

***Fred Davis
Lighting Sessions
Moderator***

*NESEA
BuildingEnergy 2015
WTC, Boston*

**FRED DAVIS
CORPORATION**

Efficient Lighting Since '83
Wholesalers Nationwide

THE LIGHTENING VOLT™

an occasional news letter on energy efficient lighting from Fred Davis Corporation

phone: 800-497-2970
fax: 508-359-3644

info@FredDavisCorp.com
www.FredDavisCorp.com

**Please subscribe to our free occasional
e-newsletter on developments in efficient
lighting**

...and stop by our booth.

We must reduce use of fossil fuels
80% by 2050.

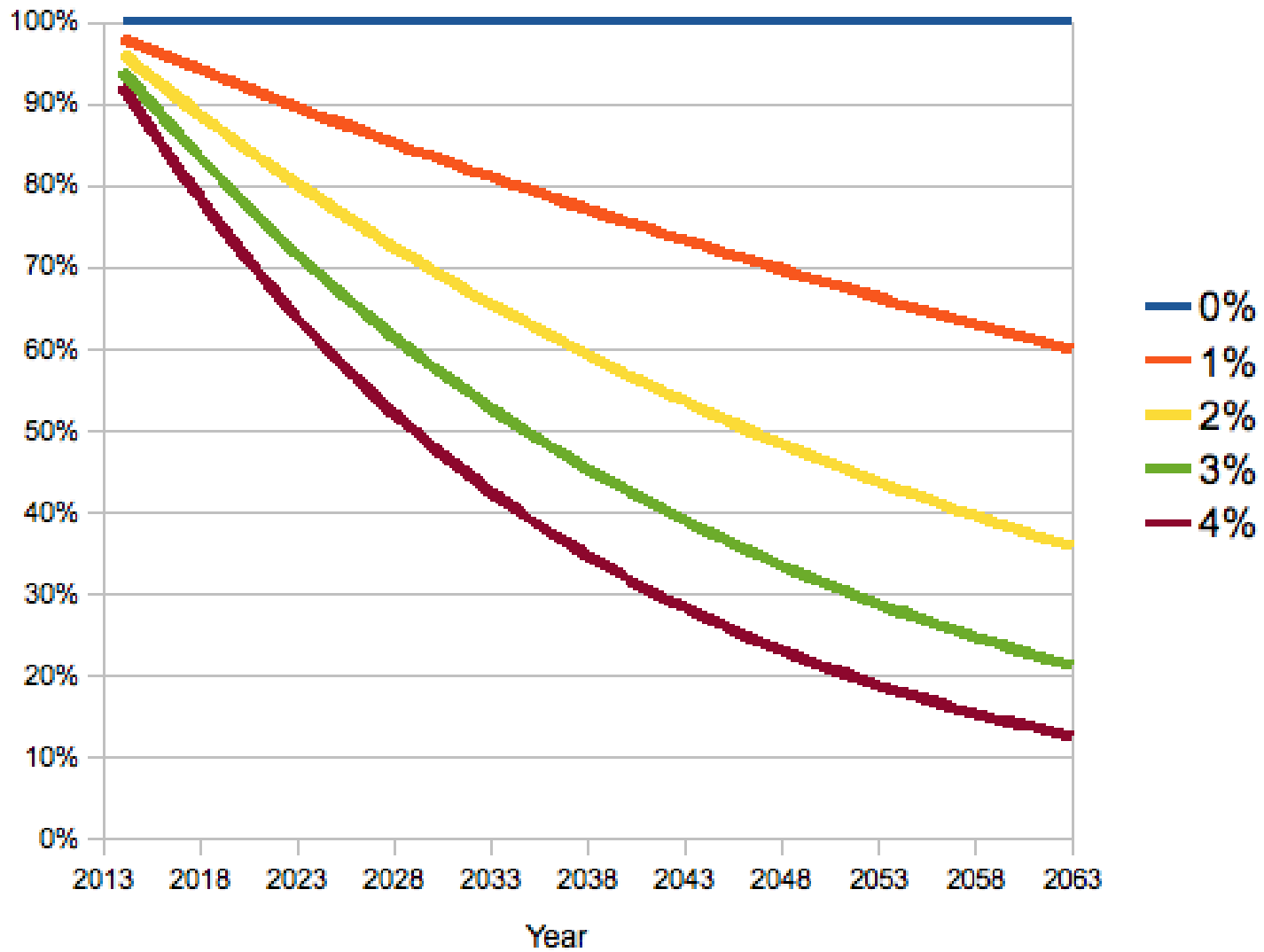
It is up to all of us.

We must save 80% by 2050.

Anyone know how to do that?

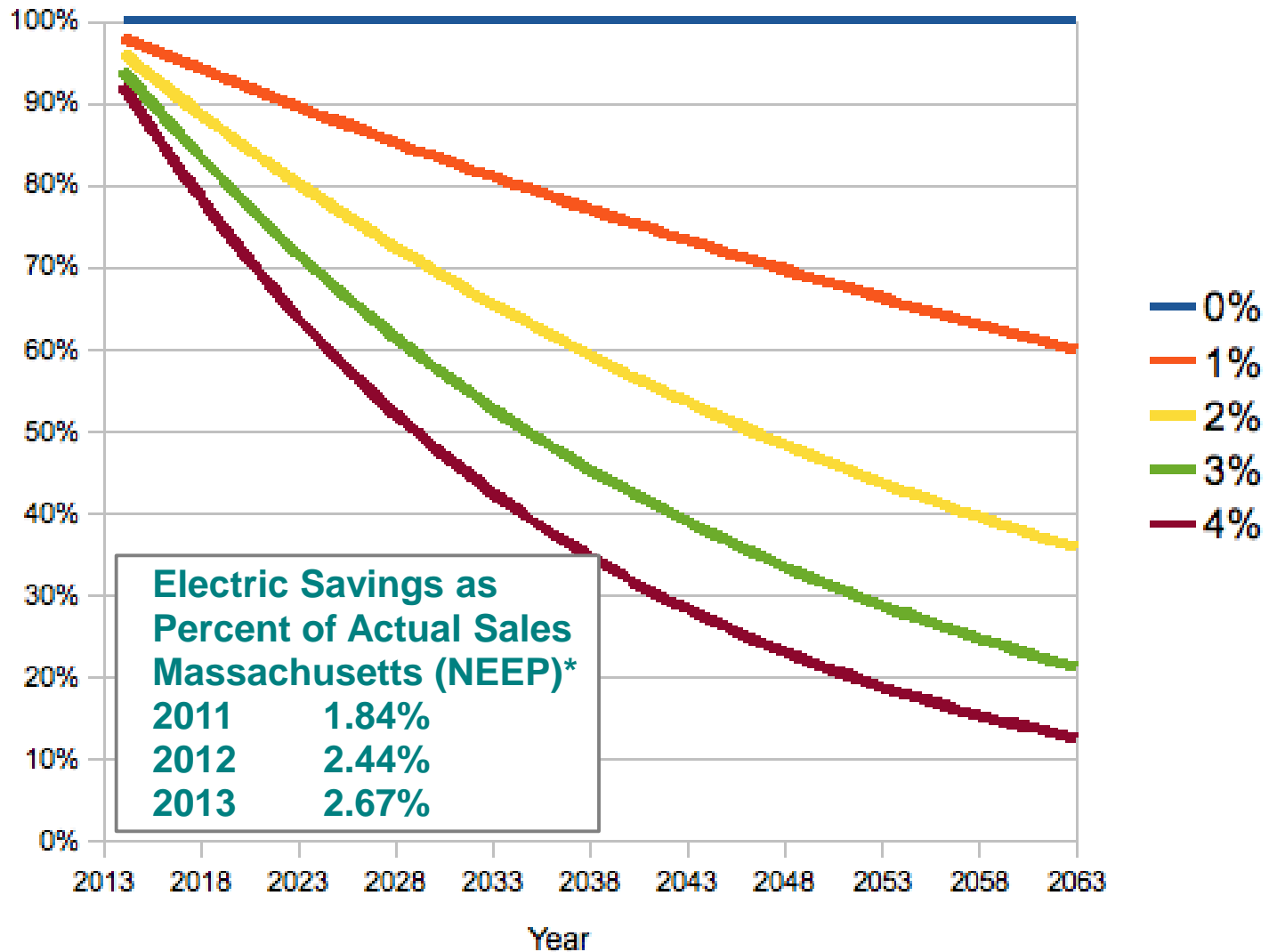
Projected 50-Yr Electric Consumption

from continuous annual decreases



Projected 50-Yr Electric Consumption

from continuous annual decreases



* Gross Annual Energy Savings Electric Meter Level
 Northeast Energy Efficiency Partnerships, Inc. Regional Energy Efficiency Database.
 Retrieved 2/26/15, from www.neep-reed.org

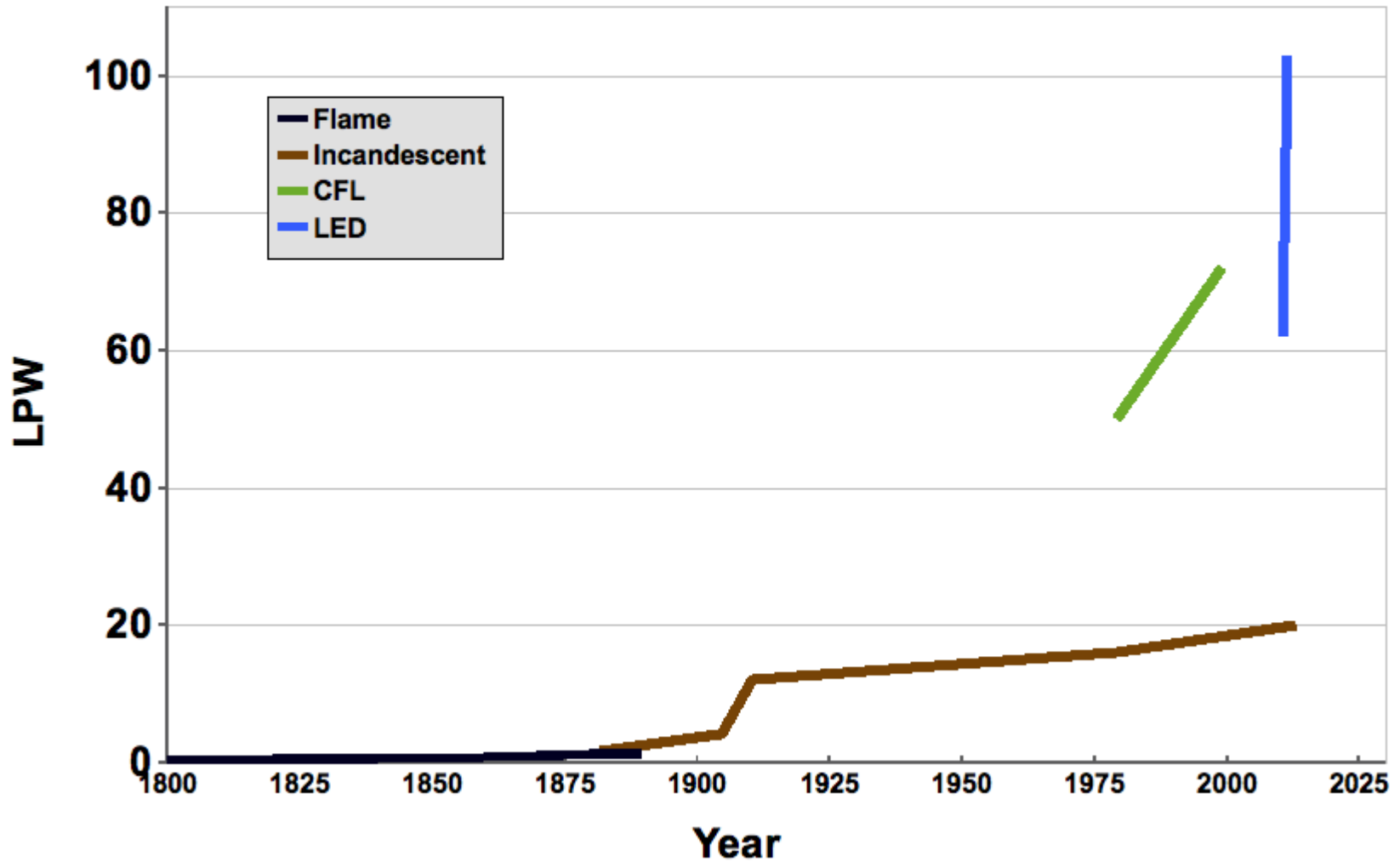
Fred's Formidable Formula:

If efficiency doubles,
and amenity halves,
that's a net 75% reduction.

Historical Context

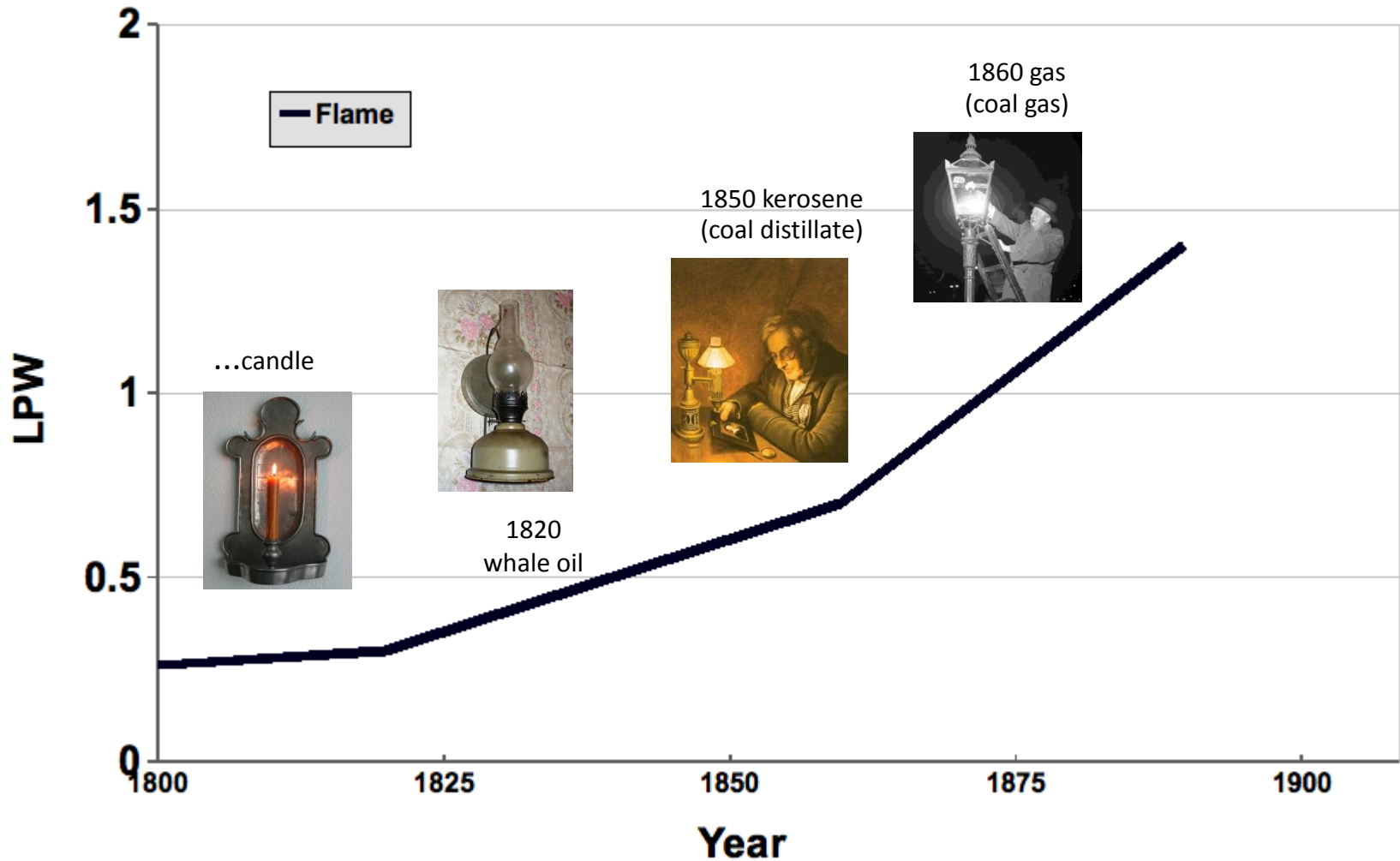
History of Lamp Efficiency

Best Source Efficacy in Lumens per Watt

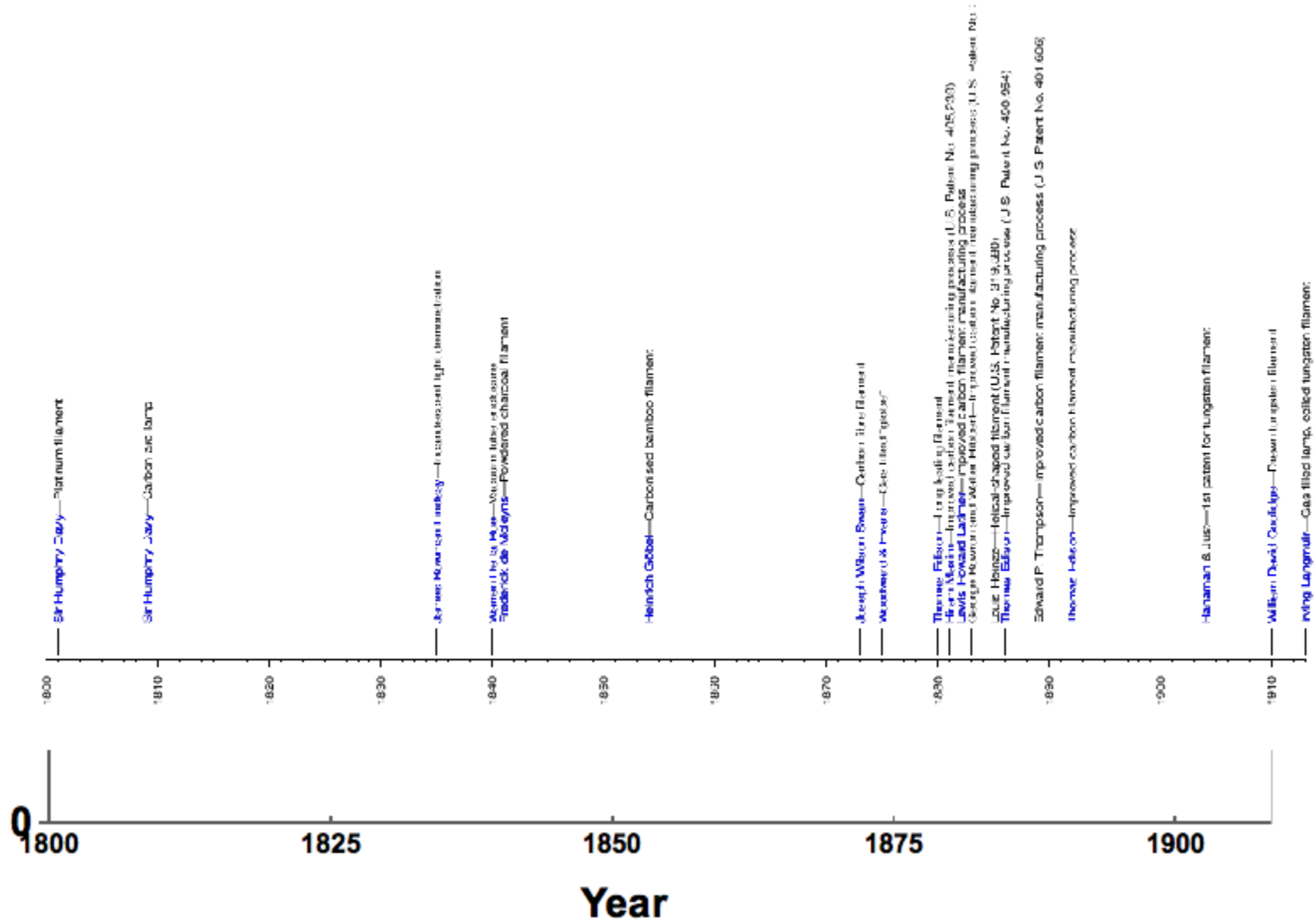


History of Lamp Efficiency

Best Source Efficacy in Lumens per Watt

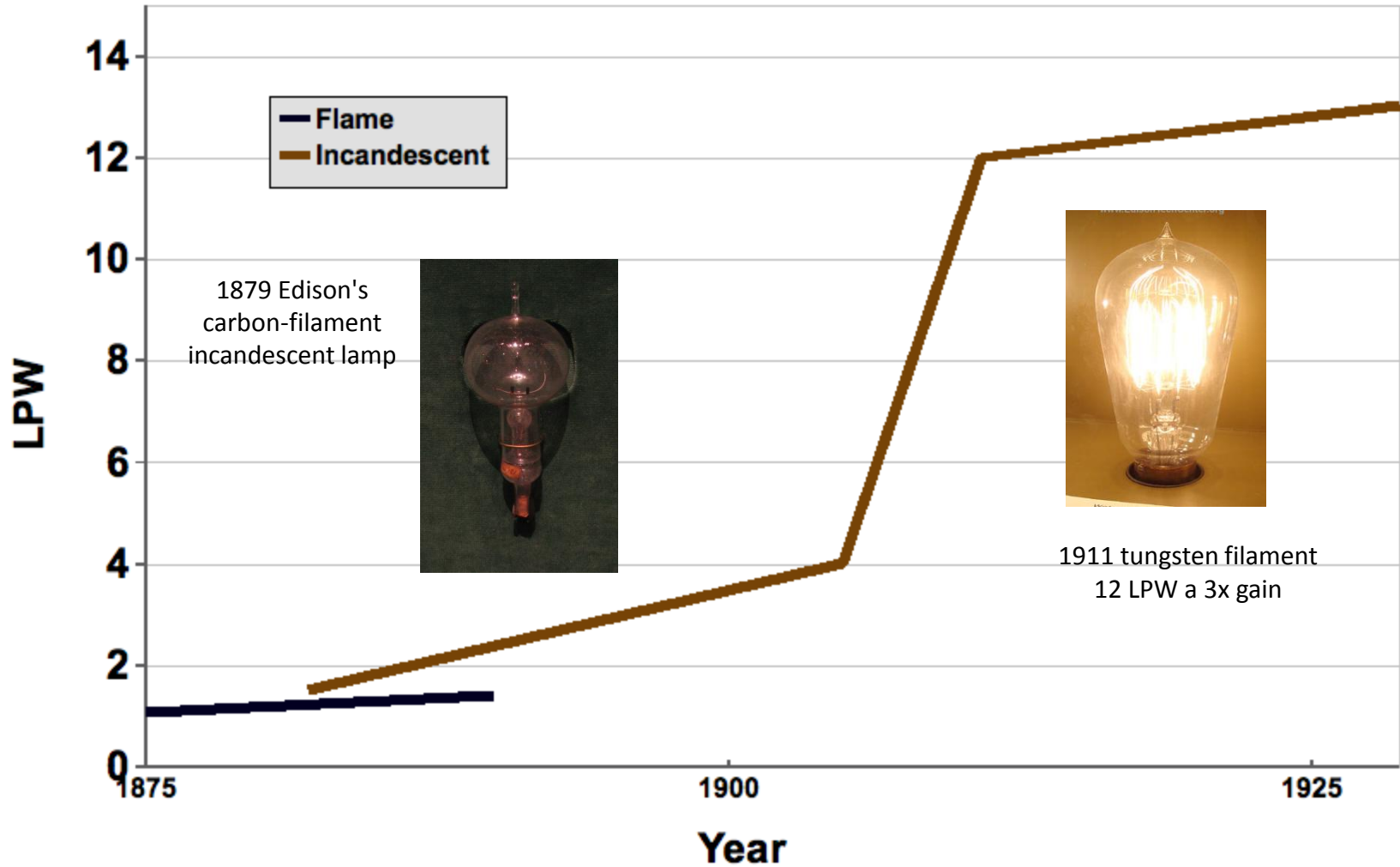


History of Lamp Efficiency



History of Lamp Efficiency

Best Source Efficacy in Lumens per Watt



**“Vintage” or “antique” incandescents are being sold today.
Appropriate in museums...if turned off.
Otherwise they should be illegal.**

**60 watts
305 lumens

= 5 LPW !!!**

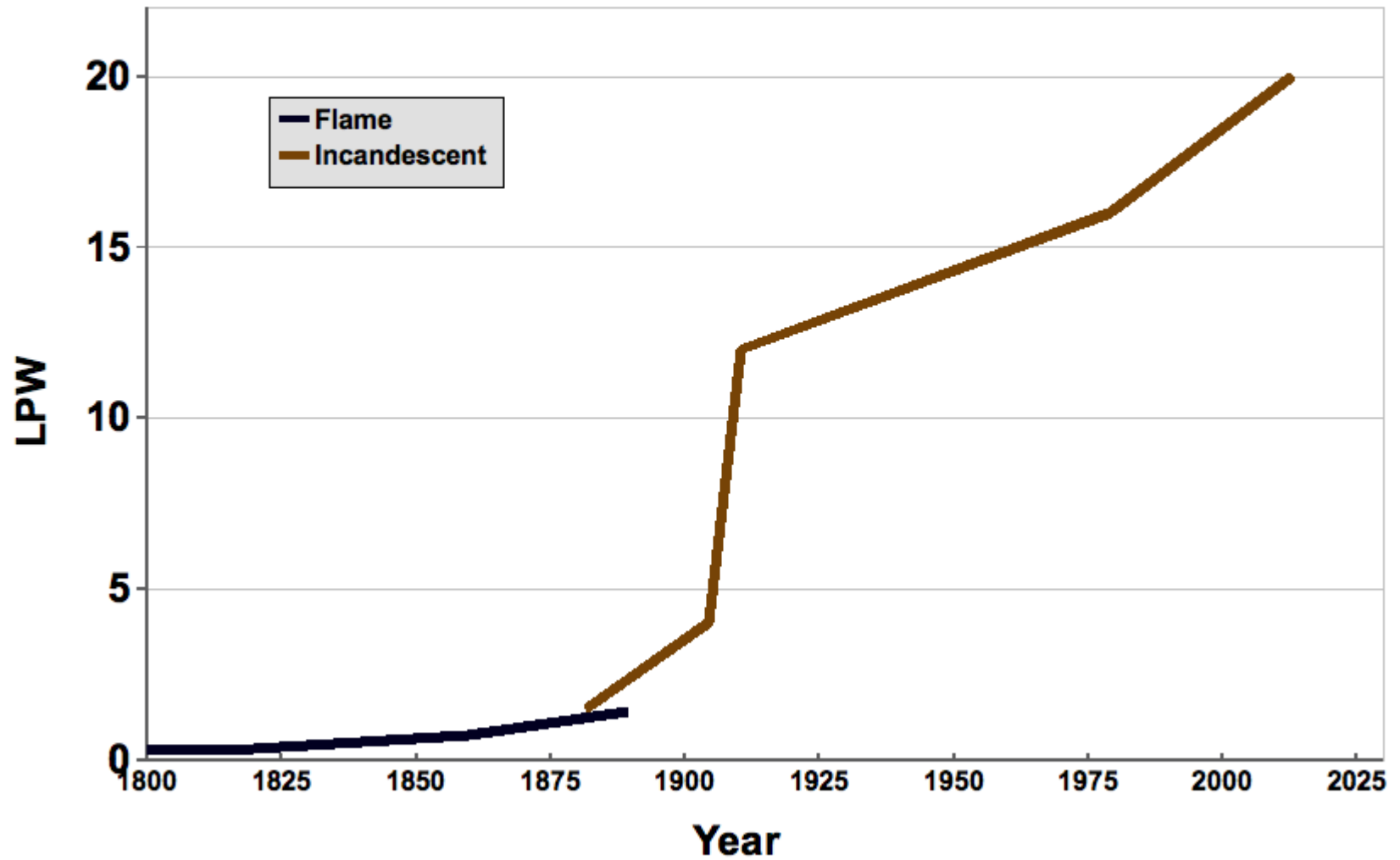


**Efficacy is circa 1900!
Predates tungsten filament!**

Please educate people.

