



Northeast Energy Efficiency Partnerships

# Shedding Light on Market Transformation: What Happens When CFL Programs Go LED?

Elizabeth Murphy, The United Illuminating Company

Mananya Chansanchai, Pacific Gas and Electric Company

Rob Carmichael, Cadeo Group

Moderated by Claire Miziolek, NEEP

ACEEE Market Transformation Symposium

Tuesday, April 21<sup>st</sup>, 3:30-5:00pm

# TODAY

- How the lighting market is transforming
- What approaches different regions are taking
- How we are transitioning from



to



# ABOUT NEEP

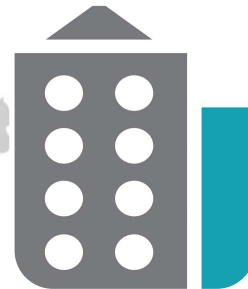
## MISSION

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



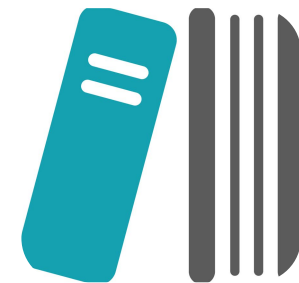
Reduce Building Energy Use



Speed High Efficiency Products



Make Efficiency Visible



Advance Knowledge - Best Practices

*Regional energy efficiency collaborations since 1996*

# NORTHEAST RESIDENTIAL LIGHTING STRATEGY



Northeast Residential Lighting Strategy:  
2014-2015 Update

Northeast Energy Efficiency Partnerships  
December 2014

# www.neep.org



The screenshot shows the website's interface. At the top, a browser address bar displays 'www.neep.org'. Below it is a dark navigation bar with links for 'Content', 'Structure', 'Appearance', 'People', 'Modules', 'Configuration', 'Reports', and 'Help'. On the right side of this bar are links for 'Blog', 'Calendar', 'Private Portal', 'Subscribe', and social media icons for Twitter, Facebook, and LinkedIn. The main navigation menu includes 'ABOUT NEEP', 'INITIATIVES', 'EVENTS', 'NEWS', 'NETWORK', and 'RESOURCES', with 'RESOURCES' highlighted by a teal circle. A search bar is located to the right of the navigation menu. The main content area features the NEEP logo and the text 'Northeast Energy Efficiency Partnerships'. A large banner image with a bokeh light background contains the text 'Developing strategies and guidance for the region' and a yellow 'Learn More >>' button with left and right navigation arrows.





# A MARKET IN TRANSITION



Once upon a time...

- Fluorescents reigned supreme in the kingdom of efficient lighting products...
- While flawed, the humble CFL overcame many hurdles to become a much loved measure for efficiency programs.
- But then, the strong and powerful LED entered the fray...



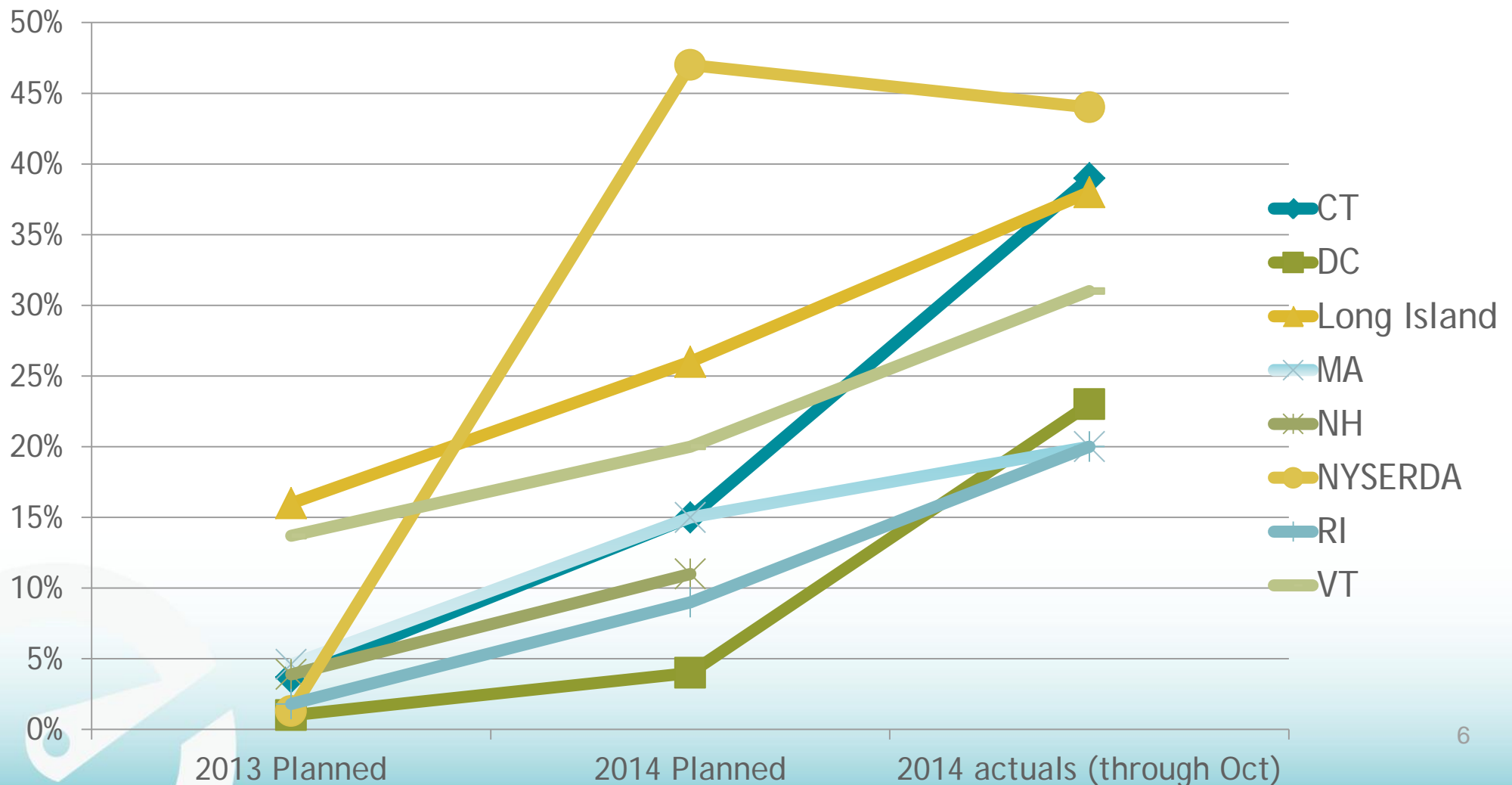
The story  
continues...

# IN THE NORTHEAST



- Programs have aggressive levels of residential lighting promotion
- Shifting rapidly from CFLs to LEDs

LED Percentage of portfolio



# MOVING PIECES: LIGHTING SPECIFICATIONS



- DesignLights Consortium (DLC)
- ENERGY STAR Lamps
  - Updates on Lamps 2.0, Draft 2
- ENERGY STAR Luminaires
  - Updates on Luminaires 2.0, Draft 2
- CEE Tiers



Performance Level	Total # of Lamps	Omni-Directional	Directional	Decorative
Tier 1	2,827	485	2,145	197
Tier 2	1,040	312	658	70
Tier 3	232	8	224	0



# TODAY'S SPEAKERS



Mananya Chansanchai

- Supervisor - Energy Efficiency Core Products

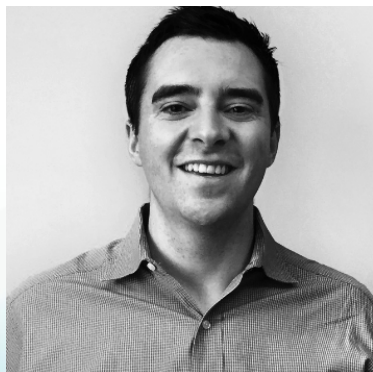


Elizabeth Murphy

- Senior Program Administrator



UIL HOLDINGS CORPORATION



Rob Carmichael

- Founder and Principal



*What products and market channels  
are you seeing transition from  
fluorescent to LED?*



