Northeast Energy Efficiency Partnerships

Welcome to the 2014 Northeast Residential Lighting Workshop

Tuesday, October 7th 2014

9:00am-4:00pm

Lighting Research Center

2014 Northeast Lighting Workshop

Welcome to New York!

Ryan Moore, NYSERDA
Lighting Research Center
October 7, 2014

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Energy. Innovation. Solutions.

2014 Northeast Lighting Workshop

What's New in New York

1) NYSERDA's Residential Lighting Point-of-Sale (POS) Program for 2014

2) Briefly discuss NYSERDA's recently submitted Clean Energy Fund Proposal

   - Outlines the future direction and role of NYSERDA from a strategic standpoint
   - Invests in solutions that enable private sector to innovate, invest in, and deploy more clean energy at a lower cost.

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2014: Looking back

NYSERDA's Residential Lighting Point-of-Sale (POS) Program

- Funded by Energy Efficiency Portfolio Standard (2012-2016).
- More than $16m in incentives, 75% dedicated to the Sales Performance Program for standard CFLs, and the remaining 25% to LEDs and SCFLS.
- Early 2014, NYSERDA implemented several successful SCFL and LED buy-down promotions.
  - Sold more than 275,000 SCFLs @ $1.50/bulb and 225,000 LEDs @ $3/bulb
  - Paid more than $430k on SCFL buy-downs
  - Paid more than $670k on LED buy-downs
- NYSERDA also launched its first market-lift contract through its Sales Performance Program to increase bare-spiral CFL sales and help gain kWH savings not met by SCFL and LED buy-down promotions.

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2014: Lessons Learned

- LED Prices dropping dramatically, bare-spiral sales remain at 2010 levels, however, SCFLs sales are being sold based on cheaper halogen options and the lower LED prices
- Consumer education still a major barrier
  - Lumens vs. Watts
  - Picking the right bulb
  - Halogens and the EISA Phase-Out
- Sales Performance/market-lift initiatives can only succeed with a committed and dedicated retailer, rather than relying on manufacturer for accurate sales data.

Clean Energy Fund

- Mission: To achieve long-term greenhouse gas emissions reductions and establish new approaches to the clean energy market to drive greater deployment of clean energy resources.
- The Clean Energy Fund aims to set the framework to deliver on our strategic objectives including:
  - Clear transition from resource acquisition to market animation
  - Refocus of strategy on enabling markets, overcoming specific barriers, and encouraging innovation
  - Fuel neutrality to enable more responsiveness to consumer demand for clean energy
  - Evaluation leading to actionable data and insights that inform go-forward investment decisions and program design
  - Funding and budget certainty for NYSERDA while reducing the SBC/EEPS collections from ratepayers decline.

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Questions?

Ryan Moore

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1-866-NYSERDA, ext.3267

www.nyserda.ny.gov

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LIGHTING

About NEEP

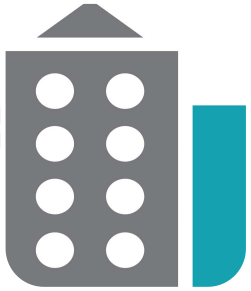
MISSION

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

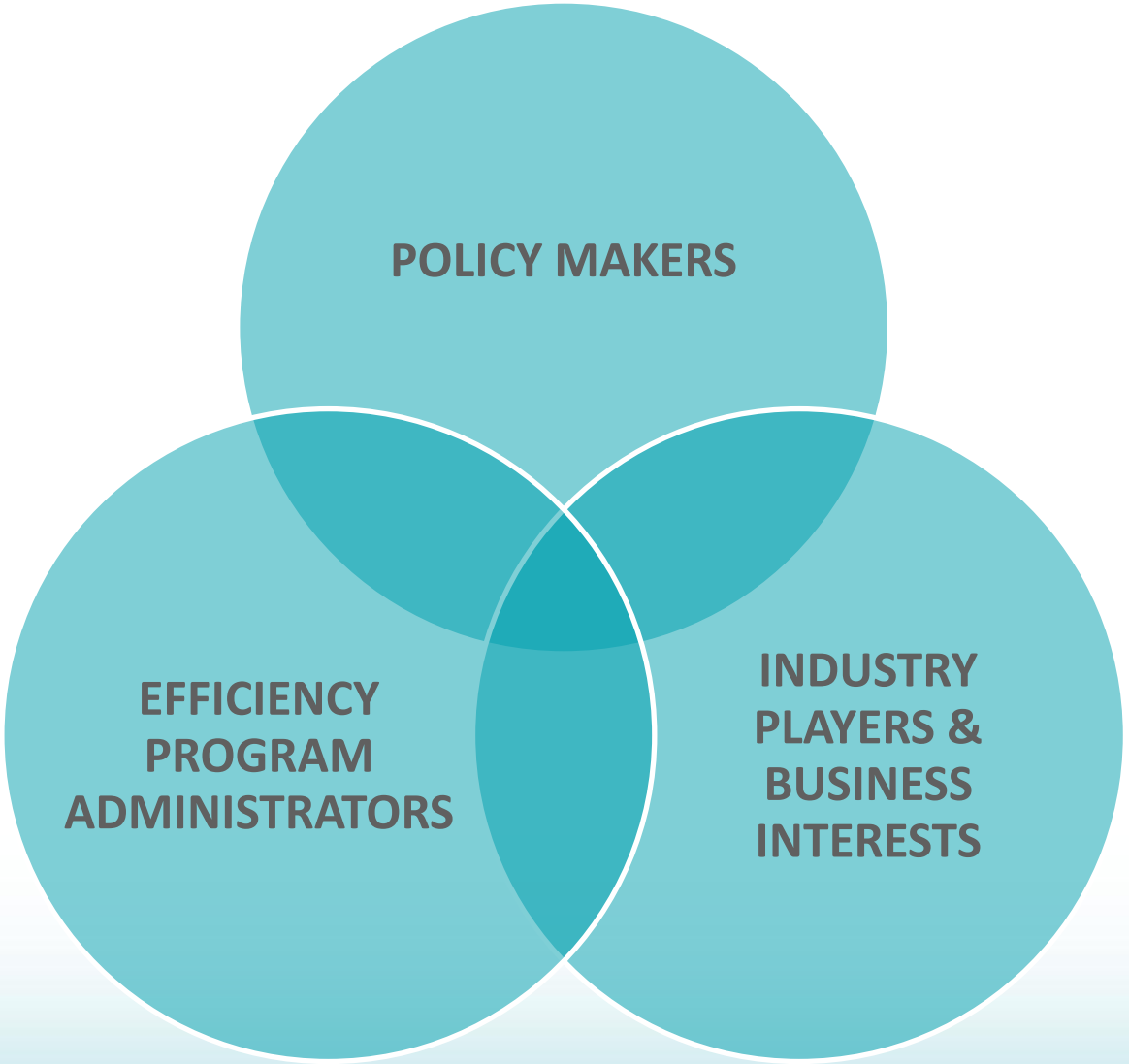
Make Efficiency Visible

Advance Knowledge - Best Practices

Regional energy efficiency collaborations since 1996

About NEEP

PRIMARY AUDIENCES: WHO WE SERVE



THANK YOU TO THE RESIDENTIAL LIGHTING LEADERSHIP ADVISORY COMMITTEE

- ACEEE
- Apex Analytics
- CLEAResult
- Connecticut Light & Power
- Cree
- DC Sustainable Energy Utility
- Efficiency Vermont
- Energy Futures Group
- GE
- Globe Electric
- The Home Depot
- ICF International
- Lockheed Martin
- Lowes
- Lutron Electronics
- MASS Save Program Administrators
- OSRAM Sylvania
- NMR Group
- Northeast Utilities
- NYSERDA
- Philips
- PSEG-Long Island
- Samsung
- United Illuminating
- US EPA/ENERGY STAR
- TechniArt

SPECIAL THANKS TO

nyserda
Energy. Innovation. Solutions.

TODAY'S AGENDA

8:00-9:00	Networking Breakfast
9:00-9:15	Introduction and Welcome
9:15-9:45	Residential Lighting Strategy: An Update
9:45-11:15	The Future of Lighting Program Design
11:15-11:45	Lighting and Human Health
11:45-12:40	Networking Lunch
12:40-1:50	Innovations in Residential Lighting Marketing
1:50-2:05	Break
2:05-2:50	Impact of New Specifications on Lighting Programs
2:50-3:00	Wrap Up, Next Steps
3:00-4:00	Tour of the Lighting Research Center
4:00	Meeting Adjourned—Thank You!

Northeast Energy Efficiency Partnerships

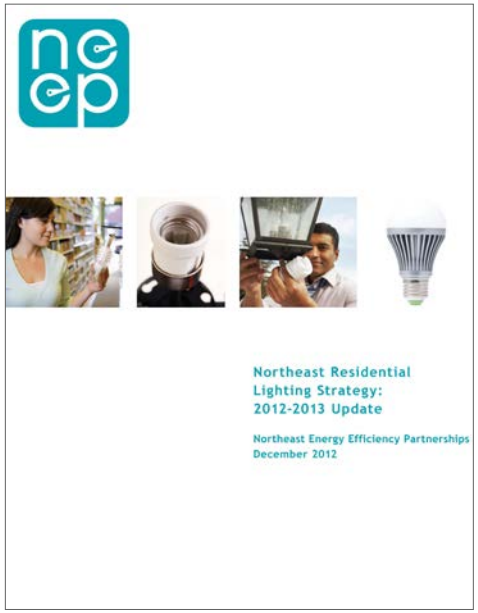
The Northeast Residential Lighting Strategy: 2014-2015 Update

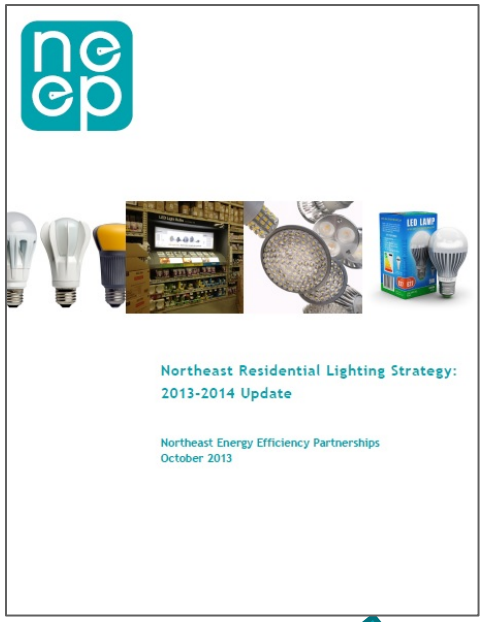
Claire Miziolek, NEEP

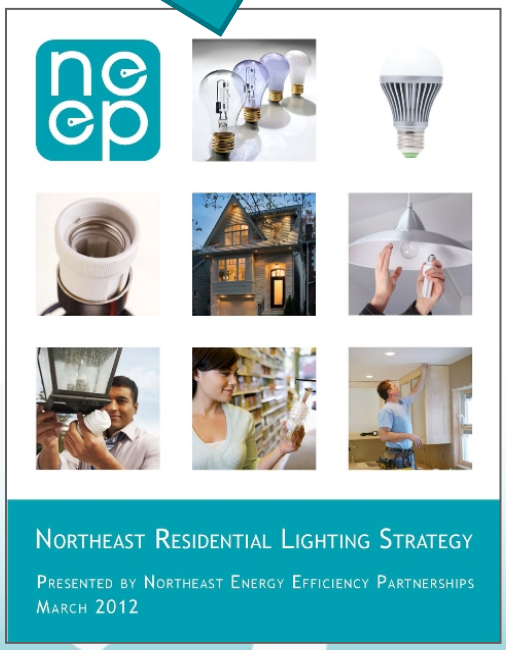
2014 Northeast Residential Lighting Workshop

Tuesday, October 7th 2014 9:15am

RLS EVOLUTION





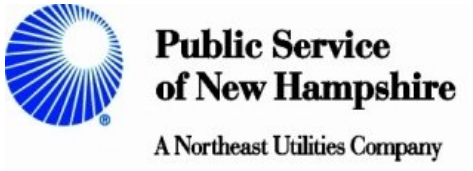


Available from neep.org

Findings presented today

2014-2015 Update released SOON!

EFFICIENCY PROGRAMS



WHAT IS IN THE RLS**

Where is the Northeast Going

- Northeast Program Updates
- Updated Efficiency Program Projections
- Recent and Planned Evaluations

Research to guide us there

- LED Pricing Trends
- CFL to LED transition strategies

Other activities of note

- Lamp Specifications Updates: ENERGY STAR, CA, CEE: Discussed at 2:10 session
- ENERGY STAR/NEMA Lighting Roadmapping effort: Discussed at 12:40 session
- DOE Solid-State Lighting Initiative Update
- EISA 2020 rulemaking process
- Enervee Lighting Database
- CREED Initiative
- Recommendations: Key Strategies for Success of the RLS

**Preliminary findings shown. Subject to change as report is finalized and feedback or information from workshop.

NORTHEAST PROGRAM UPDATES: TRENDS

Where is the Northeast Going?

- Results (from 2013, 2014 program planning projections, and 2014 year-to-date PA activity) in the region point to:
  - a continued strong reliance on lighting for most residential sector portfolios
  - an acceleration of LED program activity both at retail and through direct install efforts
- We've seen withdrawal of retail support for select CFL type in Connecticut and DC
  - largely due to better performance by LED alternatives
- We've witnessed continued declines in LED pricing (more to come)

NORTHEAST PROGRAM UPDATES

- 2014 Planned Retail Lighting Activity (# of Units)

Planned 2014 Retail Lighting Activity	CFLs	Specialty CFLs	CFL Fixtures	Total CFLs	LEDs	Total Units	% LEDs	House holds	Units/ HH
Connecticut	2,493,909	577,203	6,844	3,077,956	867,980	3,945,936	22%	1,392,677	2.8
DC SEU	350,000			350,000	100,000	450,000	22%	257,220	1.7
Long Island (PSEG)	1,200,000	575,000	3,000	1,778,000	650,000	2,428,000	27%	998,404	2.4
Massachusetts	4,372,296	1,533,839	230,597	6,136,732	987,707	7,124,439	14%	2,053,361	3.5
NYSERDA	206,632	73,311		279,943	216,328	496,271	44%	6,275,695	0.1
Rhode Island	580,000	420,000	64,200	1,064,200	172,000	1,236,200	14%	425,083	2.9
Vermont	518,000	187,200	3,671	708,871	276,035	984,906	28%	309,019	3.2
New Hampshire	210,951		3,249	214,200	25,696	239,896	11%	518,973	0.5

SHARE OF LEDS: NORTHEAST PROGRAM UPDATES

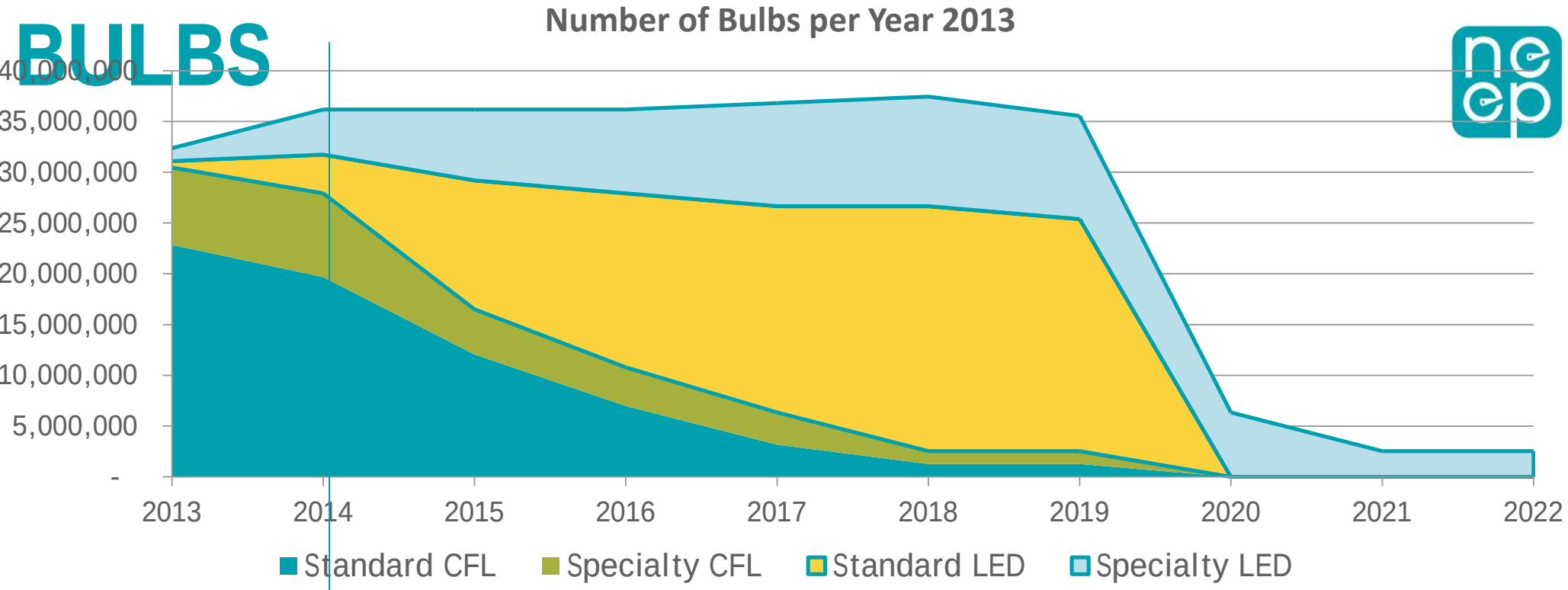
	2013	2014 YTD
Connecticut	15%	35%
District of Columbia	4%	23%
Massachusetts	15%	20%
Rhode Island	9%	20%
Vermont	20%	30%
PSEG-LI	19%	37%
NYSERDA	47%	44%

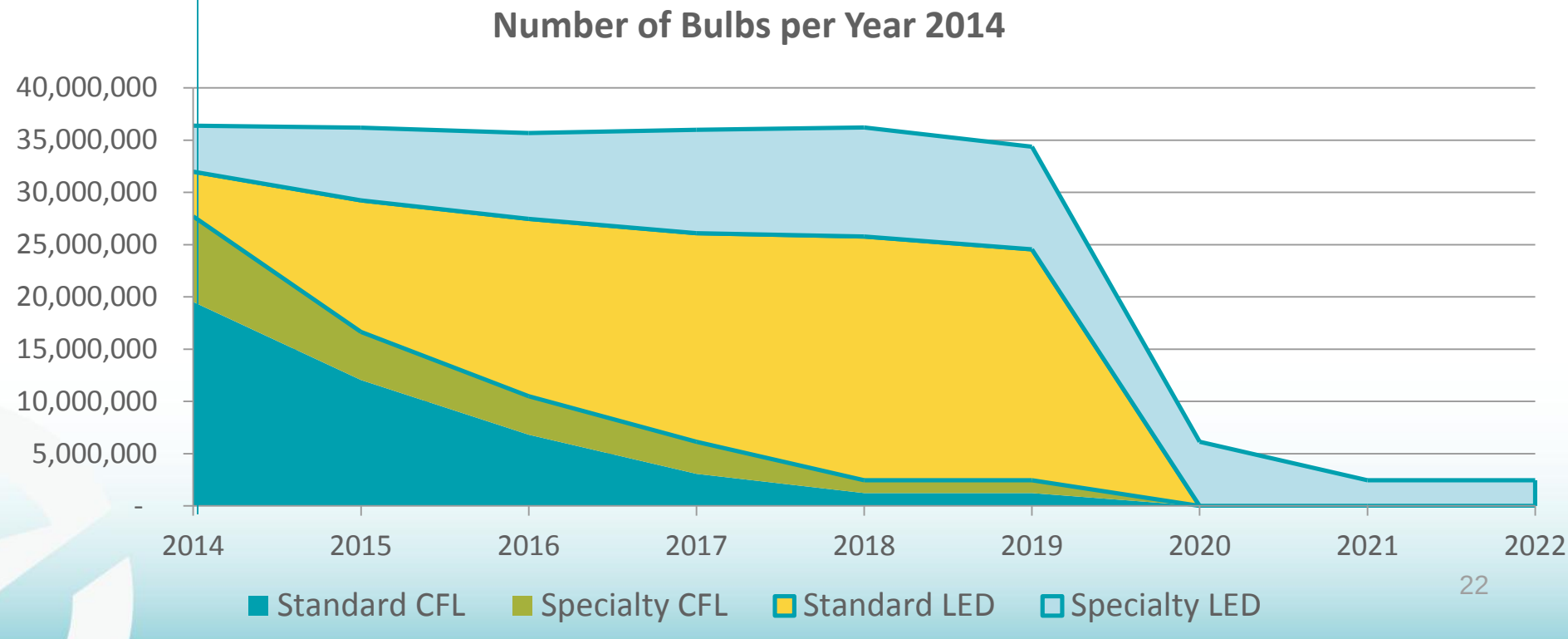
UPDATED EFFICIENCY PROGRAM PROJECTIONS

- Using 2014 data, we've updated our projections for the outlook of efficiency lighting programs through 2020.
- Generally, the findings from last year that CFL promotions would drop off significantly after 2018 stand
- Seeing greater savings from decreased incentive $
  - Longer HOU*, LED prices going down
- While not presented here, this year the RLS will be doing some state-by-state analysis based on specific state inputs (namely bulbs per household)

- Note: NY makes up a significant portion of the region's activities. While these models apply the same considerations to all states in the region, the plans for NY will change the regional perspective significantly.

BULBS


Number of Bulbs per Year 2013
40,000,000
35,000,000
30,000,000
25,000,000
20,000,000
15,000,000
10,000,000
5,000,000
-
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
Standard CFL
Specialty CFL
Standard LED
Specialty LED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35,000,000
30,000,000
25,000,000
20,000,000
15,000,000
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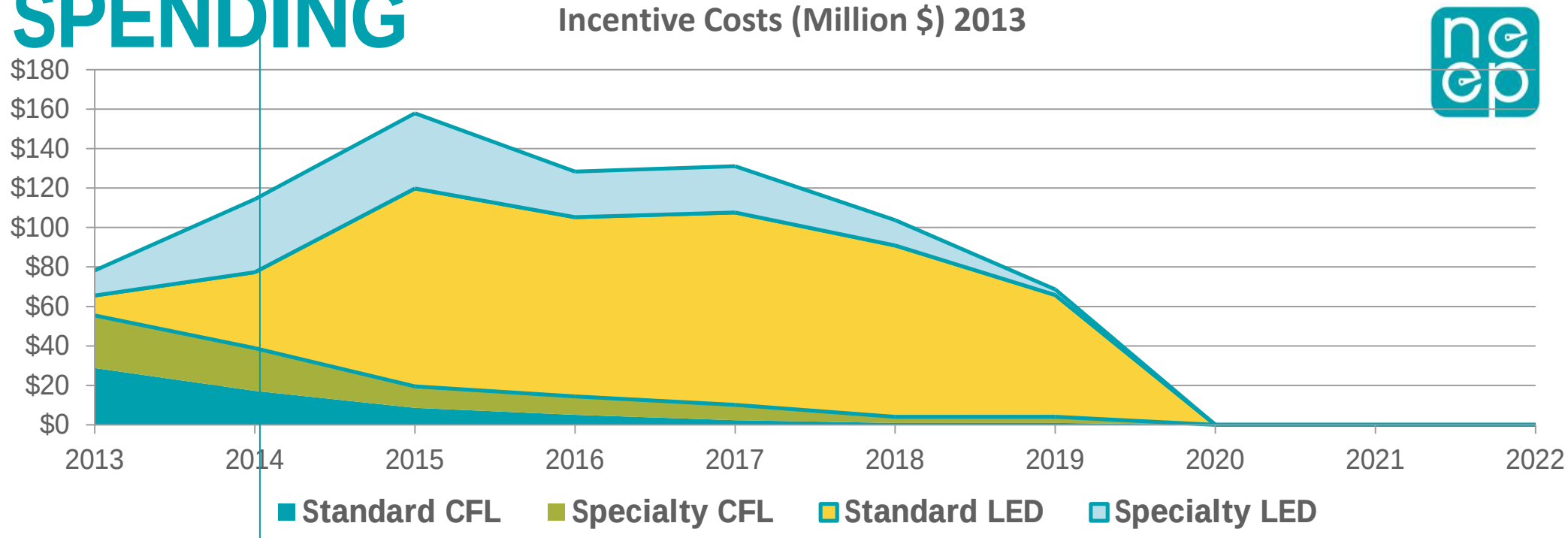
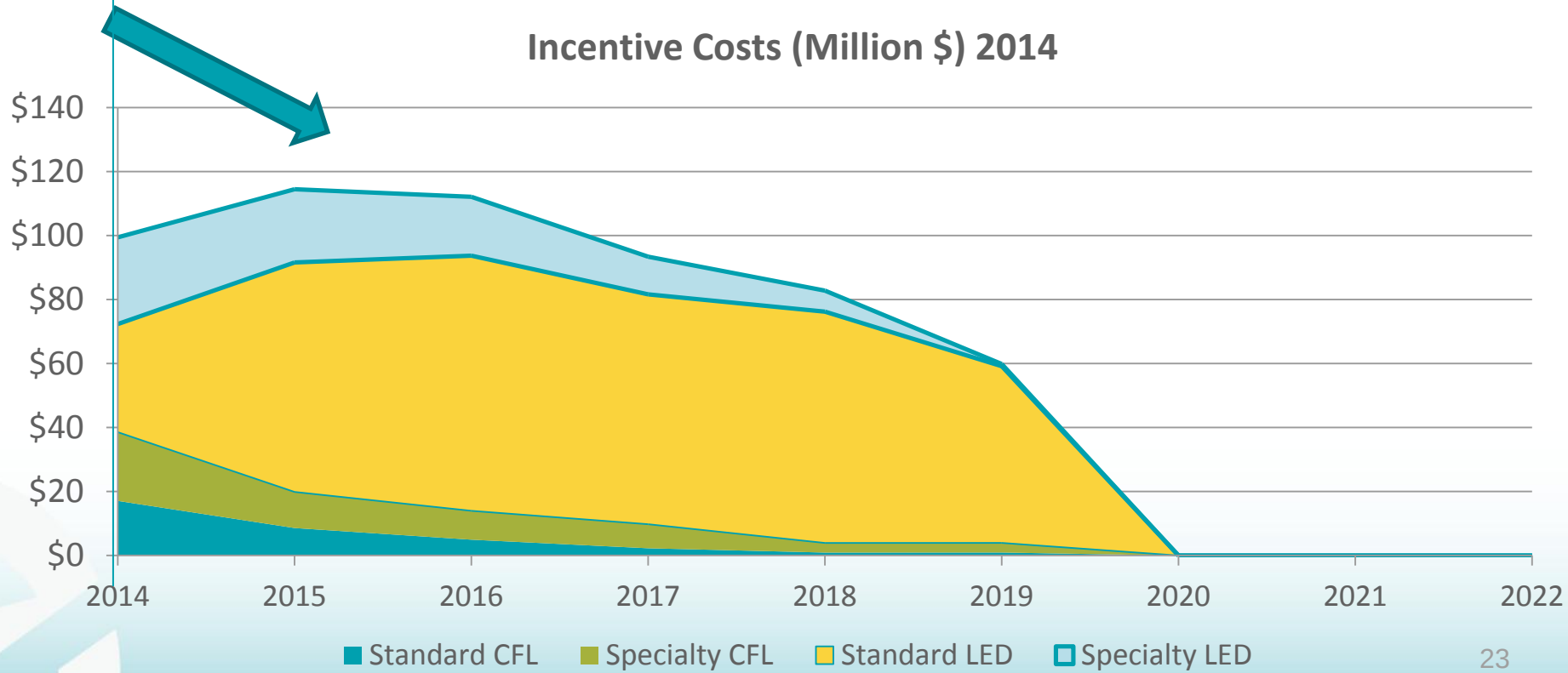
5,000,000
-
2014
2015
2016
2017
2018
2019
2020
2021
2022
Standard CFL
Specialty CFL
Standard LED
Specialty LED