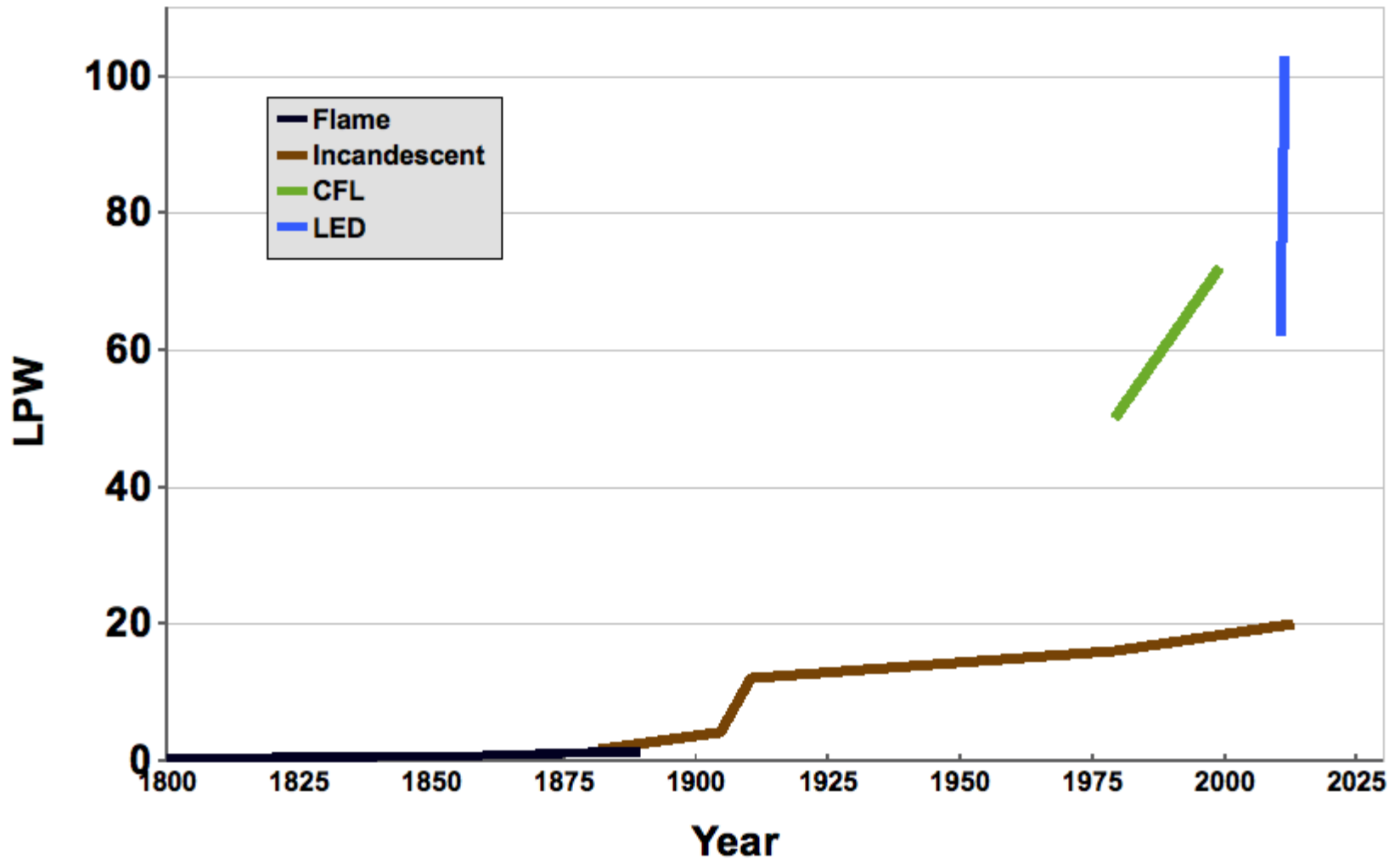
History of Lamp Efficiency

Best Source Efficacy in Lumens per Watt



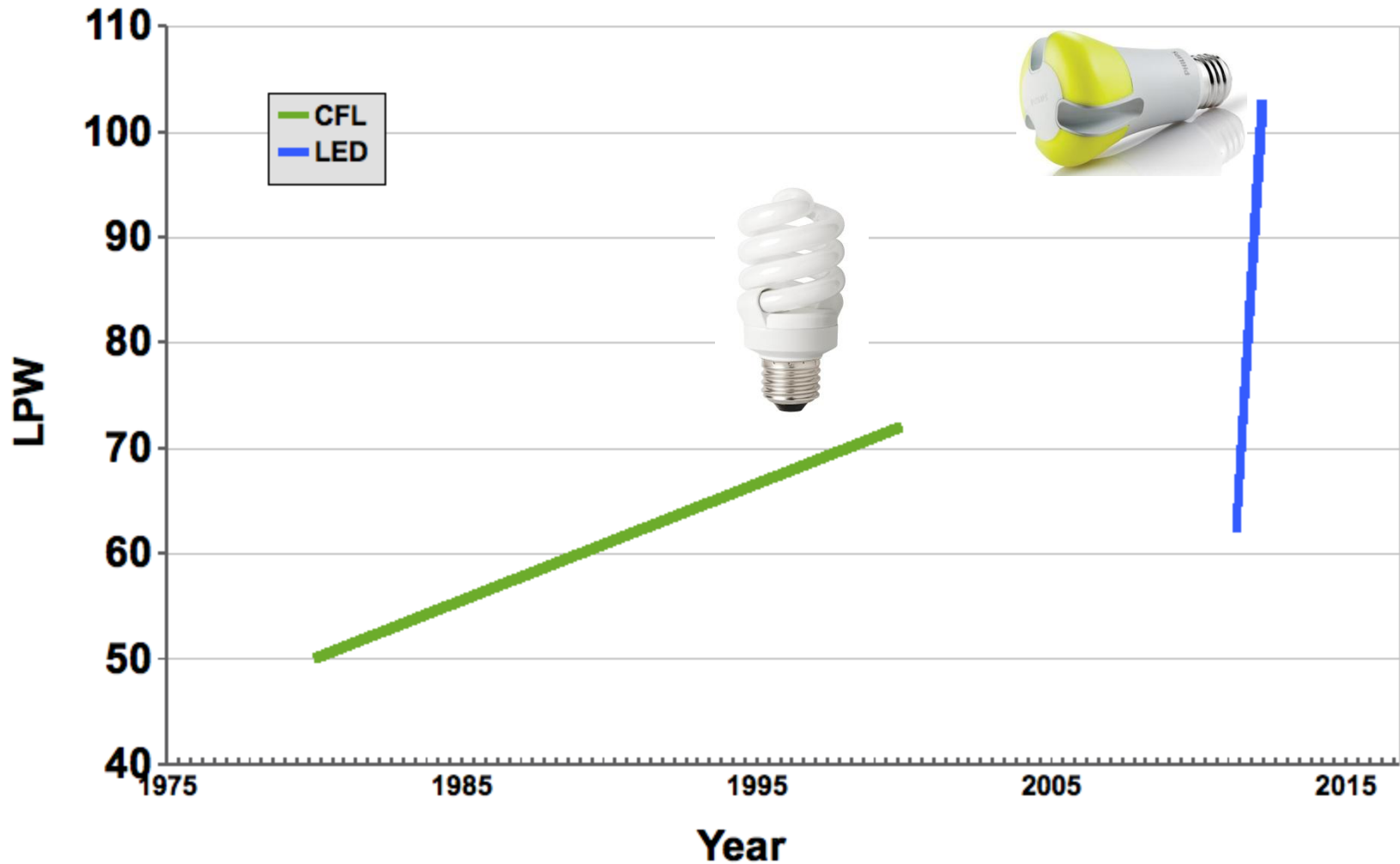
History of Lamp Efficiency

Best Source Efficacy in Lumens per Watt



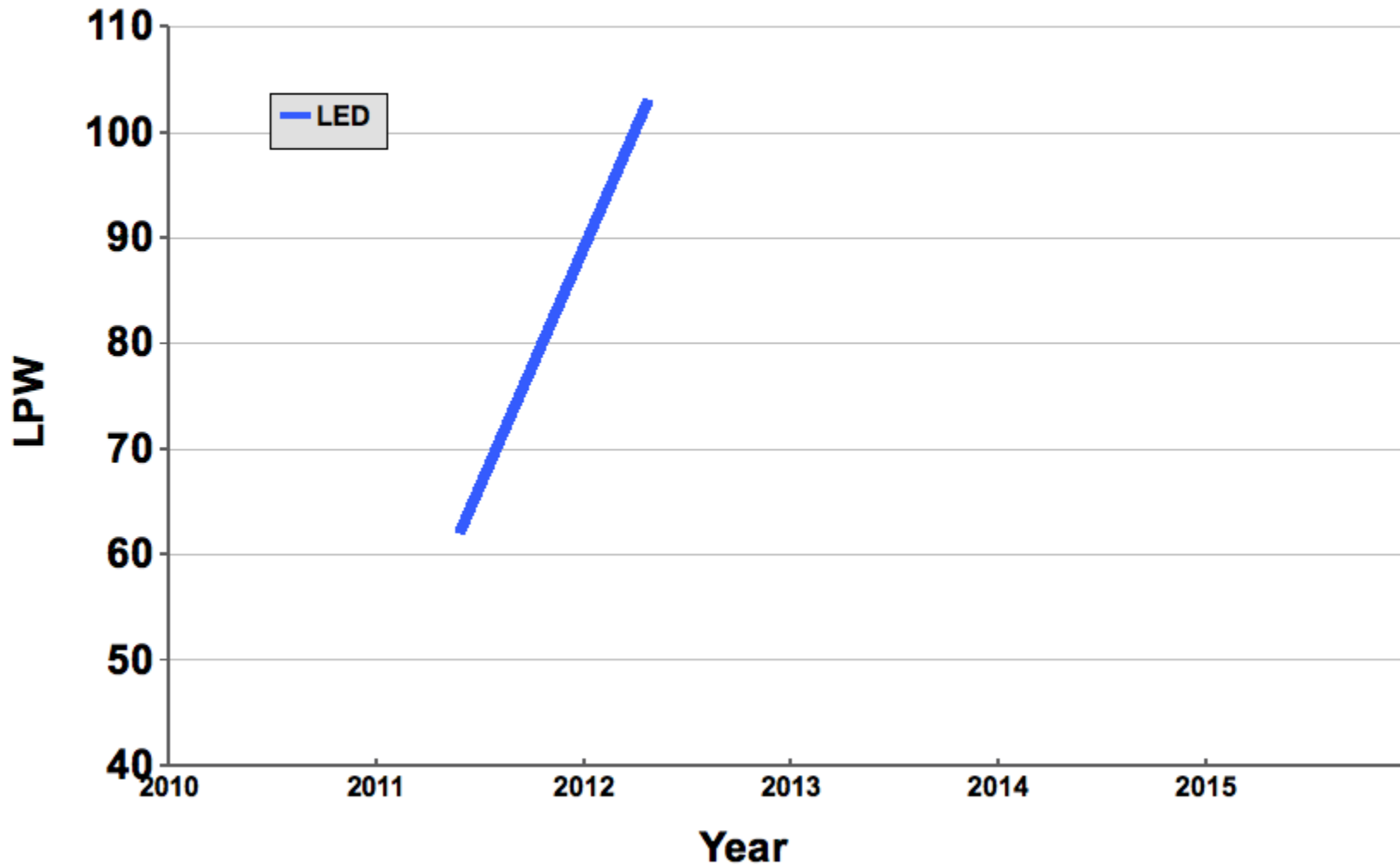
History of Lamp Efficiency

Best Source Efficacy in Lumens per Watt



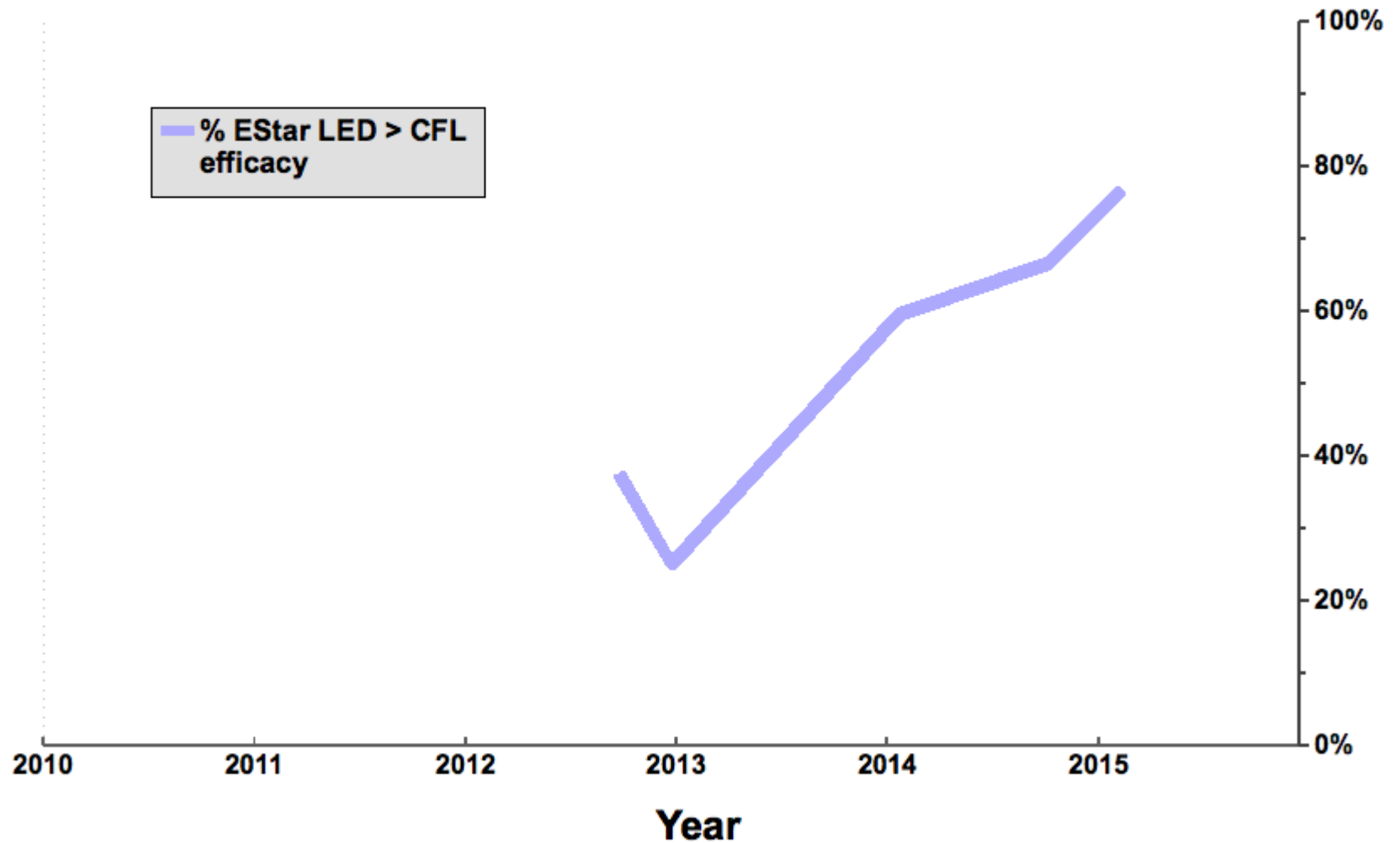
History of Lamp Efficiency

Best Source Efficacy in Lumens per Watt



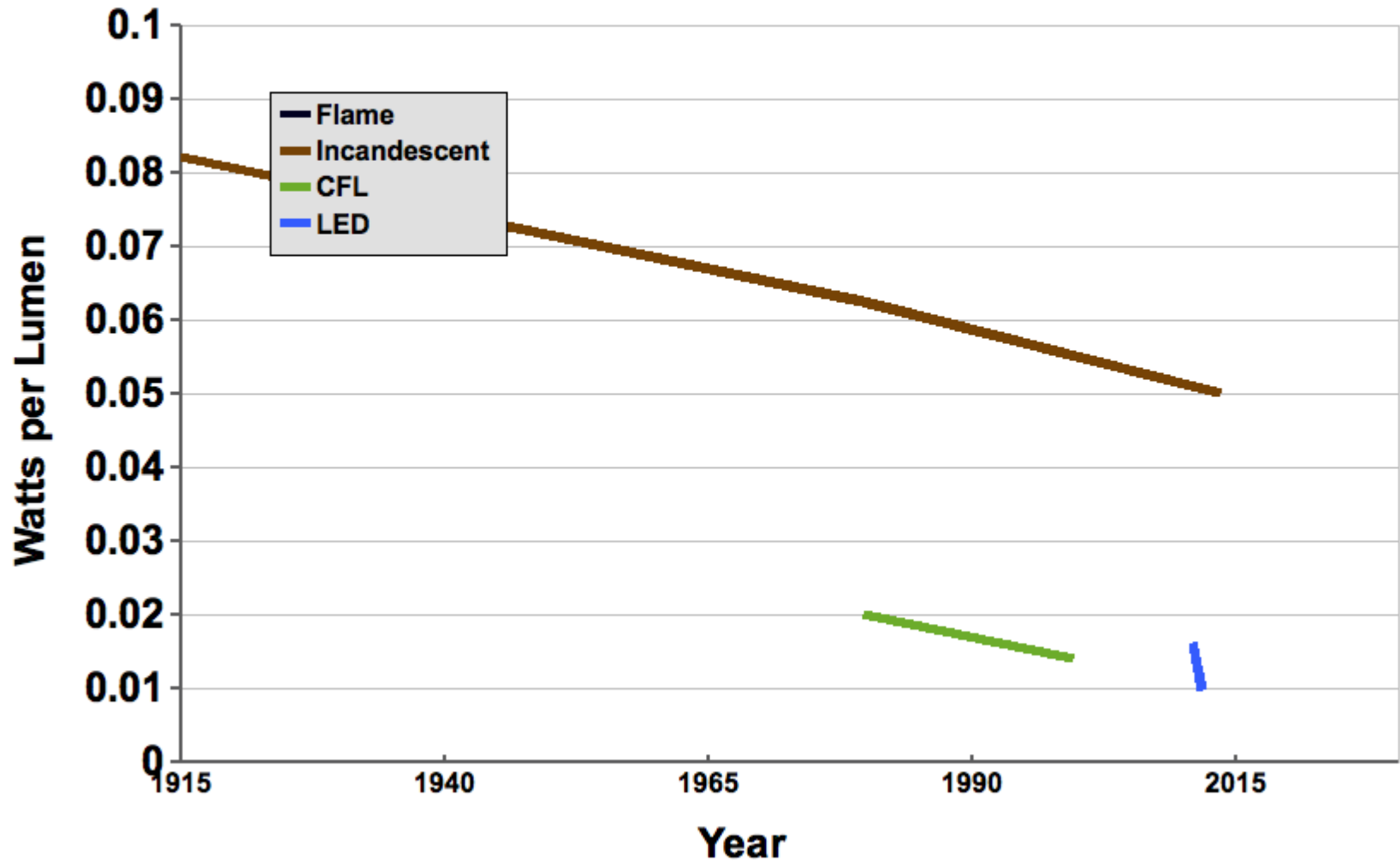
History of Lamp Efficiency

Percentage of LED A-Lamps Beating CFL Efficacy

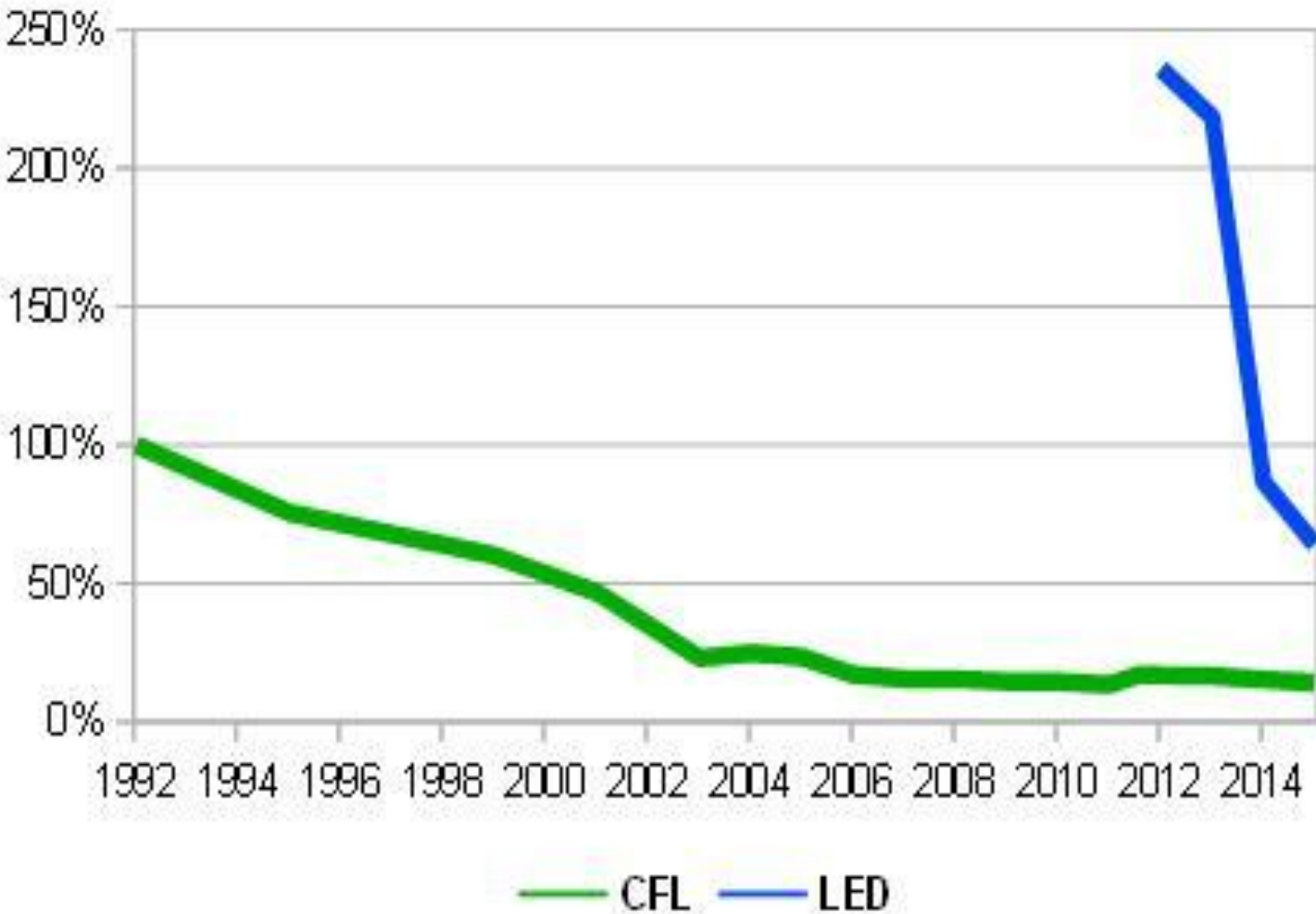


History of Lamp Efficiency

Wattage input needed per unit of light



Benchmark Wholesale Pricing Over 23 years

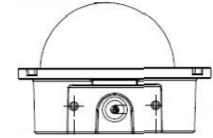


We must reduce use of fossil fuels
80% by 2050.

We have the tools.
Let's implement.

Introductory Lighting Glossary

L.E.D. = Light Emitting Diode: a semiconductor device, as are computer chip and PV cell.



Lumen = unit of visible light power (output)

Watt = unit of power (input)

LPW = lumen per watt = unit of efficiency (lamp efficacy)

Light bulb =

screw-in bulb

general purpose lamp

A-lamp with medium E26 base or its equivalent

(presume all of these refer more or less to the same thing)



BUILDING ENERGY 15

MARCH 3-5, 2015 AT THE SEAPORT WORLD TRADE CENTER

AIA Provider: Northeast Sustainable Energy Association

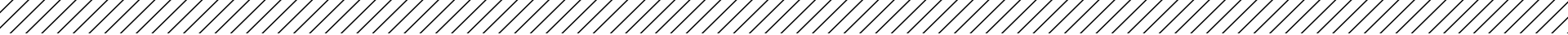
Provider Number: G338

Course Title

BE1557

Fred Davis, Jim Gaines, Taylor Jantz-Sell

March 5, 2015



Credit(s) earned on completion of this course will be reported to **AIA CES** for AIA members. Certificates of Completion for both AIA members and non-AIA members are available upon request.

for continuing professional education. As such, it does not include content that may be deemed or construed to be an approval or endorsement by the AIA of any material of construction or any method or manner of handling, using, distributing, or dealing in any material or product.

Questions related to specific materials, methods, and services will be addressed at the conclusion of this presentation.

This course is registered with **AIA CES**

**FRED DAVIS
CORPORATION**
Wholesale Distributors of Energy
Efficient Lighting Products



Course Description

If LEDs are the next best thing, why do so many building professionals still feel “in the dark” about the technology? Welcome to modern lighting where counter-intuitive chaotic tension is the hallmark of the LED revolution. Part one will focus on the most accessible, yet possibly most frustrating, LED product category: the replacement light bulb. Expectations for LED bulbs are great but until this year, any advantage was both marginal and expensive. In the past year, the best LED lamps have pushed efficiency significantly upwards. Years into the incandescent phase-out, is LED technology living up to its promise? Why are some approved LED lamps still less efficient than a cheap CFL? What are industry leaders doing to maximize mainstream adoption? What should we expect in pricing? And should building professionals even be promoting screw-in bulbs, or do new LED fixtures provide better savings?

