Lee Cush, Solid State Lighting Business Development Manager, Philips Lighting

Lee Cush is a SSL Business Development Manager for Philips lighting North America and has been with Philips for five years. Within Philips he is recognized as a certified LED professional. He is a member of the IESNA and is recognized as an LC by the NCQLP. He covers the Central United States and Eastern Canada as his geographic responsibility with a specific focus on LED retrofit lamp product line as well as the LED refrigerated display case product. He covers all professional market segments including contractor, industrial, retail, government, healthcare, hospitality and commercial. He is originally from Australia and is a Graduate of Griffith University, Gold Coast, Australia with a Bachelor of Business in Retail Management.

Philips SSL

Lee Cush SSL Business Development Manager

AGENDA

- The LED Industry
- LED Benefits and Ideal applications
- How to evaluate products/Philips Differentiators

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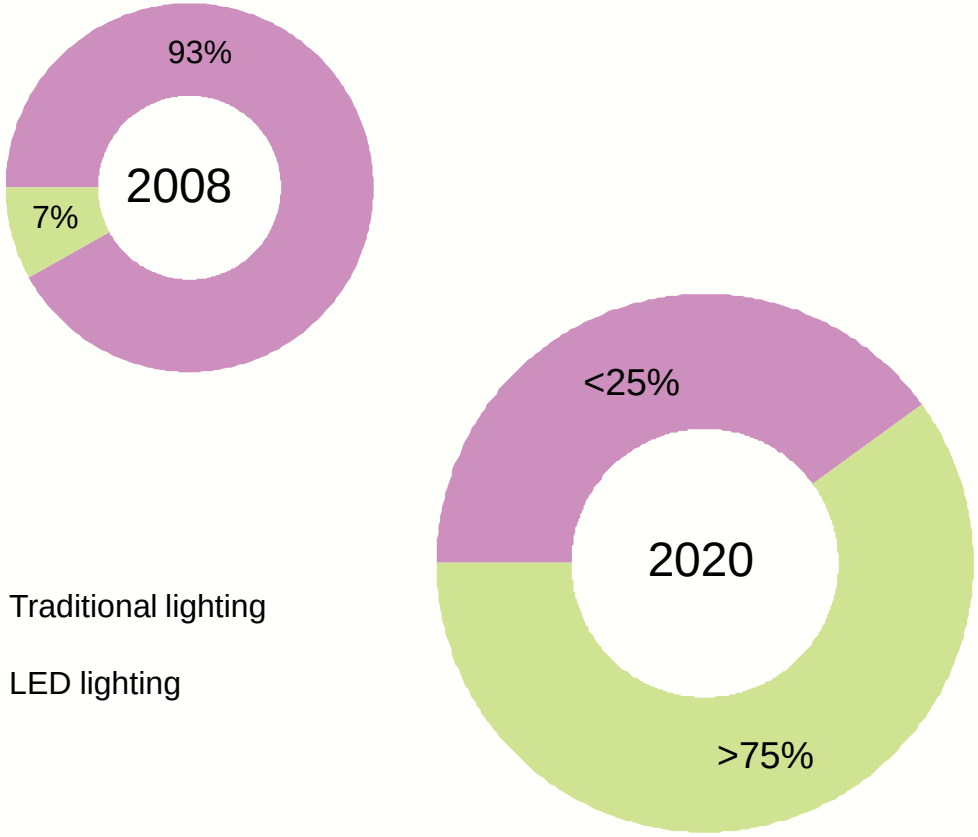
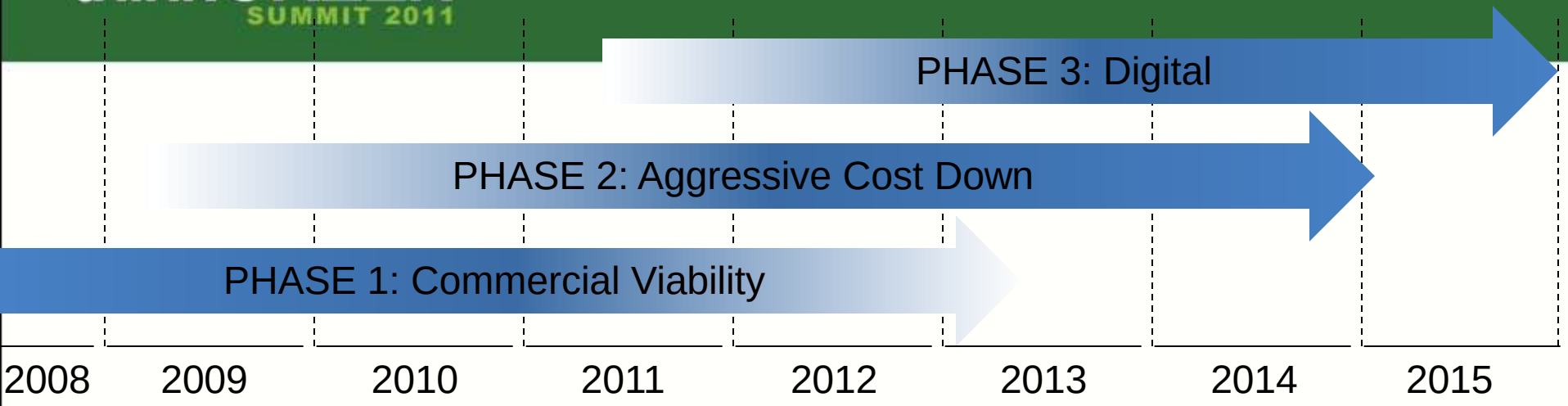
The Digital Revolution