SPENDING


Incentive Costs (Million $) 2013
$180
$160
$140
$120
$100
$80
$60
$40
$20
$0
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
Standard CFL
Specialty CFL
Standard LED
Specialty LED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$140
$120
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$60
$40
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$0
2014
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2016
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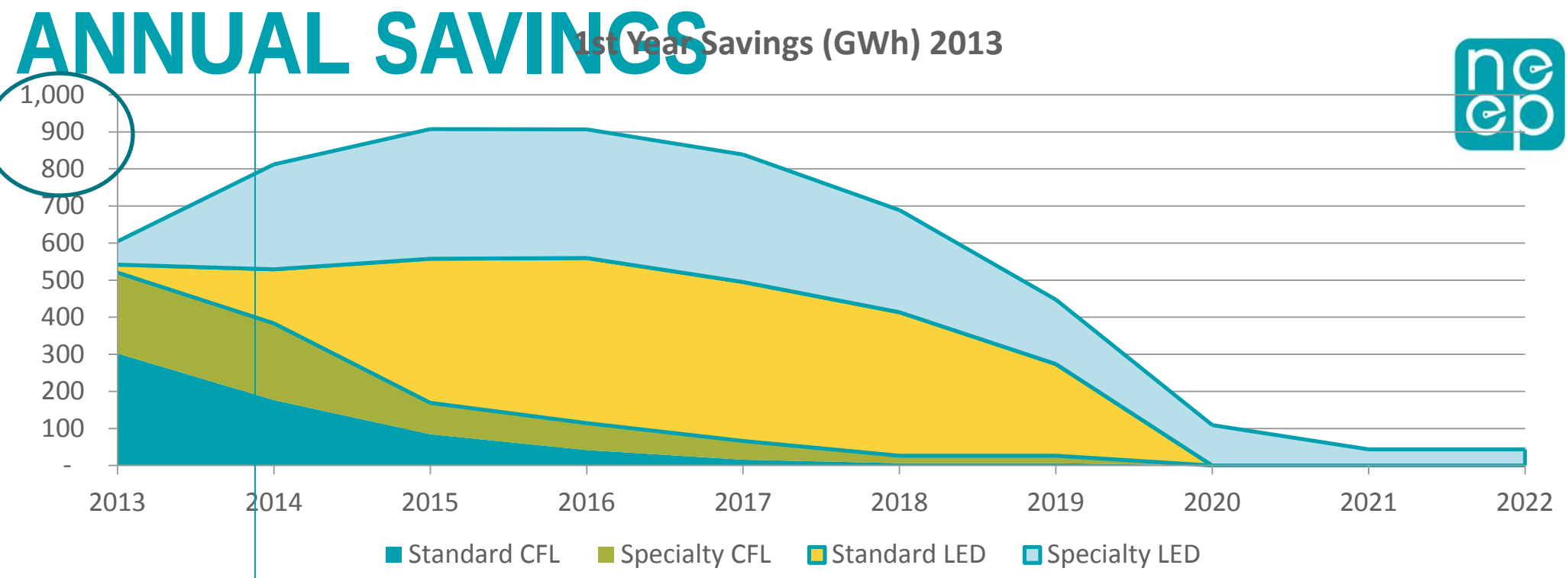
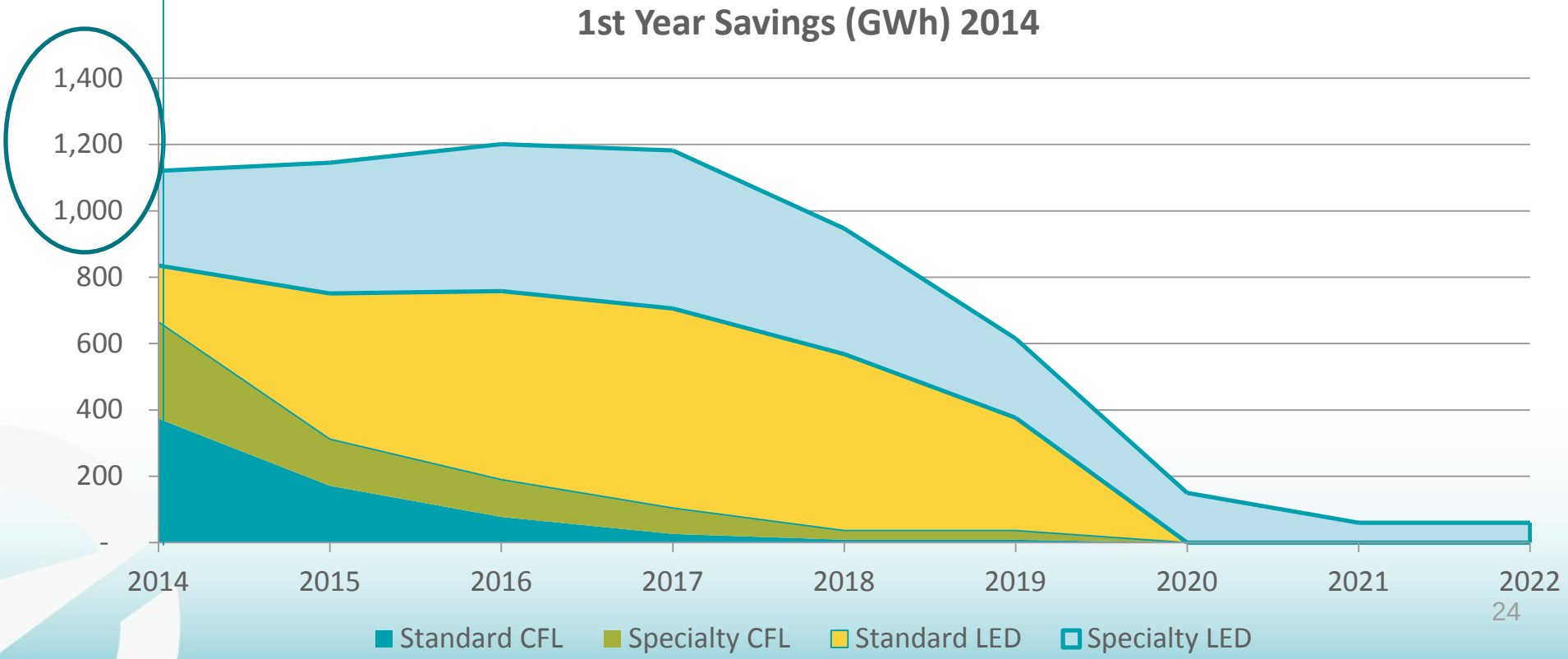
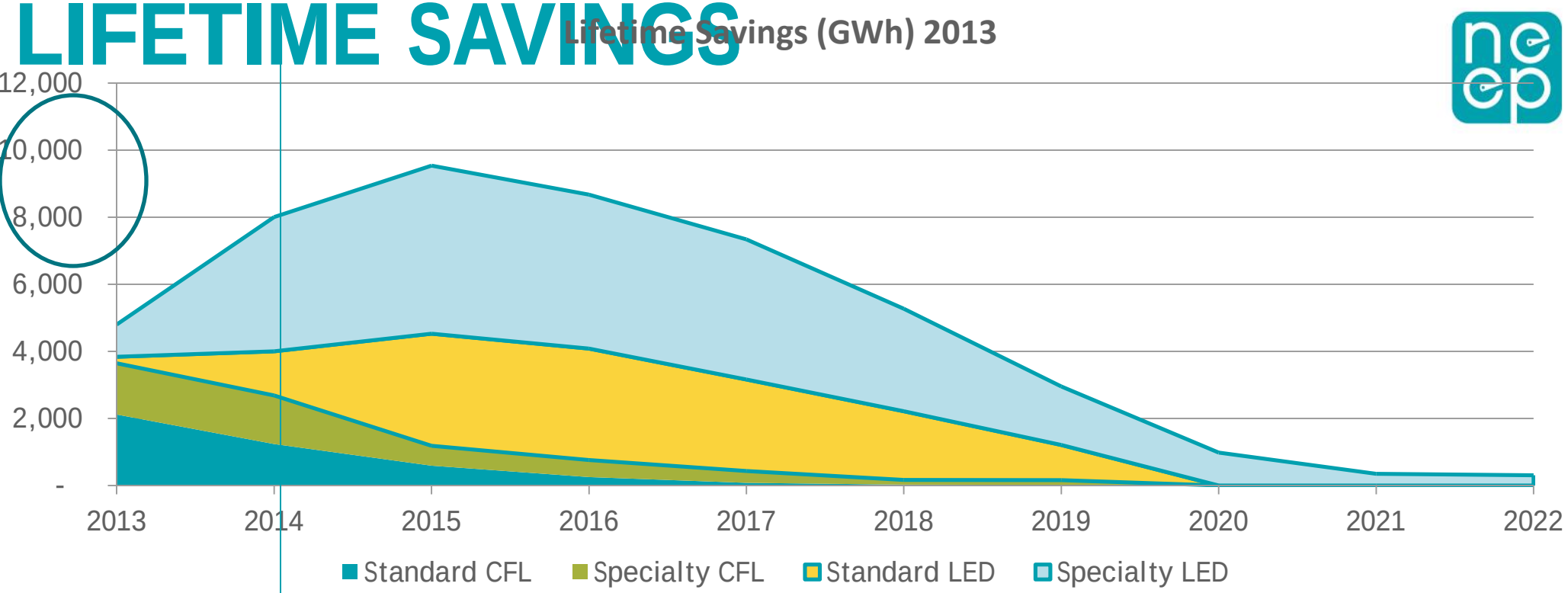
2020
2021
2022
Standard CFL
Specialty CFL
Standard LED
Specialty LED

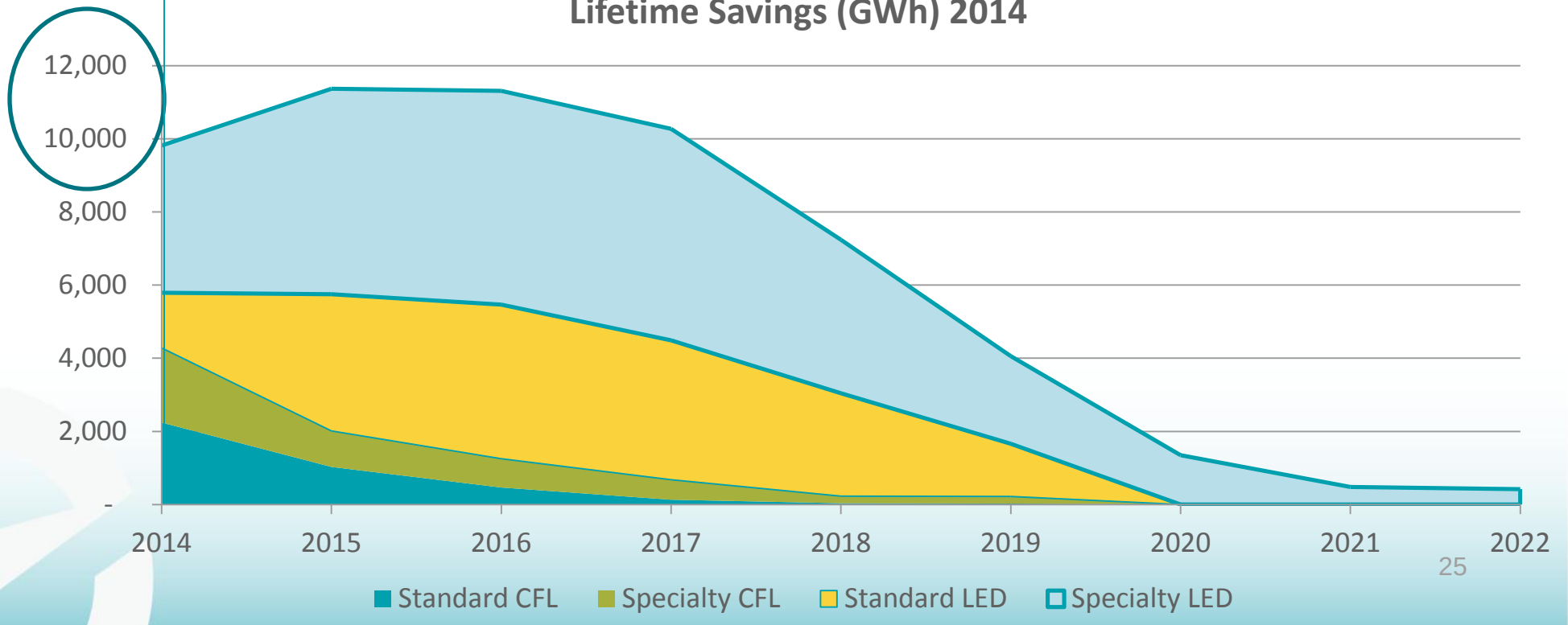
ANNUAL SAVINGS



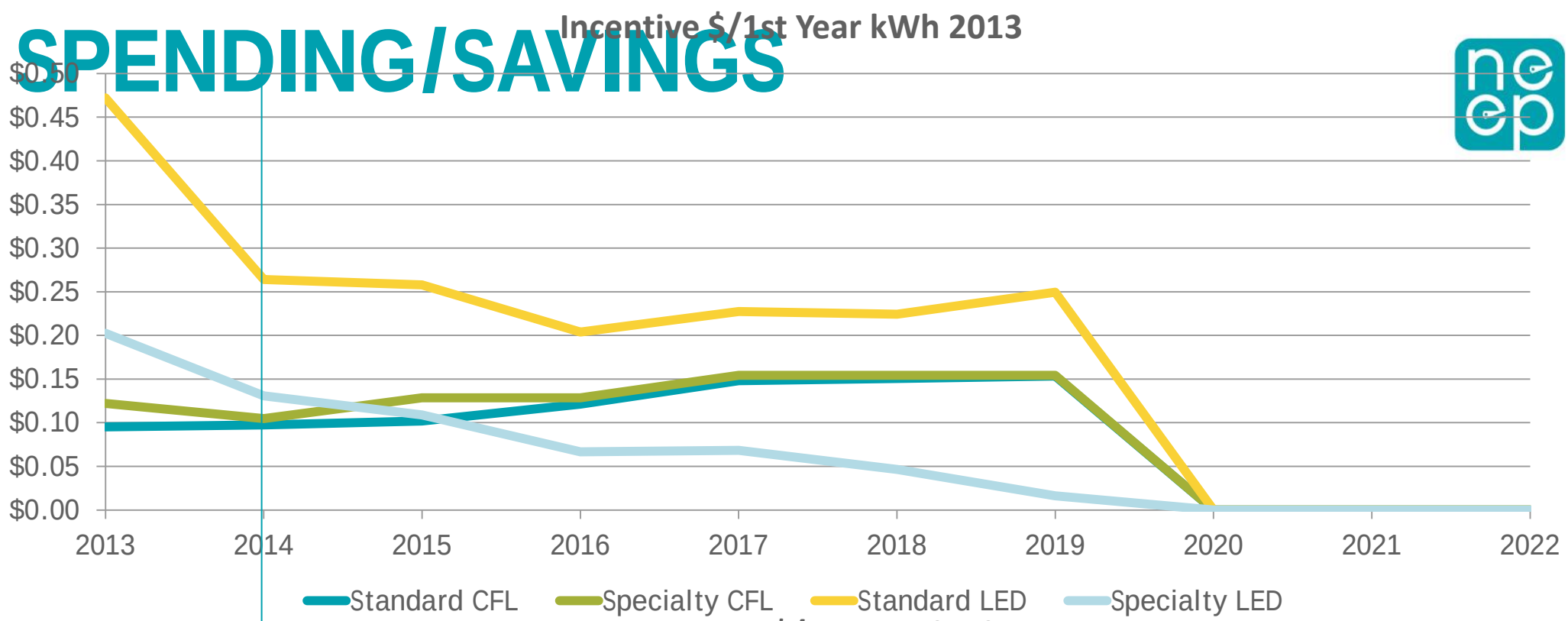


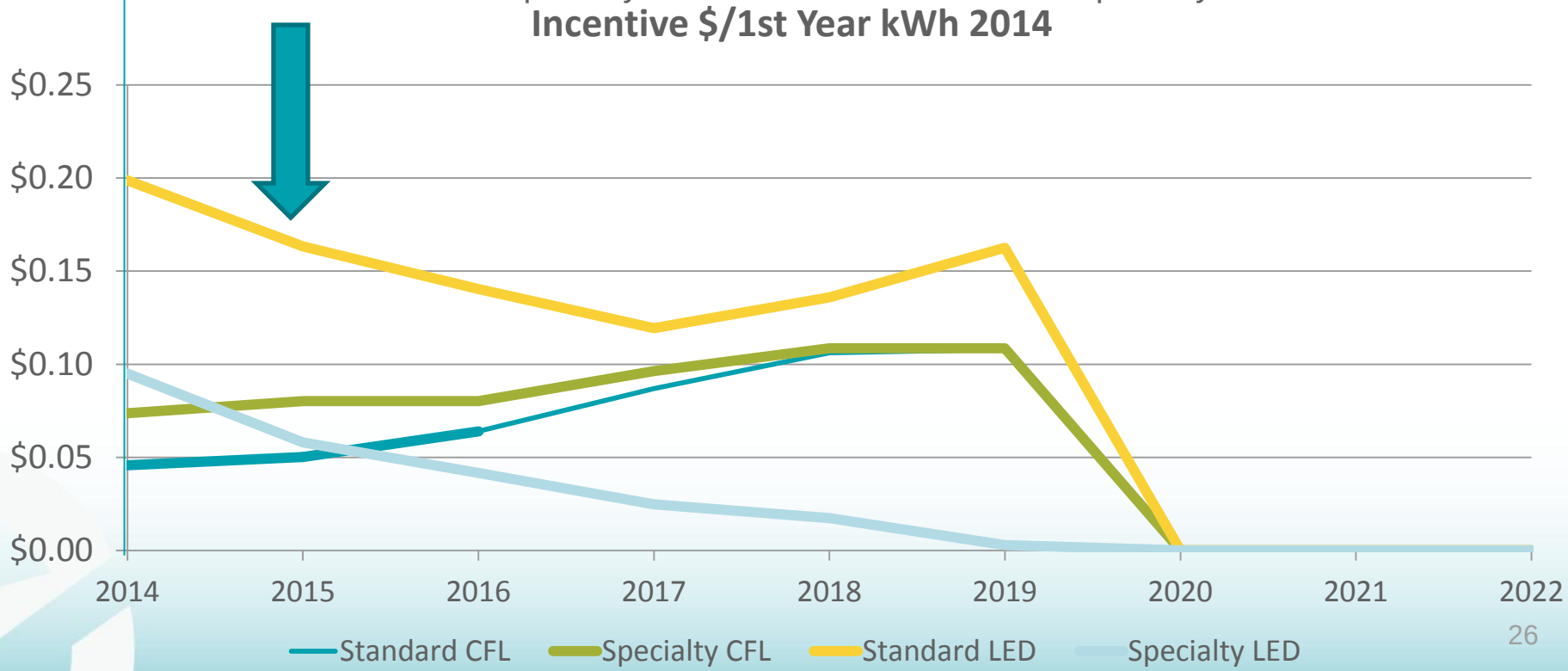
LIFETIME SAVINGS





SPENDING/SAVINGS





RESEARCH/EVALUATIONS

- Sneak peek on what will be in report
- Deeper dive on a few key pieces
- We're Keeping our eye on…
  - PA Res/Comm lighting Metering Study
  - VT Trade Ally and Customer Willingness to Pay Surveys
  - VT Single Family Home Characterization
  - MA Market Lift Assessment
  - MA Multistage lighting NTG
  - MA On-Site Surveys
  - CT Lighting Interactive Effects
  - CT Res Lighting NTG
  - DC Product Leakage/In-Service rate analysis
  - ME HOU and Socket Saturation
  - PA NTG

RECENT EVALUATIONS

- Completed reports we Analyzed:
  - NE Res HOU Study—coming up!
  - MA Low Income Metering Study
  - MA Res Lighting Shelf Survey and Pricing Analysis
  - NYSERDA POS Program Evaluation (2010-2012)
  - Market Lift final report
  - Post-EISA Report—deeper dive!

NEEP Post-EISA Impact Report Preliminary Findings

Northeast Residential Lighting Workshop

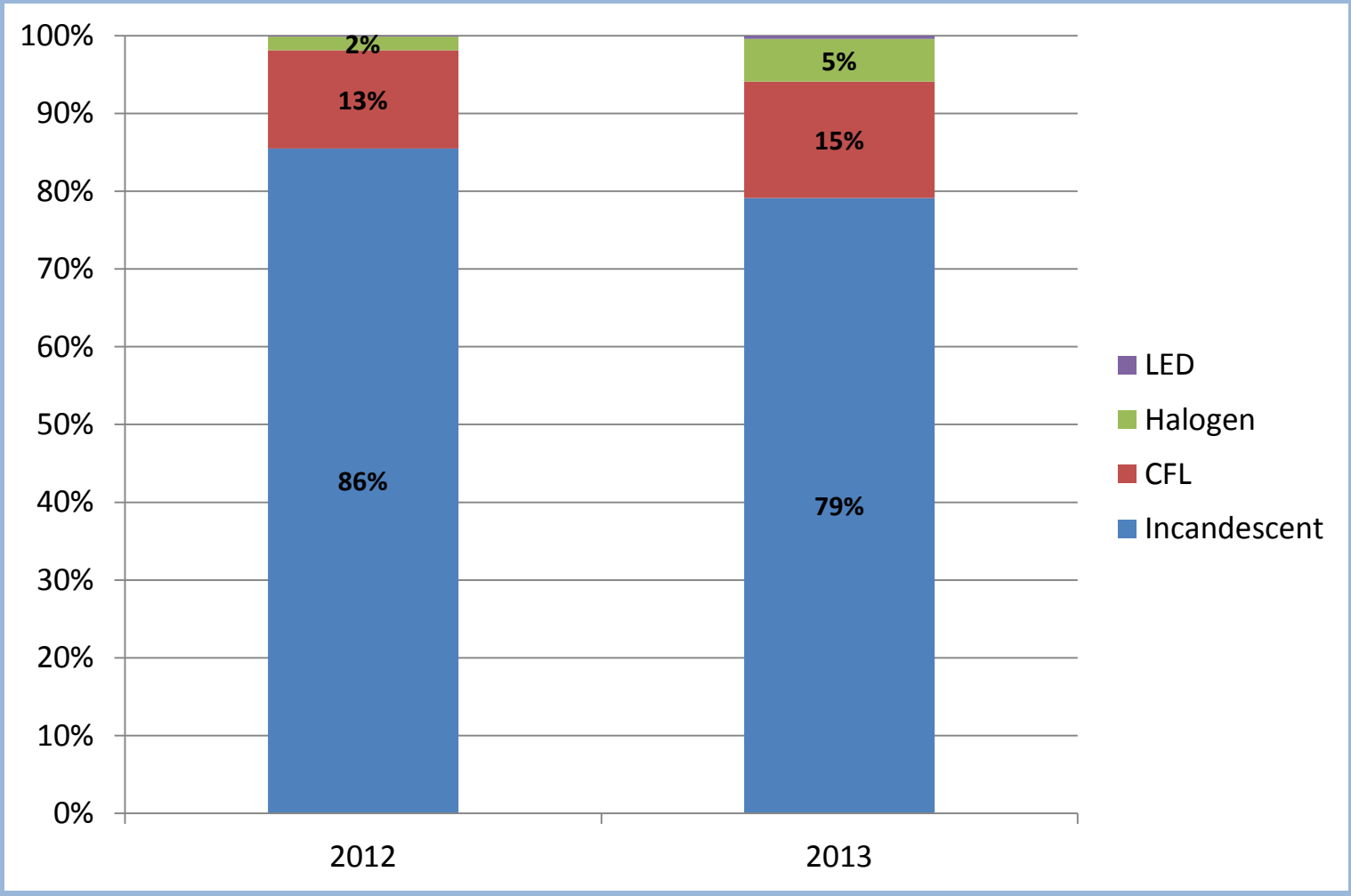
D&R INTERNATIONAL

Overview

- Goal: Assess the impact of EISA on sales and saturation of 1100 lm (75W) and 1600 lm (100W) residential A-lamps
- Modeled the interaction of the installed base and sales in MD, DC, VT, MA, RI and CT using empirical saturation, import, and sales data
- Model outputs: 2012 and 2013 sales and saturation by technology and lumen bin
- Not the final word as it too soon to understand impact of full implementation

A-Line Lamp Sales*

- **Incandescent** share still ~78-80% of sales at end of 2013 across states modeled



* Results align with anecdotal information from manufacturers and retail store shelf surveys

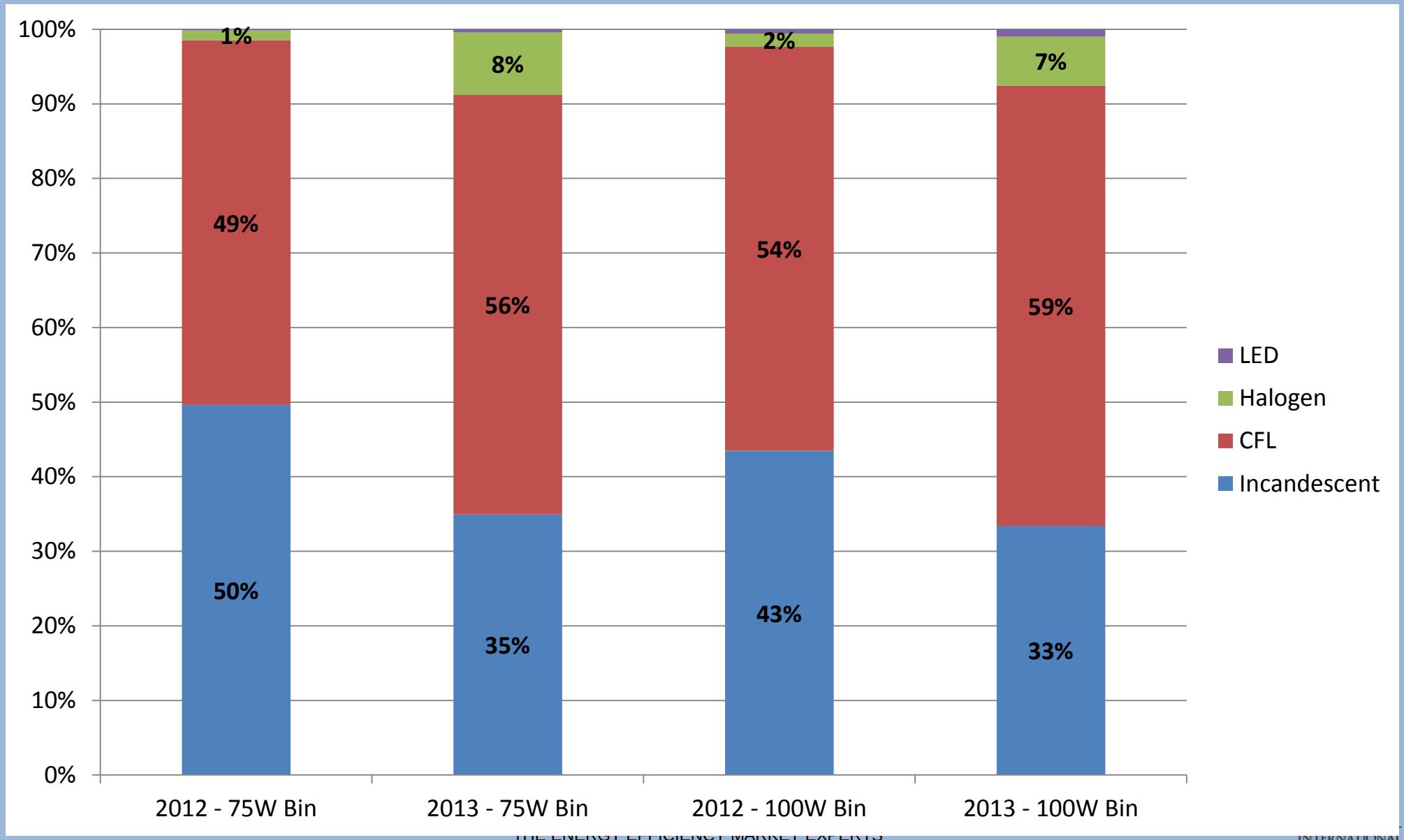
D&R INTERNATIONAL

Preliminary Findings: Saturation

- **Overall socket saturation has shifted slightly**
  Incandescent saturation dropped ~20-30% in EISA bins

- **Most incandescent being replaced by halogen**
  Halogen saturation grew from 1% to ~6-8% in EISA bins, in most states

Post-EISA Report: Estimated A-Lamp Socket Saturation

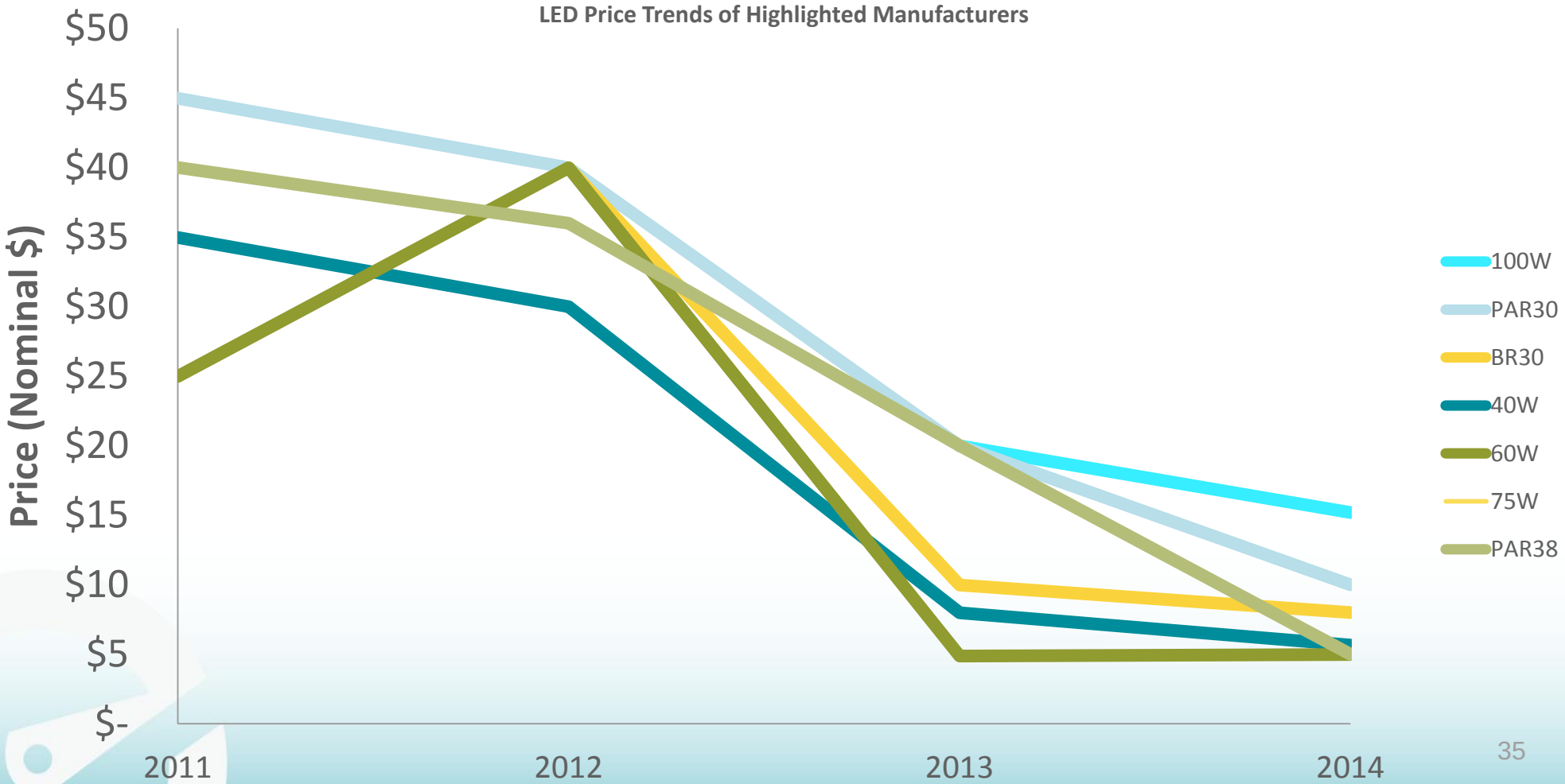



D&R
INTERNATIONAL


D&R
INTERNATIONAL

NEW RESEARCH: LED PRICING TRENDS

- Looked at several key lamp types tracking lowest cost ENERGY STAR product in category
- Projected prices out to end of 2015



LED PRICING TRENDS REVIEW

- Data Sources/background for analysis
  - The data are pulled from databases maintained by Ecova for incentive tracking purposes.
  - Ecova obtains these data price points directly from manufacturers during product communications and pricing changes, and are verified by utility partners and in-field Ecova employees.
  - The data represents a robust dataset spanning many different manufacturers and retailers, accumulated directly from manufacturers and verified in-store in numerous retailer locations.
  - While the timing and exact price may vary depending on market, the general national trends are consistent

Looked at ENERGY STAR certified, lowest cost products

LED PRICING TRENDS

A19 40 W Equivalent 2700-3000k Lamps

- Looked at 5 prominent models
- The prices of have dropped in both the second and third quarter of 2014, falling from an average of $11.10 at the start of the year to $8.89 at the end August.
  - Based on our model, we expect the average price of an A19 40W equivalent lamp at the end of 2015 to be $6.11.