Learning Objectives

At the end of the this course, participants will be able to:

1. Understand what efficiencies are actually gained by using LED bulbs and at what cost
2. Understand the differences between LED and CFL and how to compare them when considering a project
3. Learn about new lighting technologies and how they affect what is available
4. Learn about fixture types and what works best in different applications

Outline

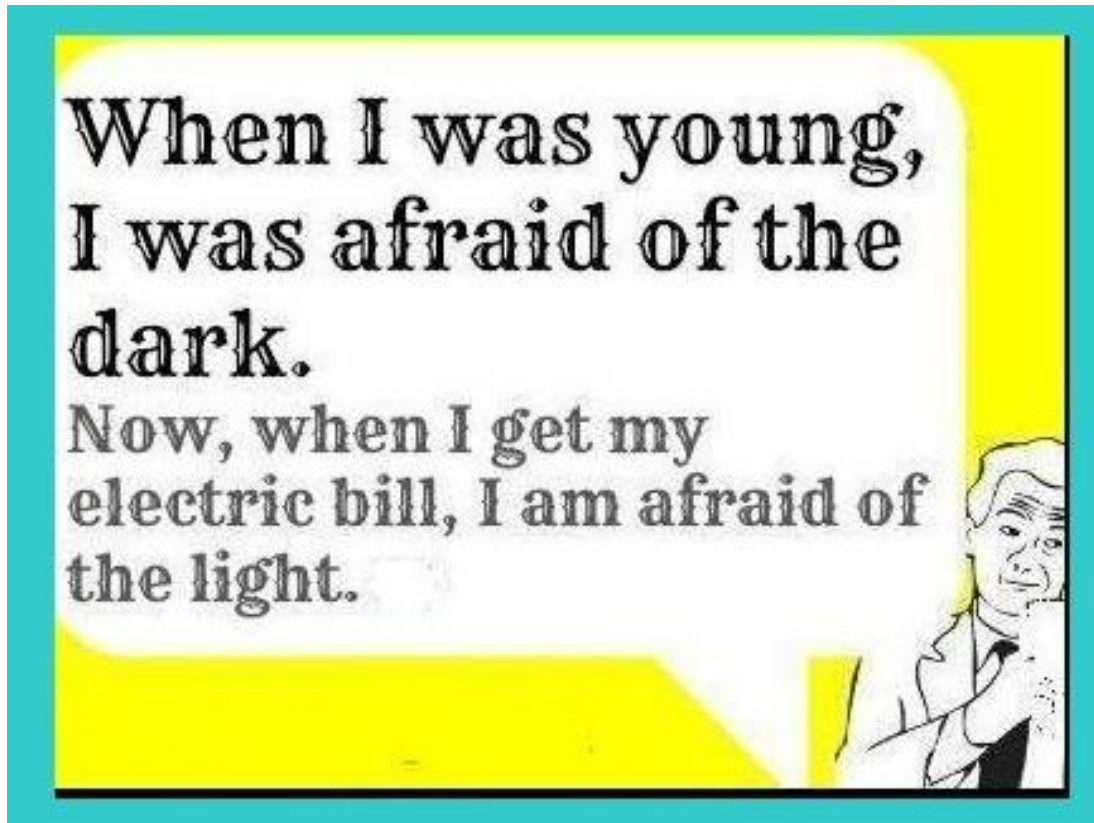
History

Adoption

Manufacturer aims

Further improvement

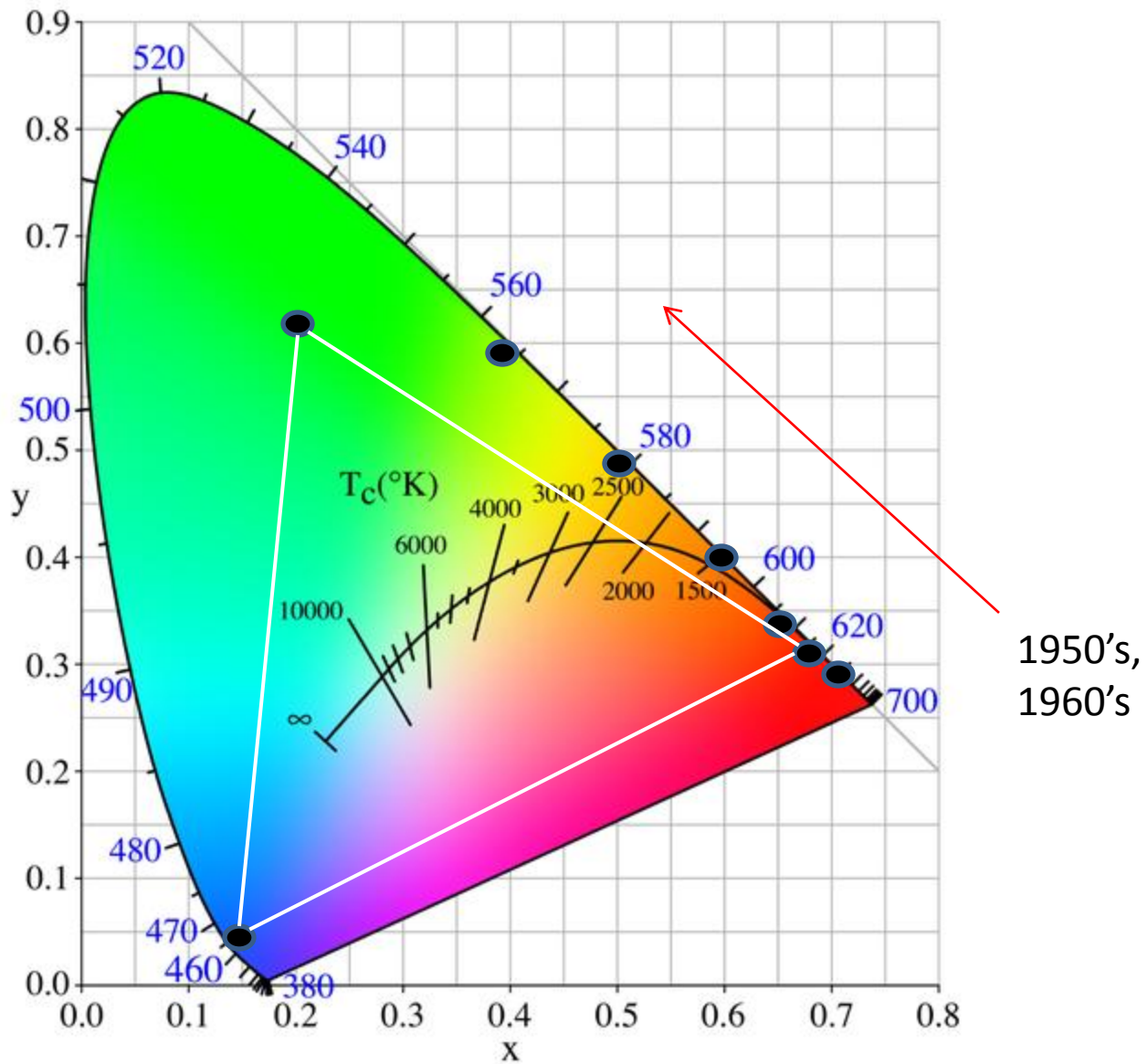
Compare to CFL



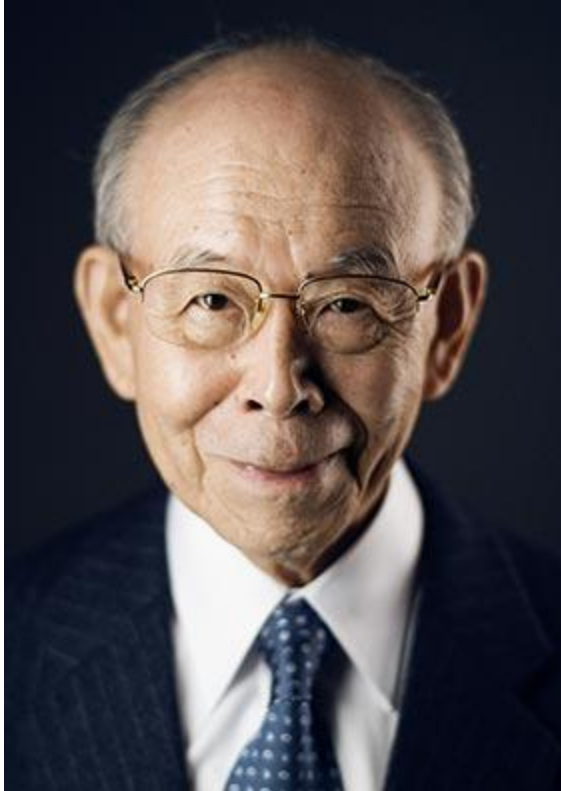
Promise of SSL: Save energy

LED Lighting might make this guy feel better!

White light with LEDs



2014 Nobel Prize for Blue LEDs



Isamu Akasaki



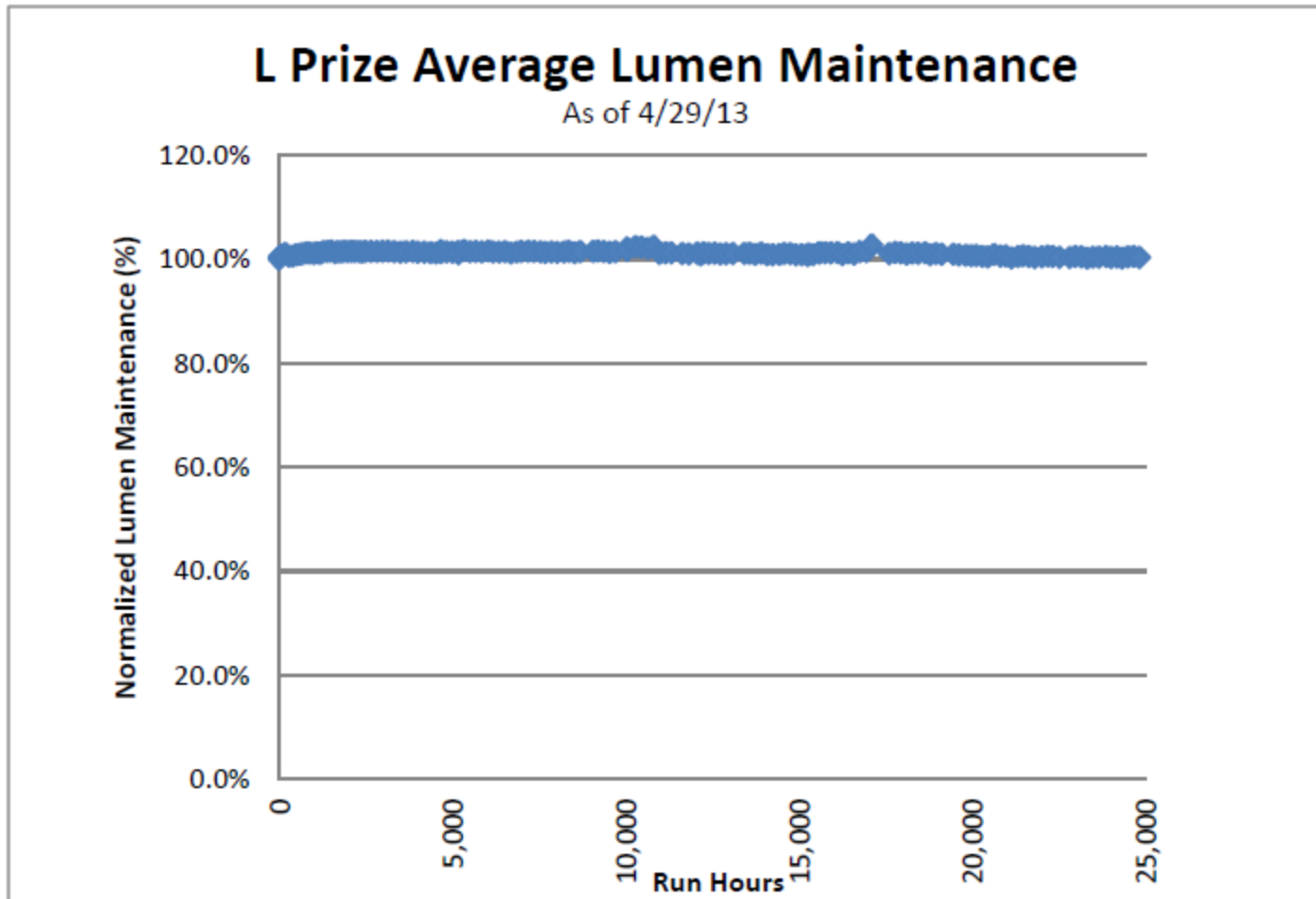
Hiroshi Amano



Shuji Nakamura

Photos by A. Mahmoud

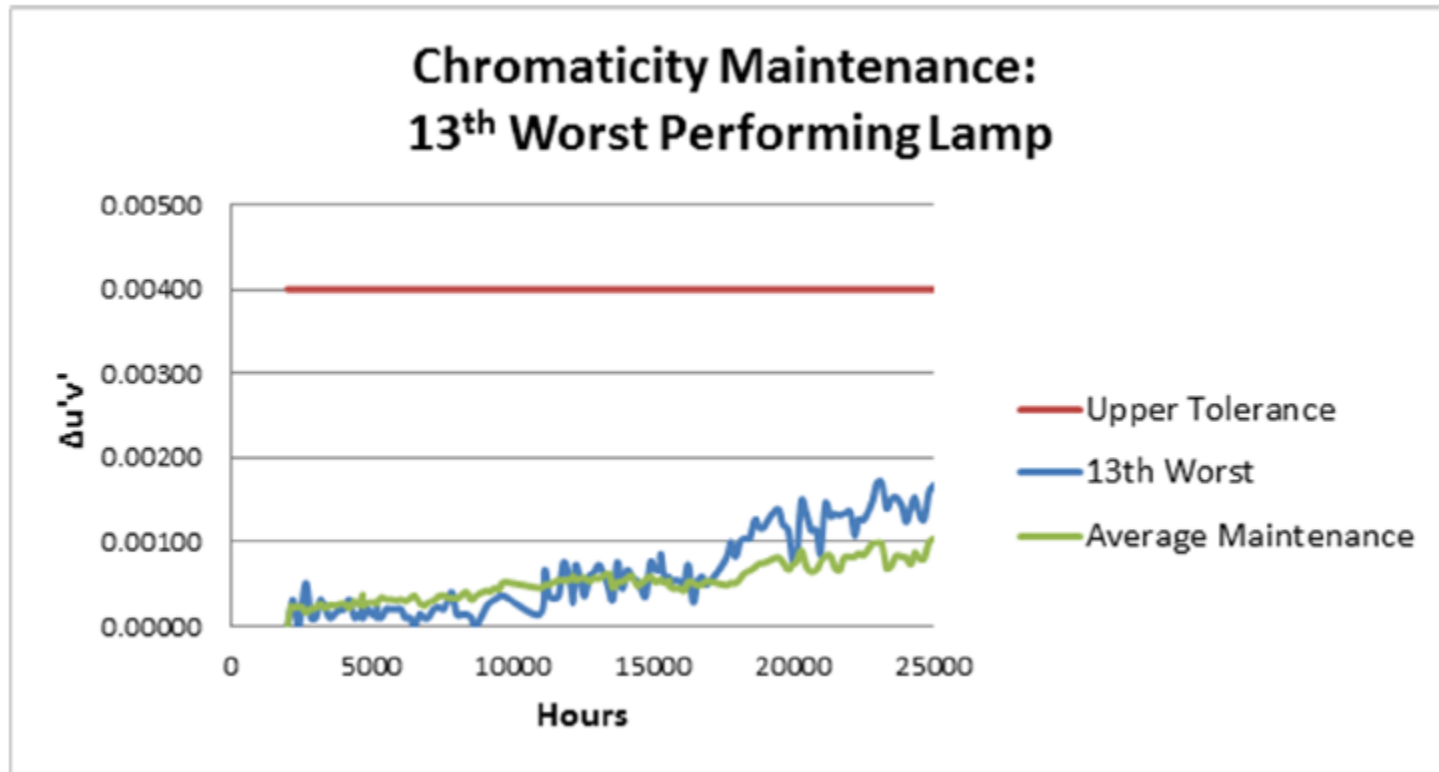
L Prize - Yardstick



http://www.lightingprize.org/pdfs/lprize_60w-lumen-maint-testing.pdf

August 2011

L Prize - Yardstick



Are people buying LED products?

©2012 ALEXANDER HOFFMAN. ALL RIGHTS RESERVED.
PLANET THORBURN.TUMBLR.COM

HOW MANY BUREAUCRATS DOES IT TAKE TO SCREW IN A LIGHT BULB?

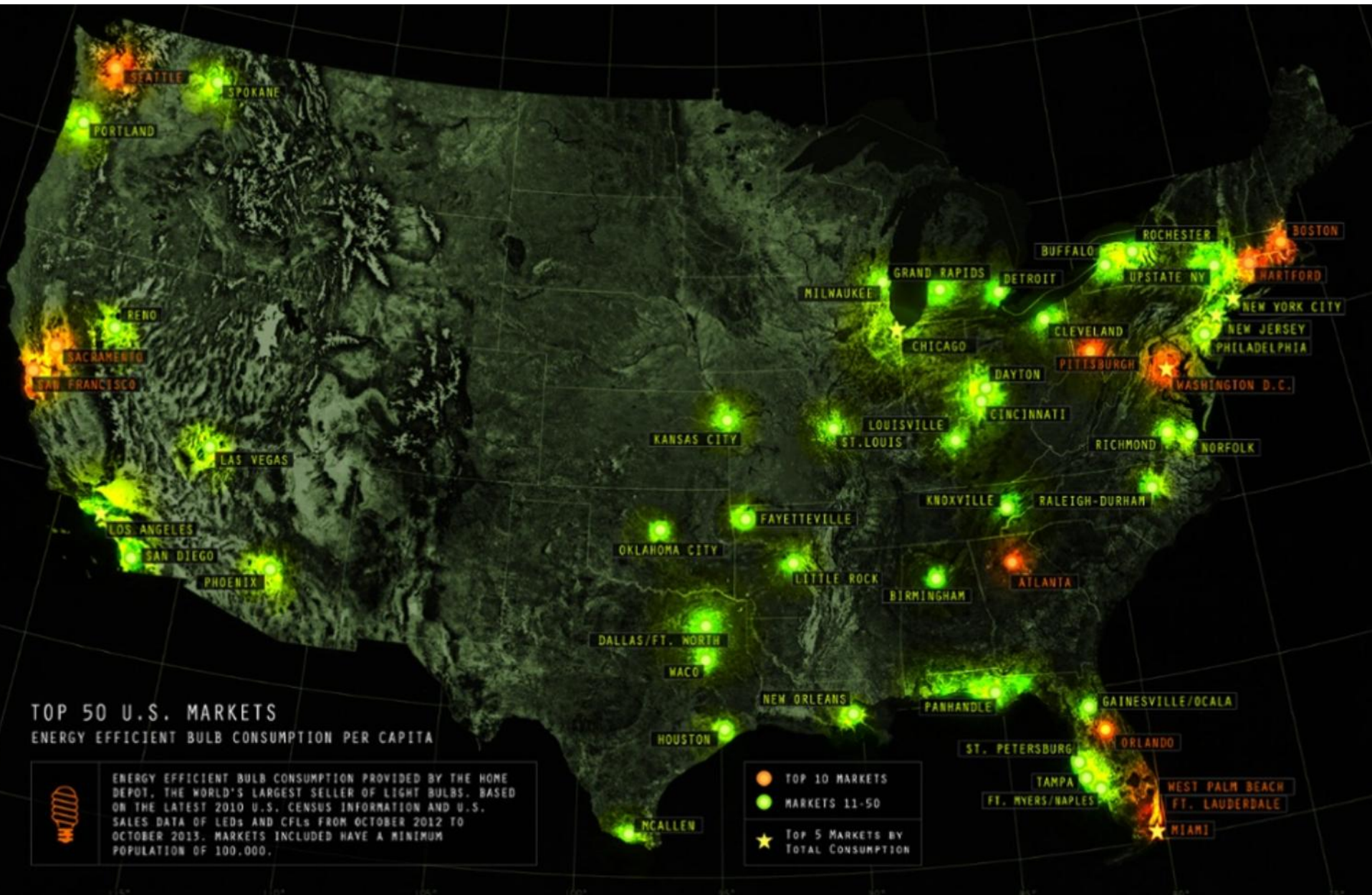
ANSWER: THREE
ONE TO BAN 75 CENT
INCANDESCENT BULBS

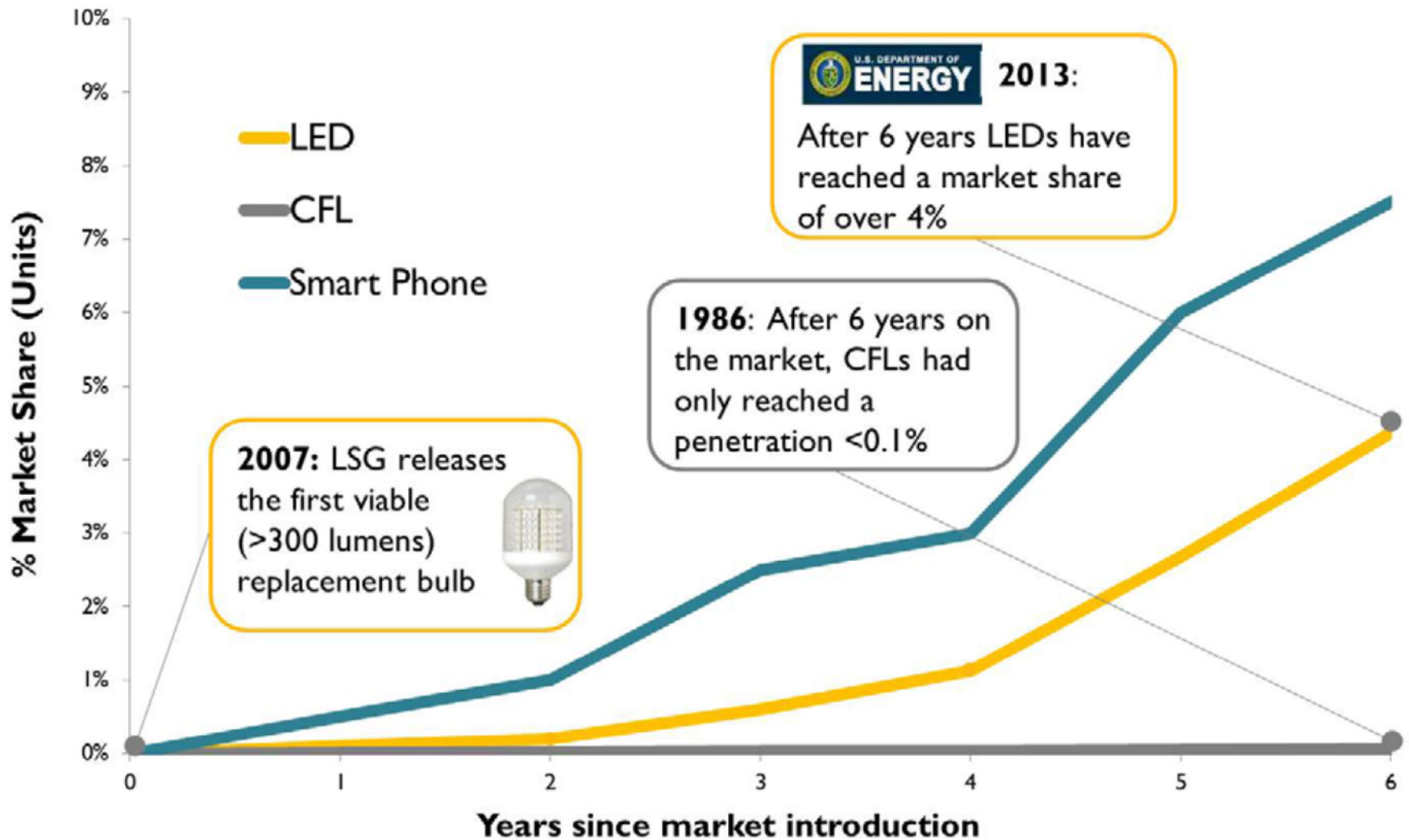
ONE TO PAY AN ENERGY
COMPANY \$10 MILLION
IN TAX PAYER MONEY

