



*Maximizing Energy
Savings With CFLs:
Don't Bench
Your Superstar*

Presented by:

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D&R International, Ltd.

Overview



- CFLs are the superstar
- Why coaches say they want to bench them
- Taking another look at the game tapes
- New game plan

CFLs are the
efficiency
equivalent of
LeBron James



QuickTime™ and a
TIFF (Uncompressed) decompressor
are needed to see this picture.

CFLs Have Delivered for Energy Efficiency Program Sponsors



Program Sponsor	Share of total DSM savings from CFL Programs
NYSERDA	84%
Wisconsin Focus on Energy	64%
Pacific Gas and Electric	62%

Source: D&R International, based on contact with ENERGY STAR Partners.

Some Regulators Reducing Support for General Service CFLs



- Connecticut has decided to suspend CFL programs in 2010
- Other areas of the country are facing similar issues:
 - CA – CPUC plan cuts spending on these bulbs
 - NW – Northwest Power and Conservation Council reduced claimable savings
 - MA – Net to gross values are declining
 - TX – CPS Energy in San Antonio is discussing whether to continue CFL incentives
 - AR – Attorney General's office testified to PUC that market is transformed

Reasons for Proposed Reductions



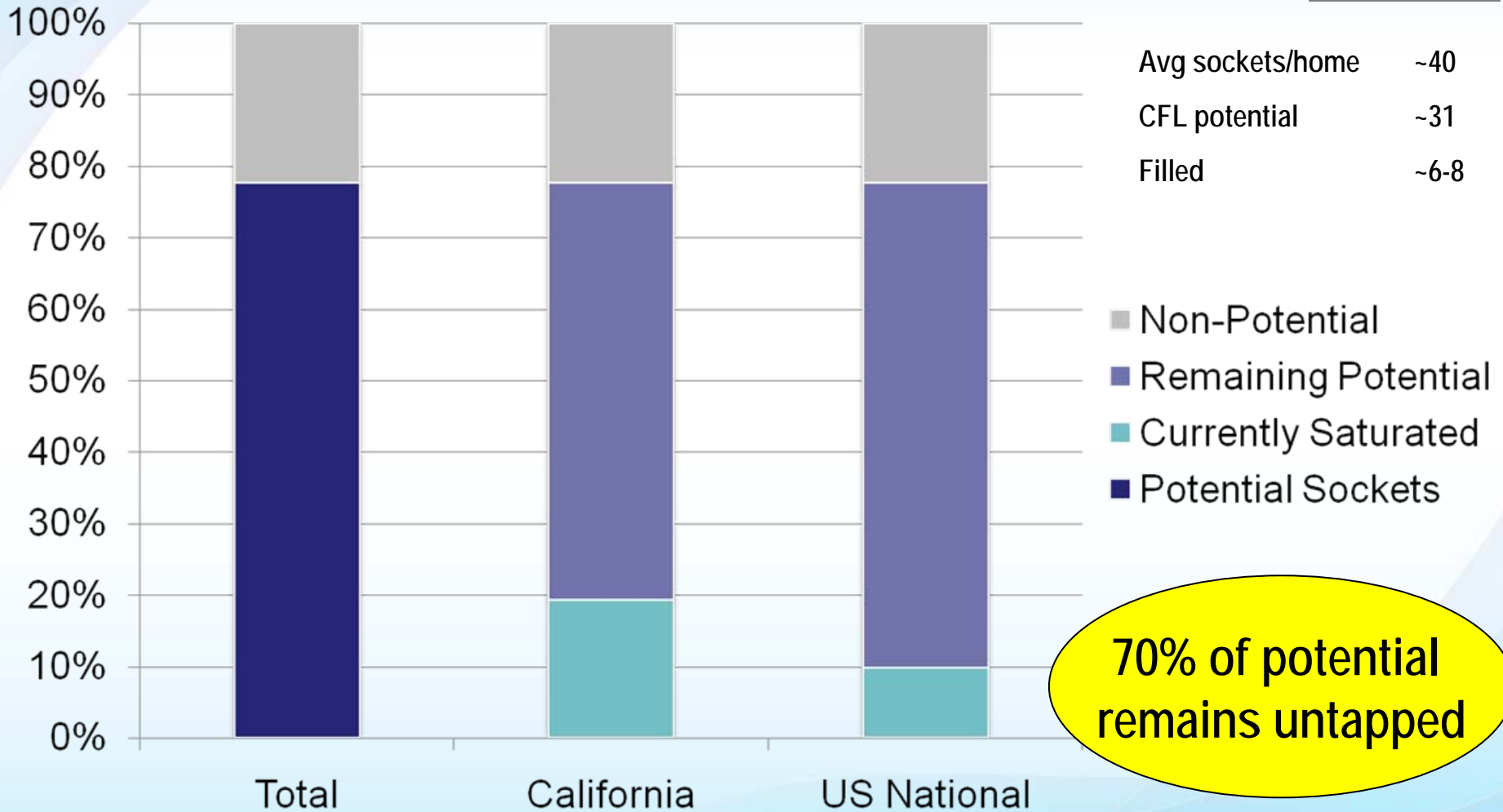
- Captured most of the general service CFL savings already, remaining sockets require specialty bulbs
- It is a better investment to bring down cost of LEDs, specialty bulbs, and "super CFL"
- General service CFL market no longer needs support, as market is transformed
- EISA will complete remaining market transformation
- Need utilities to begin building capacity to deliver big savings from other sources and not delay while relying on CFLs

Misconception



We have captured most of the general service CFL savings already.

