savings through 2022 are estimated to be 42 percent higher largely due to increased promotion of CFLs—primarily standard CFLs—and LEDs to increase socket saturation of high efficiency lamps compared to the March 2012 RLS projection.

Figure ES-2



While savings increase considerably compared to the initial RLS, estimated PA incentive budgets remain largely unchanged; decreasing one percent compared to the March 2012 RLS projection. The RLS Update assumes lower LED incentives reflecting continued reductions in product pricing and a higher proportion of standard CFLs to specialty CFLs than in the March 2012 RLS.

Figure ES-3



The total number of bulbs to be promoted by PA programs is estimated to increase by 34 percent— with higher activity in the near-term, particularly for standard CFLs—compared to the March 2012 RLS.

High Level Residential Lighting Strategy Goals Are Unchanged: 90 Percent Saturation of Efficient Lighting by 2020 Remains the Key RLS Goal

While the residential lighting landscape in the Northeast, Mid-Atlantic and nationwide changed significantly over the past year (e.g., the initial implementation of EISA and the accelerated market introduction of LED lighting products), NEEP continues to strongly support a regional goal of achieving a 90 percent efficient lighting socket saturation (45 lumens/watt or better) by 2020. With a regional residential efficient lighting socket saturation of approximately 36 percent in late 2011 - consisting of 27 percent CFLs, eight percent linear fluorescent lamps and less than one percent LEDs - the remaining near-term opportunity for significant residential lighting savings – associated with filling the remaining 63 percent of light sockets - remains large.

To achieve energy savings, NEEP's recommended outcomes and milestones articulated in the initial RLS remain intact, along with the following key recommendations:

1. Continue support for ENERGY STAR® CFLs
2. Ramp up support for ENERGY STAR LEDs
3. Continue early engagement with regulators and efficiency programs
4. Pursue alternative, flexible program and regulatory approaches
5. Deliver clear and consistent messages to consumers
6. Collaborate regionally to achieve a 90 percent household socket saturation rate by 2020

Relative to the March 2012 RLS, only one strategy element—promotion of 2X halogens—is removed from the recommended strategy list.

Outline of Changes Contained in the RLS Update:

Recent Changes in Regional Lighting Program Efforts: Continued and Increased Support for CFLs and LEDs in Most Jurisdictions

Residential lighting programs in states across the region have changed or are preparing to change. Highlights include:

- The District of Columbia Sustainable Energy Utility (DC SEU) began its upstream retail lighting program efforts of standard and specialty CFLs in August.
- PAs in Massachusetts, Rhode Island and Vermont have market lift pilots planned to begin in January 2013.
- Several statewide efficiency programs either attained CFL program sales of over 2.5 CFLs per household in 2011 and/or plan to do so in 2012. Efficiency Maine, Efficiency Vermont and the Connecticut retail lighting programs all exceeded 2.5 CFLs per household in 2011, with the Connecticut program achieving sales of 3.2 CFLs per household.
- All PAs in the region, with the exception of the Efficiency Maine and DC SEU, support LEDs at retail (New Hampshire supports LEDs through rebate programs).
- Connecticut PAs are developing LED upgrade packages for their existing home retrofit programs.

Initial Findings from Recent Program Evaluation and Market Research Activities: Residential Socket Saturations may not be Growing as Quickly as Anticipated

Several evaluations and market research activities addressing lighting, including at least three socket saturation surveys, have been completed in the Northeast since last fall. These include:

- A socket saturation survey study (early 2012) and consumer focus groups in Connecticut. CFL saturation increased to 27 percent from 23 percent in mid-2009.
- A socket saturation survey study (early 2012) in Massachusetts. CFL saturation increased to 27 percent from 26 percent in late 2010.
- An existing home market characterization study in Vermont (late 2011). CFL saturation increased to 30 percent (or 33 percent, not including fluorescent tubes and circlines) from an estimated 17 percent (estimate based on a 19 percent socket saturation result that did not include fluorescent tubes and circlines) in 2008.

The small net increases in socket saturation in Massachusetts and Connecticut are despite significant CFL sales through programs in both states, particularly Connecticut. This finding supports the increased CFL per household estimates used in this Update to estimate regional savings and incentive budget estimates. It also supports the recommendation below for further analysis to inform how to increase socket saturation rates more quickly.

Building Energy Codes, Federal Lamp Standards and ENERGY STAR Lamp Specifications: Critical and Complementary Activities

Activities outside the region will also have a considerable impact on the direction of residential lighting program efforts. These include:

- Federal Energy Independence and Security Act (EISA) lamp standards began to be phased in for higher wattage lamps (~100 watt incandescent equivalents in January 2012, with ~75 watt equivalent standards effective January 2013).
- States are beginning to consider adoption of the residential 2012 International Energy Conservation Code (IECC 2012), which requires that 75 percent of all permanent lighting be efficient (45 lumens/watt or greater). However, no state is likely to have this new code effective until mid-2013 at the earliest.
- ENERGY STAR continued its efforts to develop a single lamp specification. The July draft "restored" higher lifetimes for LEDs; 15,000 to 25,000 hours depending on the lamp type versus 10,000 hours for CFLs. Draft 3 is expected in January, 2013.

Regulatory Activities: Creating a Supportive Environment to Support the Transformation of the Residential Lighting Market

Developing multi-year planning perspectives and exploring alternatives to traditional net to gross measurements are among some of the recent regulatory activities that will likely affect residential lighting program planning and implementation.

Recent regulatory highlights include:

- Connecticut's next Conservation and Load Management(C&LM) Plan will be a three-year plan (2013-2015).
- A recently completed (August 10, 2012) Massachusetts Department of Public Utility (DPU) investigation (DPU 11-120) and Order on Program Net Savings and Environmental Compliance Costs[2].

In contrast, in New York, responding to the October 2011 Public Service Commission (PSC) Order that found high levels of reported free-ridership for programs that promote CFLs, NYSERDA ceased promotion of standard CFLs and requested a significant reduction in its projected program savings. NYSERDA since followed the Order by requesting reconsideration in order to promote standards CFLs. At publishing time, NYSERDA had just received permission from the PSC to implement a revised lighting program that will include the promotion of standard CFLs.

Consumer Outreach and Education: Directing Consumers to the Right Efficient Lighting Choice

The PAs across the region have produced a wide variety of marketing and educational materials that consistently address the benefits of high efficiency lighting choices, as well as guide consumers in understanding how to buy the right bulb for the right application. Relative to consumer messaging, this update focuses on the following:

- The new EISA standards that took effect in January 2012, as well as the next round of phased in standards in January 2013.
- Helping consumers understand the new Federal Trade Commission (FTC) Lighting Facts labels.
- Federal and national engagement.
- Industry partnerships.
- Assessment of initial outreach efforts.

2 http://www.env.state.ma.us/DPU_FileRoom/frmDocketSingleSP.aspx?docknum=11-120

Research Recommendations

In completing this Update and reviewing the referenced materials, a number of potential research needs emerged. While these proposed efforts could be pursued by individual PAs or at the state level, some would likely benefit from a more coordinated regional approach, including processes such as NEEP's Regional Evaluation, Measurement and Verification Forum. Recommended research activities are grouped by priority level into top tier priority and priority. Top tier priority is viewed as the most crucial in supporting our efforts to transform the lighting market.

Top Tier Priority:

- Conduct regular socket saturation surveys using consistent methodologies (protocols) that yield comparable data to track market progress across the region.
- Compile and disseminate product sales data collected from market lift and other alternative program implementation models, and/or from current program efforts.
- Address LED dimmer compatibility issues.

Priority:

- Perform market research and analysis to better understand the disposition of CFLs sold at retail.
- Understand interactive effects between residential lighting and space conditioning energy use.
- Track LED product pricing at retail.

Savings Remain Large, Cost Effective and Cost Efficient

The most important conclusion presented in the initial RLS was that substantial opportunities remain for PAs to continue pursuing residential lighting savings through their retail products programs and through other residential efficiency programs that promote efficient lighting. These opportunities include continued promotion of both standard and specialty compact fluorescent lamps (CFLs), as well as a ramp-up of support for light emitting diodes (LEDs), both standard (A-lamp form factor) and specialty (reflector, decorative, etc.) LEDs[3]. Lighting will and should continue to be a major component of all residential efficiency portfolios. This key conclusion and recommendation remains unchanged.

The initial RLS estimated regional (New England and New York) first year net savings starting at approximately 512 GWh in 2012 and declining through 2019. The decline in savings was the result of:

- Reduced gross per unit savings due to the 2012-2014 EISA lamp standards
- Falling net to gross ratios reducing per unit net savings
- Fewer products per year sold through PA programs. In the initial RLS, the total number of lamps sold per household started at 2.0 in 2012 and then began declining in 2017. The number eventually fell to 1.6 lamps per household in 2019, the last year for which PA program support is assumed necessary, given the 2020 EISA 45 lumen/watt backstop standard.

The revised 2012-2022 regional net savings estimates are shown in Figure 1-1. The estimated savings potential presented below is significantly higher than that presented in the initial RLS starting at approximately 624 GWh in 2012. Much of these higher savings are the result of assumed increased promotion of standard CFLs. Aggressive PA promotion of CFLs – both standard and specialty – has not always resulted in the expected increase in residential socket saturations as discussed in more detail below. As a result, the remaining opportunities for PA promotion of standard CFLs are likely to be larger than previously estimated. Table 1-1 presents the revised lamp number per household assumed through 2022 in developing the regional savings estimate. The total number of lamps that are estimated to be promoted through PA programs is shown in Figure 1-2. As with the original RLS these lamp numbers are meant to reflect a moderately aggressive level of program activity and may not reflect current or planned program activity at the individual PA or state level.

In addition to the revised lamp numbers, there have been some additional changes in how the updated regional savings estimates have been calculated and presented, including:

- The inclusion of the District of Columbia Sustainable Energy Utility in the regional

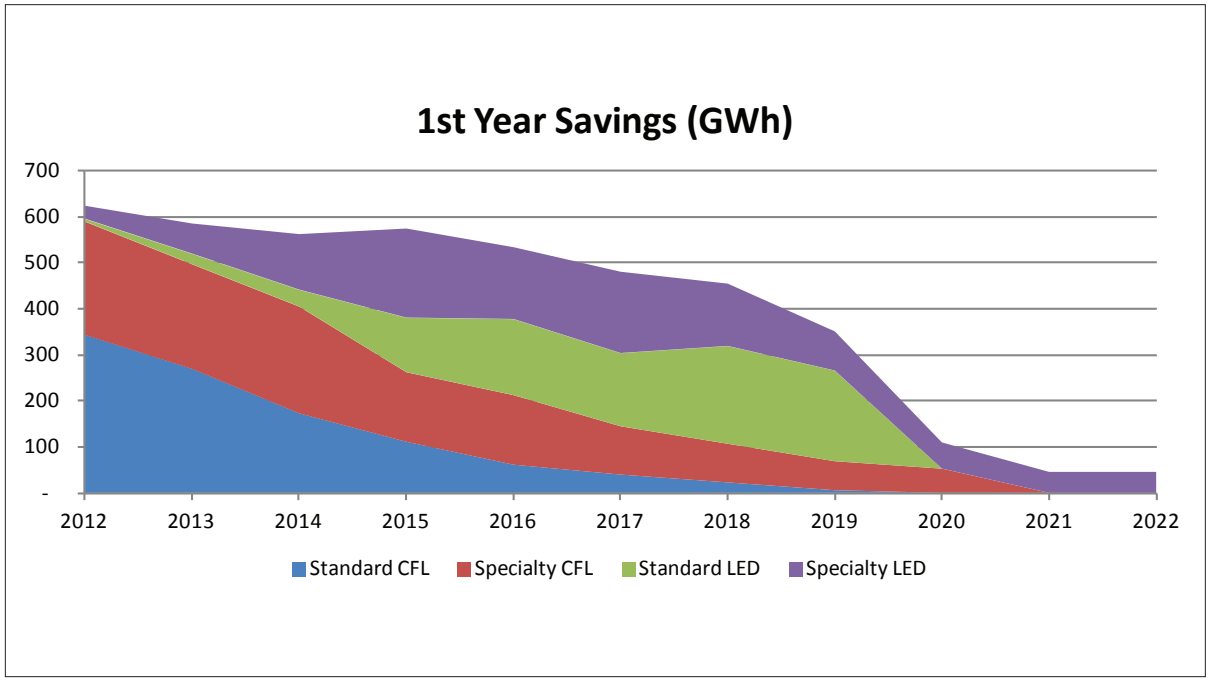
3 Note that while dimmable CFLs are classified as a specialty lamp, dimmability is generally considered an inherent trait of LEDs. Hence, dimmable A-Lamp LEDs are a standard, not a specialty, LED.

savings and incentive budget estimates.