ONE TO HELP SELL YOU
THEIR BULB FOR \$50,
ALL IN THE NAME OF
LOWERING ENERGY COSTS



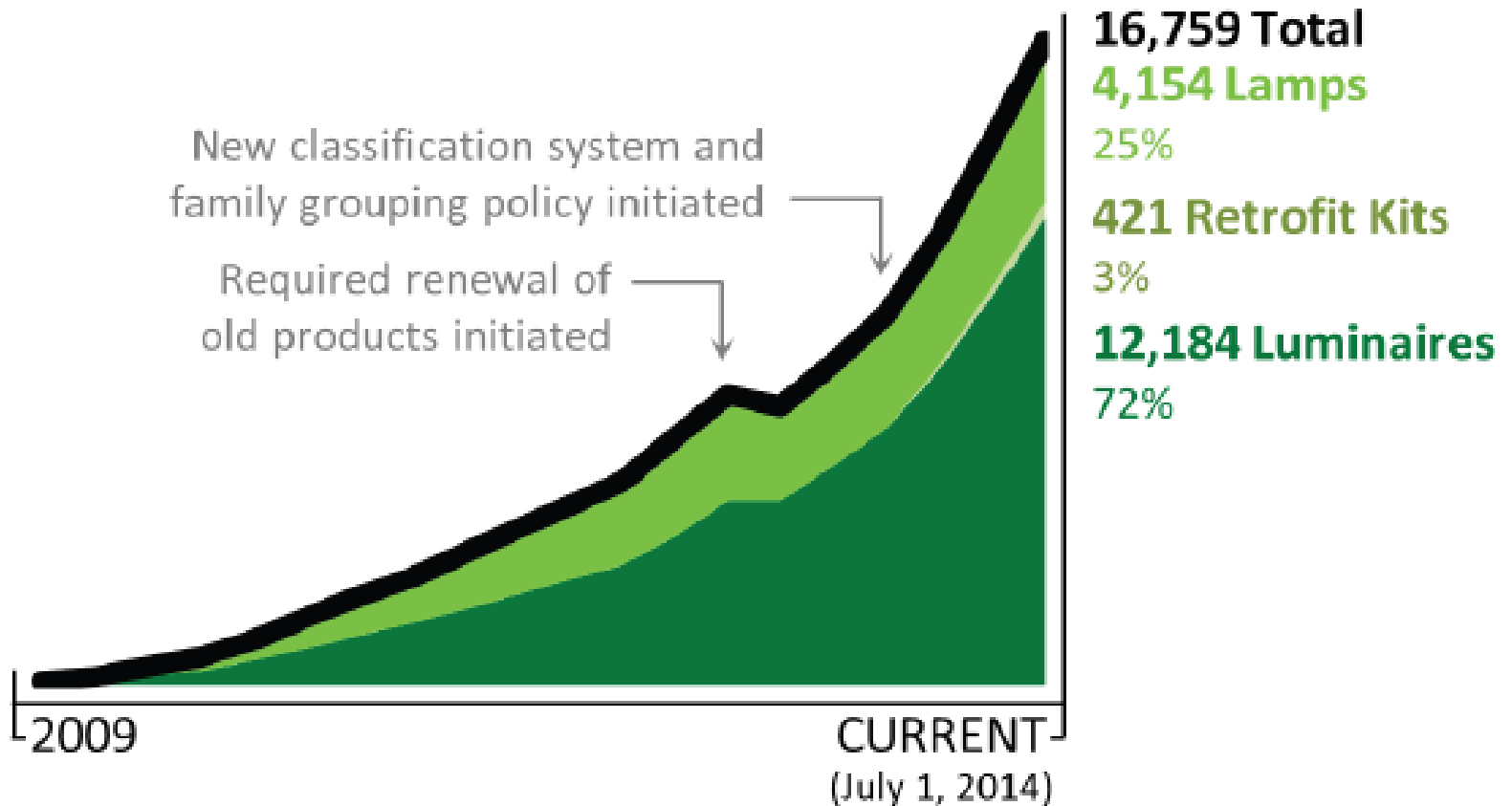
Home Depot sales information





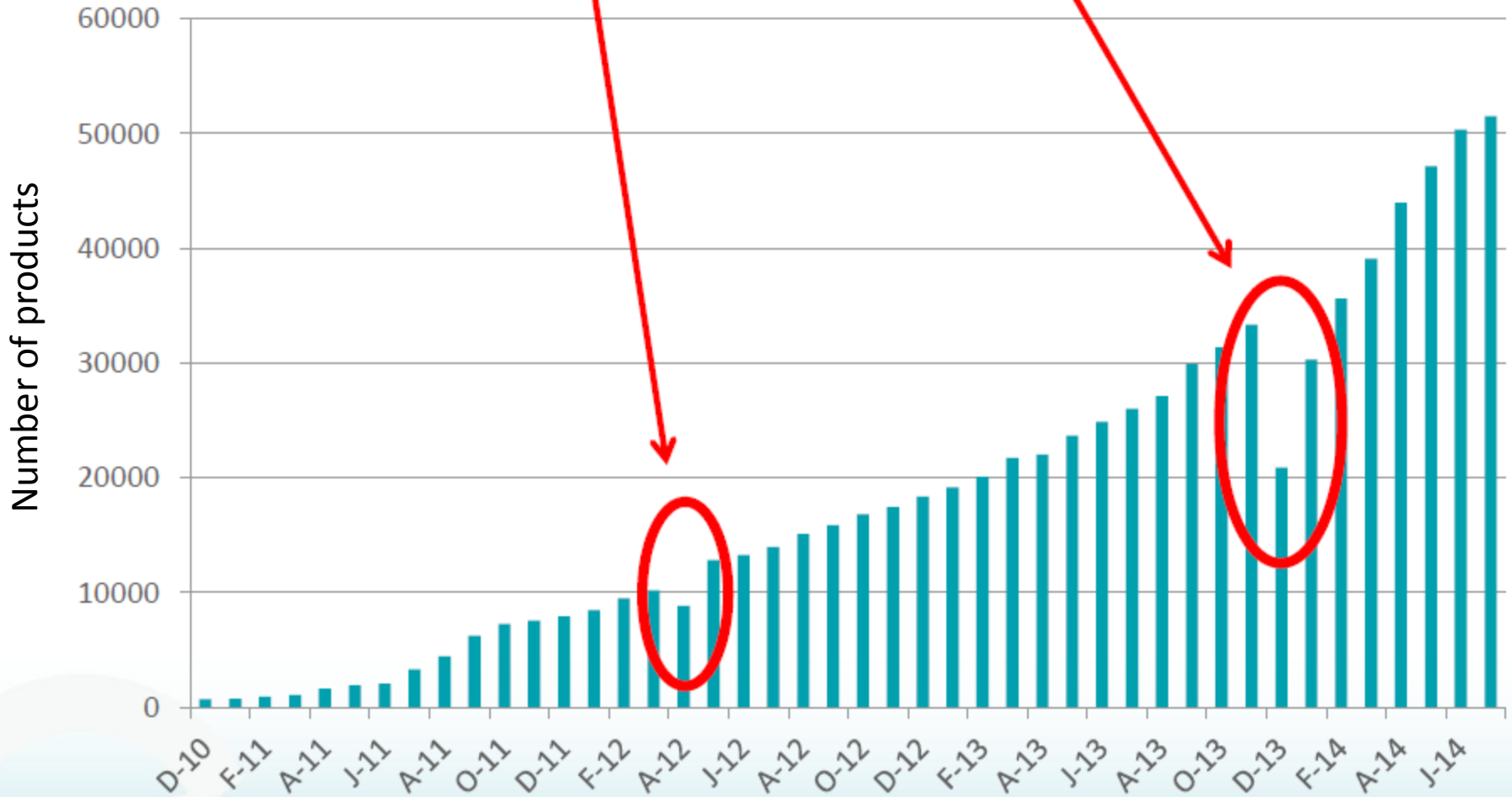
DOE report: "Solid-State Lighting: Early Lessons Learned on the Way to the Market" Published January 2014
http://apps1.eere.energy.gov/buildings/publications/pdfs/ssl/ssl_lessons-learned_2014.pdf

Growth in Lighting Facts products

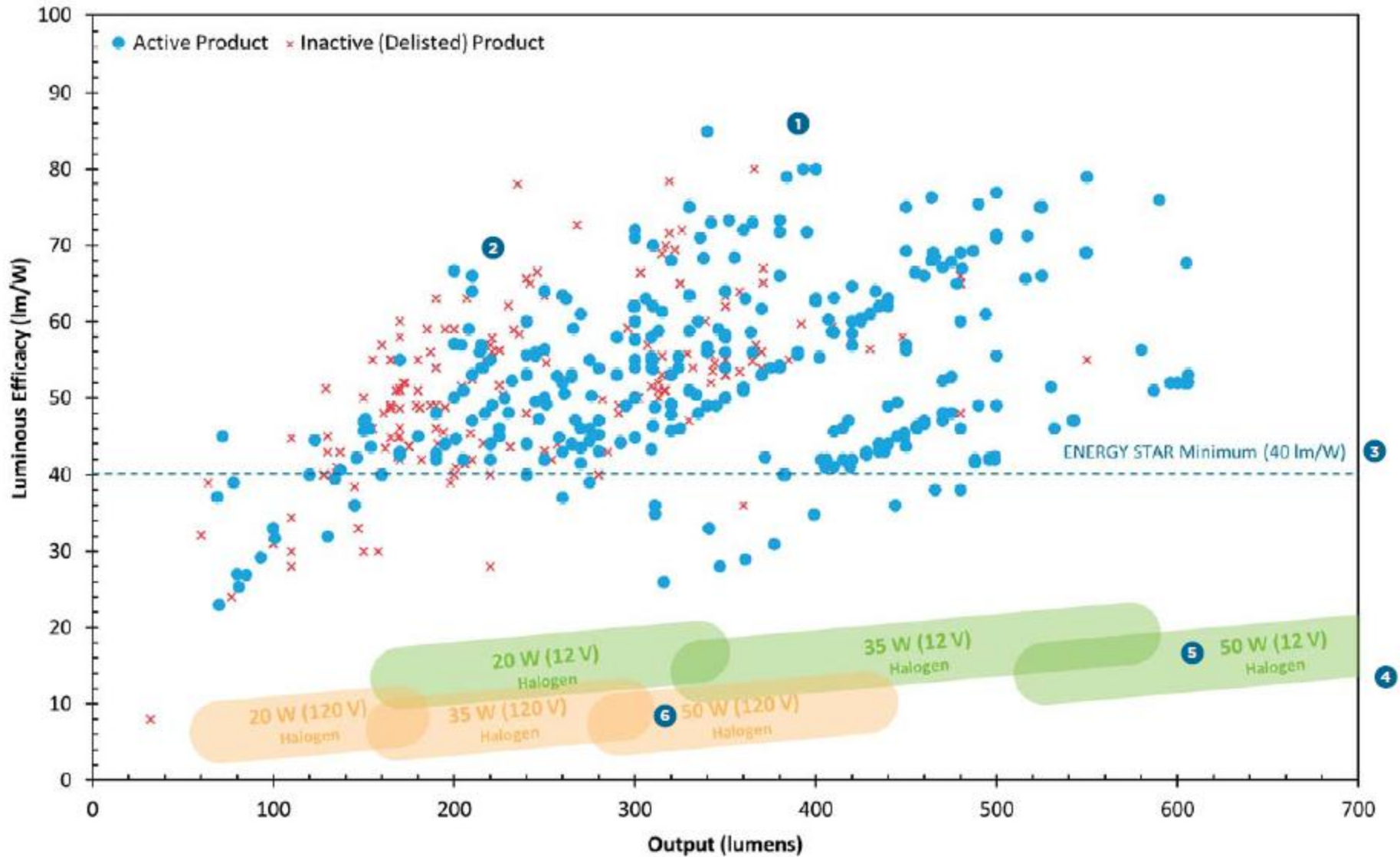


22730 on Feb 23, 2015

Specification Revision History



LED Lighting Facts – MR16 lamps



Big distribution!

http://apps1.eere.energy.gov/buildings/publications/pdfs/ssl/snapshot2014_mr16.pdf

Product lifetime

Dilemma: Products that last 25 years, but only last 18 months on the market.

Super design – in a super short time

Lighting field blown wide open by SSL.

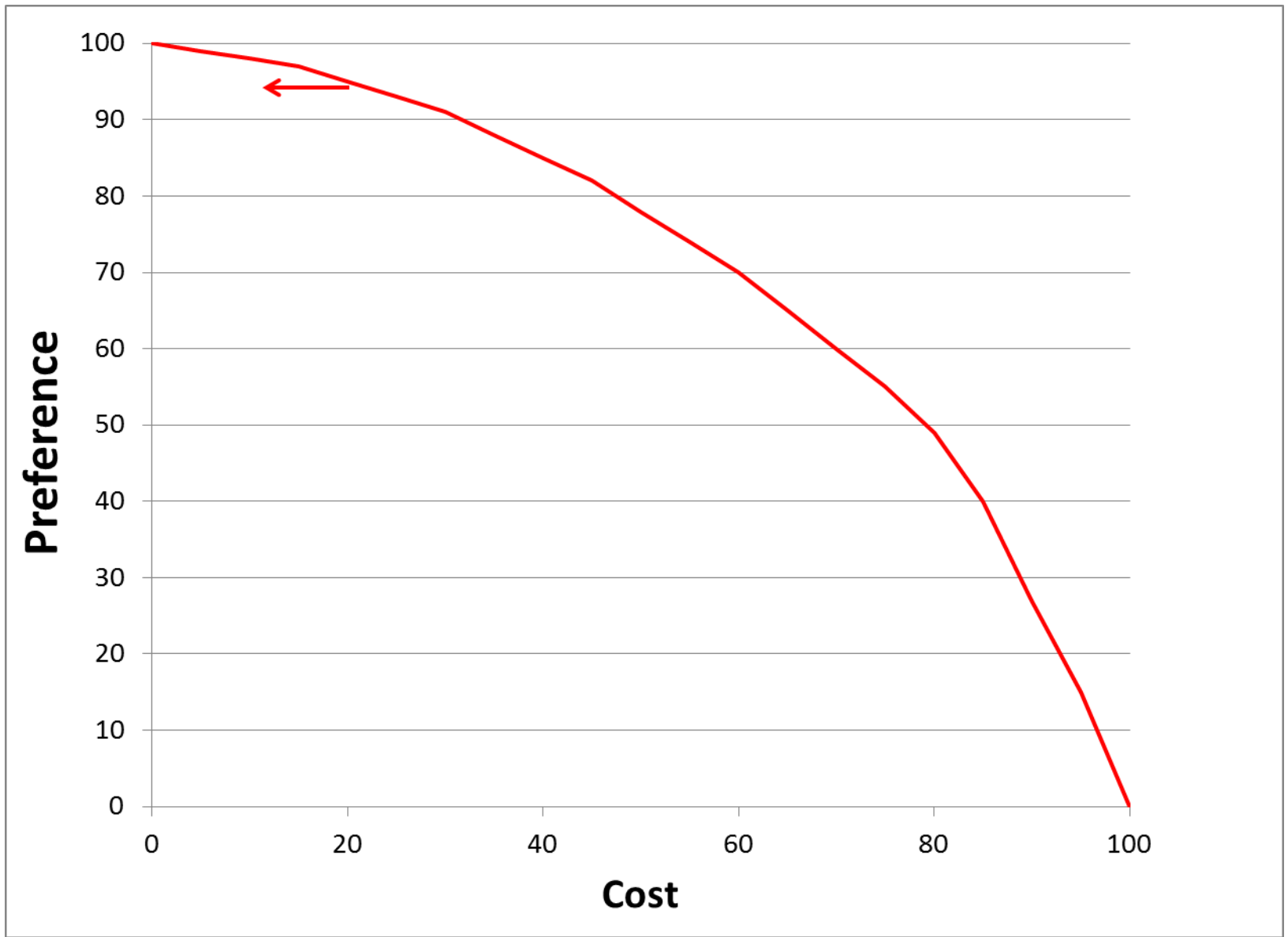
Lots of competitors → Fast pace

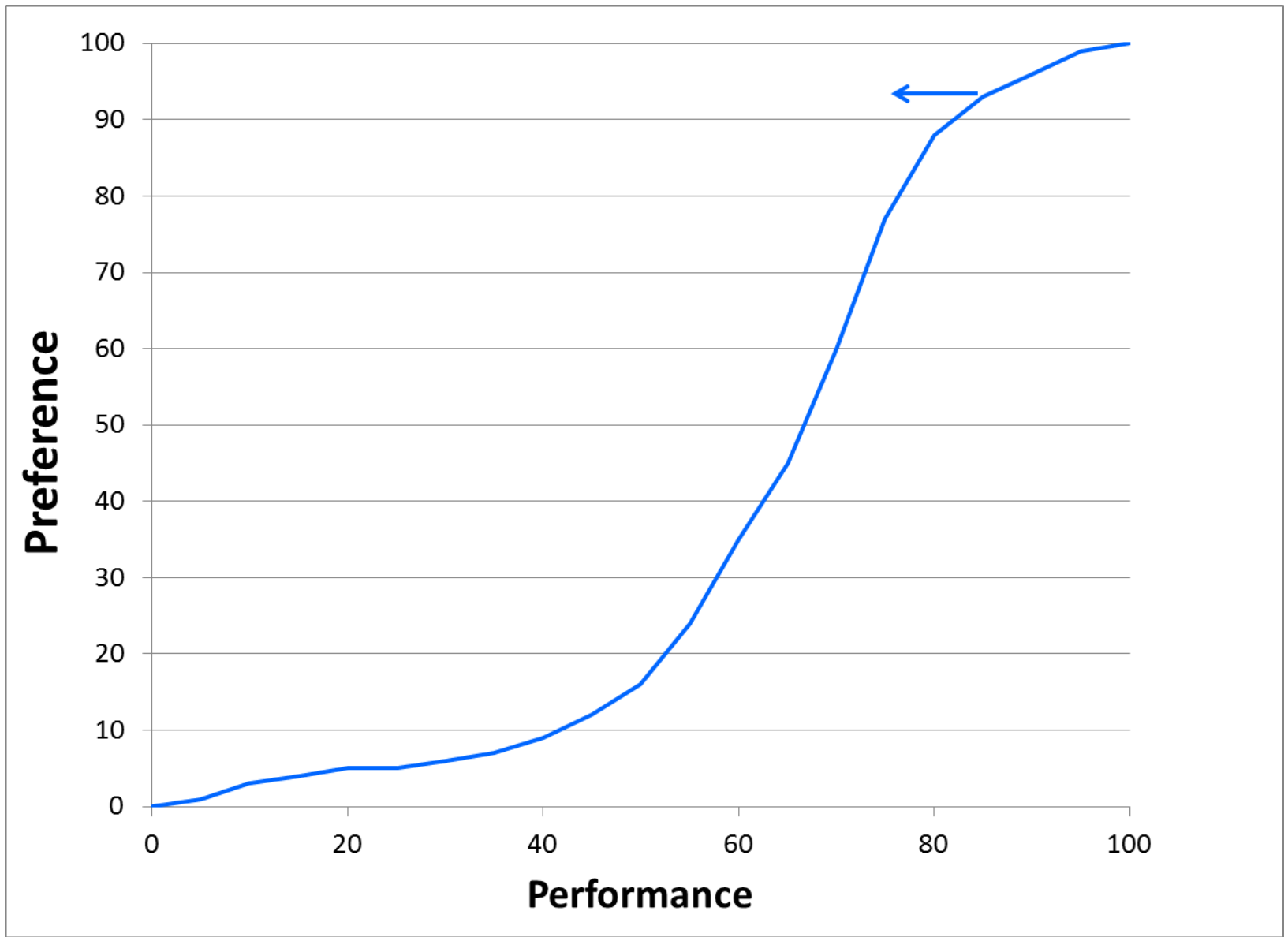
High expectations

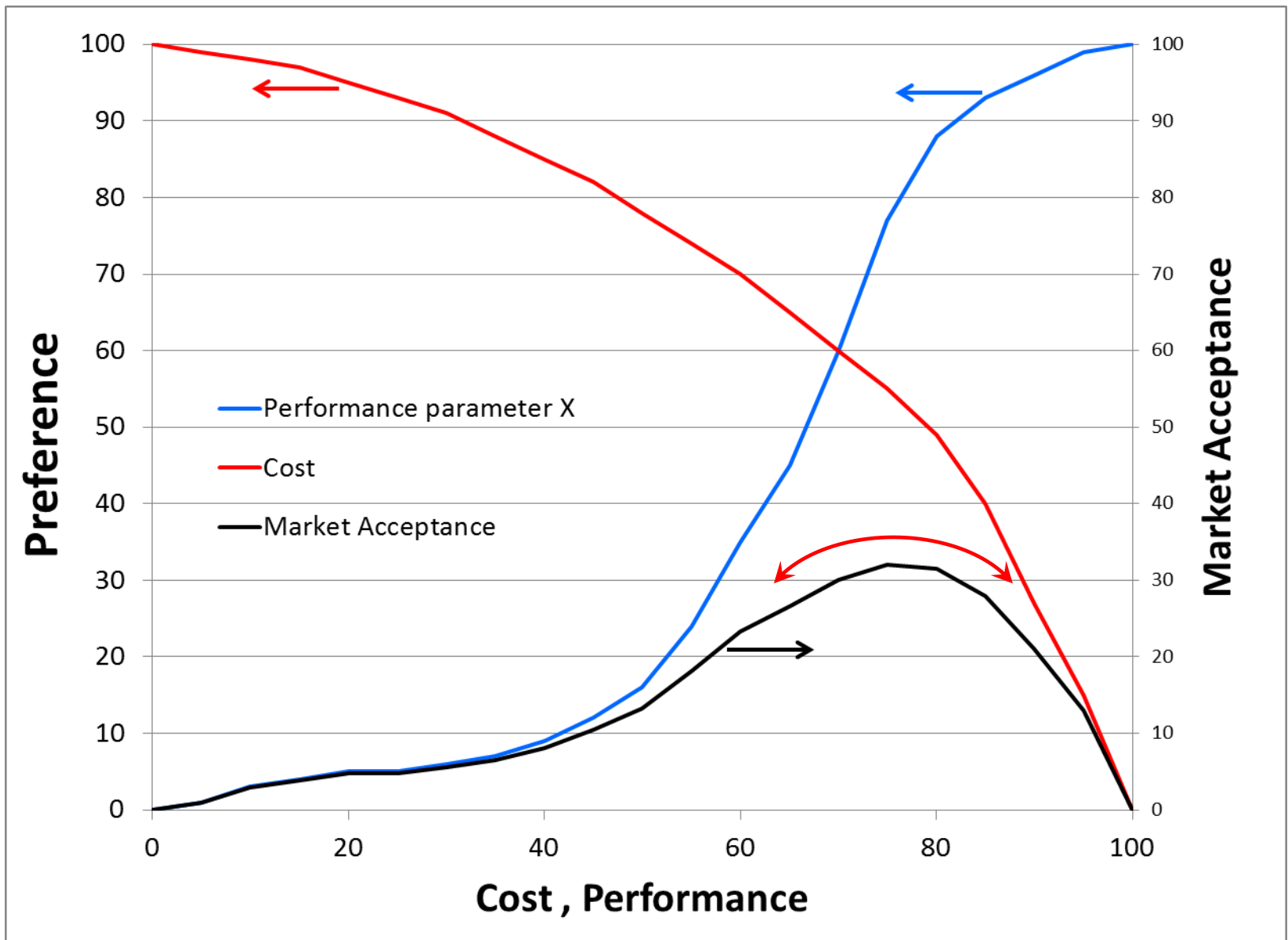


> 100 lm/W









Over-focus on performance is just as likely to hurt market adoption as over focus on cost.

New, wonderful LED technology!

But, we keep trying to imitate incandescent.

Why?



This *is* an LED Lamp!

Retrofit Lamps

Expectations for LED Lamp Market, Luminaires, etc

Retrofit will only last awhile – or will it?

Connected

Thermal

Force of habit/installed base/installation cost

Why do we still have screw-in CFLs?



Should building professionals even be promoting standard bulbs, or do new LED fixtures provide better savings?

...it depends...on the application

- Usage per day
- Installation cost
- Cost of electricity
- Desire for “new look”



- +Familiar
- +Easy installation
- +Lowest initial cost
- What if ballast dies?
- Luminaire efficiency



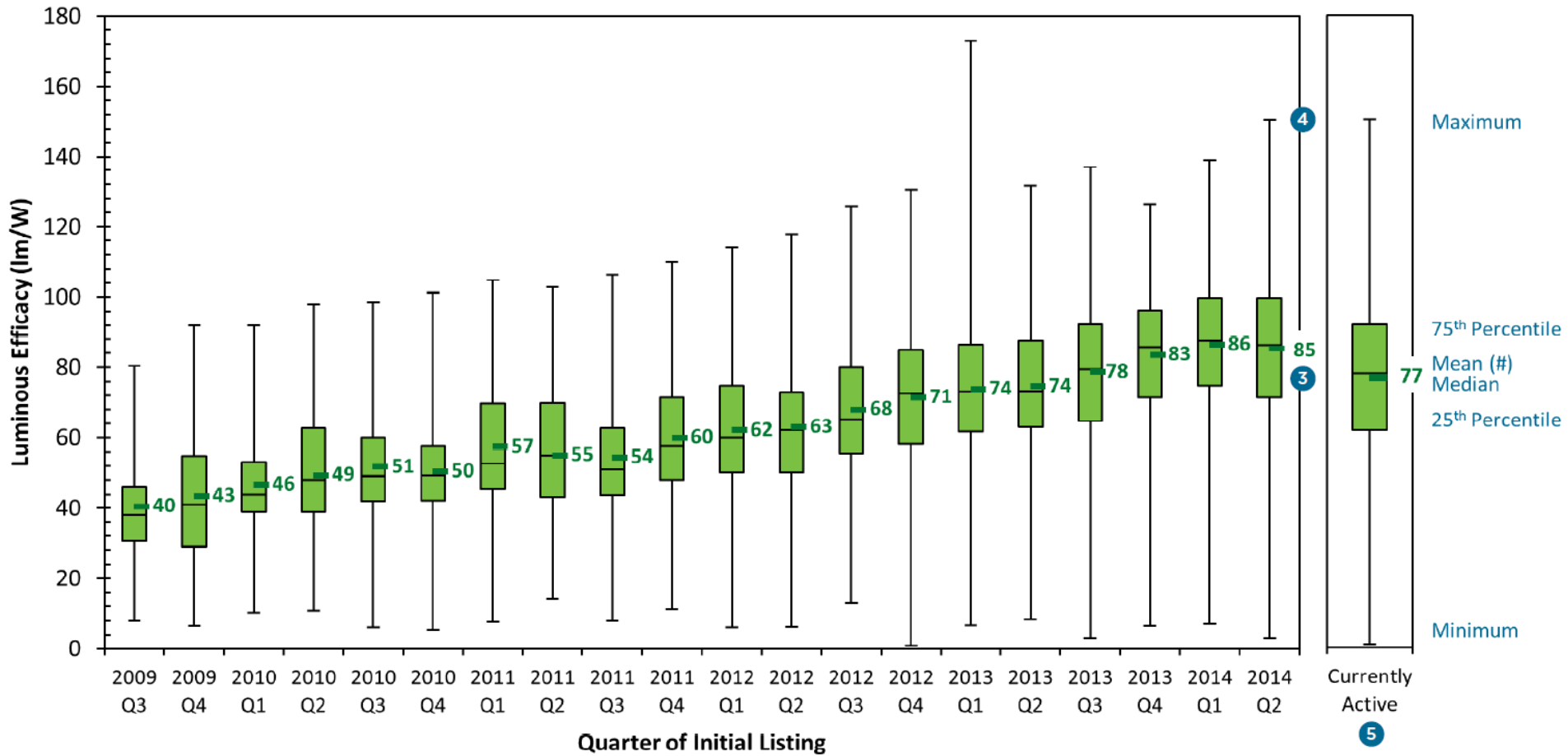
- +New look
- +Integrated sensing/controls option (?)
- ±Intermediate installation cost



Embedded controls in each luminaire combine presence detection and daylight dimming to save energy

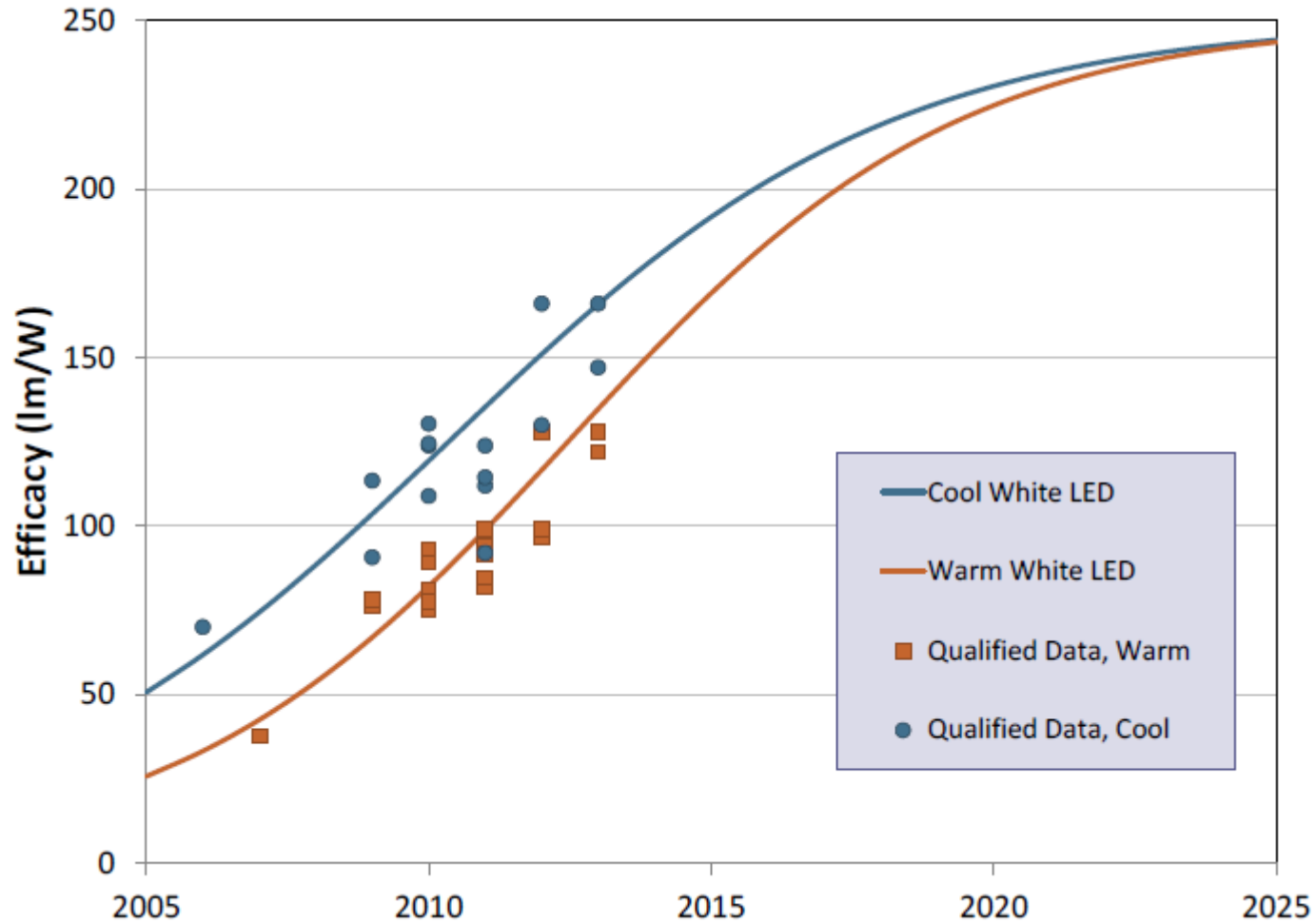
- +New look
- +Integrated sensing/controls option (?)
- Highest installation cost

Efficacy Improvement, according to Lighting Facts



How Efficient can SSL get?