*LED lighting is transforming the entire landscape**



*Market estimate based on internal Philips study

LED revolution has three phases



Phase I: Philips Leads in "Commercial Viability"

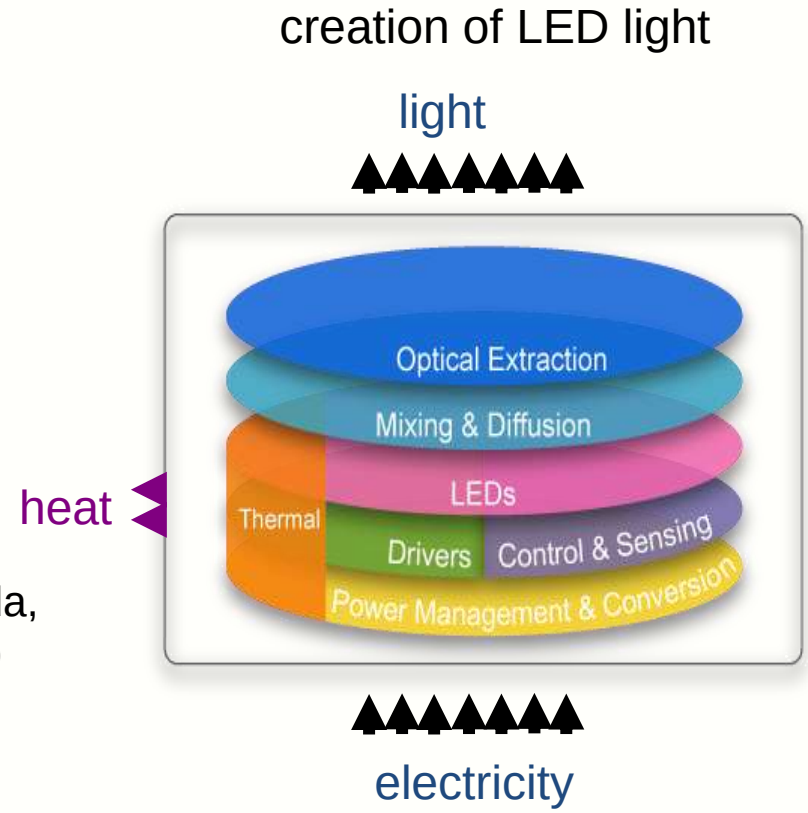
Phase II: Philips Leads in Cost (product, manufacturing, distribution)

Phase III: Philips Leads in Digital Lighting

We are the domain expert on LED

Philips has IP's licenses in every required technological domain for LED lamps

- We invite others to use our knowledge via our licensing program
- More than 225 patent families
- More than 425 issued patents
- About 770 patents pending
- Worldwide (e.g. U.S., Europe, China, Canada, Japan, Korea, Australia, Taiwan, Hong Kong)