- Splitting out the single LED lamp category into standard (A-lamp) LED and specialty (primarily directional and decorative) lamp types. This allows for better modeling of the 2012-2014 and 2020 EISA standards (restricted to general service lamps, i.e., standard CFLs and LEDs.)
- A phased-in transition to the 2020 EISA 45 lumen/watt backstop requirement through 2022 to better account for inventory clearance.
- Continued PA support for specialty LEDs - which are not currently covered by the 2020 EISA standard – through 2022.
- Revised savings for specialty CFLs to reflect planned 2015 DOE standards for bulge reflector (BR) and elliptical reflector (ER) lamps.

Note that estimated lamp-type net to gross ratios remained largely unchanged in this Update.

Figure 1-1



As clearly noted in the initial RLS, the cost to attain the regional residential lighting savings opportunity will increase over time in both absolute terms and as measured on a per net kWh basis ($/net kWh). This finding remains generally unchanged. These higher costs are driven by increased incentives for LEDs and specialty CFLs and lower per lamp net savings due to federal standards and lower net to gross ratios (NTGRs). Some of these higher costs will be offset by the projected decline in LED prices and, by extension, LED incentives. Even with higher costs per saved kWh, efficient lighting will continue to be an important and cost efficient resource in PAs' residential portfolios.

Table 1-1
Assumed Number of Program Supported Efficient Lamps per Household

Rate of In-Program Bulbs (# per household, per year)											
	2012	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
Standard CFL	1.70	1.80	1.70	1.40	0.90	0.70	0.40	0.10	0.00	0.00	0.00
Specialty CFL	0.65	0.60	0.70	0.60	0.60	0.50	0.40	0.30	0.25	0.00	0.00
Standard LED	0.01	0.05	0.10	0.35	0.60	0.65	1.00	1.10	0.00	0.00	0.00
Specialty LED	0.04	0.10	0.20	0.35	0.35	0.45	0.40	0.30	0.25	0.20	0.20
	2.4	**2.6**	**2.7**	**2.7**	**2.5**	**2.3**	**2.2**	**1.8**	**0.5**	**0.2**	**0.2**

Figure 1-2

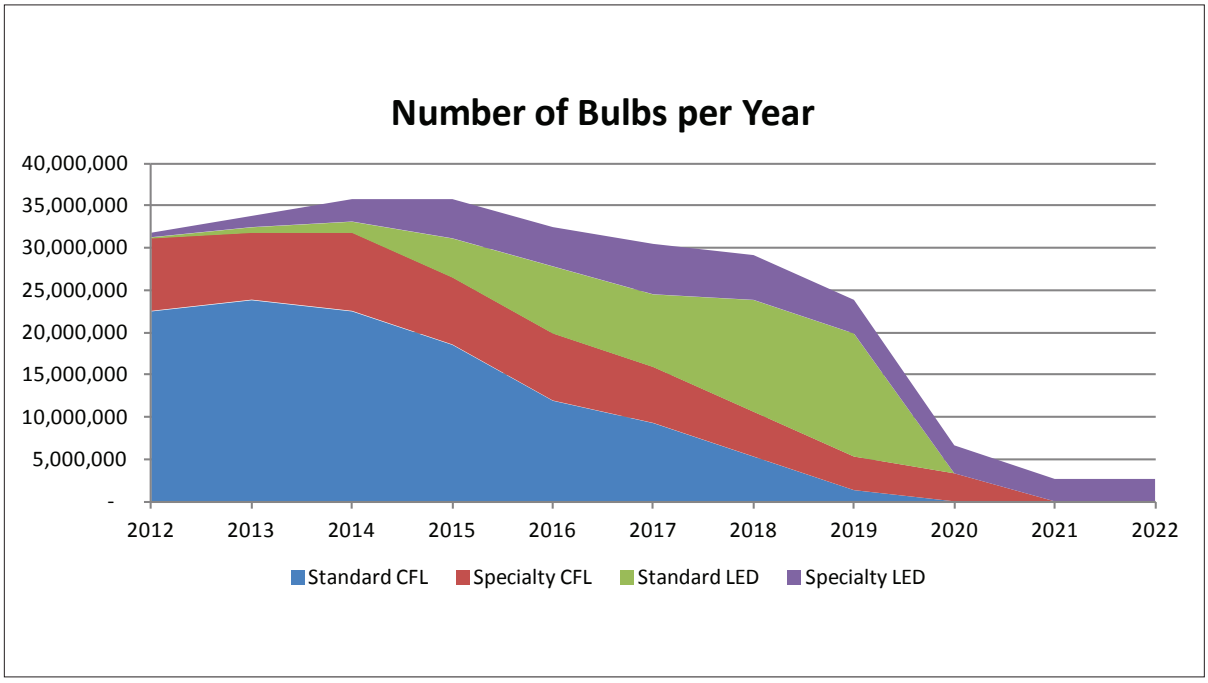


Figure 1-3 shows estimated lighting program incentive budget costs for the region. These costs peak in 2015 and fall through 2019 due to a combination of fewer unit numbers and declining LED incentives. Assumed PA per unit incentives by lamp type are shown in Table 1-2.

Figure 1-3

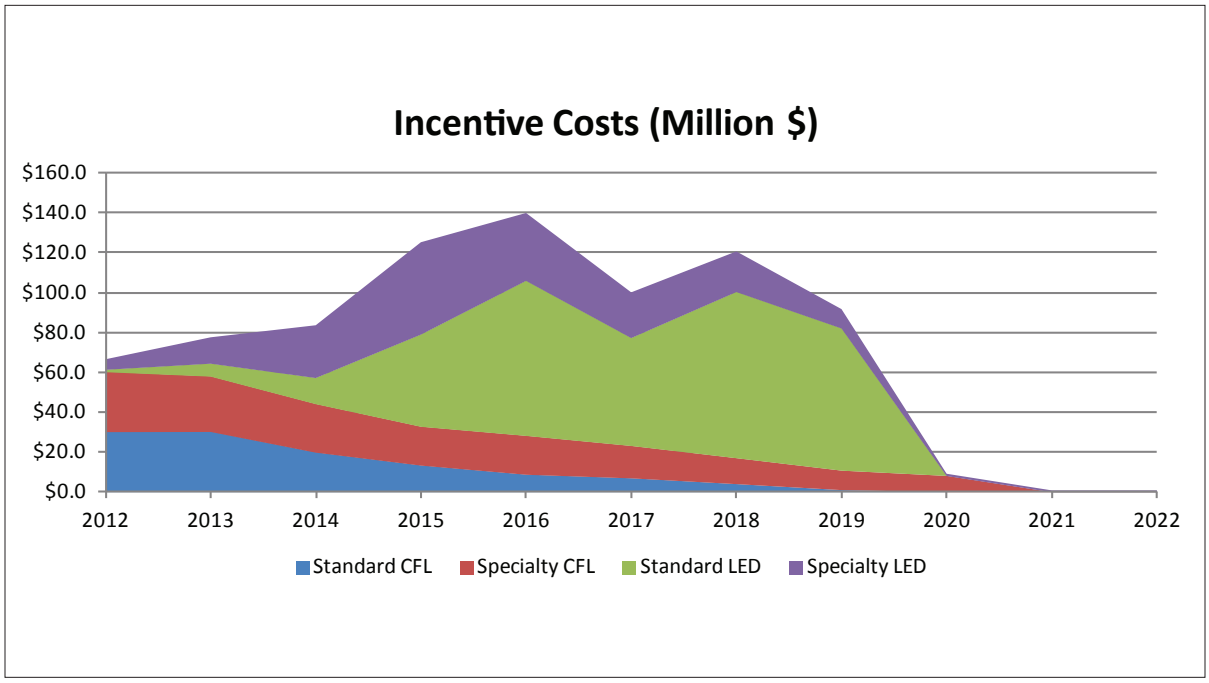


Table 1-2
Estimated PA per Lamp Incentives

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Standard CFLs	$1.33	$1.26	$0.88	$0.71	$0.73	$0.74	$0.75	$0.77	$0.00	$0.00	$0.00
Specialty CFLs	$3.50	$3.50	$2.63	$2.45	$2.45	$2.45	$2.45	$2.45	$2.45	$0.00	$0.00
Standard LEDs	$10.00	$10.00	$10.00	$10.00	$9.80	$6.30	$6.30	$4.90	$0.00	$0.00	$0.00
Specialty LEDs	$10.00	$10.00	$10.00	$10.00	$7.35	$3.85	$3.85	$2.45	$0.35	$0.35	$0.35

Lighting programs have been attractive to PAs and to regulators given their historically low cost per saved kWh. As in the initial RLS, estimates of 2012-2019 costs per first year saved kWh generally increase for CFLs and decrease for LEDs (Figures 1-4 and 1-5). For all lamp types, the incentive cost per first year net kWh saved increases from $0.11/kWh in 2012 to $0.26/kWh in 2019. On a lifetime basis, these figures increase from $.014/kWh in 2012 to $.043/kWh in 2019. Note that these $/kWh values only reflect estimated program incentive costs and are not directly comparable to values calculated from PA screening models. For jurisdictions using the total resource cost (TRC) test, this analysis would also include non-incentive PA program costs, customer costs, and the value of the incandescent or halogen lamps not installed due to longer CFL and LED measure lifetimes.