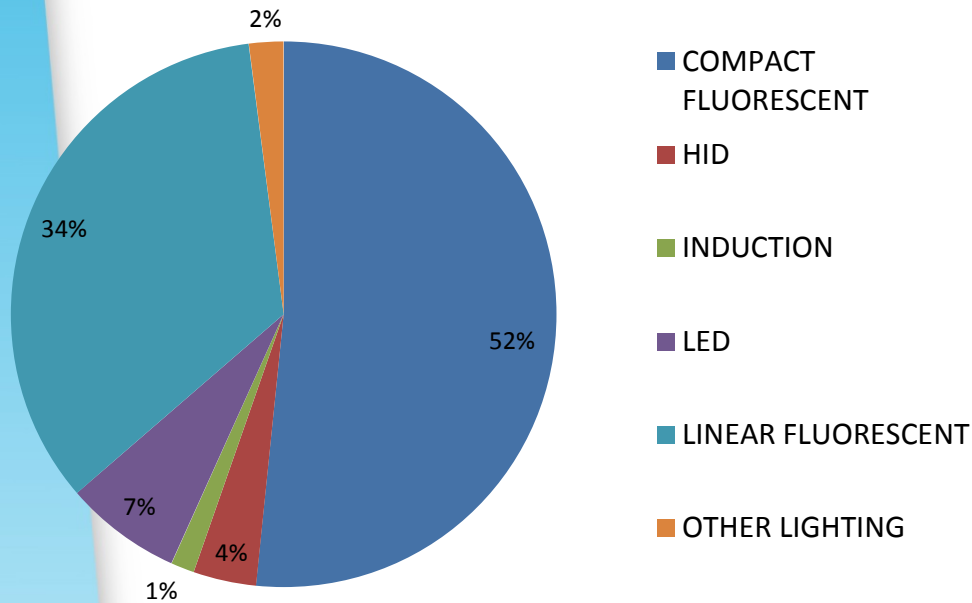
# TRANSITION FROM FLUORESCENT TO LED LIGHTING



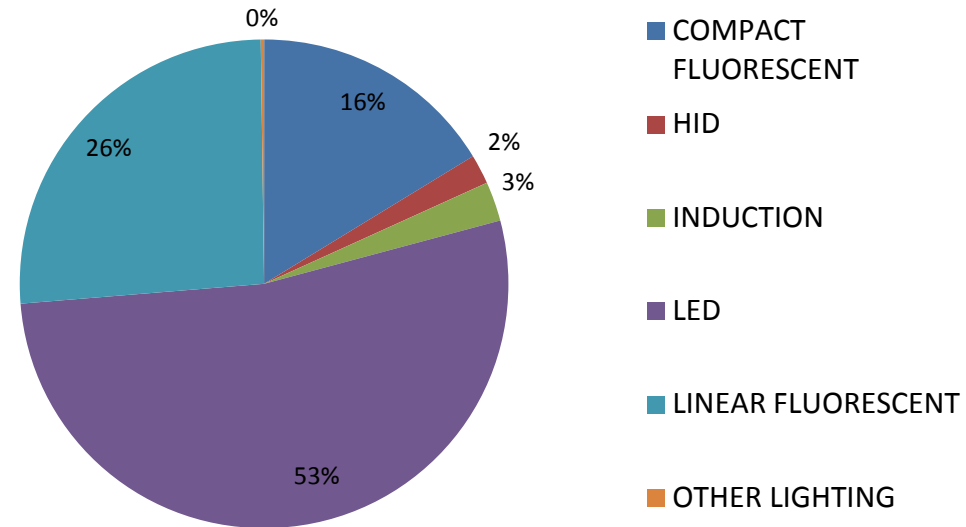
Together, Building  
a Better California

# PG&E Lighting Portfolio Transitioning to LED

## 2010 - 2012 Lighting Savings (kWh)



## 2013 – Apr 2015 Lighting Savings (kWh)

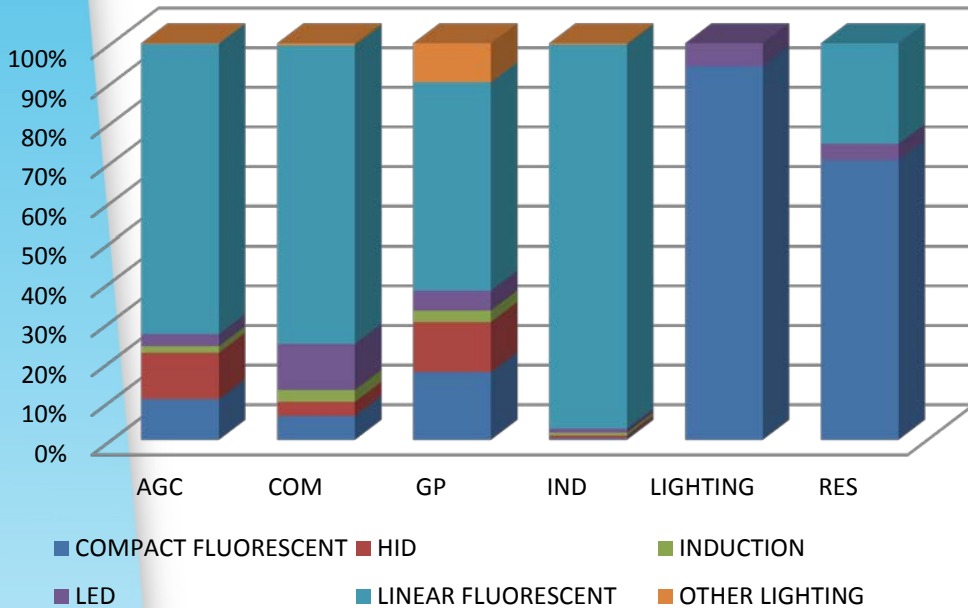


**% of Portfolio kWh Savings from Lighting Drops from ~52% in 2010-2012 cycle to ~33% currently**

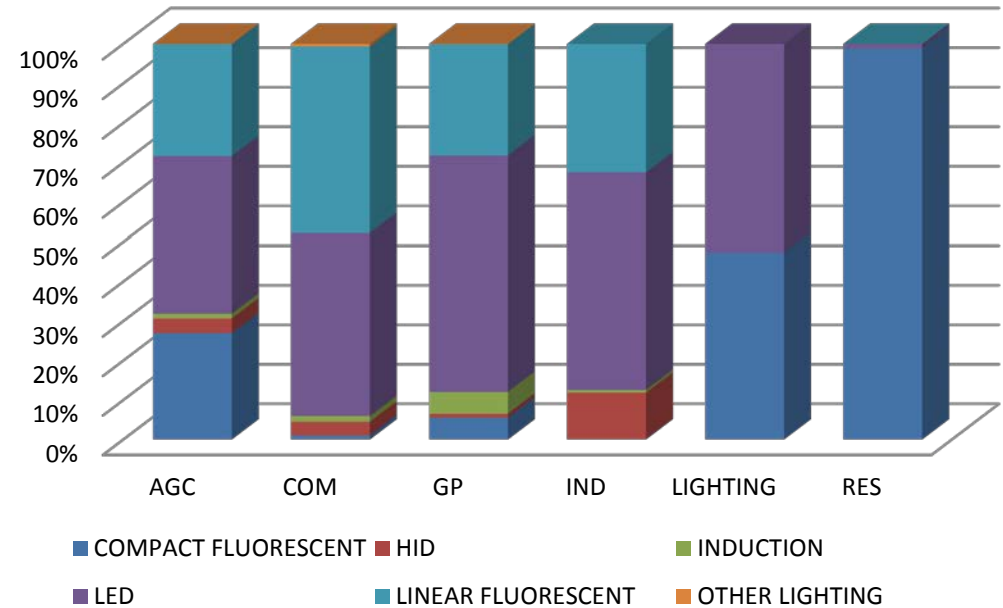
**Successfully transitioning lighting portfolio mix from fluorescent to LED**