DOE forecast, from May 2014 MYPP:



How Efficient can SSL get?

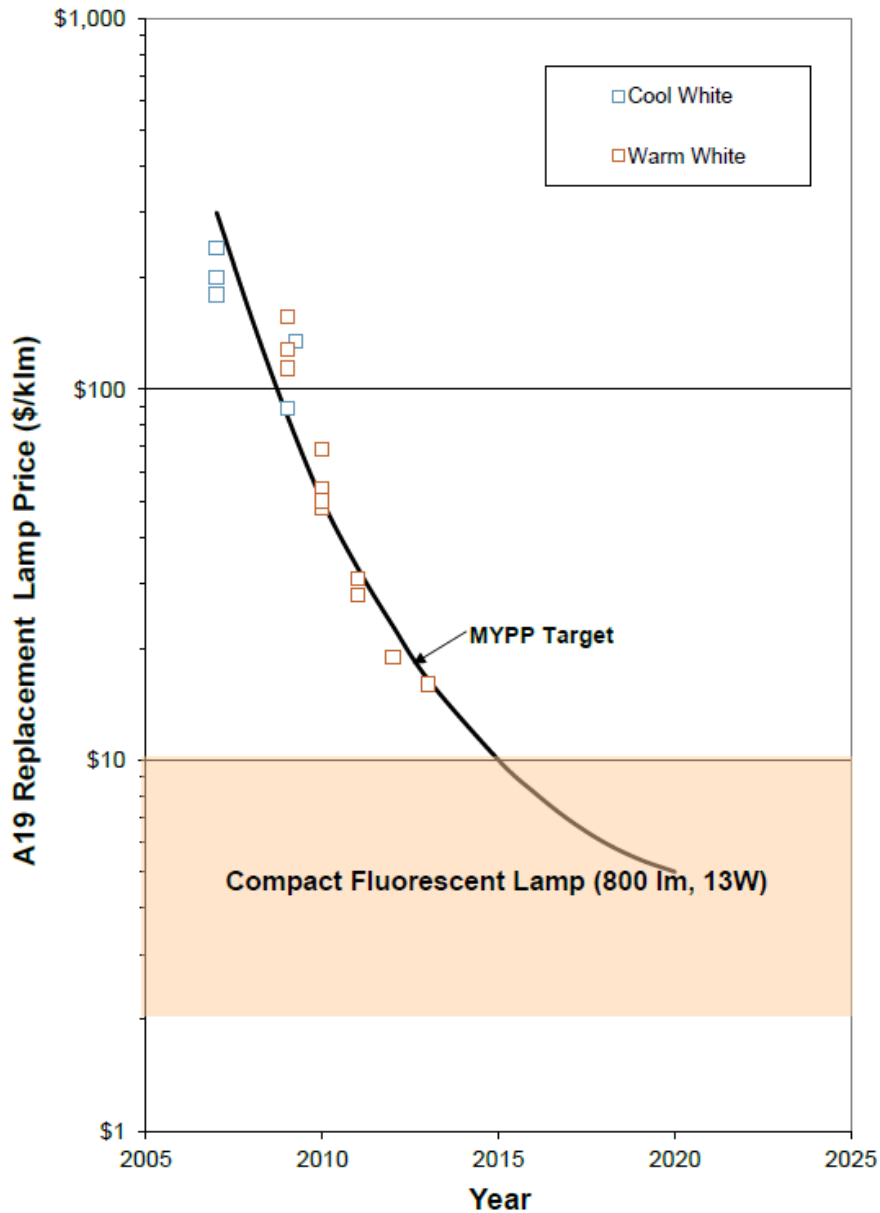
DOE forecast, from May 2014 MYPP:

TABLE 3.10 BREAKDOWN OF WARM-WHITE¹ LED LUMINAIRE EFFICIENCY PROJECTIONS

Efficiency Channel	2013	2015	2020	Goal
Package Efficacy Projection ² (lm/W)	135	169	225	250
Thermal Efficiency (increased T _{op})	86%	88%	93%	95%
Driver Efficiency	85%	87%	93%	96%
Fixture/Optical Efficiency	85%	89%	94%	96%
Electrical Efficiency (reduced I _{op})	115%	113%	109%	105%
Overall Luminaire Efficiency	71%	77%	89%	92%
Luminaire Efficacy ³ (lm/W)	96	130	200	230

Notes:

1. Warm-white packages and luminaires have CCT = 2580-3710K and CRI>80.
2. Package efficacy projections are for the warm-white, pc-LED, per Figure 4.1.
3. Luminaire efficacy is obtained by multiplying the resultant luminaire efficiency by the package efficacy.



DOE forecast, from May 2014 MYPP.

Several lamps can be bought for less than \$10 now (without rebate).

Effect of ability to direct light – efficacy isn't the only benefit

- Streetlights
- TLEDs
- MR's

Luminaire efficiency



High Pressure Sodium
Los Angeles' Hoover Street before ... Credit: Los Angeles Bureau of Street Lighting

LED
... and after the conversion to LED street lighting. Credit: Los Angeles Bureau of Street Lighting

Controls

An LED is a semiconductor diode.

Current → Light

Vary the current → vary the light

By controlling the current, we control the amount of light. Dimming is simple, *in principal*.

Complications:

- Phase cut dimmer compatibility
- Protocols (many – no clear winner)
 - Wired (Phase cut, 0-10V, DALI, DMX)
 - Wireless (Zigbee x 12, WiFi, 6LoWPAN, Z-Wave, Insteon, Bluetooth, proprietary systems)

Everyone wants to avoid a repeat of the CFL “failure” in the market.

DOE publication:

Solid-State Lighting: Early Lessons Learned on the Way to Market

<http://energy.gov/eere/femp/articles/new-report-early-lessons-learned-bringing-ssl-market>

They also list 12 lessons/cautions about things that could still go wrong.

Lesson 1: Rigorous testing requirements adopted in the early days of SSL industry development were necessary to counter exaggerated claims of performance by some manufacturers, but they eventually led to unreasonably high testing costs

Lesson 2: Despite the promise of long life, there is no standard way to rate the lifetime and reliability of LED products

Lesson 4: The range of color quality available with LED-based products and the limitations of existing color metrics may confuse users

Lesson 5: The color delivered by some LEDs shifts over time, enough to negatively impact adoption in some applications

Lesson 9: Greater interoperability of lighting control components and more sensible specifications of lighting control systems are required to maximize the energy savings delivered by LED-based sources



CFL lamps – what went wrong?

Poor start in the market:

- Color variation too large
- Color quality (CRI) poor
- Slow start up
- Heavy
- Bulky, won't fit in fixtures
- Life not as long as expected
- Flicker (magnetic ballasts)
- Poor or no dimming
- Noise
- Cost too high
- New light quality parameters that public does not understand (CCT, CRI)



Result:

- The public was turned off early

Additional complications:

- CA Utilities selected low quality CFLs for massive rebate programs, perpetuating poor impressions, and giving manufacturers the wrong message about what products they should make.

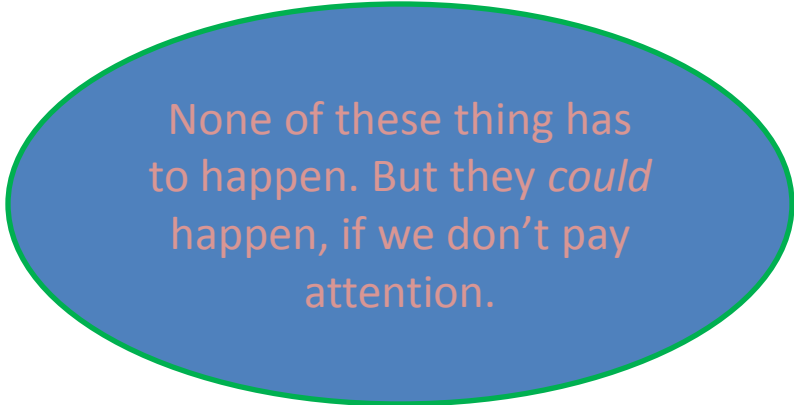
The public has a long memory.

LED lamps – what might go wrong?

- Color variation too large
- Color quality (CRI) poor
- ~~Slow start up~~
- ~~Heavy~~
- ~~Bulky, won't fit in fixtures~~
- Life not as long as expected
- Flicker
- Poor dimming
- Noise
- Cost too high
- New light quality parameters that public does not understand (CCT, CRI)

DOE has done a good job to understand the problems with CFL, and take steps to avoid them with LED.

- CALiPER program
- Gateway program
- Product performance testing and reporting
- Funded performance improvement research



None of these things has to happen. But they *could* happen, if we don't pay attention.

Lessons from California

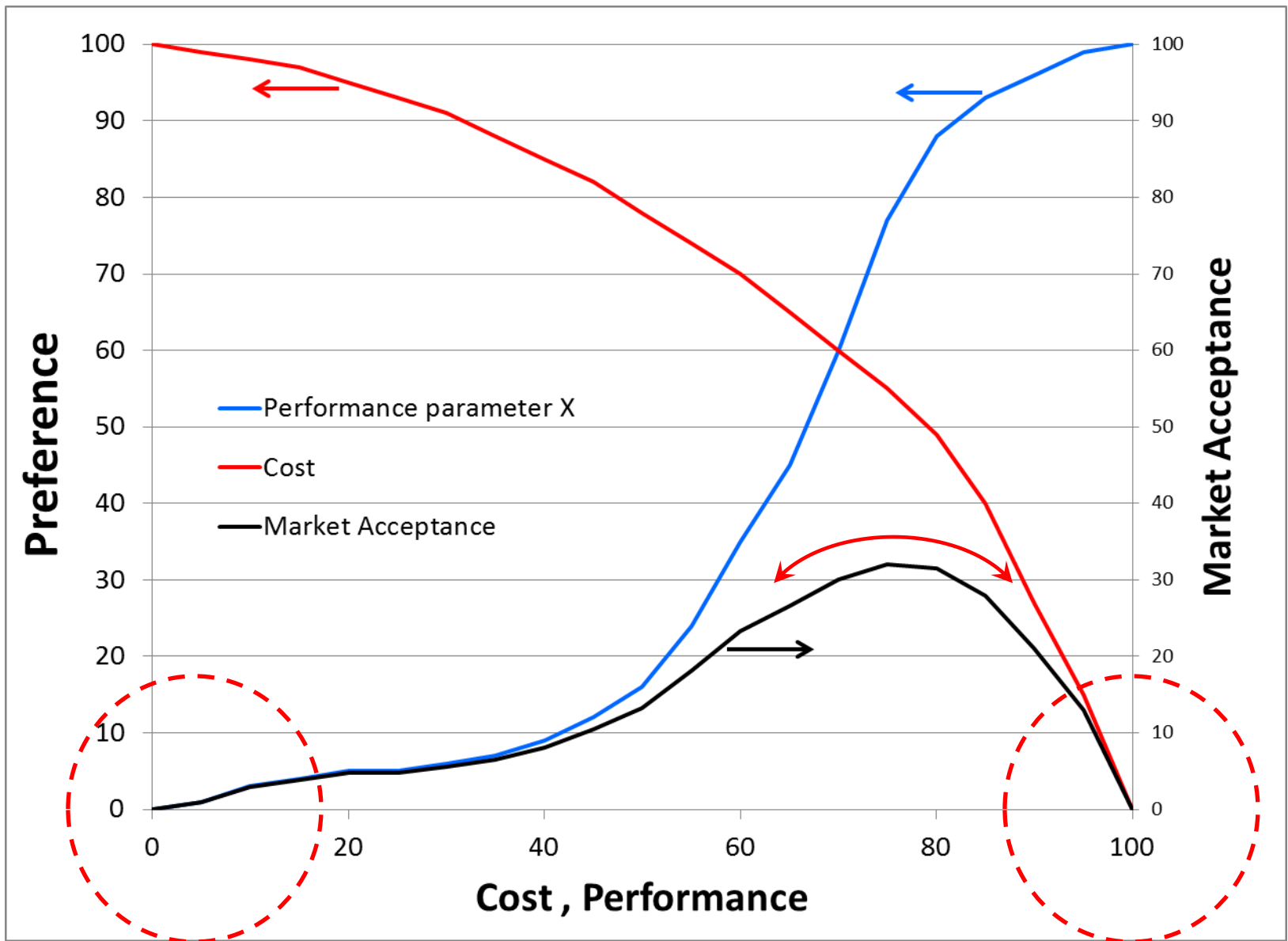
CFL: CA sold (and rebated) many CFLs that were not Energy Star and had CRI's that were around 65. Customer perception and adoption are likely to be based on these low performance CFLs.

Philosophy: **“Give it to ‘em cheap and they’ll learn to love the light”**

Nearly all of these problems have been corrected, but it took two decades, and CFLs still don't do well.

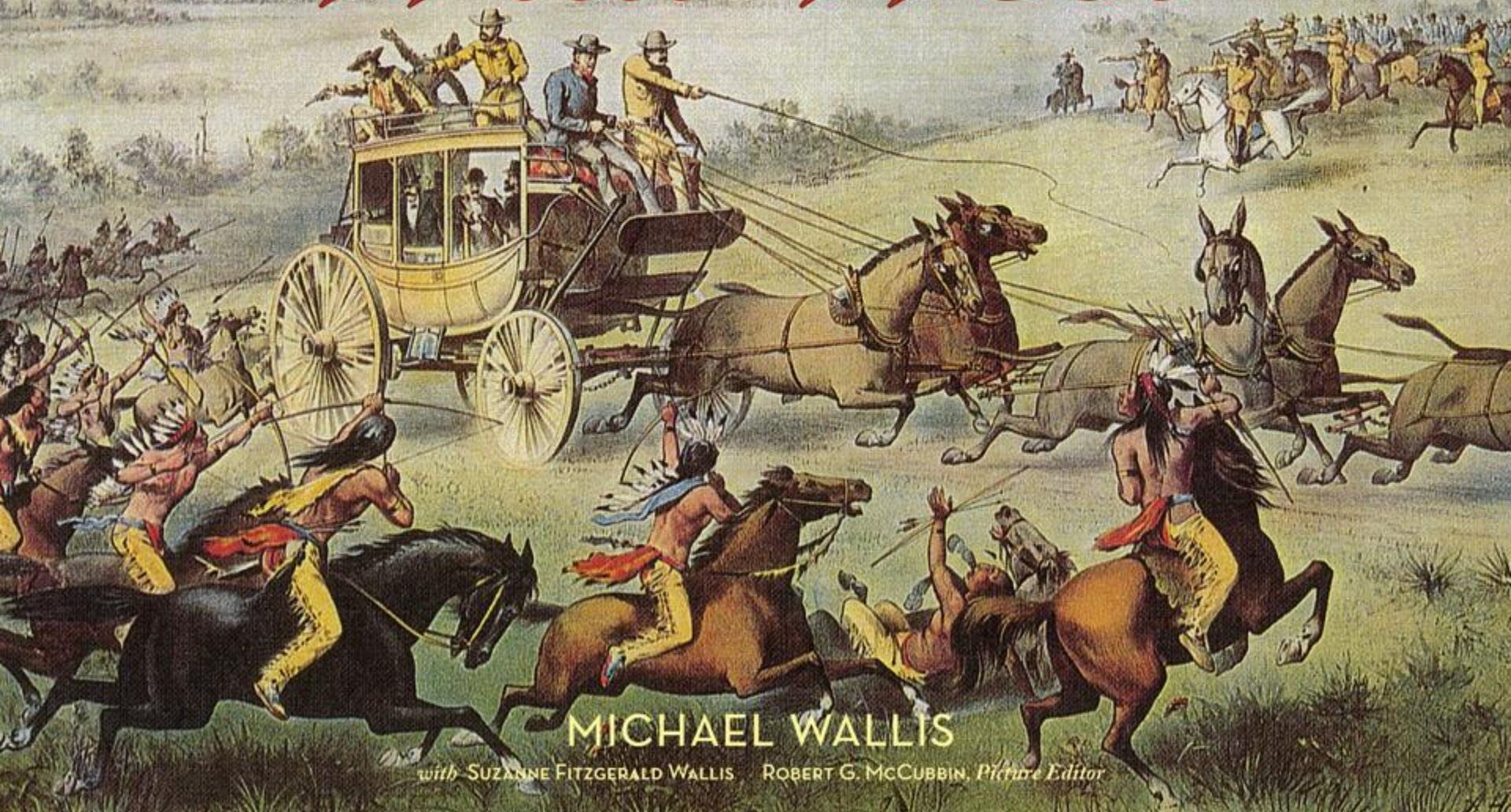
LED: CA realizes that their policy with CFL failed. New policy: The California Quality LED Lamp Specification and Title 20/24.

Philosophy: **“Give it to ‘em just like an incandescent and they’ll learn to love paying for it”**



Over-focus on performance is just as likely to hurt market adoption as over focus on cost.

the Wild West 365



MICHAEL WALLIS

with SUZANNE FITZGERALD WALLIS ROBERT G. McCUBBIN, *Picture Editor*

counter-intuitive chaotic tension

High power, high light-output light sources are the last places that LED will go

- Streetlights

Troffer luminaires belong to OLEDs

LED Lamps cost \$50 and you're telling me they'll be less than \$10 when?

Fred Davis

Jim Gaines

Taylor Jantz-Sell



This concludes The American Institute of Architects
Continuing Education Systems Course

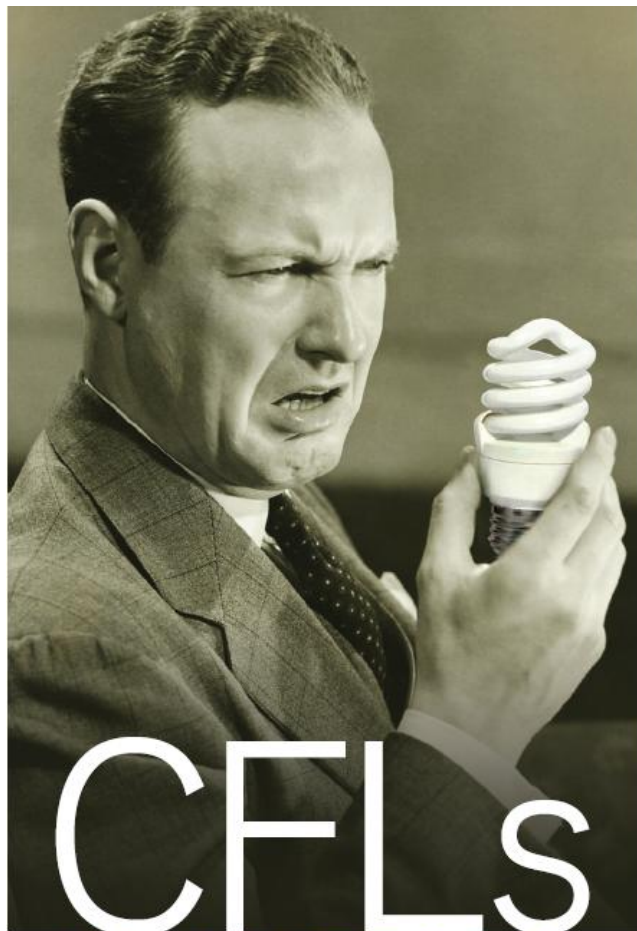


LEDing the Lighting Revolution Part 1: How Many Light Bulbs Will it Take?

Thursday, March 05, 2015

10:30 am to 12:00 pm

- In the past year, the best LED lamps have pushed efficiency significantly upwards.
- Years into the incandescent phase-out, is LED technology living up to its promise?
- Why are some approved LED lamps still less efficient than a cheap CFL?
- What are industry leaders doing to maximize mainstream adoption?
- What should we expect in pricing?
- And should building professionals even be promoting screw-in bulbs, or do new LED fixtures provide better savings?



CFLS

IN AMERICA:

LESSONS LEARNED ON
THE WAY TO MARKET

BUILDING TECHNOLOGIES OFFICE

Solid-State Lighting: Early Lessons Learned on the Way to Market

January 2014

“Actions by DOE, voluntary energy-efficiency programs, and standards organizations have helped the U.S. market to avoid some problems with early SSL products. Standardized testing, minimum performance and reporting requirements, and publication of testing and demonstration results have made it more difficult for poor-performing products to remain on the market, and rewarded manufacturers whose products perform well.”

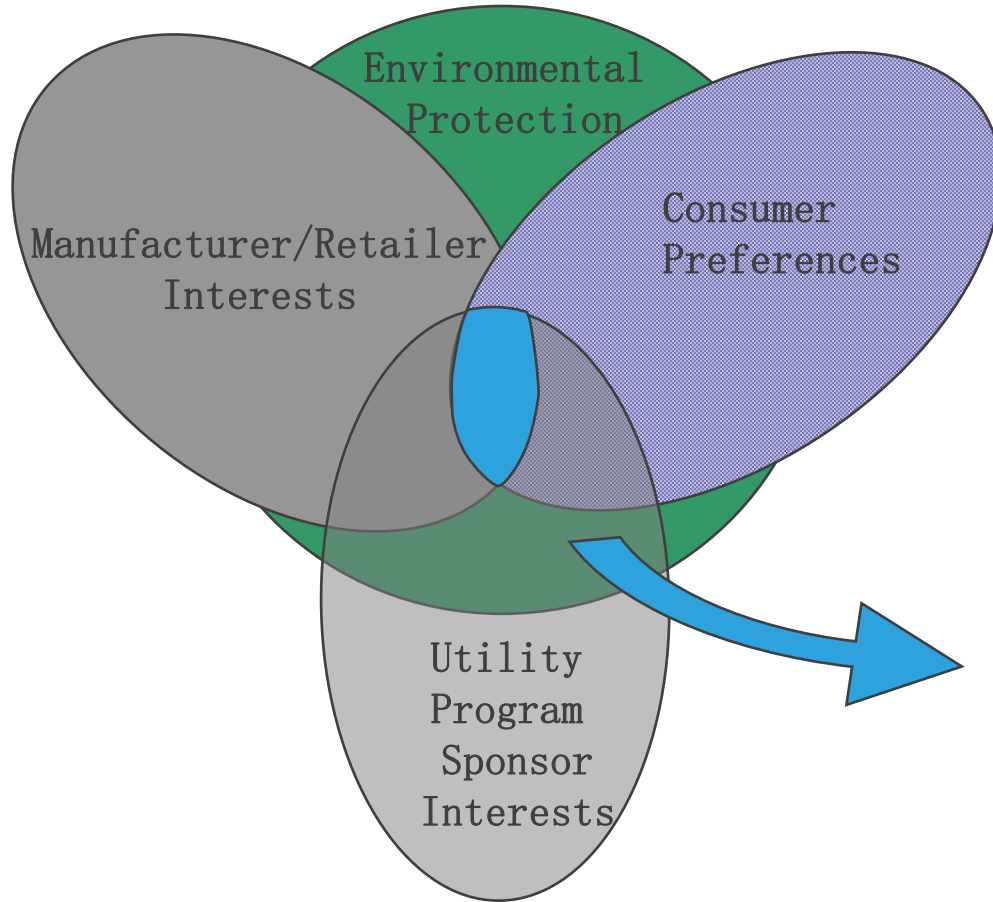


What is ENERGY STAR?