A19 60 W Equivalent 2700-3000k Lamps

- Looked at 5 prominent models
- The prices have dropped primarily in the second quarter of 2014, falling from an average of $13.16 at the start of the year to $9.12 at the end August.
  - Based on our model, we expect the average price of an A19 60 W equivalent lamp at the end of 2015 to be $6.81.

LED PRICING TRENDS

BR30

- Looked at 5 prominent models
- The prices have dropped in both the second and late in the third quarter of 2014, falling from an average of $17.16 at the start of the year to $15.07 at the end August.
  - We forecast the average price of a BR30 lamp at the end of 2015 to be $12.18.

PAR30

- Looked at 3 prominent models
- The prices have dropped in both the second and third quarter of 2014, falling from an average of $29.32 at the start of the year to $25.89 at the end August.
  - Based on our model, we estimate the average price of an A19 40 W equivalent lamp at the end of 2015 to be $21.13.

LED PRICING TRENDS

PAR38

- Looked at 4 prominent models
- The prices have dropped in both the second and third quarter of 2014, falling from an average of $26.219 at the start of the year to $23.46 at the end August
  - We forecast the average price of a PAR38 lamp at the end of 2015 to be $19.59.

Further exploration of LED pricing to come…

CFL TO LED TRANSITION RESEARCH

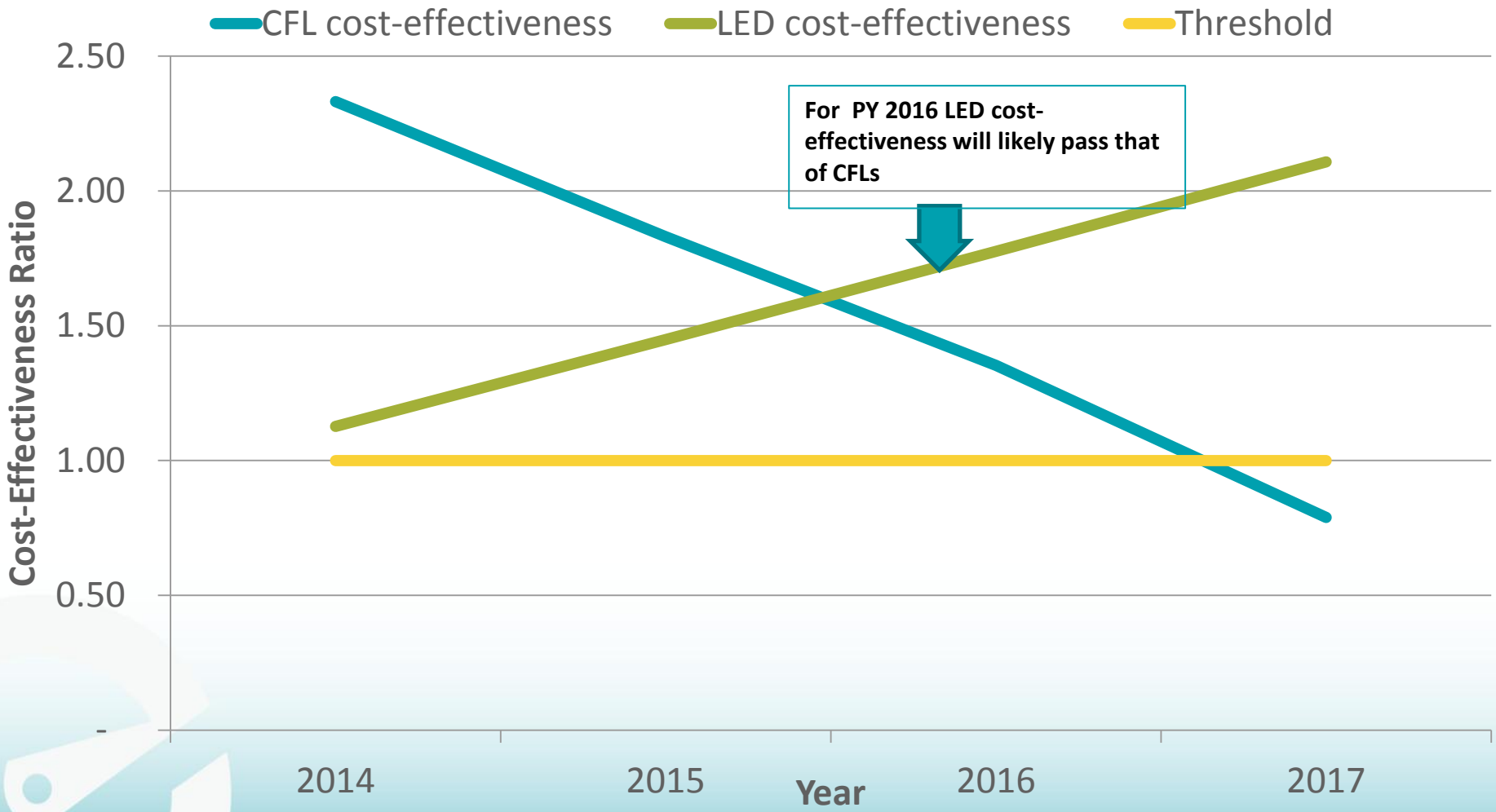
- Looked at specific inputs for each PA to find the TRC for CFLs and LEDs
- Performed sensitivity analysis for each input

Results

- CFLs:
  - Most impactful inputs: Incremental measure cost, NTG, and HOU
  - Least impactful inputs: Install rate, incentive, discount rate
  - Average 2014 TRC value: 2.65
- LEDs:
  - Most impactful inputs: Incremental measure cost, discount rate, delta watts, install rate, HOU
  - Least impactful inputs: incentive, estimated usable life, NTG
  - Average 2014 TRC value: 1.11

CFL TO LED TRANSITION REVIEW

- In Program year 2015, LEDs gain momentum
- By PY 2016 they are more cost effective.



COMING UP LATER TODAY

- Lamp Specifications Updates: ENERGY STAR, CA, CEE
  - Discussed at 2:10 session
- ENERGY STAR/NEMA Lighting Roadmapping effort
  - Discussed at 12:40 session

DOE SSL INITIATIVE

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.

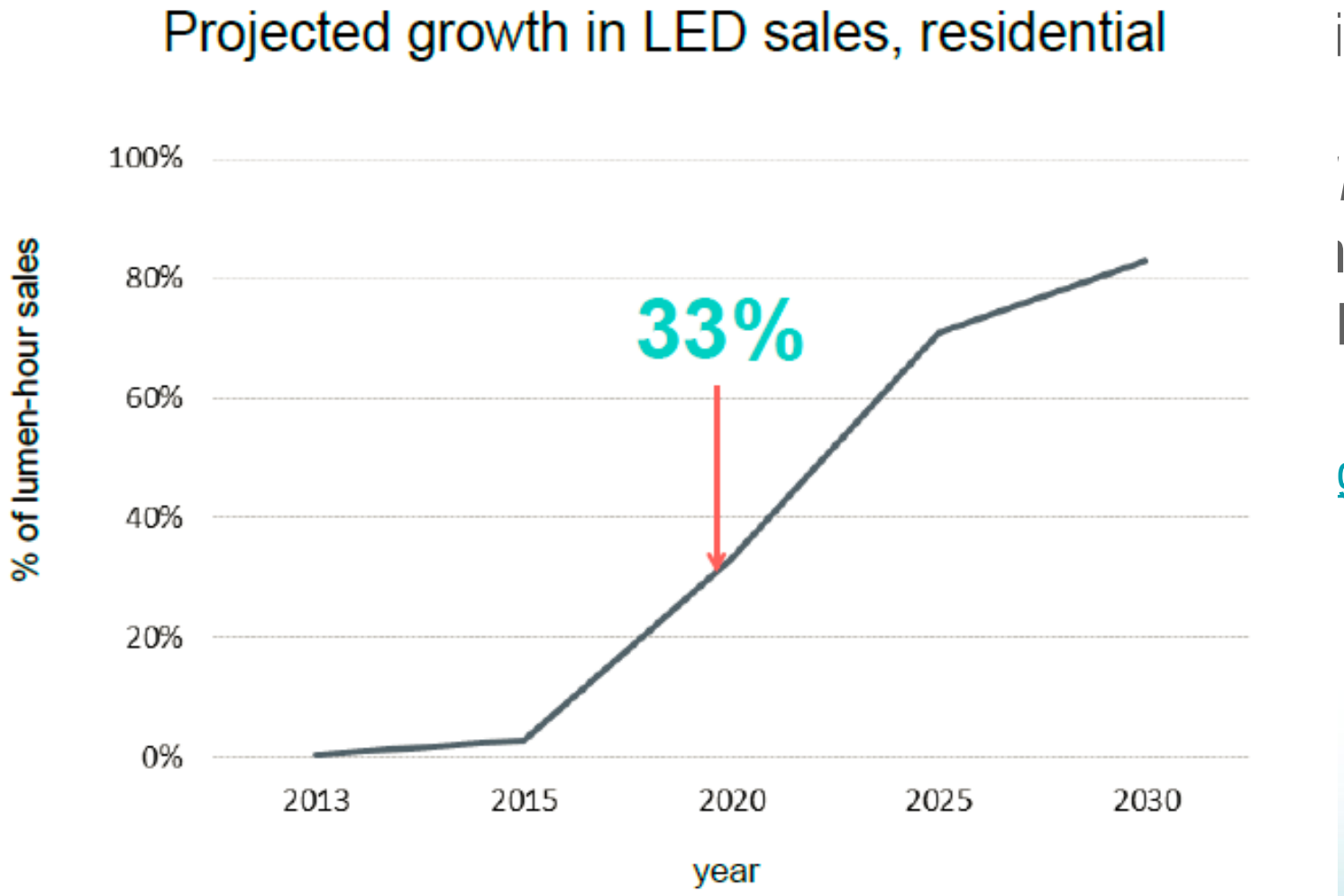
DOE SSL INITIATIVE

DOE SSL Technical Information Resource

TINSSL: www1.eere.energy.gov/buildings/ssl/

Updates

- New re ight sources *Energy Savings* *nation* *Applica* ıption in the U.S LED lighting
  - http: gysavingsfo recas



Source: Energy Savings Forecast of Solid-State Lighting in General Illumination Applications, DOE, AUG 2014

DOE SSL INITIATIVE

DOE SSL Technical Information Resource

TINSSL: www1.eere.energy.gov/buildings/ssl/

Have several important resources in the room

- CRI Factsheet
- Recessed LED Downlights
- General Service LED Lamps
- Energy Efficiency of LEDs

U.S. DEPARTMENT OF ENERGY

Upcoming Workshop: SSL Market Development, Nov 12-13, Detroit

  - http://energy.gov/eere/ssl/ssl-market-development-workshop

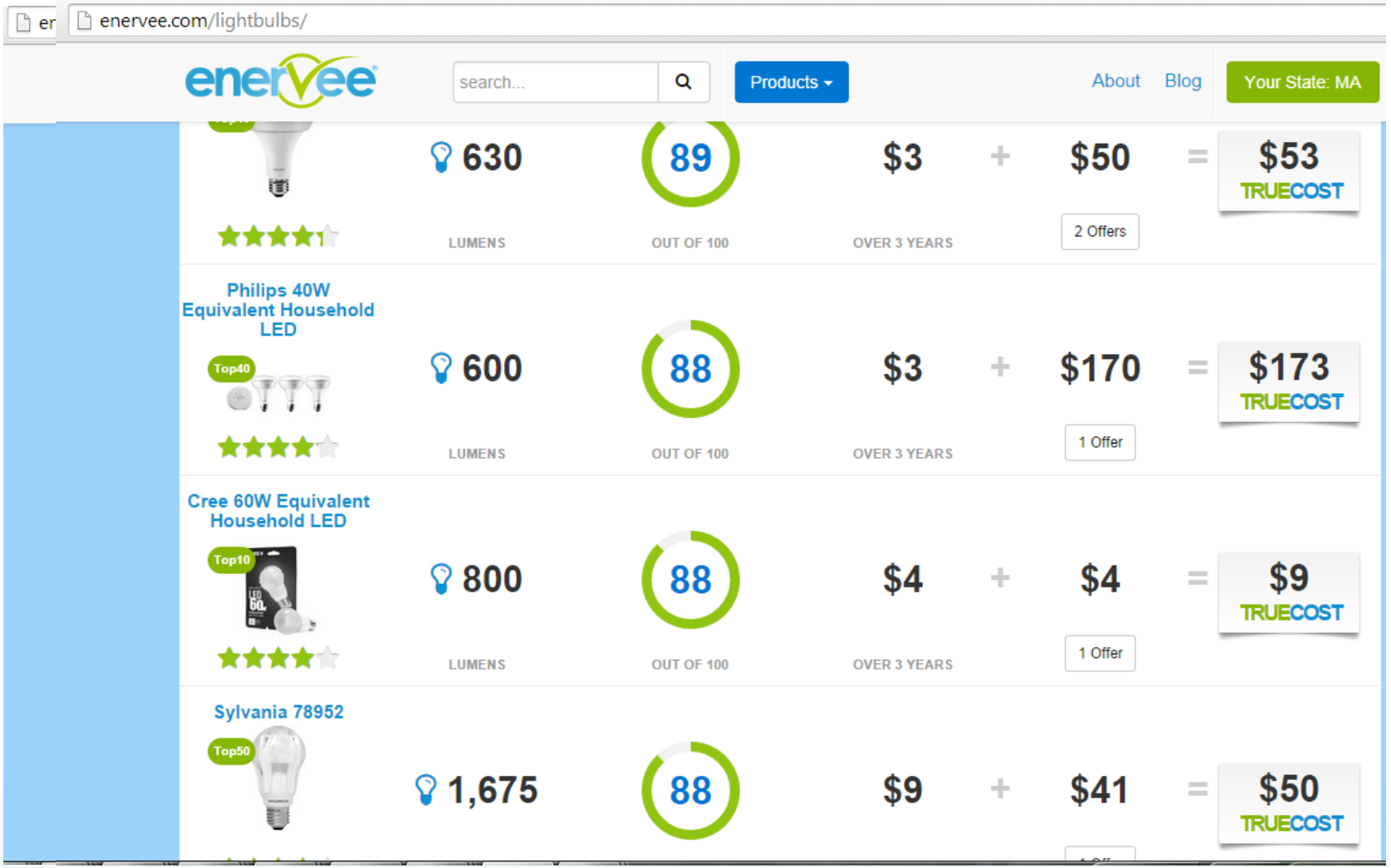
EISA 2020 RULEMAKING PROCESS

- Still moving forward to increase efficiency levels of lamps
- Process is ongoing, monitored closely by NEEP and efficiency advocates
- Preliminary technical support document expected late 2014

EISA = Energy Independence and Security Act

ENERVEE LIGHTING DATABASE

Nation public resource



If manufacturers or retailers would like to include their light bulb listings on Enervee, contact Alex Katzman alex@enervee.com

CREED INITIATIVE

- Consortium for Retail Energy Efficiency Data
- LightTracker is initial effort to get sales of lighting data
  - Currently have data for grocery, drug, dollar, club, and mass merchandiser
  - Working together to attain large home improvement channel
- Consortium:
  - Program Administrators
  - Consultants
  - Manufacturers
  - EPA/ENERGY STAR
- Communicate in a Single Voice to retailers

What is CREED LightTracker?

- Bi-monthly conference calls
- Bi-monthly memos on status/next steps
- Brainstorm ***together*** for solutions
- *Current members:*

- We serve the stakeholders
  - Letters
  - Calls
  - Proposals
  - Conferences

Northeast Energy Efficiency Partnerships

nationalgrid

NSTAR

A UIL HOLDINGS COMPANY

Connecticut Light & Power
A Northeast Utilities Company

BONNEVILLE POWER ADMINISTRATION

GEORGIA POWER
A SOUTHERN COMPANY

CREED

RECOMMENDATIONS: KEY STRATEGIES FOR SUCCESS

- Sorry, can't spill all the beans just yet! Why would you ever read the report?
- For NEEP's continued recommendations, look out for the 2014-2015 Update to the Northeast Residential Lighting Strategy, hitting www.neep.org next month!*

*We're still accepting volunteers to review the draft report, contact Claire if interested!

Northeast Energy Efficiency Partnerships

The Future of Lighting Program Design

Laurie Acone and Angela Li, National Grid
David Barclay, NMR
Stan Mertz, CLEAResult

2014 Northeast Residential Lighting Workshop
Tuesday, October 7th 2014 9:45am

SPEAKERS:

Introduction:

Glenn Reed, Principal

Energy Futures Group

Panelists:

Laurie Acone, Program Manager, Residential Lighting MA and RI

Angela Li, Program Strategy

National Grid

David Barclay, Senior Project Manager

NMR Group, Inc.

Stan Mertz, Director of Retail Operations

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NEEP 2014 Northeast Residential Lighting Workshop

Residential Lighting Landscape

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Overarching 3 Year Plan Strategies RI (2015-17)

- Promote cost-efficiency
- Empower communities and markets to embrace energy efficiency
- Innovate to capture untapped savings
- Develop opportunities for system-level savings and integration

Challenges

- Lower NTG rates
- Implement strategies and messaging to prepare customers for high winter peak demand and high bills
- Customer confusion over lighting technologies

Opportunities

- Strong consumer acceptance of LEDs
- Consumer costs declining for emerging technologies
- Social media campaigns, pop-up retailer, community sponsorship
- RFP for direct install lighting

What we do

- Community Sponsorships

- Social Media Campaigns

- School Fundraiser

- Pop up retailer

- Catalog and Spanish language

CFL and LED Sales and Savings

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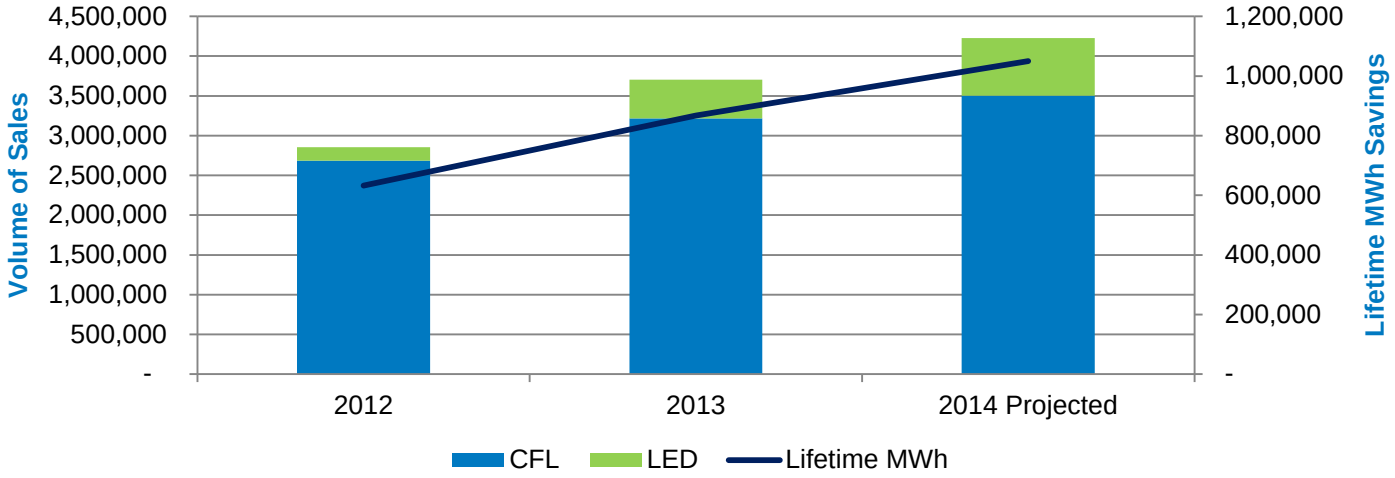
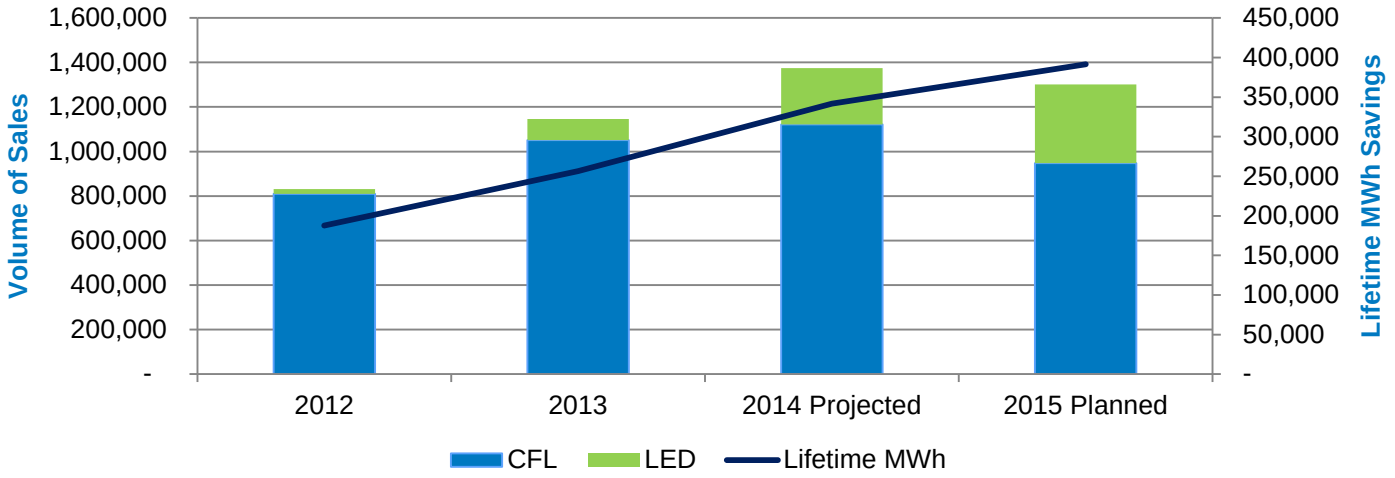
MA Residential Lighting Results



RI Residential Lighting Results



Pop Up Retailer and Social Media Sales

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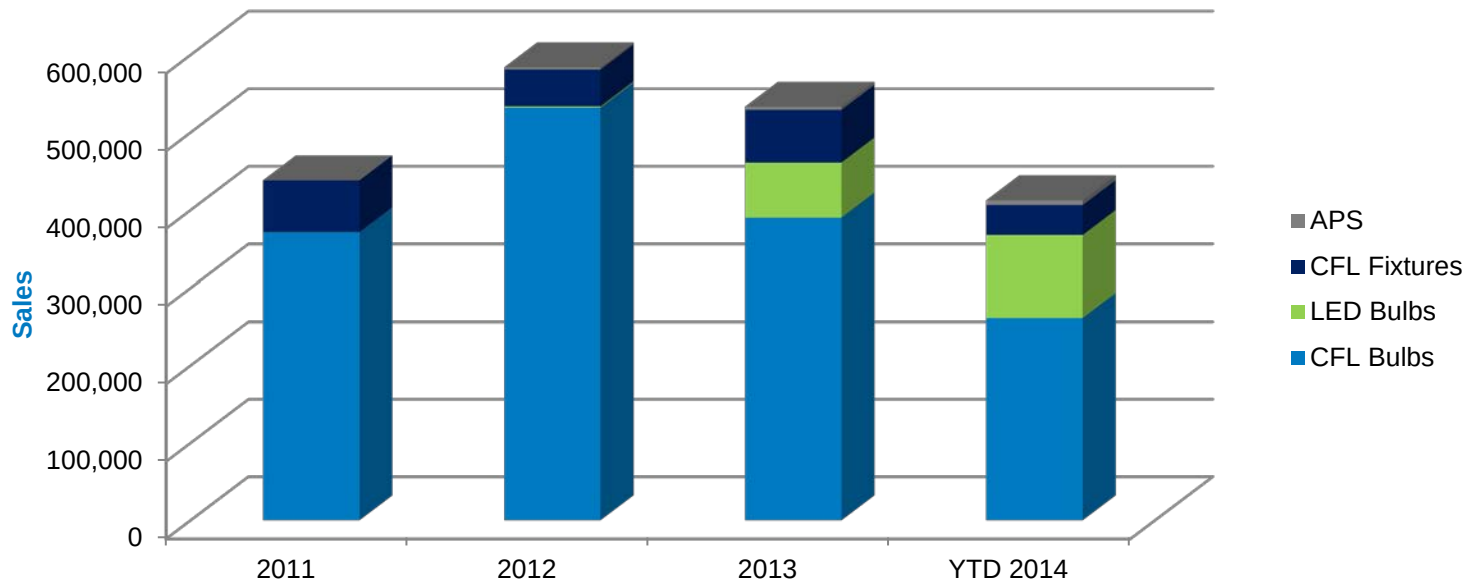
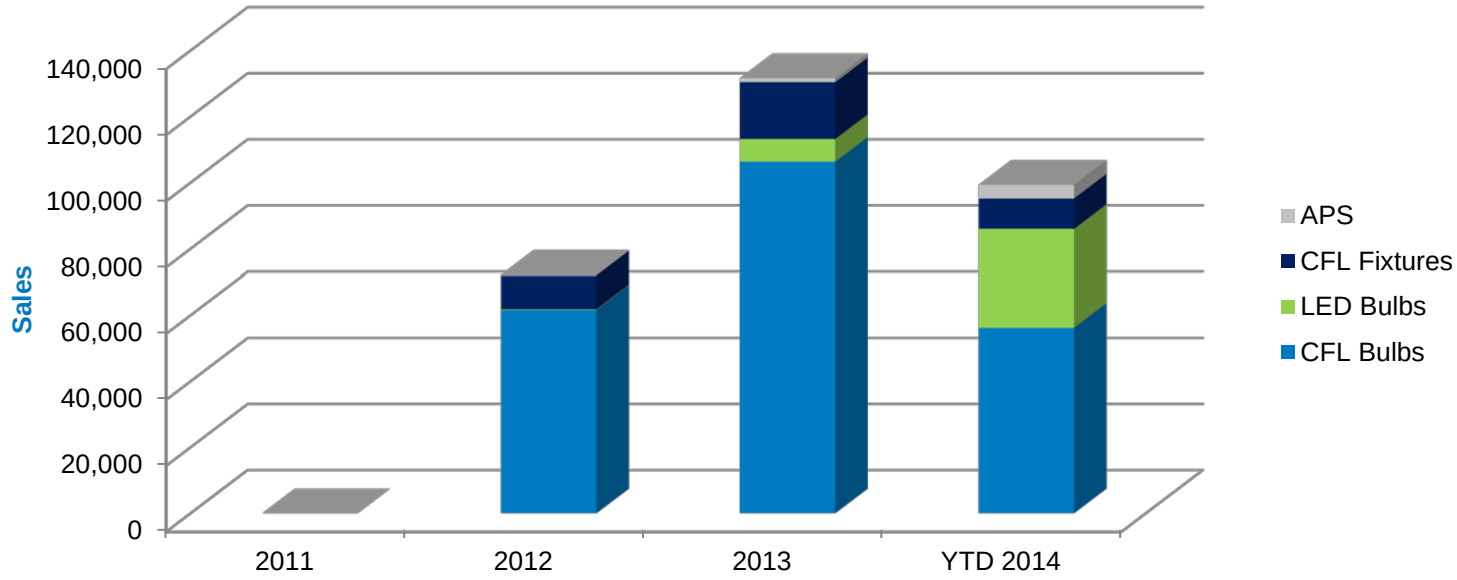
MA Pop Up Retailer and Social Media Sales