# LED Savings Penetration Across All Market Segments

## 2010-2012 Lighting Savings (kWh) Across Programs



## 2013-Apr 2015 Lighting Savings (kWh) Across Programs



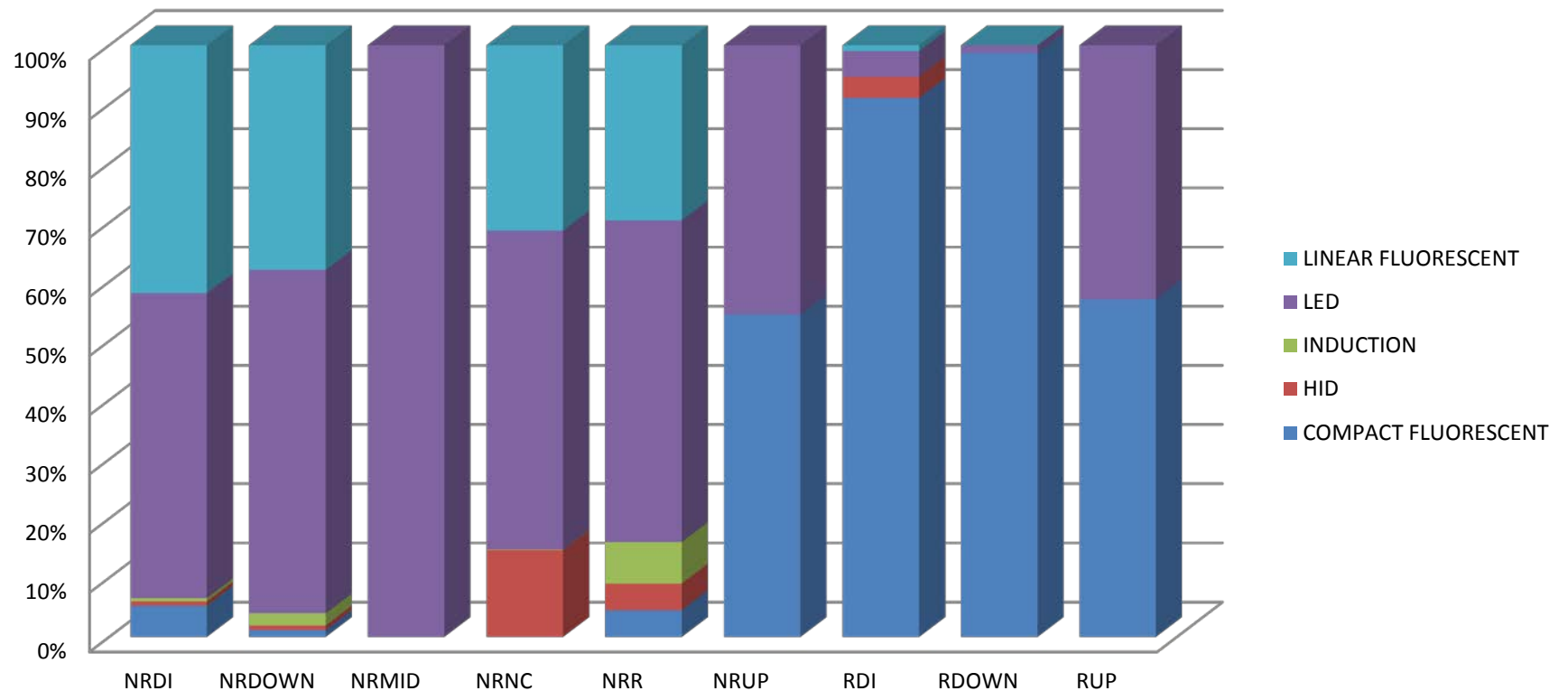
**With increased LED penetration, even distribution across programs**

**With increased code baseline, LEDs provide greater incremental savings potential**



# LED Penetration Across Delivery Channels

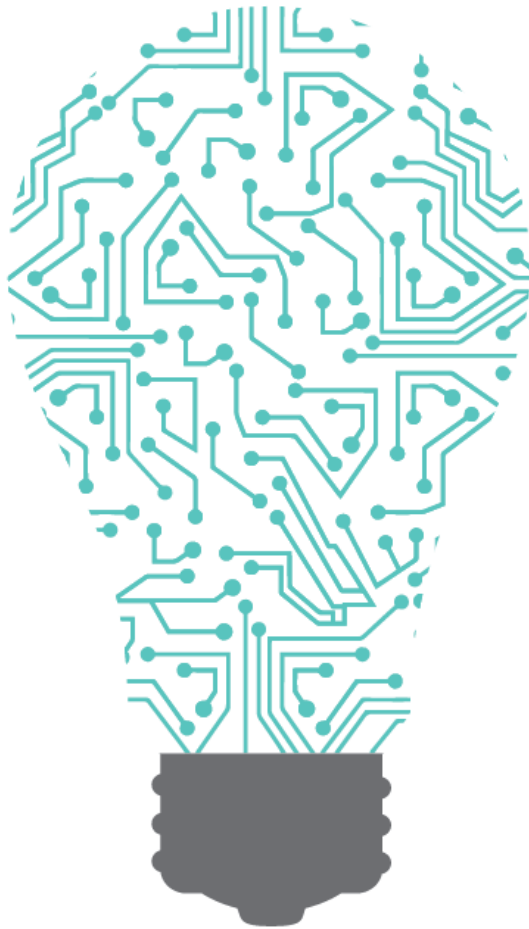
## 2013 - Apr 2015 Lighting Savings (kWh) by Delivery Type



**83% of Non-Residential LED Savings Delivered through Downstream, Direct Install or Custom Retrofit**

**99% of Residential LED Savings (~35 GWh) Delivered through Upstream Channel via Lighting Program**

# BPA Lighting Market Characterization 2014-2015



- Interviews
- Sales data collection
- LED sales prices
- Regional lighting program data
- Retail shelf survey data
- National data sources