We have captured only a fraction of CFLs' savings potential



Sources: California - "Residential Lighting Metering Study – Preliminary Results," KEMA, February 2009

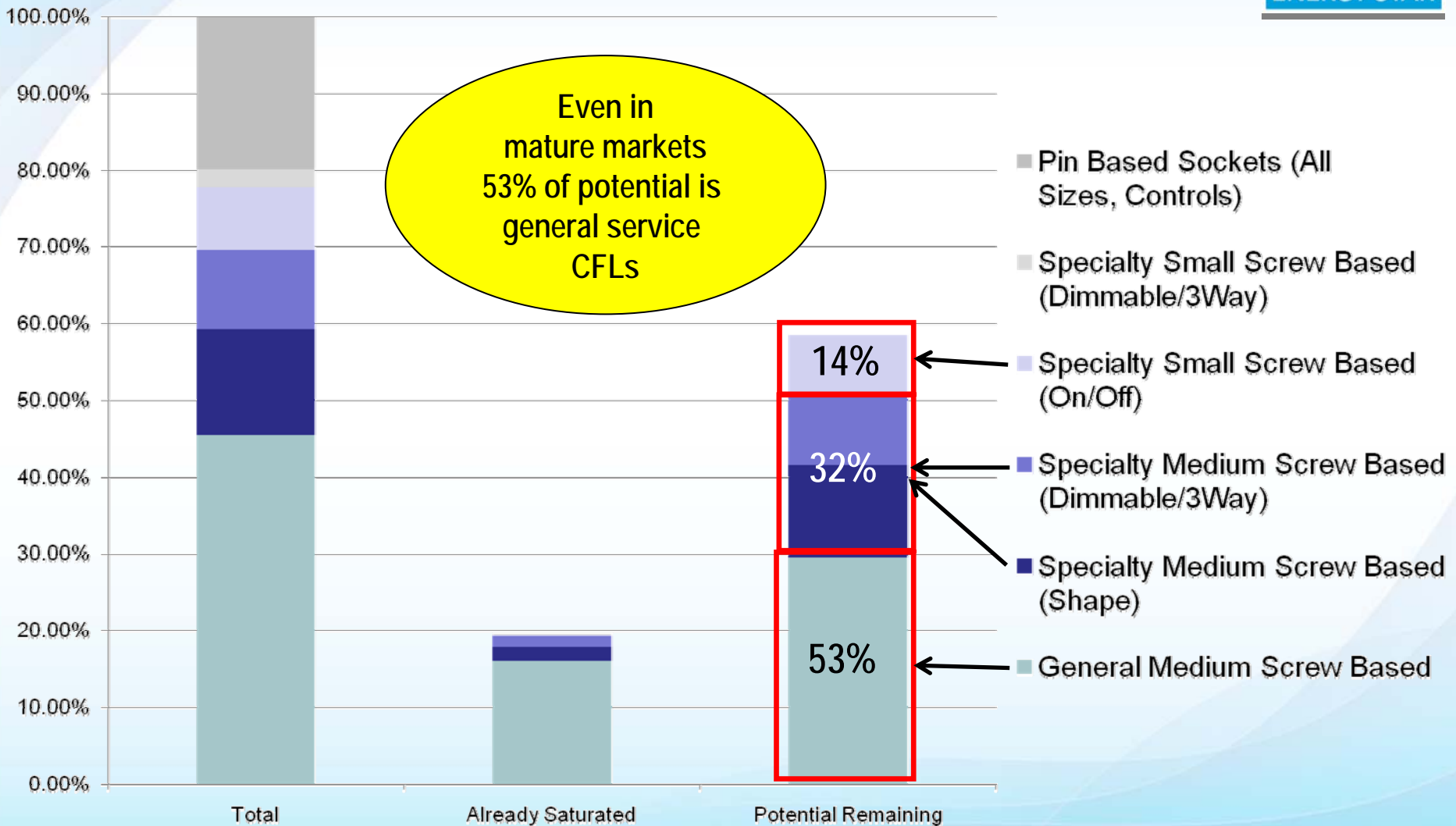
National – D&R International, estimate for 2008.

Misconception



Most of the remaining savings will come from specialty bulbs.

More than half of remaining potential is for general service CFLs



Fewer sockets require specialty bulbs than most people think



- California 2009 Inventory Data

Control Type	Percent of Sockets
On/Off	85%
Dimmer	12%
3-Way	3%

Base Type	Percent of Sockets
Medium Screw	69%
Pin	19%
Small Screw	10%
Other	2%

Misconception



Stored CFLs will capture much of the remaining savings.

