DOE ENERGY STAR Program Update

2008 ENERGY STAR Lighting Partner Meeting
February 25, 2008

Richard H. Karney, P.E.
ENERGY STAR Products Manager
U.S. Department of Energy

Phoenix History

Phoenix History

Phoenix History

Phoenix History

History in Phoenix

DOE ENERGY STAR Program Update

Presentation Outline

1. Energy Independence and Security Act of 2007
2. ENERGY STAR CFL Criteria Version 4.0
3. 2008 ENERGY STAR CFL Promotions
4. ENERGY STAR Solid-State Lighting Update

DOE ENERGY STAR Program Update

Energy Independence and Security Act of 2007 (EISA 2007)

EISA 2007

- The bill sets new standards for lighting products.
  - GENERAL SERVICE INCANDESCENT LAMPS

Rated Lumen Ranges	Maximum Rate Wattage	Minimum Rate Lifetime	Effective Date
1490-2600	72	1,000 hrs	1/1/2012
1050-1489	53	1,000 hrs	1/1/2013
750-1049	43	1,000 hrs	1/1/2014
310-749	29	1,000 hrs	1/1/2014

EISA 2007

- This will effectively ban the incandescent bulb *as we know it.*
- According to ACEEE, this will, from 2010-2030:
  - Save consumers $40 Billion
  - Prevent the construction of 14 coal-fired power plants
  - Cut annual GHG emissions by 51 million tons of Carbon.

Bright Tomorrow Lighting Prizes

- Provides $10 million per year from 2009 to 2012 for an educational campaign to consumers
- $10 Million will go to the developer of an LED to replace the traditional 60-watt incandescent A-lamp.
- $5 Million will go to the developer of an LED to replace the PAR38 Halogen lamp.
- $5 million will go the developer of an advanced LED that operates at >150 lumens/W efficacy, produces >1200 lumens of light output, has >90 CRI and 2800-3000K CCT, and has a lifetime of >25,000 hours.

DOE ENERGY STAR Program Update

ENERGY STAR CFL Criteria Version 4.0

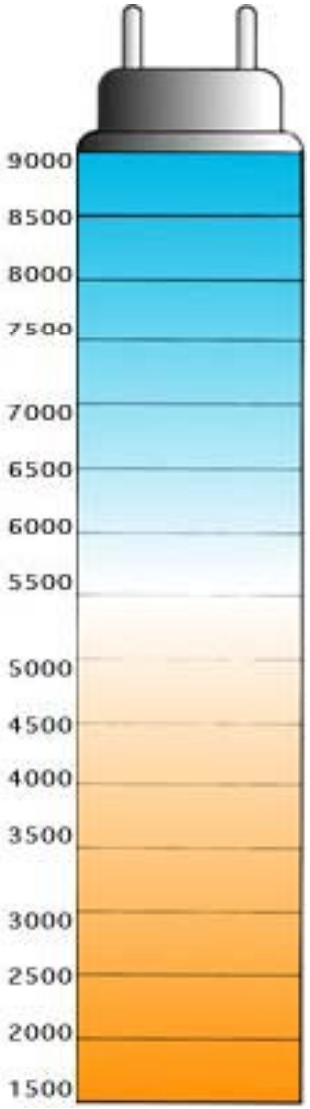
CFL Criteria 4.0

- Released February XX, 2008
- Effective date November XX, 2008
- Covers medium screw based and candelabra based CFLs
- GU24 base intergrated self-ballasted CFLs removed

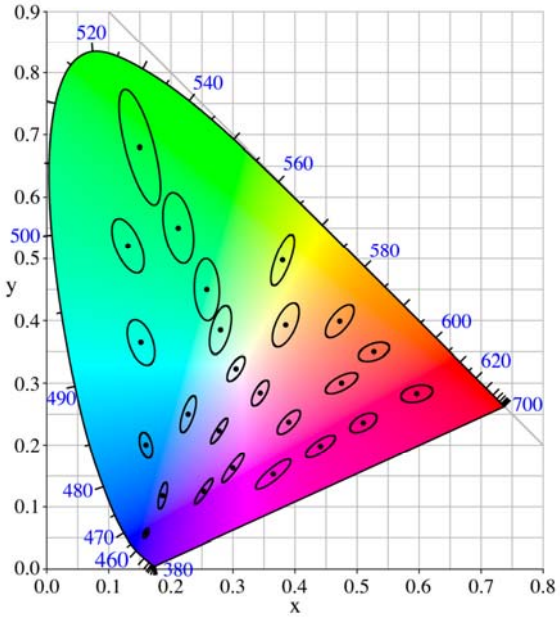
CFL Criteria 4.0

- Increased efficacy levels
- Tightened CRI tolerances
- Six designated correlated color temperatures
- 3rd party testing program
- High heat testing for reflector lamps
- Mercury content requirement
  - Lamps under 25 watts: ≤ 5 mg
  - Lamps 25 watts-40 watts: ≤ 6 mg
  - Mandatory packaging language: www.epa.gov/bulbrecycling or www.lamprecycle.org
- Run-up time
  - Amalgam run-up time < 3 minutes
  - Non-amalgam run-up time < 1 minute
- End of life protection-TBD

