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The LED Lighting Revolution

**ACEEE - National Symposium on
Market Transformation**

March, 2010

Disclosure: Forward-Looking Statements

This presentation includes forward-looking statements about Cree's business outlook, future financial results, product markets, plans and objectives for future operations, and product development programs and goals. These statements are subject to risks and uncertainties, both known and unknown, that may cause actual results to differ materially, as discussed in our most recent annual report for fiscal 2009 filed with the SEC.

Important factors that could cause actual results to differ materially include current uncertainty in global market conditions that could negatively affect product demand, collectability of receivables and other related matters; our ability to successfully develop new products; our ability to lower costs; increasing price competition; the complexity of our manufacturing processes and the risk of production delays and higher than expected costs; risks associated with the ramp-up of production for new and existing products; the rapid pace of technology development that could affect demand; and the difficulty of estimating future market demand for our products.

The forward-looking statements in this presentation were based on management's analysis of information available at the time the presentation was prepared and on assumptions deemed reasonable by management. Our industry and business are constantly evolving, and Cree assumes no duty to update such forward-looking statements to reflect subsequent developments.

Agenda

- **Cree Overview**
- **Background for The LED Lighting Revolution**
- **Evidence of the Revolution – Rapid Deployment**
- **Key Policy Advances Needed**

CREE, INC.

A Global Company



Founded in 1987

- Public since 1993 (Nasdaq: CREE)
- Headquartered in Durham, NC
- Strong patent portfolio
 - 508 U.S. patents and 916 foreign patents

Global Reach

- 10 Major Locations
- 3,200 Employees
- Fiscal 2009 Revenues \$567M

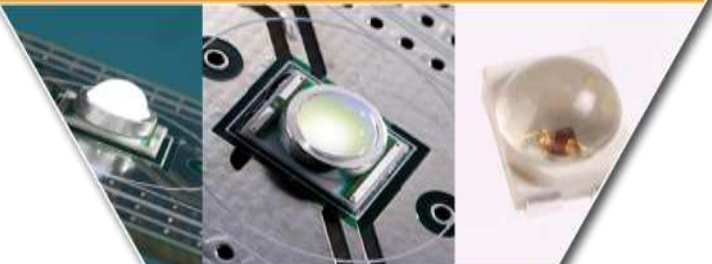
Vertical Integration

LED Lighting Market

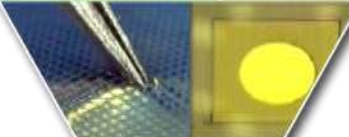
LED Systems



LED Components



LED Chips



Materials



LED Components

World leader in
**Lighting-Class
XLamp**
power LEDs



High-Brightness LEDs

for signage and
entertainment



Outdoor & Indoor Lighting



Emergency Vehicle
Lighting



Architectural Lighting

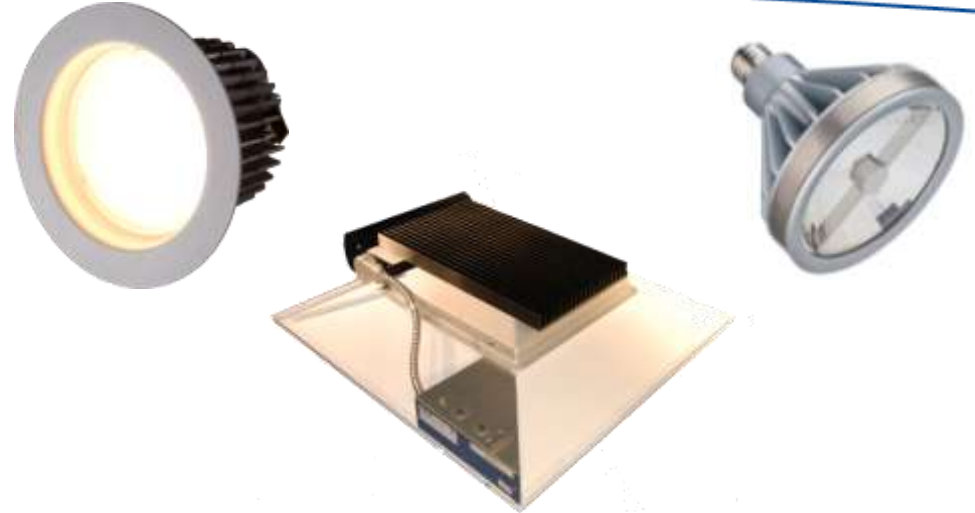
Portable Lighting



Video Screens

LED Lighting

Industry-leading and
award-winning family of
**LED fixtures
and lamps**



Hospitality



Restaurant



Residential



Office & Industrial



Retail & Museum

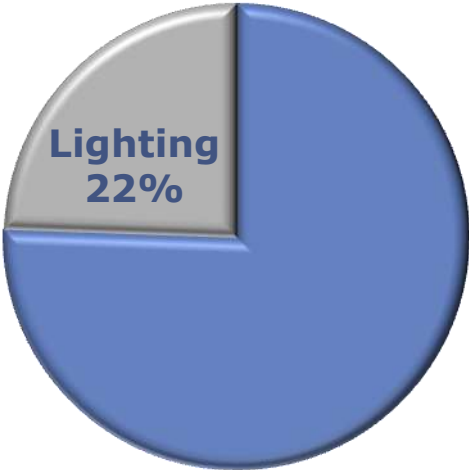


**Lead the LED Lighting Revolution
and obsolete energy-inefficient
light bulbs**

WHY LED LIGHTING, NOW?

Two Global Macro Trends

- 1. Energy availability and cost
- 2. Green movement



**US Electricity
Consumption**

Source: EIA



US DOE “Gets It”

- **Recent projections:**
 - **By 2030, lighting energy consumption is estimated to be well below the 2010 level due to LED lighting**
 - **In 2030, the LED scenario represents a reduction of 25%**
 - **Savings is equivalent to 25, 1,000 megawatt nuclear plants**

Source: DOE, Energy Savings Potential of Solid-State Lighting in General Illumination Applications 2010 to 2030

US DOE "Gets It"

U.S. DEPARTMENT OF **ENERGY** | Energy Efficiency & Renewable Energy

Solid-State Lighting

About the Program | R&D Projects | Market-Based Programs | Using LEDs | Information Resources | Financial Opportunities

Search Help | More Search Options | EERE Information Center Programs and Offices

DOE Solid-State Lighting Portfolio

The U.S. Department of Energy and its partners are working to accelerate advances in solid-state lighting — a pivotal emerging technology that promises to fundamentally alter lighting in the future.