Most stored CFLs are unlikely to replace incandescents in high-use sockets



Number of CFLs Installed	Socket Saturation %	CFLs Stored	Incandescent Lamps Stored
0	0	0.17	6.61
1-10	2.5 - 25	1.97	6.69
More than 10	>25	6.75	7.15

- Failed bulbs in low saturation homes more likely to be replaced with incandescents
- CFL "adopters" have not abandoned incandescents

Households are storing about 1/4 of purchased CFLs*

Sources: "Residential Lighting Metering Study – Preliminary Results," KEMA, February 2009 [California]

* 27% - Northwest Energy Efficiency Alliance, "Consumer Product Market Progress Evaluation Report 3," 2007

Misconception



LEDs will soon deliver more energy savings and are a better investment than CFLs.

High volume sales of replacement LED lamps are still some years off

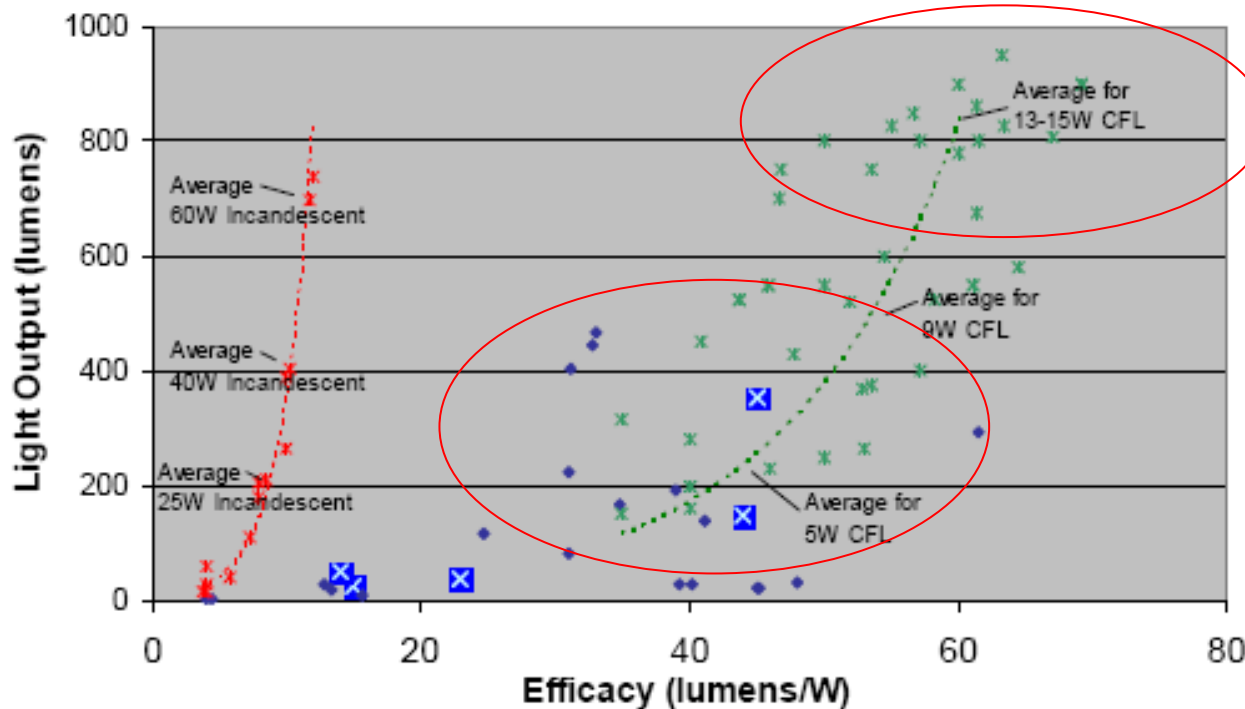


- ENERGY STAR LED Replacement Criteria
 - Final Criteria- October 2009
 - Earliest Possible Effective Date- July 2010
- Expect few products at first with momentum building in 2011 as the technology matures, as was the case for SSL Luminaire program
- First cost will be big barrier – price points on some products are \$50/unit
- Current non ENERGY STAR products could damage market

Current LED replacement lamps perform poorly compared to CFLs



Performance of A-lamps and Small Omni-Directional Replacement Lamps



- ✕ SSL CALiPER Round 8, 2-8W
- SSL CALiPER Earlier Tests, 1-14W
- * Incandescent Benchmarks, 4-60W
- * CFL Lamp Benchmarks, 4-18W

MR-16 and directional lamps are closer, but still not there

Benchmark values are based on CALiPER benchmark tests, surveyed ratings, and averaged manufacturer ratings for incandescent and CFL lamps. Values are based on initial output, not average life-time output.

Figure 4. Comparison of A-lamp SSL Products Versus Benchmarked Traditional Lamps

As measured by the DOE CALiPER Program Cycle 8

http://apps1.eere.energy.gov/buildings/publications/pdfs/ssl/caliper_round_8_summary_final.pdf

Misconception



We must use sophisticated segmentation to capture remaining savings.

