Northeast Energy Efficiency Partnerships

Residential Lighting: A Strategy for the Northeast to get to Net Zero

Claire Miziolek
Residential Program Manager
Northeast Energy Efficiency Partnerships
Feb 6th, 2014

INTRODUCTIONS

Me

Residential Program Manager

Energy Efficiency

Residential Lighting

Consumer Electronics

Retail Products

Lexington MA based

You

Who is here?

Designer, construction, architects, business, efficiency consultants

Any others?

Vermonters?

New Englanders?

Outsiders? ☺

AGENDA

Introduction and Welcome

NEEP

Background

The Northeast Residential Lighting Strategy (RLS)

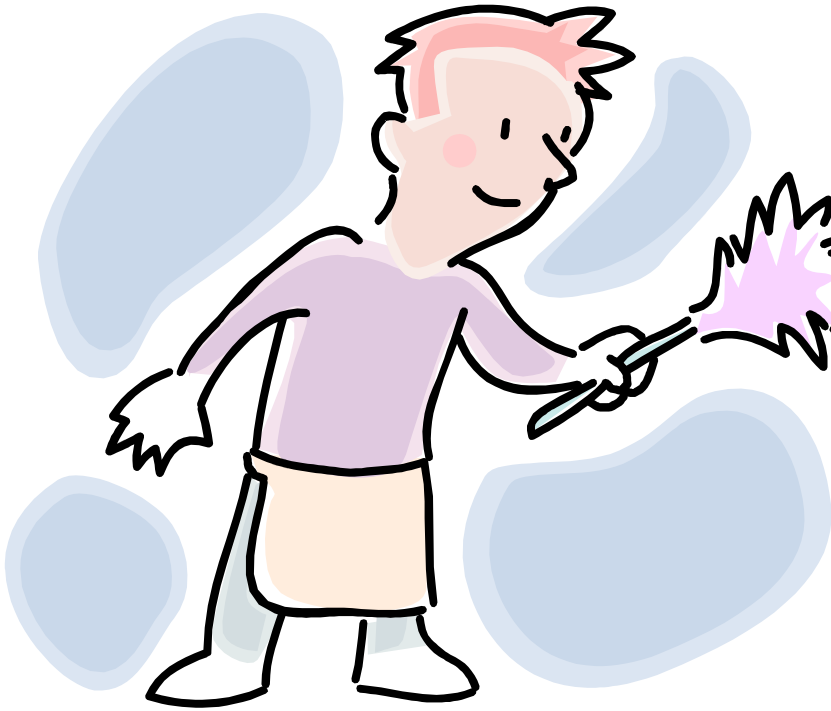
Small Groups breakouts

Next Steps, the future, conclusion

Questions, Comments, Concerns

HOUSEKEEPING

- Tried to define all acronyms, but if anything isn't clear, please raise hand
- We have 90 minutes, will have breakout portion for 20 minutes towards end, reconvene, leave time for questions at the end
- Clarifying questions are encouraged throughout
- Slides will be available online through conference website



ABOUT NEEP

MISSION

Accelerate energy efficiency in homes, buildings & industry in the Northeast – Mid-Atlantic region

GOAL

Keep the region a national leader in accelerating energy efficiency

STRATEGIES

Reduce Building Energy Use

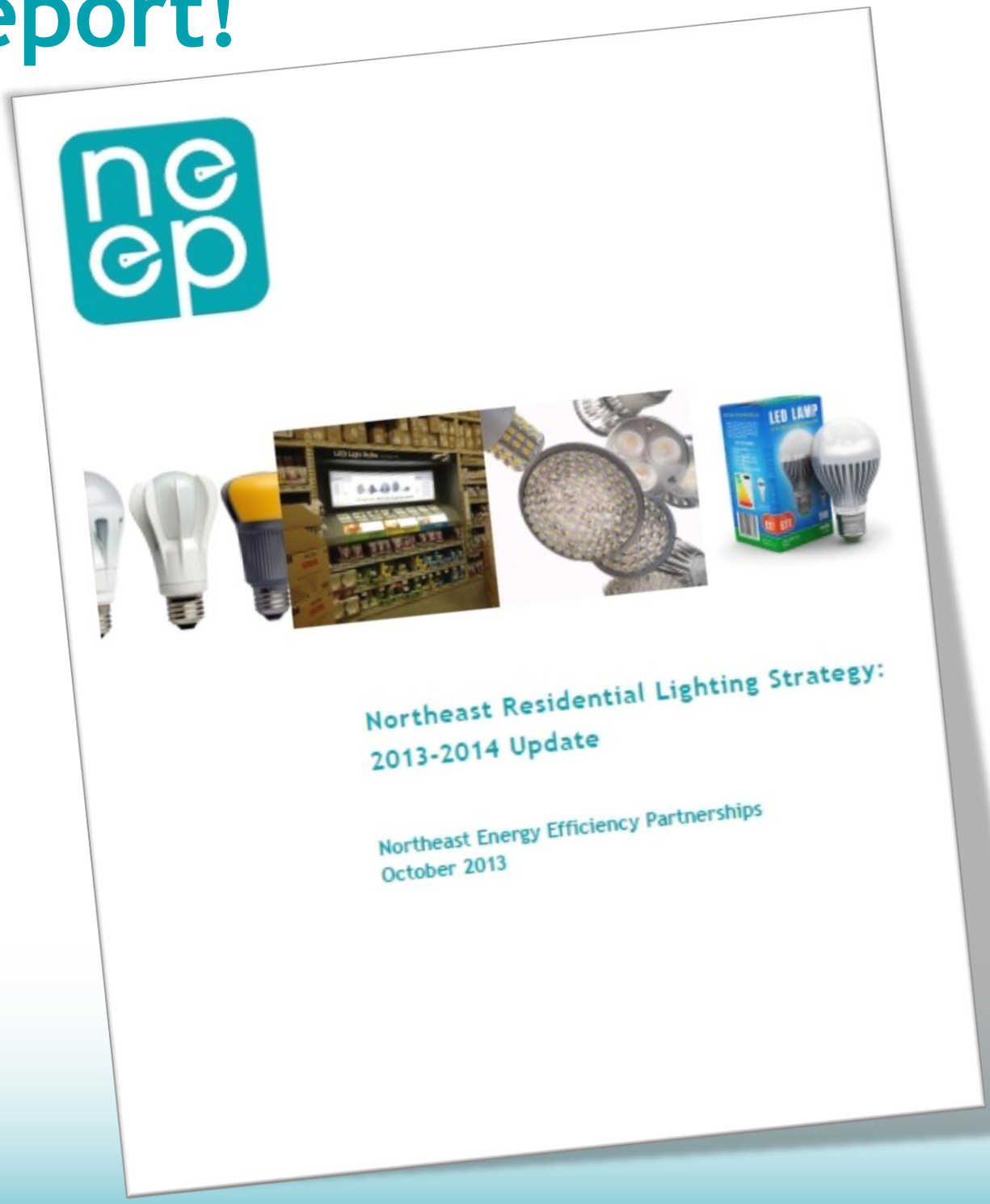
Speed High Efficiency Products

Make Efficiency Visible

Advance Knowledge - Best Practices

Regional energy efficiency collaborations since 1996

New Report!


Northeast Residential Lighting Strategy:
2013-2014 Update
Northeast Energy Efficiency Partnerships
October 2013

www.neep.org

home

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NORTHEAST ENERGY EFFICIENCY PARTNERSHIPS
FACILITATING PARTNERSHIPS TO ADVANCE ENERGY EFFICIENCY

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ABOUT NEEP | PUBLIC POLICY | EFFICIENT PRODUCTS | EM&V FORUM | NEEP EVENTS | NEEP SUPPORTERS | MEDIA | RESOURCES | PRIVATE PORTAL

- HIGH EFFICIENCY LIGHTING
- BUSINESS & CONSUMER ELECTRONICS
- EMERGING TECHNOLOGIES
- WORKFORCE DEVELOPMENT

ACCELERATING ...RGY EF
HOMES ...LDINGS AND IN
N...THEAST - MID-ATLANTI

NEEP is a non-profit organization that transforms the way we use and think about energy. Through advocacy, collaboration and education we focus on three areas where we believe energy efficiency can have the greatest impact: buildings, high efficiency products & best practices. Our unique approach helps bring together all stakeholders to accelerate energy efficiency and highlight its impacts on the region, the economy, and the planet.

HIGH EFFICIENCY PRODUCTS

NEEP Launches Consumer Electronics Strategy

NEEP is undertaking a project to create

ENERGY EFFICIENT BUILDINGS

Building Energy Rating & Disclosure

Building energy rating, reporting and

BEST PRACTICES

Regional Energy Efficiency Database (REED)

REED, an online collection of electric

NEEP RESOURCES

Policy News: Highlights

News and analysis on the most

www.neep.org

High Efficiency Lighting

neep.org/efficient-products/high-efficiency-lighting/index

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Home > Efficient Products > High Efficiency Lighting

HIGH EFFICIENCY LIGHTING

Solid state lighting (SSL) technology is rapidly emerging as the central game-changer for the future of the lighting industry. Never before has a technology shown such promising cost and energy savings for a limitless number of commercial and residential applications.