Color Communication



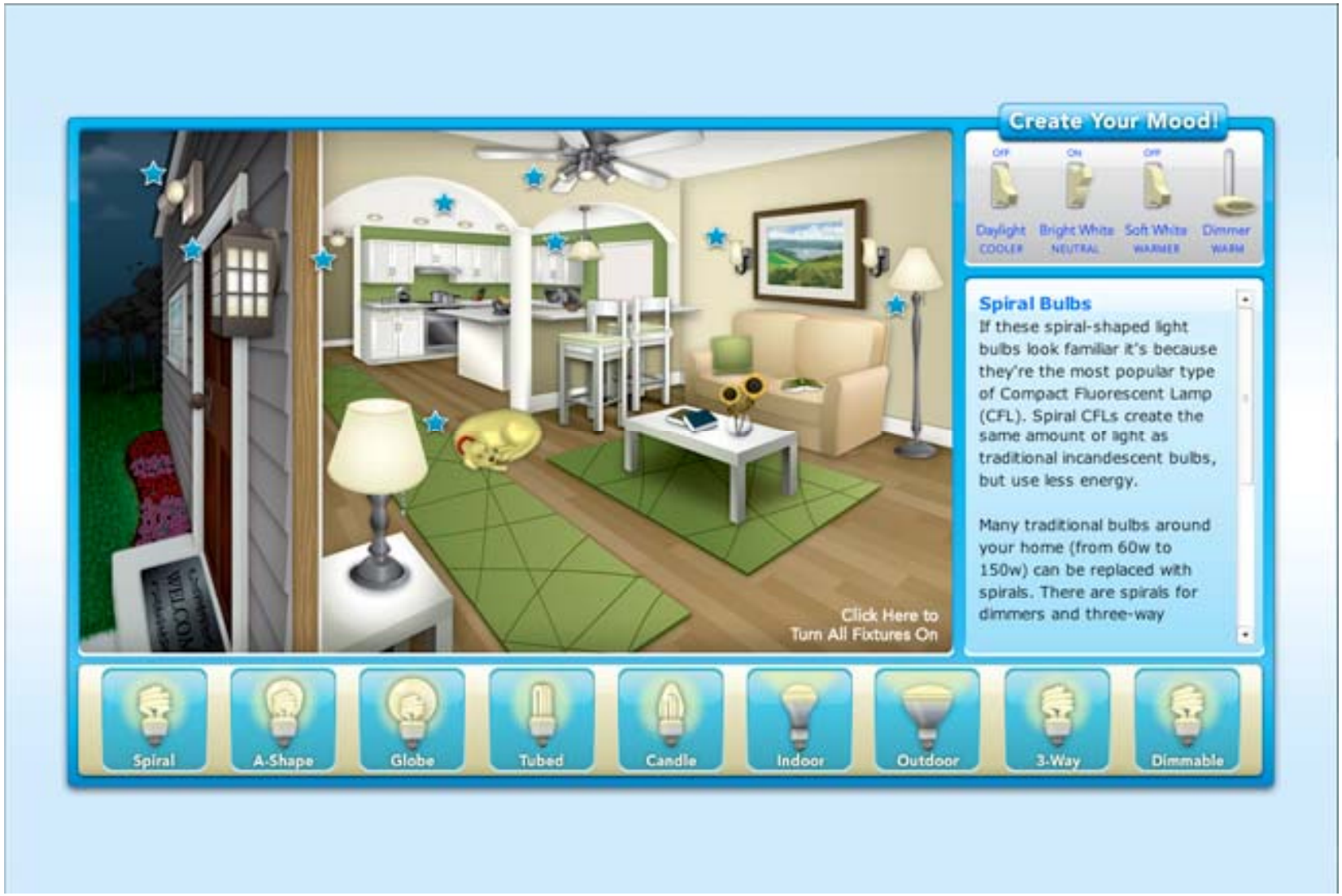
- No required color descriptor language
- Products must be identified by one of the six designated correlated color temperatures.
- 9 of 10 samples must fall within a 7-step MacAdam ellipse for the designated CCT.
  - 2700K
  - 3000K
  - 3500K
  - 4100K
  - 5000K
  - 6500K



