



Northeast Residential Lighting Strategy: 2014-2015 Update

Northeast Energy Efficiency Partnerships
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EXECUTIVE SUMMARY

The Northeast Residential Lighting Strategy (RLS) is being updated to provide the Northeast and Mid-Atlantic region with the most relevant and timely information regarding the efficient residential lighting market and to provide recommendations for how efficiency programs can effectively transform the market. This is the fourth document in the suite of RLS reports and provides narrative updates on regional activities, summaries of completed and ongoing research and evaluations, and updated projections for regional program savings. This report also contains original research focused on critical issues. This report is broken up into three sections: the Residential Lighting Landscape Developments section provides updates to relevant activities since the 2013-2014 RLS Update was published. The Market Analysis of Residential Lighting section contains projections for the future of lighting markets and programs, and Key Recommendations section outlines the strategies to achieve this future scenario. This report is intended to build upon the previous RLS iterations, not replace them.

Since the release of the 2013-2014 Update, the residential lighting landscape has continued to evolve. When looking at lamp sales trends and baselines, there is evidence of high penetrations of incandescents and halogens persisting into 2014. The A-line lighting market has not been transformed and many inefficient options still exist for consumers. This may have unexpected implications for programs that have assumed halogen alone to be the baseline, as this evidence supports a blended baseline for 2014. Based on these lamp trends, there exists a large opportunity and need for programs to influence the market.

The Northeast region has been a national leader in residential lighting programs. NEEP has been documenting the status of regional programs since the first Residential Lighting Strategy report. 2014 represents a significant shift in program portfolios as they realize the potential of LEDs for residential lighting. Regional activity shows a continued strong reliance on lighting for most residential sector portfolios and an acceleration of LED program activity. As in the past, lighting also plays a large role in many PAs' portfolios beyond just the retail channel; residential lighting continues to be a successful measure for low income, direct install, multifamily, and new construction programs.

Specifically, lighting program activity in the region ranges from less than 1 bulb/household to 4 bulbs/household. For portfolio mixes, support of specialty CFLs has decreased in some states, while standard CFLs continue to be a majority of program promotions. All states in the region are ramping up their planned support of LEDs; goal unit percentages range from 11-44 percent, but year-to-date data shows even larger percentages of LEDs moving through programs than had been planned. States are taking creative approaches to promote efficient lighting and finding considerable success, especially around LED promotions.

2014 saw the completion of several key lighting evaluation activities, ranging from an impactful Regional Hours of Use (HOU) study to shelf surveys and program impact evaluations. There

are also several studies still underway that may have regional implications upon completion. Many of these reports have involved multiple states to provide a regional perspective, demonstrating the value of regional collaboration and coordination.

Nationally, there are several relevant specification activities that we analyzed. ENERGY STAR's Lamp 1.1 specification has been implemented and tweaked since the last RLS, and ENERGY STAR is also beginning their Luminaire 2.0 specification process. The California Energy Commission's Quality LED specification is in effect and efficiency programs in California are finding more and more products are able to qualify for their high CRI lamp specifications. Additionally, California has started their standards process for small diameter and general service lighting. The Consortium for Energy Efficiency has developed a tiered lamp specification which, pending CEE Board approval, would offer program administrators the option to claim higher saving for ENERGY STAR products that had higher efficacies and had achieved CEE's tiers. The final specification is expected to be released in early 2015.

2014 was also a year for the development and advancement of many initiatives and topics of research. ENERGY STAR and NEMA came together to lead a roadmapping initiative with industry and efficiency stakeholders to push forward activities aimed at streamlining verification testing, conducting consumer education research, and to discuss the latest lighting trends. As part of their Technical Information Network on Solid State Lighting, the DOE released several resources, including an R&D Roadmap, the Multi Year Program Plan, new CALiPER Reports, a report of Early Lessons of Solid State Lighting, and resources on LED safety and health. The DOE also released a forecast of what various lighting sectors would look like if LED lighting continued to gain momentum; this demonstrated a very significant opportunity for energy savings for LEDs by 2030. LED lighting and health also received a great deal of attention in 2014 with several pieces of research and presentations discussing the potential LEDs have to both help and hurt human health. A lighting database tool was launched in 2014 by Envervee that features a platform to list lighting products based on efficiency, features, and price. Another advance in 2014 is the Consortium for Retail Energy Efficiency Data (CREED) Initiative that is working on behalf of program administrators across the nation to purchase category level sales data for lighting to demonstrate the impact efficiency programs are having on the lighting market. From the federal standards perspective, the Phase II of EISA rulemaking kicked off in 2014 and is ongoing.