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EnduraLED retrofit portfolio – 100+ SKU's

A19 (A-Shape)
7W,8W,12.5W
3 SKUs - Dimmable

R20 & PAR 20
7W
5 SKUs - Dimmable

BR 30
13W
1 SKU Dimmable

"Series 800"
PAR 30 12W 10°, 15°, 22°, 36°
PAR38 17W, 10°, 15°, 22°, 36°
19 – SKUs Dimmable – Improved Lumens

Candle - BA9, B10.5
2W , 3W, 3.5W
***13** SKUs*
E-12 & E-26 Base
Non Dimmable & Dimmable

MR16 4W -24°
7W,10W 15° 24° 36°
18 SKUs
Increased Transformer Compatibility
7W & 10W Dimmable

GU10 25°
4W
2 SKUs
Dimmable & Non Dimmable

"Series 600"
PAR30 Short & Long 20°, 25°- 11W
PAR38 13W10°, 16W 20°, 25°
22 – SKUs Dimmable & Non-Dimmable

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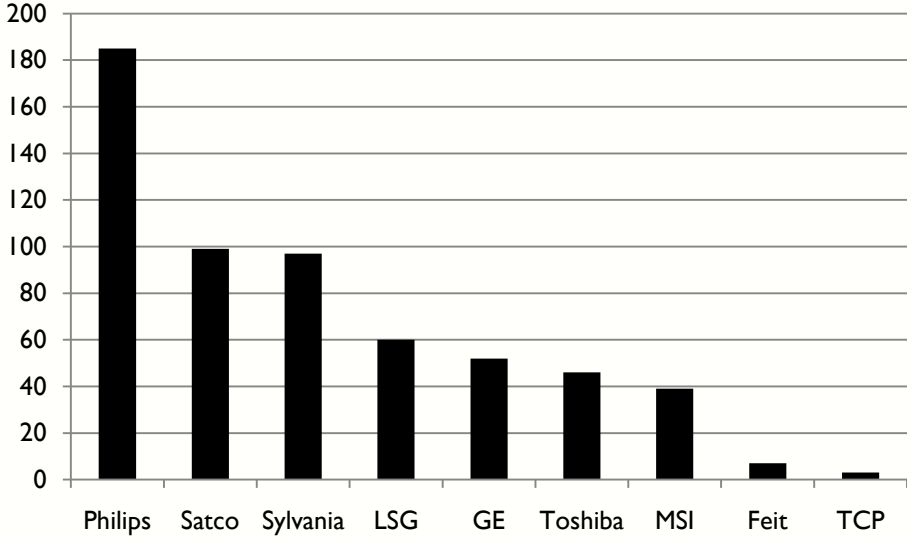
Lighting Facts:

Philips vs. Competition

Manufacturer's Approved "lighting facts" Labels



3279 total Lighting facts approved SSL products.

1396 total replacement lamps.

185 Philips approved replacement lamps.

•As of August 29, 2011, visit the Lighting Facts website for more details.

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Recognized LED Market Leader

EnduraLED A19 Lamp

Manufacturer: **Philips Lighting**

The new dimmable 12 watt EnduraLED A19 lamp is the industry's first LED replacement for a 60 watt incandescent light bulb. Facility Managers and Property Owners will now have an alternative for the most common bulb that delivers the same soft white light and shape they are familiar with. Replacing a standard 60 watt bulb with the EnduraLED A19, which uses just 12 watts of power and delivers an industry benchmark of 806 lumens, could save a business or commercial property up to $120 over the course of the life of the lamp.

http://www.lightingfortomorrow.org/2010/winners/ssl_philips_en

LIGHTING for tomorrow

"…it was the onl… passed muster – co… imming were the m… ose that didn't…" – …ment of Energy 9/23/10

…gov/buildings/ssl/postings.html

Philips A19 L Prize Winner!

TIME IN PARTNERSHIP WITH CNN

Thursday, Nov…

The … bulb

…only submission …he L Prize!