RI Pop Up Retailer and Social Media Sales

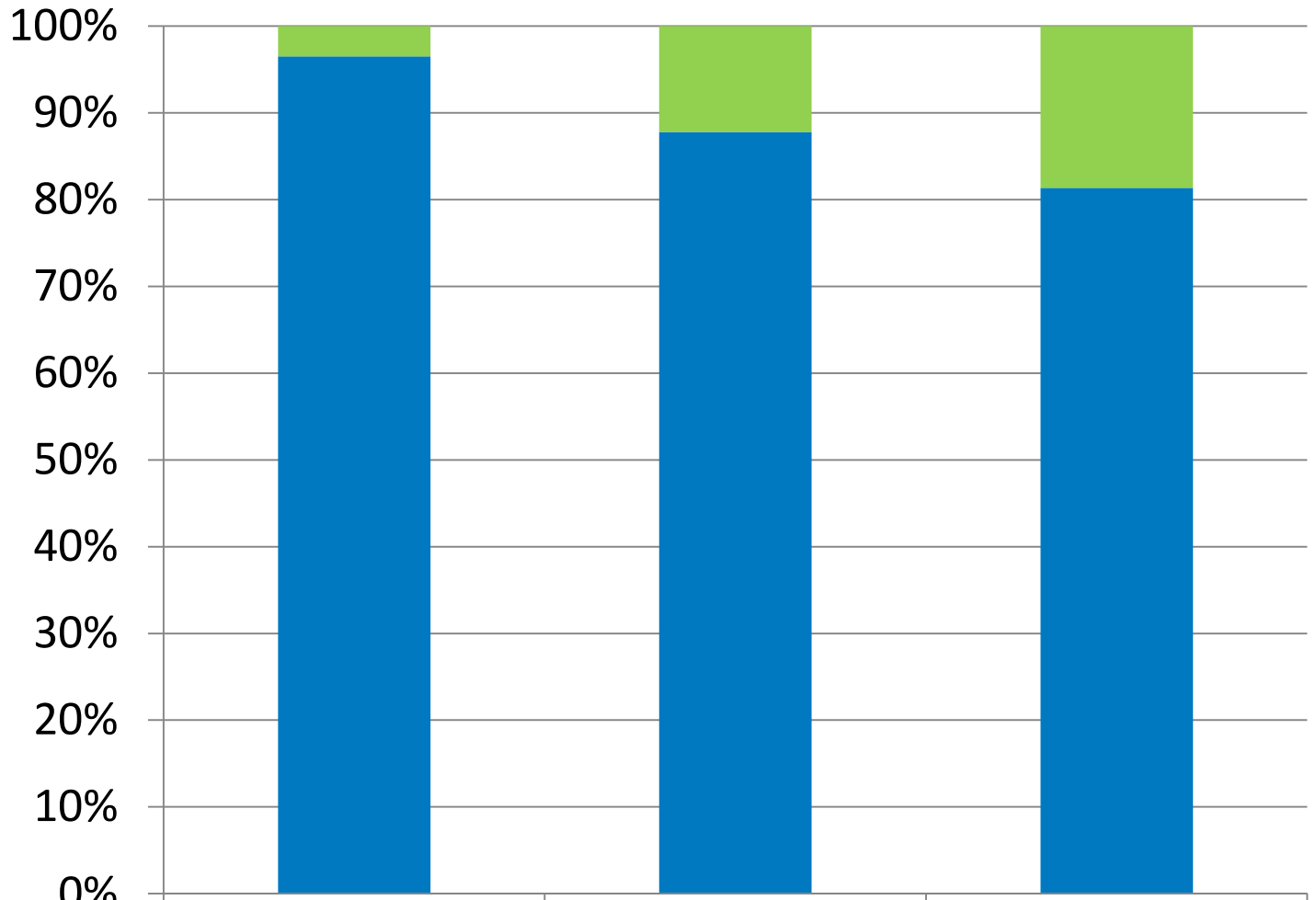


- Home Energy Services (Assessment program)
- Residential New Construction
- Income Eligible program
- Multi-family program

Maximize cost effectiveness

Provide consistency and high quality products

Income Eligible Example of RFP Impact



	2013	2014 YTD	Sep-2014
LEDs	3,700	9,200	1,083
Total Bulbs	102,592	66,192	4,729

Northeast Residential Lighting HOU Study

Evaluation Results

NEEP RLS Workshop

October 7, 2014

Presented by: David Barclay

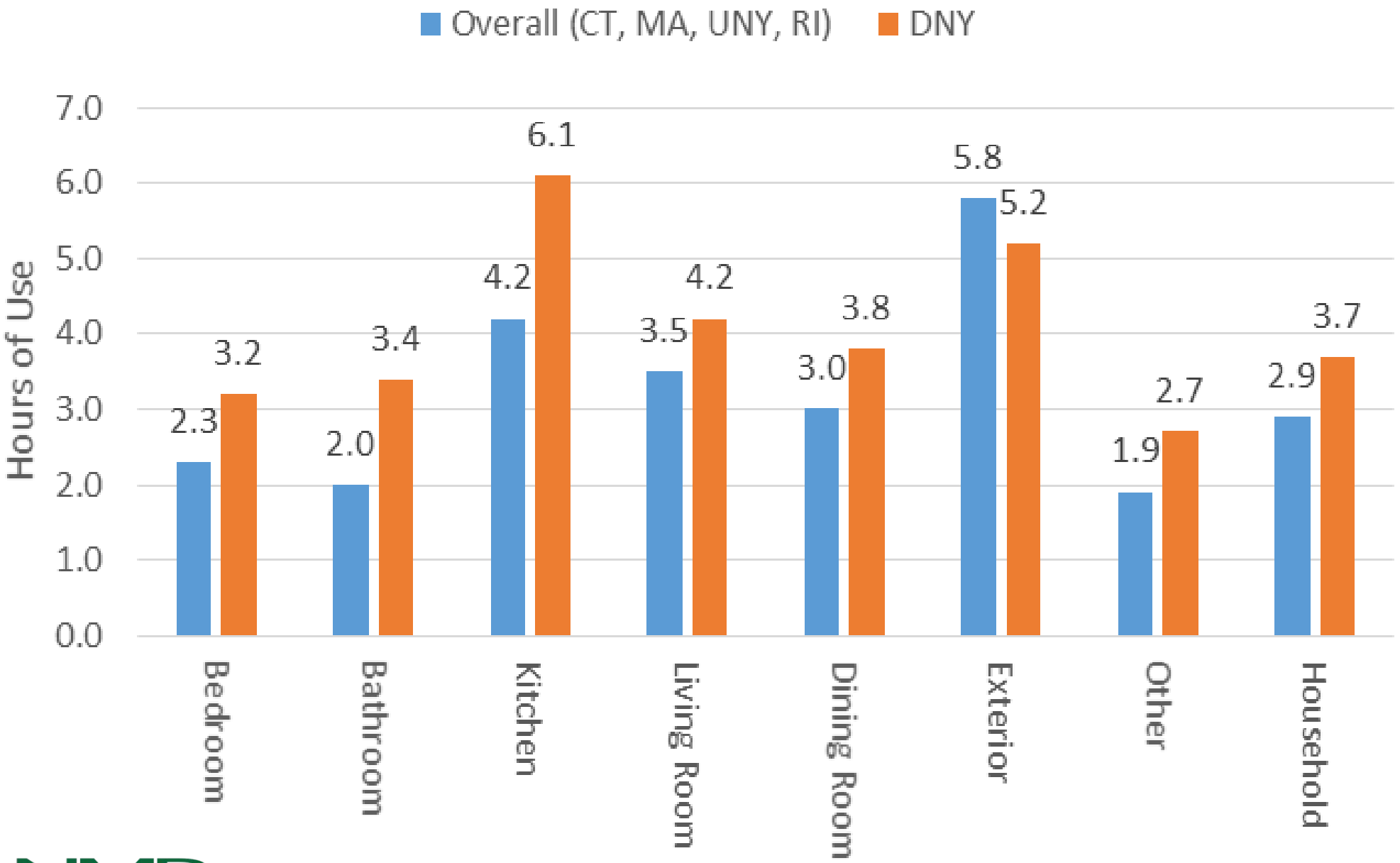
Overview

- Last lighting HOU study done in 2009
- Concerns that we might be over-stating operating hours
- Residential lighting remains a large part of the portfolio, and HOU directly drives savings
- Multistate study involving NY, CT and RI along with MA ; May be the most comprehensive study of residential lighting usage patterns ever done in the US.

Results

- Very few significant differences between:
  - States (CT, MA, RI, and UNY)
  - Income levels
  - Home types
- HOU for CT, MA, UNY, and RI:
  - Upstream: 2.9 HOU
  - Direct install: 2.7 HOU
- HOU in Downstate New York are significantly higher
  - Upstream: 3.7 HOU
  - Direct install: 3.3 HOU
- Significant differences between efficient and inefficient bulbs
- Substantial saving opportunities remain
  - No signs yet that EISA is eliminating opportunity

HOU by Room Type



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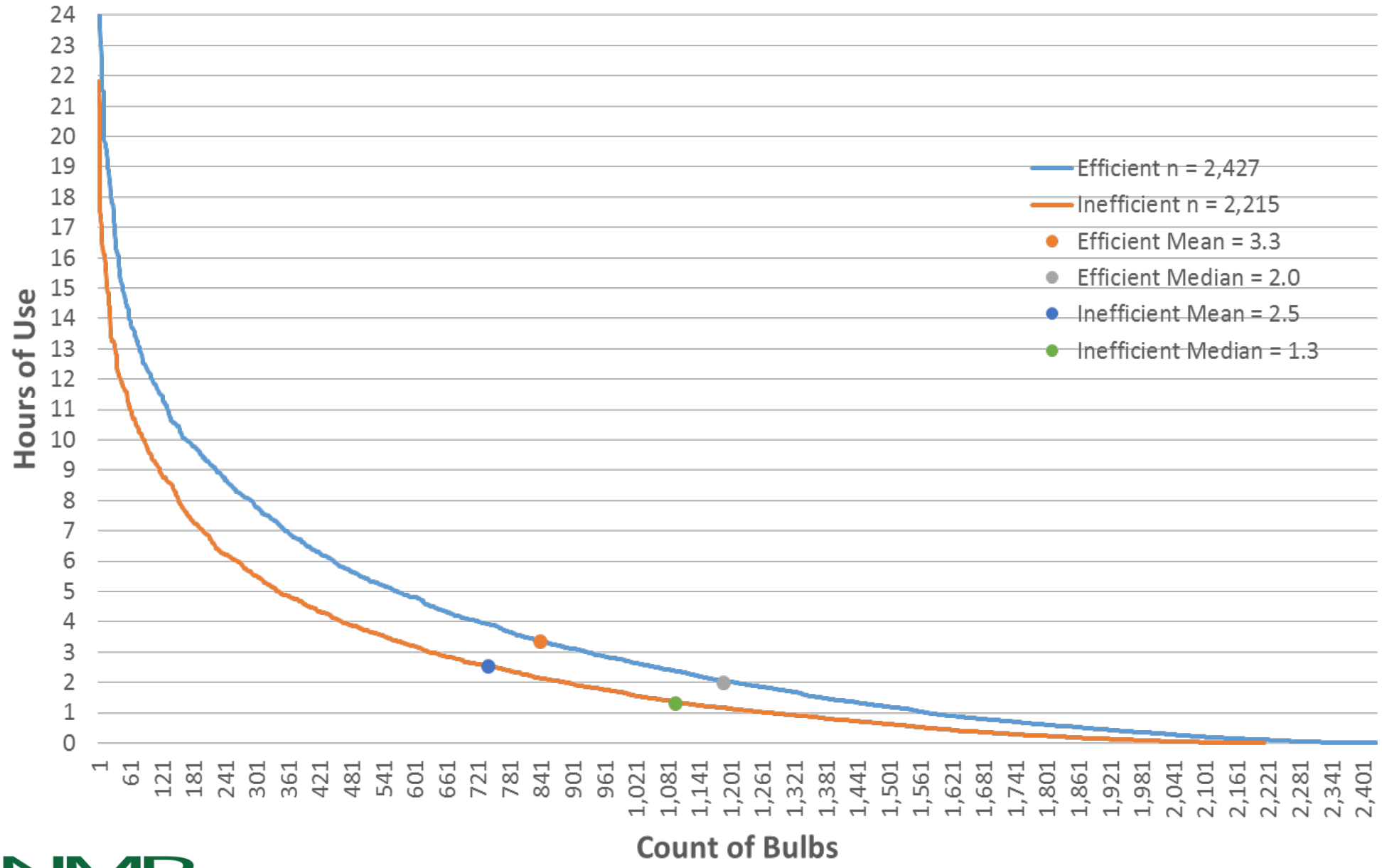
Hours of Use by Number of Bulbs

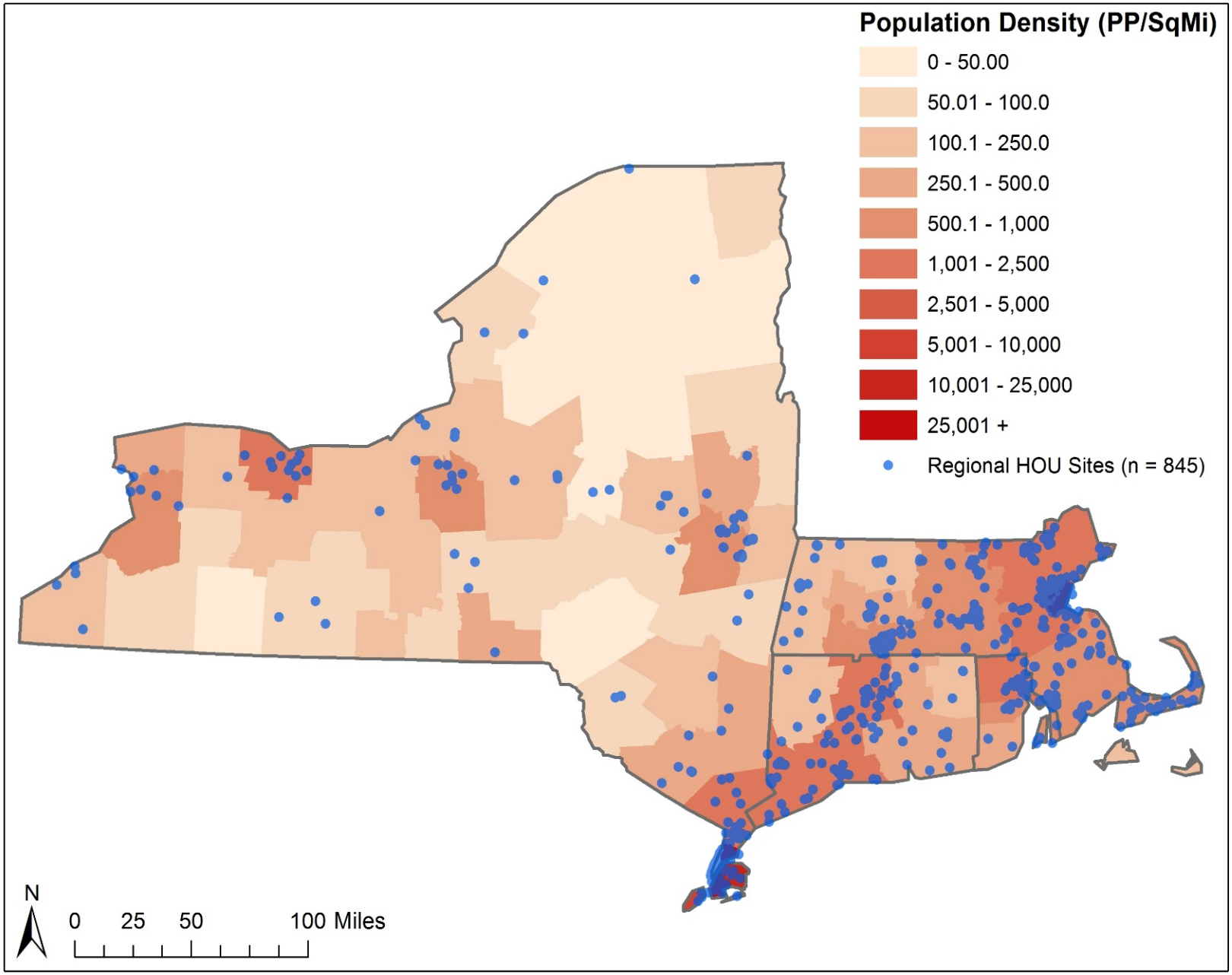


NMR Group, Inc.

Project Background

- Project started November 2, 2012
- Sponsored by:
  - Massachusetts PAs, Connecticut PAs, National Grid Rhode Island, & NYSERDA
- Study objectives:
  - Update HOU estimates by room type
  - Develop estimates for categories of homes:
    - Single family (<5 units) vs. multifamily (5+ units)
    - Low-income vs. non low-income
    - High-rise buildings
  - Last HOU study conducted five years ago
- Incorporated data from MA Low Income HOU Study

Sample Locations



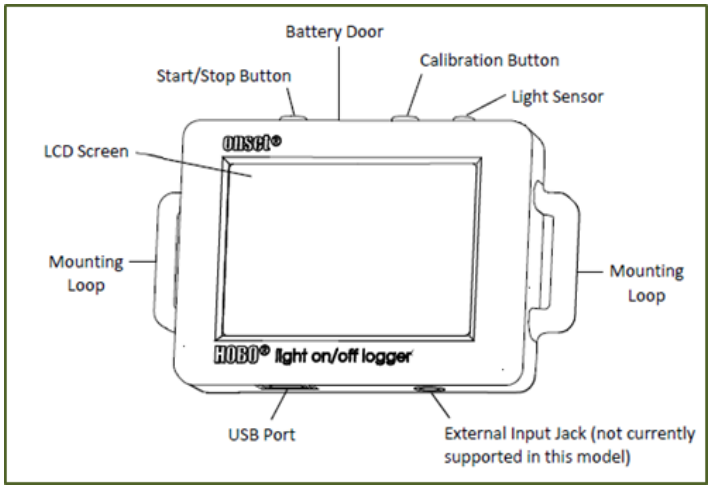
Lighting Loggers

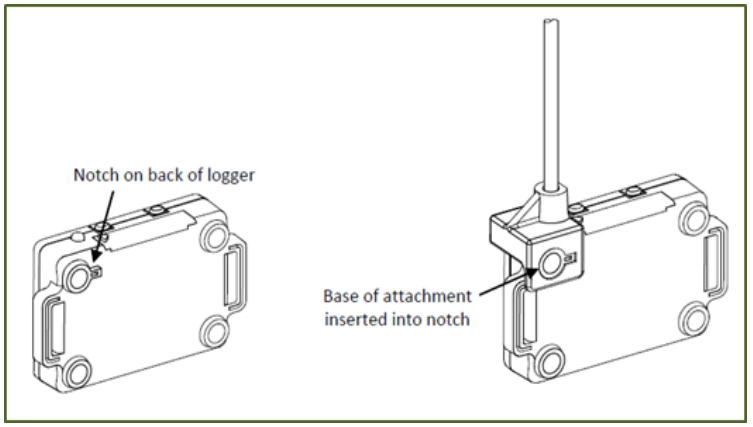
- An average of seven loggers per home
  - Six multifamily
  - Eight single family
- Installed on randomly selected fixtures
- Targets per home:
  - 1 Dining room (single family only)
  - 1 Exterior (single family only)
  - 1 Living space
  - 1 Bedroom
  - 1 Bathroom
  - 1 Kitchen
  - 2 Other (Closets, utility rooms, garages, basements, etc.)

What are Lighting Loggers?

- About the size of a business card

- Small sensor detects light





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Methodology - Outliers

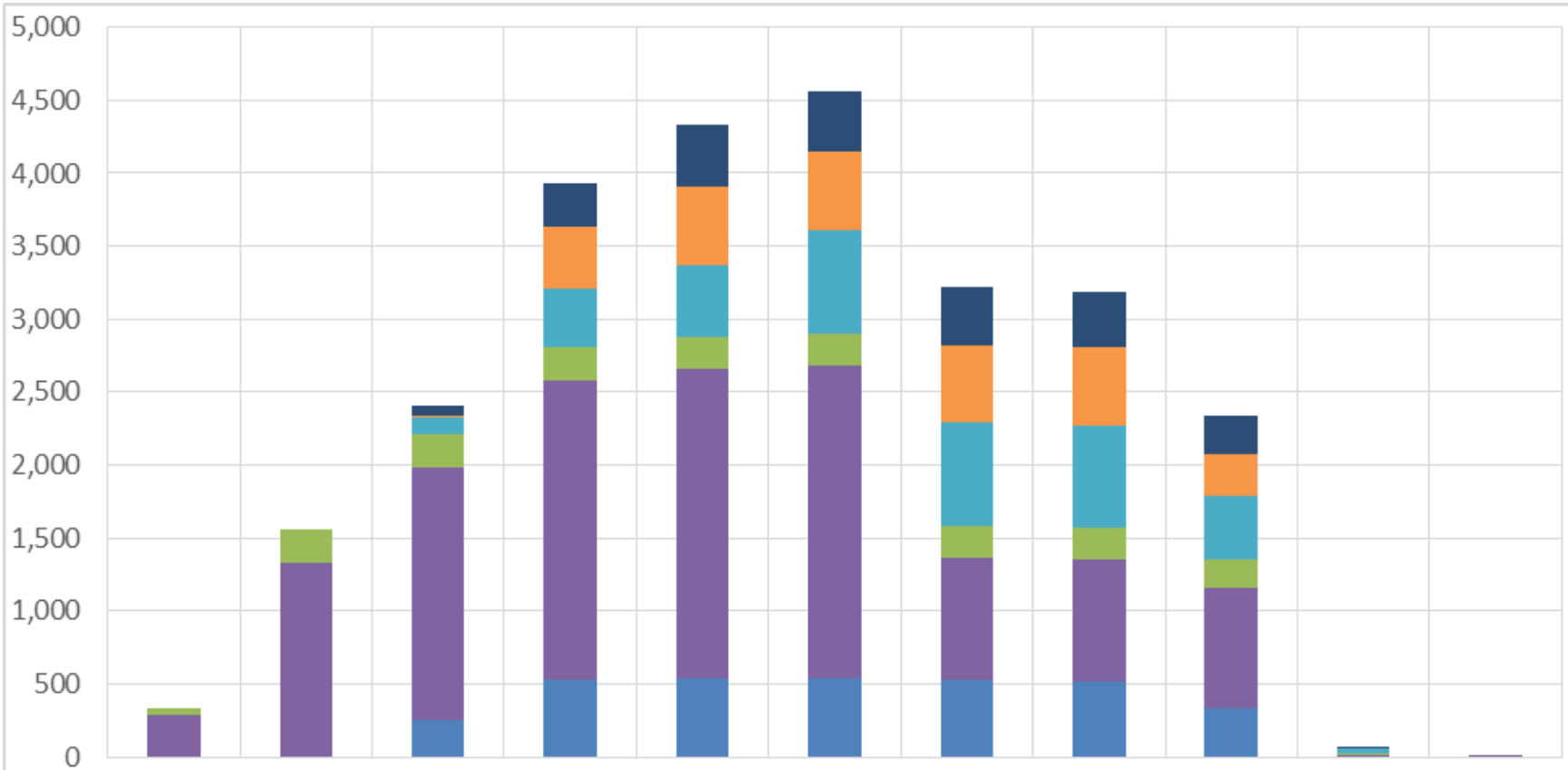
- Installation QA/QC steps
  - Test logger activation based on light on/off (install)
  - Test logger activation based on light on/off (removal)
  - Ask customer to estimate usage (removal)
  - Revisits at 5% of sampled sites to verify installation (install)
- During data cleaning some anomalies or outliers were identified – anomalies included:
  - Loggers that were on for weeks at a time
  - Loggers turning on/off rapidly (flickering)
  - Exterior loggers that were on during daylight hours
- More information on QA/QC and data cleaning included in the full report

Confirmation of Light Usage

Self-Reported Estimate	# of Loggers	Avg HOU Recorded
Total # of Loggers	*3,506*	*3.6*
Less than 1 hour per day	191	1.5
1-2 hours per day	392	2.7
3-4 hours per day	274	4.5
5-6 hours per day	333	4.7
7-9 hours per day	59	8.6
10-14 hours per day	63	11.1
15-20 hours per day	29	11.4
24 hours per day/always	45	14.1
Never/Almost never	90	1.8
Infrequent Use	1,294	2.3
Frequent Use	504	4.5
Don't know	232	3.6

*Data presented are unweighted.
*Self-reported usage was not provided by all participants

Loggers Installed by Month

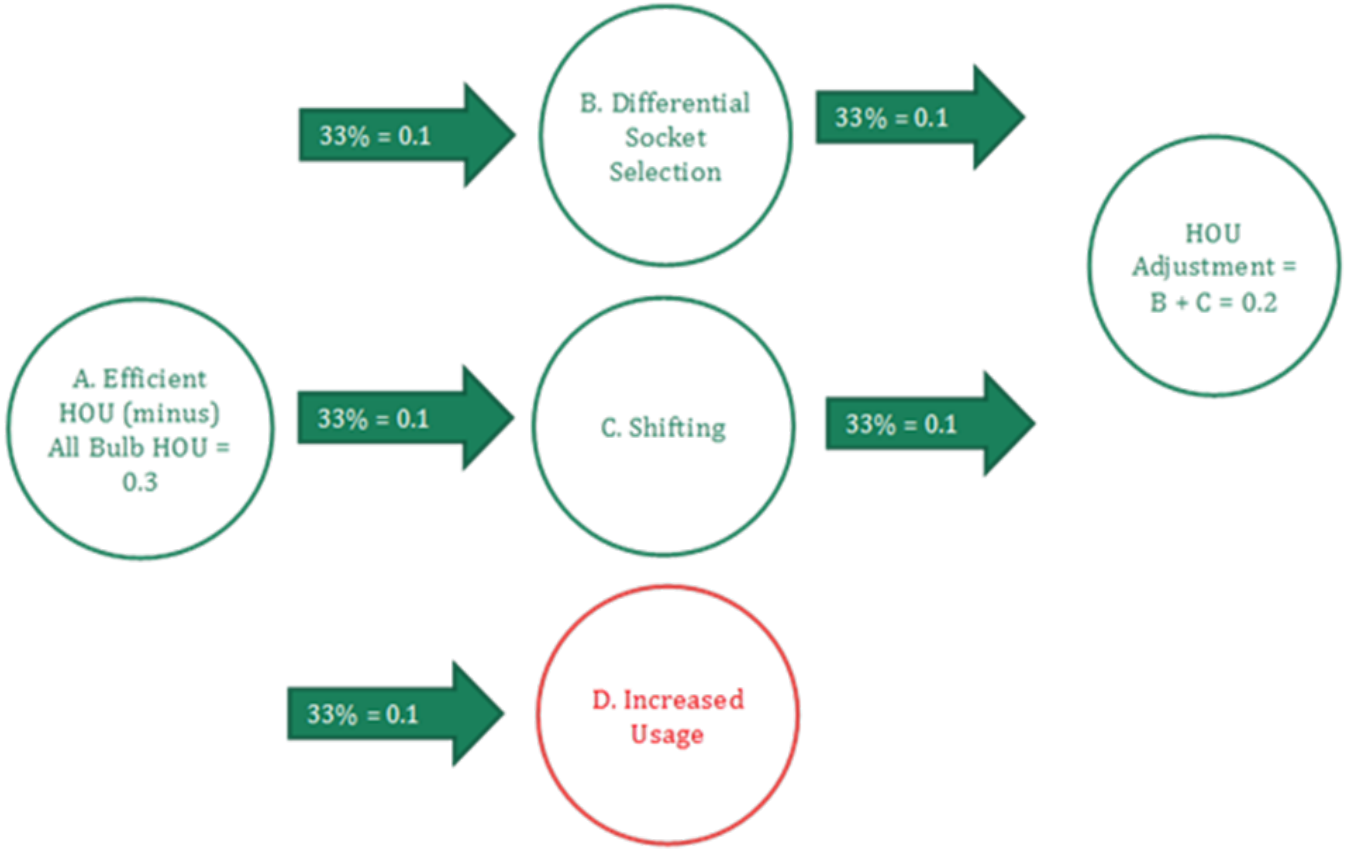


	Nov-12	Dec-12	Jan-13	Feb-13	Mar-13	Apr-13	May-13	Jun-13	Jul-13	Aug-13	Sep-13
DNY			73	294	419	410	400	387	270	7	
MHT			16	421	542	536	535	530	281	7	
UNY			108	399	487	710	705	699	431	27	
RI	50	229	230	227	224	222	219	217	200	15	
MA	284	1,335	1,736	2,060	2,110	2,138	831	835	824	13	6
CT			250	524	546	543	534	523	335	2	
Total	334	1,564	2,413	3,925	4,328	4,559	3,224	3,191	2,341	71	6