Figure 1-4

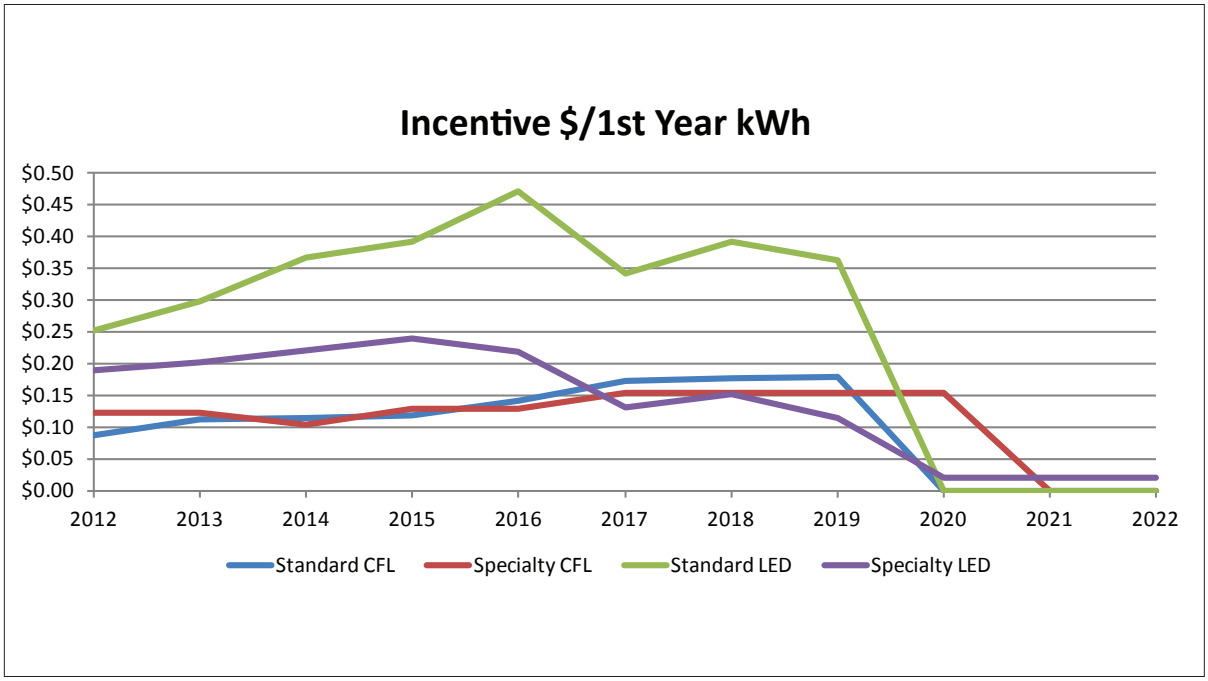
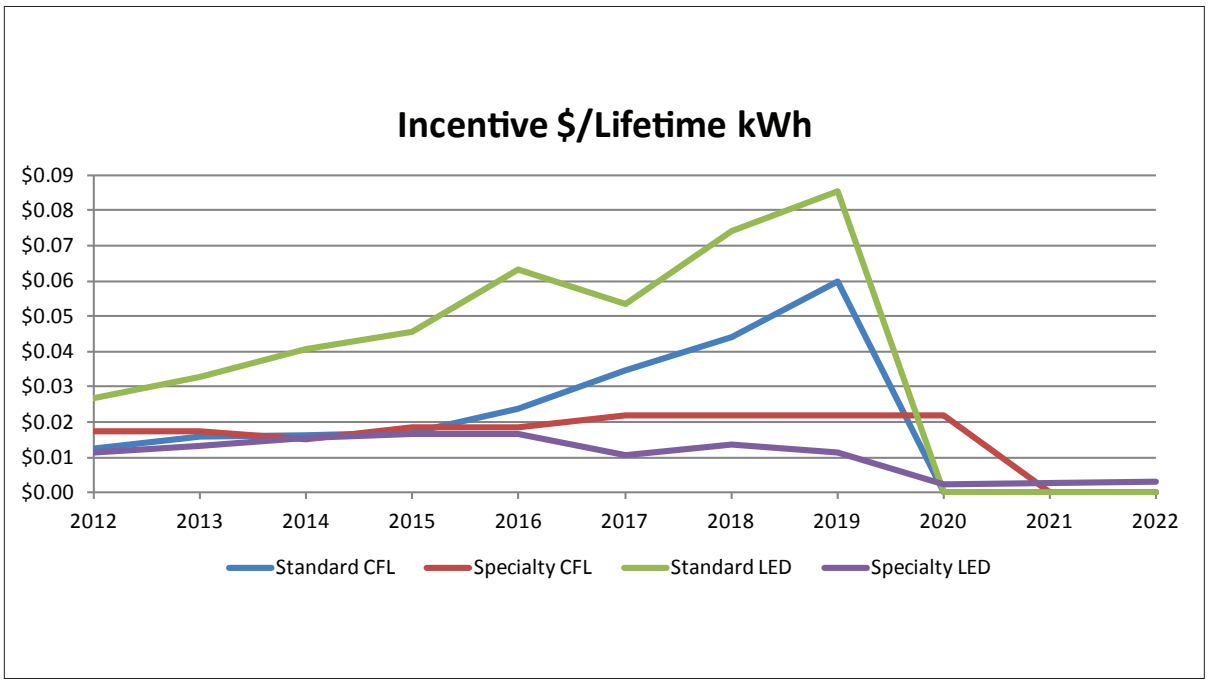


Figure 1-5



High Level RLS Milestones and Strategies Are Largely Unchanged

While there have been some significant changes in the residential lighting landscape in the Northeast, Mid-Atlantic and nationwide over the past year, the RLS continues to **strongly support a regional goal of achieving a 90 percent efficient lighting socket saturation** (45 lumens/watt or better) by 2020. In comparison, the initial RLS estimated a regional residential efficient lighting socket saturation of approximately 36 percent in late 2011, consisting of 27 percent CFLs, eight percent linear fluorescent lamps, and less than one percent LEDs. The remaining near-term opportunity for significant residential lighting savings remains large. In order to achieve these savings, the initial RLS outcomes and milestones remain intact, with only one strategy element—promotion of 2X halogens—removed from the strategy list.

To fully achieve the high levels of remaining cost-effective residential lighting savings, NEEP recommended a set of ten comprehensive strategies, each consisting of more detailed near- and longer-term actions and considerations. These strategies are summarized below and, with the exception of strategy #3, the RLS strategies remain largely unchanged:

1. **Aggressively support CFLs through retail products, income eligible, existing homes, and new construction programs to maintain residential lighting savings levels.** With current saturations in the 25 to 30 percent range throughout most of the region, CFLs will continue to offer significant, cost effective and cost efficient savings in the near to midterm.
2. **Ramp up promotion of ENERGY STAR LEDs**. PAs will increase their promotion of LEDs as products improve and become more readily available, and as prices become more competitive.
3. **DELETED: Consider limited duration promotion of 2X halogens (i.e., halogen lamps that are twice the efficiency of standard (pre-EISA) incandescents and twice the lifetime).** Based on feedback from the RLS Advisory Group, proposed support for 2x halogens has been removed as a regional residential lighting program strategy. In making this change, Advisory Group members noted the lack of a commercially available product, the limited timeframe during which this technology would be supported, and concerns regarding customer confusion by adding yet another technology choice to programs.
4. **Pursue alternative program and promotional approaches and/or markets to maximize impacts while minimizing potential free-ridership.** These include, but are not limited to, market lift.
5. **Deliver a clear and consistent message to consumers on efficient lighting choices.** All parties in the region are strongly committed to and have produced consistent educational and marketing materials that provide consumer knowledge of how to select efficient lighting products. With coordination with national and industry

efforts, this messaging is pivotal in ensuring consumer satisfaction and increased adoption of high efficiency lighting products.

6. **Support adoption and implementation of strong lighting efficiency requirements in building energy codes and 2020 EISA standards.** Continued input to federal processes is needed to set future lighting standards that reflect the market adoption of lighting products in the Northeast, as well as integration of lighting efficiency into national model building energy codes and, eventually, state building energy codes.
7. **Ensure that PA efforts are focused on promoting quality lighting products.** Continued vigilance is required on the federal level to ensure that quality assurance processes and certification bodies are robust to maintain a high level of lighting product quality and performance that will meet or exceed consumer expectations. Efficiency programs must provide feedback about current and future quality assurance procedures and participate in product selection processes to evaluate incentivized products.
8. **Develop and implement regional systems to track key product and market data to inform program design, implementation and evaluation.** This strategy is being addressed, in part, by NEEP's EM&V forum and by planned implementation of CFL market lift pilots by several PAs in early 2013.
9. **Engage regulatory bodies early to reinforce need for continued and aggressive PA engagement in the residential lighting market and to limit regulatory uncertainty.** All parties reinforce the message that 2012-2014 EISA standards will not diminish the need for continued residential lighting market intervention using a range of high efficiency lighting products: CFLs are not the baseline. Support a multi-year strategy to transform the residential lighting market with flexible programs responsive to market developments. New approaches to program evaluation, particularly with regard to cost-effectiveness, must be considered to continue achieving the ever-increasing efficiency goals in the region.
10. **Implement process to continue regional lighting engagement on an on-going basis.** NEEP supports and facilitates the engagement and input from lighting stakeholders on a yearly basis to ensure that the RLS Updates reflect the most current market, regulatory, PA and other related lighting changes and activities.

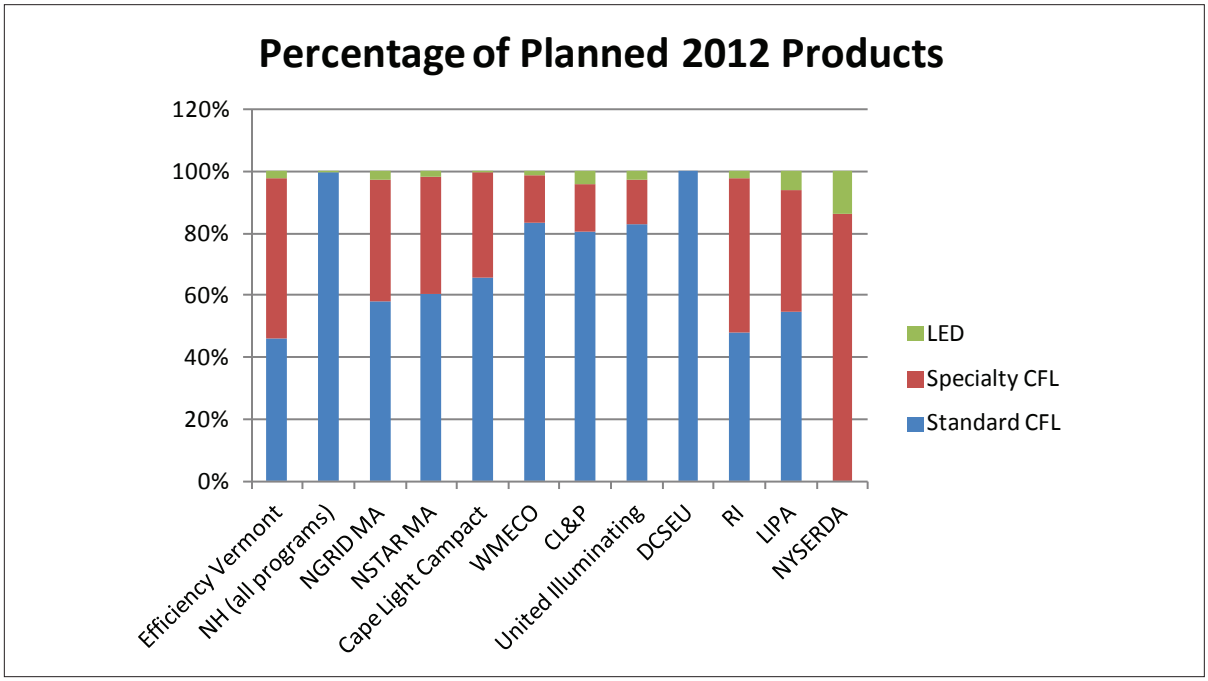
Current and Planned Program Administrator Efforts

With one important exception noted below and discussed in more detail in the regulatory update, all residential lighting programs in the region have continued or expanded their commitment to residential lighting. Of interest over the past several months:

- The Washington, D.C. Sustainable Energy Utility (DC SEU) began providing upstream incentives for CFLs through its retail lighting programs in mid-summer of 2012
- Several statewide efficiency programs either attained CFL program sales of over 2.5 CFLs per household in 2011 and/or plan to do so in 2012. Efficiency Maine, Efficiency Vermont and the Connecticut retail lighting programs all exceeded 2.5 CFLs per household in 2011, with the Connecticut program achieving sales of 3.2 CFLs per household.
- With the exception of Efficiency Maine and D.C. SEU, all PAs in the region currently offer—or will do so later in 2012—LED fixture and/or lamp incentives. Figure 1-6 provides a breakout of residential lighting program support by technology for many retail lighting programs in the region.
- Of those PAs that do support LEDs, many have decided not to provide support for the ENERGY STAR nonstandard lamp category, due to concerns regarding potential customer dissatisfaction arising from misapplication of these lamps.
- Efficiency Maine distributed 300,000 CFLs through the Good Shepherd Food Bank network in 2011.
- PAs in Massachusetts, Vermont and Rhode Island plan to implement CFL market lift pilots.
- A number of PAs in the region are sponsors of TopTen USA, including Efficiency Vermont, Connecticut Light and Power, and the United Illuminating Company; they plan to utilize this platform in their filings as an opportunity to drive consumers to the highest efficiency products. PAs in Massachusetts and Rhode Island are also planning to join TopTen for 2013 program implementation.
- Several PAs have plans this year to offer LEDs as a direct install option as part of their low income, existing home, or residential new construction programs. For example, Connecticut PAs plan to offer LEDs as an option—with a customer co-pay—under their Home Energy Solutions existing homes retrofit program. Connecticut PAs have gone out to bid to obtain bulk purchase pricing for LEDs for their Home Energy Solutions (HES) Program. This program currently serves about 50,000 customers a year (including low income customers) and installs an average of 18 CFLs per household.
- While NYSERDA had stopped supporting standard CFLs as a result of an October 2011 order from the New York Public Service Commission, their request for reconsideration was accepted. This is discussed in more detail in the regulatory section below.

A comprehensive listing of 2012 Northeast Residential Lighting Efficiency Program Elements can be found in Appendix C.

Figure 1-6



Note that NH and DCSEU programs do not separate out standard and specialty CFLs. Both programs will promote specialty CFLs in 2012.