No other lighting technology offers as much potential to save energy and enhance the quality of our building environments, contributing to our nation's energy and climate change solutions.

Read more about the energy-saving potential ([PDF 72 KB](#)), [Download Adobe Reader](#).



L-PRIZE™
The Race for Super Efficient Light Bulbs
L-Prize Partners stand ready to support the winning products.
[Learn more >](#)

Partners



[Learn more about DOE SSL partners >](#)

For more information, e-mail:
James.Brodick
You can also [see full contact information](#) including phone and address.

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R&D Projects >

- [Project Portfolio](#)
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Market-Based Programs >

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- [GATEWAY Demonstrations](#)
- [Lighting for Tomorrow](#)
- [Next Generation Luminaires](#)

Using LEDs >

- [LED Basics](#)
- [LED Applications](#)
- [LED Measurement](#)

UPDATES

Register for SSL Updates

News

[Raleigh R&D Workshop Highlights and Presentations Posted >](#)
February 17, 2010

[DOE Report Estimates Energy Savings Potential of SSL >](#)
February 15, 2010

[Next Generation Luminaires Announces LED Design Competitor Winners >](#)
February 11, 2010

[Top R&D Achievements Honored at DOE SSL Workshop >](#)
February 5, 2010

[DOE Announces Selections for SSL Core Technology Research, Product Development, and Manufacturing >](#)
January 15, 2010

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Events

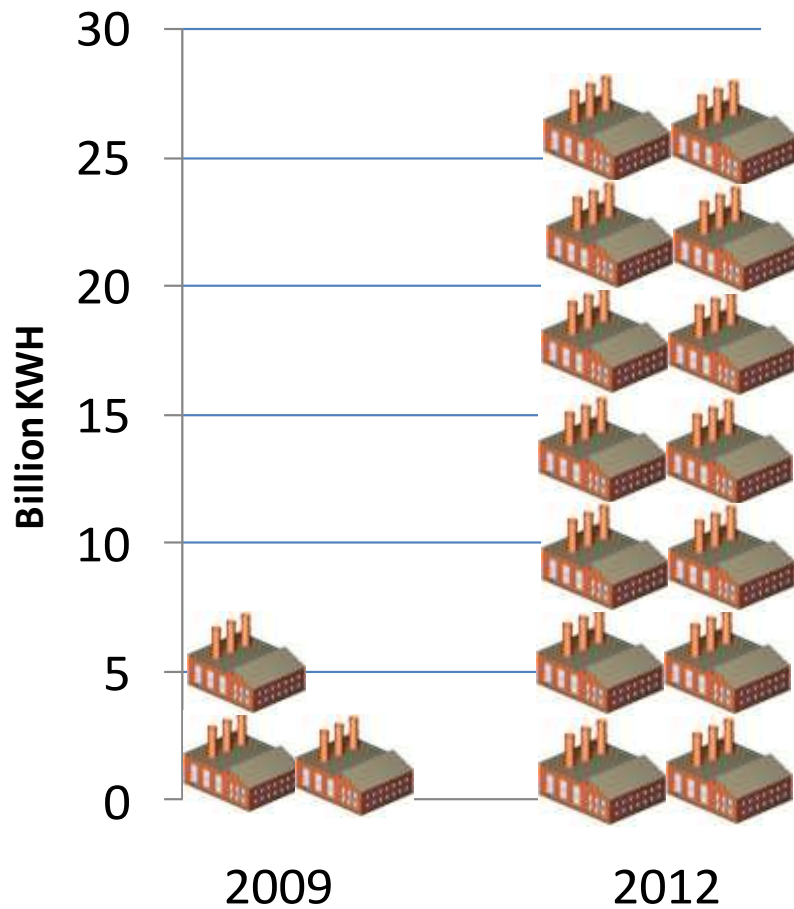
[Webcast: LEDs for Interior Office Applications >](#)
March 18, 2010

[2010 DOE Solid-State Lighting Manufacturing R&D Workshop >](#)
April 21-22, 2010

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Content Last Updated: 03/04/2010

Impact of LED Lighting – Green Benefit



2009

- Cree LED chips save 6 billion kWh/year
- Equivalent of 3 coal-fired generators

2012

- Estimate savings of 28 billion kWh/year
- Equivalent of 14 coal-fired generators

Source: Cree Analysis

Traditional Technologies Have Big Problems

- **Incandescents not efficient enough**
 - **Space heater that gives off a little light**
 - **Banned worldwide over next 10 years**

- **Fluorescents have mercury**
 - **About 5mg mercury per bulb regardless of type**
 - **Concern for ground water contamination**
 - **Less than 10% are ever recycled**
 - **See EPA website for clean up**

Utilities are Changing Focus

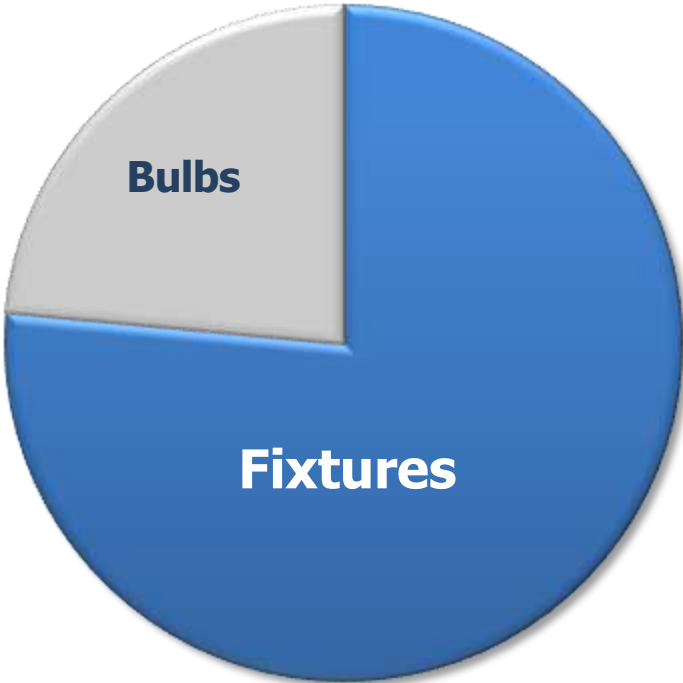
- **Surging spend on programs for energy efficiency**
 - Now almost 2 percent of revenue
 - Equivalent to about 15-20 percent of pre-tax earnings