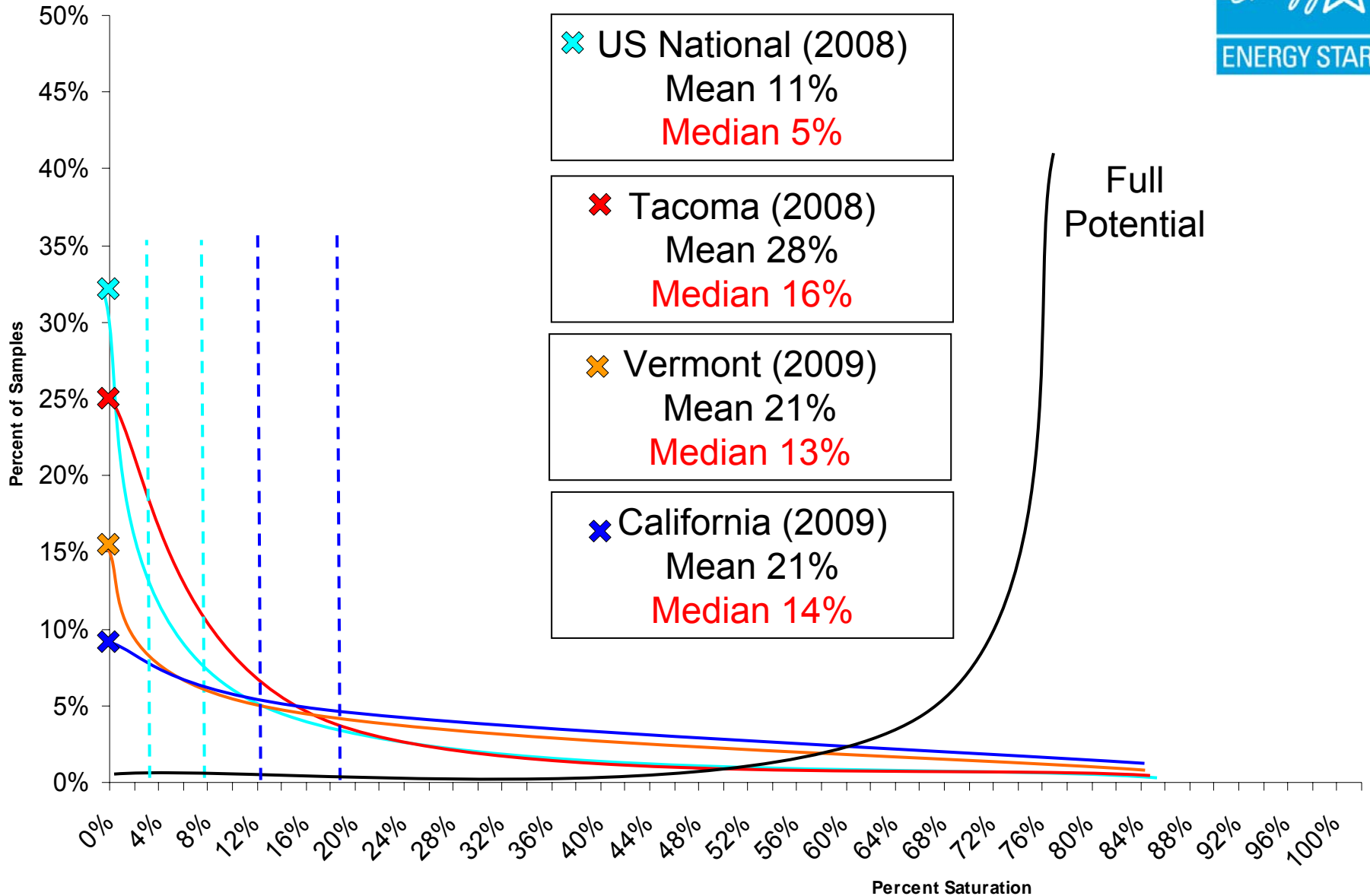
Most CFLs are in a minority of homes most homes contain few CFLs



10% saturation = ~ 4 CFLs		Distribution by % Socket Saturation			
		0	1-20%	21-40%	41%+
National	Households	30%	58%	8%	3%
	CFLs	0%	49%	30%	21%
Vermont	Households	15%	45%	21%	20%
	CFLs	0%	19%	28%	53%
California	Households	9%	52%	22%	16%
	CFLs	0%	24%	30%	47%
Puget Sound	Households	31%	39%	14%	16%
	CFLs	0%	21%	24%	55%
Tacoma	Households	19%	44%	20%	18%
	CFLs	0%	21%	28%	51%
Even in mature markets		60-70% homes Have less than 8 CFLs		~80% of installed CFLs are in 30%-40% of homes	

Sources: **National** - D&R International; **VT**: - "Overall Report for Existing Homes in Vermont – Final Report", Nexus Market Research, RLW Analytics, 2009; **CA** - "Residential Lighting Metering Study – Preliminary Results", KEMA, February 2009; **Puget Sound** – "Puget Sound Sound Area Residential Compact Fluorescent Lighting Market Saturation Study", EMI, 2007; **Tacoma** – "Tacoma 2008 Household Compact Fluorescent Lighting Survey", Dethman & Associates, 2008