Recent and Planned Program Evaluation and Market Research Activities

Socket Saturation Surveys: Three statewide onsite socket saturation surveys were completed in late 2011 and early 2012 in Connecticut, Massachusetts and Vermont (still in draft). Of note are the small changes in the CFL saturation estimates in Connecticut and Massachusetts compared to previous estimates. In Connecticut, the CFL socket saturation increased from 23 percent to 27 percent over approximately 30 months[4]. In Massachusetts, the CFL socket saturation increased only one percentage point from 26 percent to 27 percent over approximately 18 months[5]. Both Connecticut and Massachusetts PAs aggressively promoted CFLs in the timeframe between the two surveys.

Reasons for the small changes in the measured socket saturations might include:

- Some number of program supported CFLs being installed in commercial establishments. EVT estimates that 10.5 percent of CFLs through its retail products program

4 Connecticut Efficient Lighting Saturation and Market Assessment. Submitted to the Connecticut Energy Efficiency Fund, Connecticut Light and Power and The United Illuminating Company. NMR Group, Inc. October 2, 2012.

5 Results of the Massachusetts Onsite Compact Fluorescent Lamp Surveys. Submitted to the Massachusetts Energy Efficiency Advisory Council, Cape Light Compact, NSTAR, National Grid, Unitil, Western Massachusetts Electric. NMR Group, Inc. October 23, 2012.

are installed in commercial establishments.

- Similarly, CFLs installed in common spaces in multifamily dwellings were not included in the socket saturation analyses.
- "Leakage" of program supported CFLs to outside the supporting jurisdictions.
- CFLs replacing CFLs rather than incandescent lamps. Over half of Connecticut telephone survey respondents stated that purchased CFLs would be used to replace failed CFLs.
- Overall growth in the number of sockets per household.
- Some sockets previously occupied by CFLs being replaced at failure by incandescent or halogen lamps.
- Limited ability to directly compare the previous and past values given the sample sizes used and the confidence intervals associated with the socket saturation estimates.
- Possible differences in the onsite data collection protocols and quality control/quality assurance procedures.

The Connecticut and Massachusetts program evaluator is currently revisiting the socket saturation results to better understand what the disposition is of CFLs purchased at retail.

In comparison, the CFL saturation in Vermont increased from an estimated 17 percent (estimate based on a 19 percent socket saturation result that did not include fluorescent tubes and circlines) to 30 percent (33 percent not including fluorescent tubes and circlines) over approximately a three-year timeframe[6].

The small increases in socket saturation in Massachusetts and Connecticut may raise some challenges for how best to use socket saturation as a primary metric of residential lighting program performance. There were relatively aggressive levels of program activity in both states in the timeframe between their respective 2010 and 2012 socket saturation surveys. Connecticut in particular had a very aggressive retail CFL program. The Connecticut PAs had a shareholder performance incentive tied to attaining a 36 percent CFL socket saturation by the end of 2011. In 2010 and 2011 their retail products program sold 5.28[7] million and 4.72 million CFLs[8], respectively, in a state with approximately 1.5 million housing units.

LED Bulb Dimmer Compatibility: While LEDs generally dim better than their CFL counterparts, not all LEDs dim well, in large part due to lamp/dimmer compatibility issues. The Cape Light Compact (CLC) is completing a limited field study (approximately 16 sites) to do pre-and post-metering of homes that have LEDs installed in dimming circuits. The post data

6 "Draft residential socket saturations from the 2012 Vermont Residential Market Assessment. Final report and residential socket saturation results are due 4th Qtr 2012."

7 Connecticut Energy Efficiency Fund. Connecticut's Investment in Energy Efficiency - 2010 Report of the Energy Efficiency Board. March 1, 2011, p10

8 Connecticut Energy Efficiency Fund. *2011 Report of the Energy Efficiency Board. March 1, 2012. p10.*

will reflect operation with newly installed LED-compatible dimmers. The CLC's evaluation contractor will also complete a short customer satisfaction and behavior survey. Results are expected by the second quarter of 2013.

Lighting Hours of Use: In the latter half of 2012 a number of PAs in the region agreed to undertake a regional residential hours of use (HOU) study. By the end of 2012 participant recruitment and logger installations were underway in Massachusetts and Rhode Island. Recruitment in New York (except for Nassau and Suffolk counties) and Connecticut was scheduled to begin in early 2013. Across all four states, loggers will be installed in a total of 406 residences. In addition to this regional HOU study, two other residential lighting HOU studies were ongoing or planned in the region. NYSERDA plans to do a related HOU oversample of 123 residences in high rise buildings in New York City. Massachusetts has a separate lighting HOU study underway that is targeted to low income residences. Loggers will be installed in 264 low income dwellings.

Building Energy Codes and Federal Lamp Standards

Activities outside the region will also have a considerable impact on the direction of residential lighting program efforts. These include mandatory requirements established through federal equipment standards and those mandated by state or local building codes. Federal equipment standards — most notably EISA as the 2012-2014 general service lamp standards phase in — will directly affect gross savings claims for general service CFLs and LEDs in both retail products and direct install residential lighting program efforts. Further, the 2020 45 lumen/watt backstop standard significantly reduces the savings claims that can be made for efficient lighting products beyond that date, regardless of when the lamps are installed. This issue is discussed in more detail in the regulatory section.

Recent codes and standards highlights include:

- Federal EISA lamp standards began being phased in for higher wattage lamps (100 watt and greater incandescent equivalents). As the federal standards are a manufacturing (not sales) prohibition, it was expected that covered lamps would remain on the shelf beyond the standards effective date. Through mid-2012, anecdotal evidence supports this contention. Research in California suggests that although the federal standards were applied one year earlier there—in early 2011—about 50 percent of surveyed retailers still had 100W incandescent bulbs on shelves.
- States are beginning to consider adoption of the residential 2012 International Energy Conservation Code (IECC 2012), which requires that 75 percent of all permanent interior and exterior lighting[9] be efficient (45 lumens/watt or greater). However, no state is likely to have this new code in effect until mid-2013 at the earliest (Table 1-3). Nonetheless, for ongoing 2013 and multi-year program planning, PAs will need to seriously consider the impact of energy code lighting requirements on residential new construction (RNC) program savings and, potentially,

9 Low voltage lighting is excluded

on program cost effectiveness. Given the low penetrations of electric heat and hot water in new construction and the relatively low cooling loads in most of the region, most RNC programs rely on efficient lighting for most of their electricity savings. For example, Massachusetts PAs project that approximately 71 percent of their 2012 RNC savings will come from lighting.

- Several states, as well as a Regional EM&V Forum effort, are developing attribution models that recognize PA engagement in codes and standards support and will potentially allow them to claim savings for relevant program activities. While the new 2012 IECC lighting requirements may significantly reduce and potentially eliminate PA lighting savings claims for their RNC programs, there may be challenges as to compliance with these code provisions; residential lighting efficiency is not an area that builders, electricians and code officials have typically focused on from a codes perspective. If PAs support compliance of these energy code lighting provisions, energy savings attribution models may offer an opportunity for PAs to claim savings from these efforts.

Both Massachusetts and Rhode Island are currently investigating this savings attribution opportunity (focusing on efforts to support code compliance), which will also be informed by a national codes attribution project NEEP is managing through the Regional EM&V Forum. A report is expected in the first quarter of 2013 and is guided by an advisory committee represented by states and national organizations. The project is jointly funded by CLASP via the Institute for Market Transformation (IMT), the Institute for Energy Efficiency and NEEP sponsor funding for NEEP's Public Policy Outreach.

Table 1-3
NEEP Summary of Regional Energy Codes and Planned Updates

Jurisdiction	Current Edition (Residential/Commercial)	Date Adopted	Considering	Possible Date	Comments
CT	IECC 2009 R&C	Sep-11	IECC 2012 R&C	Mar-14	Started Codes Action 3/12
DC	IECC 2006	Dec-11 passed	IECC 2009	2013 or 2014	Comment period ends in Jan-13 for a Q1 hearing
DE	IECC 2009/90.1-07	Jul-10		Jun-14	Working Group begun
ME	IECC 2009 R&C	Jun-10	Rescinded	???	Statewide adoption rescinded (opt-out)
MD	IECC 2012/90.1-10	Jan-12		DONE	Counties must adopt by Jan-13
MA	IECC 2009 R&C	Jan-10		Jul-13	BBRS to act in July-13; Sep-13 on 'Stretch' code
NH	IECC 2009 R&C	Apr-10		???	Ratified by NH legislature 6/12
NJ	IECC	Sep-10	IECC 2012/ 90.1-10	Jan-14	Must consider 2012 this year
NY	IECC 2009/90.1-07	Dec-10		Jul-13 (Comm.) 2014 (Res.)	Process accelerating for Comm.
RI	IECC 2009 R&C	Jan-10	IECC 2012 R&C	Jan-14	Started Building Code & Standards fall-12
VT	RBES 2011/ CBES2011	Oct-11 & Jan-12		2014	RBES is based on IECC 2009. Have yet to begin revision
NYC	IECC 2006 R&C	Jul-08	IECC 2012/ 90.1-10	Jan-14	

Voluntary Lamp Specifications: ENERGY STAR and TopTen USA

ENERGY STAR Lamp Specifications

The Environmental Protection Agency (EPA) continued developing a single ENERGY STAR lamp specification. EPA circulated a second draft of the ENERGY STAR lamps V1.0 specification[10] on July 6 to stakeholders. Draft 1proposed a technology neutral lifetime requirement of 10,000 hours. The Draft 2 specification requirement has been changed to 15,000 or 25,000 hours for LEDs, depending on lamp type, and 10,000 hours for CFLs. Other key changes in the Draft 2 specification, as outlined in the accompanying cover letter[11] from EPA, include:

- The Elevated Temperature Life Test is now proposed only for directional and semi-directional lamps, and for omni-directional lamps greater than or equal to 10 watts. Decorative lamps, typically installed in applications with adequate air circulation and lower ambient temperatures, are exempt from this proposed requirement.
- A commercial grade performance tier has been added to the specification. Elevated performance requirements have been proposed for lumen maintenance and reliability, power factor and warranty. In addition, commercial grade lamps are proposed to meet more stringent elevated temperature testing requirements, as applicable.
- MR-16 lamps, both low- and line-voltage versions, have been introduced to the specification scope. Consistent with data from the U.S. Department of Energy (DOE) showing that the majority of low-voltage MR-16 lamps in the U.S. are installed in commercial applications, the draft includes a proposal that these lamps meet the proposed new commercial tier requirements to earn the ENERGY STAR label.

In an effort to address the issue of lamp dimmability as part of their next draft (3) of the lamps specification, EPA launched an ad hoc committee in October, 2012 to develop some basic requirements that lamps must meet in order to carry a "dimmable" label and the ENERGY STAR certification. EPA has made it clear that they intend on including this set of proposed criteria as part of the forthcoming draft spec, estimated for early 2013. ENERGY STAR is relying on a number of ongoing efforts to help inform their proposed requirements and associated test procedures. The National Electrical Manufacturers Association (NEMA), the Lighting Research Center (LRC) and Pacific Northwest National Laboratories (PNNL) have all been leading efforts to address various issues involving measuring dimming capabilities of high efficiency lighting, namely CFL and LED technologies.

10 http://www.energystar.gov/ia/partners/prod_development/new_specs/downloads/lamps/V1.0_Draft_2_Specification.pdf?f736-e2cb

11 http://www.energystar.gov/ia/partners/prod_development/new_specs/downloads/lamps/V1.0_Draft_2_Cover_Letter.pdf?0141-74b9

Top Ten LED PAR Lamp Specifications

TopTen USA[12], an ENERGY STAR Partner supported by NEEP and several PAs in the region[13],has teamed up with The Institute for Electric Efficiency (IEE) and Ecova to identify the ten best LED PAR38 and PAR30 reflector bulbs on the market. The study will measure not only energy-related qualities—efficiency, payback period, and lifetime cost savings—but also how each bulb compares with a halogen incandescent bulb in its light quality, dimming capability and other factors. A mix of bench tests and human observation, the study is being overseen by a technical committee that includes experts from ENERGY STAR, nongovernmental organizations, utilities, and the energy efficiency community. Funding is currently provided by DTE Energy, Southern California Edison, Pacific Gas & Electric, Progress Energy, and MidAmerican Energy. Rankings of the top ten bulbs will be released through the TopTenUSA.org website in December and also published by IEE. The TopTen USA LED PAR lamp list will complement ENERGY STAR's more extensive lamp list by highlighting LED PAR lamps that provide the greatest energy savings and overall performance quality in the PAR 30 and PAR 38 categories.