- **Recognize that CFLs have been “stimulated enough”**

Source: Cree and Black and Veatch, 2010 Strategic Directions in the Electric Utility Industry Survey

The Market is Attractive

\$119 Billion*



Applications

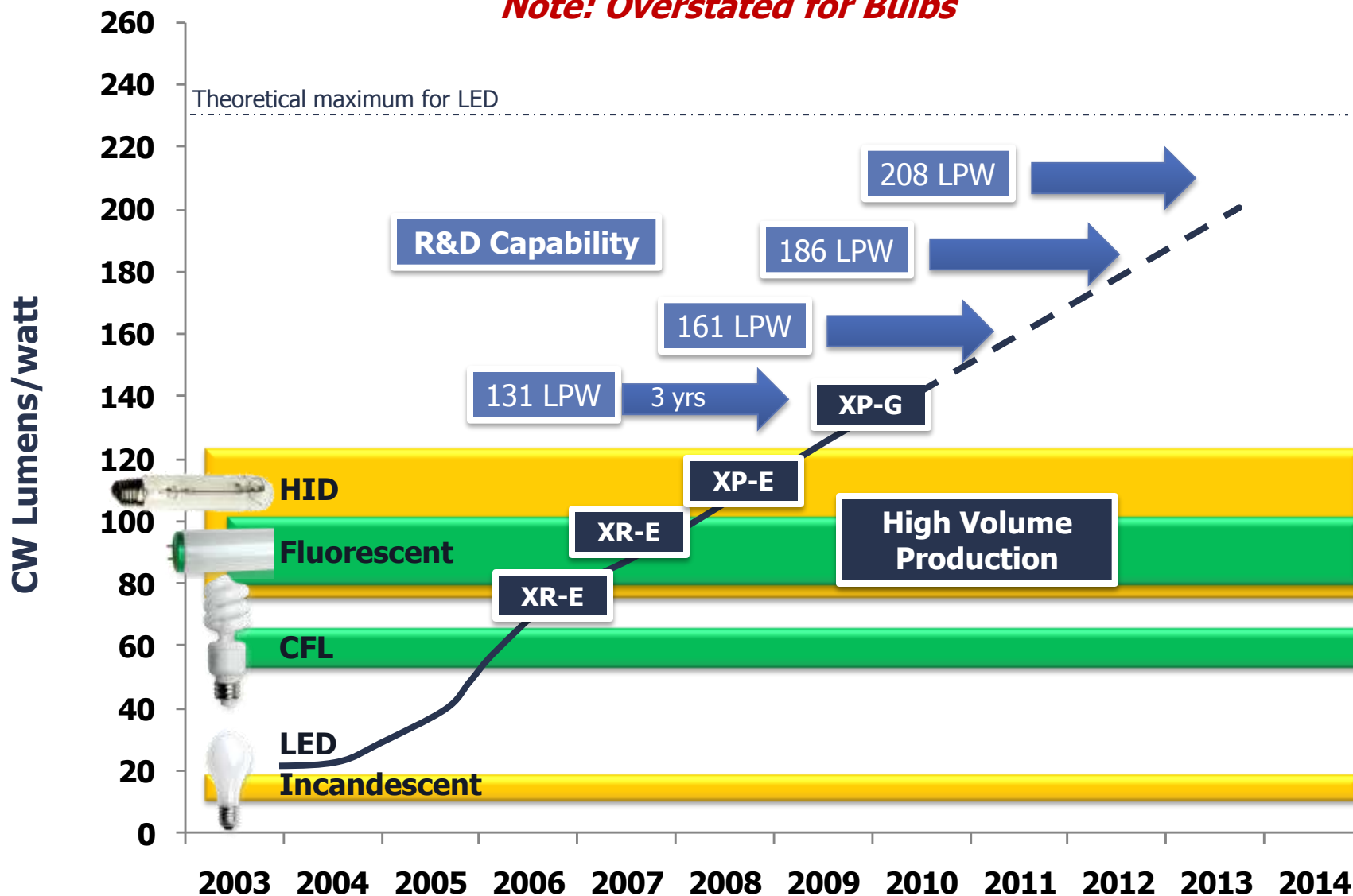


*Source: Freedonia Group estimate for 2007

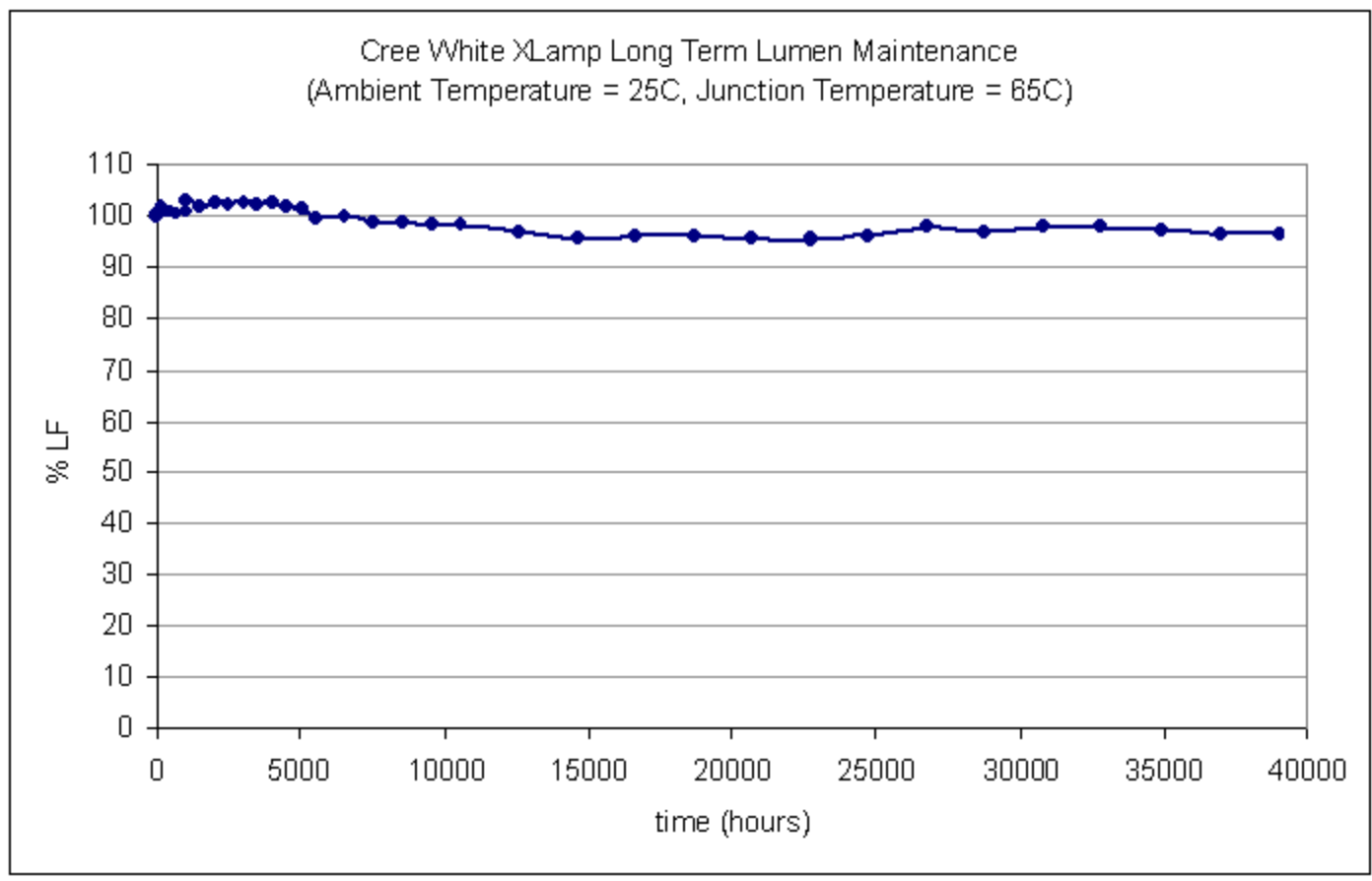


LEDs Have Superior Performance

Note: Overstated for Bulbs



Superior Performance: New Reliability Results

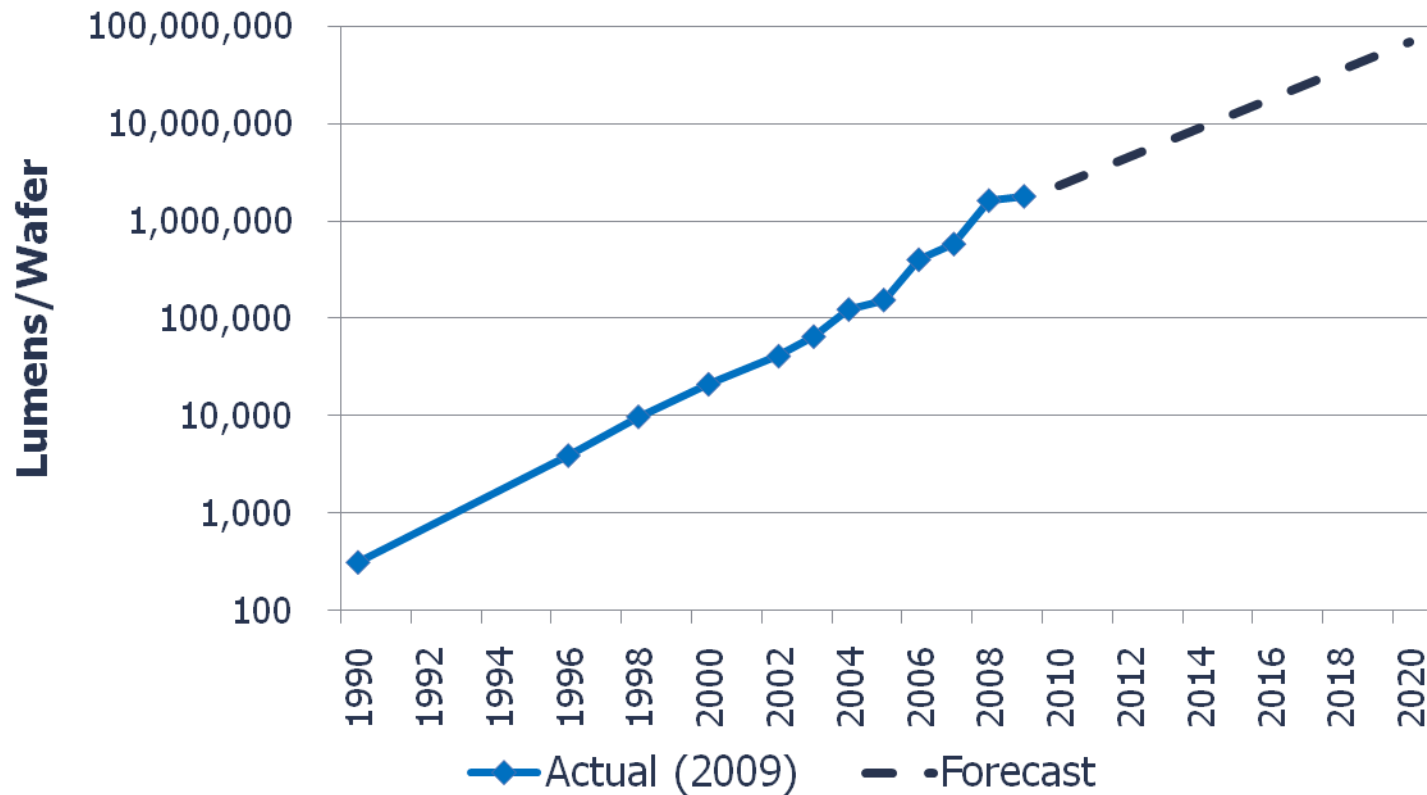


Standards are in Place

Standard	Draft	Comment	Comment Resolution	Projected Publication
IESNA RP-16 Definitions	X	X	X	Complete
ANSI BSR C78.377A, Chromaticity	X	X	X	Complete
IESNA LM 79, Luminous Flux	X	X	X	Complete
IESNA LM 80, Lumen Depreciation	X	X	X	Complete
NEMA SSL-1, SSL Drivers	X			
NEMA LSD-44 & 45, (SSL-2) SSL Interconnect	X	X		
NEMA SSL-3, LED Binning	X			
TM-21, Lumen Maintenance Extrapolation Method	X			
NEMA-ALA Joint White Paper Definition of Functional & Decorative Lighting	X			
IESNA LM-xx, LED Light Engine & Lamp Measurement	X			
CIE S009, Photobiological Safety	X	X		