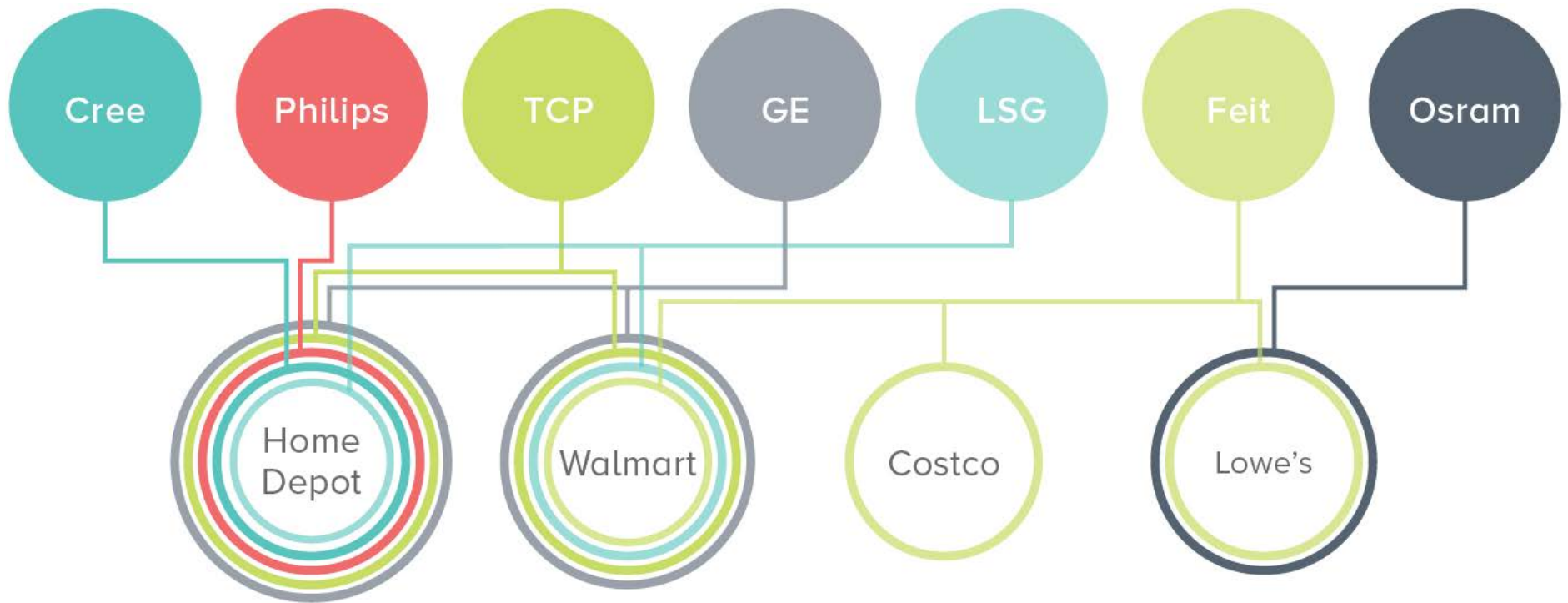
LED Manufacturer

# COMMERCIAL MARKET CHANNELS

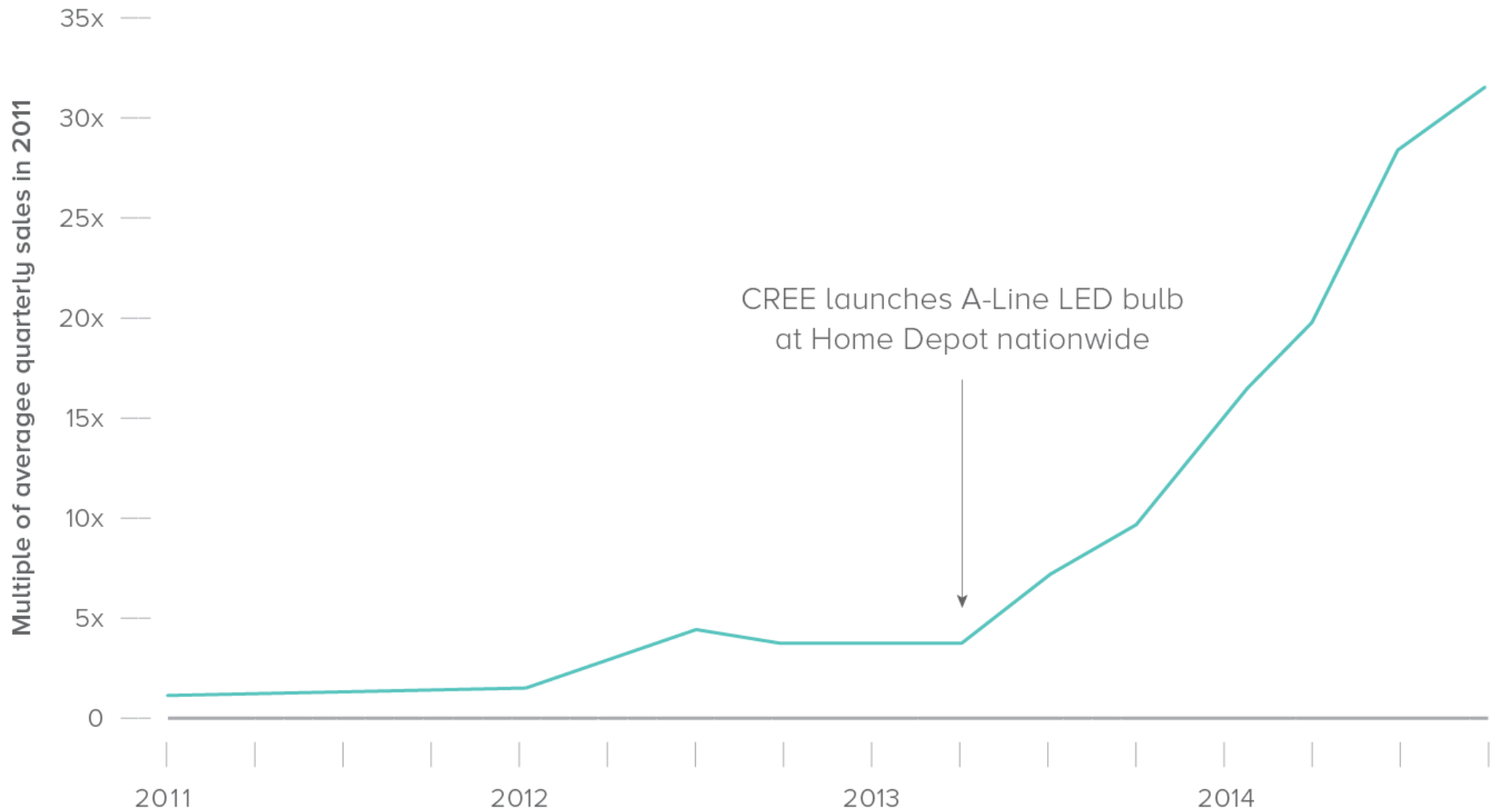


# RESIDENTIAL MARKET

Supply relationships for 60W A-Line LED



# THE POWER OF RETAIL





# CONNECTICUT'S RESIDENTIAL LIGHTING MARKET



- Lighting accounts for more than half of residential energy efficiency portfolio
- 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
  - Retailers seeking less support for CFLs
  - Increased stocking of LEDs in DIY and independent retail channels



# CONNECTICUT'S RESIDENTIAL LIGHTING MARKET

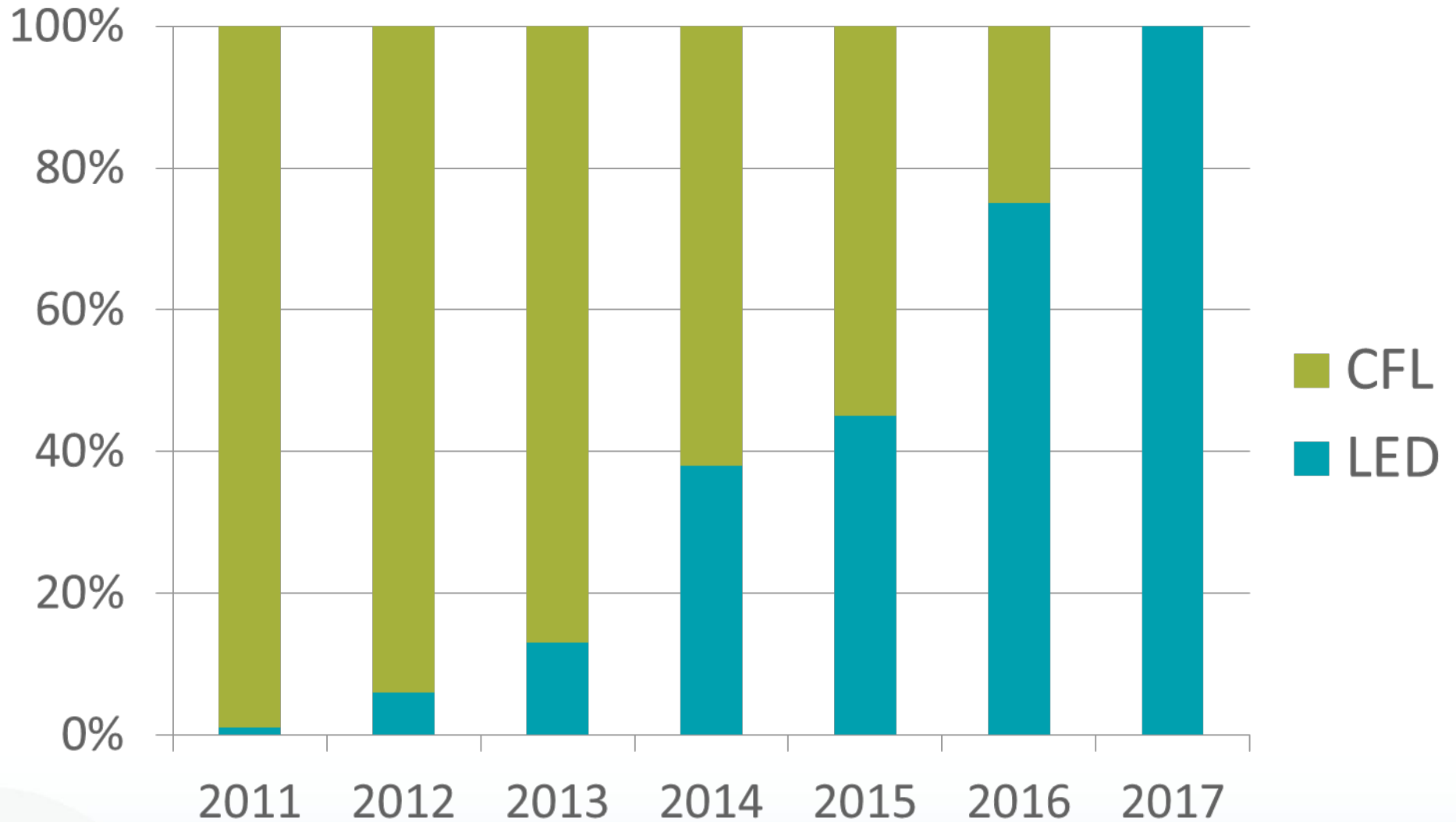


- Regulatory direction to increase promotion of LEDs, better educate customers and target market segments unlikely to invest in energy efficient lighting
- Increased marketing budgets
- In 2014, supported more than 1.5 million LEDs through retail program

# CONNECTICUT'S RETAIL LIGHTING



## MIX



# 2014-2015 PROGRAM TRENDS

- Target hard-to-reach market segments
  - Low-income, elderly, and bilingual
- Discontinue support for specialty CFLs
  - Target LED replacement in decorative lighting and high-wattage sockets
- Introduce LEDs to low-income direct install program
- Exploring transitioning to all LED direct install programs in 2016

## *The Lighting Customer:*

*What do we know about them and what have we tried on them?*

*What are you doing differently to encourage efficient purchases now that LEDs are in the mix?*





# WHAT WE KNOW ABOUT OUR CUSTOMERS



- Customers just want to buy a light bulb
  - The lighting aisle is confusing
  - Education is still important
  - Simple messaging is most effective

# MARKETING STRATEGY

- Educate consumers and create awareness of energy-efficient lighting
  - Seasonal digital, media and print campaigns
    - Energy and financial benefits of LEDs
    - Education about proper bulb application, dimming and lighting terms such as lumens, color temperature, lifetime, lighting facts label, etc.
  - Partner with local TV station to produce educational lighting segment
  - Retailer pocket guide

# MARKETING STRATEGY

I'm No Einstein!



The advertisement features the Energize Connecticut logo at the top, with the tagline "Empowering you to make smart energy choices". Below this is a green speech bubble containing the text: "LED bulbs use up to 80% less energy and last up to 25 times longer. That's smart!". At the bottom of the speech bubble are four different styles of LED light bulbs. In the bottom right corner of the advertisement, it says "Save energy and money!" with a small orange triangle.