Currently the evaluation of these two lamp categories is in draft form and IEE and TopTen USA welcome input into its process. Under one proposed approach, to be considered a candidate for full evaluation, a lamp must meet the following initial criteria:

- Meets ENERGY STAR program requirements for integral LED lamps, version 1.4 and is present on the ENERGY STAR Qualified Products List on or before 3 July 2012.
- Exceeds the Energy Efficiency minimum efficiency requirements by a percentage to be determined.
- Must use LED technology; CFLs are not being evaluated.
- Falls within one of two size and shape combinations: PAR38 or PAR30.
- Data on key product attributes (e.g. CRI, CCT) is publicly available.
- The products are widely available for purchase, either online or through a bricks-and-mortar retailer.
- The lamps fall within the "warmer" CCT range of 2700-3000K.

TopTen, IEE and Ecova, along with the TopTen USA LED Advisory Panel, are reconsidering both the categories and the weighting to be used in selecting the top ten PAR 30 and PAR 38 bulbs and it is likely that significant changes will be made.

12 http://www.toptenusa.org/LED-Lighting

13 Connecticut Light & Power and United Illuminating with the Connecticut Energy Efficiency Fund, and Efficiency Vermont are currently TopTen sponsors, though EVT does not plan to incorporate aspects of TopTen into its programs until 2013. PAs in Massachusetts and Rhode Island plan to join TopTen and include it in their 2013 programs.

Product Quality Assurance Testing: The Continued Need for Third Party Testing

Program administrators in the Northeast have a long-standing commitment to support quality assurance testing of efficient lighting. Many PAs – as well as NEEP – were early and active supporters of the CFL third-party testing administered through the Program for the Evaluation and Analysis of Residential Lighting (PEARL). PEARL's efforts helped lay the foundation for subsequent lighting product testing by ENERGY STAR and DOE.

Current activities to address lighting product quality include:

- U.S. EPA's ENERGY STAR CFL third-party verification testing.
- DOE's Commercially Available LED Product and Reporting (CALiPER) program.
- DOE's LED Light Facts product list.

ENERGY STAR CFL Third-Party Verification Testing

To ensure consumer confidence in the ENERGY STAR label and to protect the investment of ENERGY STAR manufacturing partners, EPA requires all ENERGY STAR products to be third-party certified. This requirement includes product testing in an EPA-recognized laboratory that meets international standards for quality and competency, review of the product by an EPA-recognized certification body to determine ENERGY STAR eligibility, and ongoing testing to ensure that products continue delivering superior energy efficiency and performance.

ENERGY STAR is performing verification testing on 20 percent of products in each lighting category, including fixtures. All PAs are encouraged to submit nominations and rationale for testing. NEEP serves on U.S. EPA's Product Selection Working Group to track this testing program and facilitate NEEP Sponsor input and recommendations for product testing and results application.

In 2011 ENERGY STAR completed two batches of lighting verification testing on 104 CFLs and 13 luminaires.[14] Of these, 32 CFLs and four luminaires were disqualified. Note that these models represent unique products and do not reflect that many lighting products are private labeled and sold under multiple brand names. For example, the 68 products tested in Batch 1 in 2011 represented 675 qualified products, or 13.7 percent of the then current total qualified product list.[15]

14 U.S. Environmental Protection Agency ENERGY STAR Labeled Products: Verification Testing. 2011 Summary. http://www.energystar.gov/ia/partners/downloads/2011_ES_Verification_Testing_Summary_Final.pdf?fc61-956c

15 ENERGY STAR CFL Third Party Testing and Verification. Cycle 1: Results. Final Report: Cycle 1. D&R International. May 2011. http://www.energystar.gov/ia/partners/downloads/Cycle_1_Final_Report_Public_7-18-11.pdf

Figure 1-6 summarizes the Batch 2 test results. These results[16] were published in February 2012. Key findings from the report's Executive Summary include:

- **Performance on individual tests was mixed.** Every model in Batch 2 passed the Efficacy, Starting Time and Color Rendering Index Tests. The proportion of models that passed each of the remaining seven tests ranged from 79 percent on the Rapid Cycle Stress Test to 97 percent on the Power Factor Test.
- **Specialty and covered lamps failed at a higher rate than bare spiral models.** While 62 percent of the bare spiral models tested passed all initial tests, only 29 percent of bare specialty models and 21 percent of covered models passed all initial tests. Note that the number of specialty CFL models tested was considerably smaller than the number of bare spirals and this finding may not apply to the full population of ENERGY STAR qualified CFLs.
- **Of the 29 lamps in Batch 2 that failed one or more tests, 20 failed just one test, but nine failed two or more tests.** Of these nine, one was bare spiral, two were bare specialty and six were covered models. Further, 21 of the failed models significantly underperformed on at least one of the failed tests, meaning the model's measured performance was more than two standard deviations away from the mean value. Similar results were observed among Batch 1 models.
- **A minority of manufacturers with models in Batch 2 had all their tested models pass all ten tests.** Among the six manufacturers that had five or more models tested, two had only one failure, three had about half of their tested models fail and one had four of its five tested models fail. This variation among manufacturers is consistent with the findings of the Program for the Evaluation and Analysis of Residential Lighting (PEARL).
- **Use care when generalizing from the test results described in this report to the entire market of ENERGY STAR qualified CFLs**. The sample of models tested is not representative of ENERGY STAR shipments, nor is it perfectly representative of the current list of ENERGY STAR qualified models. Nevertheless, the test results are the best data available on the performance of ENERGY STAR qualified CFLs sold at retail.

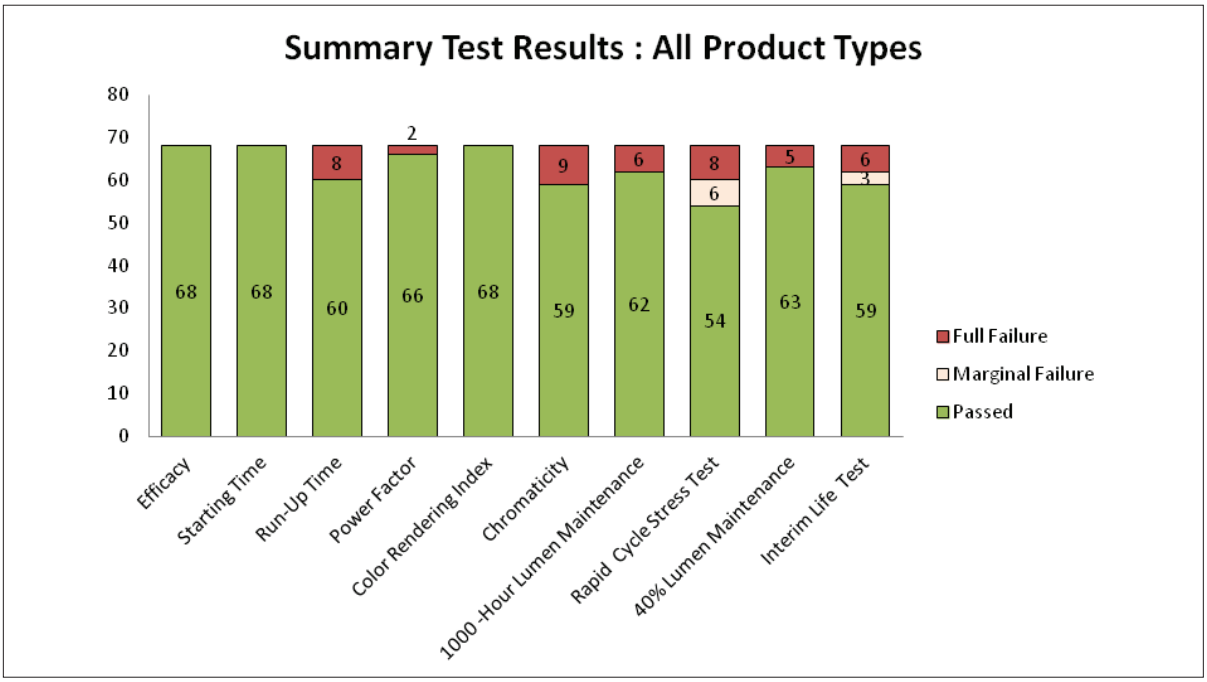
Verification testing of LEDs has been delayed in anticipation of an earlier completion date of the new ENERGY STAR Lamps specification. EPA intends to begin LED verification testing as soon as possible, but plans to consider the practicality and burden on manufacturers and test labs as to which specification to test to if the new Lamps specification is finalized soon.

16 ENERGY STAR® CFL Third Party Testing and Verification: Off-the-Shelf CFL Performance, Trends, and Implications. D&R International http://www.energystar.gov/ia/partners/downloads/ENERGY_STAR_CFLs_Batch_2_Report_Public_Feb_2_2012.pdf?00af-7548

More information about ENERGY STAR's third-party verification process can be found at www.energystar.gov/integrity[17], including verification testing results, disqualified products and other pertinent information about ENERGY STAR's quality assurance processes.

NEEP recommends that Northeast and Mid-Atlantic efficiency programs stay involved in these ENERGY STAR processes by providing feedback on specification changes, along with product nominations for testing, and ensuring that the current testing protocols meet the needs of the programs by continually maintaining the highest standards in quality assurance measures. NEEP will continue to keep NEEP Sponsors informed and assist their participation to maintain vigilance on this crucial issue of product quality and performance.

Figure 1-7
Summary of ENERGY STAR CFL Batch 2 Verification Testing



U.S. DOE CALiPER LED Product Testing

DOE has been testing general luminance LEDs since 2006 through the CALiPER Program. In 2012 DOE completed and published the results from several additional CALiPER testing rounds including:

- Exploratory Study. Retail Replacement Lamps – 2011[18]
- Application Summary Report 16: LED BR30 and R30 Lamps[19]

17 http://www.energystar.gov/index.cfm?c=partners.pt_es_integrity

18 CALiPER Exploratory Study. Retail Replacement Lamps – 2011. Prepared for the Solid-State Lighting Program, Building Technologies Program, Office of Energy Efficiency and Renewable Energy, U.S. Department of Energy. Prepared by Pacific Northwest National Laboratory. April 2012.

19 CALiPER Application Summary Report 16: LED BR30 and R30 Lamps. Prepared for the Solid-State Lighting

The retail replacement lamp study tested 38 different lamp models covering a number of different lamp types: A19, G25 (globe), MR 16, PAR20, and PAR 30. This was a follow-up to a similar test series completed in 2010. For the 2011 study the lamps were purchased at retail in the Portland, OR, Richland, WA and Boston, MA areas or from online retailers.

The results of the second retail replacement lamp study indicate substantial improvement across many performance characteristics, as well as better performance at a given price. Besides notable increases in lumen output and efficacy, retailers stocked more products that performed as indicated by manufacturer's claims. Also, more products included the ENERGY STAR and/or LED Lighting Facts labels, equivalency claims were more accurate and color quality improved. Specifically, in comparison to the first retail replacement lamp study:

- There continued to be a range in performance, but fewer products were considered unacceptable in terms of lumen output, efficacy and color quality.
- A much higher percentage of products had performance similar to the incandescent and compact fluorescent (CFL) lamps they were intended to replace.
- Many more products were listed by LED Lighting Facts or were ENERGY STAR qualified; this is likely to foster more effective consumer evaluations.
- With a much higher percentage of products measured within tolerance of listed performance values, there were fewer obvious disparities between different manufacturers and different retailers.[20]

The second 2012 CALiPER report presented the results from the test of 13 LED lamps labeled as BR30 or R30. Key findings from this study included:

- Many of the LED lamps tested could be effective replacements for conventional directional lamps if used in the right application
- The lumen output of many of the products was equivalent to 65 lumen/watt or 75 lumen/watt incandescent BR30/R30 lamps, and all emitted between 450 and 860 lumens
- Efficacy ranged from 51 to 91 lumen/watt, although all except one of the products was between 51 and 65 lm/W
- More than half of the LED products tested had luminous intensity distributions similar to compact fluorescent (CFL) R30 lamps, with wider beam angles than are typical of conventional incandescent directional lamps.[21]

NEEP will continue keeping Sponsors and other stakeholders informed of CALiPER test results through TINSLL, a regular newsletter and information dissemination service undertaken in cooperation with U.S. DOE and Pacific Northwest National Laboratory.

