SSL Technology Evolution

ENERGY STAR® Solid-State Lighting Stakeholder Meeting

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SSL on the Move

- Significant breakthroughs, more to come
- R&D alone is not enough
- Need to drive products to market
New Product Announcements

• “Philips Lumileds shatters 350 mA performance records with 115 lm/W LED”
  January 2007

• “Seoul Semiconductor introduces world’s brightest LED, a 240 lumens single die light source” [100 lm/W]
  December 2006

• “Nichia delivers 92 lm/W at 350 mA”
  November 2006

• “Cree delivers first 160-lumen white power LED” [85 lm/W]
  October 2006
Unique and Potentially Better Technology

- Heat transfer
- Low voltage DC
- Small emitter
- Directional
- Shades of white light

Halley LED Desk Lamp
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The Legislative Authority
Domenici-Barton Energy Policy Act 2005

Section 912

“The Secretary shall carry out a Next Generation Lighting Initiative in accordance with this section to support research, development, demonstration, and commercial application activities related to advanced solid-state lighting technologies based on white light emitting diodes.”
DOE SSL Technology & Market Partners
DOE Solid-State Lighting Workshop

- 260 attendees at annual meeting
- Purpose: DOE program planning; & network
- Luminaire manufacturers (34)
- Lighting designers
- Source manufacturers
- Trade Associations
- Energy Efficiency Programs
- Utilities
SSL Partnership
Next Generation Lighting Industry Alliance MOA

“The Parties will conduct activities in support of research, demonstration and deployment of solid-state lighting (SSL) technologies for general lighting applications.”

“…create criteria for voluntary market conditioning programs, such as ENERGY STAR®”

Members:

Accelerated R&D for White Light SSL

SSL Laboratory and Commercial Curves, revised May 2006
1 Technology Tsunami

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3 DOE Market Deployment
Compact Fluorescent Lighting in America: Lessons Learned on the Way to Market

• Valuable lessons
  – Be aggressive about dealing with technology failures that affect main benefit claims
  – Know and admit technology limitations
  – Don’t introduce inferior products; first impressions are long lasting
  – Accurate incandescent equivalency on packaging is critical
  – Manufacturers and energy-efficiency groups should coordinate to establish minimum performance requirements
• Use to avoid “CFL Part II”
• Apply to SSL commercialization path
Lighting for Tomorrow: SSL Competition

- For first time, 2006 LFT included SSL competition
- Entries allowed for: undercabinet, portable desk/task, outdoor
- Proposals due Sept. 15; 34 proposals received
- Judging on Oct. 11; winners announced
- Winning luminaires displayed at 2007 DOE SSL Workshop

Outdoor Category Entry; 3.5 Watts, 2700K CCT
Commercial Product Testing Program

• Program publicly announced at Workshop in DC in October 2006
• Purposes: assist DOE program planning; assist SSL test procedure refinement; inform buyers
• 4 products tested to date: downlights, under-cabinet light, task light
• 12 more in process
• Primary measurements include: total lumens, luminaire efficacy, CCT, CRI, spectral power distribution, electrical measurements
• Test results available: www.netl.doe.gov/ssl/comm_testing.htm
SSL Fact Sheet Series

- Written for efficiency program and facility managers
- Five completed in ’06
- Five more coming in ’07
Standards & Test Procedures Development

• DOE leadership – March and October workshops convene key standard organizations
  – Prospect of ENERGY STAR SSL criteria primary driver
  – Agreement to accelerate process
  – Maintain master roadmap of activities

Standards & Procedures In Development
• Definitions (IESNA RP-16) – under ANSI committee review
• Drivers (ANSI C82.XX) – draft out for committee review and comment
• Lumen maintenance (IESNA LM-80) – draft in final development
• Luminous Flux (IESNA LM-79) – in first official round for committee comment
• Chromaticity (ANSI C78.377) – draft out for committee review and comment
• LED Safety Outline of Investigation (UL 8750) – in draft for industry review
• Luminous Intensity (CIE 127) – under development
For More Information

For more information and ongoing updates on the DOE Solid-State Lighting Program, visit: www.netl.doe.gov/ssl