# ENGAGING “HARD-TO-REACH” MARKET



- Target hard-to-reach market segments
  - Low-income, elderly, bilingual
- Segmented Store Approach
  - Increased number of discount retailers
  - Increased point-of-purchase (POP) education during high traffic periods
  - Bilingual POP material

# ADVANCED LED MARKET RESEARCH



Together, Building  
a Better California



# So Many Choices...Not Enough Information



## Customers face a crowded and confusing assortment of products

- Soon, familiar and inexpensive bulbs (incandescent) will no longer be an option
- Residential customers aren't used to making thoughtful decisions about light bulbs
- Many new choices don't look like "old-style" bulbs



# Researching the LED Customer

## Goals

Educate on Benefits

Advanced LEDs = Quality + Efficient + Discounted

Leverage PG&E Instant Rebate

Packaged Assets for Other Utilities

### Phase 1

- Focus Groups
- Messaging, Features & Benefits
- Gather current knowledge



### Phase 2

- In-home Ethnographies
- Uncover purchase drivers & functional /emotional connections



### Phase 3

- Creative Development
- Drive purchase of Advanced LEDs

# Qualitative Focus Group Research Findings



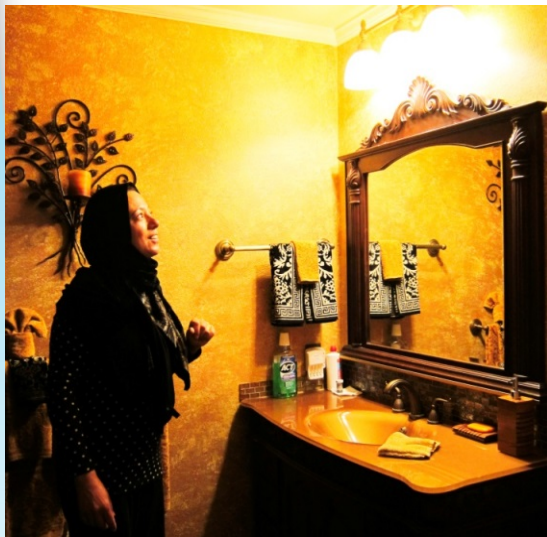
- Gathered current knowledge regarding customer bulb experience & purchase habits
- Developed descriptive category name and articulated key benefits for creative

- Customers often do not have the words to talk about lighting
- Most powerful purchase drivers: **price, light quality and energy efficiency** (i.e. savings / performance / value)
- Marketing must quickly and clearly communicate customer benefits



# In-Home Ethnographies

## Overall Clarity



“It is so much brighter  
You can see everything!”

## Close Up Precision



“Overall, things are just  
sharper.”

## Natural Skin Tone



“Like Sunlight through the  
window”

# Advanced LED Retail Marketing



The right light for living.



Look for this sticker for instant savings.



[pge.com/advancedled](http://pge.com/advancedled)



Reduced price brought to you by PG&E.



Purchase limit: 20 units

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**Key Messaging:**  
Light you can LIVE with

**Campaign:** The Right Light for Living

**Advanced LED Emblem:**

- Symbol to identify Advanced LED products across manufacturers,
- Provide attribution to PG&E, and
- |



**Instant rebate on Advanced LED light bulbs**

Choose Advanced LED lighting to enjoy great savings and better light quality. Advanced LEDs help you save by:

- Reducing your monthly energy bill
- Lasting up to 20 years or more
- Using 75% less energy

Visit [pge.com/advancedled](http://pge.com/advancedled) for a store near you.

Purchase limit: 20 units. For more information on rebates, visit [pge.com/rebates](http://pge.com/rebates). "PG&E" refers to Pacific Gas and Electric Company, a subsidiary of PG&E Corporation. ©2014 Pacific Gas and Electric Company. All rights reserved. These offerings are funded by California utility customers and administered by PG&E under the auspices of the California Public Utilities Commission. PG&E prints its materials with soy-based ink & an recycled paper. Q

Look for this emblem and save at checkout with an instant rebate from PG&E. Visit [pge.com/advancedled](http://pge.com/advancedled) for a store near you.



# Advanced LED Messaging

## Key Findings from 2014 Customer Research Studies\*:

- Strong product acceptance of advanced LED after use
- *“The right light for living”* powerfully engenders very positive emotions and imagery
- “Advanced LED” Communicates a sufficient level of modernity without over-stating and raising undesired miscommunication



\* Research conducted by Talley Research Group




# Advanced LED Co-Marketing


The right light for living.

Save money and energy in your home with Advanced LED lighting.



- Uses 75% less energy
- Superior quality of light
- Produces bright, natural light and enhances colors
- Better for the environment




Look for this sticker and save.

**CREE**  | **LED BULB**

SHOWS COLORS  
TRUE AND NATURAL™  
— TW SERIES —

**A19 8.5W (40W)  
TW SERIES SOFT WHITE**  
BOMBILLA A19 DE LUZ BLANCA SUAVE SERIE TW, 8.5W (40W)  
SKU 1000-022-804




**\$9<sup>97</sup>**

EACH

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**A19 13.5W (60W)  
TW SERIES SOFT WHITE**  
BOMBILLA A19 DE LUZ BLANCA SUAVE SERIE TW, 13.5W (60W)  
SKU 1000-022-805




**\$9<sup>97</sup>**

EACH

---

**4" RECESSED DOWNLIGHT  
11.5W (65W) TW SERIES  
SOFT WHITE**  
4" LUZ DESCENDENTE EMPOTRADA BLANCO SUAVE SERIE TW, 11.5W (65W)  
SKU 1000-053-525




**\$19<sup>97</sup>**

EACH

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**6" RECESSED DOWNLIGHT  
12.5W (65W) TW SERIES  
SOFT WHITE**  
6" LUZ DESCENDENTE EMPOTRADA BLANCO SUAVE SERIE TW, 12.5W (65W)  
SKU 1000-053-515 / 1000-024-002



**\$19<sup>97</sup>**

EACH

Reduced price made possible by PG&E.

**More saving. More doing.** 

## Home Depot End Cap Display – CREE – PG&E



Product Sticker: Feit and PG&E featured in ACE Hardware stores

The right light for living.

Save money and energy in your home with Advanced LED lighting.

- Uses 75% less energy
- Superior quality of light
- Produces bright, natural light and enhances colors
- Better for the environment

Reduced price made possible by





**LED 65W REPLACEMENT**



DEEP DISCOUNT DIMMABLE SHATTERPROOF RESISTANT 25,000H FLOODLIGHT SOFT WHITE



Case Display: Greenlite and PG&E – featured in ACE Hardware stores



# Status of Advanced LED promotions

- Promotions ongoing
- Created a shared language internally and externally to describe lamp category
- Modular, highly leverage-able materials for any utility looking to promote Advanced LEDs within and outside California
  - Aligns with LEDs that meet CEE Tier 2 & 3 Lamp Spec



LM-79 In-Situ Temperature Measurement Test  
LM-80 Junction Temperature Lumen  
Maintenance Downward Delivered Lumens  
Color Corrected Efficiency Lumen  
Depreciation TM-21 Lifetime Wattage  
Equivalent Optical Efficiency Temperature  
Color Rendering Index Voltage Watts Power  
Factor Source Efficiency Thermal  
Efficiency System Efficiency Useful  
Life Lumens per Watt



LM-79 In-Situ Temperature Measurement Test

LM-80 Junction Temperature Lumen

Maintenance Downward Delivered Lumens

Color Corrected Efficiency Lumen

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Equivalent Optical Efficiency Temperature