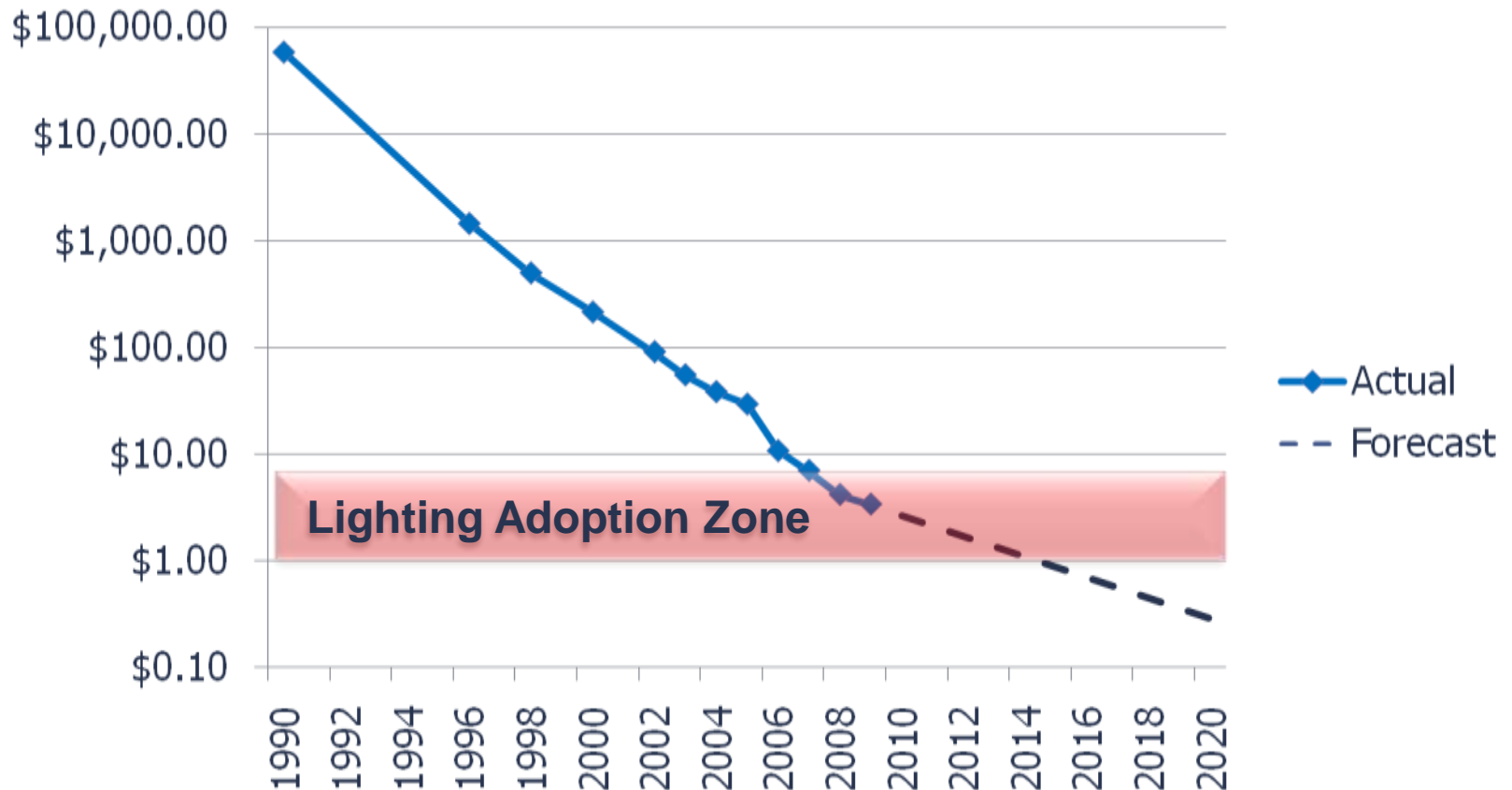


Technology Improvement Drives Adoption



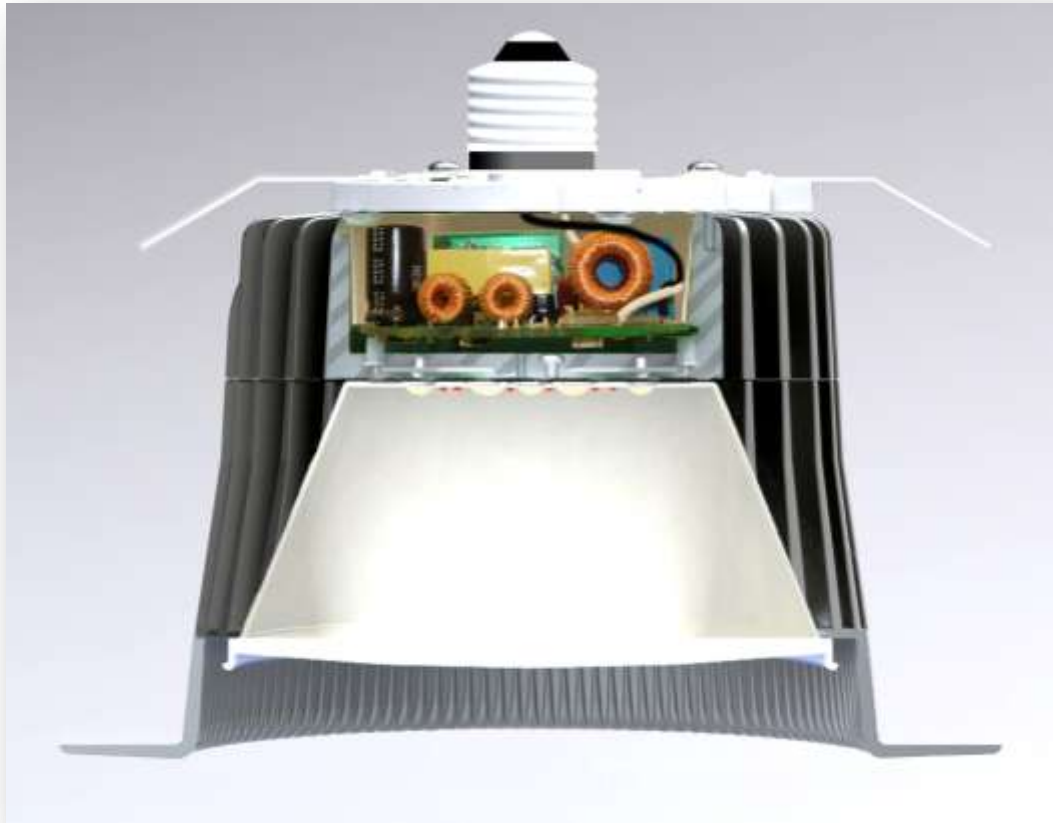
Cree's Law:
Lumens per wafer doubles every 18 to 24 months