With our sponsors and key allies, NEEP works to prepare the region for embracing the future of lighting to make transformational changes in the market. We raise awareness of the issues around SSL, and develop strategic guidance for regional deployment of SSL products. NEEP is working with market players throughout the SSL industry from across the nation and around the world, to maximize the potential of this technology and to speed the adoption of these lighting products in the Northeast-Mid Atlantic region.

- HIGH EFFICIENCY LIGHTING
  - Residential Lighting
  - Commercial Lighting Technologies
- BUSINESS & CONSUMER ELECTRONICS
- EMERGING TECHNOLOGIES
- WORKFORCE DEVELOPMENT

Commercial Lighting Technologies

NEEP's Commercial Lighting Technologies work focuses on the fundamental goal of improving energy efficiency in commercial and industrial buildings. NEEP is a national leader in accelerating high efficiency lighting technologies, such as Solid-state Lighting (SSL) for use in commercial setttings. [More]

High Efficiency Residential Lighting

Residential Lighting

Efficien rtheast continue to lead the way in achieving energy savings through residential lighting. Lighting will remain the most cost-effective residential program measure and should continue to receive strong support through at least 2020. [More]

www.neep.org

Residential Lighting Strate ×

neep.org/efficient-products/high-efficiency-lighting/residential-lighting-strategy/index

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RESIDENTIAL LIGHTING

HIGH EFFICIENCY LIGHTING

Residential Lighting

Commercial Lighting Technologies

BUSINESS & CONSUMER ELECTRONICS

EMERGING TECHNOLOGIES

WORKFORCE DEVELOPMENT

Products

Market data, product information, regional recommendation

Public Policy

Current developments, best practices, information for regulators and policy makers

Consumer Value

Consumer research and analysis, marketing and education best practices

Regional Activity

Regional impact, program highlights, NE Residential Lighting Workshop

Northeast Residential Lighting Strategy (RLS)

A regional roadmap for residential lighting efficiency programs

2013-2014 Update to the Residential Lighting Strategy

This is NEEP's newest RLS update and is informed by 2013 data. Released October, 2013.

www.neep.org

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NORTHEAST RLS 2013-2014 UPDATE

Northeast Residential Lighting Strategy:
Significant Savings Still Remain for Residential Lighting Efficiency

HIGH EFFICIENCY LIGHTING

Residential Lighting

Commercial Lighting Technologies

BUSINESS & CONSUMER ELECTRONICS

EMERGING TECHNOLOGIES

WORKFORCE DEVELOPMENT

Northeast Residential Lighting Strategy:
2013-2014 Update

Northeast Energy Efficiency Partnerships
October 2013

High efficiency residential lighting will remain a huge source of savings for efficiency programs. The residential lighting market has a long way to go towards being transformed, and efficiency programs continue to have a very meaningful role to play.

NEEP worked in partnership with regional efficiency programs, regulators, policy makers, industry, other stakeholders, and consumers to research and develop a roadmap for the rapidly changing lighting market. The 2014-2013 Update to the Northeast Residential Lighting Strategy (RLS) details how the region can achieve critical energy savings over the next 7 years.

2013-2014 RLS Update:

NEEP released an updated version of the RLS in October 2013. This report is intended to provide direction and support for energy efficiency program administrators (PAs), provide insight to regulators and evaluators, and be a planning tool for policymakers. Additionally, this document is intended to push this region to reach the full potential of residential lighting efficiency and is informed by regional stakeholders, NEEP Staff, and analysis from Optimal Energy and Energy Futures Group. Major updates include:

- Recent changes in regional program lighting program efforts, including the need for a huge shift towards LEDs
- Findings from recent program evaluation and market research activities; new socket saturations surveys, hours of use evaluations, and more
- New lamp specifications, building energy codes, federal lamp standards, and regulatory activities that will affect lighting program efforts
- Product developments and trends in the fast-changing residential lighting market
- Current consumer outreach and education
- New and revised regional recommendations

Just Released! Download the 2013-2014 Update to the Residential Lighting Strategy

Download the full RLS report

Blog! EnergyEfficiencyMatters.org

www.energyefficiencymatters.org

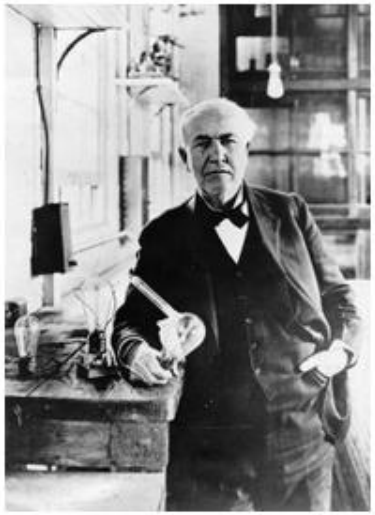
ABOUT NEEP | BUILDINGS | PRODUCTS | BEST PRACTICES | GUEST CONTRIBUTORS | NEEP POLICY HIGHLIGHTS

Energy Efficiency Matters

A blog from Northeast Energy Efficiency Partnerships

From Edison to the LED, NEEP's RLS Has You Covered

Posted on November 6, 2013 by Claire Miziolek | 3 Comments



Light is amazing. Not only is the lightbulb the international symbol for ideas and innovation, but lighting is one of humankind's earliest technologies. From the first fires to candles to oil lamps, when Thomas Edison created the incandescent lightbulb in 1879, it was the best invention since—well, the lightbulb! However, though the bulb itself represented innovation, the incandescent technology used today is largely the same as in Edison's time—hardly innovative.

