

# Lighting the Way to Energy Efficiency

## CFLs and LED Lighting



Energy Efficiency Partner Network

e-Connections Wednesday Webinar  
August 19, 2009





# Agenda

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## Energy Efficient Lighting

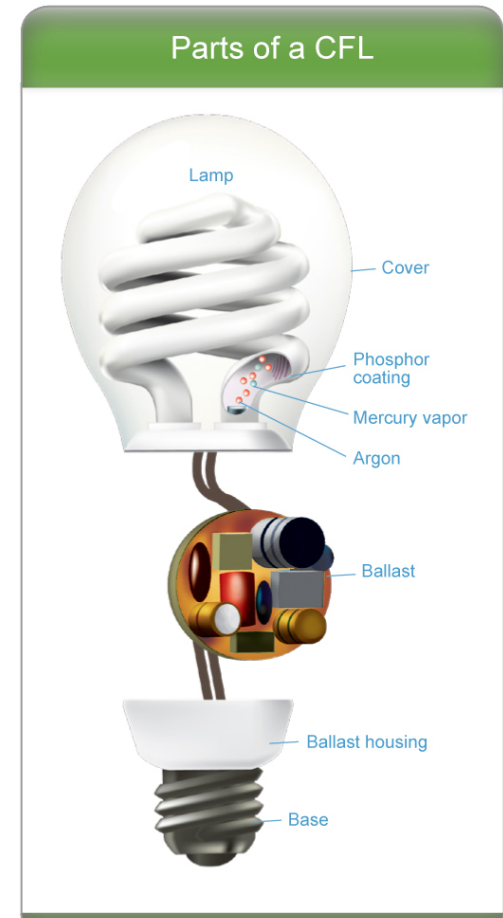
1. CFLs – Compact Fluorescent Lighting
  - Overview of the technology
  - Customer Myths
  - ENERGY STAR® Change A Light campaign details
  - Becoming a participating retailer
  
2. LEDs – Light-Emitting Diodes
  - Overview of the technology
  - Current market trends
  - A look ahead (improvements, testing, demonstrations, etc)
  - Cash rewards from Alliant Energy
    1. Types of qualifying LED lights
    2. NEW! LED Holiday Lighting pilot





# Compact Fluorescent Light Bulbs (CFLs)

- How CFLs work
  - Electric current is driven through a tube which generates invisible ultraviolet light; the bulbs fluorescent coating then emits visible light
- Energy Savings
  - Use about 75% less energy than incandescent bulbs
  - Save about \$30 in energy costs over its life
  - Pays for itself in 6 months
  - Lasts 10 times longer than incandescent bulbs





# CFL Myths

- **Flicker or have delay in start-up?**
  - Earlier CFLs had magnetic ballasts; today's have electronic ballasts that do not flicker and turn-on is nearly instant
- **Buzzing noises?**
  - Older CFLs with large, heavy magnetic ballasts caused buzzing in some bulbs
  - Today's CFLs with electronic ballasts do not buzz
- **Unpleasant light?**
  - Available in variety of colors
  - Look for warm white or soft white to match standard color of incandescent bulbs

Warm White, Soft White		Cool White, Bright White		Natural or Daylight	
The standard color of incandescent bulbs.		Good for kitchens and work spaces.		Good for reading.	
2700K	3000K	3500K	4100K	5000K	6500K





# CFL Myths (cont)

- Not visually appealing or won't fit in every fixture?
  - Many types of CFLs available (i.e. globe, candle, covered a-shape, etc.)
  - Some enclose the spiral in glass so looks more like incandescent
- Danger of mercury?
  - Bulbs contain trace amounts of mercury (4 mg per bulbs)
  - No mercury released when bulbs are in use
  - Use of CFLs mean less mercury emitted by power plants
  - Do recommend precautions if a bulb breaks
    - Information on proper disposal at [alliantenergy.com/cfl\\_disposal](http://alliantenergy.com/cfl_disposal)





# ENERGY STAR® Change a Light (CAL)

- Annual Change a Light campaign
  - Reduce greenhouse gases and save energy by changing lights from standard incandescent bulbs to CFLs
- Alliant Energy residential, small business and agricultural electric customers receive special pricing on select ENERGY STAR qualified bulbs
  - Bulbs as low as \$0.99 each at participating retail stores
  - Iowa CAL runs from October 1 through December 31, 2009
  - Minnesota runs from October 1 through November 30, 2009
  - Wisconsin campaign runs from September 13 through December 31, 2009 (sponsored by Focus on Energy)
  - Limit 12 bulbs per customer
  - Stores have lists of all participating utilities