Program, Building Technologies Program, Office of Energy Efficiency and Renewable Energy, U.S. Department of Energy. Prepared by Pacific Northwest National Laboratory. July 2012

20 CALiPER Exploratory Study. Retail Replacement Lamps – 2011. Op. cit. p2.

21 CALiPER Application Summary Report 16. Op. cit. p2.

DOE Lighting Facts

DOE's Lighting Facts program requires that manufacturers submit test data on five key performance criteria: lumens, wattage, lumens/watt, color rendering index (CRI) and correlated color temperature (CCT). An analysis of the 4,400 LED lamps and luminaires registered in the DOE Lighting Facts database as of March 2012 revealed[22]:

- All 176 LED A-lamp replacements listed met the 2012-2014 standard efficacy levels and 97 percent of LED A-lamp replacements listed in 2011 or later met the 2020 federal efficacy requirement of 45 lumens per watt
- Excluding products listed before 2011, about 23 percent of LED products produce less than 450 lumens, 52 percent of LED A-lamp replacements produce 450 lumens or more (40 watt incandescent A-lamp equivalent), 23 percent of LED replacement meet or exceed 800 lumens (60 watt incandescent A-lamp equivalency), less than 1 percent meet or exceed 1100 lumens (75 watt incandescent A-lamp equivalency) and none meet or exceed 1600 lumens (100 watt incandescent A-lamp equivalency).
- Of 873 LED PAR and R lamps in the database, the highest output lamps can meet incandescent or halogen reflector lamp equivalency levels (based on light output alone) up to 90W PAR38, 70W PAR 30 and 50W PAR 20.

Regulatory Activities that Will Affect Lighting Program Efforts

Successful transformation of the residential lighting market requires a supportive regulatory environment. This includes a long-term planning perspective and considering how best to address lighting measure free ridership. Developing multi-year planning perspectives and exploring alternatives to traditional net to gross measurements are among some of the recent regulatory activities that will likely affect residential lighting program planning and implementation.

Recent Regulatory Activities: The most notable recent regional regulatory activity has been the New York Public Service Commission (PSC) order cited above and more fully discussed below that had originally directed NYSERDA to cease support of standard CFLs and then more recently allowed them to proceed with a modified program model. Other recent regulatory highlights include:

- Connecticut's next Conservation and Load Management (C&LM) Plan will be a three-year plan (2013-2015). In doing so, Connecticut will join Massachusetts, NYSERDA and Rhode Island in undertaking detailed multi-year planning – including residential lighting.
- A Massachusetts Department of Public Utility (DPU) investigation (DPU 11-120) into net savings and the resulting August 10, 2012 Order on Net Program Savings and

22 Product Snapshot: LED Replacement Lamps. LED Lighting Facts. Prepared for U.S. Department of Energy. Prepared by D&R International. July 2012.

Environmental Compliance Costs. NEEP provided comments[23] and made a presentation[24] — New Approaches to Net Savings: Insights and Options — at a March technical session. Massachusetts continues to be the only state in the region that applies adjustments, including revised NTG ratios, retrospectively to PAs' savings claims and reporting. The Order directs the PAs to no longer apply net savings adjustments retrospectively.

Several parties in the proceeding raised questions as to whether current methods of estimating free ridership and net to gross should be revised. In particular, whether current approaches fully captured market effects. The Order states that:

> "…the Department will convene a working group to explore if and how a market-based approach could be developed and implemented in a way that produces net savings results that improve upon the status quo."[25]

- While nearly all of the lighting programs in the region have continued or increased their support for CFLs in 2012, as well as in filed and draft 2013 and/or multi-year plans, this had not been the case in New York. In response to an October 2011 Public Service Commission (PSC) Order, the New York Energy Research and Development Authority (NYSERDA) had to cease supporting standard CFLs. Note that at the time, CFL saturation was 25 percent for New York City and 21 percent for the remainder of New York State, less Nassau and Suffolk counties (served by the Long Island Power Authority). The recommended NTG ratio for CFLs was 0.36 for New York City and 0.45 for the remainder of New York State (less Nassau and Suffolk counties). As a result of the PSC order, NYSERDA had increased its planned support of specialty CFLs and LEDs only. For their 2013-2015 planning cycle, NYSERDA projected that this would result in significantly lower lighting program savings, given budget constraints and higher LED and specialty CFL incentives. At time of publishing, NYSERDA had just received a decision[26] from the PSC that reversed their ealier stance on standard CFLs that will allow NYSERDA to move forward with an expanded residential lighting program involving standard CFLs, under a revised program model.

Ninety Percent Light Socket Saturation Goal: Ultimately, the region's long term energy efficiency goals are best served by a focus on what is installed in residences rather than what is sold at retail. To address that, the initial RLS proposed as an overarching regional goal: a

23 http://neep.org/uploads/policy/NEEP%20Comments-%20DPU%2011-20%20NOI%20-%201.31.12.pdf

24 http://neep.org/uploads/policy/NEEP%20Slides%20-%20DPU%20Net%20Savings%20Mtg%203.28.12.pdf

25 The Commonwealth of Massachusetts Department of Public Utilities. Order on Program Net Savings and Environmental Compliance Costs. D.P.U. 11-120-A. August 10, 2012. p13.

26 State of New York Public Service Commission; Order Modifying Budgets and Targets for Energy Efficiency Portfolio Standards Programs and Providing Funding for Combined Heat and Power and Workforce Development Initiatives. December 17, 2012

90 percent socket saturation of efficient lighting in residences by 2020. NEEP continues to recommend this long-term goal and encourages regulators and PAs to use longer term socket saturation goals within a multi-year planning framework as a measure and benchmark for residential lighting program success. This is a departure from the typical focus on retail lamp sales as the primary program performance measure. Recent socket saturation surveys in Massachusetts and Connecticut, which show some "disconnect" between aggressive retail lighting promotions by PAs in both jurisdictions and increases in efficient lamp socket saturation, support the need to also focus on lamp installation. Inclusion of socket saturation goals in program plans and performance measures will require continued engagement with regulators as well as discussion among PAs.

Lifetime of Lighting Savings: While not strictly a regulatory issue, there is some question as to the lifetimes that some PAs are using for LEDs. While technical lifetimes for LED products may exceed 20 years, PA savings estimates should consider the effect of the 2020 EISA 45 lumen/watt backstop standard to calculate the effective lifetime of energy savings claims. The following two methods account for the impact of federal standards on program lifetime savings and benefits calculations:

1. Truncate savings at 2020, or some date soon thereafter, to account for inventory clearance and possible bin jumping. In its 2012 C&LM Plan, Connecticut truncated LED savings to 10 years to account for the EISA 2020 standard.
2. Calculate a baseline shift in 2020 or soon thereafter to account for the more efficient EISA baseline and the much lower gross savings that result. This approach was used in the RLS lifetime saving calculations

Note that consideration of the 2020 EISA 45 lumen/watt backstop standard is primarily for standard CFLs and LEDs bulbs that are covered by the EISA general service lamp requirements.

Piloting Alternative Program Designs to Address Free-Ridership: Market Lift

The NEEP EM&V Forum is collaborating with D&R International to facilitate delivery of a market lift project in the Northeast. For this project, program administrators in three states – Vermont, Massachusetts and Rhode Island – will offer lift pilots in which they provide incentives to one or more major retailers for promotion of efficient lighting products. The structure of the pilots and incentive arrangements vary slightly across the states. In every case, participating retailers receive incentive payments for products sold above a pre-negotiated baseline level. The baselines will be determined based on analysis of historical sales trends and consensus agreement between the retailer and program administrator(s).

As part of the project, D&R International will provide the program administrators with reports on the pilot performance as well as full category sales data from the retailers (i.e. detailed data on sales by product types for efficient and conventional lighting) and an analysis of post-EISA sales that takes into account a comparison of sales from "lift" states

with sales from comparator states. Co-sponsoring this project are program administrators from several other Forum states, notably Connecticut, New York, Maryland and the District of Columbia. Sales data from some of these states will be collected to serve as comparators with the pilot states.

The actual market lift pilot is scheduled to launch in 2013 and to last for six months. This schedule will (1) allow for collaboration among retailers and states to plan the lift promotion and coordinate field efforts, (2) offer the possibility of more retailers participating and (3) offer the possibility of additional states (e.g. possibly California) participating. If some states start earlier, their experience of implementing can be used to better prepare other states for a later launch. The Forum project is taking place in tandem with a market lift pilot sponsored by the Bonneville Power Authority in Oregon.

While the market lift model has the potential for helping PAs and regulators better address retail lighting program free ridership and NTGR issues, and to inform program design and evaluation by delivering timely "full category" sales data for dynamic markets, it is still in early-stage testing. Because its success depends heavily on the cooperation of various retailers to provide the required sales data, as well as support from program administrators, expanding the implementation of this program design could be challenging. Note that others have proposed alternative upstream models to address PA and regulator concerns regarding lighting program free-ridership.[27] NEEP will continue to monitor all current and alternative approaches to the estimation of residential lighting free-ridership and market effects.

Initial Responses to Marketing and Educational Promotions

The PAs have produced a wide variety of marketing and educational materials to address the changing landscape of high efficiency lighting. With the new EISA standards taking effect in January 2012, efficiency programs have worked independently and with their industry partners to help guide consumers through a confusing and increasing array of lighting products with new FTC Lighting Facts labels[28]. It is essential that customers know how to replace their old incandescent bulbs with energy-efficient versions and now must choose lumens (or brightness) over watts. They also have to understand color temperature to ensure they are making choices that will match the quality of light output they are accustomed to with their incandescent counterparts. Moreover, customers need to decide which bulb to buy for different fixtures. PAs continue to promote ENERGY STAR lighting products to ensure customer satisfaction.

This information has been delivered to Northeast customers through a wide variety of marketing channels, including point of purchase materials, PSAs, bill inserts, tear off sheets, social media engagement, videos, lighting bar layouts at retail outlets and other informa-

27 Communication from Stan Mertz, APT, StanM@AppliedProactive.com. Stan Mertz and Seth Craigo-Snell, PhD. *Revenue Neutral Model: A New Approach to Free Ridership Estimation*.

28 http://www.lightingfacts.com/ftclabel

tional outreach opportunities. Through these channels consumers learn that they now have more options for lighting products than ever before. They also receive guidance on how to make the right choice to fit specific needs.

Federal efforts have been provided through ENERGY STAR and the Department of Energy (DOE), yet there remains a need to increase those efforts to reach the broadest possible audience with existing PSAs, billboards, bus transit and other outreach initiatives, since they have mainly occurred outside the Northeast region.

Nationally, the LUMEN Coalition[29] provides broad reaching messages by making videos available to guide consumers on how to purchase LEDs, understanding lumens vs. watts and reading the FTC label, among other issues. At www.energysavers.gov/lumens, you can find a tip card with the message "Goodbye watts, Hello lumens." The card is available to PAs and other organizations for broad distribution.

Manufacturers are strong advocates for the new standards and continue to partner with programs to create successful NCP agreements. They have also produced point of purchase (POP) materials to help educate customers in stores. Some have produced packaging that will alleviate confusion in choosing the right bulb for the right application, as well as other information to guide consumer choice. More work is needed to engage full participation of retail partners in this outreach.

The effectiveness of PA marketing tactics will be determined during the fall of 2012. This assessment will include a review of available metrics and feedback from promotional partners. These tactics were developed with the goal of educating customers and driving sales of ENERGY STAR CFLs and LEDs. A sampling of the marketing and educational outreach can be found in Appendix C.

Recommended Residential Lighting Research

In completing this Update and reviewing the referenced materials, a number of potential research needs emerged. While these proposed efforts could be pursued by individual PAs or at the state level, some of these proposed activities would likely benefit from a more coordinated regional approach. Proposed research activities are broken into two prioritization categories: Top tier priority and priority

Top Tier Priority Research

- **Conduct regular socket saturation surveys using consistent methodologies (protocols) that yield comparable data to track market progress across the region.** With the long-term strategy goal of achieving at least 90 percent socket saturation of high efficiency lamps in households across the region, it is important to track the progress and impact of program efforts relative to this goal. The differences

29 http://lumennow.org/

between recent studies and methods to assess and compare socket saturation rates and bulb sales suggest the value of a regional approach using a consistent methodology over a multi-year period.