Efficient vs. All Bulbs

- Household Efficient Bulb HOU
  - 3.0 / day or 1,095 / year (Overall)
  - 4.0 / day or 1,460 / year (DNY)
- Household All Bulb HOU
  - 2.7 / day or 986 / year (Overall)
  - 3.3 / day or 1205 / year (DNY)
- Difference
  - 0.3 / day or 110 / year (Overall)
  - 0.7 / day or 256 / year (DNY)

Adjusting for Differences



	HOU		
	3.0	Efficient HOU	
	2.7	All bulb HOU	
A.	0.3	Difference	
B.	0.1	Differential Socket Selection	= one-third of difference
C.	0.1	Shifting	= one-third of difference
D.	0.1	Increased Usage	= one-third of difference
	2.90	Adjusted Efficient HOU	= all bulb HOU + differential socket selection + shifting (2.7 + 0.1 + 0.1) OR = efficient bulb HOU - increased usage (3.0 - 0.1)

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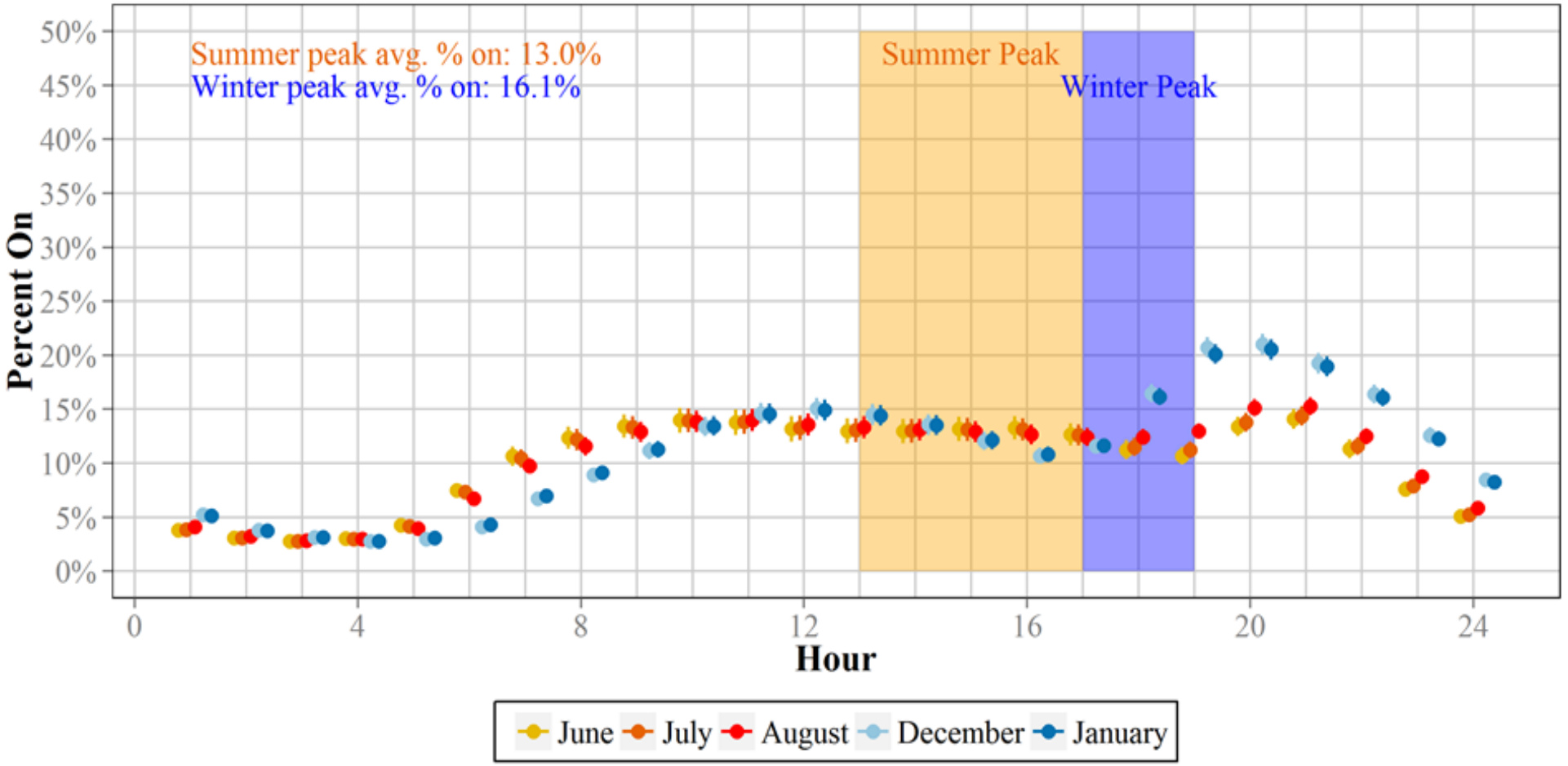
HOU Estimates by Program Type

- Programs require different estimates
- Upstream
  - Snapback adjusted efficient HOU (2.9)
  - Room-by-room updated by saturation
- Direct Install - Full replacement
  - All bulb HOU (2.7)
- Direct Install - Partial replacement
  - Room-by-room estimates (when applicable)

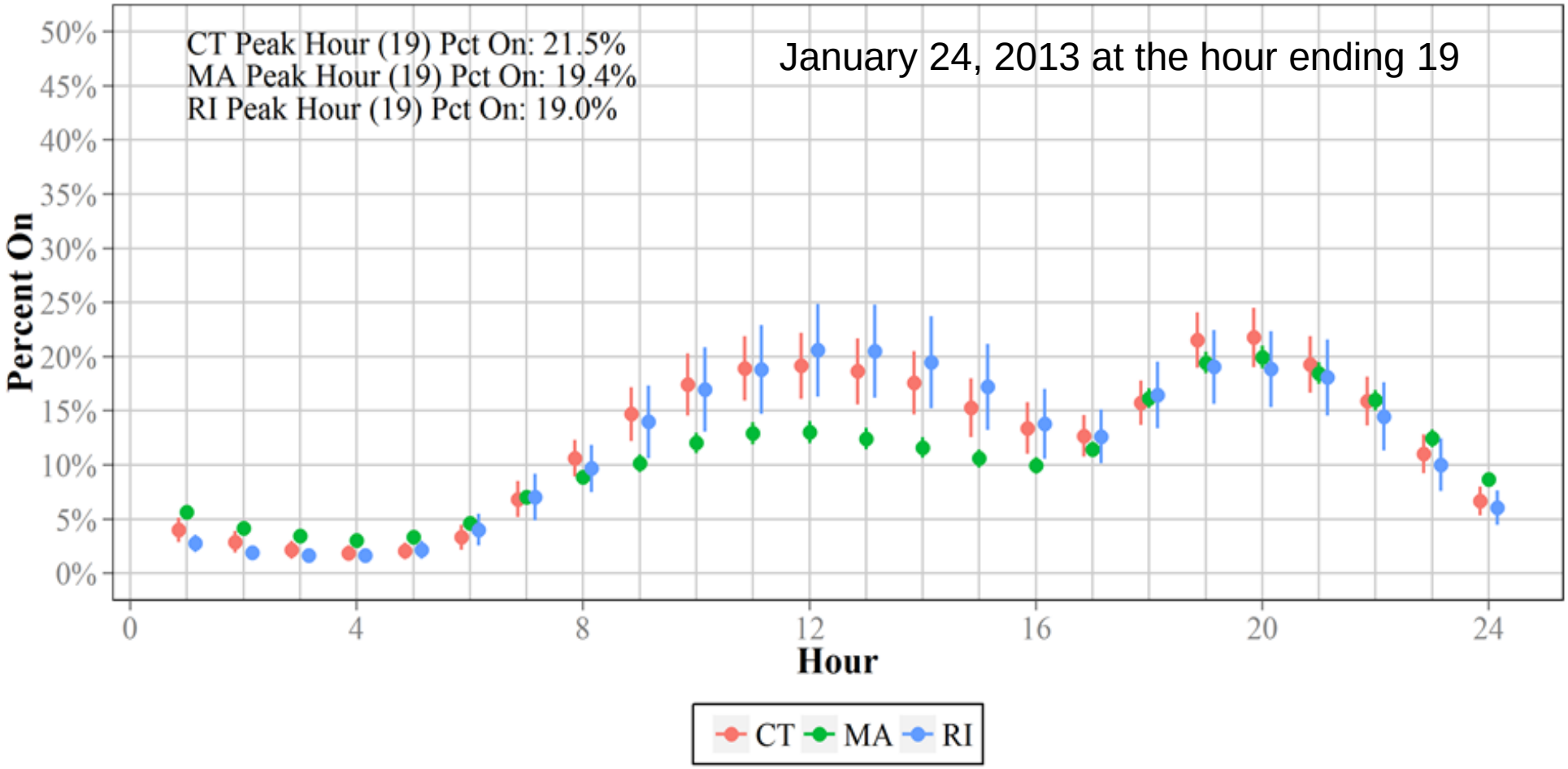
Load Shapes

- Used in calculation of coincidence factors
- Developed for each month
  - Actual hourly data: February – July
  - Modeled hourly data: August – January
- Model provides a very good fit
  - Model vs. Actual indicate predictions are on average within +/- 0.01 of actual

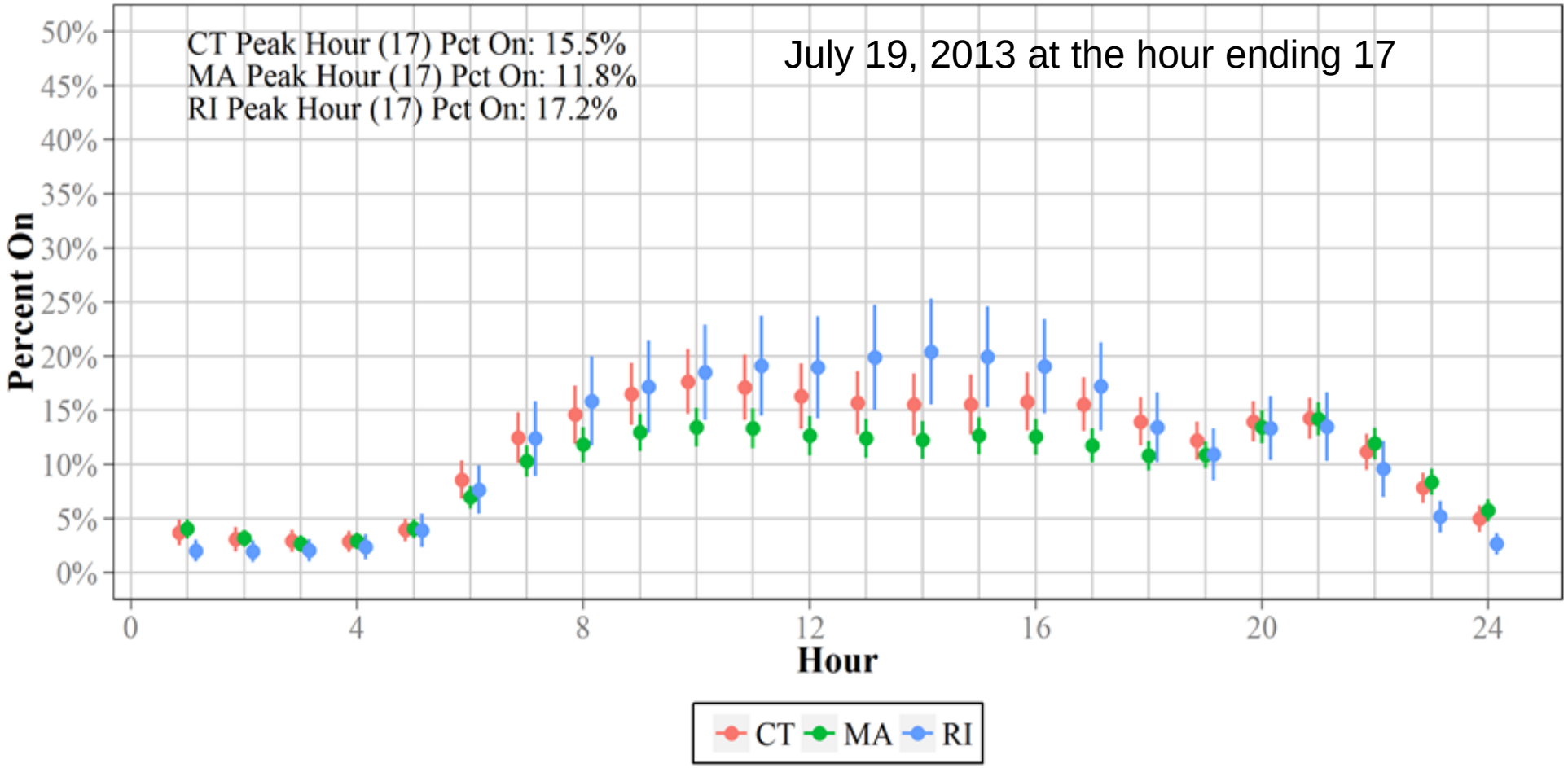
Overall Load Curve



ISO-NE Seasonal Peak Hours – (Winter)



ISO-NE Seasonal Peak Hours – (Summer)



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Utility Program Lighting Trends through 2020

October 3, 2014

We change the way people use energy™

Comparative cost per bulb today

Incandescent
~$0.42 / bulb

Compact Fluorescent
$1.22 - $2.75 / bulb

EISA Compliant Halogen
$0.92 - $1.50 / bulb

LED Bulb
$9- $40 / bulb

Comparative cost per bulb in 5 years

Incandescent
No Longer Available

Compact Fluorescent
$1.22 - $2.75 / bulb

EISA Compliant Halogen
$0.90 - $1.00 / bulb

LED Bulb
$4 - $15/ bulb

Estimated bulb costs

	Std Inc.	EC Halogen	CFL	LED-A	LED-R
2011 (pre-EISA)	$0.34	$2.25	$2.25	$23.00	$29.23
2012	$0.34	$2.00	$2.45	$18.79	$23.87
2013	$0.34	$1.50	$2.45	$16.34	$19.74
2014	$0.34	$1.50	$2.40	$10.86	$12.93
2015	$0.34	$1.25	$2.30	$8.60	$11.64
2016	$0.34	$1.25	$2.25	$7.74	$11.25
2017	$0.34	$1.00	$2.25	$6.96	$10.12
2018	$0.34	$0.90	$2.25	$6.00	$9.00
2019	$0.34	$0.80	$2.25	$5.00	$9.00
2020 & after	N/A	N/A	$2.25	$4.00	$9.00

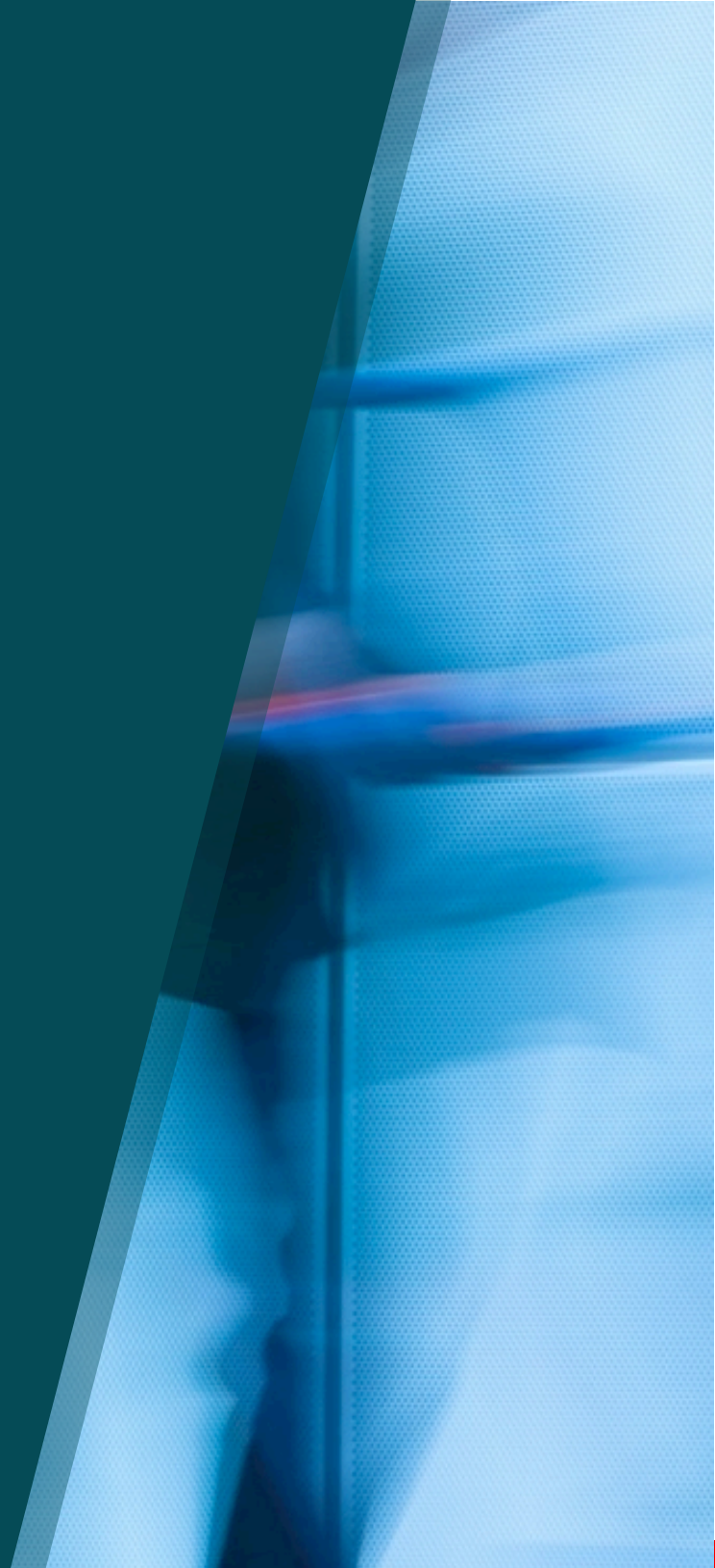
Transition from specialty CFL to LED

- CLEAResult is not recommending that utility sponsored programs continue to incentivize Specialty CFLs beyond 2015
  - Recent decreases in retail pricing
  - Wider availability of ENERGY STAR products
  - Pricing for comparable LED categories will decline
    - Offer higher incentives than CFLs
    - Overcome customer objections to performance, mercury, run-up time, dimming, etc.

Expectations from transition

- Once incentives are removed from specialty
  - Sales of Covered CFL A-line products to transfer into the Standard Omni directional LED product category
    - Incentives typically higher than average twist CFL
  - Sales of CFL Reflector products transfer into the Reflector LED product category
    - Comparable CFL Reflector at par on pricing with LED Reflector
  - Sales of CFL decorative product to transfer into the Decorative LED product category
    - Pricing for decorative bulbs have decreased
    - LEDs will allow similar rate with better performance

LED and CFL Budget Transition Strategies



LED and CFL budget transition strategies

- LED bulbs have seen vast improvements and availability due to technological advancements (efficacy, dimming and heat management)
  - Brought lower costs that exceeded any forecasts from industry with regards to retail pricing
    - LEDs to be more widely available to consumers than in the past
- Challenges for program
  - As retail prices decline, sales volume increases that results in budgeting issues
  - Many budgets were built when retails were significantly higher and sales volume expectations were lower
  - Significant dollar spend with lower kWh generation

LED and CFL budget transition strategies

- Transition strategies
  - Moderate integration of LEDS into lighting programs
    - Allows time for leveraging down incentives when retails decrease
    - Result in consistent budgets
  - Aggressive integration of LEDs into lighting programs
    - Require higher incentives to generate sales
    - Budget dollars will increase significantly over a more moderate approach

Bulb Mix (LED units)	2015	2016	2017	2018	2019	2020
Moderate	17.4%	20.9%	28.8%	35.6%	42.4%	49.2%
Aggressive	38.9%	53.0%	61.0%	66.1%	72.9%	83.1%

Summary

Bulb Mix(CFL)						
	2015	2016	2017	2018	2019	2020
Moderate	82.6%	79.1%	71.2%	64.4%	57.6%	50.8%
Aggressive	61.1%	47.0%	39.0%	33.9%	27.1%	16.9%

Bulb Mix(LED)						
	2015	2016	2017	2018	2019	2020
Moderate	17.4%	20.9%	28.8%	35.6%	42.4%	49.2%
Aggressive	38.9%	53.0%	61.0%	66.1%	72.9%	83.1%

Incentive Mix(CFL)						
	2015	2016	2017	2018	2019	2020
Moderate	59.5%	55.4%	47.2%	45.2%	42.4%	42.6%
Aggressive	30.4%	23.2%	19.2%	17.1%	14.7%	11.8%

Incentive Mix (LED)						
	2015	2016	2017	2018	2019	2020
Moderate	40.5%	44.6%	52.8%	54.8%	57.6%	57.4%
Aggressive	69.6%	76.8%	80.8%	82.9%	85.3%	88.2%

Connect with us.

Learn how CLEAResult can help you change the way you use energy.

Stan Mertz

Director of Retail Operations

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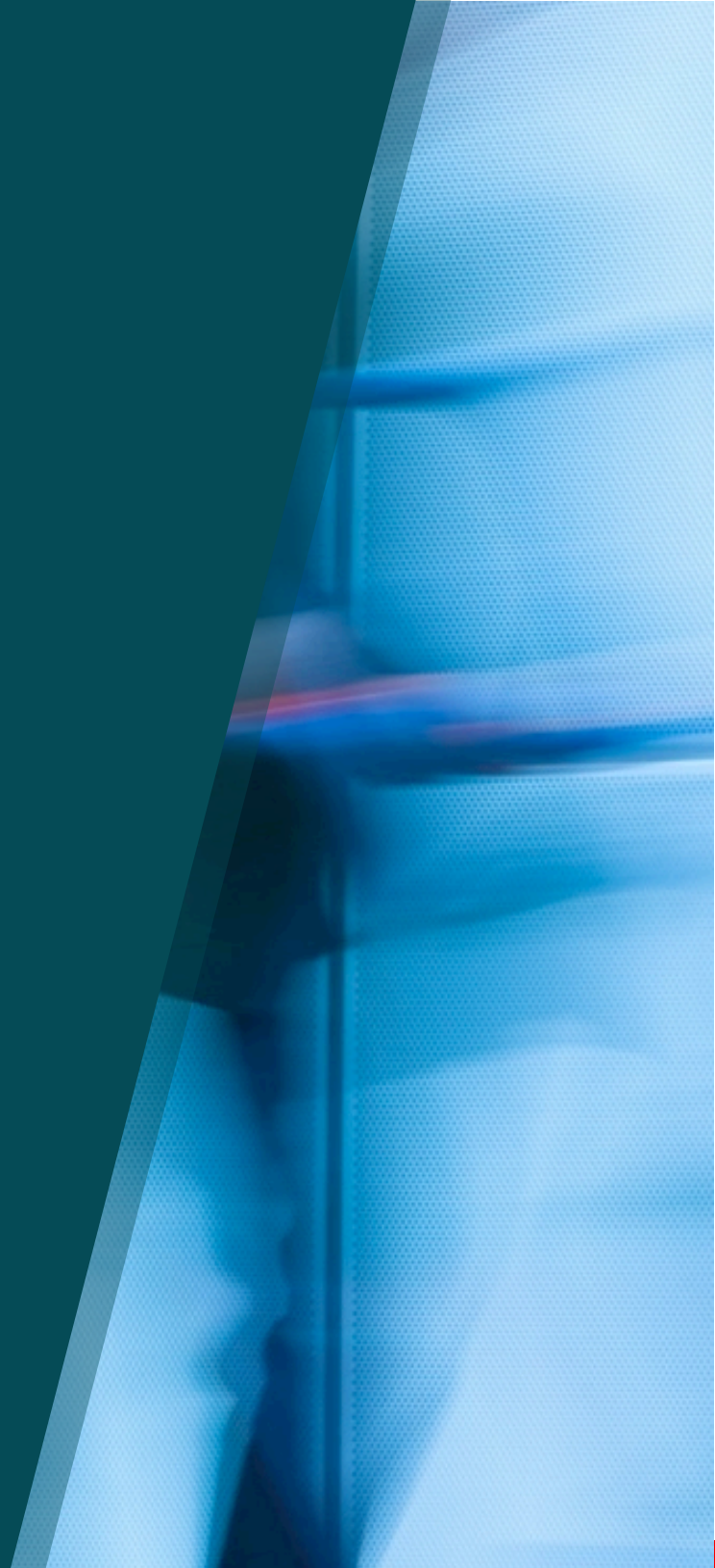
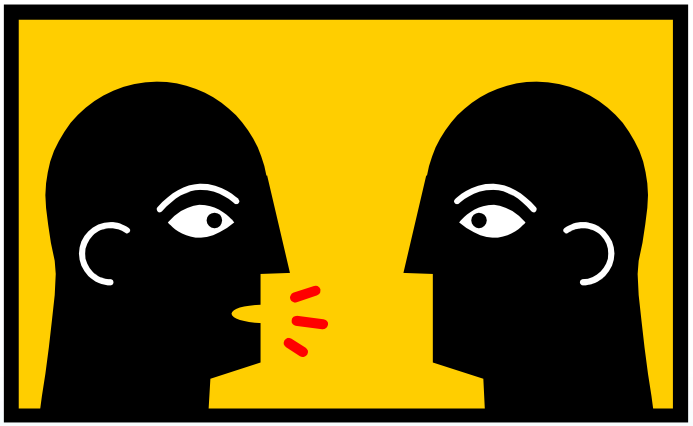
413-731-6546 ext. 231



DISCUSSION

Questions:

- What big changes can we expect to see?
- Future of the specialty CFL category (when to sunset)?
- Forecasts for LED Sales—where are we going?



Northeast Energy Efficiency Partnerships

Lighting and Human Health

Daniel Frering, Director of Educational Programs
Lighting Research Center

2014 Northeast Residential Lighting Workshop
Tuesday, October 7th 2014 11:15am

Light and Human Health

Daniel Frering, LC

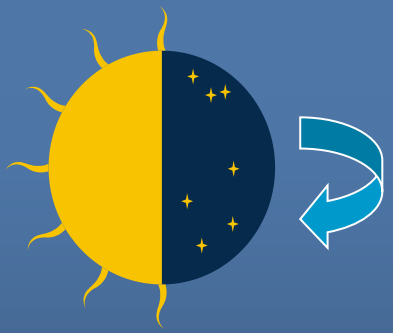
Lighting Research Center
Rensselaer Polytechnic Institute

Lighting Research Center

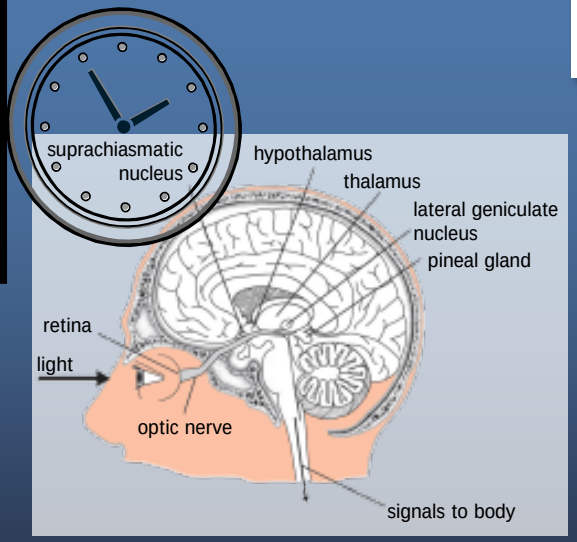
Rensselaer

Why is light so important?

- Light reaching the retina can impact
  - Visual system – enables us to see
  - Circadian system – enables us to maintain synchronization with the solar day



The natural 24-hour light-dark cycle



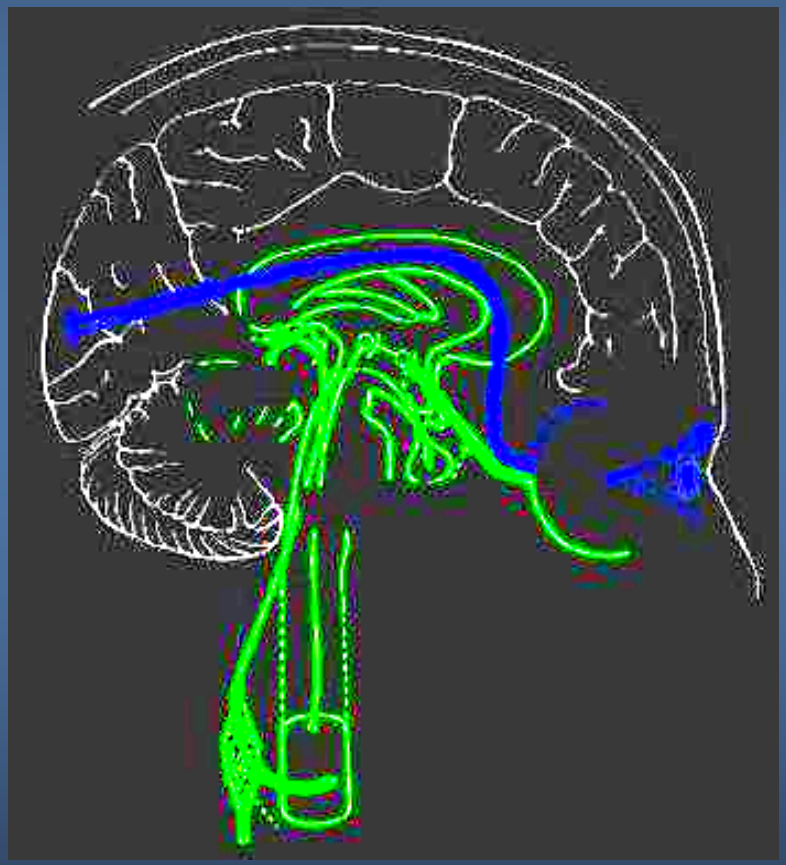
Adapted from National Library of Medicine image, 2007, (public domain).