- Created by the U.S. Environmental Protection Agency in 1992 to reduce greenhouse gas emissions
- Voluntary product certification and labeling program
- Products that have earned the ENERGY STAR label meet **strict energy efficiency & performance guidelines** set by the US EPA with **open and broad stakeholder engagement**



Builds Upon Intersection of Interests

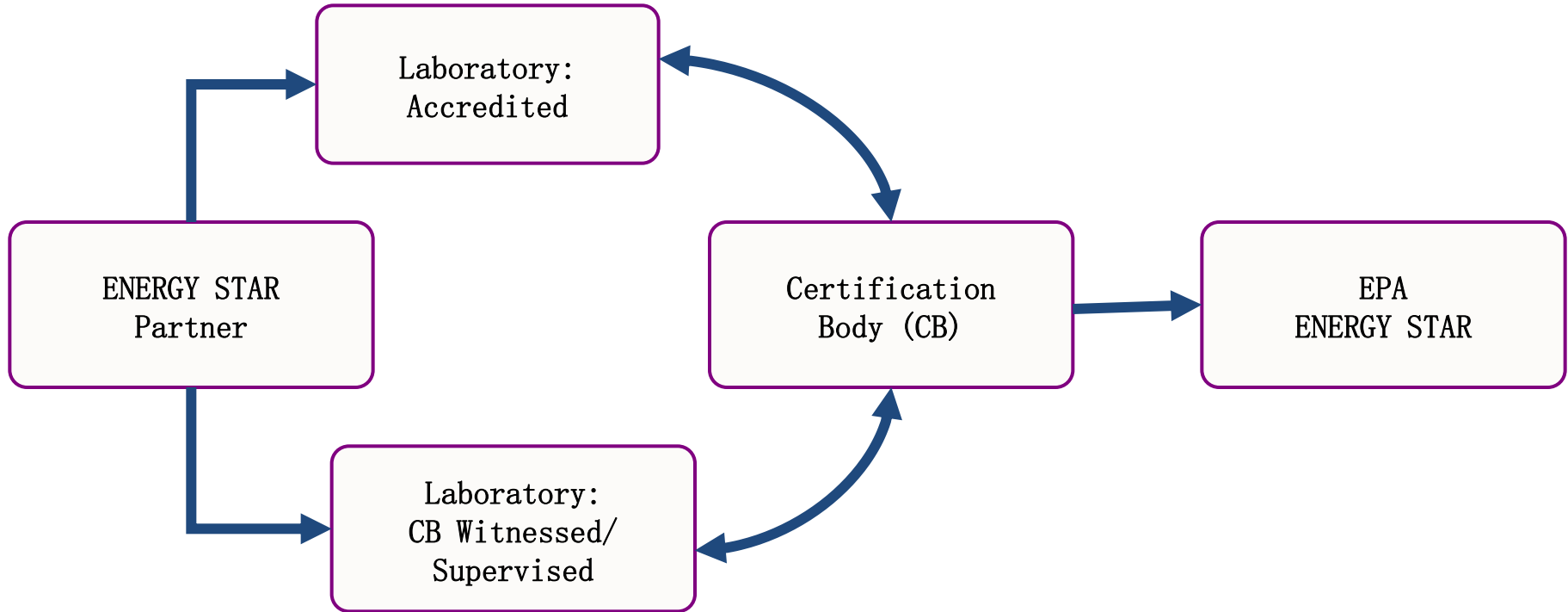


Cost-effective
No sacrifice
in performance
Gov't backed

Consumer is Key

ENERGY STAR

Product Certification Process



ENERGY STAR Certification for Lighting Products

- More than just efficiency
- Designed to ensure quality and performance consumers expect:
 - Minimum warranty requirement
 - 6 different requirements for color to ensure quality up front & over time
 - Light output and distribution requirements
 - Size and shape requirements for light bulbs
 - Long term high heat testing & rapid cycling
- ENERGY STAR third-party **certification and verification testing** help confirm **delivery on performance**

ENERGY STAR Lighting

Residentially focused scope: Not all inclusive

Energy saving replacements for the most common residential light bulbs

Eligible to Earn the ENERGY STAR	NOT Eligible to Earn the ENERGY STAR
General purpose CFL and LED lamps	Linear fluorescent lamps and their solid state retrofits
Accent lights (line-voltage and directional track lights)	High bay fixtures and recessed troffers
Down lights: recessed, pendant, surface-mounted, solid state retrofit kits	Outdoor street and area lighting: wall packs, garage, canopy lighting and wall packs
Wall sconces, chandeliers, bath vanities, ceiling and close-to-ceiling mount, floor and table lamps	Signage of any type, including EXIT signs and channel letter backlighting systems
Under cabinet or shelf-mounted task lighting	Linear fluorescent pendants
Ceiling and ventilation fans with lighting	Party or entertainment lighting
Portable desk task lights	Adapters or converters



ENERGY STAR Lamp Specification

- Important but lesser known requirements
 - If it looks like a general purpose A lamp it has to act like one – omnidirectional light distribution requirements and strict



guidelines for equivalency claims

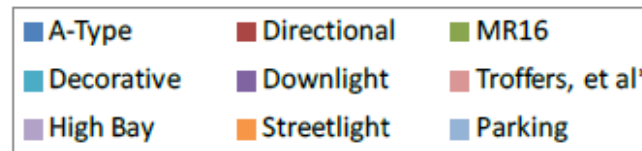
Long term elevated temperature testing to ensure bulbs perform as expected in higher temperature scenarios, e.g. recessed can,



How Many Bulbs Will it Take?

Remaining potential for bulbs is HUGE:

- A-Type
 - 3 billion sockets
- Directional
 - 240 million
- MR16
 - 46 million
- Decorative
 - 1.2 billion



*Includes other common fluorescent fixtures

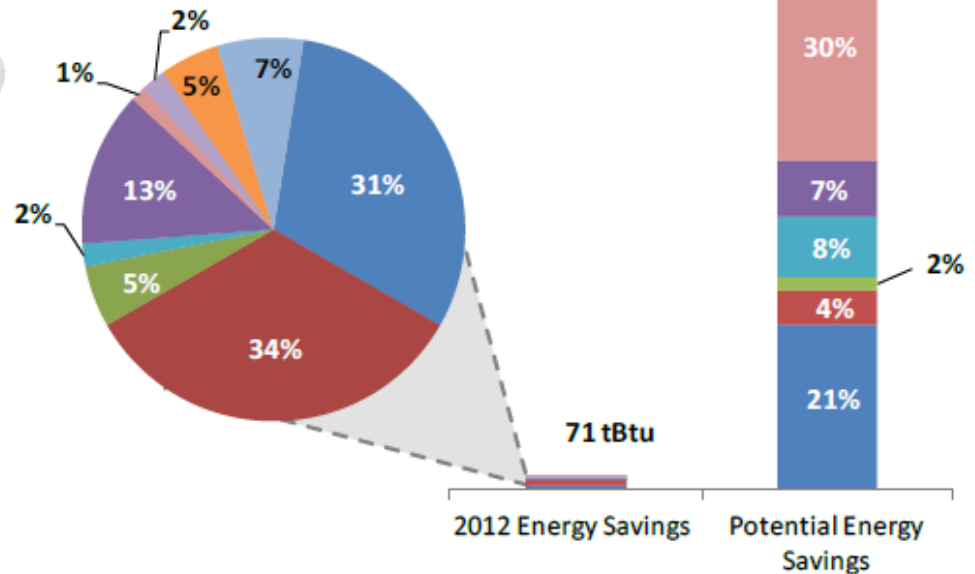
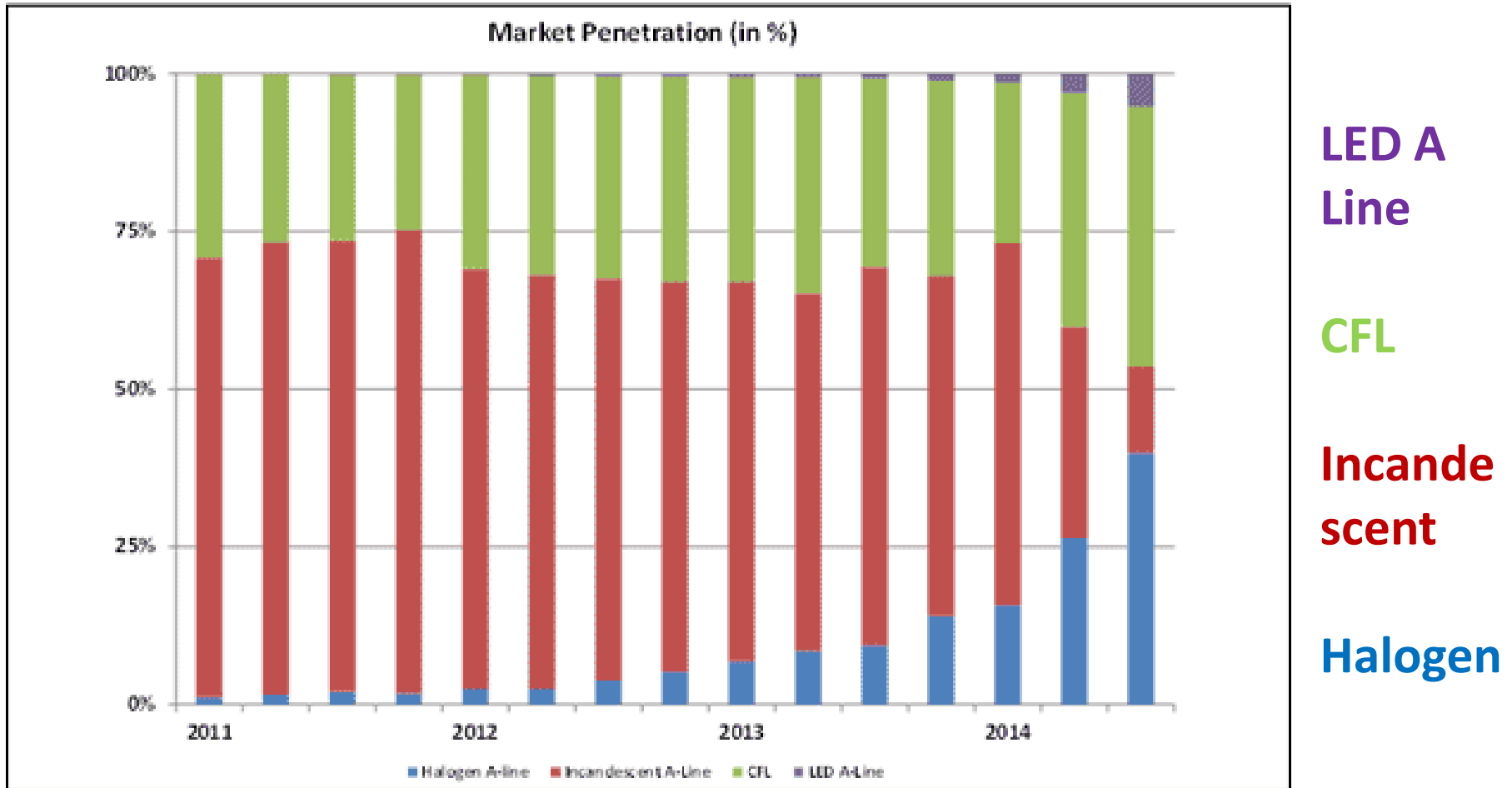


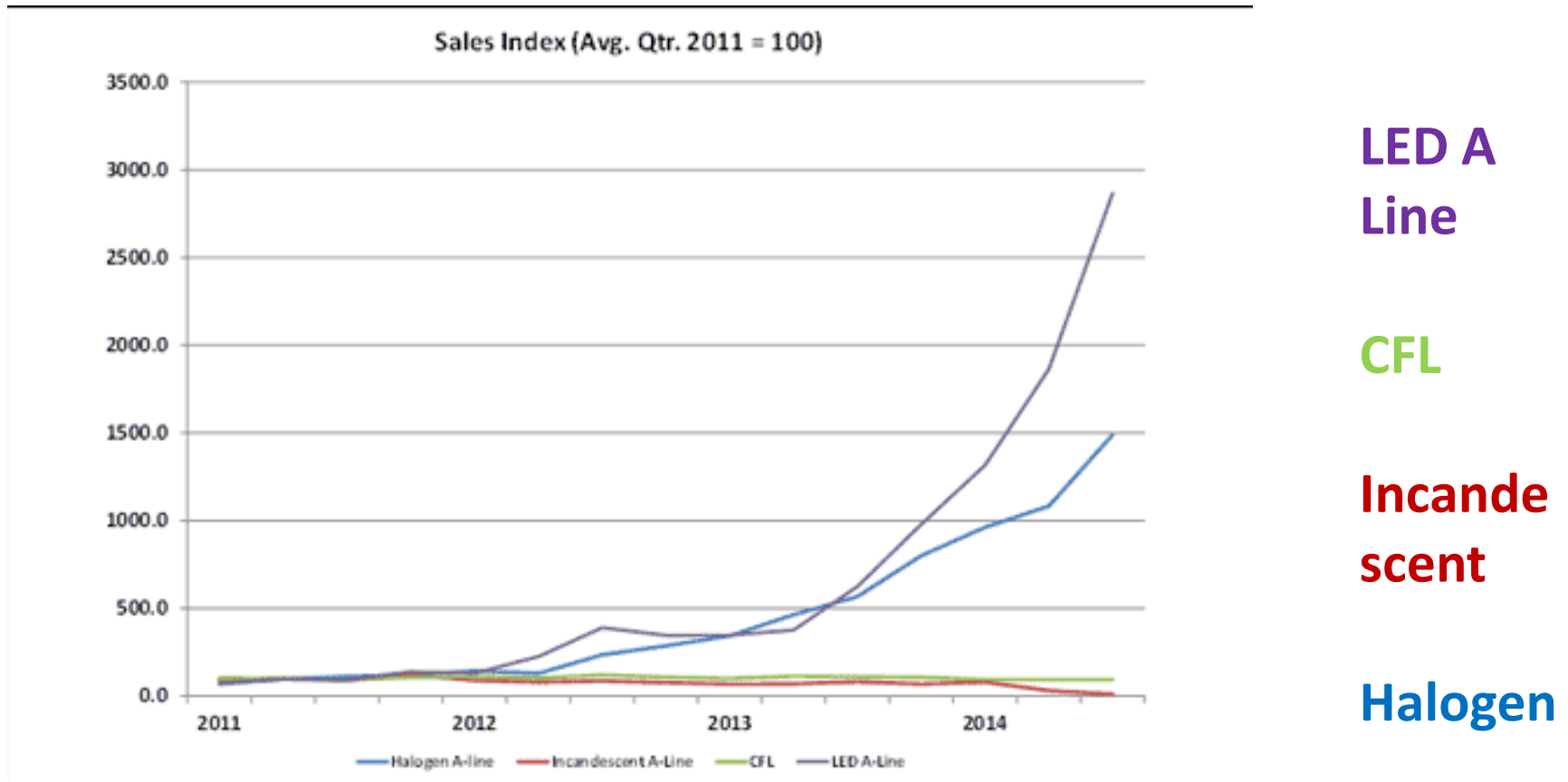
Figure ES.1 – Comparison of Current and Potential Source Energy Savings

A lamp Shipments up to Q3 2014



Source: NEMA (U.S. association of electrical equipment and medical imaging manufacturers) <http://www.nema.org/news/Pages/Compact-Fluorescent-Lamp-Shipments-Continue-to-Lag.aspx>

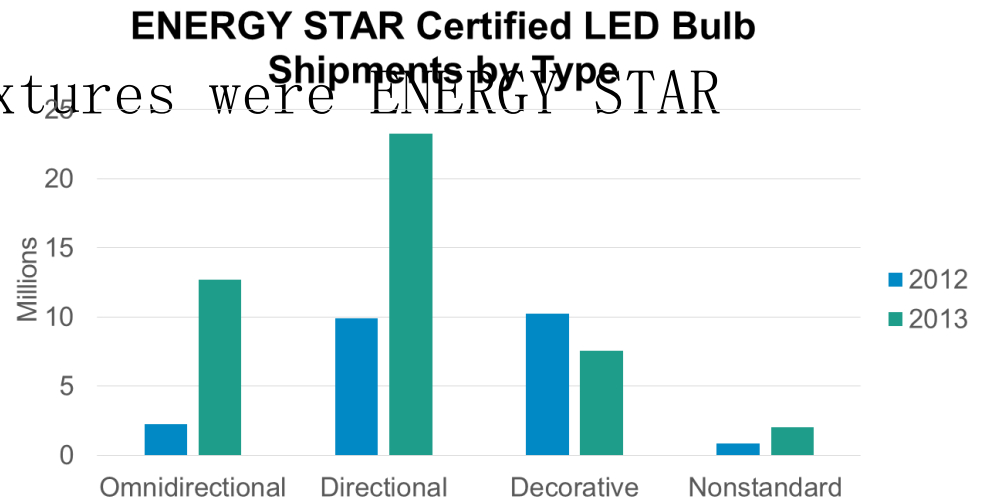
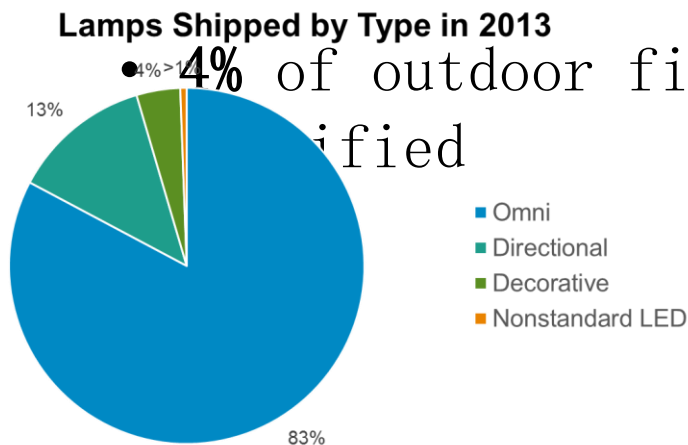
A lamp Shipments up to Q3 2014



Source: NEMA (U.S. association of electrical equipment and medical imaging manufacturers) <http://www.nema.org/news/Pages/Compact-Fluorescent-Lamp-Shipments-Continue-to-Lag.aspx>

ENERGY STAR Shipments from 2013

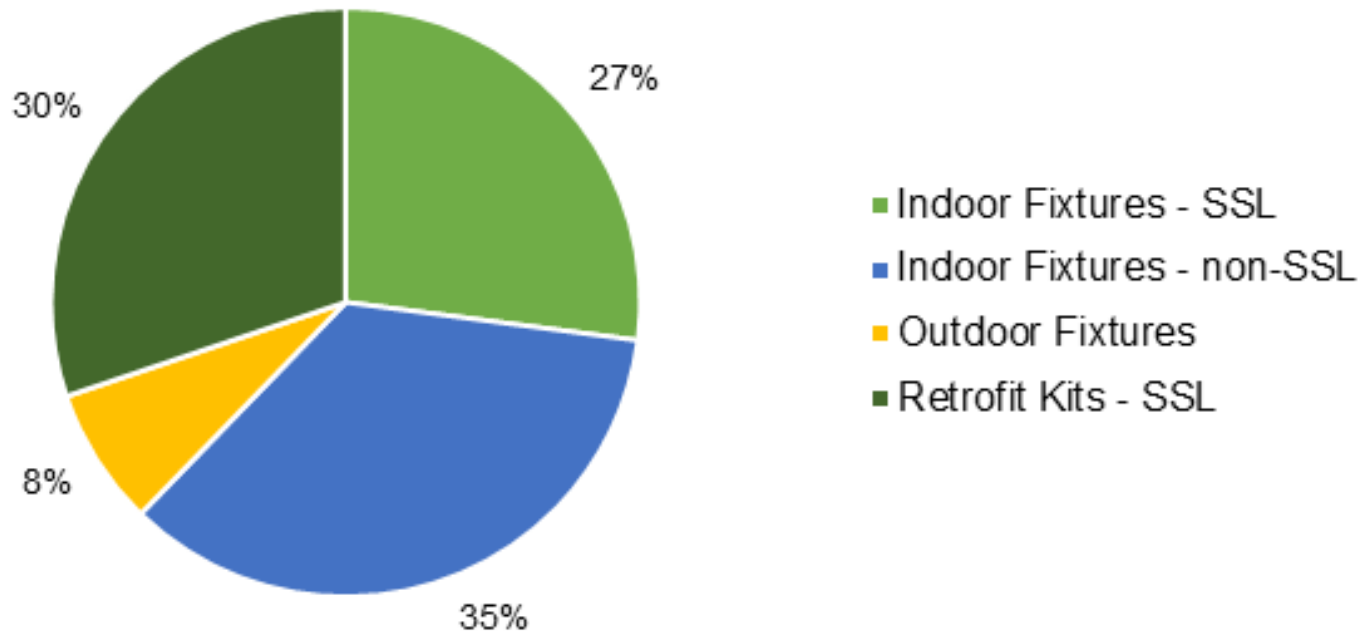
- ❖ 18% of light bulbs shipped in 2013 were ENERGY STAR certified – more than 350,000,000 units
 - 83% of CFLs were ENERGY STAR certified
 - 76% of LED bulbs were ENERGY STAR certified
 - 13% of indoor fixtures were ENERGY STAR certified

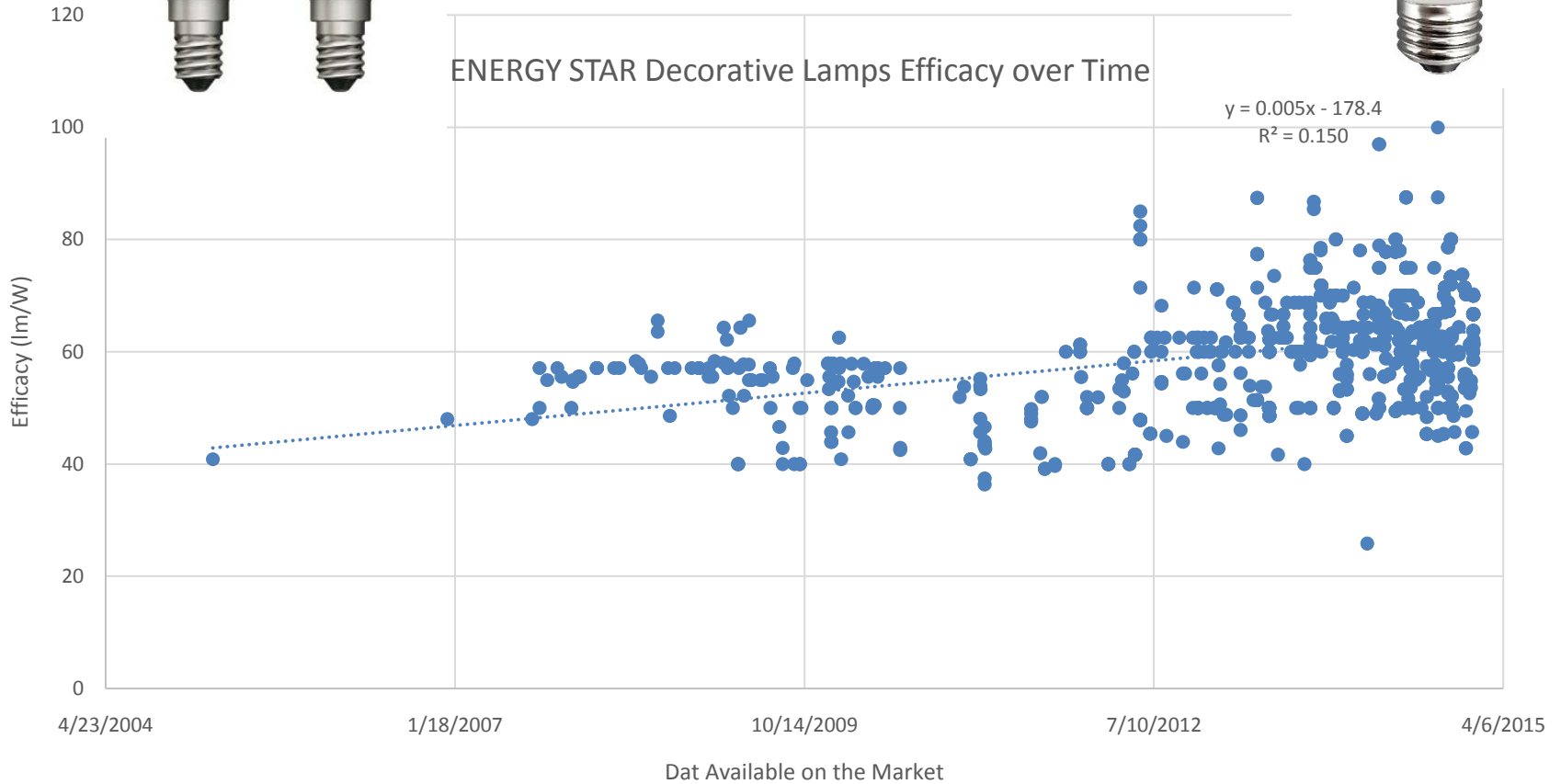


4% of outdoor fixtures were ENERGY STAR certified

ENERGY STAR Fixture Shipments

Luminaires Shipped by Type in 2013

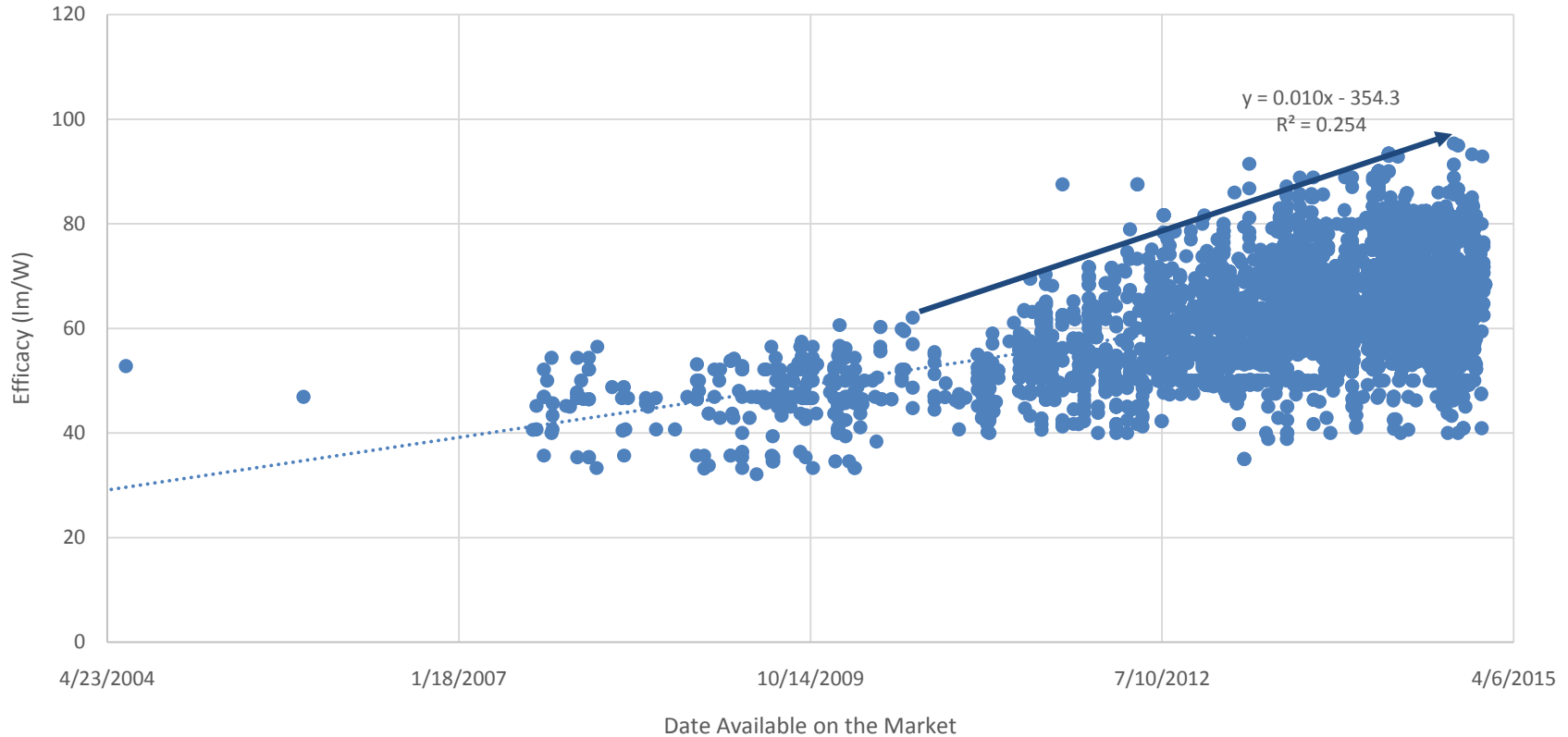




- Average increase of 2.117 lm/W per year.