- **Compile and disseminate product sales data collected from market lift and other alternative program implementation models, and/or from current program efforts.** Such information will help PAs and regulators better assess retail lighting program free-ridership and NTGR issues, and inform program design and evaluation by delivering timely "full category" sales data for dynamic markets.
- **Address LED dimmer compatibility issues.** Most ENERGY STAR LEDs are labeled dimmable by their manufacturer. While dimmable LEDs do generally dim better than their CFL counterparts, this is not always the case. There may be multiple possible solutions to this problem; some involving consumer education and proper matching of LEDs with compatible dimmers at retail while others work to seek a technology fix. DOE/PNNL, NEMA and others are working on the latter and, as noted, Cape Light Compact has a small field underway on dimmer savings impacts and compatibility.

Priority Research

- **Perform market research and analysis to better understand the disposition of CFLs sold at retail.** The recent Massachusetts and Connecticut socket saturation studies raise questions as to how many CFLs sold at retail are replacing inefficient lamps in residential dwellings. Additional process and market research might help PAs better understand the smaller than expected increases in socket saturation and how PA programs can overcome current consumer reluctance to increase the number of sockets with efficient lighting.
- **Track LED product pricing at retail.** The rate of market adoption of LED products depends in part on how quickly the price for these products declines to become more competitive with CFL and other comparable products. Tracking LED product pricing is important to inform program goals, promotions and incentive levels.
- **Understand interactive effects between residential lighting and space conditioning energy use.** While this impact is generally considered in the commercial sector, this is not typically the case in the residential sector.

As these issues affect all lighting programs across the region, we recommend that PAs pursue such studies through coordinated--if not jointly funded—research. The Regional EM&V Forum offers one approach to do this.

Appendix A:
Expected Outcomes from Implementation of a Regional Residential Lighting Strategy

Outcomes	Milestones/Indicators of Success
By 2020, achieve a 90 percent socket saturation of high efficiency lighting (45 lumens/watt or better) – CFLs, LEDs and high efficiency halogens - in homes	• By 2014, the large majority (70% or more) of eligible LED products on retailer shelves in the region are ENERGY STAR qualified • By 2015, 90 percent of residential screw-based sockets can be filled with ENERGY STAR LEDs • By 2016, the majority of lighting products purchased by consumers are high efficiency • By 2018, all ENERGY STAR eligible LED products on participating retailer shelves are ENERGY STAR qualified
By 2015 the large majority of consumers are highly satisfied with high efficiency lighting (45 lumens/watt or better) lighting products.	• By 2014, the large majority (70% or more) of ENERGY STAR eligible LED products on retailer shelves are ENERGY STAR qualified • By 2014, the large majority (80% or more) of consumers select lighting products based on lumen rating rather than wattage • By 2015, the majority of industry lighting marketing efforts targeting consumers promote the benefits of LEDs • By 2015, 90 percent of residential screw-based sockets controlled by dimmers can be filled with dimmable ENERGY STAR LEDs
Energy efficiency programs in the Northeast maintain a high level of net savings from residential lighting through 2015 or longer.	• Net residential lighting program savings are maintained at or near 2011 savings levels through 2015 or longer • PAs, with industry support, implement alternative program strategies such as market lift to complement current upstream activities to help address gross vs. net savings concerns • By 2016, in the majority of states in the region PAs and regulators reach agreement on key program planning assumptions prior to submission of PA plans
The unsubsidized purchase cost of ENERGY STAR lighting products, in particular LEDs, is significantly less by 2015 compared to 2011.	• The percentage reduction in the cost of ENERGY STAR LEDs is equal to or greater than that for all LED products as projected in DOE's SSL Multi-year Plan
By 2015, the range of ENERGY STAR LED product options expands to address at least 90 percent of all screw-based residential lighting applications. (i.e., a bulb for every socket).	• Dimmable directional and non-directional ENERGY STAR LEDs in both medium and candelabra bases are available in a full range of lumen outputs and color temperatures

Appendix B: Residential Lighting Strategy Strategies and Actions

Near-Term Actions & Considerations (2012-2014)	Longer-Term Actions & Considerations (2015-2020)
Aggressively support CFLs through retail products, income eligible, existing homes, and new construction programs to maintain residential lighting savings levels	
1. PAs target standard CFLs given current moderate (25-35%) efficient lighting socket saturations in the region 2. PAs ramp-up specialty CFL sales to target appropriate customer applications 3. Manufacturers and PAs communicate and work with builders, electricians and electrical supply houses on how best to use CFLs to meet building energy code lighting efficiency requirements 4. PAs monitor pricing of CFLs given expected increase in phosphor pricing. Adjust incentives levels as needed 5. Retailers expand CFL recycling efforts	1. PAs decrease emphasis on CFLs as LEDs become increasingly available and at lower prices 2. PAs phase-out of support for reflector (directional) CFL lamps may occur first given performance, cost and availability considerations
Ramp-Up Promotion of ENERGY STAR LEDs	
1. NEEP and PAs closely monitor market to track ENERGY STAR qualified LED pricing and availability 2. PAs set - and adjust on an on-going basis as needed - appropriate LED incentive levels 3. Industry and PAs leverage non-energy benefits: no mercury, longer lifetime, improved dimmability, etc. to promote LEDs 4. PAs initially focus on reflector (directional) LED lamp applications as they may provide the greatest initial market opportunity; currently there is greater ENERGY STAR directional LED availability vs. A-lamps (omni-directional) 5. Manufacturers seek ENERGY STAR certification for all eligible LED products 6. Retailers provide preferential display of ENERGY STAR qualified products 7. Manufacturers and PAs communicate and work with builders, electricians and electrical supply houses how best to use LEDs to meet building energy code lighting efficiency requirements 8. PAs identify and implement cost-effective direct install opportunities, e.g., high hours of use applications in income eligible, existing single family and multi-family homes, and new construction programs; possibly supported by bulk purchase efforts 9. PAs develop "upgrade" LED offers — requiring a customer co-pay for existing homes, multi-family, and new construction programs to attract early adopters and to lower PA program costs 10. NEEP and PAs coordinate with DesignLights Consortium™, PA C&I programs, retailers, and others the promotion of residential and commercial LED products	1. LEDs become the principal focus of PA residential lighting efforts 2. PAs ramp-up A-lamp (omni-directional) LED promotions as more products become available in a wider range of wattages and at lower prices 3. PAs increase role of LEDs/phase-out CFLs in existing homes, eligible income and new construction programs 4. Manufacturers share with retailers and PAs their response to second tier of EISA standards (2020 efficacy requirements) early enough to inform need for continued PA LED engagement toward end of "Longer Term" planning period; i.e., when will the residential LED market be transformed? 5. States continue to leverage building energy codes to increase saturation of efficient lighting 6. NEEP and PAs continue coordination with commercial LED product promotion

Near-Term Actions & Considerations (2012-2014)	Longer-Term Actions & Considerations (2015-2020)
Pursue alternative program and promotional approaches and/or markets to maximize impacts while minimizing potential free-ridership	
1. PAs implement strategies such as market share and/or market lift with industry support, i.e., provision of required sales data 2. PAs to work together and with other interested stakeholders to develop and adopt consistent approaches to evaluate program impacts, such as through Regional EM&V Forum protocol development. 3. PAs seek up-front regulatory engagement/ approval as needed 4. PAs target hard-to reach retailers and customer segments that are otherwise unlikely to adopt efficient lighting products	1. PAs continue to pursue alternative/ complementary program designs and markets to maintain high net program savings
Deliver a clear and consistent message to consumers on efficient lighting choices	
1. All parties work with national (LUMEN) and regional groups (NEEP) to develop consistent consumer messages informed by ongoing market research to understand how to build consumer acceptance of and satisfaction with high efficiency lighting products 2. PA messaging may need to be more targeted on driving consumers to efficient product choices and/or value of ENERGY STAR label 3. All parties leverage EISA standards and new FTC lamp labeling as an opportunity to move consumers to efficient lighting choices 4. Federal entities fund ongoing efforts and assist with enhanced industry partnerships 5. PAs structure NCP submissions to include industry marketing/educational component 6. PAs leverage on-going, planned and proposed industry market research and PA EM&V efforts to inform "local content" of this messaging	1. PAs shift focus of marketing and consumer education to LEDs 2. NEEP and PAs continue market research and EM&V efforts to inform messaging
Support adoption and implementation of strong lighting efficiency requirements in building energy codes and 2020 EISA Standards	
1. In anticipation of IECC 2012 75% efficient lighting requirement, NEEP and PAs work with builders, lighting designers, code development officials and others to educate them on best lighting choices in RNC 2. In anticipation of EISA 2020 lighting standard setting proceeding to begin in 2014, NEEP with the PAs collect information to inform setting a strong standard in 2020	1. NEEP and PAs provide documentation of RLS success to DOE to inform possibly higher 2020 federal efficacy standard 2. NEEP, the PAs and states participate in US DOE's 2020 EISA standard setting proceeding to support a strong 2020 standard 3. Builders and their lighting designers collaborate with code enforcers to develop a checklist and website as tools to verify compliance
Ensure that PA efforts are focused on promoting quality lighting products	
1. PAs only support ENERGY STAR qualified LEDs and CFLs with PA incentive and marketing 2. DOE CALiPER and ENERGY STAR third-party testing efforts continue with active NEEP and PA participation, where failed products are delisted 3. PAs withdraw funding from delisted products quickly	1. Continue and enhance near-term actions

Near-Term Actions & Considerations (2012-2014)	Longer-Term Actions & Considerations (2015-2020)
Develop and implement regional systems to track key product and market data to inform program design, implementation and evaluation	
1. PAs and industry work through NEEP and others to promote methods to track and share sales data 2. Use NEEP EM&V Forum and other venues to share PA data; e.g., shelf-price surveys, annual program data, etc. 3. Reduce the cost of evaluation and market analysis through regional approaches (e.g., EM&V Forum) to collect commonly needed data (e.g., product availability and price, socket saturation rates, customer knowledge and satisfaction with high efficiency lighting products) 4. Investigate third-party efforts to track market activity; e.g., D&R's Better Data Better Design	1. Continue and enhance near-term actions
Engage regulatory bodies early to reinforce need for continued and aggressive PA engagement in the residential lighting market and to limit regulatory uncertainty	
1. PAs and NEEP develop and distribute residential lighting memo as part of PAs' 2012 Plan submissions encouraging adoption of long-term market transformation goals and general strategy 2. Manufacturers and retailers convey their support of the RLS to regulators in letters of support and public input hearings 3. All parties reinforce message that 2012-2014 EISA standards will not diminish the need for continued residential lighting market intervention: CFLs will not be the baseline 4. NEEP and PAs highlight large remaining savings potential in not only retail products program, but other PA residential programs 5. NEEP and PAs clearly convey message that costs for lighting program savings will increase; possibly considerably, and that this may affect overall program, sector and portfolio cost rates: $/annual or lifetime kWh 6. NEEP and other stakeholders use available public input processes to educate regulators and present results of regional data collection 7. NEEP and PAs emphasize need for program flexibility to address rapidly changing market 8. NEEP develops with PA input annual RLS updates and provide to regulators and other key stakeholders 9. PAs and regulators reach agreement on processes needed to pursue alternative/complementary program models like market share and market lift 10. PAs and regulators limit regulatory uncertainty – and PA reluctance to aggressively pursue lighting savings – by reaching agreement early on key planning assumptions: net-to-gross ratios, measure lifetimes, baseline wattages, etc. 11. Regulators consider and pursue as appropriate alternative cost-effectiveness approaches such as utility cost test (or energy and water test) and claiming gross vs. net savings (where such topics are being addressed by the Regional EM&V Forum in 2012)	1. NEEP continues to engage regulatory agencies through annual and multi-year plan submissions and through NEEP policy outreach efforts 2. NEEP and PAs continue efforts to emphasize need to maintain a longer term, multi-year vision of the residential lighting market 3. All Parties assess success of program efforts and work together to refine program strategies as needed 4. PAs and regulators integrate non-energy benefits more fully into cost effectiveness calculations
Implement process to continue regional lighting engagement on an on-going basis	
1. NEEP provides on-going forum and resources to allow all parties to revisit and revise RLS as market evolves	1. Continue and enhance near-term actions