Circadian system

- All plants and animals exhibit patterns of behavioral changes over an approximately 24-hour cycle that repeat over successive days — these are circadian rhythms

  circa = about; dies = day

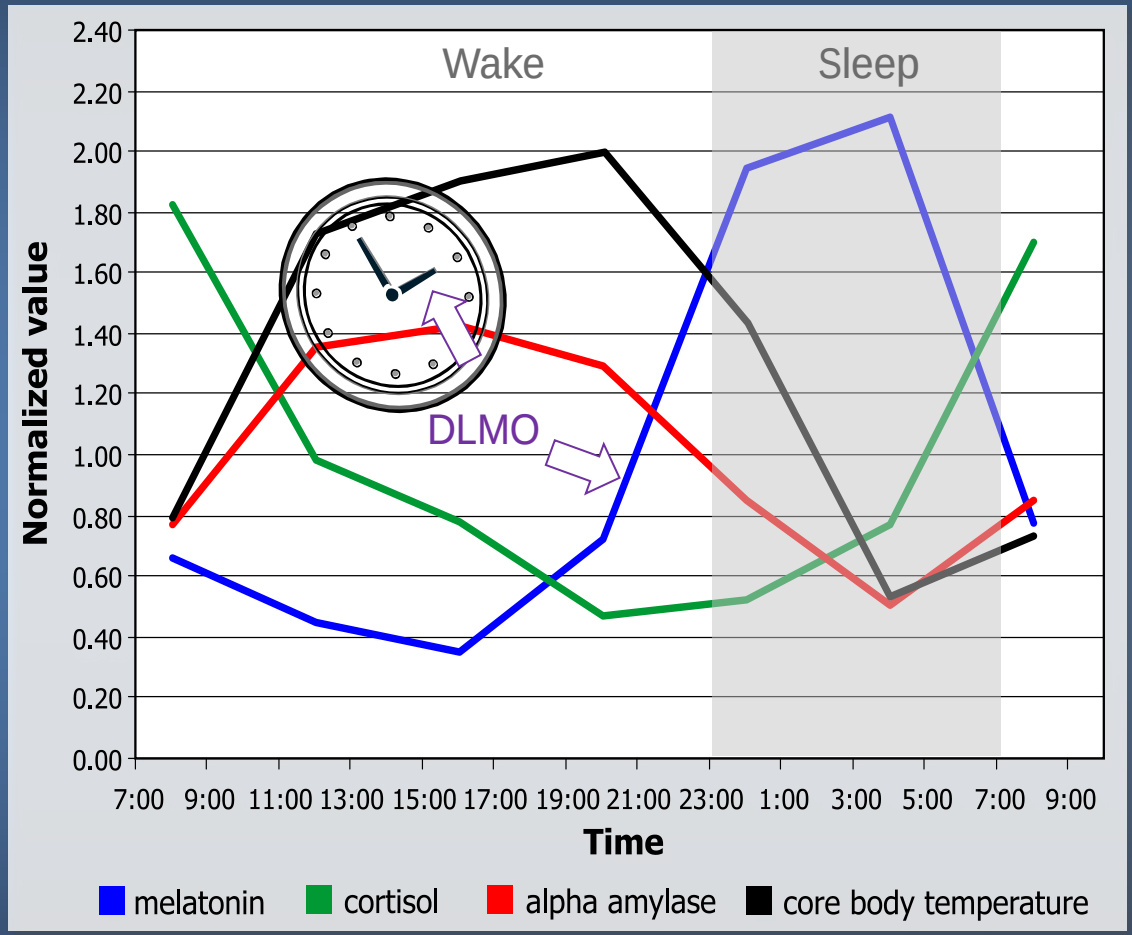
- Circadian rhythms are influenced by exogenous and endogenous rhythms
  - Light/dark patterns are the strongest entrainment stimulus for the circadian system



Adapted from IESNA Handbook

Overt rhythms

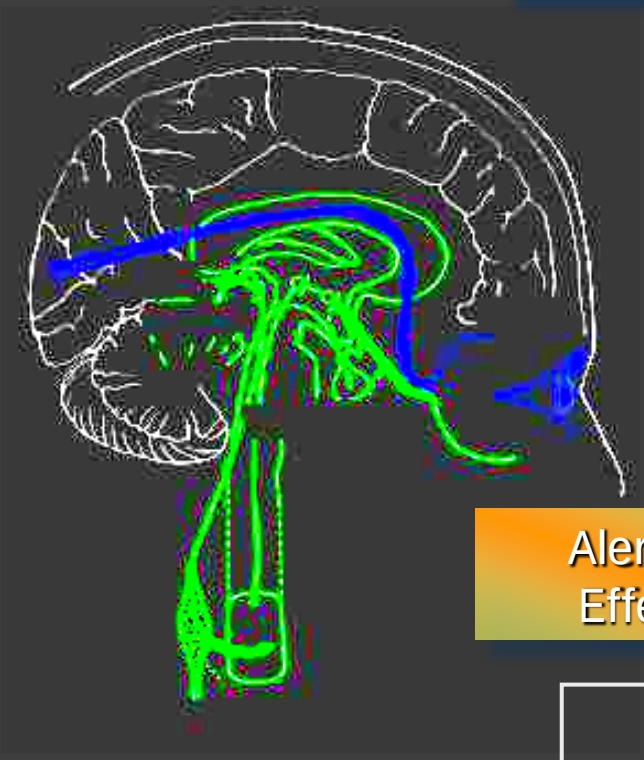
- Biological (circadian) rhythms can be measured in several ways
  - Sleep/wake cycle
  - Core body temperature
  - Melatonin concentration/onset
  - Cortisol concentration
  - Alpha amylase concentration



Figueiro et al. 2009
Sponsor: Office of Naval Research

Light and human performance

Vision + Circadian + Message



Intensity
Spectrum
Distribution
Timing
Duration

Appearance
Visual System
Visual Performance

Performance, Well-being, Satisfaction, and Comfort

Culture, Experience, Expectations

Alerting Effects
Circadian System
Phase Shift

Intensity
Spectrum
Distribution
Timing
Duration

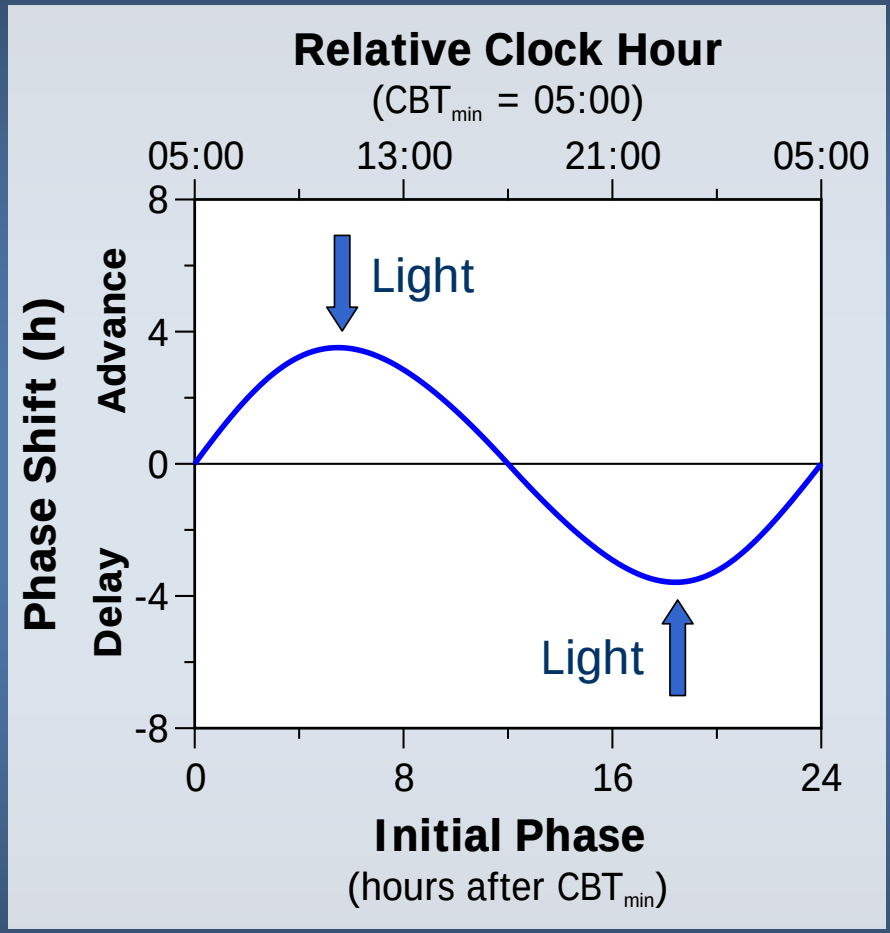
IESNA. 9th ed

Lighting Research Center

Rensselaer

Circadian rhythms and light

- Light has a dual effect on the 24-hour melatonin profile
  - Acute effect – appears immediately after the exposure to “bright” or “blue” light
  - Phase-shifting effect – detectable several hours or a few days later

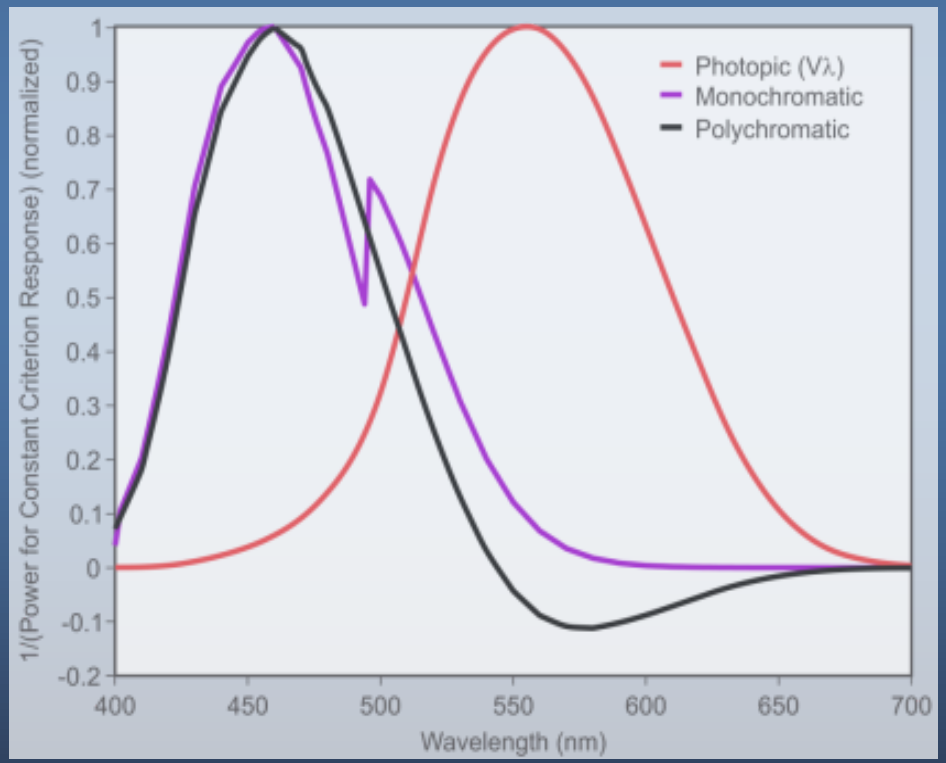


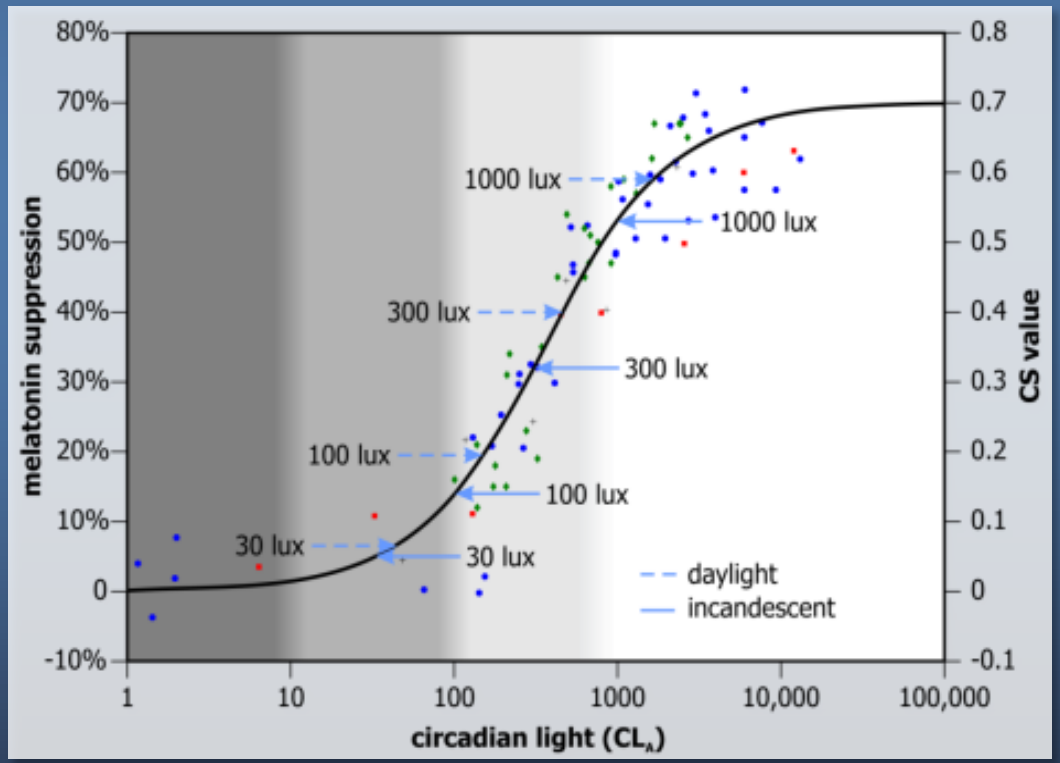
5 hr pulse of 7,000 to 13,000 lux

Based on Khalsha et al. 2003

Melatonin and light

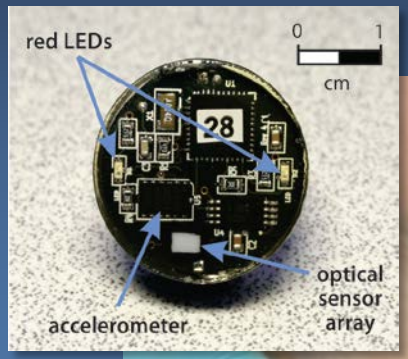
- Circadian system as measured by acute melatonin suppression and phase shifting of dim light melatonin onset (DLMO) has a peak sensitivity at short-wavelengths (blue light) with a system response characteristic from threshold to saturation

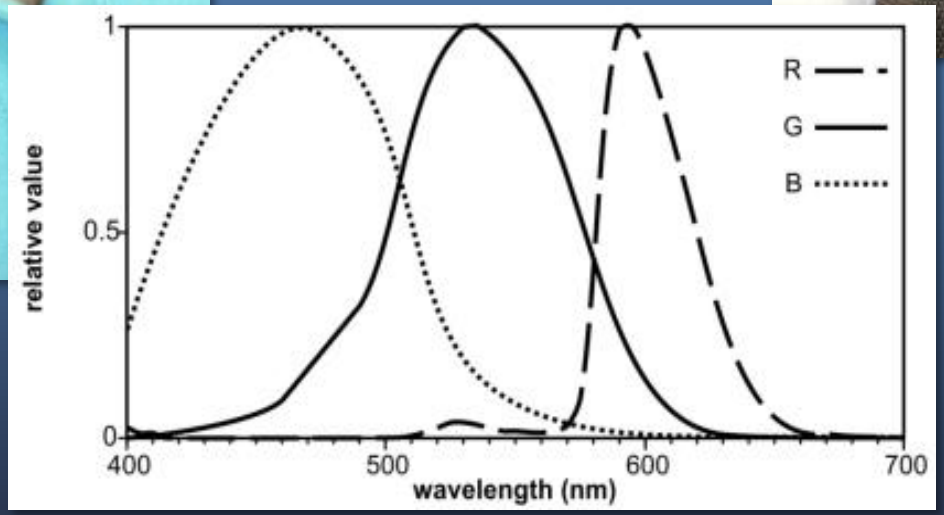


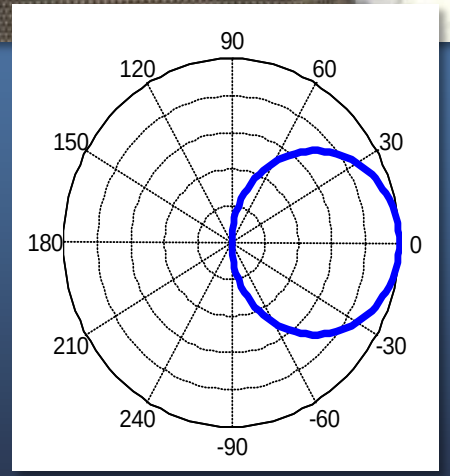


Rea et al 2005; 2011

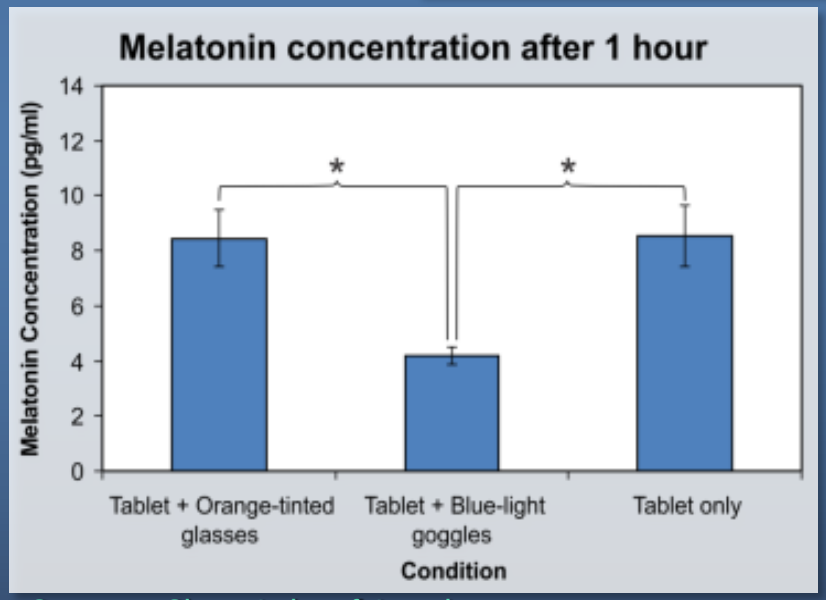
Daysimeter

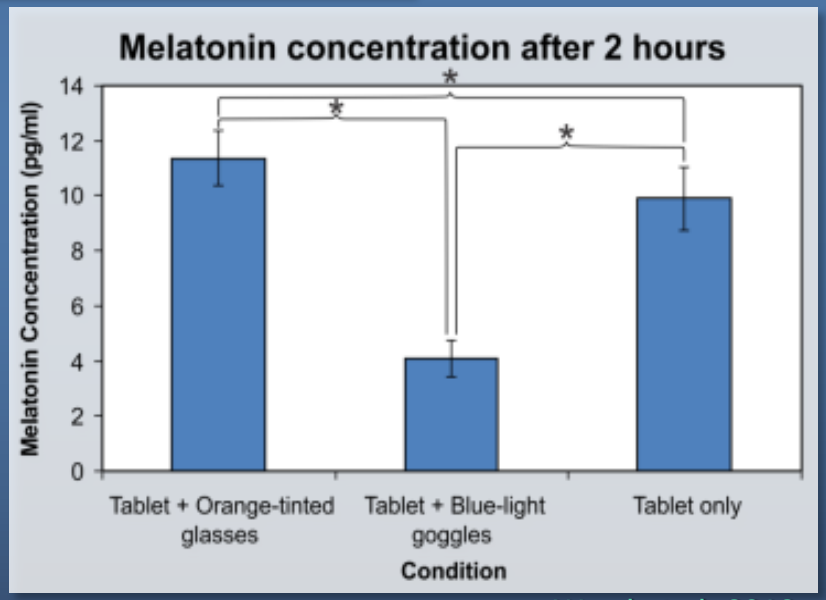






Impact of light from iPads on melatonin levels





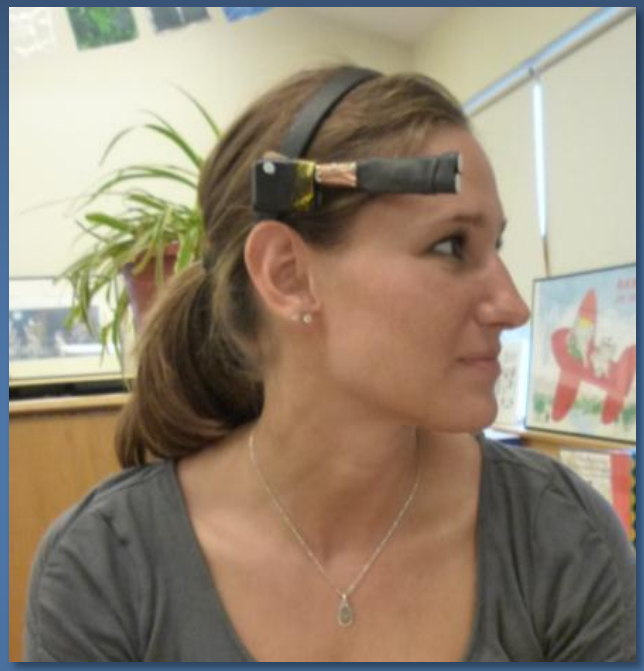
Sponsor: Sharp Labs of America

Wood et al. 2012

Significant ($p<0.05$) lower melatonin levels for tablet + blue light and tablet only compared to tablet + orange-tinted glasses after 2 hours, but melatonin levels for tablet only after 1 hour were not significantly lower than tablet + orange-tinted glasses

Predicted suppression and actual (median) = 3%

Measuring light at night and circadian disruption for a sample of female schoolteachers



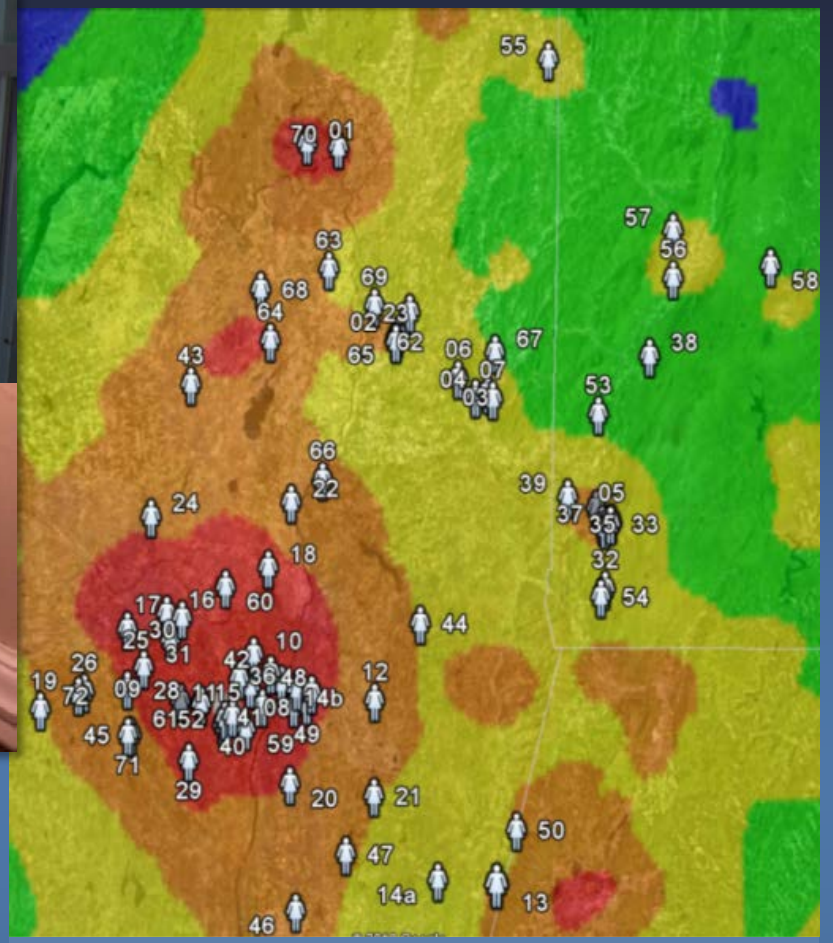
Sponsor: NIH, CDC, NEMA

Authors: MS Rea, JA Brons, MG Figueiro

Published: Chronobiology International

Methodology

- 72 school teachers
  - Spring 2010, Fall 2010
  - Females
- Wore Daysimeter seven days/evenings
- Installed two measurement devices in bedroom
  - Window
  - Nightstand
- LRC compared field measurements to “sky brightness” category



Cinzano *et al.* “Sky Atlas” (2001)
Sky “brightness” (μ cd/m^2)

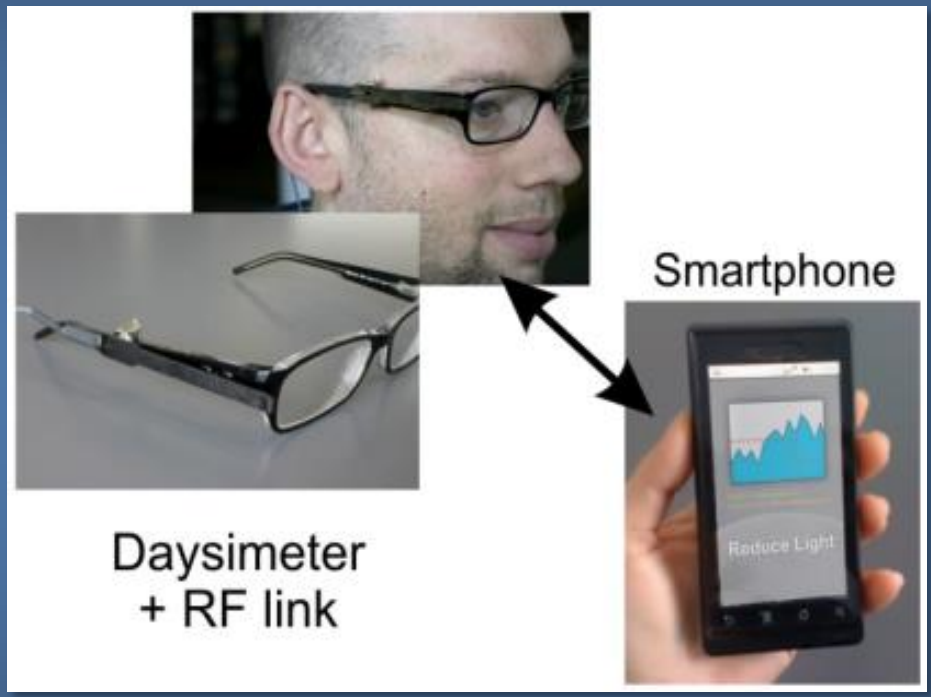
›blue	27.7–83.2
›green	83.2–252
›yellow	252–756
›orange	756–2268
›red	2268–6804
›white	>6804

Conclusions

- Satellite photometry is not a good surrogate for LAN exposure as it might impact the circadian system
- Extremely low levels of light at night in bedrooms
- Teachers' circadian patterns similar to other day-shift workers, not disrupted
  - "Evening" exposure: possible, slight melatonin suppression
- To link light at night and/or circadian disruption to breast cancer incidence, photometric devices must be calibrated in terms of the operational characteristics of the human circadian system

Broad implications

- Minimizing impact of jet lag and shift work
- Improving performance
- Potentially reducing health risks (e.g., obesity, cardiovascular disease, breast cancer)
- Correcting sleep problems