Looking forward, using data collected from Northeast program administrators and other cited sources, we analyzed the pricing and cost effectiveness trends that impact the product mix in programs and revisited our projections for potential achievable program activity in the region. As LEDs have come down in price significantly in recent years, we analyzed pricing data for popular ENERGY STAR lamps from key manufactures and projected out to the expected price at the end of 2015. For example, the 60W equivalent A Lamp is expected to drop from an average low-cost price of \$9.12 in August 2014 to \$6.81 by the end of 2015. Overall, we see that prices will continue to drop significantly into 2015 and program administrators should adjust incentives accordingly.



Regarding cost-effectiveness, LEDs are currently a more expensive technology and their promotion in programs is less cost-effective than that of CFLs. In the years to come, however, LED prices are expected to decrease and a large portion of the possible savings from CFLs will still not be attributable to program activities. We researched the variables impacting the cost-effectiveness of CFLs and LEDs and plotted some regional averages for expected inputs impacting cost effectiveness to determine when LEDs might overtake CFLs as the more cost effective option. We found that LEDs may pass CFLs in cost-effectiveness for the 2016 Program Year. For this reason, we recommend a transition plan aimed at having a lighting portfolio where LEDs make up the majority by 2017 in order to maintain cost-effectiveness.

Using this new information, we updated our regional savings and costs projections. A high-level modeling analysis brings together the latest information on CFL and LED pricing and efficacy trends, net-to-gross evaluation findings, and expectations about the number of bulbs that could move through efficiency programs. We decided to build two models this year, one that was more optimistic and one that considered some potential challenges program administrators may face. These projections show a relative plateau of consistently high level of annual savings potential for several years. These savings are also less expensive than anticipated in the 2013-2014 RLS Update, as the prices of LEDs continue to drop beyond our expectations. This forecast finds costs to attain residential lighting savings will decrease over time on a per net kWh basis (\$/net kWh).

These findings reinforce the fact that while the lighting market continues to rapidly evolve, efficient lighting will continue to be an important and cost efficient resource in PAs' residential portfolios. Many of these opportunities stem from the expected contraction of standard CFL promotions and the ramp-up of support for both standard and specialty LEDs. Specialty promotions may shift more quickly from CFLs to LEDs. As standard LEDs come down in price and become more cost effective, the necessity for a large incentive is diminishing, and the opportunity is emerging for greater savings to be gained at lower spending levels. **For the next several years, lighting will and should continue to be a major component of all residential efficiency portfolios.**

Finally, we have revisited our original recommendations and present one new, two revised, as well as continued support for the seven remaining recommendations to help achieve success in efficient lighting in the Northeast Mid-Atlantic Region. Through implementation of these strategies, rapidly shifting towards LED promotion, and regional collaboration, the Northeast Mid-Atlantic region can achieve success in transforming the market for residential lighting.

New Recommendation:

Consider rapid transition of program support towards specialty LEDs and away from specialty CFLs as LED technology is better suited for the specialty applications and the prices of specialty LEDs continue to fall.

Revised Recommendations:

Accelerate use of ratepayer funds to support LED technology in near-term. PAs should develop a transition plan aimed at having a lighting portfolio where LEDs make up a majority of the lighting portfolio by 2017 in order to maintain both a portfolio and measure TRC/SCT greater than 1.

Partner with manufacturers, retailers, and ENERGY STAR to hone in on key marketing, messaging, and education. Streamline messaging to make it easier for the consumer to select the proper bulb.

Existing Recommendations to Remain:

Leverage markdown and buy-down agreements to specifically promote higher quality, and lower cost LED lamps to reduce program incentive costs, product costs, and increase consumer adoption.

Consider adoption of creative or alternative program and promotional approaches and/or markets to maximize impacts while minimizing potential free-ridership.

Support adoption and implementation of strong lighting efficiency requirements in building energy codes to help increase socket saturation of efficient lighting in new construction.

Ensure that PA efforts are focused on promoting quality lighting products using ENERGY STAR as a key indicator of product quality.

Develop and implement regional systems to track key product and market data to inform program design, implementation, and evaluation.

Continue to engage regulatory bodies early to reinforce the need for continued and aggressive PA engagement in the residential lighting market and to limit regulatory uncertainty.

Continue regional lighting engagement on an on-going basis.