Bulbs are not distributed evenly across homes



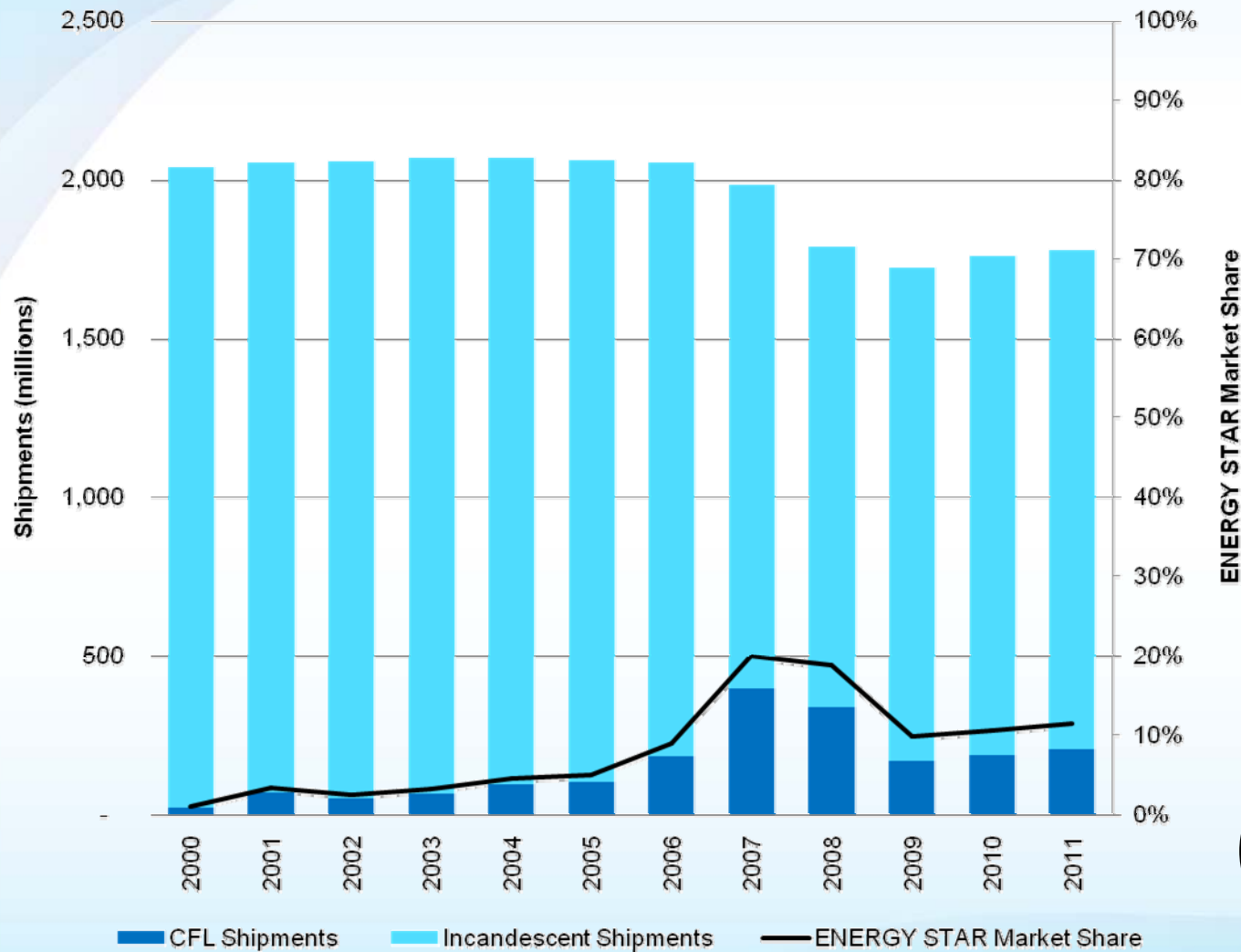
~Bulbs: 4 8 20 30

Misconception



The market for general service medium screw based lamps is transformed.

CFL shipments and sales have fallen far from their peak



- Shipments down 49% from 2007 peak
- **Sales down 25% [NEMA]**
- Retail sales down only 10% for all products.
- CFL market share ~25% [NEMA; (shipment data says 11%)]

3 of 4 bulbs purchased today are incandescent

Sources:

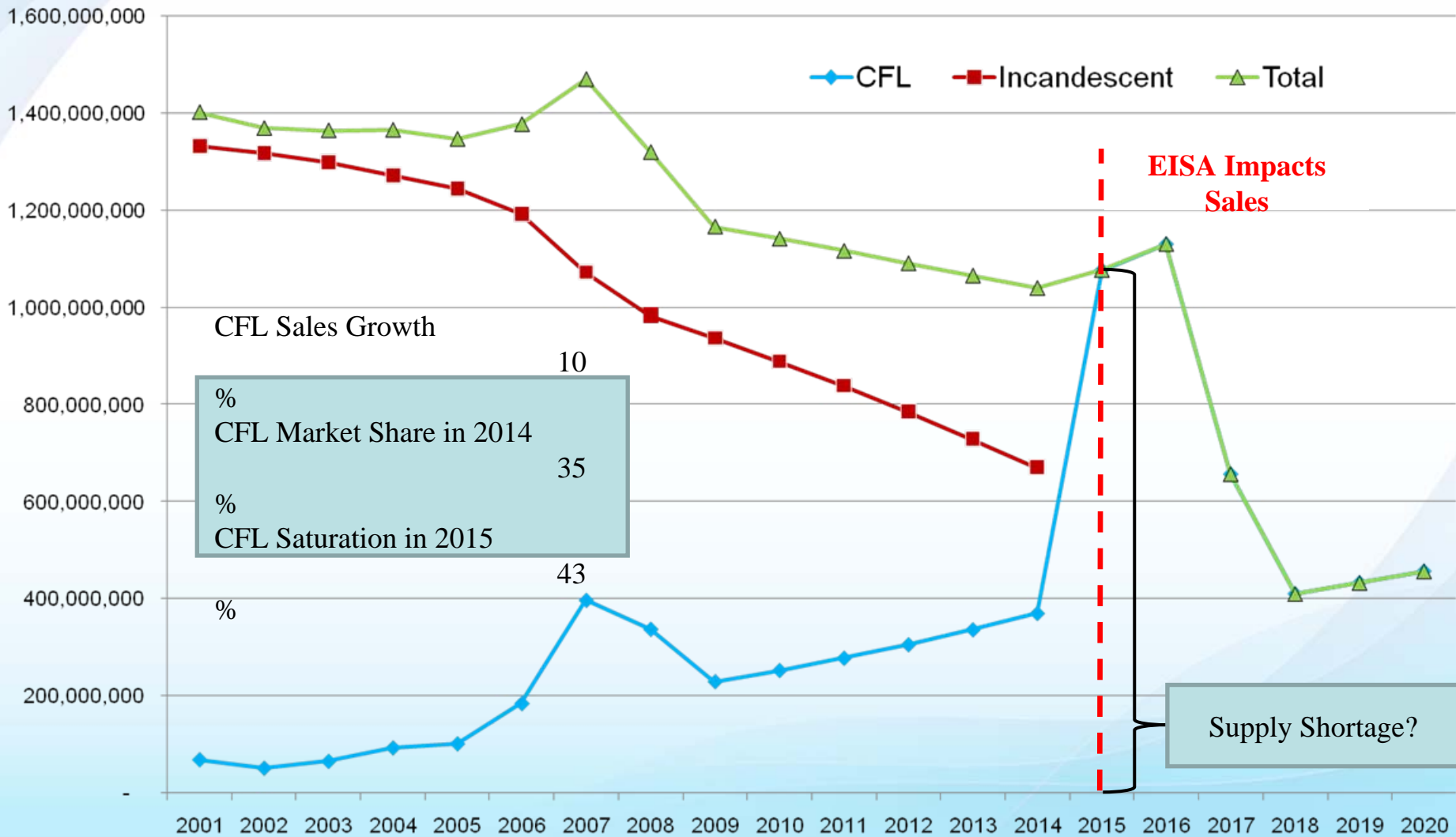
Department of Commerce; "U.S. Lighting Market Characterization, Volume 1: National Lighting Inventory and Energy Consumption Estimate," 2002, Navigant Consulting; U.S. Census Bureau; NEMA

Misconception



EISA will complete the market transformation and deliver the energy savings potential.

Relying on EISA creates enormous lost energy savings and possible supply shortages