Continue reading →

→ 3 Comments

Posted in Products, Uncategorized

Tagged DOE, Energy Efficiency, energy efficiency programs, ENERGY STAR, high

NEEP'S SUPPORTERS

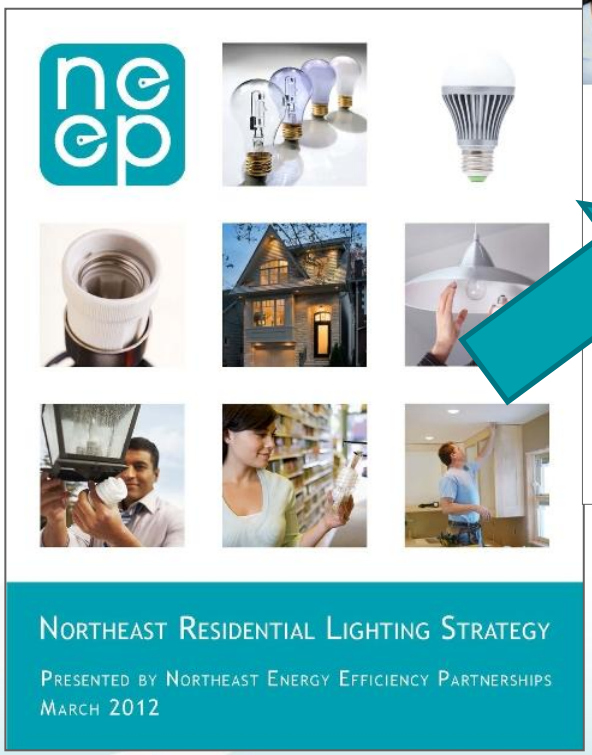
Cape Light Compact

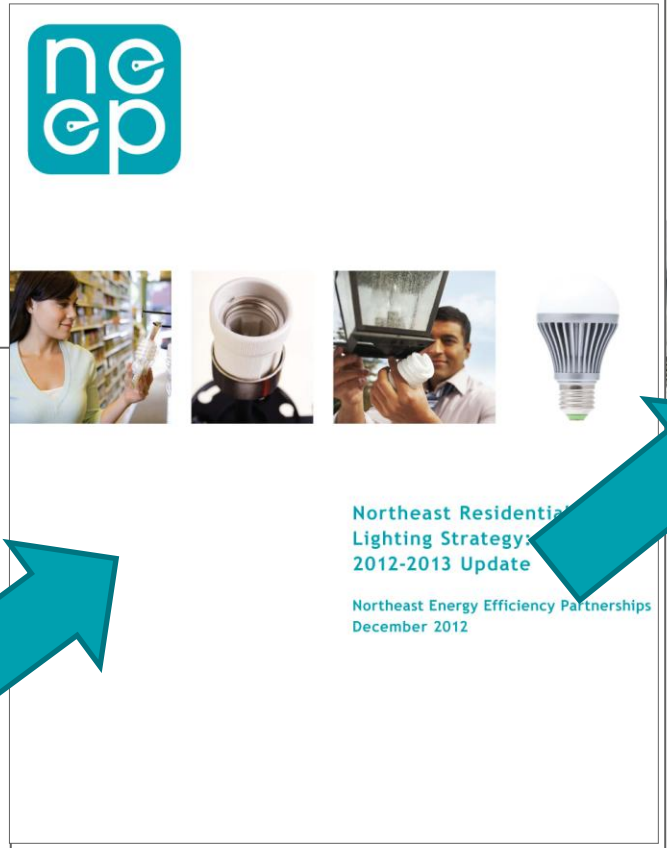
CSG Conservation Services Group

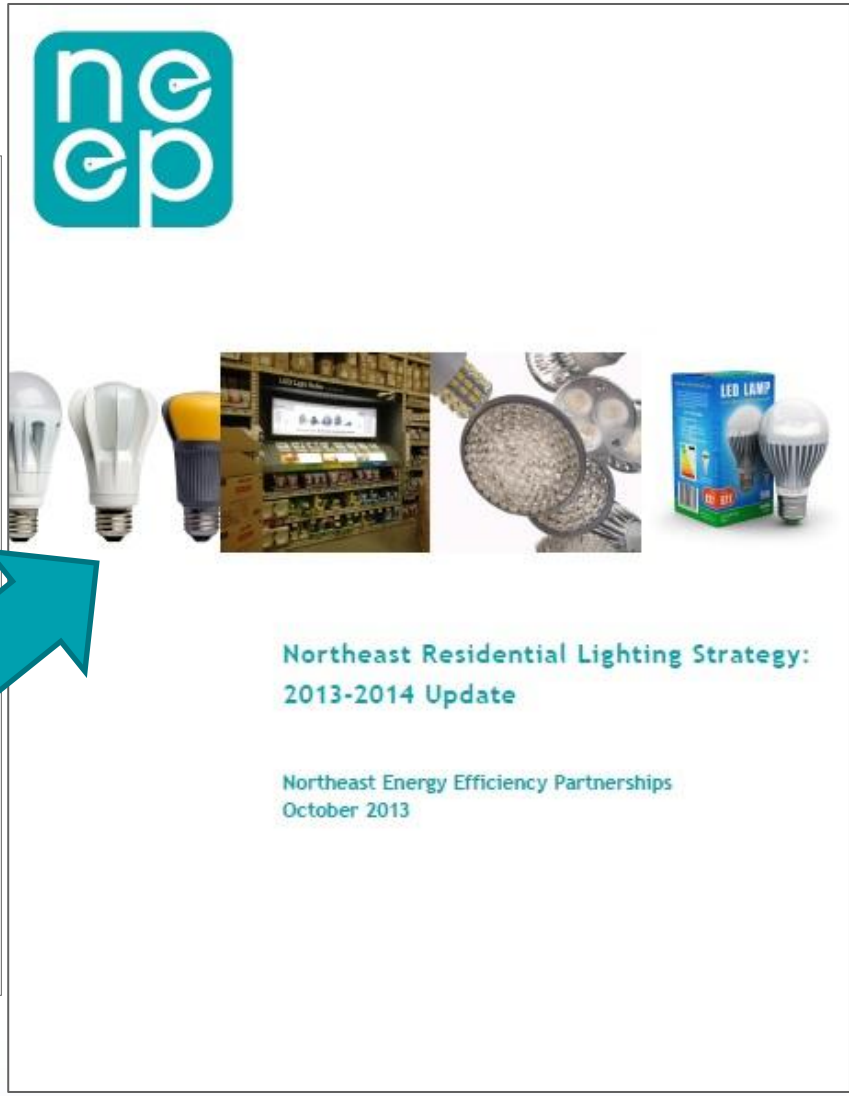
CONNECTICUT ENERGY EFFICIENCY FUND

Connecticut Light & Power

RLS Evolution







Efficiency Programs Analyzed

NSTAR

mass save
Savings through energy efficiency

nationalgrid
HERE WITH YOU. HERE FOR YOU.

your New Hampshire Electric Co-op

Western Massachusetts Electric
A Northeast Utilities Company

CONNECTICUT ENERGY EFFICIENCY FUND

Public Service of New Hampshire
A Northeast Utilities Company

Connecticut Light & Power
A Northeast Utilities Company

LIPA
Long Island Power Authority

Unitil

ui
The United Illuminating Company

Cape Light Compact

Efficiency Vermont

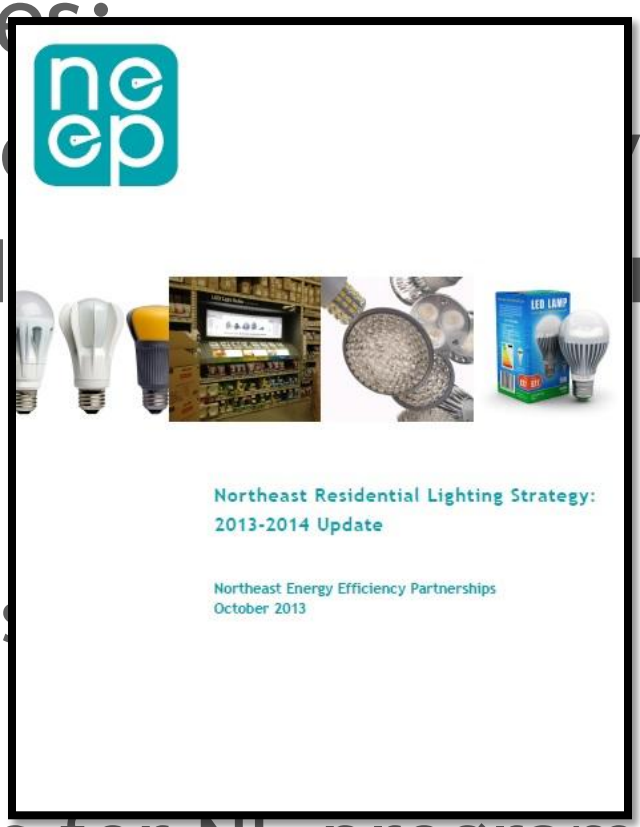
DCSEU

nyserda
Energy. Innovation. Solutions.

Major Findings

This Report includes:

- Updates on efficien ity
- Recent and planned research
- New developments:
  - New Research
  - Lamp specifications
  - Product trends
- Updated projections for NE programs
- Recommendations: Key Strategies for Success of Residential Lighting in efficiency programs



Major findings (cont)

- **The residential lighting market has not been transformed! Inefficient lighting still the majority, and therefore efficiency programs still have a very important role to play**
- LEDs are where it's at for residential lighting programs, need aggressive promotion in next 5 years
- Lighting program savings will persist and even grow
- But so must the budgets and activities

Recommendations:

- ENERGY STAR as key indicator of quality
- Especially promote low-cost, high quality LEDs

Setting the scene of the region

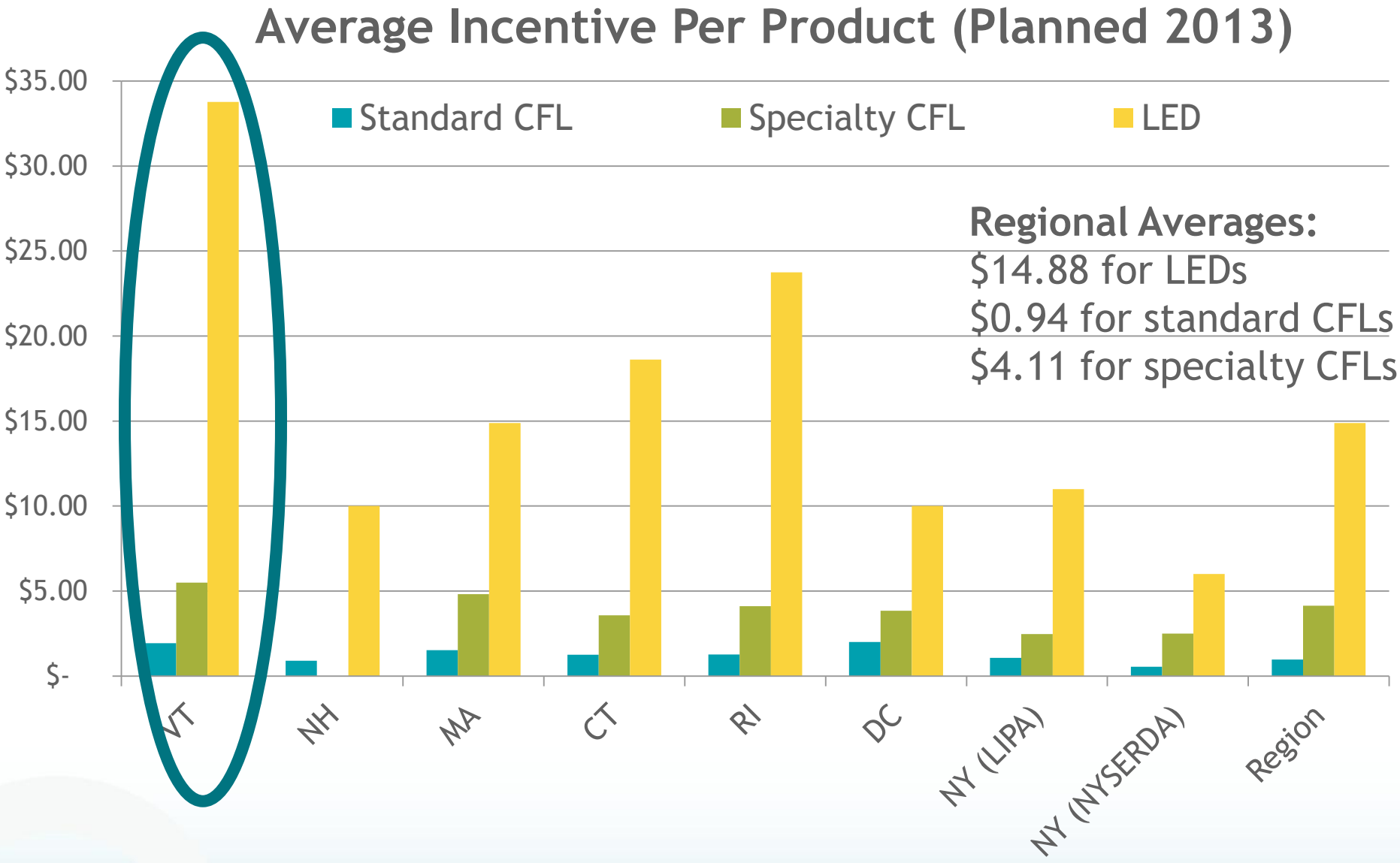
- Efficiency Program Administrators (PAs) continue support for CFLs and ramp up support of LED
- PAs are trying different approaches to achieving lightings savings
- Many PAs are integrating LEDs into other, non-retail programs
  - i.e. direct install option in their low income, existing home, multi-family and residential new construction programs