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Life Lumens per Watt

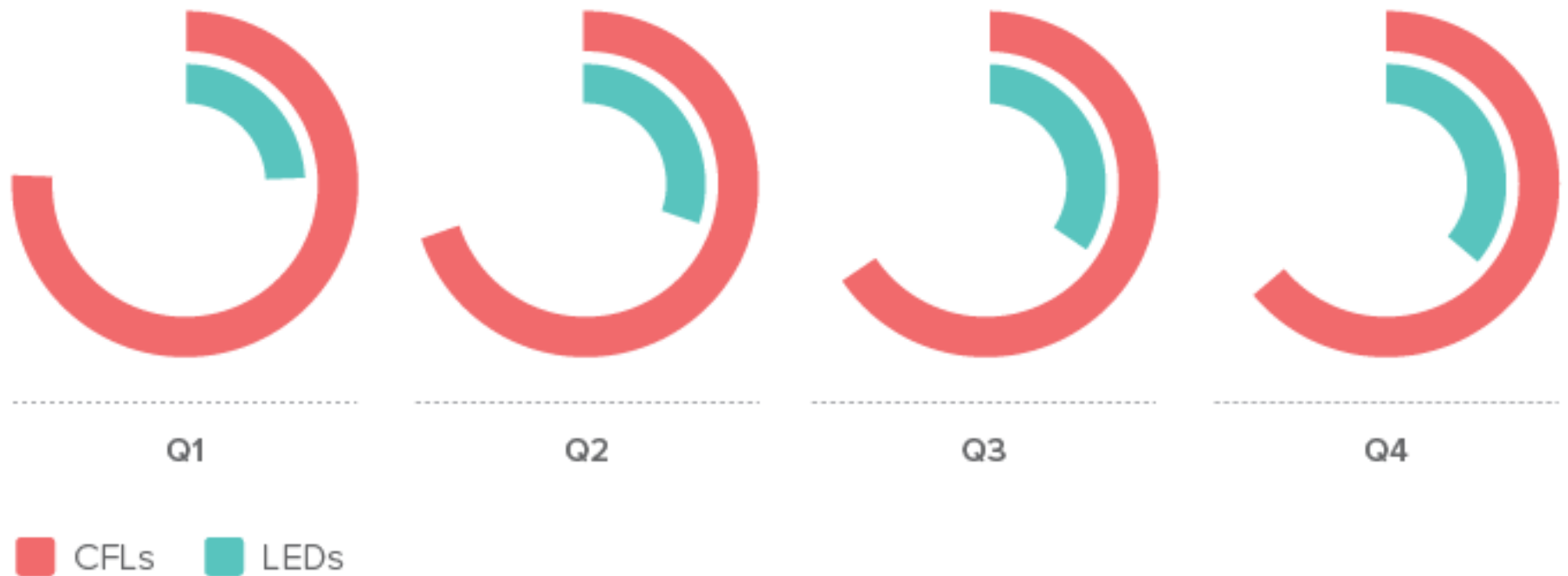
# KEEP IT

# SIMPLE.

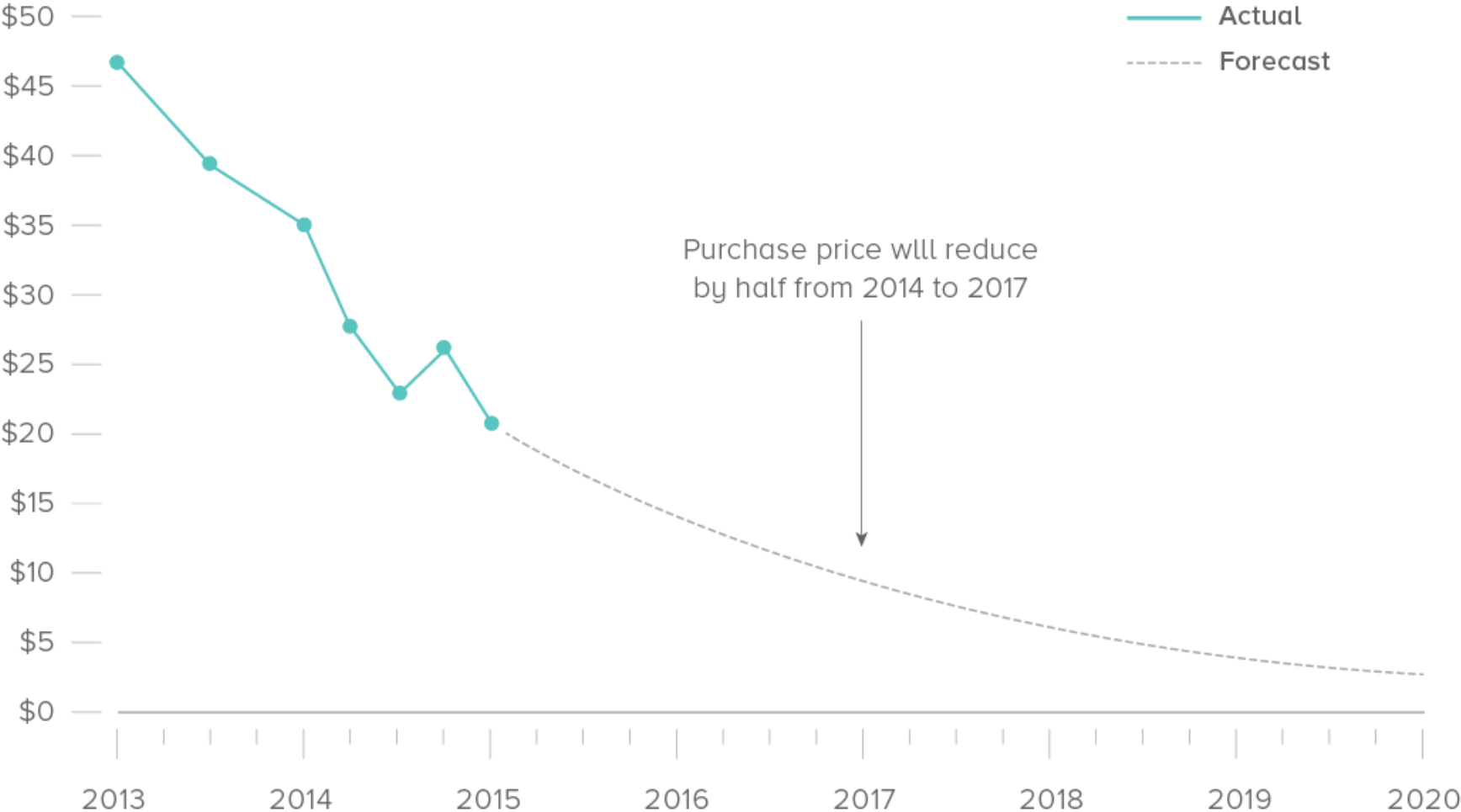


# CFLs vs LEDs

CFL and LED Retail Sales Mix in the Northwest in 2014



# TLEDs ARE TAKING OFF



*Within these changes, tell us a tale of  
a specific (and maybe unexpected)  
outcome?*

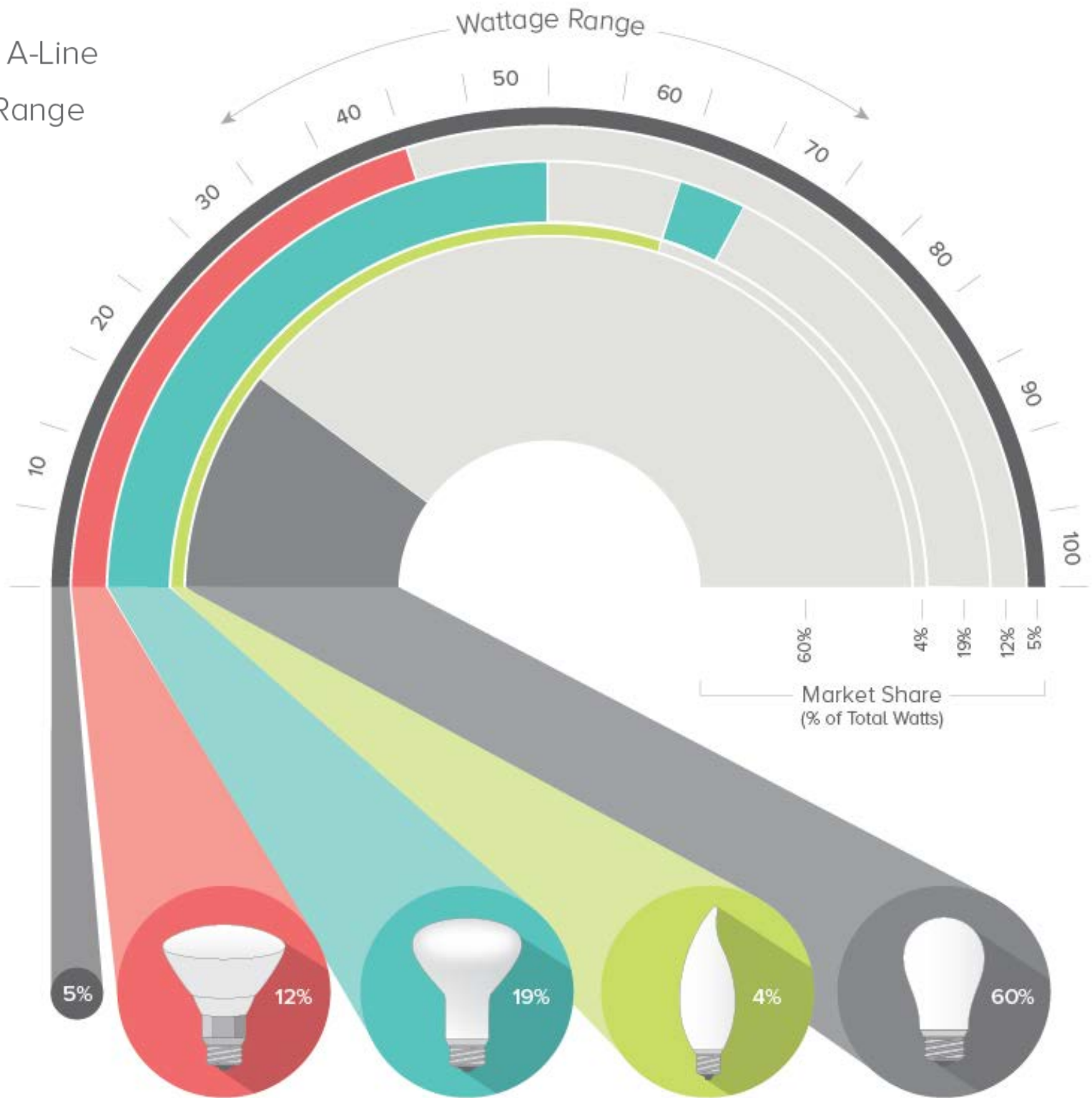


# NEEA Shelf Survey

- Data collected in late 2014
- Cadeo weighted results to estimate total regional shelf space using:
  - Retailer market share estimates
    - Channel market shares
    - Store counts
    - Interviews