Lighting for Older Adults

24-hour Lighting Scheme for Older Adults

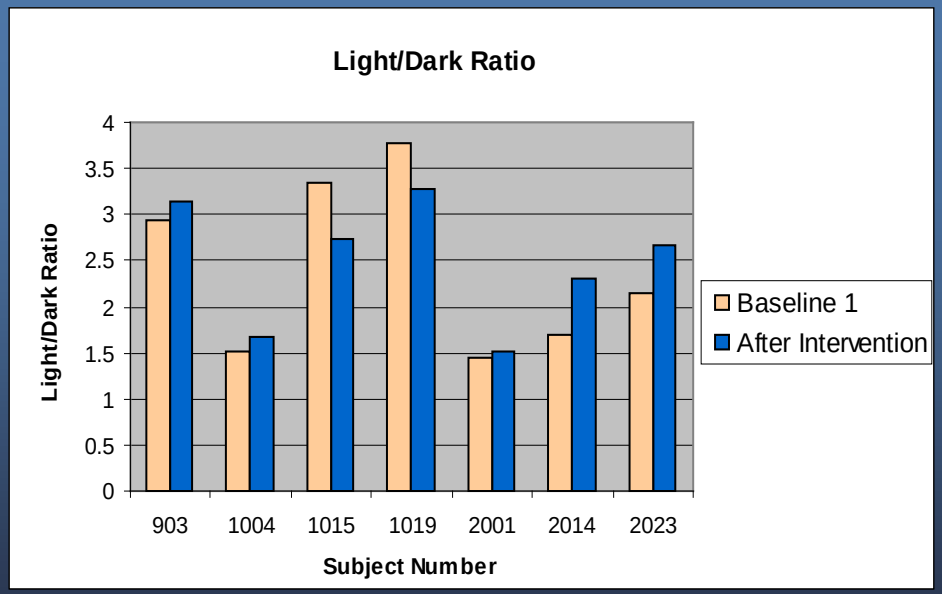
Lighting Research Center

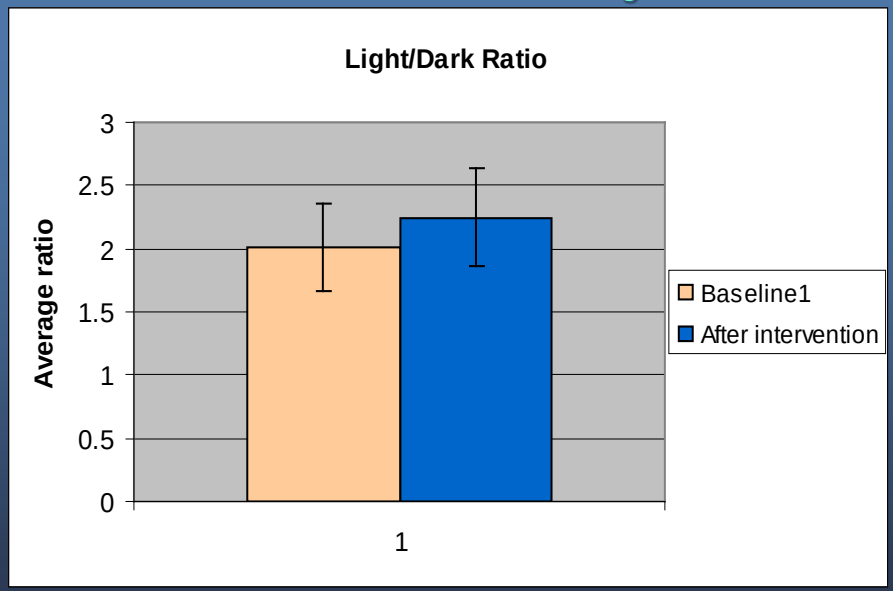
Rensselaer

High CCT light therapy

- American Institute of Architects (AIA) research grant
  - High circadian stimulation all day and low circadian stimulation during the evening increased light/dark ratio in 8 healthy older adults with sleep complaints

Figueiro et al. 2008

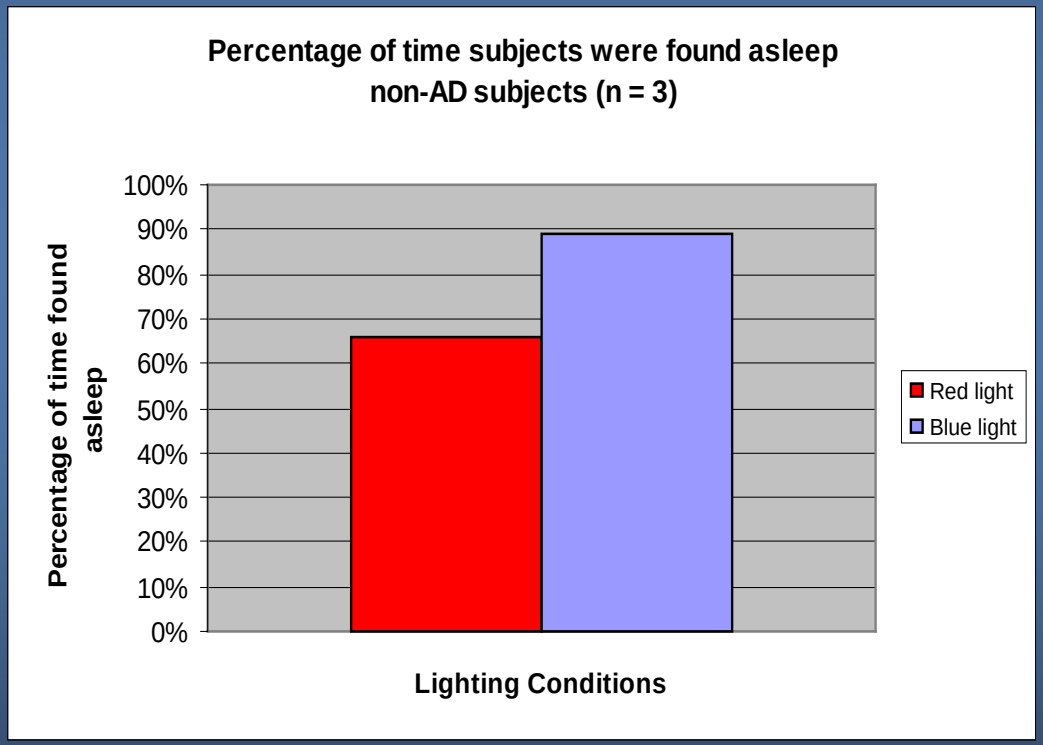


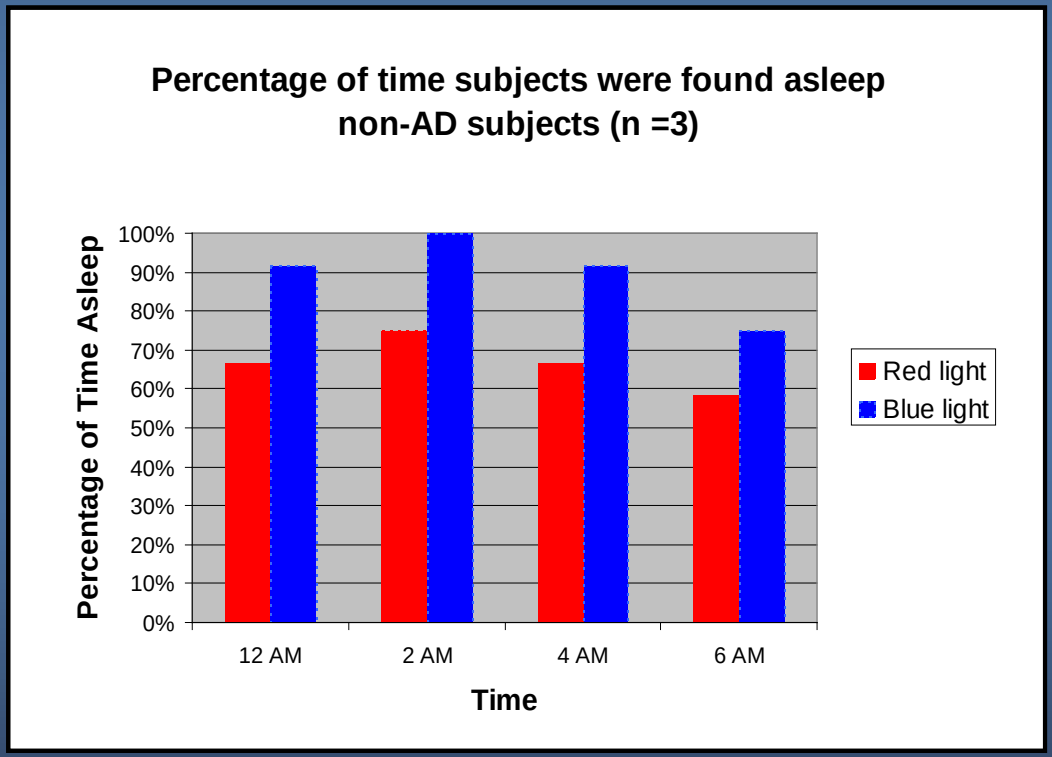


Product donation: OSRAM SYLVANIA and Hunter Lighting

Short-wavelength light therapy

30 lux of 470-nm light for 2 hours in the early evening increased sleep efficiency in healthy older adults with sleep complaints





Product donation: Nichia America Corp

Blue = 89.5% asleep
Red = 67% asleep
p = 0.0003

Figueiro and Rea, 2005

Light and the aging visual system: Principles

- More light on the task area with darker surrounds for the task area
- Minimize glare by hiding direct and reflected view of the source and minimizing use of glossy reflections
- Softer shadows throughout the space; balance illuminance levels in the space
- Increase contrast and improve color discrimination

Importance of each depends upon the person

Lighting and the aging circadian system: Principles

- During the daytime hours (or at least for 2 hours in the morning)
  - Increase light levels (at least 400-600 lux at the cornea) and use “bluish white” (correlated color temperature of at least 6500K) or 40 lux of blue light (light emitting diodes λmax = 450-470 nm) for at least 2 hrs in the morning
  - Promote outdoors activities on a regular schedule
- During the evening hours
  - Decrease light levels (less than 50 lux at the cornea) and use “yellowish white” (correlated color temperature of 2700-3000K)

Figueiro et al., 2008

Light and the aging perceptual system: Principles

- Provide safe nightlights that do not disrupt sleep or increase falls risk
  - Nightlights that provide visual and perceptual cues to reduce falls risk

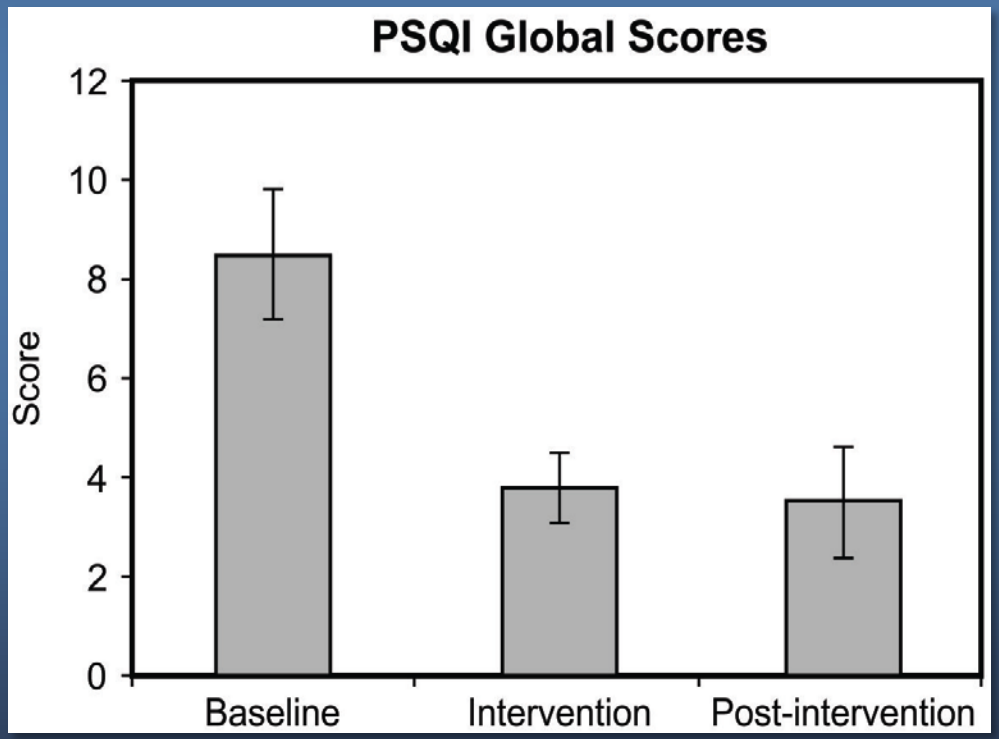
Proposed 24-hour lighting solution

Light and Alzheimer's disease (AD)

- Objective – Use of circadian-tailored light to consolidate sleep patterns in persons with dementia
- Pilot study completed with 10 subjects residing in adult care facilities and being conducted with 28 subject-caregiver pairs in homes
- Luminaires using 9300 K fluorescent lamps were placed in rooms to provide 400 lux at the eye

Light treatment for persons with dementia

- Significant improvement in sleep scores, depression scores, and reduction in agitation after lighting intervention



Swedish Healthy Home

- Develop the framework for lighting a “healthy home” in Sweden
  - Maximize value:

$$\frac{\text{Human health \& well-being}}{\text{\$ or Kronor (SEK) + kWh}}$$

  - Support all functions for occupants (value)
  - Use energy for maximum benefit
    - Minimize wasted energy (cost)
  - Integration & control of daylight & electric light

What is Healthy Home Lighting?

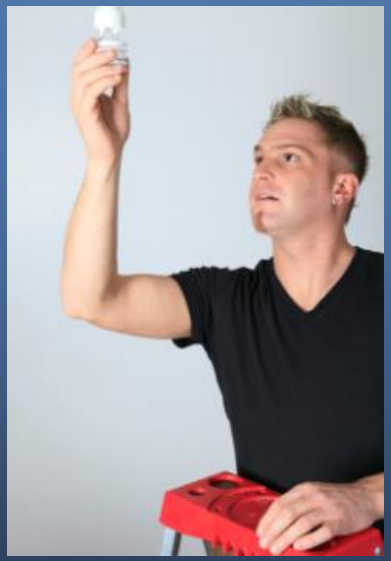
- Lighting in a healthy home is effective for people, attractive, energy-efficient, well-controlled, and environmentally sustainable. (Maximize value per Watt)

Design Goals

- Visibility - support the vision of home occupants, no matter their age or visual abilities
- Provide for Safety and Security
- Minimize Falls
  - Good visibility
  - Horizontal and vertical cues

Design Goals

- Provide a pleasing atmosphere
  - Allow for flexibility to adjust light
  - Good color properties
    - Good color rendering
    - White light
    - Close tolerances
- Easy to maintain
  - Long life
  - Easy to use and adjust as needs change
  - Maintains characteristics over time



Design Goals

- Universal Design
  - Flexible, allow for changes as people age or needs change
  - Functions of spaces changes as family members age
  - Think ahead
    - Allow for changes and adaptations over time
    - light level, distribution, and appearance

Design Goals

- Use light only when and where needed
  - Control lighting usage (manual vs. automatic)
  - Avoid wasted light
  - Individually controlled lighting
- Use the most efficient and effective technology
  - Efficient sources
  - Application efficacy
  - Time and space (when and where)

Design Goals

- Promote sleep quality, health, and well-being
  - Home is the “hub” for a healthy life
    - Track light experiences throughout the day,
    - Understand how light interacts with our biological systems,
    - Make adjustments to light at home to maintain circadian entrainment & good health
      - spectrum, amount, timing, duration

The Technology

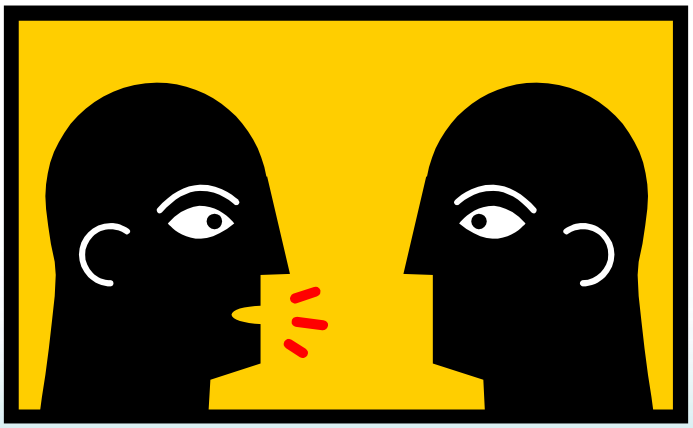
- Track, record, and interpret light we experience throughout the day
  - "Daysimeter" – detects and records personal light exposure
  - Information stored in each person's personal electric device (e.g., smart phone)
  - When person arrives home, information is transmitted to home lighting control system
    - Could adjust light automatically or provide a lighting prescription.

Questions?

Thank you.

DISCUSSION

- What impacts might this research have on LEDs in the future?
- How can programs prepare for aging populations?
- What other research is happening at the LRC that might have impacts to our work?
  - Taking a tour at 3!



LUNCH 11:45-12:40PM

Northeast Energy Efficiency Partnerships

Innovations in Residential Lighting Marketing

Rene Burger, Philips
Elizabeth Murphy, UI
Adam Tardif, TechniArt

2014 Northeast Residential Lighting Workshop
Tuesday, October 7th 2014 12:40pm

SPEAKERS:

Panelists:

Rene Burger, Senior Marketing Manager

Philips

Elizabeth Murphy, Program Administrator, Residential Retail Products

UIL Holdings Corporation

Adam Tardif, President

TechniArt

Philips Daylight Savings Promotion

October 1
November 1, 2014

Project Overview

PHILIPS

Daylight Savings Promo: Overview

- **Promotion Overview:** Draw attention to energy savings and utility rebates during October
- **Promo Duration**: October 1 – November 1, 2014
- **Product**: Slim Style Portfolio (A19, BR30)

Turn back the clocks: November 2nd!

PHILIPS

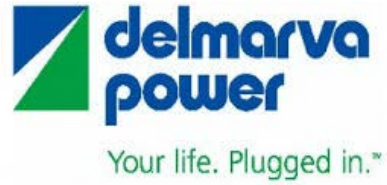
Daylight Savings Promo: Overview

Turn back the clocks: November 2nd!

- **Promotion Highlights:**
  - ✓ End Caps in participating stores
  - ✓ Additional utility incentives
    - ✓ $2 dollars/sku for 4 weeks
    - ✓ Target retail: **$1.97 - $5.97**
  - ✓ Daylight Savings signage
    - ✓ Utility Funded and Installed by the utility
    - ✓ Creative was provided to the utility for printing and placement
  - ✓ Social Media – Philips & Utilities
    - ✓ Twitter, Facebook, Instagram

Daylight Savings Promo: Overview

- In total, Philips partnered with 16 Utilities



Your life. Plugged in.™

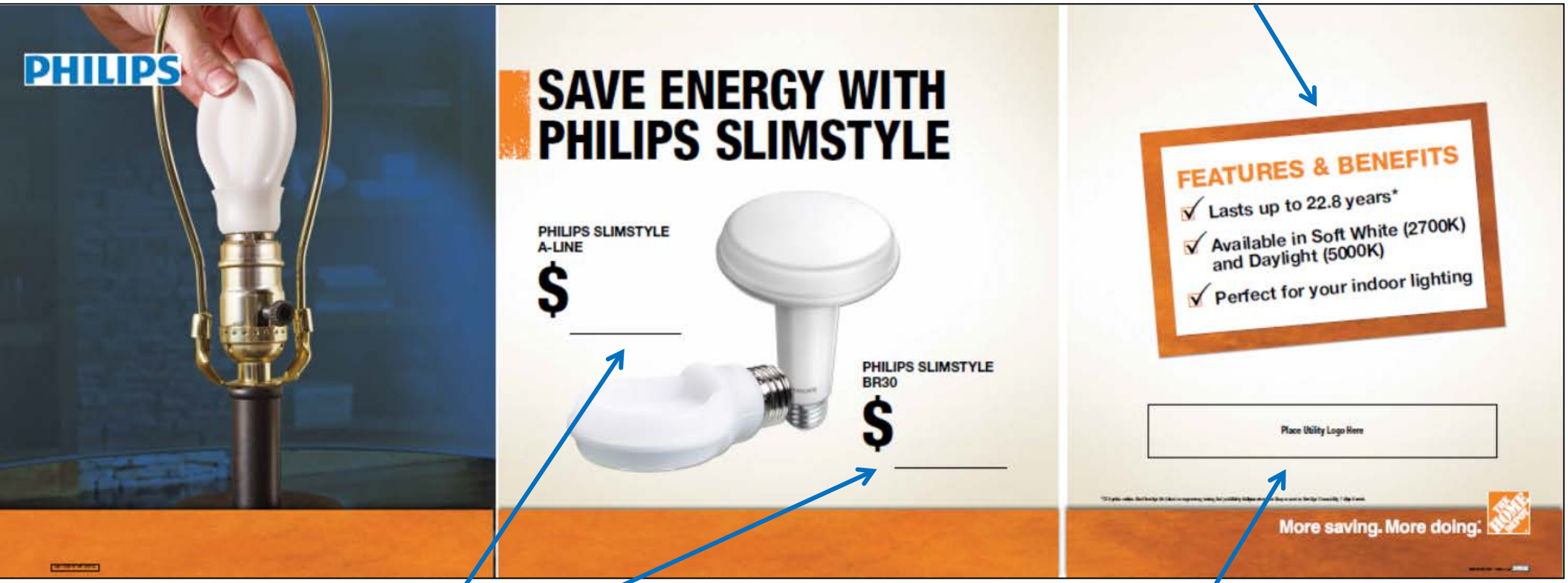
Western Massachusetts Electric

A Northeast Utilities Company

PHILIPS

In-Store Slim Style End Cap

Features and Benefits



Updated Utility Pricing

Utility logos added by utility provider

PHILIPS

Thank You

Rene Burger
Senior Marketing Manager
Philips
Rene.burger@philips.com

energize CONNECTICUT

Empowering you to make smart energy choices

The Success of LED Marketing in Connecticut

Presented by:
Elizabeth Murphy, UIL

October 7, 2014

Overview

- Energize Connecticut Initiative
- Connecticut's Residential Lighting Market
- Seasonal Marketing Campaigns
- Retail Partnerships
- Engaging Hard to Reach Market
- The Great Light Bulb Exchange
- Questions

What is Energize Connecticut?

- Connecticut's branding initiative to help consumers save money and use clean, affordable energy.

- Energize Connecticut programs are a partnership of the Energy Efficiency Fund, the Clean Energy Finance and Investment Authority, the state, and local electric and gas utilities.

- Programs are funded by a charge on customer energy bills.

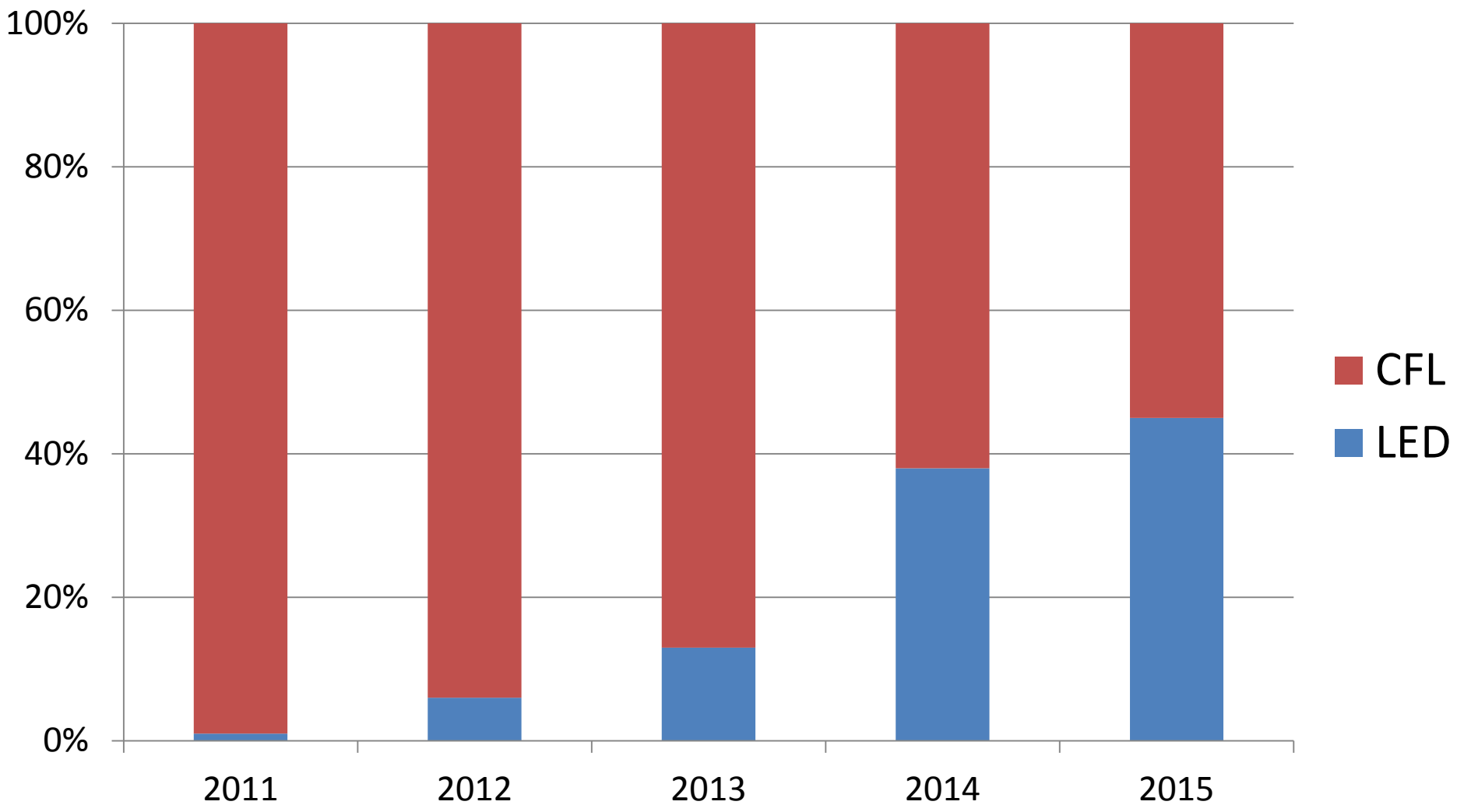
Residential Lighting Market

- Accounts for more than half of CT's residential energy efficiency portfolio savings
- Increasingly difficult to claim savings
  - CFL free-ridership
  - EISA phase-out of standard incandescent bulbs, replaced by halogen baseline
- Market shift from CFLs to LEDs

Residential Lighting Market - 2014

- Regulatory direction to increase promotion of LEDs, better educate customers and target market segment unlikely to invest in energy efficient lighting
- Increased marketing budgets
- $11.5 million incentive budget statewide
- Nearly 1 million LEDs incented YTD

Residential Lighting Mix Since 2011



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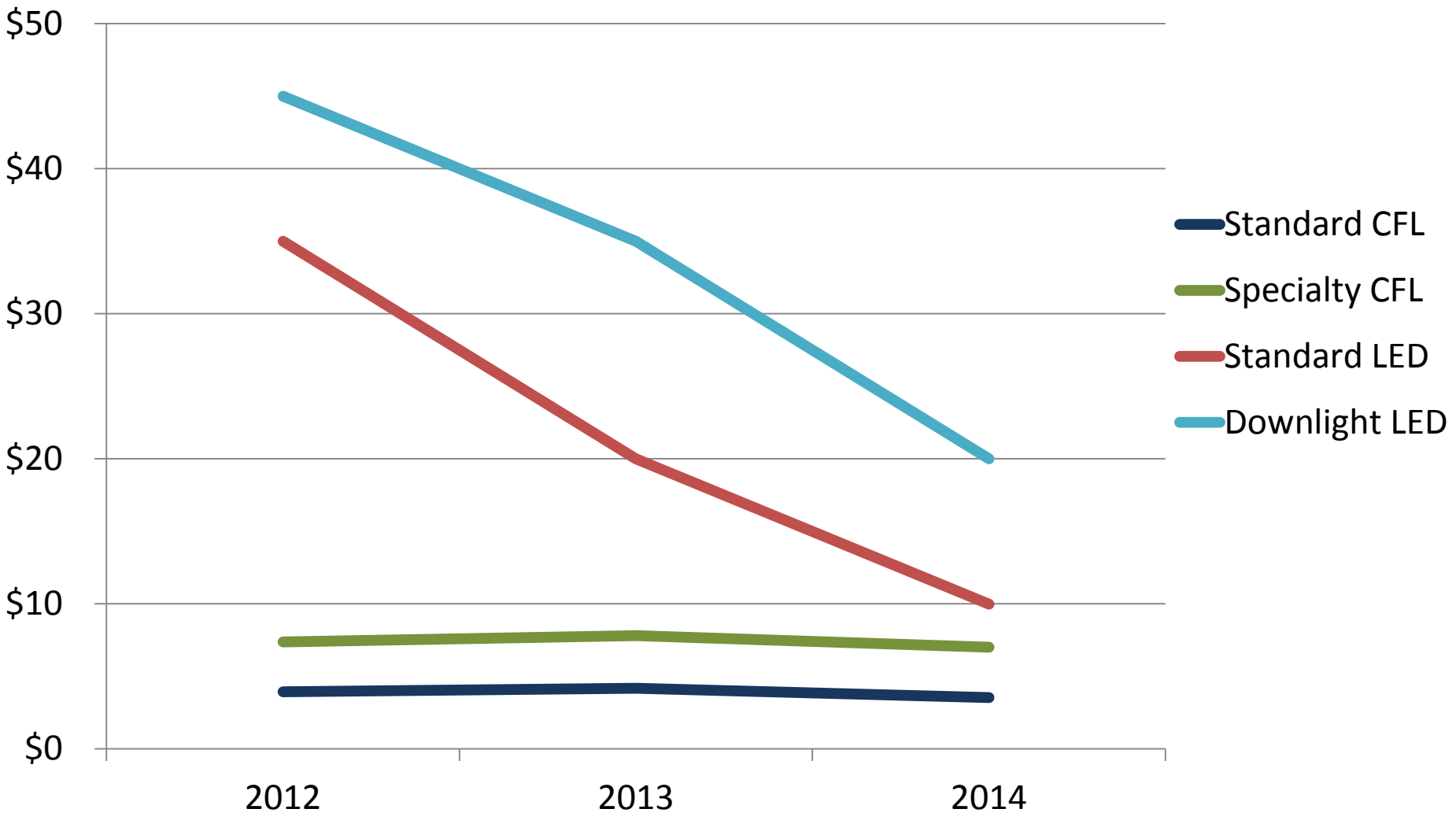
Declining Retail Prices (pre-incentive)