DOE ENERGY STAR Program Update

2008 ENERGY STAR CFL Promotions

Where to Use Web Tool



2008 ENERGY STAR CFL Promotions

- Invitation to U.S. military bases to change out inefficient light bulbs and replace them with ENERGY STAR qualified models
- Earth Day, 2008 kick-off at Camp Lejeune
- DOE creating resource materials and toolkits for bases
- Potential partnering opportunities
- For information: Lani Macrae or during concurrent sessions

DOE ENERGY STAR Program Update

ENERGY STAR Solid-State Lighting Update

DOE Strategy for SSL Criteria

- Key driver: avoid buyer dissatisfaction and delay of market development
  - Lessons from CFL experience
- Initially, criteria limits products that can be qualified, but establishes efficacy targets for wider range of future applications as technology advances
- Market will have many products not qualified; ENERGY STAR will provide differentiation and consumer value proposition of quality

Scope of ENERGY STAR Criteria

- Limits coverage to LED systems for white light general illumination only
- Both commercial and residential
- Establish 2-category specification
- Luminaire efficacy key metric

Transitional Two-Category Approach

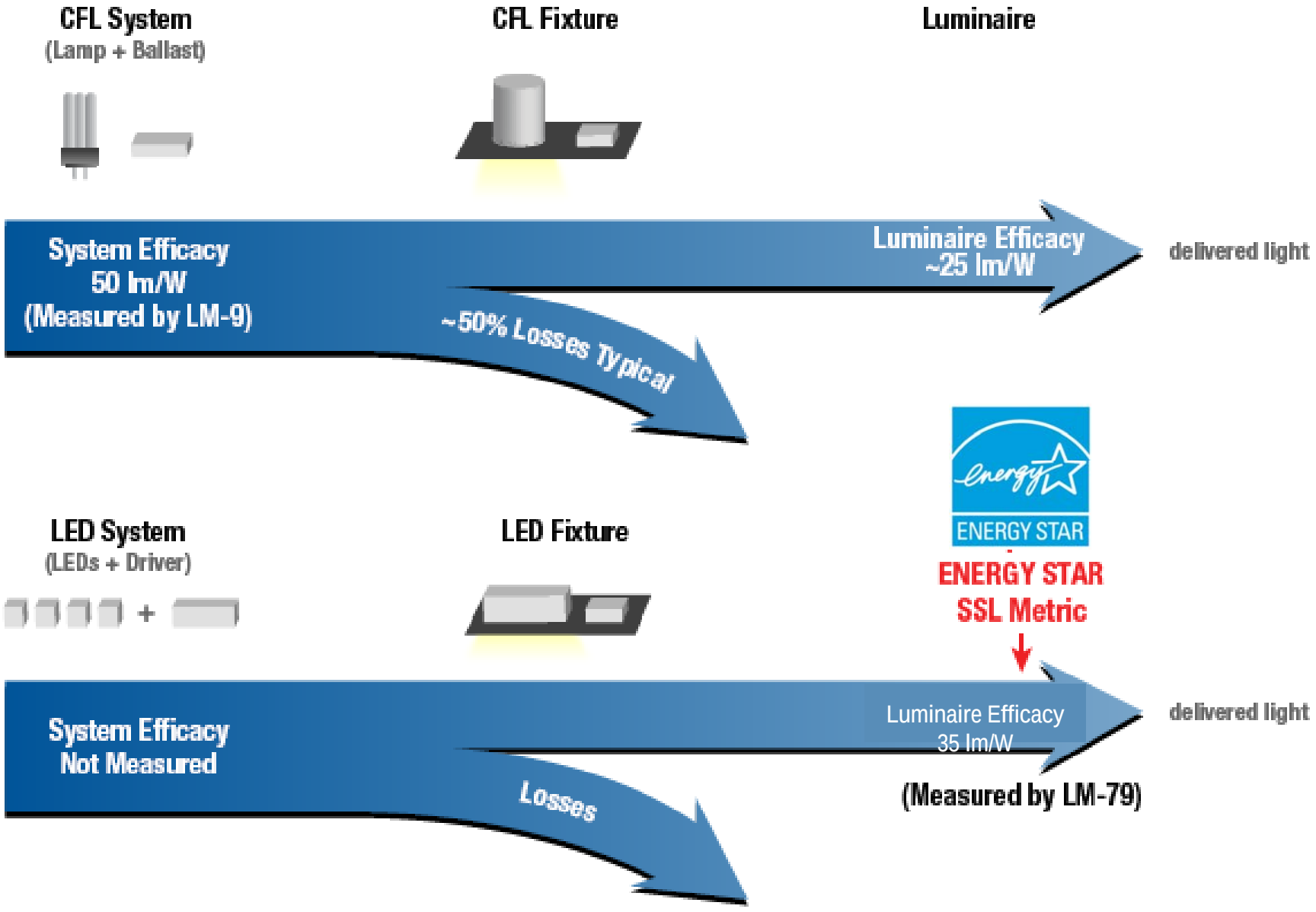
- Approach recognizes rapidly changing technology
- Category A: Allows early participation of limited range of SSL products for directional lighting applications
- Category B: In about 3 years, Category A will be dropped entirely; Category B then becomes basis of criteria