Number of Bulbs

Planned 2013 PA Retail Lighting Goals

State	CFL Units	LED Units	Total Units	Units/HH
CT	1,934,787	74,683	2,009,470	1.5
DC	280,000	3,000	283,000	1.1
MA	5,297,669	257,508	5,555,177	2.2
NH	321,521	12,896	334,417	0.6
NY-LIPA	1,555,000	300,000	1,855,000	2.0
NYSERDA	7,595,032	100,000	7,695,032	1.2
RI	885,300	16,000	901,300	2.2
VT	576,990	91,800	668,790	2.6
Region	**18,446,299**	**855,887**	**19,302,186**	**1.5**

Regional Incentive Levels

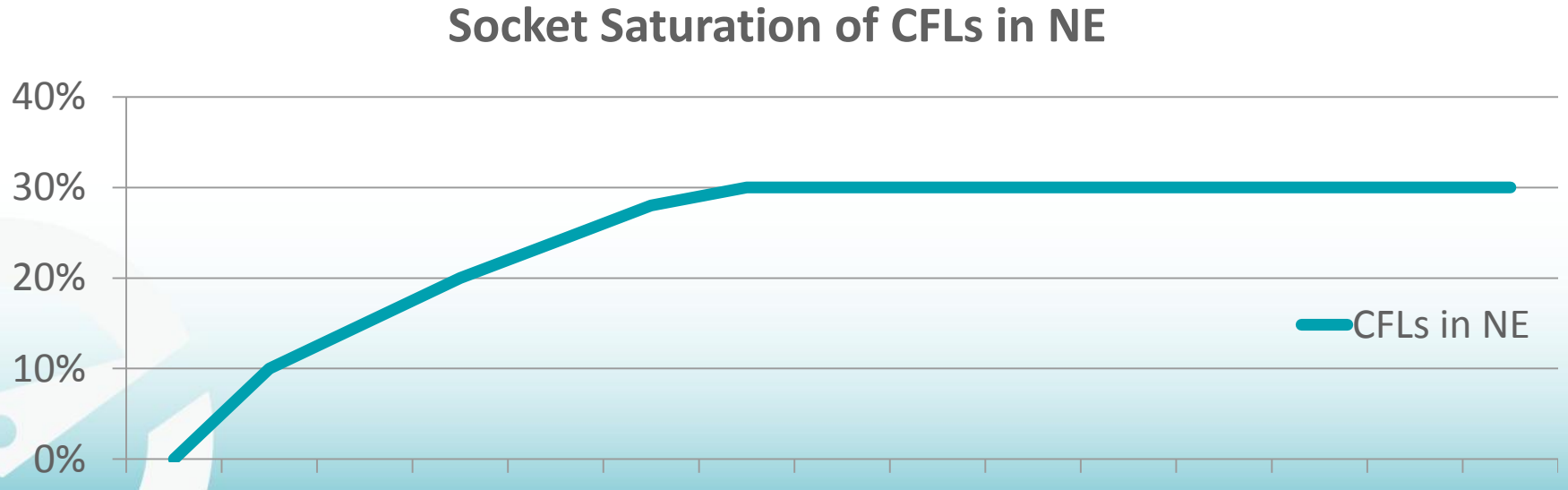


Note: the actual PA average incentive amounts paid typically tend to be lower than PAs' planning assumptions.

Socket Saturation

- Refers to % of efficient bulbs installed in sockets in homes
- Largely stalled around 30%, CFLs replacing CFLs
- Supported by new studies in MA, NH, NY (also by 2012 studies in CT and VT*)

*VT showed increases from 17% to 30% over 3 years largely with ramped up programs and low initial penetration. Unclear if will continue with that trajectory.



Hours of Use/Day (HOU)

- Estimate for how may hours each bulb is on in a day, major factor for calculating savings
- While a NH study shows 2.0, DOE National study: 1.5-1.6 (1.9 for CFLs)…
- Current regional planning estimates: between 2.8-3.2 (not VT or NH)
- Major New England study recently completed, seems to support planning estimates
- Ongoing MA and Mid-Atlantic studies—should provide even more clarity

From regional PAs to the home…

- Quick review of lighting basics
  - Different technologies/options
  - Review CCT, CRI, lumens, lifetimes
- Consumer education and guidance
- Dimming
- Design and construction considerations

What's available in Residential Lighting?

EISA = Energy Independence and Security Act

- EISA Impacts on traditional incandescent (manufacturing ban)
  - 1/1/2012: 100 watt: out!
  - 1/1/2013: 75 watt: out!
  - 1/1/2014: 40 and 60 watt: out!
  - Some levels of stockpiling observed
  - Halogen is the baseline, supply and marketing rise to the occasion
- But, we also have efficient options:
  - LED (light emitting diode)
  - CFL (compact fluorescent lamp)
- Halogen incandescent are ***not*** considered efficient…

TERMINOLOGY REVIEW

Lumens vs. Watts

- Lm measures the light output of a light source.
- Wt measure the amount of energy used to operate the light source.

Traditional Wattage	Lumen Ranges
100 watt	1490-2600
75 watt	1050-1489
60 watt	750-1049
40 watt	310-749

Efficacy

- How much light is put out given the amount of energy used, measured in lm/w
- Higher is better, but can have a very dim light with a low efficacy, or a bright light that's very efficacious

Lifetime

- For LEDs, how long we think they will last based on their degradation. LEDs don't fail, they fade, so at what fade level they become useless

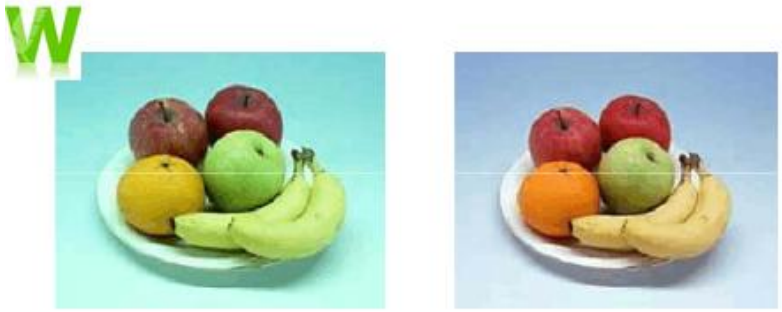
TECHNOLOGY REVIEW

	Halogen Incandescent	CFL 	LED
Price	$	$$	$$-$$$$
Good	Familiar, dimming, color rendering	Efficient, omnidirectional, pretty familiar, medium lifetime	Color rendering*, directional, omnidirectional, dimming**, very efficient
Bad	Inefficient, short lifetime 	Not as aesthetically pleasing, warm up time (esp. for covered), color rendering, dimming	Less familiar, new players, price, dimming** 

COLOR REVIEW

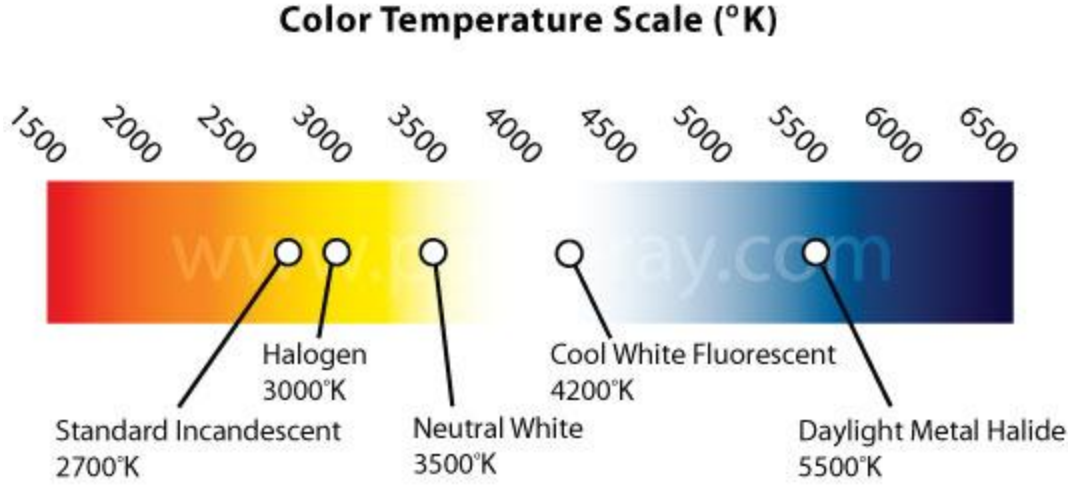
CCT

- Correlated Color Temperature
- Measures the color of the light source in degrees Kelvin, usual range for lighting from 2700K-6000K
- Lower is redder, higher is bluer, “right” CCT is based on application and preference



CRI=75

CRI > 95



CRI

- Color Rendering Index
- Measures how well light brings out the “true colors” of objects**
- Range typically 0-100, though can have negative values (i.e. R9). Higher is better (esp. >80)

CONSUMER CONFUSION

- Why are these so expensive?
- Where are the bulbs I'm used to?
  - Why is the government controlling my light bulbs!?
- Will they work with my old dimmer switch?
- I bought a CFL years ago and it was very expensive and produced terrible light! Why should I buy one now?
- What is all this terminology?
- This lighting aisle is so confusing!