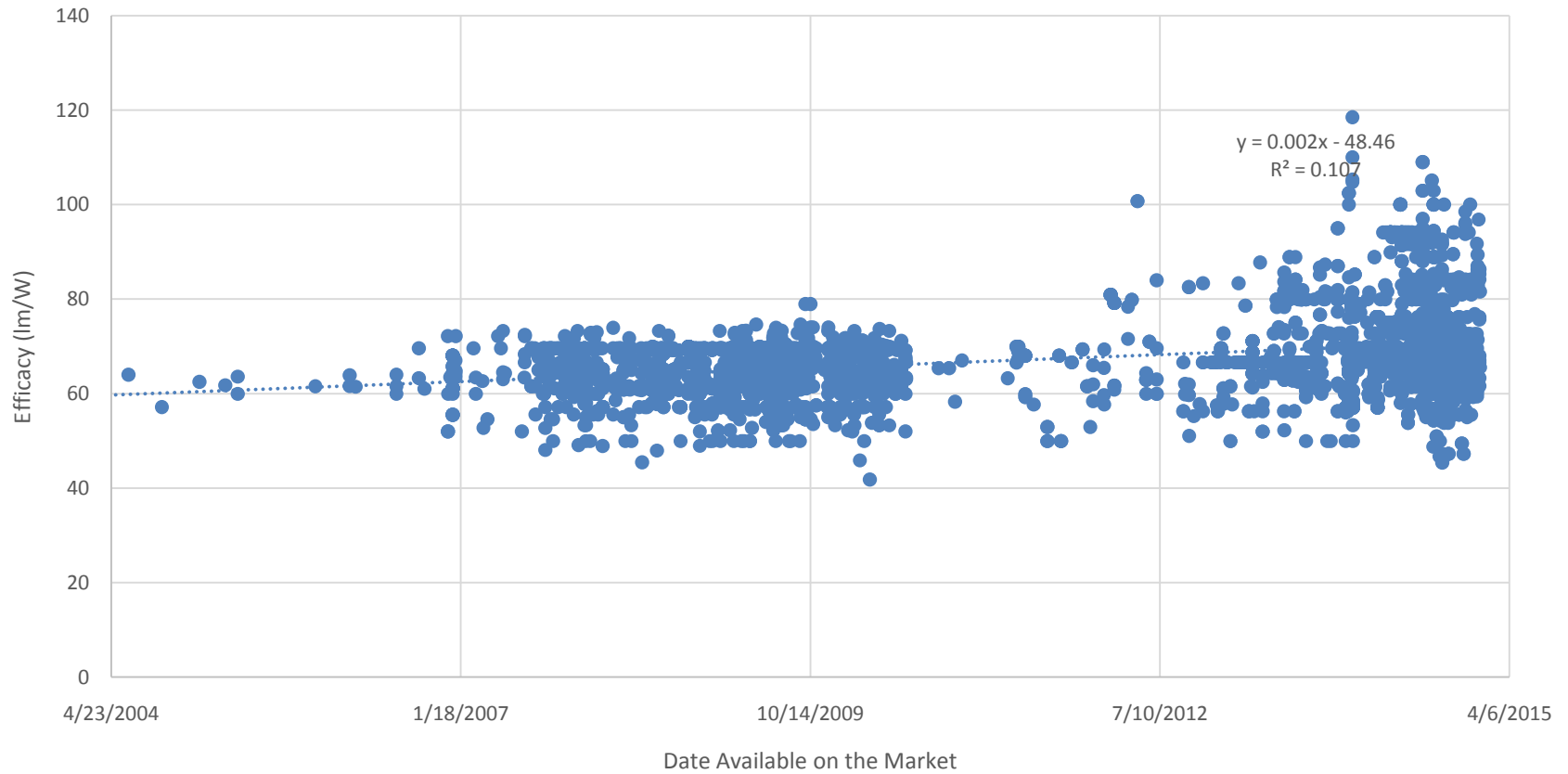
ENERGY STAR Directional Lamps



- Overall trend, 3.65 lm/W per year.
- Recent trend in maximum efficacy, increasing by close to 10 lm/W per year since 2011.

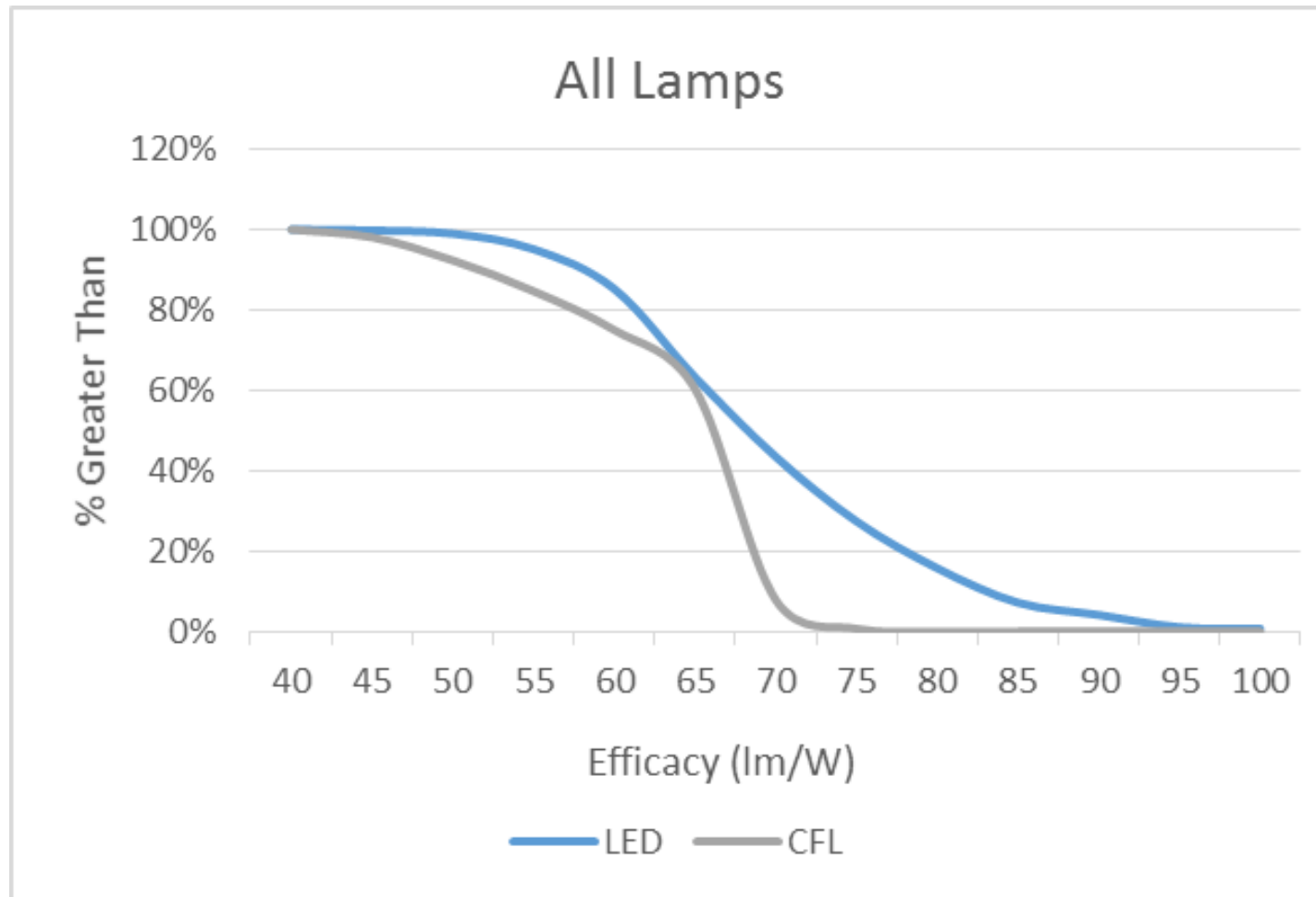


ENERGY STAR Omnidirectional Lamps

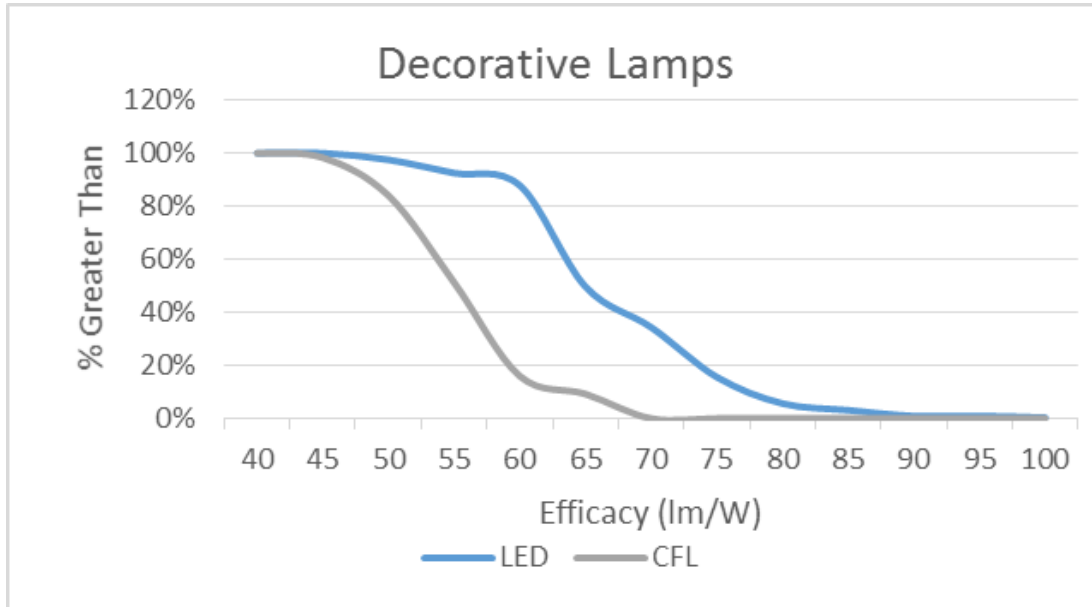


- Average increase of 1.022 lm/W per year.

Today's ENERGY STAR Bulb Efficacy Levels



ENERGY STAR Decorative Bulbs

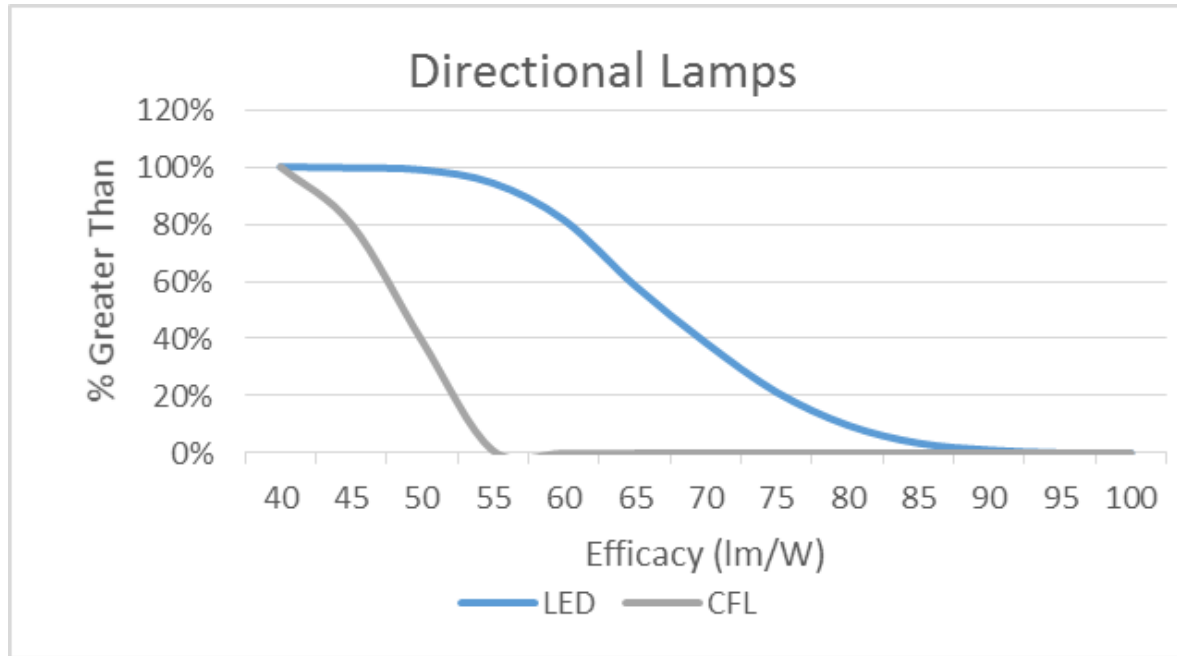


Decorative

- **27% of sockets**
- Baseline Efficacy: 6-12 lm/w
- **No federal standard**
- Current ENERGY STAR min: 45, 50, 60 depending on wattage lm/w
- Proposed for 2016: 65 lm/w



ENERGY STAR Directional Bulbs

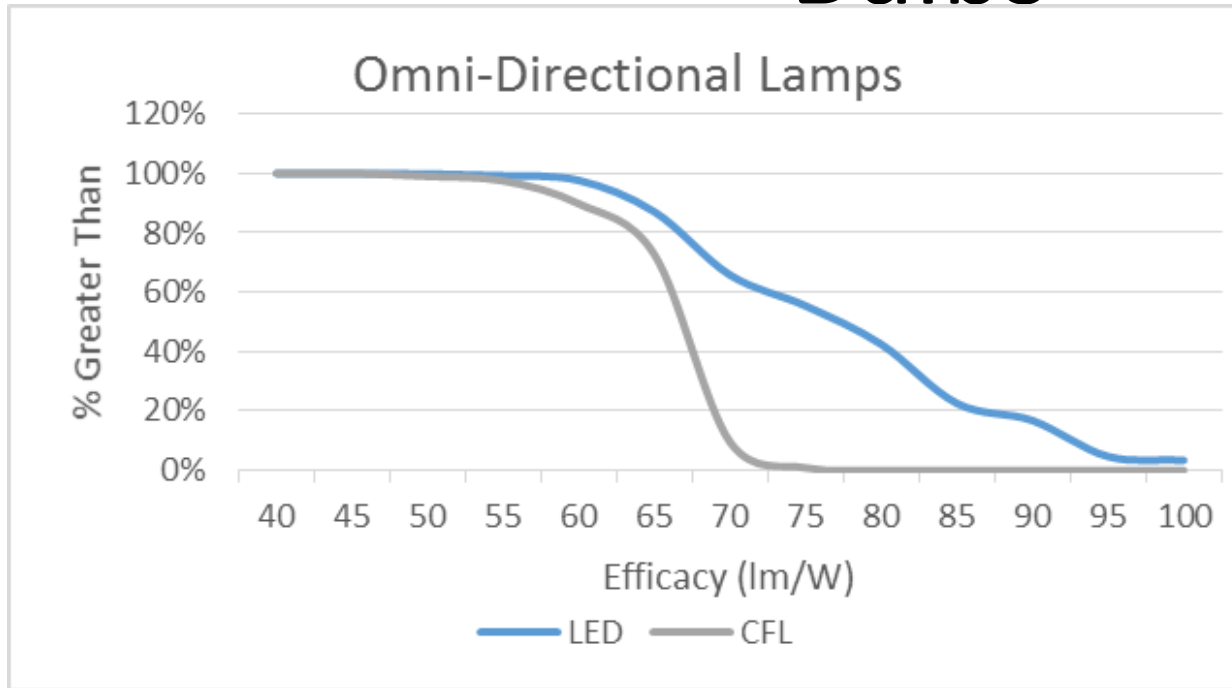


Directional

- Baseline Efficacy : 6 – 32lm/w
- **Some federal standards exist**
- **Popular exemptions e.g. BR30**
- **6% of sockets**
- **Current ENERGY STAR: 40 lm/w**
- **2016 Proposed : 65 lm/w**



Omni-directional ENERGY STAR Bulbs



Omni/A lamp/General Purpose

- **67% of sockets**
- Baseline (EISA) Efficacy: 6 – 23lm/w
- **Federal standards exist for most**
- **Federal standards in 2017 for all technologies**
- **Federal standard backstop 45 lm/w 2020**
- Current ENERGY STAR: 55 or 65lm/w (15W break)
- 2016 Proposed: 70 Lm/w



127 LPW Products

[Home](#)[Shop](#)[Product Line](#)[Energy Savings](#)[About Us](#)[Contact Us](#)

Shop

Shop > Standard A Bulbs > AXP A19 (Warm White)

AXP A19 (Warm White)

\$11.99–\$13.99

AXP Lighting's A19 Series offers advanced Filament LED™ technology, with superior brightness, efficiency, longevity, and the classic look of an incandescent light bulb, but without the burning heat!

Equivalent Chart:

4 Watts (35W Equivalent)

5 Watts (45W Equivalent) – Dimmable bulb

6 Watts (50W Equivalent)

7 Watts (65W Equivalent)



Wattage

Choose an option...



Base Color

plighting.com/wp-content/uploads/A19-white-base.jpg



118.5 Lm/W Product



\$19.20 on
Amazon.com
1600 Lm
13.5 Watts
5000K

\$20.97
3000K
1100 Lumen
10W
110lpw

What are industry Leaders doing to
Advance market adoption?

ENERGY STAR LED Bulb Challenge

- ❖ More than **20 million ENERGY STAR certified** LED bulbs sold
- ❖ Educated consumers on the benefits of ENERGY STAR LED bulbs
- ❖ Increased visibility of ENERGY STAR certified LED bulbs, both in stores and online!



**ENERGY STAR
LED BULB CHALLENGE**

Congratulations
to our partners
who met the
challenge.

GOAL ACHIEVED

**OVER
20
MILLION
SOLD**

Find ENERGY STAR certified LED bulbs at the following:
*Ace Hardware, Best Buy, Costco, Bulbs.com,
Lowe's & The Home Depot*

The graphic is a blue rectangular banner. At the top, it reads 'ENERGY STAR LED BULB CHALLENGE' in white, bold, sans-serif font. Below this, a line of white text says 'Congratulations to our partners who met the challenge.' To the right of this text is a large green circular graphic that looks like a ribbon or a seal. The text 'GOAL ACHIEVED' is written in white, curved along the top edge of the green circle. In the center of the green circle, the text 'OVER 20 MILLION SOLD' is written in white, bold, sans-serif font. At the bottom of the banner, there is a line of white text that says 'Find ENERGY STAR certified LED bulbs at the following:' followed by a list of retailers in a smaller, italicized white font: 'Ace Hardware, Best Buy, Costco, Bulbs.com, Lowe's & The Home Depot'.

Collaboration: EPA, Philips, The Home Depot

Why bulbs with ENERGY STAR® certification are important

- ✓ They use less energy
- ✓ They can save money
- ✓ They help protect the environment

Por qué las bombillas con certificación ENERGY STAR® son importantes

- ✓ Consumen menos energía
- ✓ Ahorran dinero
- ✓ Ayudan a proteger el medio ambiente

Look for the ENERGY STAR® label. Busca la etiqueta de ENERGY STAR®.

Meet our LED family

Largest selection of ENERGY STAR® certified LED bulbs
An LED bulb for every room in your home

Conoce nuestro conjunto de LED

Selección más grande de bombillas LED con certificación ENERGY STAR®
Una bombilla LED para cada habitación de tu hogar.

PHILIPS

The display below the sign shows several Philips LED bulbs in their packaging, each with an ENERGY STAR label. Below the bulbs are three panels showing different lighting environments: 'White' (Luz blanca brillante), 'Bright White' (Luz blanca brillante), and 'Daylight' (Luz natural).

LIGHTING MADE EASY
Just Look for the ENERGY STAR®

Just look for the ENERGY STAR label to ensure that they will save energy and perform as promised.

- Use 75% less energy than incandescent bulbs
- Save you \$40 to \$35 in energy bills
- Provide the same brightness (lumens) with less energy (watts)
- Last 10 to 25 times longer than incandescent bulbs
- Help protect the environment and prevent climate change

	BULB TYPES					
ENERGY STAR certified CFL and LED bulbs are available in a variety of shapes and sizes for any application — including recessed cans, track lighting, table lamps, and more. You can even find certified bulbs that are dimmable. Use this chart as a guide to finding the right ENERGY STAR certified bulb for your light fixture and remember to always check the packaging for proper use.	TABLE LAMP	PARALLEL TRACK	RECESSED CAN	LOCAL DIMM	WALL SWITCH	RECESSED DIMM
BRIGHTNESS	WARM WHITE	COOL WHITE	DAYLIGHT	WARM WHITE	COOL WHITE	DAYLIGHT
WATTAGE	40W	60W	75W	90W	100W	150W
LUMENS	450	800	1,100	1,600	2,000	2,800

Visit energystar.gov/lighting for more information.

Collaboration: EPA, Walmart, TCP Inc.



EPA ENERGY STAR Promotions

- Fall 2014 EPA launched a new LED bulb promotion, featuring exciting new social media tools
- Check out our **three quirky, irreverent new video vignettes** that highlight the benefits of ENERGY STAR certified LED bulbs.
- Facebook tab



[Madame Helga](#) – [Margaret the Zombie](#) – [Floyd's Explosive Surprise](#)

ENERGY STAR LED Lighting Facebook tab!

- ❖ Latest in ENERGY STAR Lighting
 - Sweepstakes
 - Showcasing certified products, videos, reviews and tools to help consumers
 - Add this tab to your Facebook page!

The image shows a screenshot of the Energy Star Facebook page. At the top, the Facebook navigation bar is visible with the 'facebook' logo and login fields for 'Email or Phone' and 'Password'. Below the navigation bar is a grid of images related to energy and sustainability. The main content area features the Energy Star logo and the text 'Energy Star Government Organization'. The 'LED Lighting' tab is selected, displaying a promotional banner for 'LED LIGHTING MADE EASY Just Look for the ENERGY STAR®'. The banner includes text explaining that thousands of LED products have earned the ENERGY STAR mark, indicating they have been independently certified. Below this, there is a section for 'CURRENT SWEEPSTAKES FROM ENERGY STAR PARTNERS' featuring a 'PHOTO CONTEST' by Cooper Lighting. The contest encourages users to submit photos of their old lighting to win up to \$1000 worth of HALO LED light fixtures. The banner also mentions '3 PHOTO WINNERS!!!' and 'ENTER TODAY... Click for details!'. The Energy Star logo is prominently displayed at the bottom of the banner.

Energystar.go v/LED

- ENERGY EFFICIENT products
- ENERGY SAVINGS at home
- ENERGY EFFICIENT new homes
- ENERGY STRATEGIES FOR buildings & plants
- ABOUT ENERGY STAR
- PARTNER RESOURCES

Home > Products > Join Our Campaign > Lighting

The "Bright" Choice: an ENERGY STAR Bulb

LED lighting can deliver outstanding energy efficiency. But LED bulbs are not all the same when it comes to performance. To get the energy efficiency and performance you expect, always look for the ENERGY STAR label. LED bulbs that earn the label are independently certified to ensure they deliver on brightness and color, and shine light where you want it.

GALLERY OF BRIGHT BULBS

FIND LED REBATES

MY ENERGY STAR

Welcome to your personalized tool for saving energy with ENERGY STAR.

START SAVING NOW

LIGHTING

Choose ENERGY STAR certified light bulbs for one room (Replace 5 bulbs) +

Choose ENERGY STAR certified light bulbs for your house (Replace 30 bulbs) +

GET STARTED

SEE ALL WAYS TO SAVE >

HELPFUL INFORMATION

LIGHTING MADE EASY

LIGHTING MADE EASY INFOGRAPHIC
Learn about how new lighting choices can save you money and lower your electricity bill.

PERMANENT FIXTURES			
CEILING FIXTURES			
CEILING FANS			

LIGHTING PURCHASING GUIDE
Information on finding the right light bulb you need depending on your color and brightness preferences, as well as light fixture.

Ask the EXPERT

ASK THE EXPERT LIGHTING VIDEO
Video detailing four simple tips on how energy efficient light bulbs save money, are long lasting, and protects the environment.

FEATURED PRODUCTS

LIGHT BULBS


LIGHT FIXTURES

CEILING FANS

VENTILATION FANS


Video to Help Consumer Choose Bulbs

YouTube







0:45 / 3:21

Ask the Expert: How to Choose a Light Bulb

 ENERGY STAR 967

32,108

+ Add to  Share  More  19  1

Two Part Lighting Podcast!