LED Cost per Thousand Lumens (k-lumen)



**Different lighting applications turn on
at different LED cost/lumen points**

LED's Are *No Longer* the Cost Issue

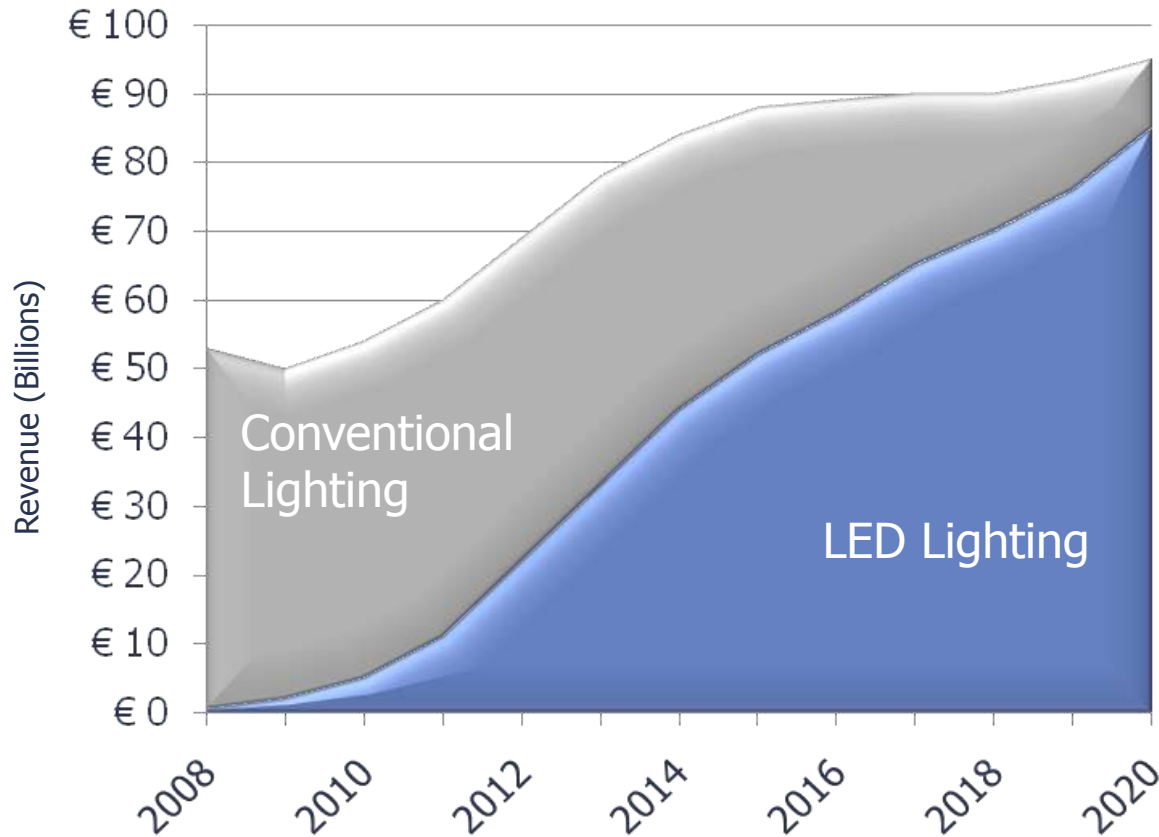


LED Fixture Costs

LEDs	35%
Power Supply	} 65%
Mechanicals	
Drive Circuit	
Optics	
Labor & OHD	

Even Bulb Companies See the Wave Coming

General Illumination Market**



* Strategies Unlimited 2009 / **Philips Lighting 2009

TODAY'S REALITY – RAPID DEPLOYMENT

CREE Lights Up the Olympics

盤古廣場LED顯示屏
CREE LED LAMP

鳥巢體育場地屏CREE
LED LAMP

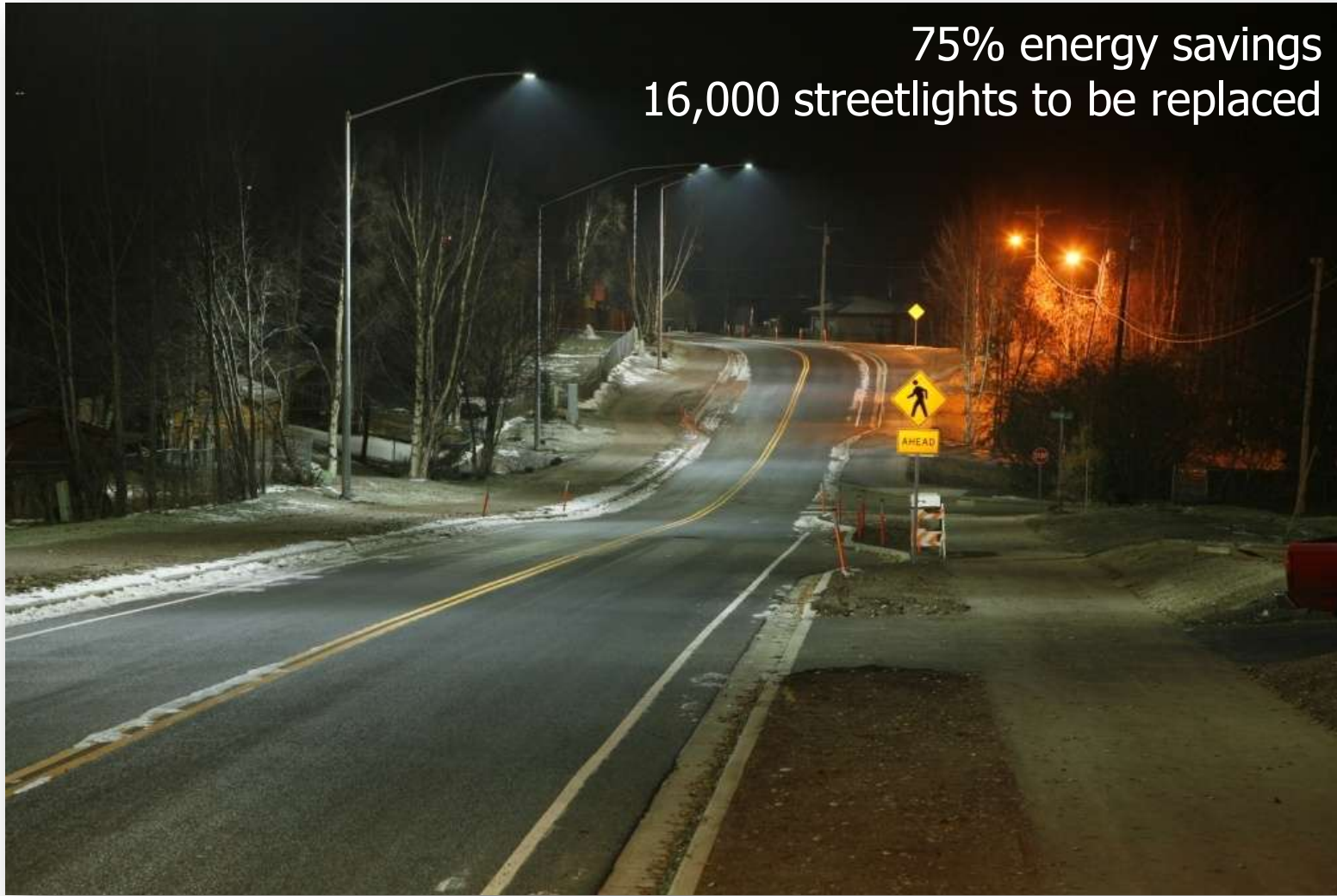


水立方
CREE XLamp LED

鳥巢外牆燈光
CREE XLamp LED

奧運廣場和水立方之間
柱形信息柱
CREE SMD LED

75% energy savings
16,000 streetlights to be replaced



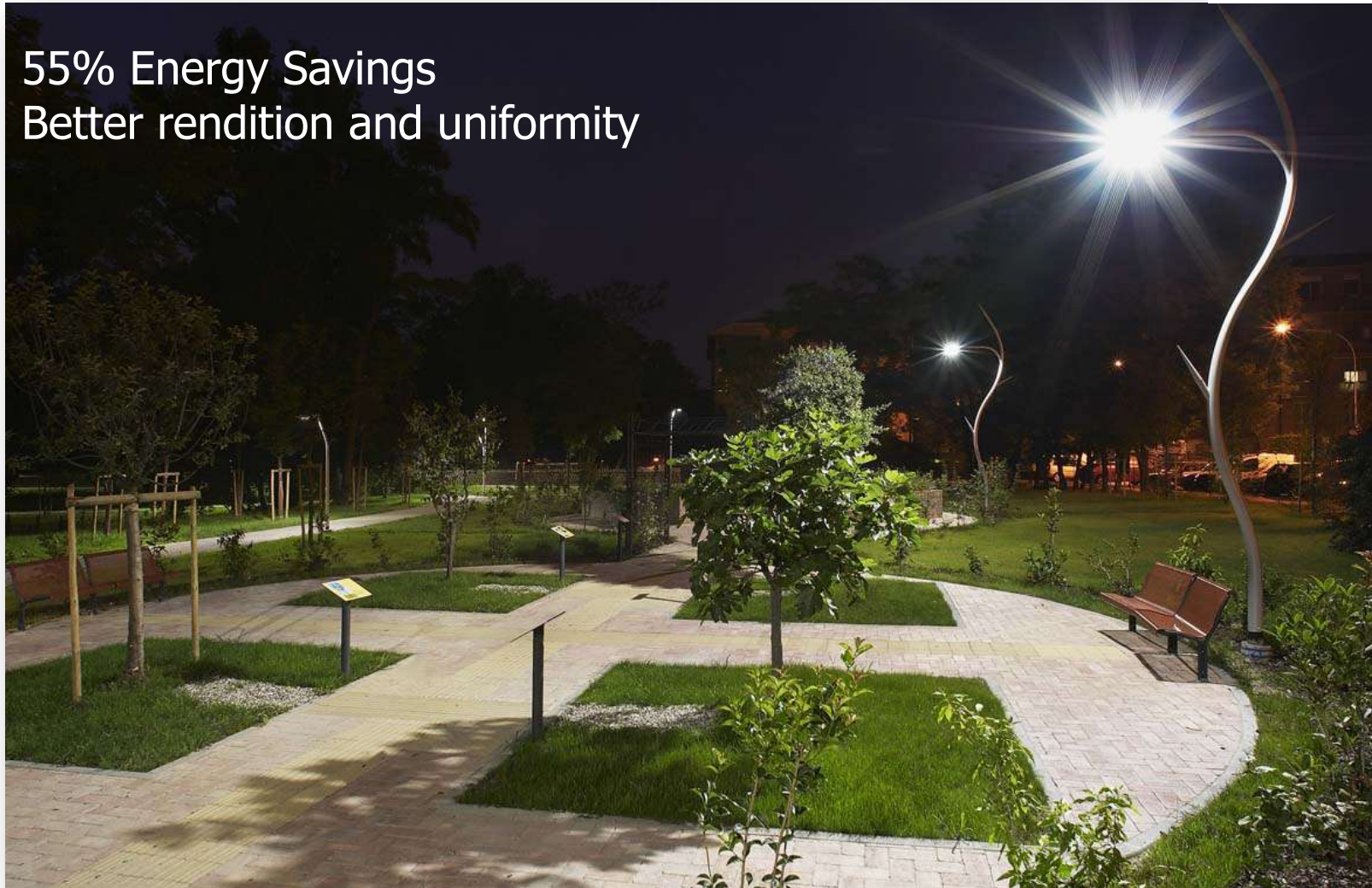
Courtesy of BetaLED

Los Angeles, CA

40% energy savings
140,000 streetlights to be replaced



55% Energy Savings
Better rendition and uniformity



Courtesy of BetaLED

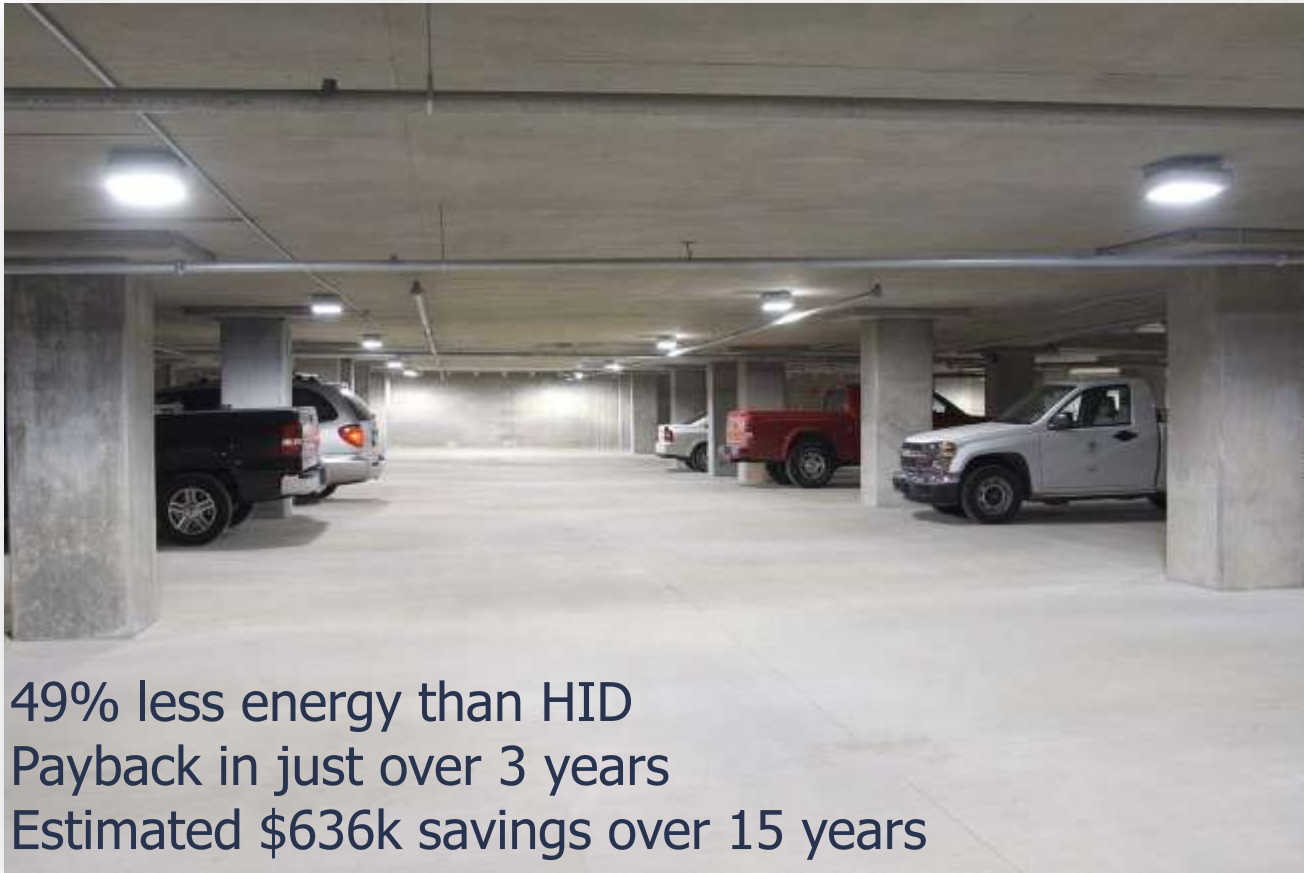


- 2,000 roadway luminaires installed

- Primary motivation:
Energy Savings



New Raleigh Convention Center



49% less energy than HID
Payback in just over 3 years
Estimated \$636k savings over 15 years