CONSUMER CONFUSION

The Challenge of Dimming

- New Homes:
  - MANY New LEDs are dimmable (and dim well), especially those through ENERGY STAR that are labeled with their compatible dimmers.
  - Must have new dimmer that is compatible with LEDs
  - Dimmable CFLs possible, but LEDs are preferred

Bottom line: dimming shouldn't be a problem

The Challenge of Dimming

Existing Homes:

- New dimmer switch
  - If installing a new dimmer switch, same considerations as for new homes
- Old dimmer switch
  - If hoping to salvage an old dimmer switch, may run into challenges
  - Possible outcomes: dimmer doesn't dim, bulbs fail, weird light (flickering, popping), sensitive/quick dim to bright
  - Best alternative—don't use the dimmer or install a new one
  - Possible short term solution: 1 inefficient bulb on circuit might trigger dimmer
  - CFLs are unlikely to be much better.

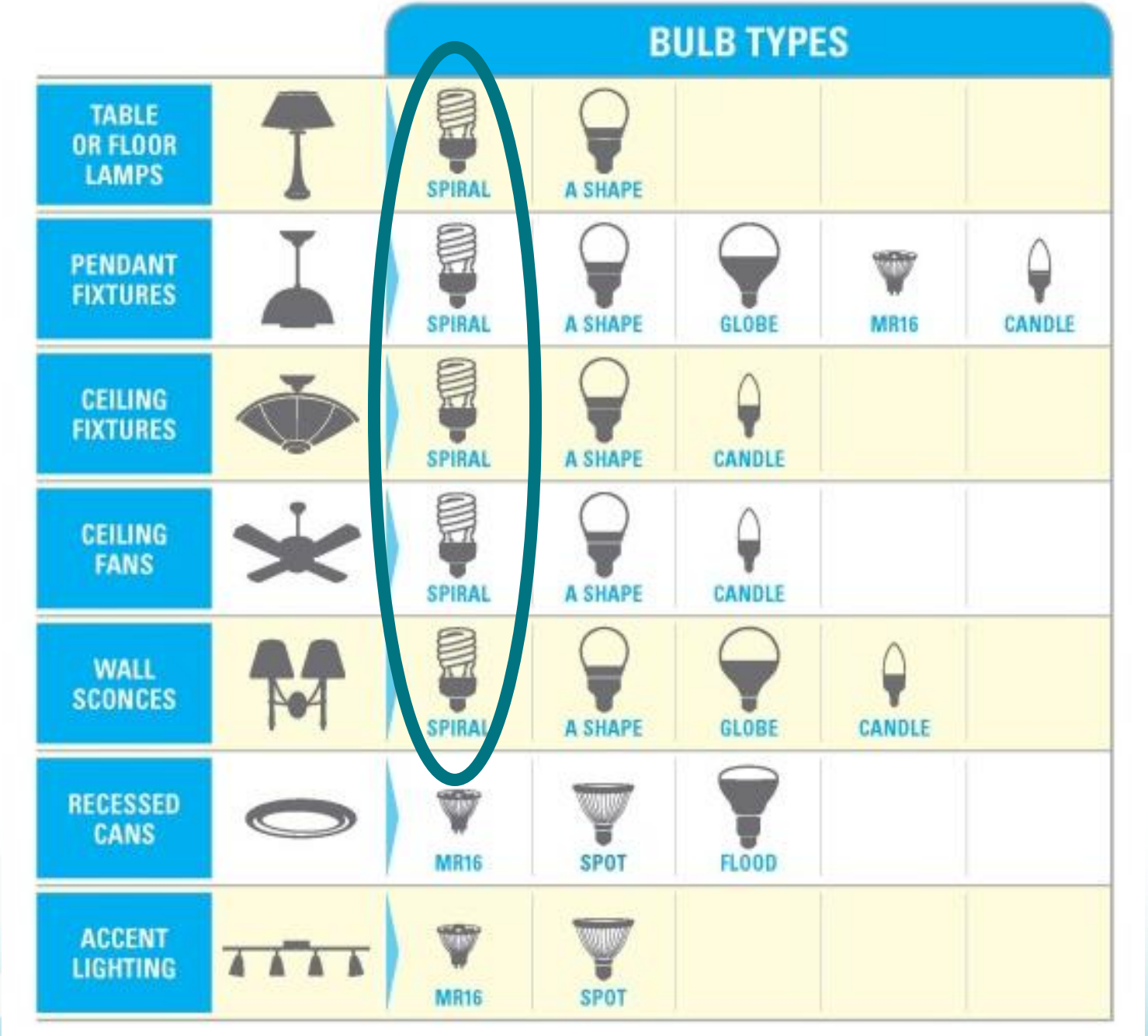
Bottom line: Difficult to do correctly

Best Applications: Which bulb where?

- Can be challenging to find the right product for the right application
- In general, CFLs good when hidden (i.e. inside a fixture, table lamp, etc.) or for general illumination when consumer doesn't mind appearance

- LEDs are great for:
  - directional applications (recessed, accent)
  - decorative uses (color specific, candle, etc)
  - increasingly for general illumination (especially because aesthetically more similar to incandescent)

Resource from ENERGY STAR



EVEN HOLIDAY LIGHTING!

LEDs have completely penetrated the holiday tree lighting market, and can make a huge difference in costs

ABOUT NEEP BUILDINGS PRODUCTS BEST PRACTICES GUEST CONTRIBUTORS NEEP POLICY HIGHLIGHTS

Energy Efficiency Matters

A blog from Northeast Energy Efficiency Partnerships

← December Energy Efficiency Policy Tracker

National Grid's Energy Efficiency Programs Enhance Rhode Island's Economy →

Efficient Lighting Options Skate to the Top of Santa's List

Posted on December 13, 2013 by Claire Miziolek | Leave a comment

Like 1 Share 1 Tweet 1 +1

It's official: the holiday season is here. With snow on the ground in much of the Northeast and days still getting darker earlier, NEEP has some tips to help you brighten up your homes while still leaving plenty of room in your budget for the newest gadgets and gifts.

Holiday lighting is a big business! Think about it:

NEEP'S SUPPORTERS

Cape Light Compact

Conservation Services Group

CONNECTICUT ENERGY EFFICIENCY FUND

Connecticut Light & Power

From the home to the market

- Availability
- Characteristics and trends
- Price

LED Products: 100W Equivalents

- 100 watt equivalent LED lamps are here
- Lighting Facts: 14 Omnidirectional lamps listed, including:
  - 6 by Philips
  - 2 by Sylvania
- ENERGY STAR: 4 Omnidirectional lamps qualified, including:
  - 1 by Philips (March)
  - 1 by FEIT (July)

LED Products: 75W Equivalents

- 75 watt equivalent LED lamps increasingly available
- Lighting Facts: 21 omnidirectional lamps listed
- ENERGY STAR: 13 Omnidirectional lamps qualified

LED Products: GU-24 and 3-way

- First GU-24 ENERGY STAR LED Light Engine from Maxlite
- Easier and Quicker qualification of ENERGY STAR Fixtures
  - There are 3-way compatible LED A-Lamps available