Available on iTunes and www.energystar.gov/podcasts



Taylor Jantz-Sell
ENERGY STAR



Naomi Miller
Lighting Designer
PNNL




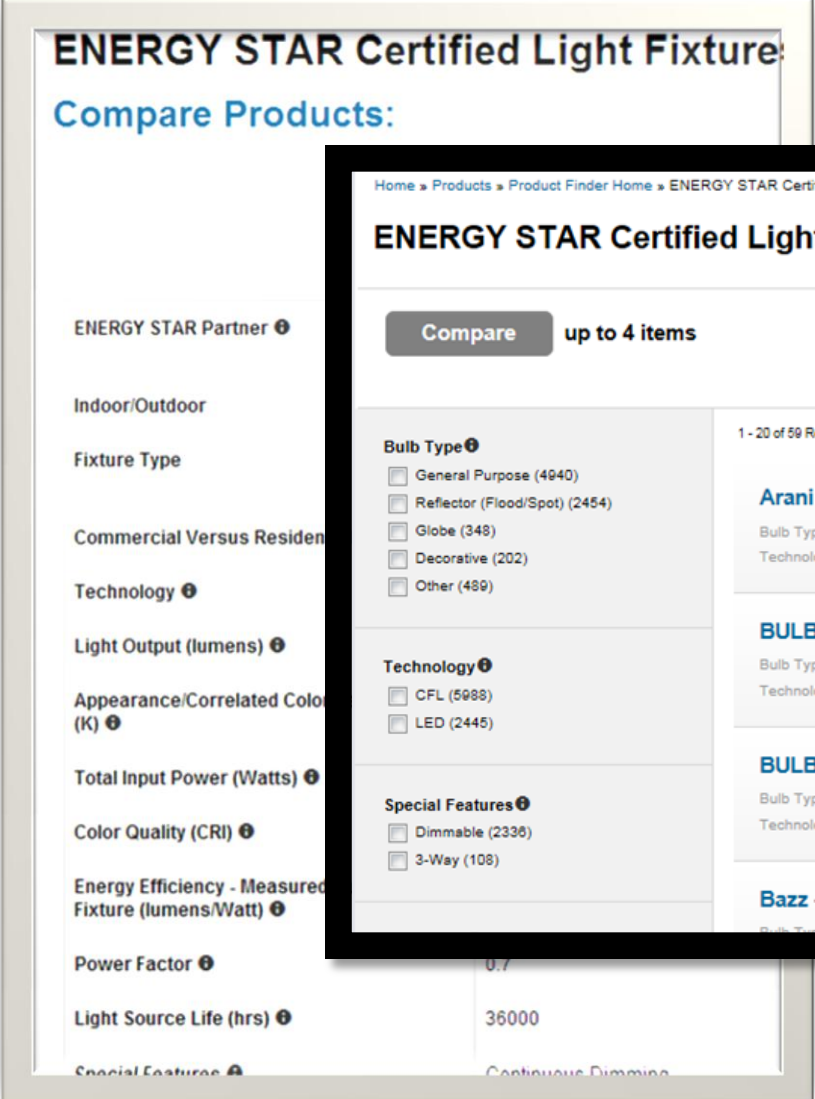
Noah Horowitz
NRDC



Mark Voykovic
The Home Depot

How to Find ENERGY STAR Certified Products

- Look for the label 
- Find & compare ENERGY STAR certified product details
- www.energystar.gov/productfinder
 - Light Bulbs
 - Light Fixtures
- Filter based on product type, features, technology, et c.
- Compare up to 4 products side by side



The screenshot displays the ENERGY STAR Certified Light Fixture product finder interface. The main heading is "ENERGY STAR Certified Light Fixture" with a sub-heading "Compare Products:". Below this, there are several filter categories with expandable options:

- ENERGY STAR Partner
- Indoor/Outdoor
- Fixture Type
- Commercial Versus Residential
- Technology
 - General Purpose (4940)
 - Reflector (Flood/Spot) (2454)
 - Globe (348)
 - Decorative (202)
 - Other (489)
- Light Output (lumens)
- Appearance/Correlated Color (K)
- Total Input Power (Watts)
- Color Quality (CRI)
- Energy Efficiency - Measured Fixture (lumens/Watt)
- Power Factor
- Light Source Life (hrs)
- Special Features
 - Dimmable (2336)
 - 3-Way (108)

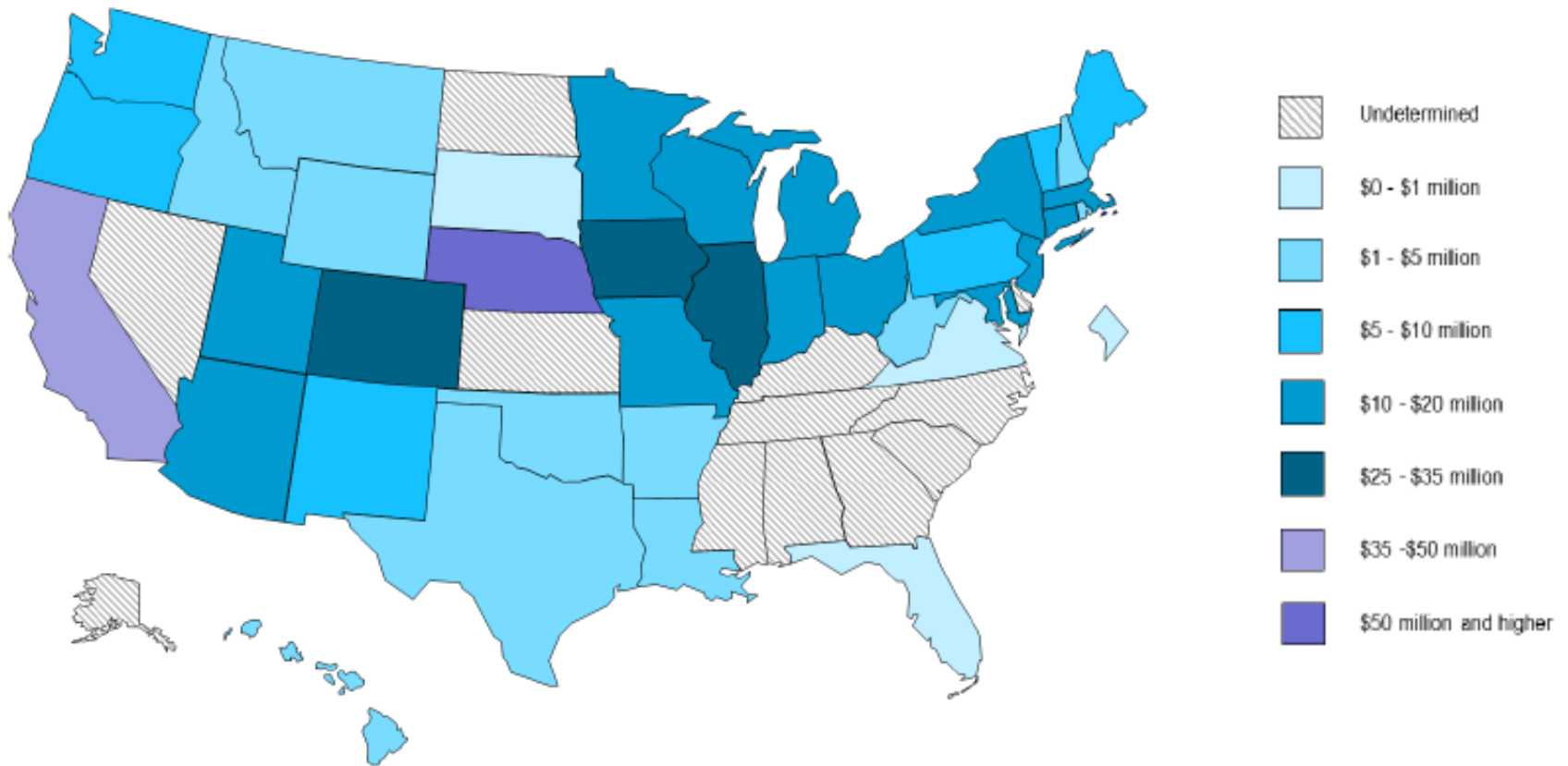
On the right side, there is a "Compare" button with the text "up to 4 items". Below the filters, a list of products is shown, including:

- Arani - AR_LEDBG
- BULBRITE - LED6M
- BULBRITE - LED6M
- Bazz - GU10LES4

The interface also shows a "1 - 20 of 59 Records Found" indicator and a "Continuous Dimming" feature listed at the bottom.

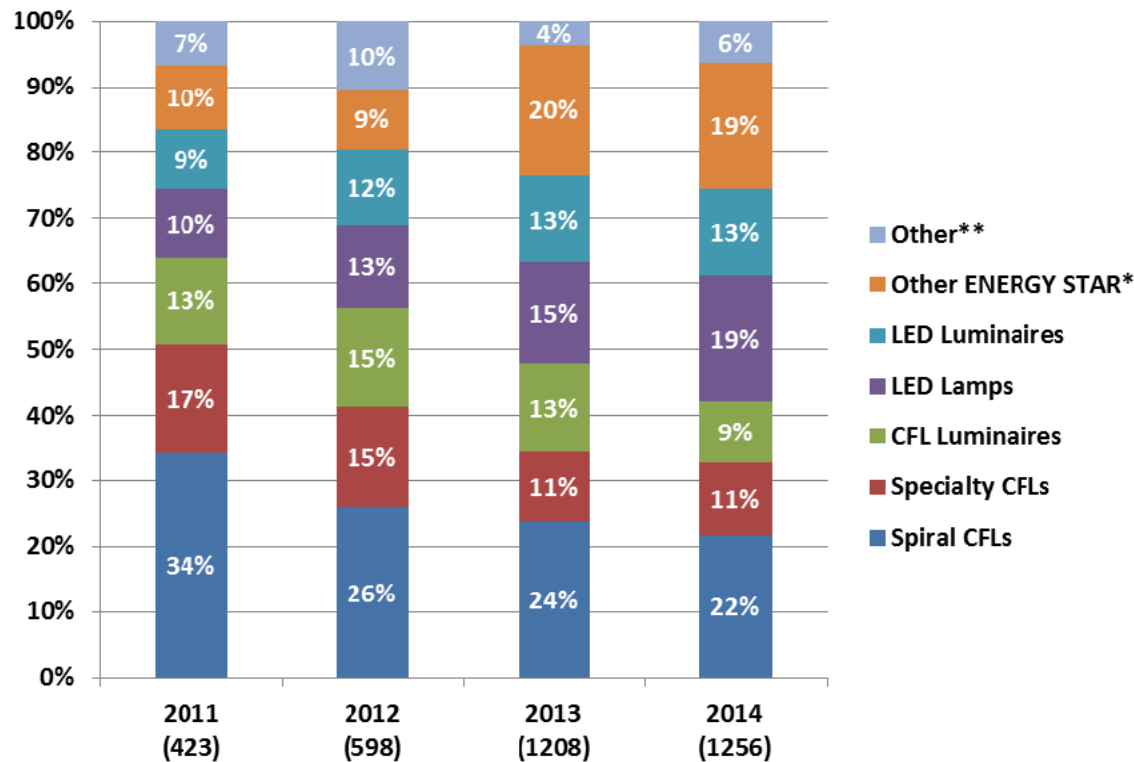
Utility Promotions

❖ The map below shows program budgets for lighting programs by state as reported by the energy efficiency program sponsors.



Utility Promotions: Product Types

ENERGY STAR and Energy-Efficient Lighting Promotions by Product Type 2011-2014
(Annual totals listed in parentheses)

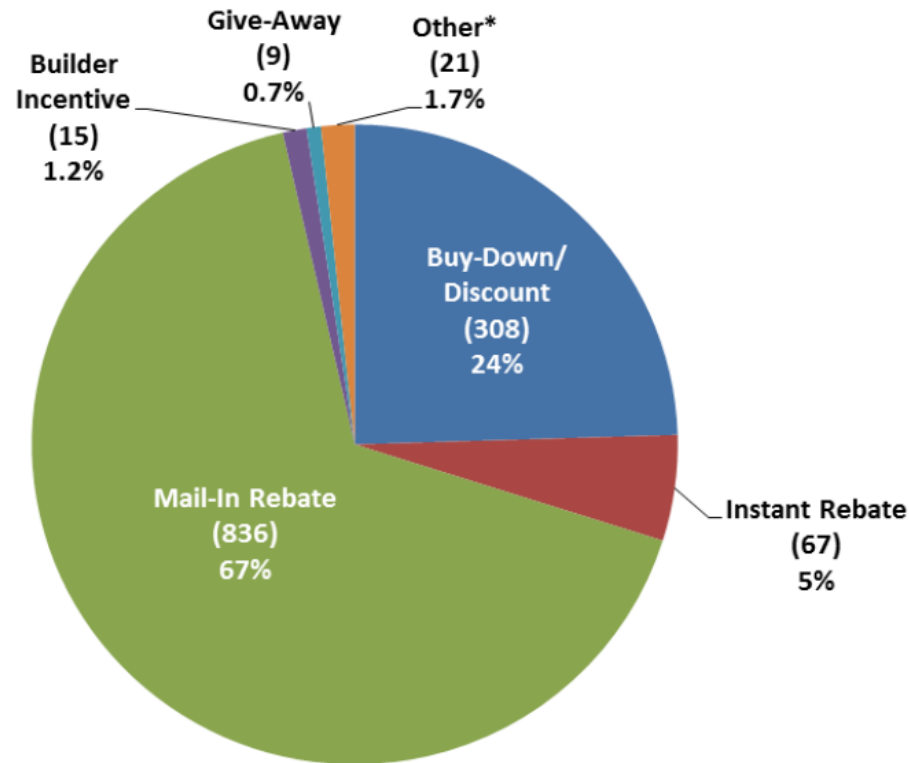


* The "Other ENERGY STAR" category is comprised of ENERGY STAR decorative light strings, CFLs w/pin base, ceiling and vent fans, and new construction programs. See the "Lighting Programs at a Glance" for individual partner details.

** The "Other" category is comprised primarily of commercial lighting products, such as LED exit signs, fluorescent T-8 or T-5, High Bay lighting, and occupancy sensors.

Utility Promotions: Incentive Type

2014 ENERGY STAR and Energy-Efficient Lighting Promotions by Incentive Type
(Totals listed in parentheses)



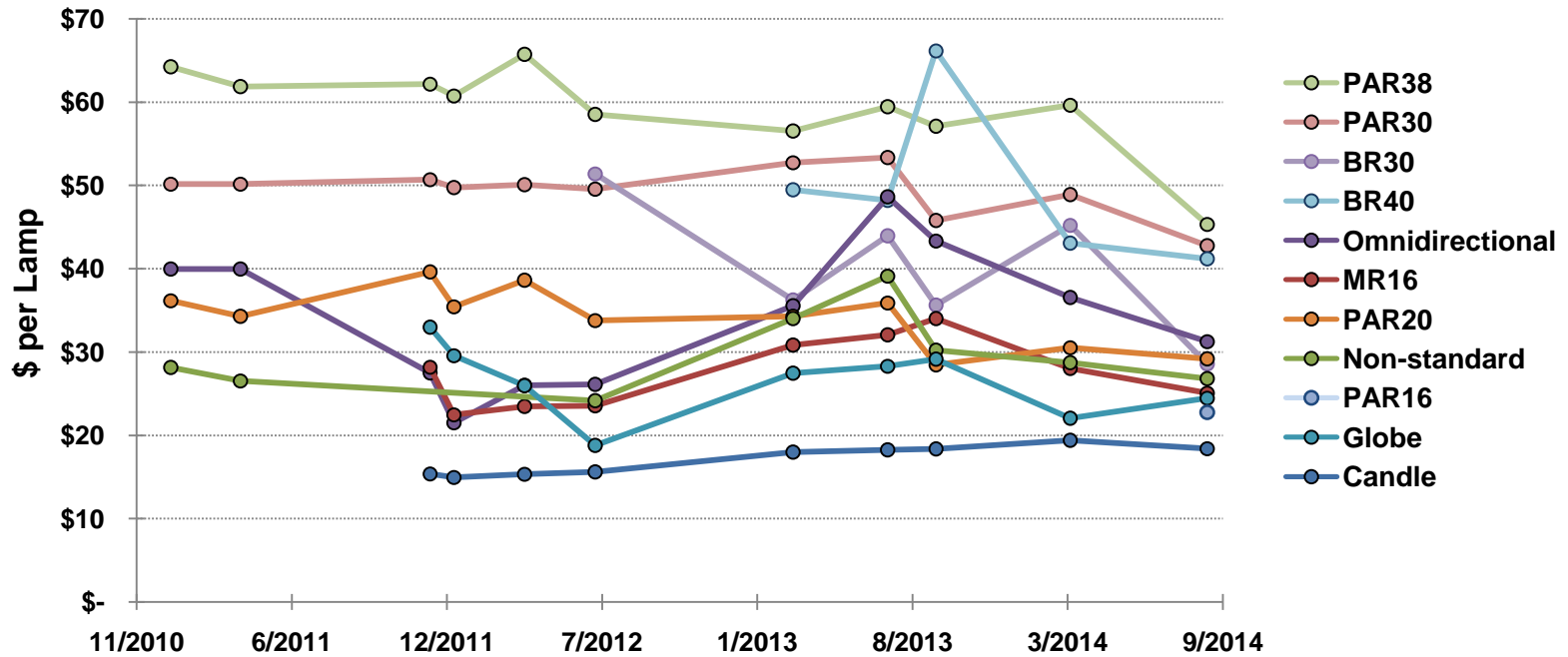
* The "Other" category is comprised of low-interest loans, bill credits, and other miscellaneous promotion types. See the "Lighting Programs at a Glance" for individual partner details.

Price Trends for ENERGY STAR certified LED bulbs



ENERGY STAR LED Bulb Price Trends from 2011–2014

**ENERGY STAR LED Light Bulb Price Trends
2011 – 2014**

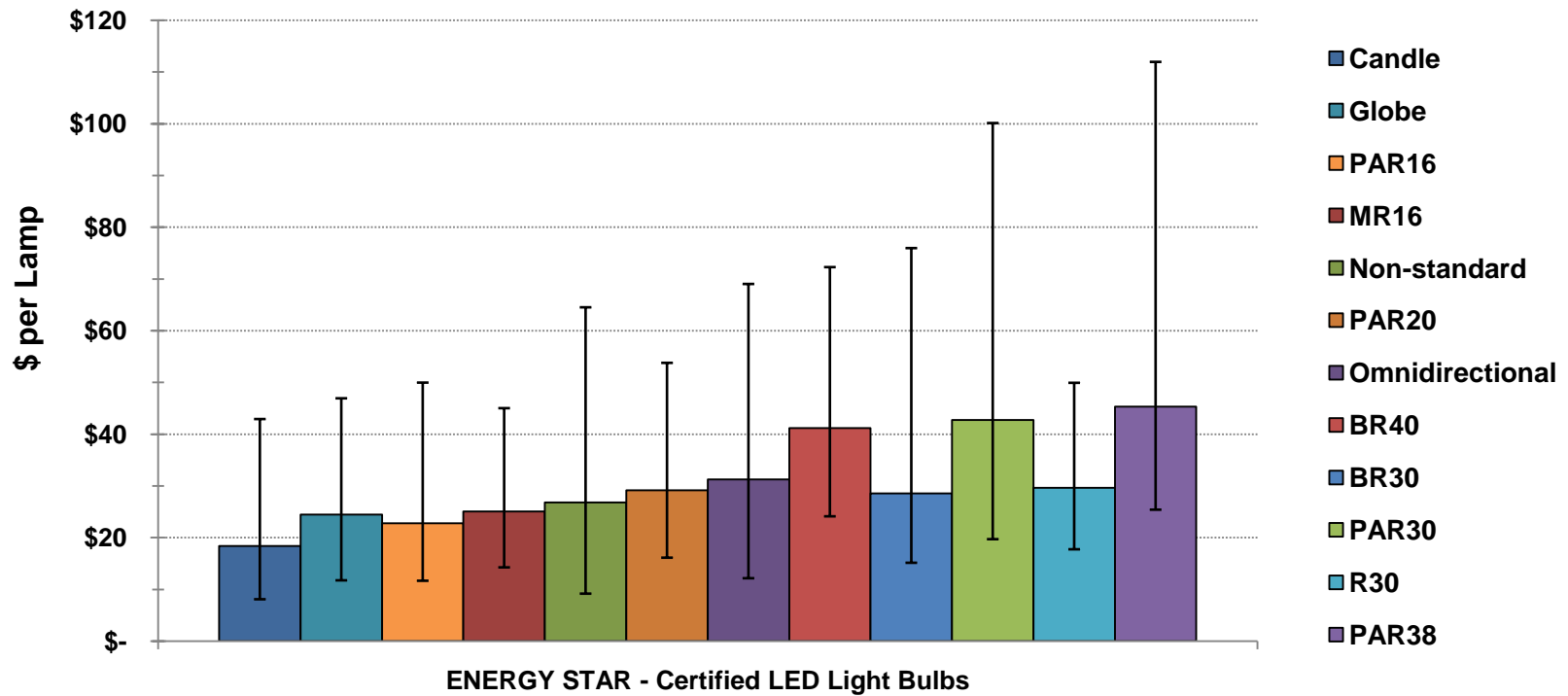


* Note: Upward price swings largely due to additional products added to tracking scope



ENERGY STAR Certified LED Light Bulb Prices

ENERGY STAR LED Light Bulb Price Summary
3rd Quarter — 2014

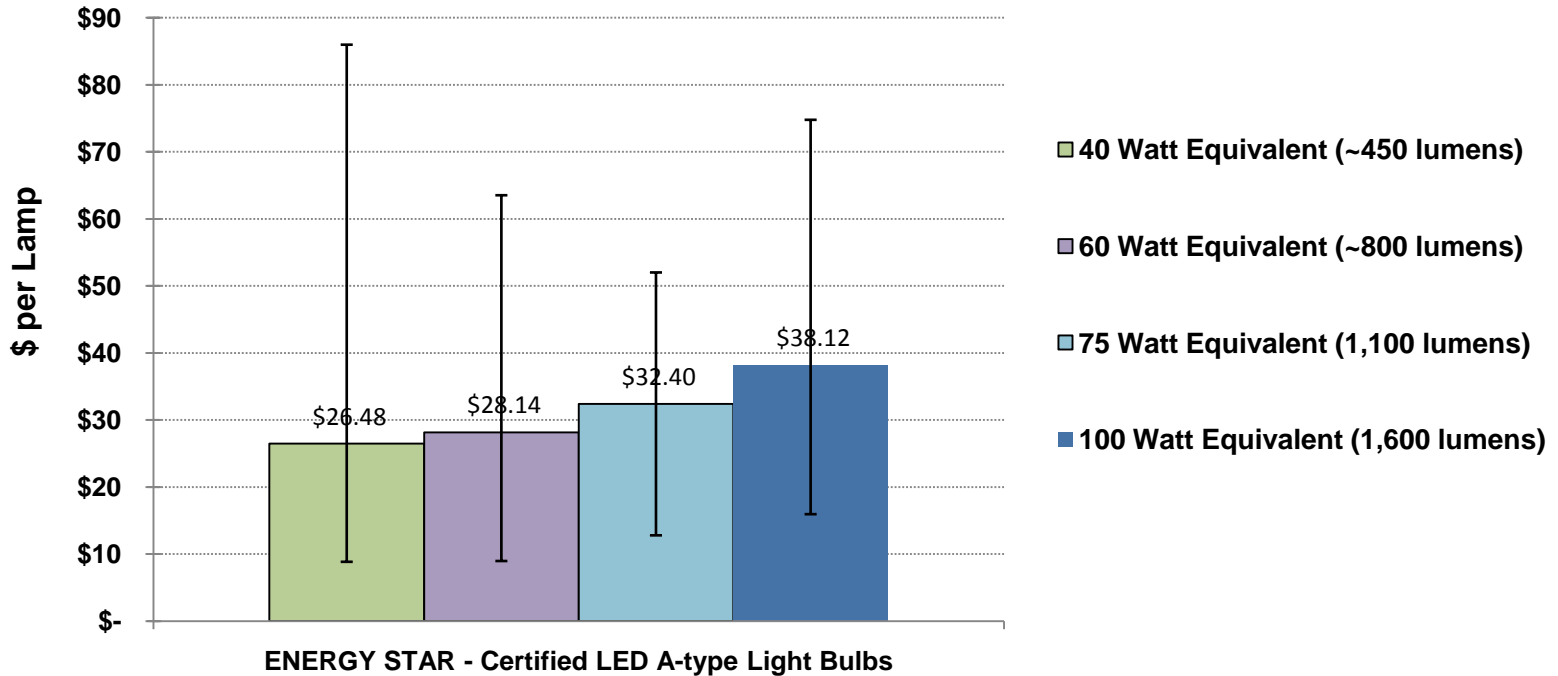


** Note: Range reflects absolute minimum and maximum prices collected per light bulb type*



ENERGY STAR Omnidirectional LED Light Bulb Prices

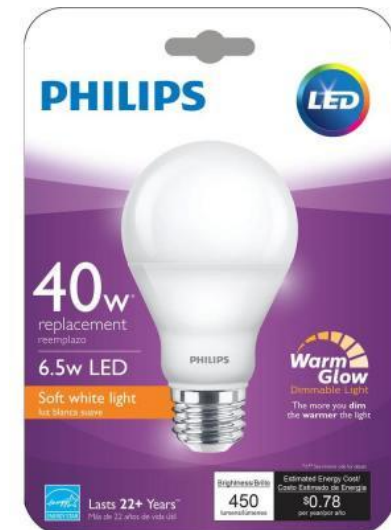
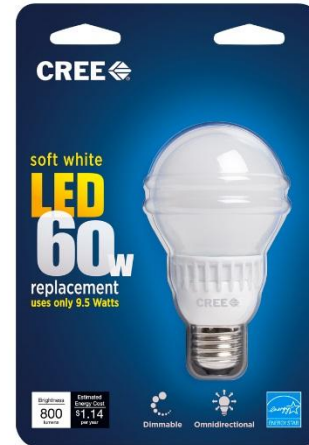
ENERGY STAR LED Omnidirectional A-type Light Bulb Summary
3rd Quarter — 2014



* Note: Range reflects absolute minimum and maximum prices collected per light bulb type

Sub \$10 ENERGY STAR 60W Replacements

- \$9.97/9.98
- \$8.97 leading major retail price for an ENERGY STAR certified, Omnidirectional, 60W replacement
—Rebates and deals bring them to \$3.98



What happens when LED bulbs are \$1.97?

- October 2014
- **Partners: Philips, The Home Depot & 15 utilities** (198 stores).
- 64 locations offered this product at \$1.97
- Ran out of inventory week 2
- **185,182 Units Sold**
 - Of the total units sold, 82% of these sales came from the 64 stores offering this product at \$1.97 (reg. retail \$8.97)



Warehouse + Re[

- Multi-packs with rebates
- 2 pk BR30 - \$4.99 per bulb
- 3 pk Chandelier bulb - \$3.99 per bulb
- 3 pk A19 - \$3.99



Taylor Jantz-Sell
ENERGY STAR Lighting Program Manager
Jantz-Sell.Taylor@epa.gov

www.energystar.gov/lighting

www.energystar.gov/lightingresources

This concludes The American Institute of Architects
Continuing Education Systems Course