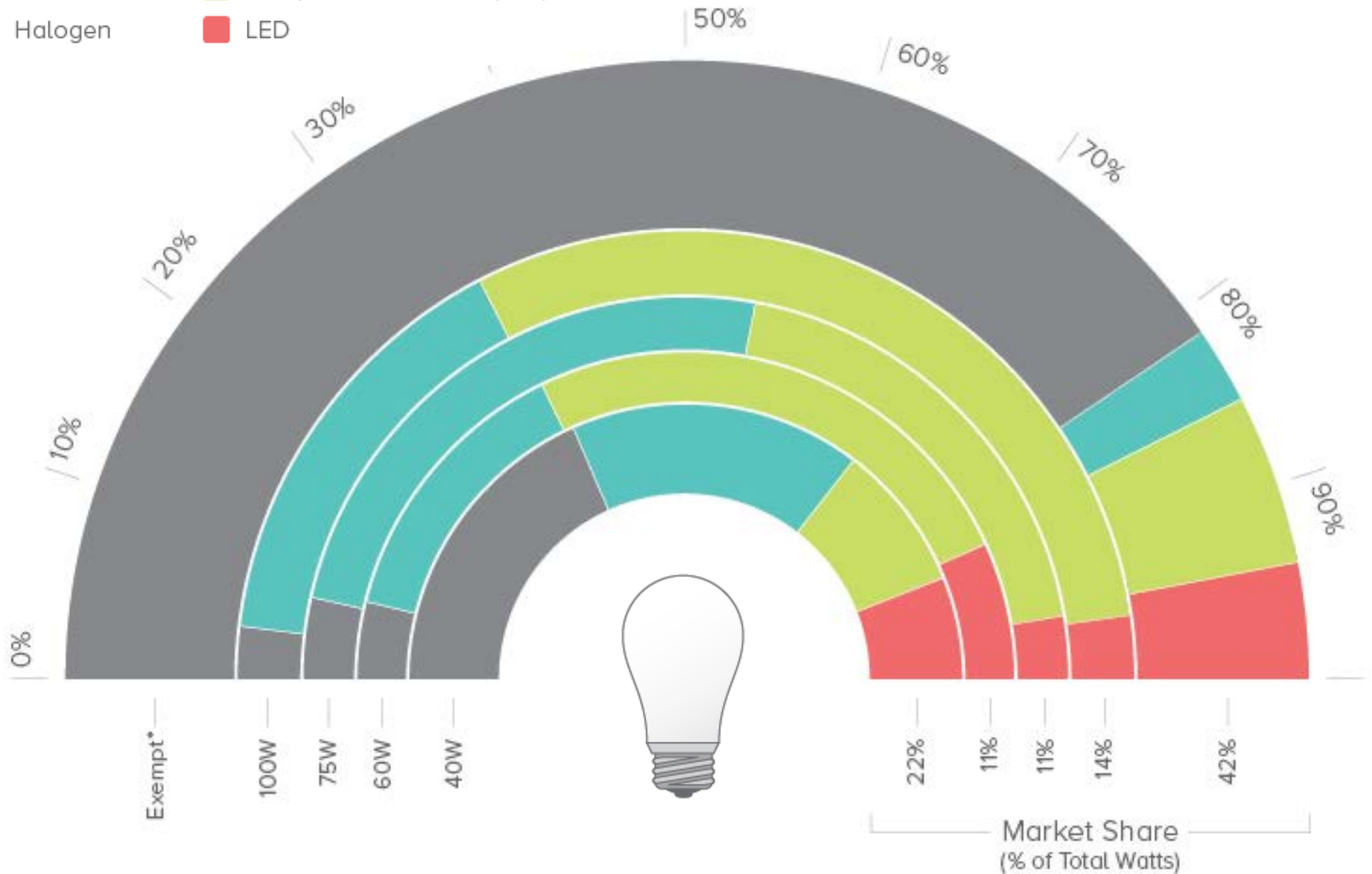
- Medium Screw Base A-Line
- Regulated Wattage Range
- Other Exemptions
- PAR Lamps
- Reflector Lamps
- Candelabra Base





# General Purpose Lamps

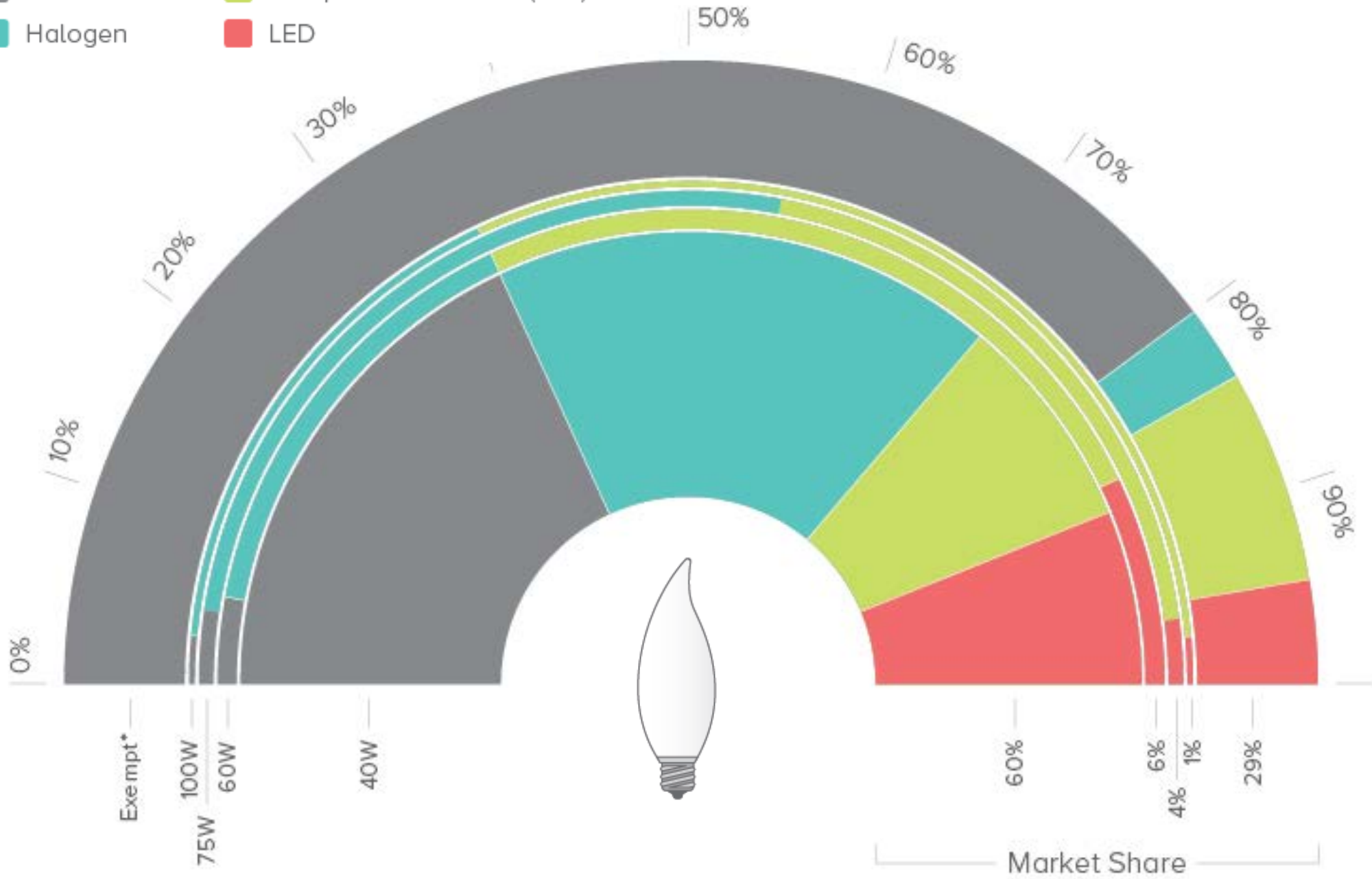
- Incandescent
- Compact Fluorescent (CFL)
- Halogen
- LED