New LED Products: Decorative

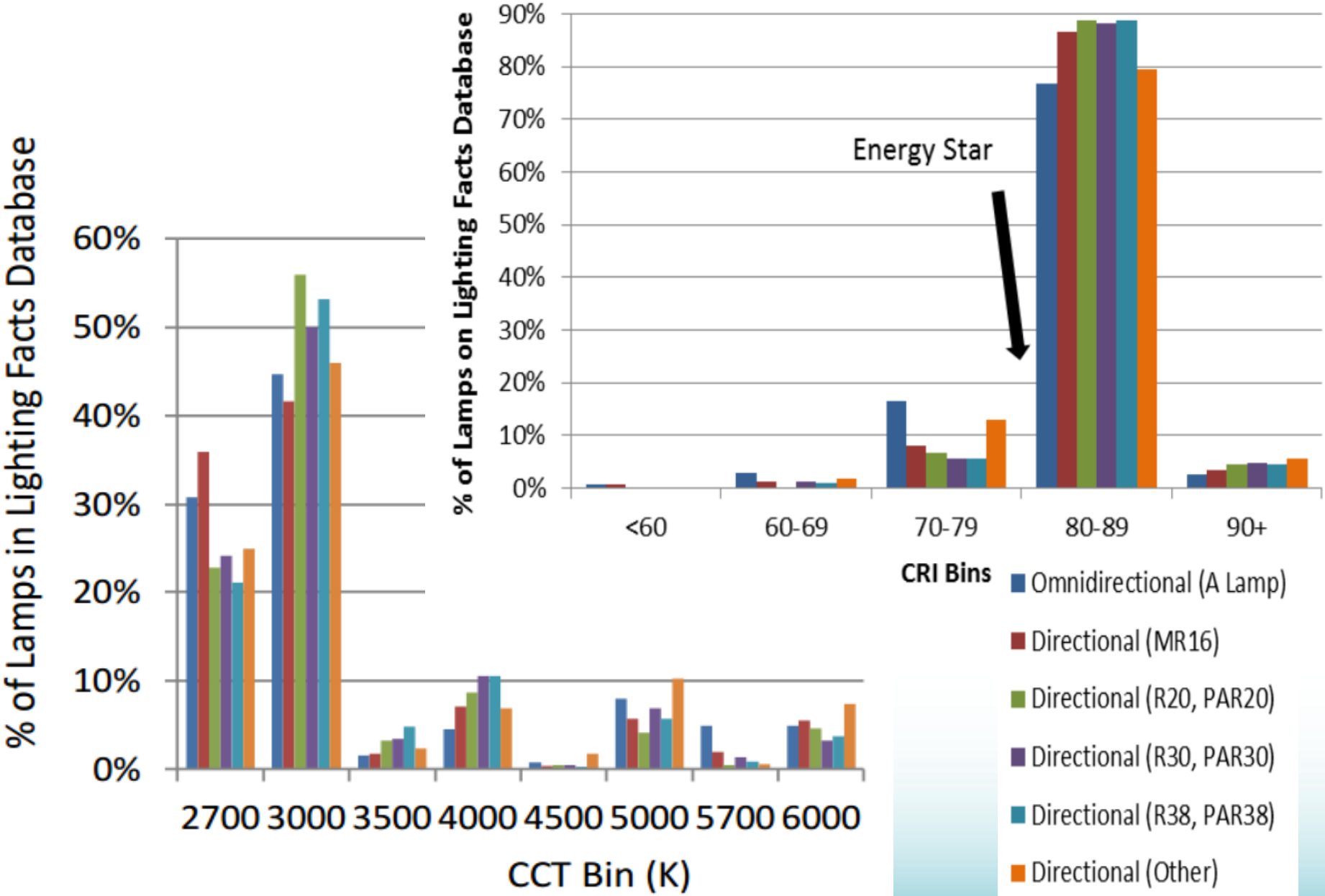
- Improved LED Decorative Lamps
- Mimic filaments of incandescent lamps
- May enable greater acceptance of efficient lighting in aesthetic applications (chandeliers, decorative wall sconces, etc.)
- Capture more sockets?

LED Products: Color and Control

- LED Lamps with networking and wireless control features
- Lamps with color changing features
- Will there be consumer demand?
- Cost-effective?

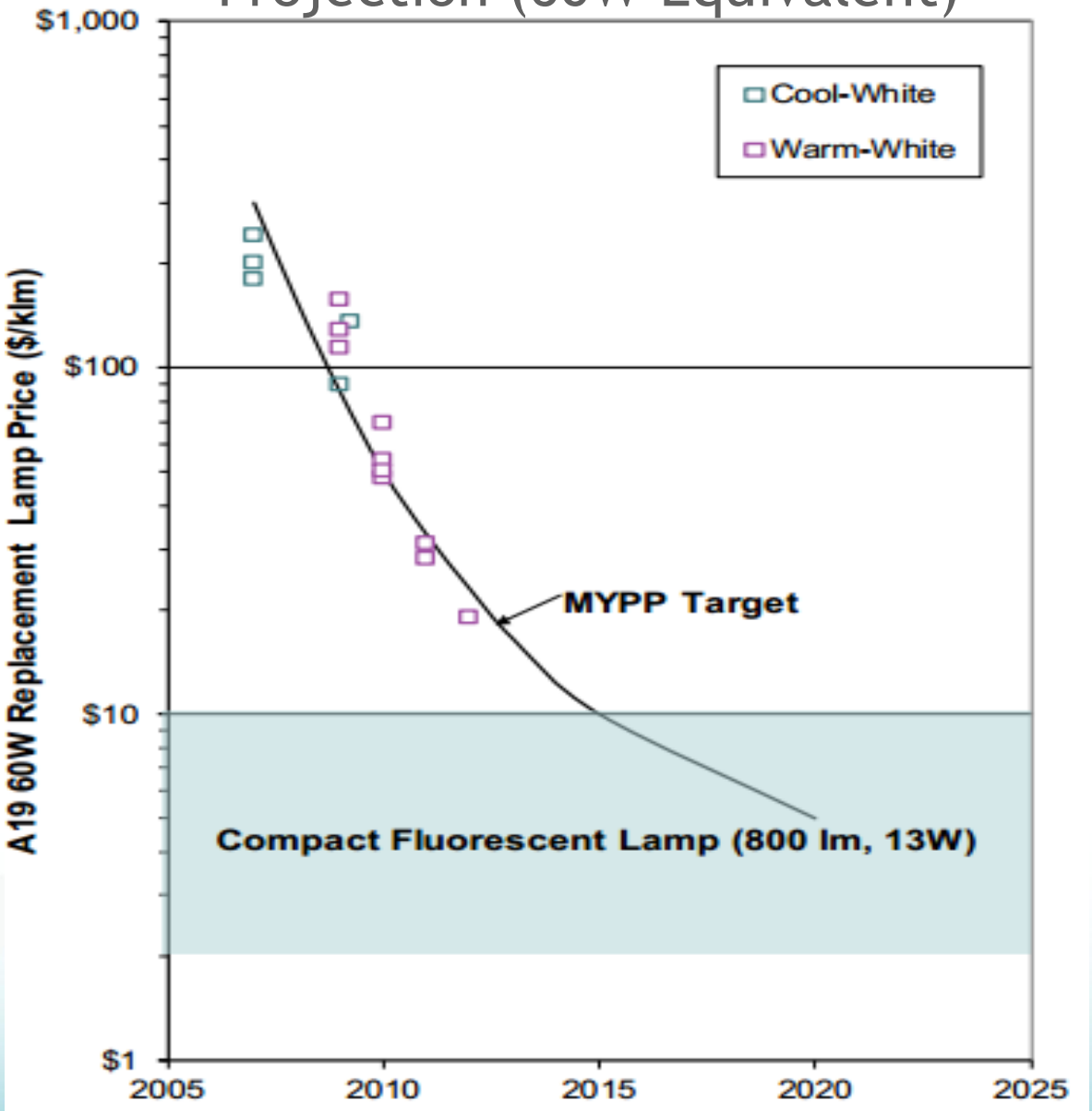
Trends: LED Color

Distribution of LED Replacement Lamps across CCT Bins and CRI, by Lamp Type



Trends: LED Lamp Prices

A19 replacement Lamp Price Projection (60W Equivalent)



Remember: Average 2013 planned incentive for LEDs is $14.88

- Philips 60W Equiv now under $15 at Home Depot

- Insignia 60W Equiv now under $18 at Best Buy

- Cree 60W Equiv now under $13 at Home Depot

Source: DOE 2013 Multi-Year Program Plan

Other Considerations

- Building Codes
- Specifications
- How to make the case for efficient lighting

Residential Building Code: IECC

IECC 2009 and 2012

IECC= International Energy Conservation Code

- IECC 2009 requires minimum of 50% “high efficacy lamps”
- IECC 2012 requires 75% of lamps in fixtures or fixtures to be high-efficacy
- All states in the region have IECC 2009 in effect, IECC 2012 in MA and RI
- Will impact Residential New Construction lighting baselines and savings

New Developments: Lamp Specs

- **ENERGY STAR Lamps version 1.0 (Effective 9/30/2014)**
  - Provides requirements for LED dimming and flicker
  - Creates new requirements for GU-24 base lamps
- **CEE Advanced Lighting Spec Initiative**
  - Being developed in response to member requests for specification with higher performance requirements than ENERGY STAR
  - Programs can promote products that meet CEE specification and claim more savings
- **California Quality LED Lamp Specification**
  - Largely mirrors ENERGY STAR, but requires 90+ CRI and only allows 2,700K and 3,000K

Making the Case: Cost/Benefit Analysis for Efficient Lighting

- How do they compare?
- How can we justify the expense? What are we gaining?
- Remember:

Factors	Inefficient	CFL	LED
Price to buy	X	X	(X)
Price to own		X	X!
Lifetime		(X)	X!!
Quality	(X)	(X)	X

Beyond the numbers…

- Efficiency programs are supporting CFLs and LEDs
- Customers are getting really excited about LED technology
- LED technology has the potential to be controlled by energy management systems

Why wouldn't it be worth it?

BREAKOUT DISCUSSIONS

- Break yourselves into groups of 3 or 4 based on seating location
- With group, take 4 minutes to develop creative responses to the following prompts:

How can you overcome the barriers of consumer education/interest/confusion to increase the penetration of high efficiency lighting?

BREAKOUT DISCUSSIONS

- Break yourselves into groups of 3 or 4 based on seating location
- With group, take 4 minutes to develop creative responses to the following prompts:

Will these codes, standards, and specifications help or hurt you to promote high efficient lighting?

BREAKOUT DISCUSSIONS

- Break yourselves into groups of 3 or 4 based on seating location
- With group, take 4 minutes to develop creative responses to the following prompts:

What resources, studies, or information would be most helpful for you to success to push forward efficient residential lighting for your job?