With the … may have just dramatically lowered America's electri… first to ente… Energy's L Prize competition, which seeks an LED alternative… 50% of the do… ent market; if they were replaced by LED bulbs, the U.S. could save… Philips wins the… , it will claim a cash award and federal purchasing agreements worth abou…

Philips' LED bulb emits the same amount of light as its incandescent equivalent but uses less than…

50 Best Inventions of 2009

From a rocket of the future to a $10 million lightbulb, here are TIME's picks for the best gadgets and breakthrough ideas of the year

Full List

THE BEST INVENTIONS

1. The Best Invention of the Year: NASA's Ares Rockets
2. The Tank-Bred Tuna
3. The $10 Million Lightbulb
4. The Smart Thermostat
5. Controller-Free Gaming
6. Teleportation
7. The Telescope for Invisible Stars
8. The AIDS Vaccine
9. Tweeting by Thinking
10. The Electric Eye

Philips is the "Beacon of Trust" in LED lamps

TIME IN PARTNERSHIP WITH CNN

Thursday, Nov. 12, 2009

The $10 Million Lightbulb

Our products lead the industry in technical performance…

With the flick of a switch, Philips Electronics may have just dramatically lowered America's electric bill. In September the Dutch electronics giant became the first to enter the U.S. Department of Energy's L Prize competition, which seeks an LED alternative to the common 60-watt bulb. Sixty-watt lights account for 50% of the domestic incandescent market; if they were replaced by LED bulbs, the U.S. could save enough electricity per year to light 17.4 million households. If Philips wins the L Prize, it will claim a cash award and federal purchasing agreements worth about $10 million.

Philips' LED bulb emits the same amount of light as its incandescent equivalent but uses less than 10 watts and lasts for 25,000 hours — or 25 times as long

…and are acknowledged by Lighting facts and DOE & Energy Star

L PRIZE℠ U.S. Department of Energy

ENERGY STAR

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LED System Benefits

Conventional Lighting Sources

- Incandescent

- Halogen

- Fluorescent

- Gas-discharge (example: neon)

SSL Source

Light Emitting Diodes (LEDs)

Benefits of SSL

- Ultra long source life (25-50K hrs)
- Highly efficient, 60+ lumens/watt
- Low power consumption
- Low maintenance
- No moving parts
- No UV emissions
- No radiated heat (IR) from light
- Digitally controllable
- Unaffected by cold temperatures
- Unaffected by high vibration
- Fast response

With long life LED, you can focus on other tasks, not bulb replacement

Maintenance Savings

PAR38 LED
45,000 hours

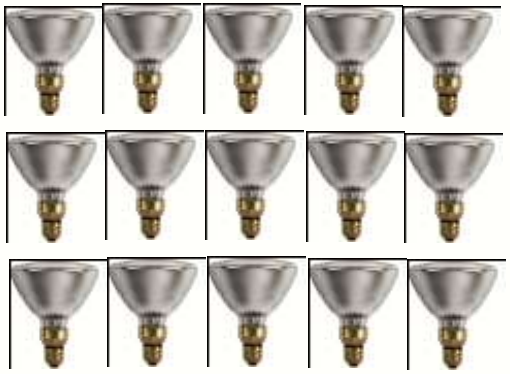
Can replace

A19 LED
25,000 hours

Can replace

MR16 LED
25,000 hrs

Can replace



15 incandescent bulbs
@ 3,000 hours

25 incandescent bulbs
@ 1,000 hours

8 incandescent bulbs
@ 3,000 hours

Calculating Maintenance Savings

1) Hourly labor rate

× Fraction of an hour to change a lamp

Labor cost for lamp change

2) Hourly equipment rate

× Fraction of an hour equipment is needed

Equipment cost for lamp change

3) Avg. rated lamp life

÷ Annual Operating Hours

Number of lamp changes per year

4) (Equipment cost for lamp change + Labor cost for lamp change)

× Number of lamp changes per year

Total annual costs for each lamp change

LEDs are efficient, so you consume less energy for the same amount of light

Energy Savings

Lamp type	Wattage	Energy Savings
EnduraLED A19	12.5	47.5W (~80%)
Incandescent A19	60	
EnduraLED PAR30	12	48 (~80%)
Halogen PAR30	50	
EnduraLED MR16	10	40W (80%)
Halogen MR16	50	