Appendix C:
2012 Northeast Residential Lighting Efficiency Program Elements

	CT		DC	MA					ME	NH	NY		RI	VT
	Connecticut Light and Power	United Illuminating Company	DC Sustainable Energy Utility	Cape Light Compact	National Grid (MA)	NSTAR Electric & Gas Corporation	Unitil	Western Massachusetts Electric	Efficiency Maine	New Hampshire*	Long Island Power Authority	NYSERDA	National Grid (RI)	Efficiency Vermont
Hard to Reach	✓	✓		✓	✓	✓	✓	✓				✓	✓	2013
School Fundraiser	✓	✓		✓	✓	✓		✓		✓			✓	✓
Food Bank			✓						✓				✓	✓
Market Lift				✓ [1]	✓ [1]	✓ [1]		✓ [1]					✓ [1]	✓ [1]
TopTen USA	✓	✓		✓ [3]	✓ [3]	✓ [3]		✓ [3]					✓ [3]	✓ [4]
Lightbulb Finder App				✓	✓	✓	✓	✓					✓	
Retail Sales Events (e.g., Techniart)	✓	✓		✓	✓	✓		✓	✓	✓	✓	✓	✓	
Behavior Programs (e.g., OPower, Tendril, etc.)	✓	✓		✓ [2]	✓	✓		✓					✓	
EISA/FTC Label Education	✓	✓		✓	✓	✓	✓	✓		✓		✓	✓	✓
Television	✓	✓				✓					✓			
Radio	✓	✓	✓	✓	✓	✓	✓	✓			✓		✓	✓
Print/Outdoor Media	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓ [5]	✓	✓
Social Media (e.g., Facebook, Twitter)	✓	✓	✓	✓	✓	✓	✓	✓		✓		✓	✓	✓
Online Catalogue	✓	✓		✓	✓	✓	✓	✓		✓	✓		✓	

***New Hampshire Includes:**

Public Service of New Hampshire; Unitil; NH Electric Co-Op; Liberty Utilities--Formerly National Grid NH)

Notes:

1. Pursuing Market Lift, but unlikely to pursue in 2012
2. Tendril pilot only
3. Proposed membership for 2013 program implementation
4. Paid sponsor, not integrated into program offerings
5. NYSERDA Partners are required to provide educational material, such as print and outdoor media, in conjunction with NYSERDA buy-downs

Appendix D – Marketing/Education Examples

Home Depot - LED Lighting Displays in Locations Throughout the Northeast

To make it easier for consumers to compare light bulbs, the Federal Trade Commission has designed a new label for light bulb packages (see reverse side for example). These labels will provide information about lumens, estimated operating cost, bulb life, and bulb color.

Incandescent Bulb (Watts)	Minimum Light Output (Lumens)	ENERGY STAR Qualified Light Bulbs (Watts)
25	250	4-9
40	450	9-13
60	800	13-15
75	1,100	18-23
100	1,600	25-30
150	2,600	30-52

LUMENS are the measurement of light produced by the lamp; the higher the number, the more light is emitted.

For example, if you normally use a 100 watt incandescent, look for a light bulb with about 1,600 lumens to get the same level of brightness.

Use the table at left to become familiar with the lumen, or light output, range for the most popular residential incandescent bulbs.

Choosing the right color: Correlated Color Temperature (CCT) is measured on a temperature scale referred to as Kelvin (K). Lower Kelvin numbers mean the light appears more yellow; higher Kelvin numbers mean the light is whiter or bluer.

Most ENERGY STAR® qualified bulbs are made to match the color of incandescent bulbs at 2700-3000K. For a whiter light, look for bulbs marked 3500-4100K. For a bluer white light, look for bulbs marked 5000-6500K.

ENERGY STAR® Qualified Light Emitting Diode (LED) Replacement Lamps – Use at least 75% less energy than conventional light bulbs and are rated to last at least 25,000 hours.

ENERGY STAR Qualified Compact Fluorescent Light bulbs (CFLs) – Use about 75% less energy than conventional light bulbs and last about 10 times longer.

LIPA Long Island Power Authority

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YOUR NEW LIGHTING LABEL

Starting January 1, 2012, the Federal Trade Commission (FTC) requires all packaging for medium screw base bulbs to include a new Lighting Facts Label. This new label will help you choose the right bulb for your lighting needs.

Understanding the Label

The new label gives you the following information:

- Brightness (lumens)
- Energy Cost (per year)
- The Bulb's Life Expectancy
- Light Appearance (for example, if the bulb provides "warm" or "cool" light)
- Wattage (the amount of energy the bulb uses)
- Whether The Bulb Contains Mercury

Brightness	Estimated Energy Cost
870 lumens	* $1.57 per year

* Cost based on a national average for residential customers. This is only an estimate and may vary from actual operating cost.

Lighting Facts
Per Bulb

Brightness	870 Lumens
Estimated Yearly Energy Cost	*$1.57
Based on 3 hrs/day. kWh Cost 11¢ depends on rates and use	
Life	
Based on 3 hrs/day	5.5 years
Light Appearance	
Warm – 2700K – Cool	
Energy Used	13 watts
Contains Mercury	
For more on clean up and safe disposal visit epa.gov/cfl.	

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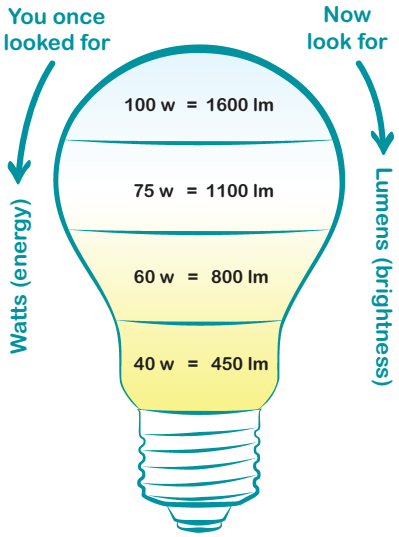
Long Island Power Authority - Lighting Label Educational Brochure

Lumens: A New Way to Shop for Light Bulbs

Choose your next light bulb for the brigntness you want. Instead of buying light bulbs based on the energy they use (watts), you'll now be able to shop for bulbs by the amount of light they produce (lumens). A bulb with more lumens produces bright light. Less lumens means dimmer light.

For the greatest savings, choose ENERGY STAR® qualified light bulbs. Qualified lighting is available in a wide variety of shades of white light. Light color is measured on a temperature scale referred to as Kelvin (K). Lower Kelvin numbers mean the light appears yellow; higher Kelvin numbers mean the light is whiter or bluer.



When Shopping for Light Bulbs, You'll Notice a New Label

The new Lighting Facts Label makes it easier for you to compare and buy the most energy-efficient bulb to meet your needs.

Brightness (Lumens)
Lumen is a measure of light output. The higher the number, the more light is emitted. A standard 60-watt incandescent bulb produces 825 lumens.

Life
An estimate of how long the light bulb will last when used for 3 hours per day.

Light Appearance
Measures how warm (yellowish) or cool (bluish) the light appears. Color temperature is measured in degrees Kelvin (°K). The lower the number, the more yellow (like candle light); the higher the number, the more blue. A standard incandescent light bulb is 2700°K.

Estimated Energy Cost
Yearly operating cost based on 3 hours a day at 11¢/kWh.

ENERGY STAR® Qualified
This light bulb meets energy efficiency and lighting quality guidelines set by the U.S. Environmental Protection Agency.

Energy Used
Measures the energy required to light the bulb. The lower the wattage, the less energy used.

Mercury Content (for CFLs only)
All CFLs contain a very small amount of mercury. The amount of mercury in a CFL has decreased over the last few years. Most CFLs contain less than 4 milligrams, which is such a small amount, it would fit on the tip of a ball point pen.

Lighting Facts Per Bulb

Brightness	**XXX lumens**
Estimated Yearly Energy Cost	**$X.XX**
Based on 3 hrs/day, 11¢/kWh	
Cost depends on rates and use	
Life	
Based on 3 hrs/day	**X.X years**
Light Appearance	
Warm — Cool	
XXXX K	
Energy Used	**XX watts**

Contains Mercury
For more on clean up and safe disposal, visit epa.gov/cfl.

For more information visit nyserda.ny.gov/FTC-label

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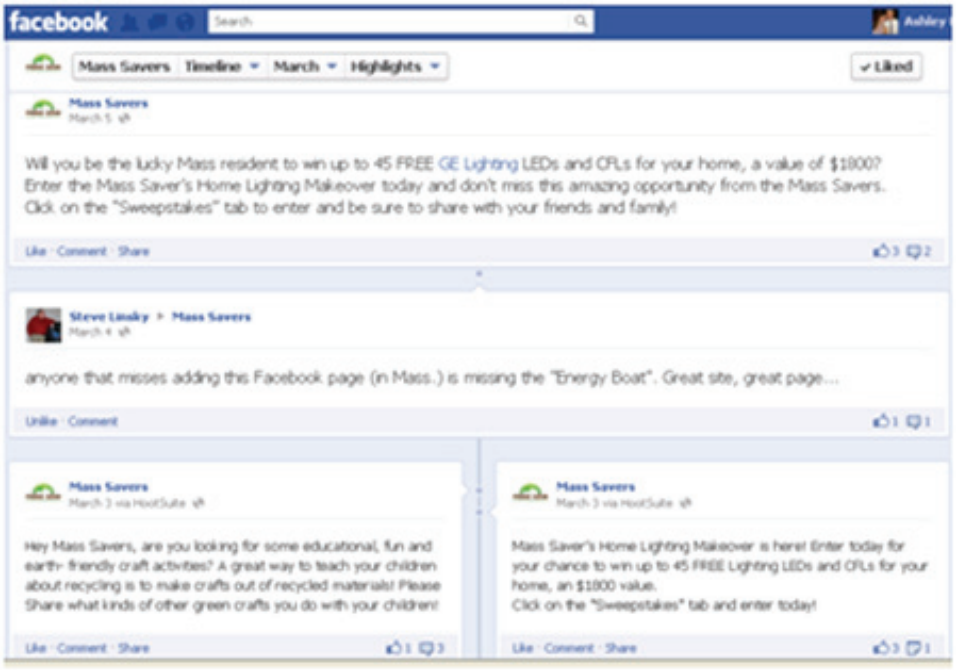
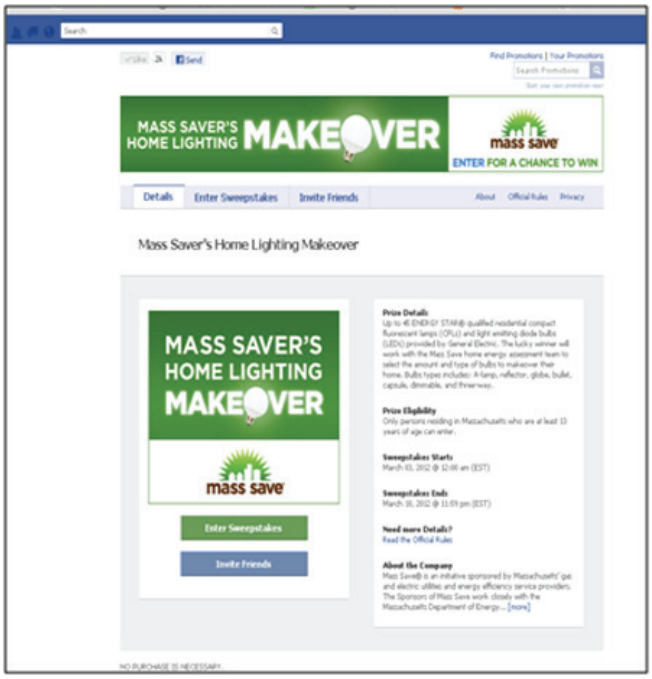
RES-PROD-lighting-fs-1-v2
Rev. 5/12

New York State Energy Research & Development Authority - Lighting Product and Label Educational Brochure

Facebook Ad



Facebook Page Content



GE Lighting Makeover Sweepstakes

Mass Save – Residential Lighting Social Media Campaigns

Lighting Education Video (http://youtu.be/9r8h0gj7K-M)

Mass Save - EISA Lighting Educational Video, featured on YouTube, Mass Save website and through in-store QR codes

GE Lighting – Online Bulb Comparison Tool