Accelerating sales and saturation delivers big savings and avoids problems



CFL Sales Growth

40

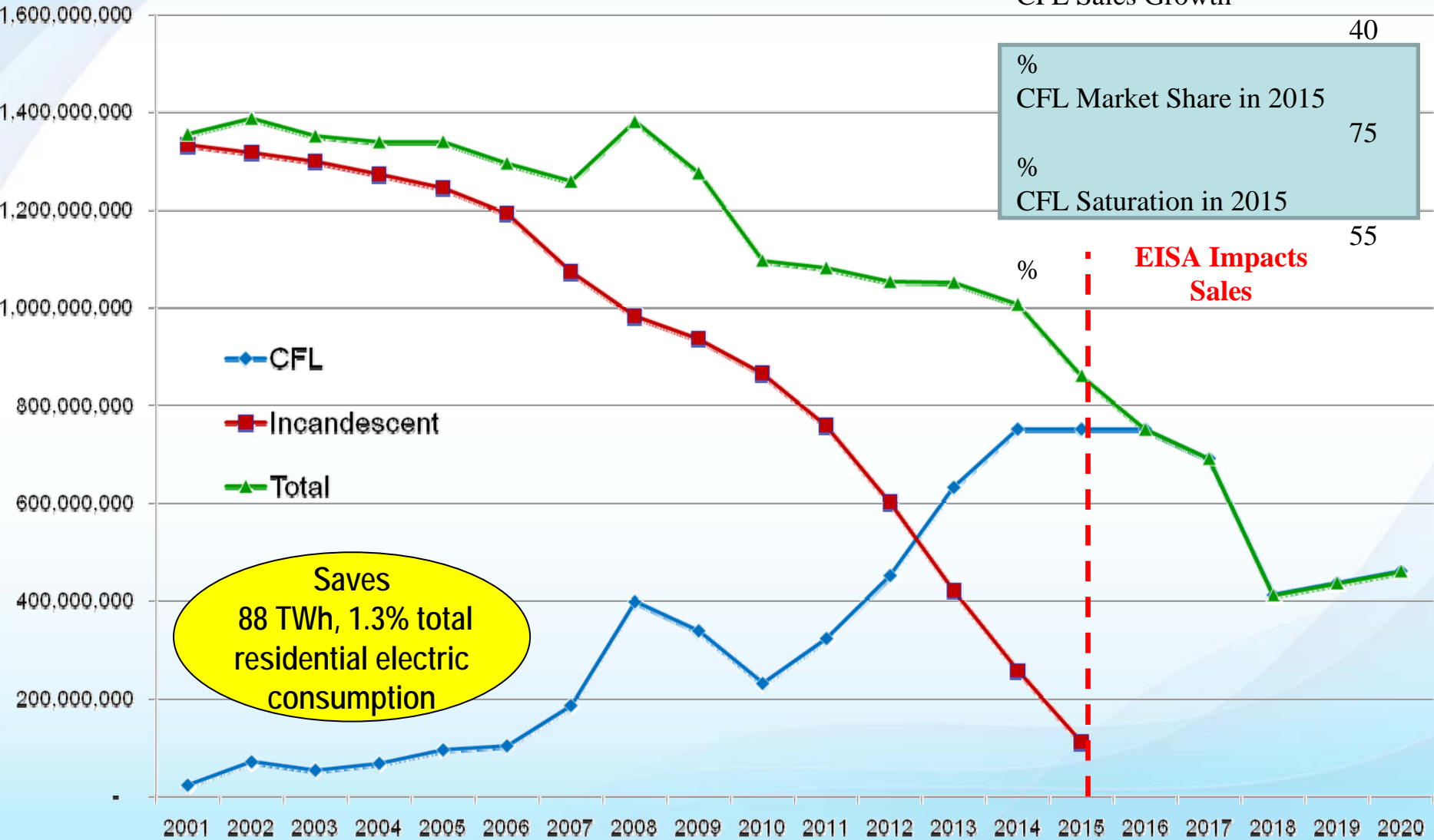
%
CFL Market Share in 2015

75

%
CFL Saturation in 2015

55

EISA Impacts Sales



Saves
88 TWh, 1.3% total
residential electric
consumption

Proposed target



- Increase saturation from 20% in 2008 to 55% by 2015
- Increase sales by 40% per year through 2014

Benefits of accelerated sales and saturation



By 2015:

- \$10 billion energy bill savings for consumers
 - Nearly \$160 in total savings per home
- 88 million MWh energy saved
 - 7.9% savings in household lighting consumption
 - 1.3% savings in total household electricity consumption
- 13 million MMT cumulative reduction in carbon emissions
- Minimal bulb shortages, no backlash, no repeal or delay in EISA implementation



The Cavs didn't bench
LeBron James.

Instead they added
another Superstar:
Shaquille O'Neil

The efficiency
community needs
to do the equivalent.

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To accelerate sales and saturation

- Sustain proven program models
- Get good data to track status and progress
 - Saturation: Use in-home inventories to directly measure inventories, saturation, and storage
 - Sales: Insist on CFL and incandescent retail sales data
- Experiment with new program models
 - Promote early retirement of incandescents and full replacement with CFLs: “Those old light bulbs are costing you \$100/year”
 - Consider models that encourage sales growth over baseline, rather than unit sales

Use on-site inventories because self-reported data is not reliable



- Comparing appliances from 2002 to 2005 using:

ENERGY STAR Market Share	Refrigerators	Clothes Washers
Residential Energy Consumption Survey 2005	57%	59%
Shipment and Market Share Data	28%	26%

← Self-Reported Survey Data

← Maximum possible saturation levels

- Even for big ticket, single unit/household items, self reports are highly unreliable.
- Is self reported data for CFL purchases and saturation likely to be better?

Recap



- CFLs have delivered and still offer tremendous energy and carbon savings.
- 70% of CFL savings potential is unrealized, even in mature market, and specialty sockets are less than 50% of remaining potential. LED replacement lamps are not yet competitive substitutes.
- The market is not transformed. 3 of 4 bulbs sold are incandescent and CFL sales have fallen much more than retail sales.
- Promotion of both general service and specialty CFLs needs to be increased rather than reduced using both mass market and targeted tactics.
- Rapid growth in sales and saturation will yield enormous energy and carbon savings and avoid potential shortages, backlash, and other bad outcomes during the EISA phase-in.
- To accurately assess progress, we need good on-site saturation and sales data. Direct calculations using on-site and hours of use data might yield more accurate measurement of savings and cost-effectiveness.