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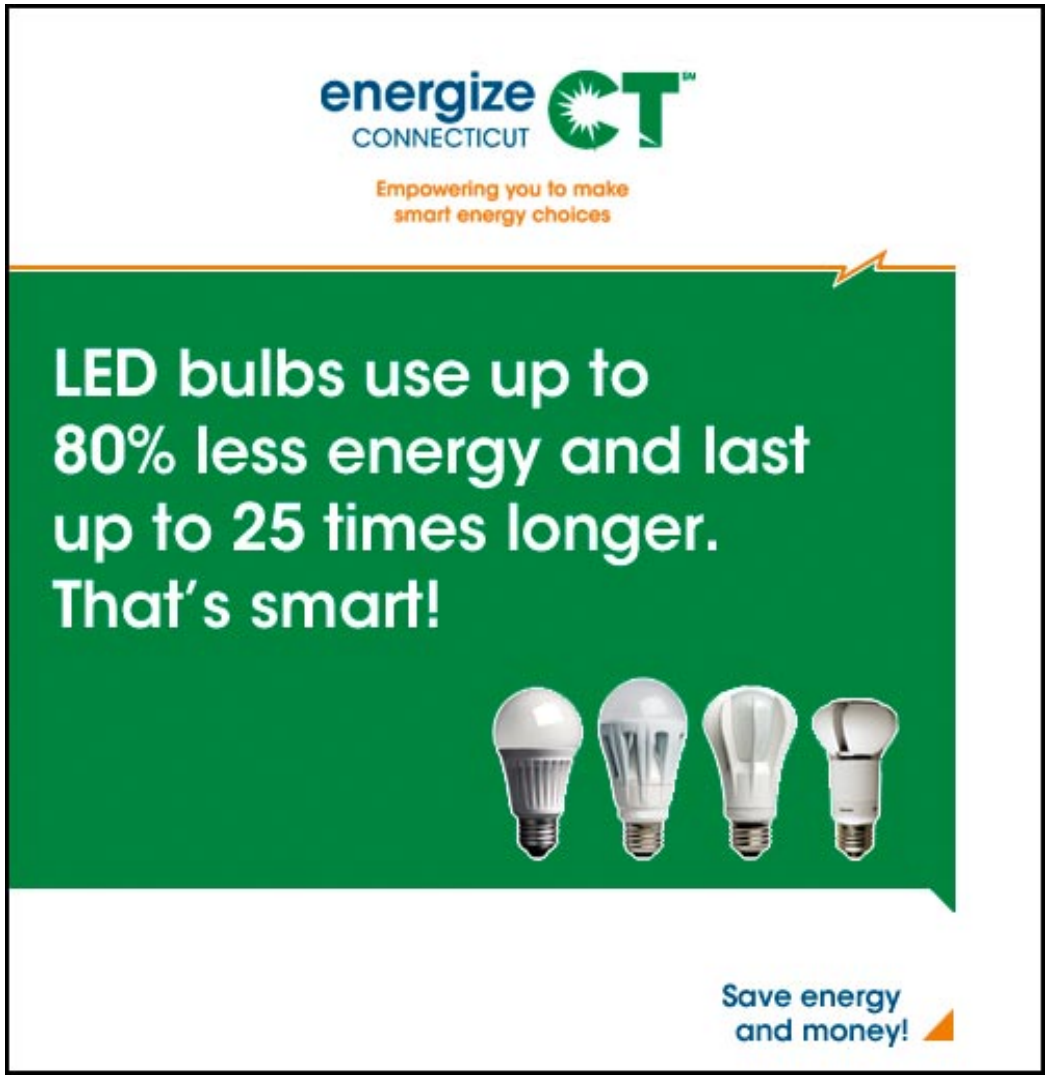
Seasonal Marketing Campaigns

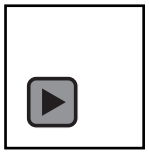
- Spring, summer and fall media campaigns (digital, media and print)
  - Benefits of energy efficient lighting
  - Focus on LEDs
  - Educate customers about proper bulb application, dimming and lighting terms such as lumens, color temperature, lifetime, lighting facts label, etc.
- Partnered with local TV station to produce educational lighting segment

Web Ads

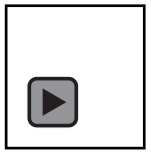

energize CONNECTICUT
Empowering you to make smart energy choices
LED bulbs use up to 80% less energy and last up to 25 times longer. That's smart!
Save energy and money!

Radio Spots

- Do the Math!



- I’m No Einstein!



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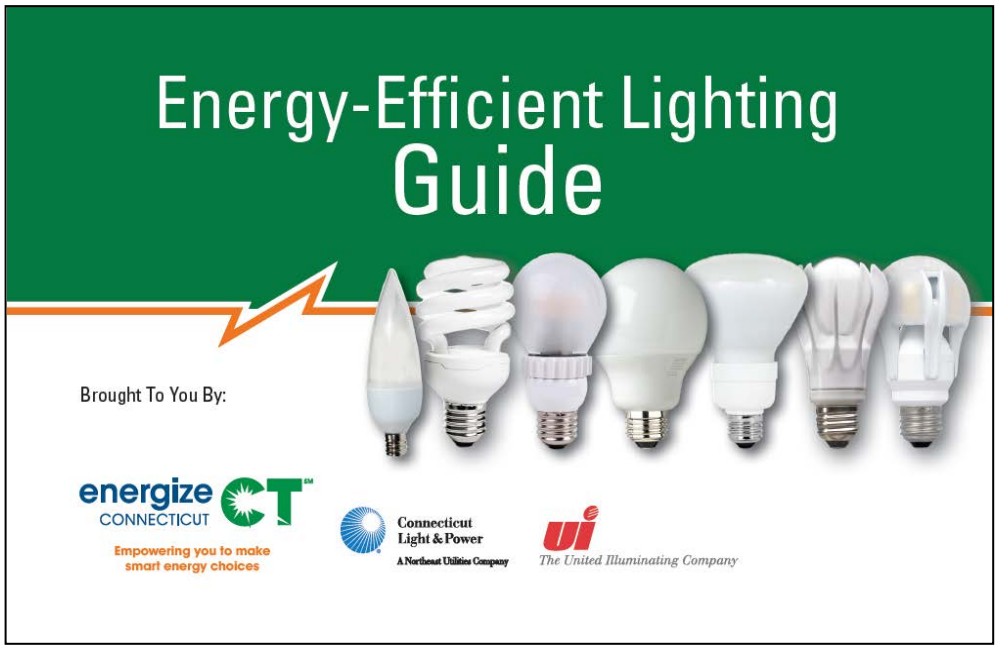
Retail Partnerships

- 30 retail partners with 600 storefronts
- Co-branded POP material
- In-store educational promotions
- Retailer-sponsored energy events
- Permanent end-caps
- Off-shelf product placement
- Retailer pocket guide



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Special Product Placement

energize CONNECTICUT℠

Engaging Hard to Reach Market

- Segmented Store Approach
  - Target hard-to-reach demographics which we defined as elderly, low-income, and bi-lingual
  - Increased number of discount retailers
  - Increased POP education during high traffic periods
  - Bi-lingual POP material

The Great Light Bulb Exchange

- Partnership between UI and municipalities to encourage residents to save energy and $ with LEDs
- Customers receive up to 2 free LEDs in exchange for incandescents

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The Great Light Bulb Exchange

- Big success!
- 5 events held at local retailers
- 1,815 households participated
- Nearly 3,700 incandescent bulbs exchanged for LEDs
- LED coupons given to customers

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energize CONNECTICUT

Empowering you to make smart energy choices

Thank You!

elizabeth.murphy@uinet.com
(203) 499-2843

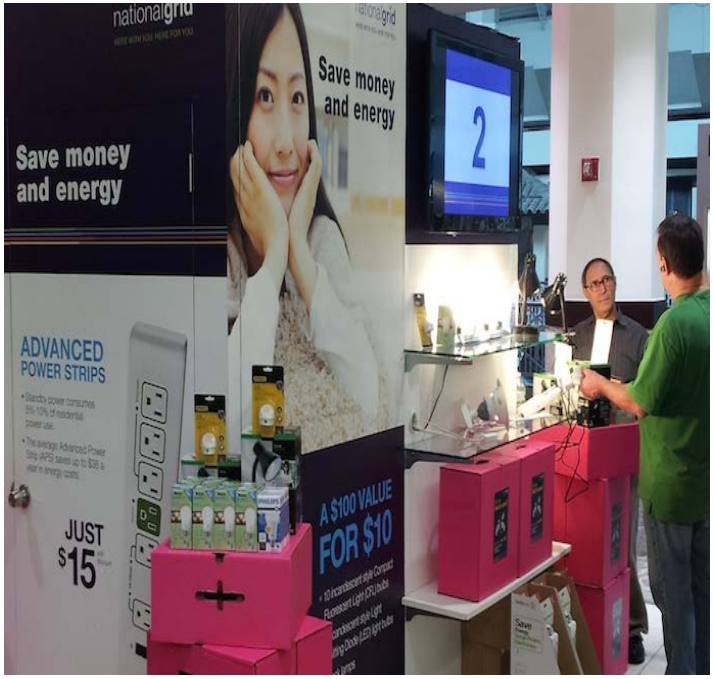
TECHNIART

ADAM TARDIF, PRESIDENT

POP-UP RETAIL

ONLINE PROMOTIONS

WHOLESALE DISTRIBUTION



WHO IS TECHNIART?

AT WORK. AT A FESTIVAL. AT THE MALL. AT THE COMPUTER. AT HOME. WE FIND YOUR CUSTOMER AND CONNECT THEM TO YOUR PROGRAM.

Founded in 1986, TechniArt has grown to a national pop-up retailer and wholesaler of energy-efficient products and services. We are passionate about meeting your customer in new locations like malls and office buildings, providing education about energy-efficient products and services, and driving the customer to action by creating a unique point of purchase opportunity. We generate behavior change. We're one of the original ENERGY STAR ® lighting partners. We rival big box retailers in sales of efficient lighting. We live and breathe the conversion rates. We transform the customer experience.

Oh, and we invented "Wake The Wizard" – so you know we' re going to have fun.

POP-UP RETAIL EVENTS

MALL TOURS, CORPORATE EVENTS, FAIRS, FESTIVALS & MORE

POP-UP RETAIL EVENTS

SUMMARY

- EVENT MARKETING MEETS BRICK & MORTAR STORE
- ENGAGE CUSTOMERS IN MALLS, OFFICE BUILDINGS, EVENTS & MORE
- INTERACTIVE DISPLAYS HELP CUSTOMERS EXPERIENCE PRODUCT
- SELL ENERGY-EFFICIENT PRODUCTS: LIGHTING, LIGHTING CONTROLS, WATER-SAVING PRODUCTS, ADVANCED POWER STRIPS, EFFICIENCY KITS & MORE
- TRAINED SALES STAFF EDUCATE CUSTOMERS ON PRODUCT FEATURES, BENEFITS, ENVIRONMENTAL IMPACT & INDUSTRY STANDARDS
- PROMOTE UTILITY BRAND & ADDITIONAL CONSERVATION PORTFOLIO PROGRAMS

FEEDBACK FROM 75,000+ CUSTOMER S

“THE BEST THING THAT HAPPENED TO LEDs…WAS CFLs” – ADAM TARDIF

- CUSTOMERS ARE PRIMED FOR LEDs AFTER YEARS OF MEDIOCRE TECHNOLOGY:

- POSITIVE FEEDBACK:
  - PERFORMANCE IS GREAT
  - LIGHT LEVELS ARE SATISFACTORY
  - NO DEFECTS (LESS THAN 0.05%)

- NEGATIVE FEEDBACK:
  - PRICE POINT IS HIGH
  - A19 FORM FACTOR CAN BE CONFUSING
  - NOT ENOUGH COLOR TEMPERATURE OPTIONS IN ALL FORM FACTORS
  - DIMMER COMPATIBILITY
  - “THE GARAGE DOOR EFFECT”

LEDs & SALES

- INCREASED TRAFFIC AT EVENTS
- INCREASED SALES PER CUSTOMER
- INCREASED TOTAL SALES

TECHNIART CLIENTS

A NATIONAL PERSPECTIVE

- NORTHEAST WAS FIRST TO UTILIZE TECHNIART POP-UP RETAIL IN UPSTREAM LIGHTING PROGRAMS (1998)
- CUSTOMERS IN THE NORTHEAST ARE JUST LIKE EVERYONE ELSE IN TERMS OF CFL ADOPTION, LED INTEREST & LED BUYING HABITS

GET IN TOUCH

ADAM TARDIF, PRESIDENT
ADAM@TECHNIART.COM
860.794.2112

DISCUSSION: ENERGY STAR LIGHTING ROADMAPPING EFFORT

Stakeholders re-activated the need for consumer lighting research in a road mapping discussion in Fall 2013.

The top points identified on furthering consumer research to inform the ENERGY STAR lighting program included:

- Selecting the right, more efficient lighting products.
- Working together to assist consumers
- Identifying the critical challenges facing consumers in making a lighting selection
- Most effective avenues and tools for addressing those challenges
- The stakeholders participating in this discussion group would focusing on funding and designing the research tasks and desired outcomes for the research project(s)

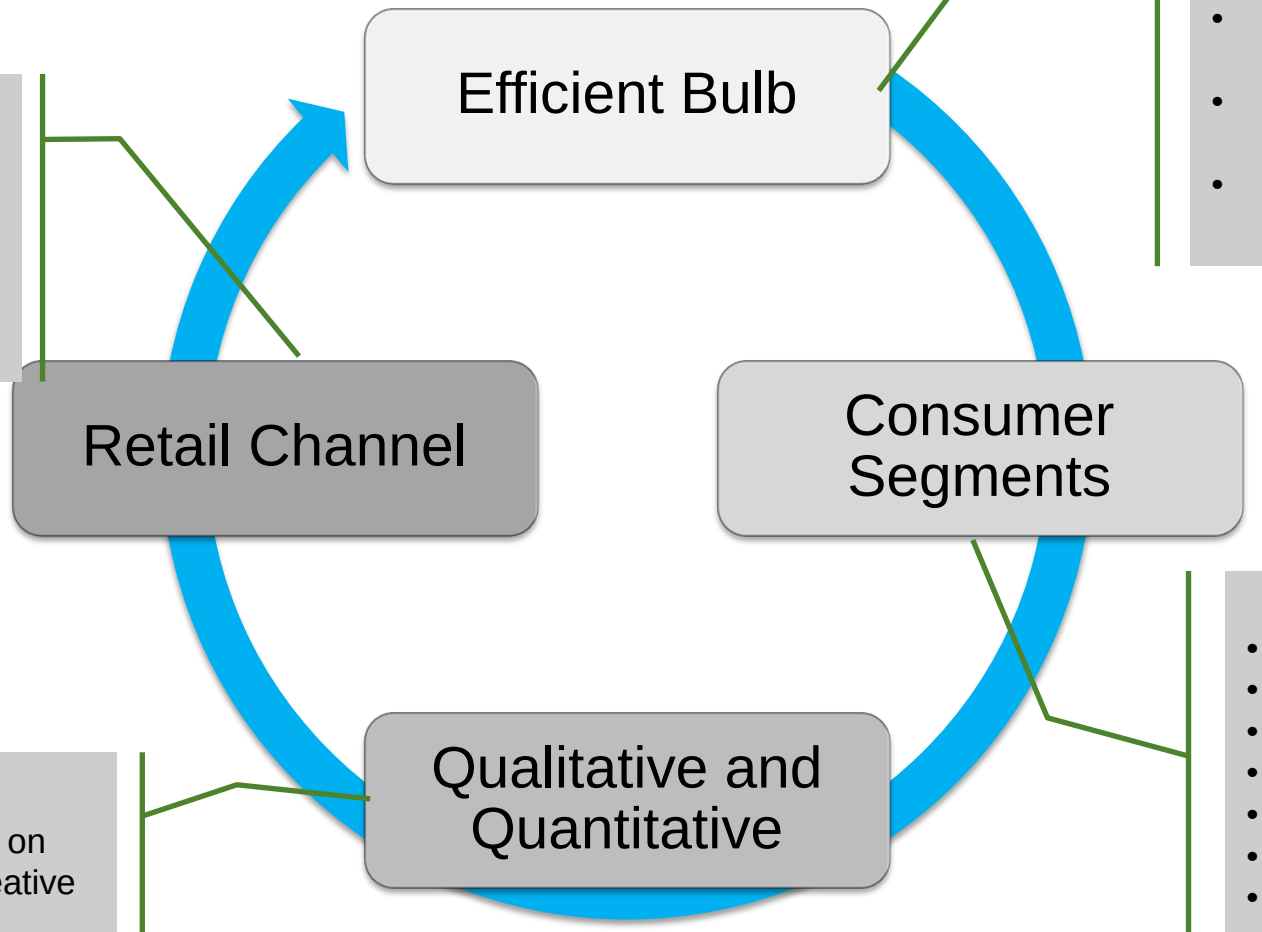
Objective – Help Consumers to Adopt Efficient Lighting

Strategy	Examples
Improved packaging and package messaging	Had GE redesign packaging to be visually cleaner and simpler
	Rebranded the lamps as "Energy Smart"
	Made "Saves $38 in energy" the primary message
Installed an in-shelf display in the lighting aisle	Showed 10 types of CFL and incandescent lamps side by side
	Incorporated messaging comparing lifetime costs and highlighting savings
Lowered the actual and perceived product price and promoted purchase of multipacks	Dropped the price of a 3-pack from $9.58 to $7.58, which decreased the per-bulb price from $3.19 to $2.52
	"Saves $38 in energy" made $7.58 seem even smaller in contrast
Placed CFLs in more prominent locations	Increased CFL shelf space by 40%
	Replaced a portion of incandescent product shelf space with CFLs
	Demoted incandescent lamps to lower shelves and placed CFLs at eye level and within easy reach
	Retained sections of lighting set previously devoted to CFLs
	Placed stack-outs in the grocery section of the store and periodically featured the product on the "Catch of the Season" wall at the front of the store
Increased advertising and PR	Advertised CFLs in weekly circulars
	GE ran a complementary print advertising campaign
	Campaign was covered in national newspaper and magazine stories

Figure 3 – Key Components of Walmart's 18 Seconds Campaign for CFLs (D&R 2012b)

NAVITAS PARTNERS

Research Approach I



- Technology: CFL or LED
- A-line, globe, or reflector
- Dimmable or non-dimmable
- Frequently used applications
- Common replacements

- Subset to bulb type
- Market size
- Income
- Urban or non-urban
- Age
- Lifestyle
- Social influencers
- Pricing

- Focus groups
- Internet survey on messaging, creative and hierarchy
- Images
- Go to market

- Product accessibility
- Pricing
- Merchandising
- Demo displays
- Trial products

NAVITAS PARTNERS

Research Approach II

- Hypothesis is what can we learn from adopters to apply to non-adopters?
  - Focus groups or mine customer reviews
  - Screen for income levels, urban/rural, male/female, age
  - Inquiry/interview and then test with some messaging/creatives

NAVITAS PARTNERS

Research Approach III

What We Know on Consumer Psychology

- Default condition
- Whatever is readily at hand
- What we see others do
- Recommendations from similar people
- Limited time / supply
- Prompts, reminders
- Choice overload
- Prompts, reminders

Collaborate and Channel Research into Go-to-Market Tactics/Tests

- Trial (free or low-cost) LEDs
- Special limited time deals
- Efficient lighting demo displays
- Get better placement of efficient lighting in stores – standout, eye-level, impulse buy
- Seasonally focus on one bulb, one application marketing push
- Get more social proof showcases into the market – blogs, customer reviews/star ratings, social media sweepstakes, celebrity sponsor

NAVITAS PARTNERS

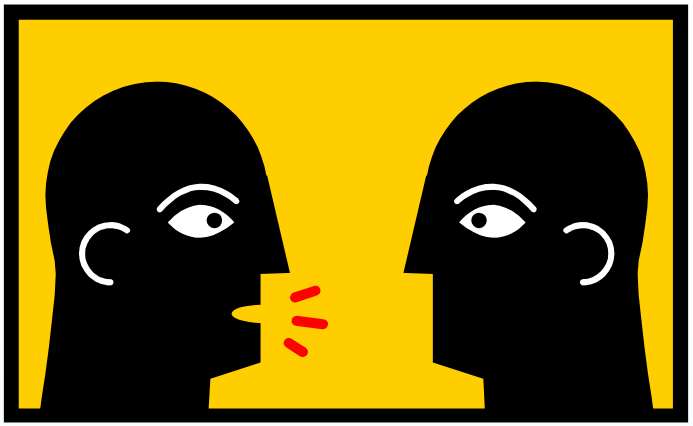
Hypotheses

- Open forum to hypothesize LED bulb type-consumer segment-retail channel
- Insights on adopters vs non-adopters
- Collaborate and develop opportunities for merchandising, product demo displays, and trial products

NAVITAS PARTNERS

DISCUSSION

- What has really worked?
- How to balance education and sales?
- How can we make the most of the Roadmapping or other efforts?



1:50-2:05 BREAK

Northeast Energy Efficiency Partnerships

Impact of New Specifications on Lighting Programs

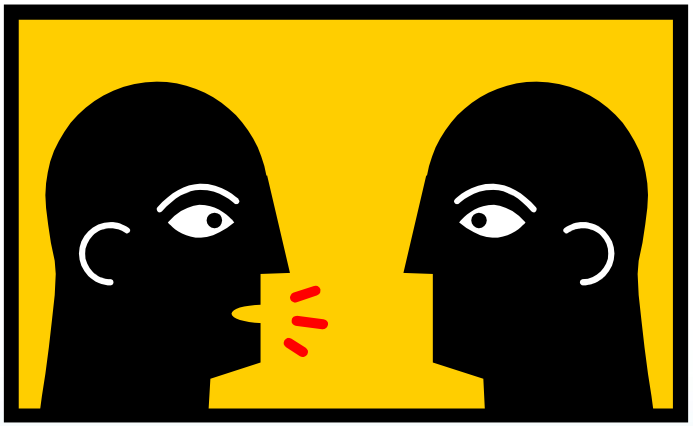
Claire Miziolek, NEEP

2014 Northeast Residential Lighting Workshop

Tuesday, October 7th 2014 2:05pm

AGENDA

- ENERGY STAR Specification
- CA LED Specification
- CEE Replacement Lamp Specification
- Discussion of impact



ENERGY STAR SPECIFICATION

- **ENERGY STAR Lamps version 1.0 (Effective 9/30/2014)**
  - 9/30, 9am: 6370 CFLs, 5130 LEDs
  - 9/30, 2pm: 585 CFLs, 1729 LEDs
  - Tightened loophole around globes passing as a-lamps
  - Addition of the GU10 base and reference to the new ANSI standard for an outline for a PAR16 with a GU10 base.
  - This update now provides a pathway for line voltage MR16 lamps with GU10 bases to earn the ENERGY STAR.
  - The center beam calculator was updated so it may be used to provide benchmark performance for replacement claims for these lamps.
  - Addition of a new MRX16 lamp type and shape specific to LED lamps.

ENERGY STAR SPECIFICATION

- ANSI just completed a new standard which includes a new outline for a taller LED lamp called the MRX16. This lamp type is now eligible to earn the ENERGY STAR.
- Test data may be shared amongst PAR30 lamps with variable neck lengths, i.e. a PAR30 long neck may now share test data as a variation of an otherwise identical short-neck PAR30 lamp.
- Clarification that the globe and decorative categories cannot be used as a certification pathway for general purpose lamps that don't meet the omnidirectional requirements, and outlines globe lamp shape requirements more specifically.

CALIFORNIA QUALITY LED LAMP SPECIFICATION

- Largely mirrors ENERGY STAR, but requires 90+ CRI and only allows 2,700K and 3,000K
- The implementation has been quite successful, regulators are happy, positive feedback
- Have over 45 products now, many manufacturers are coming on board
- List currently isn't public, but would like to have national impact
- Efficacies are improving, the prices are going down
- Spec not perfect, but many products are meeting it it

CEE Replacement Lamp Specification

- Intended to support program promotion of top performing ENERGY STAR lamps to enable greater energy savings through **BOTH** increased efficiency and market share
- A DRAFT proposal was shared with industry stakeholders on April 21, 2014
- Anticipated effective date January 2015, ***pending CEE Board approval***

Key Elements of CEE Replacement Lamp Specification

- Scope is limited to integral replacement lamps sold at retail
- The specification is technology neutral
- ENERGY STAR qualification is the baseline requirement
- CEE will not be performing verification testing and is employing metrics already being tested and reported to ENERGY STAR

Key Elements of CEE Replacement Lamp Specification, Continued

- There are different requirements by application types: omnidirectional, directional, and decorative lamps
- CEE is employing a tiered approach, which
  - Accommodates varying market conditions and program needs
  - Enables programs to encourage manufacturers with different incentive levels
  - Provides manufacturers with greater flexibility in product development decisions and enhanced ability to participate in programs

DRAFT CEE Lamp Specification Shared with Industry

All replacements must first meet the ENERGY STAR Lamp Criteria Version 1.1

	Efficacy	CCT	CRI	PF	Warranty	Dimmable
CEE Tier 1						
Omnidirectional	65	2700-5000	80	0.7	3	No
Directional	52	2700-5000	80	0.7	3	No
Decorative	52	2700-5000	80	0.7	3	No
CEE Tier 2						
Omnidirectional	70	2700-5000	83	0.7	5	Yes
Directional	65	2700-5000	83	0.7	5	Yes
Decorative	62	2700-5000	83	0.7	5	Yes
CEE Tier 3						
Omnidirectional	70	2700-5000	90	0.9	5	Yes
Directional	65	2700-5000	90	0.9	5	Yes
Decorative	62	2700-5000	90	0.9	5	Yes

Contact Information

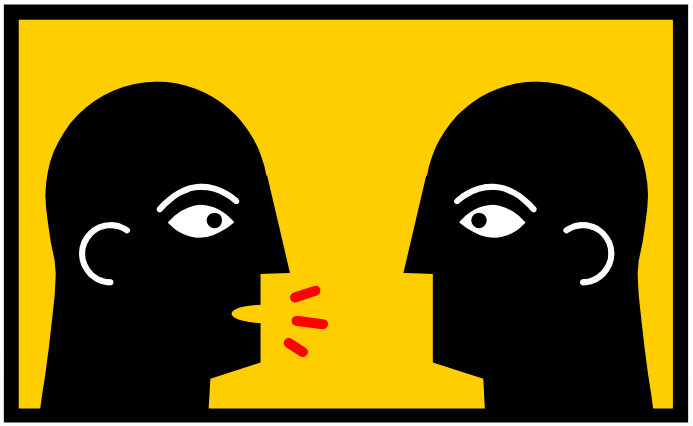
Eileen Eaton
Program Manager
(617) 337-9263
eeaton@cee1.org

ANOTHER LEVEL

- CRI Drama:
  - IES published recommendations to stop using CRI
  - LRC as resource for more information (contact during the tour)

DISCUSSION

- Who is planning to adopt the CEE spec?
- What implications might the CA activities have on our programs or for manufacturers?
- How will the anti-CRI issues come to play?



Thank you!

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Have a great day!

Northeast Energy Efficiency Partnerships

Wrap Up, Next Steps, Short Takes

David Lis, NEEP

2014 Northeast Residential Lighting Workshop

Tuesday, October 7th 2014 2:50pm

Next Steps

- 2014-2015 Update to the Residential Lighting Strategy: Coming Very Soon!
  - Incorporating feedback from stakeholders and workshop content and discussion
  - Taking volunteers for reviewers
- Presentations will be available at www.neep.org
- ENERGY STAR Partner's Meeting, October 27-29
- Public webinar upon publication of RLS Update
  - (look out for invitation)

THANK YOU TO THE RESIDENTIAL LIGHTING LEADERSHIP ADVISORY COMMITTEE

- ACEEE
- Apex Analytics
- CLEAResult
- Connecticut Light & Power
- Cree
- DC Sustainable Energy Utility
- Efficiency Vermont
- Energy Futures Group
- GE
- Globe Electric
- The Home Depot
- ICF International
- Lockheed Martin
- Lowes
- Lutron Electronics
- MASS Save Program Administrators
- OSRAM Sylvania
- NMR Group
- Northeast Utilities
- NYSERDA
- Philips
- PSEG-Long Island
- Samsung
- United Illuminating
- US EPA/ENERGY STAR
- TechniArt

FOR YOUR CONTINUED EFFORTS TO FORWARD EFFICIENT LIGHTING IN THE NORTHEAST

TOUR OF LIGHTING RESEARCH CENTER

How can we best use this regional resource?

Split into 2 groups, can leave belongings in the room