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Calculating Energy Savings

1) Wattage savings per lamp change

× Number of lamps changed

Total watts saved

2) Total Watts Saved

× Annual Operating Hours

Annual watts saved

3) Annual watts saved

÷ 1000 W per KW

Annual KW saved

4) Annual KWs saved

× KW rate ($0.11 average)

Annual energy savings

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Ambient & Spot Lighting

Track & Recessed Lighting

Hall & Task Lighting

PAR30 / PAR38

LED vs. Incandescent	
Lifetime	45K *vs* 3K hours
Energy	12W *vs* 50W (PAR30) 17W *vs* 75W (PAR38)
Light Output	660 *vs* 610 lumens 930 *vs* 960 lumens

MR16

LED vs. Incandescent	
Lifetime	25K *vs* 3K hours
Energy	4 - 10W *vs* up to 50W
Light Output	450 (10W) *vs* 600 lumens

A19

LED vs. Incandescent	
Lifetime	25K *vs* 1K hours
Energy	12.5W *vs* 60W
Light Output	800 *vs* 800 lumens

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Ambient & Spot Lighting

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A19

LED vs. Incandescent	
Lifetime	25K *vs* 1K hours
Energy	12.5W *vs* 60W
Light Output	800 *vs* 800 lumens

Customer concerns about LED

I have tried some LED's and they did not work as the mfg said they would.

Philips provides a three-year limited warranty on LED lamps Philips products are thoroughly tested and meet safety standards (RoHS, FCC, UL) Philips can provide reports recommended by the IES for both photometric performance and lumen maintenance (LM-79 and LM-80)

Quality of product is suspect- How do I know Philips has a Quality product?

Philips is a leader in developing standards for the LED industry and is recognized by the DOE and many other agencies as the quality leader. Standards Like - Lamp Facts, LM 79 and LM 80, B50 and L 70 demonstrate Philips commitment to Quality

Why should I buy LED over CFL technologies?

Longer Life improved energy savings, quality of light, Instant light -no warm up, RoHS compliant - Mercury and Lead free.

Customer concerns about LED (cont.)

LED's Cost to much.

- I understand your concern but it you look at the "total cost" of lighting that includes the number of Incandescent lamps you would have to buy. Plus labor cost to change the lamps and the Energy savings - LED is the most economical lighting solution.
- Reduce energy, potential mercury elimination and maintenance costs can help you reach your sustainability goals
- Philips is working with utilities to develop rebate programs

LED are getting better and cheaper, should I wait?

- The question you should be asking is what is the savings if I start using LED today. Much like computers and other technology LED is improving but if the product meets your needs today and can help you save money by reducing your labor and energy cost. You should start saving now.

Prior to installing

Please try to find out:

Number of lamps?
Which lamp product, exactly?
How many lamps on a dimmer?
Are lamps of different types mixed on the same dimmer?
Which dimmer, exactly?

If the product has already been installed (in additional to the above information please provide):

What are the symptoms?
At what dimmer settings is there a problem?
Application

Please keep us informed on progress at the customer site.

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5 Questions an end user should ask

when considering SSL retrofit lamps

1. **What is the light output in delivered lumens of the LED lamp; and what is the system wattage consumption (of the end product)?**
   NOTE: It is important to ask for delivered lumens of the lamp, not lumens of the LED chips.

2. **At a comparable light level, what light source and wattage does the LED lamp replace?** NOTE: For reflector lamps, compare Maximum Beam Candle Power (MBCP) instead of lumens.

3. **What lifetime is specified for the LED lamp and what is the lumen maintenance at end of life?**
   - ***Do you use the recommended standards from IES: LM-79 & LM-80?***
   - ***What lifetime warranty do you have in place for your LED lamp?***

   NOTE: The lifetime of the LED lamp is dependent on many factors, not just the lifetime of the LED chips.

4. **What is the color temperature of the LED lamp (end product), in kelvin; and do you publish a maximum range of color variation (in kelvin)?**
   NOTE: LED lamps can have large variations in color temperature resulting in visible color differences lamp-to-lamp.

5. **What documentation do you have to verify the LED lamp has met safety requirements (UL. CSA etc)?** NOTE: All LED lamps need UL certification to ensure a safe product.

NOTE: SSL lamp specifications are not regulated yet.