Photo Derry Berrigan, DBLD



62% Energy Savings
Will use in 13 properties

Courtesy of BetaLED

Restaurants



- **80% Energy Savings**
- **Excellent Color Rendering (CRI >92)**



Cree LR6



McDonald's



North Carolina's first eco-friendly McDonald's is lit with Cree LEDs

- 78% energy reduction from baseline store
- 97% of lighting is high-performance LEDs



Courtesy of Derry Berrigan, DBLD

Yum Brands



- **81% energy reduction from baseline store**
- **95% of lighting is high-performance LEDs**



Courtesy of Derry Berrigan, DBLD



Results: Awareness at a Different Level



NEEDED POLICY

General Lighting Doesn't Happen By Itself

- **Drivers of LED Adoption**
 - **Products – Improve the economics of LED lighting**
 - **Industry cooperation and focus**
 - **Policy – Change traditional market behaviors that support energy-inefficient lighting**

The Role of Policy

- **Drive change by fiat**
 - **Establish targets for energy efficiency and minimum performance levels**
 - **The cheapest, cleanest energy is the energy we don't use**
 - **Requires legislation, regulation, and industry cooperation**

Warning: China Could Trump Our Lead


- **China “gets it”, too**
 - They have no choice
- **Developing a 6-ministry initiative to massively expand their LED industry**
- **Best way to combat threat**
 - **Stimulate industry here –**
 - *Buy more LED products!*
 - *Use them everywhere!*

Summary


- ✓ **The LED Lighting Revolution is happening *now!***
- ✓ **The forces driving the Revolution are rational and extensive**
- ✓ **Policy is needed to help drive the Revolution forward**

New Cree LED Revolution Site

www.creeledrevolution.com


CREE 


LIGHTING THE LED REVOLUTION™


REPLAY VIDEO 


BREAK YOUR FLUORESCENT SHACKLES

Have you been living under the oppression of inferior lighting? It's time to stand up against wasteful spending, dismal appearance, and hazardous materials. It's time to enter a brave new world or, as we like to call it, a brave new light.

CRY FOR HELP
DIM, BAD, & UGLY 

SEE WHO'S PART OF THE REVOLUTION 

LIFE AFTER THE REVOLUTION 

LEARN ABOUT THE REVOLUTION 

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LED lighting: Energy efficient & planet friendly.

Cree. Leading the LED lighting revolution.

Join Cree's LED lighting revolution. We invite you to see how our high-performance, high-efficiency LEDs are lighting up the world.