ENERGY STAR SSL—Category A

- Establishes minimum luminaire efficacy
  - Benchmark to fluorescent
    - Consistent with ENERGY STAR lighting criteria
- Directional light applications
  - Efficacy potential higher
  - Minimal fixtures losses
- Category A will expand to include other near-term products.

System Efficacy Vs. Luminaire Efficacy

(Recessed Downlights Example)



ENERGY STAR SSL – Category A

- Under cabinet kitchen
- Under cabinet shelf-mounted task
- Portable desk task
- Recessed downlight
- Outdoor wall-mounted porch
- Outdoor step
- Outdoor pathway

Category A: Near-term Applications

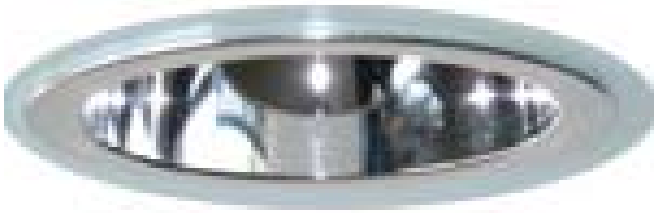
Under-cabinet Shelf-mounted Task

Osram

Philips SSL Solutions

Category A: Near-term Applications

Recessed Downlights (Res./Com.)



Renaissance

Progress

Prescolite

Category A: Near-term Applications

Outdoor Wall-mounted Porch

Category B: Efficacy Based Performance

- Efficacy specification of 70 lm/W by 2011
- Applies to all types of SSL systems for general illumination.
- Manufacturers able to qualify under Category B three (3) years after Category A effective date
- Between three (3) to five (5) years from now, Category A will be dropped.
- Serves as future target for manufacturers

Future Criteria Updates

- Pace of SSL technological improvement continues to exceed projections
- Convergent strategy for applications to align with the Category B efficacy threshold of 70 lm/w by 2011
  - Advance schedule for frequent efficacy increases
  - Expand Cat. A applications
- Allow for streamlined process and abbreviated public review

Program Launch Set for Fall

- LM-80 test procedure for lumen maintenance
  - Final test required for product qualification submission
  - Expected to complete by mid/late March
- Effective date set for Sept. 30, 2008 (no change)
- ENERGY STAR products could be available soon after effective date; ramp up through fall/winter

Partner Planning for Implementation

- DOE Partner Workshop to discuss plans for ENERGY STAR SSL implementation—April-May timeframe in Washington, DC
- Annual DOE SSL Commercialization Workshop—July in Portland, OR
  - updates on technology advances and ENERGY STAR program implementation

Quality Assurance (QA)

- Criteria allow testing flexibility—component substitutions and one product to represent full family
- Risk of decreased performance of qualified product mitigated by robust 3rd party QA program
- Currently developing QA program procedures-implement in early 2009
- Manufacturers required to participate
- Non-compliance terms

Quality Assurance Testing

- Testing lab will procure three (3) samples through the marketplace
- Test for
  - Total Luminous Flux
  - Luminaire Efficacy
  - Correlated Color Temperature
  - Color Rendering Index
  - Steady State Module/Array Temperature
  - Maximum Power Supply case/TMP Temperature

ENERGY STAR SSL Partner Support

- *New* web-based qualification process
- Regular updates:
  - Monthly emails and eNewsletter to partners
  - SSL Technical Info Network
  - ENERGY STAR content currently on DOE's SSL website: netl.doe.gov/ssl
- EEPS/Partners who want to promote products prior to qualification:
  - Promoting untested products is NOT encouraged
  - Refer to test results from on-going product testing of commercially available LEDs (CALiPER) for guidance

Program Tools and Resources

With all of the marketing activity focused on SSL, DOE is focused on providing comprehensive and engaging information to customers and partners.

- Partner Resource Guide
- Info graphics
- SSL Facts & Figures
- Frequently Asked Questions (FAQs)
- Mini Business Case
- Product Profiles, Market Profiles, Product Snapshots
- Media Outreach and support
- Sales Data

More on SSL later…

- New Technologies panel on SSL
  - Tues., Feb. 26 at 12:45 p.m.
  - Will cover updates on technology advancements, test results on performance, and standards development
  - Experts from industry and labs