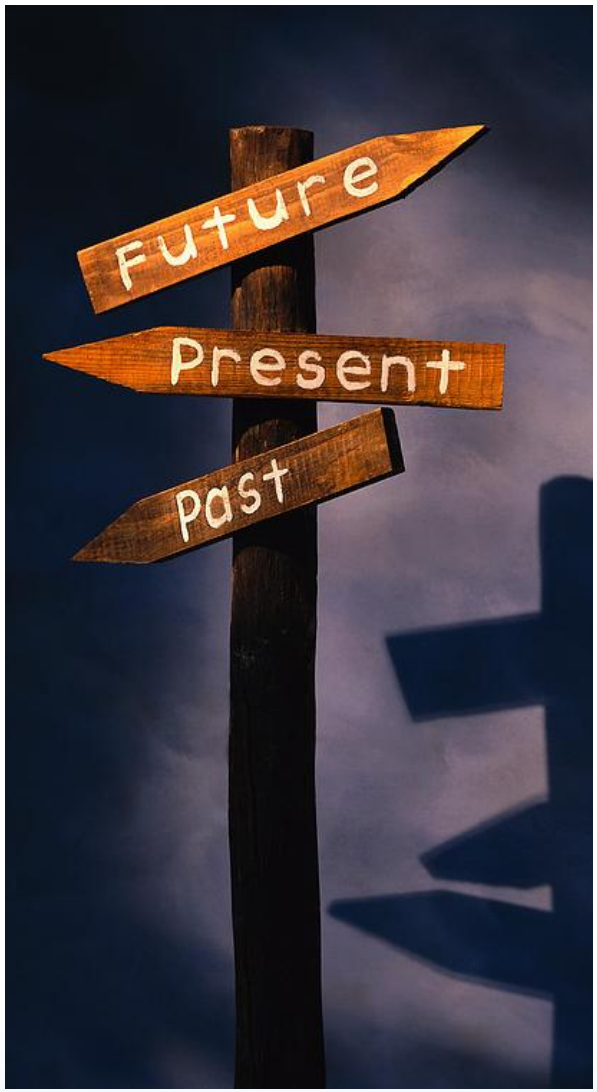
Report out

What did you learn? What can you share on:

- Consumer education barriers?
- Codes/standards/specifications?
- Necessary resources

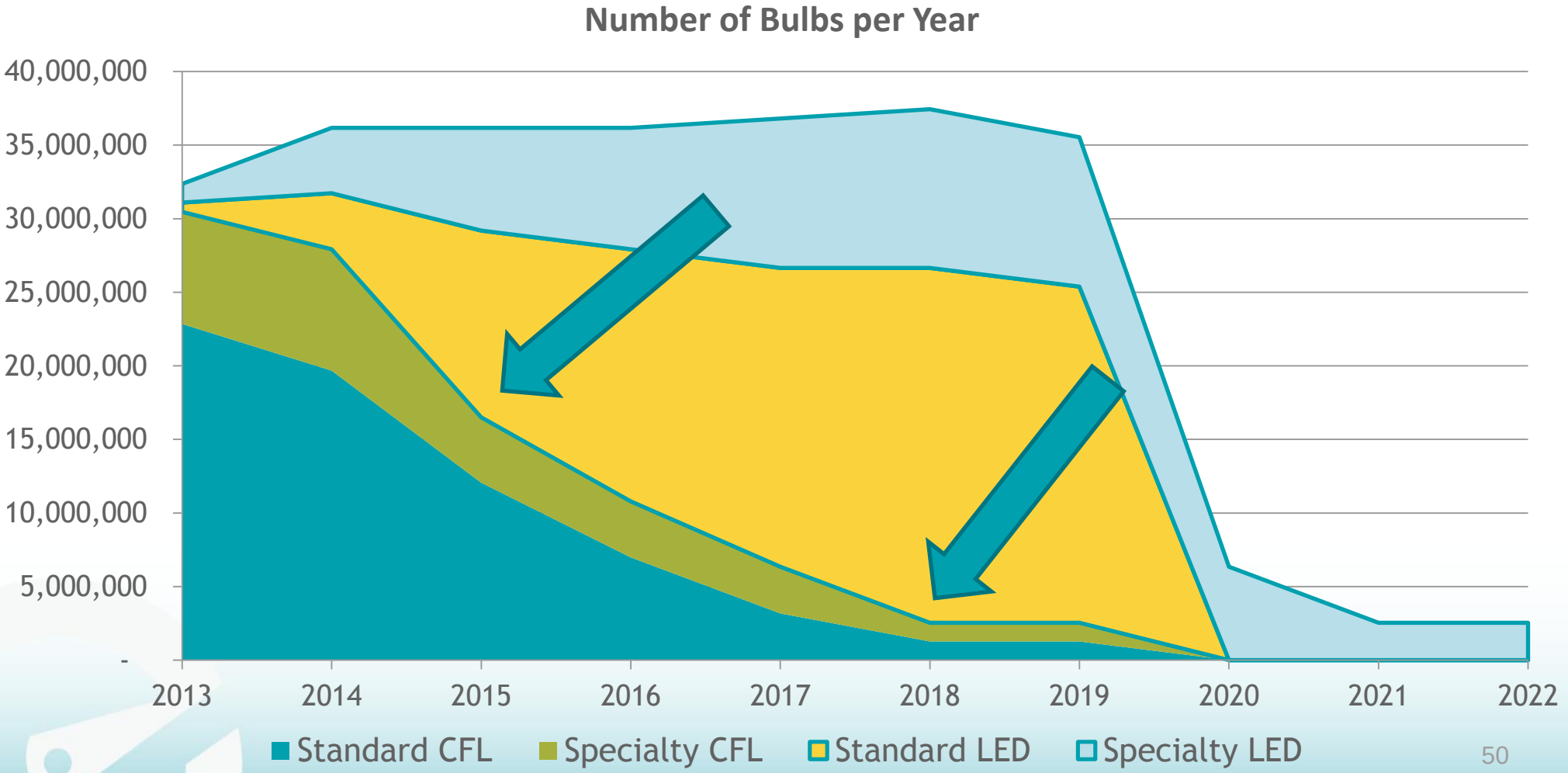
The Future for Efficiency Programs

- PAs will be promoting LEDs heavily into the future
- CFL promotions will go down, especially as LED prices fall
- Efficiency programs will continue to promote efficient lighting for the next several years and will achieve major energy savings from this.



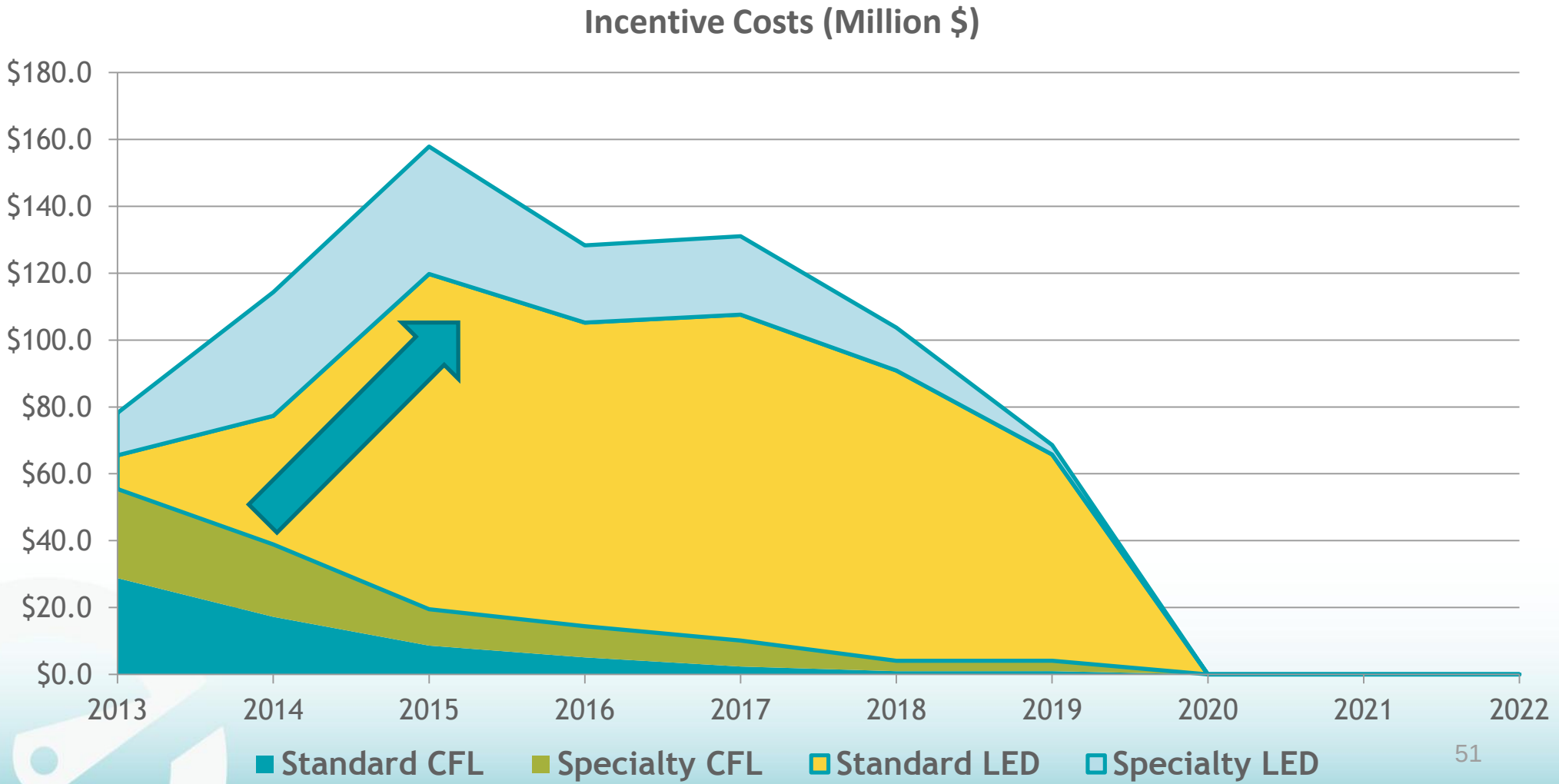
Updated Projections: Bulbs

- Number of LEDs moving through programs increasing rapidly
- CFL bulbs fall to near zero after 2018.