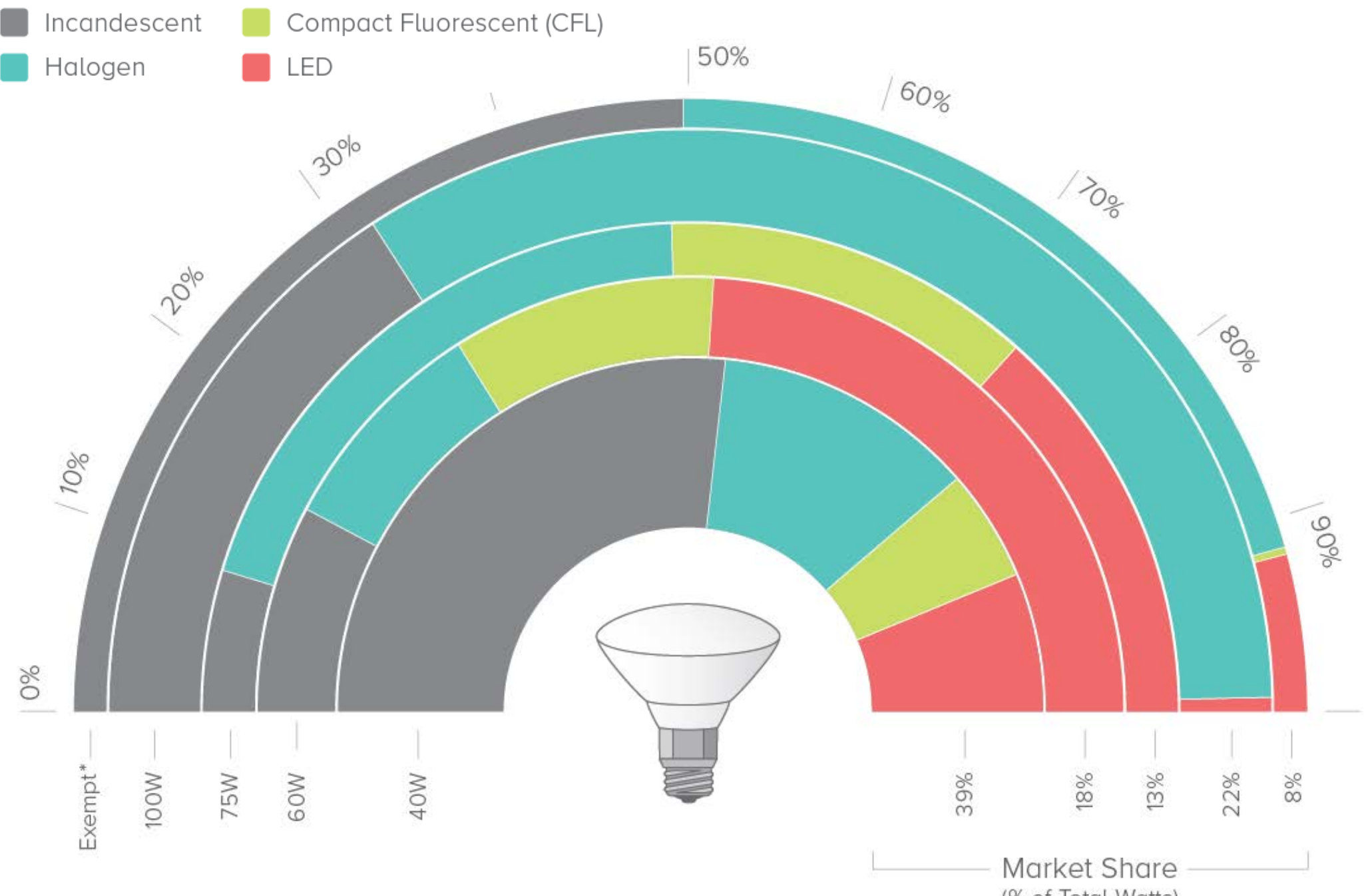


# Globe & Decorative Lamps

- Incandescent
- Compact Fluorescent (CFL)
- Halogen
- LED

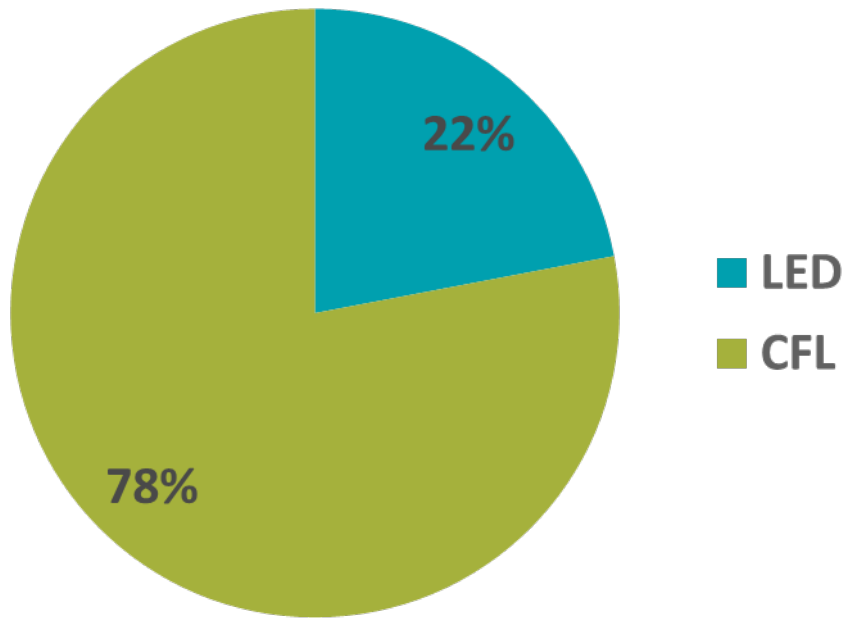


# Reflector Lamps

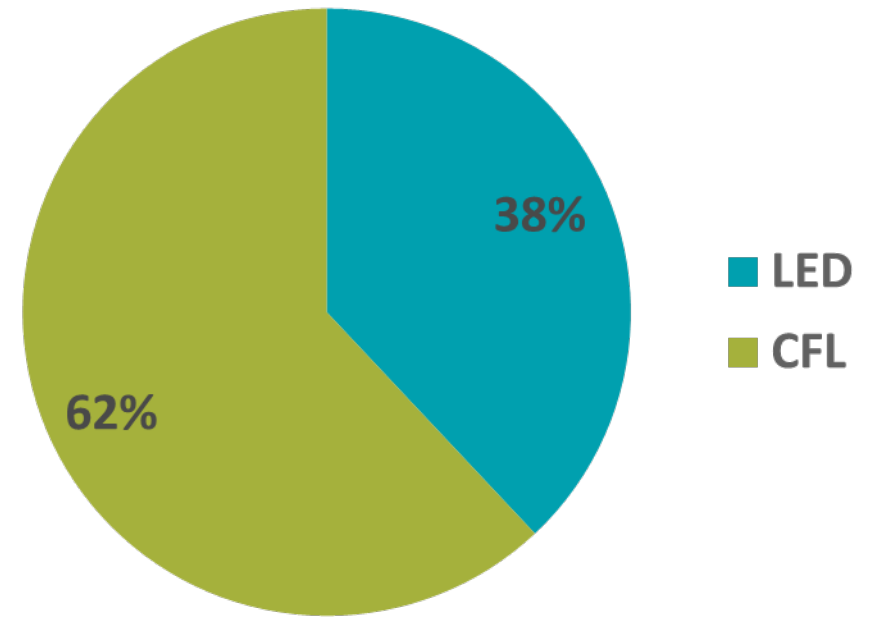


# UNEXPECTED LED POPULARITY

What we planned in 2014:



What we saw in 2014:



# GREAT LIGHT BULB EXCHANGE

- Partnership with 6 municipalities to encourage residents to save energy and money with LEDs
- Customers receive 2 free LEDs in exchange for incandescents
- 2,153 households participated
  - 4.5% participation rate



# LESSONS LEARNED

- Customers, especially those with bad CFL experiences, want LEDs and are willing to pay for quality and longevity
- Declining price points are making LEDs more affordable for efficiency programs and customers alike
- Need for more affordable replacements in decorative and high-wattage sockets

# VOLUNTARY CALIFORNIA QUALITY LED LAMP SPECIFICATION



Together, Building  
a Better California

# Voluntary California Quality LED Lamp Specification

California Energy Commission  
FINAL STAFF REPORT

## VOLUNTARY CALIFORNIA QUALITY LIGHT-EMITTING DIODE (LED) LAMP SPECIFICATION

A Voluntary Minimum Specification for "California  
Quality" LED Lamps



CALIFORNIA  
ENERGY COMMISSION  
Edmund G. Brown Jr., Governor

DECEMBER 2012  
CEC-400-2012-016-SF

**Designed to address customer  
satisfaction issues with CFLs  
ENERGY STAR Plus**

**Specifies 12 distinct criteria; 6  
exceed ENERGY STAR:**

- Color temperature
- Color consistency
- Color rendering
- Dimmability
- Rated life/warranty
- Light distribution

**First mass market product designed  
to spec launched November 2013**



# Transforming the LED Lamp Market



To date, 14 manufacturers including:

CREE, Feit, Philips, Acuity, Green Creative, TCP, MaxLite and Optolight





# Implementation of the CA Quality LED Spec

- Voluntary California Quality LED Specification adopted as the CEE Tier 3 spec, allowing utilities outside of CA to leverage the same spec for higher tier incentive programs

# CONCLUSION AND Q&A

- We've heard from the Northeast, Northwest, and California
- Is this what you are finding in your regions?
- Any key differences or similarities?
- Questions?





# THANK YOU!

Claire Miziolek

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