DOE intends to help



- Foster dialogue between partners on this issue
- Gather robust, accurate data on market and successful methods
- Disseminate this data to partners
- Inform decision makers and outside parties about the state of the market

Resources



- ENERGY STAR CFL Market Profile (March 2009)
 - www.energystar.gov/ia/products/downloads/CFL_Market_Profile.pdf
 - New edition March 2010
- ENERGY STAR Lighting Partner Meeting (March 2010)
- Monthly CFL Market Forum Call (Schedule TBD)
- ENERGY STAR Lighting Pages
 - CFLs – www.energystar.gov/cfls
 - LEDs – www.energy.gov/led
- Marketing and communication materials leveraging the ENERGY STAR platform

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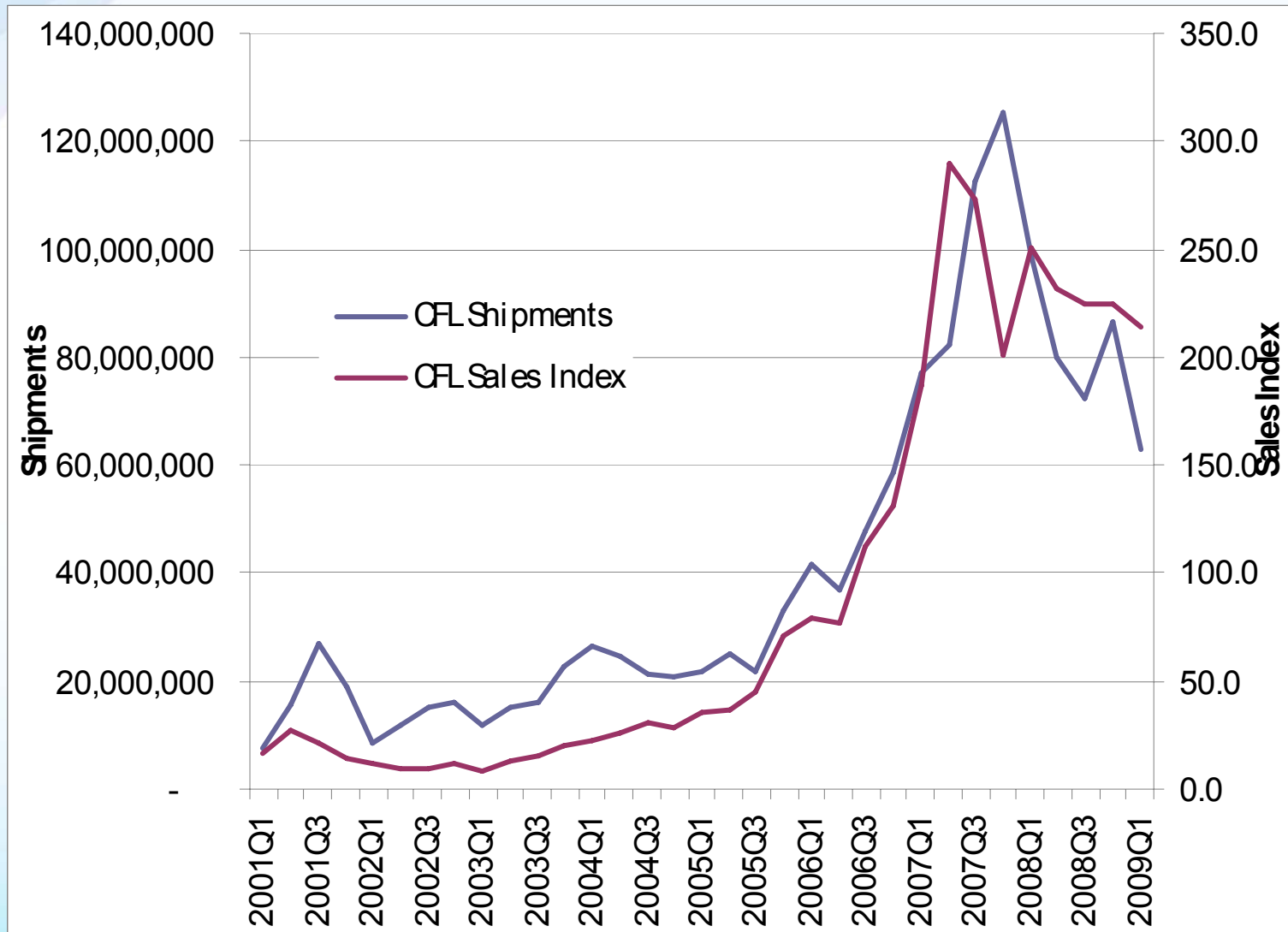
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Back-up Slides

CFL Sales vs. Shipments



Consider new methodologies to determine cost effectiveness



- Direct energy savings calculation

$$\text{Savings} = \sum (\sum [\# \text{ of new CFLs} * \text{ wattage savings} * \text{ usage}]_{\text{room}})_{\text{home}(n)}$$

$$\text{Cost per kWh}_{\text{Saved}} = \frac{\text{Total Expenditures}}{\text{Energy Savings}}$$