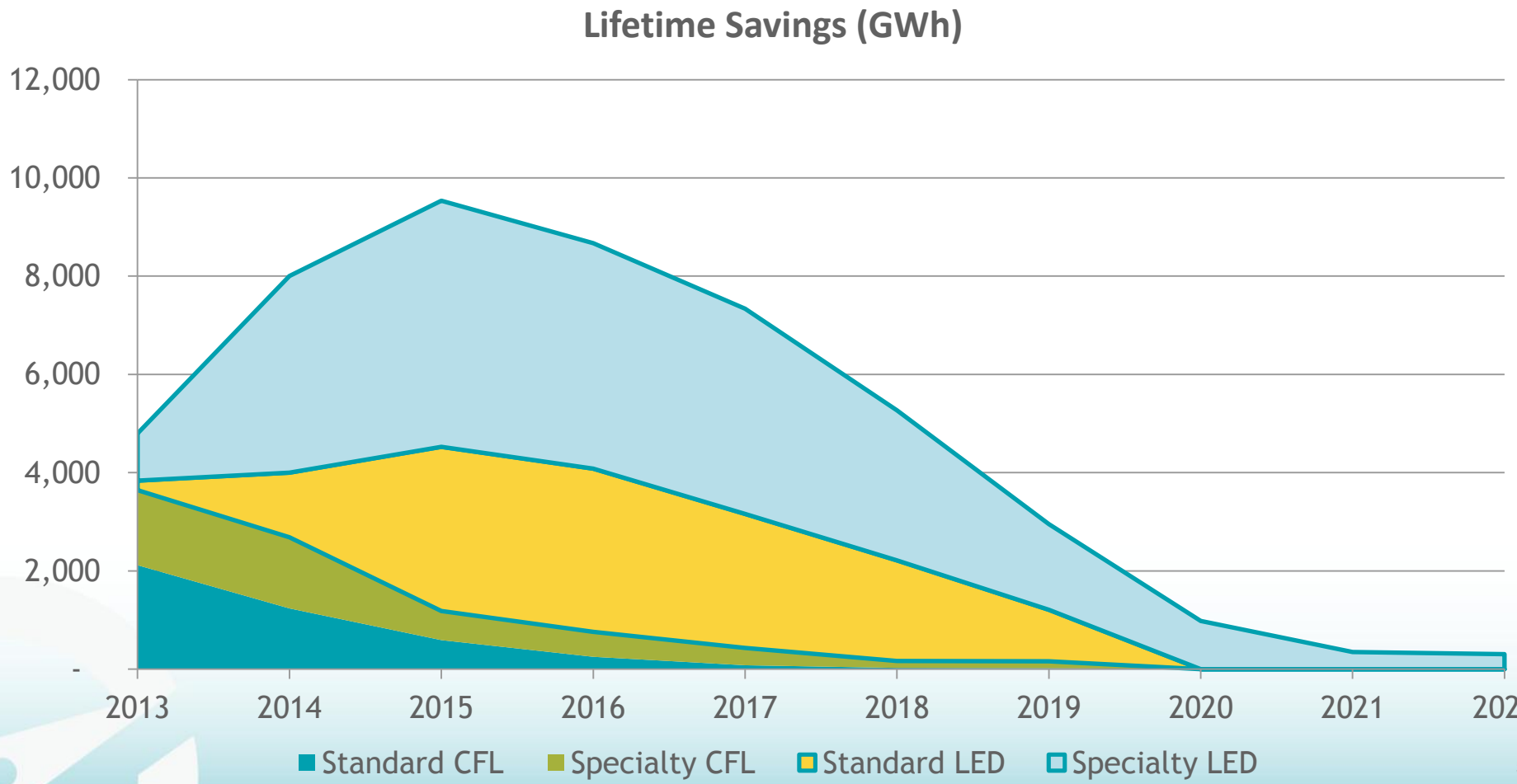
Updated Projections: Spending

- Spending for LEDs increases quickly, drops off after 2015
- CFLs incentive spending near zero after 2018.



Updated Projections: Lifetime Savings

- LED lifetime savings increase dramatically
- CFLs savings near zero after 2018



Huge savings remains, promotions will continue

- These savings contingent on:
  - investment in LEDs
  - increase in program spending
  - increase in program activity
- PAs will be saying goodbye to CFLs

Resources from NEEP

2013 Northeast ENERGY STAR Lighting Initiative Programs

State	Sponsor	Spiral CFLs	Specialty CFLS	CFL Fixtures	LED Bulbs	LED Fixtures
CT	Connecticut Light &Power The United Illuminating Co.	Up to $1.26	Up to $3.00	Up to $10	Up to $15	Up to $15
DC	DCSEU	up to $2	$2 - $4		$5 - $10	
MA	Cape Light Compact National Grid NSTAR Electric Unitil Western Mass Electric	up to $1.40	up to $6	up to $15	up to $20	up to $15
NH	Liberty Utilities New Hampshire Electric Co-op Public Service of New Hampshire Unitil	$1 - $5	$1 - $5	$10	$10	$10
NY	Long Island Power Authority	$0.80	$2.50	$10	$11	$11
NY	NYSERDA		Up To $3*		Up to $8*	Varies*
RI	National Grid (RI)	up to $1.40	up to $6	$15 - $25	up to $12	up to $15
VT	Efficiency Vermont	Bought down to $0.99	Bought down to $3.99	$5	$5 - $20	$10

DOE SSL Technical Information Resource TINSSL: www1.eere.energy.gov/buildings/ssl/

NEEP is working together with DOE's SSL programs to provide you with an excellent resources and to inform DOE of industry research needs

- CALiPER Summary Reports – provides unbiased product performance information to foster the developing market for high-performance SSL products.
- GATEWAY Demonstrations - showcase high-performance LED products for general illumination in a variety of commercial and residential applications.
- Municipal Solid State Street Lighting Consortium - shares technical information and experiences related to LED street and area lighting demonstrations and serves as an objective resource for evaluating new products on the market intended for street and area lighting applications.
- L-Prize design Competition - aims to accelerate development and adoption of SSL products to replace the common light bulb.
- Next Generation Luminaires™ - recognizes excellence in the design of energy-efficient LED commercial lighting luminaires.

More Resources: DOE

- New L-Prize for Par38
- DOE put out new Life Cycle Analysis: Part 3: Are toxic elements present that exceed regulations?
  - All lamp types exceed at least one California Restriction (Copper, Zinc, Antimony, Nickel)
  - LED concentrations comparable to cell phones and electronic devices, need to Recycle!
- DOE New factsheet: Optical Safety of LEDs (safe)
- DOE 2013 Multi-Year Program Plan, roadmap for SSL
- NEW: Pricing and Efficacy Trend Analysis for Utility Programs
  - Efficacy goes up, price goes down
- NEW: Dimming LEDs with Phase Cut Dimmers
  - For large operations, need to test it out or use new dimmers

U.S. DEPARTMENT OF ENERGY

Next Steps

- NEEP will continue these conversations, research, and analysis in residential lighting
- We have a long way to go, and NEEP is committed to helping get there
- Continued coordination of the LAC and regional conversations (let me know if you're interested)
- Hot topics of deeper investigation:
  - Consumer education
  - Better data
  - Residential controls
  - Program design to meet aggressive goals

Conclusion

- We all have a role to play to increase socket saturation of high efficient lighting!
- Use the efficiency program promotions, ENERGY STAR resources, etc. to help get the region to high penetration of efficient lighting and abounding energy savings!

Questions? Comments? Ideas?

Thank you! Leadership Advisory Committee and Report Input Providers

- Apex Analytics
- APT
- ASAP
- Cooper Industries
- Cree
- DC Sustainable Energy Utility
- Eco-Hatchery
- Efficiency Vermont
- **Energy Futures Group**
- GE
- The Home Depot
- ICF International
- LIPA
- Lutron Electronics
- **Optimal Energy**
- OSRAM Sylvania
- National Grid
- NMR Group
- Northeast Utilities
- NYSERDA
- Philips
- United Illuminating
- US EPA/ENERGY STAR
- VEIC

Thank you!

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