# Change A Light (cont)

- For more information or to see a list of participating utilities and retailers:
  - Iowa customers: 1-800-339-6856 or [iowachangealight.com](http://iowachangealight.com)
  - Minnesota customers: 1-888-476-9548
  - Wisconsin customers: 1-800-762-7077 or [focusonenergy.com](http://focusonenergy.com)
- Encourage customers to take the ENERGY STAR pledge:
  - [energystar.gov/changealight](http://energystar.gov/changealight)



**CHANGE THE WORLD,  
START WITH ENERGY STAR.**





# What's in it for you?

- If you're not a lighting retailer...
  - Lighting is where customers usually begin to explore energy efficiency
  - Customers can view you as an energy efficient expert
  - Brush up on your lighting knowledge, then use it as a building point for other energy efficient purchases
- If you are a lighting retailer...
  - Do all of the above, PLUS
  - Boost your sales by becoming a participating retailer in Change a Light
    - Must be a program affiliated retailer (partner with a CFL manufacturer)
    - Contact WECC (Wisconsin Energy Conservation Corp) 800-969-9322
    - Initial order deadline for program affiliated retailers was August 14, but can still order as long as bulb allocations are available





# What is SSL and LEDs?

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- Solid-state lighting (SSL) refers to a type of lighting that uses light-emitting diodes (LEDs) as sources of illumination rather than electrical filaments, plasma, or gas.
- Compared to incandescent lighting:
  - SSL creates visible light with reduced heat generation or parasitic energy dissipation, similar to that of fluorescent lighting.
  - Provides for greater resistance to shock, vibration, and wear, thereby increasing its lifespan significantly.





## What is SSL and LEDs? (cont)

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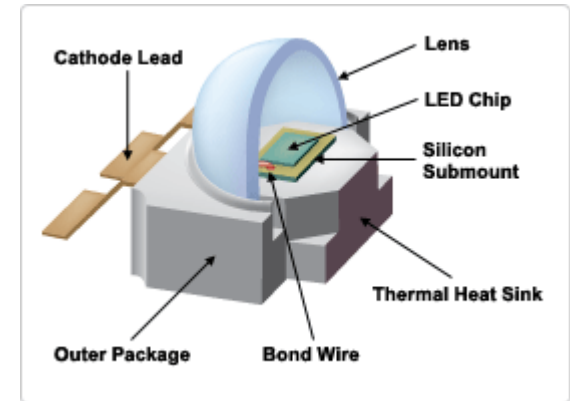
- Solid-state lighting is often used in traffic lights, vehicle lights, train marker lights, holiday lights, and etc.
- No other lighting technology offers as much potential to save energy and enhance the quality of our building environments, contributing to our nation's energy and climate change solutions.





# What is different about LEDs?

- Directional light source
- Low profile, compact size
- Breakage and vibration resistant
- Optical precision
- Perform well in cold environments
- Near instant “on”
- Rapid cycling
- Control options (adding intelligence)
- No IR, UV, mercury, lead or other substances of environmental concern





# Overall Situation

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- Electric utilities in general remain cautiously optimistic about emerging SSL/LED technologies as they present both opportunity and risk.
- Rapid advancements in LED technology coupled with an increasing number of LED products in the market place are creating early market confusion among researchers, buyers and manufacturers.
- Most LED products are newly designed and may not be tested per independent agencies.
- There is limited field information about existing LED products.
- Energy efficiency and quality of lighting is improving in a number of LED applications.





# Key Takeaways from the DOE-SSL Workshop

- Significant and rapid advancements are being made in LED technology.
  - Six month cycle on new product generations
  - Early applications are stabilizing
  - Developing applications have significant variation in quality, light output and pricing
  - Current issues with LEDs include **poor light output, exaggerated lifetimes, and poor and inconsistent color quality.**
  - ENERGY STAR labeling provides assurance of a tested product.





# Key Takeaways from the DOE-SSL Workshop (cont)

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- Education is desperately needed at various stakeholder levels -- manufacturers, retailers, contractors, designers, utilities, etc.
  - General consensus that the industry doesn't want to repeat the market mistakes made with CFL.
  - The end-use customer needs to have the correct information and be aware of the technological changes.
- What is the DOE doing to avoid mishaps with CFLs and to improve overall quality of the technology?





# DOE - CALiPER

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- Creation of CALiPER testing which provides independent testing data to discourage low performance/low quality products.
- CALiPER releases quarterly product selection and testing results which are posted online.
- <http://www1.eere.energy.gov/buildings/ssl/caliper.html>





# DOE - GATEWAY Demonstration Program

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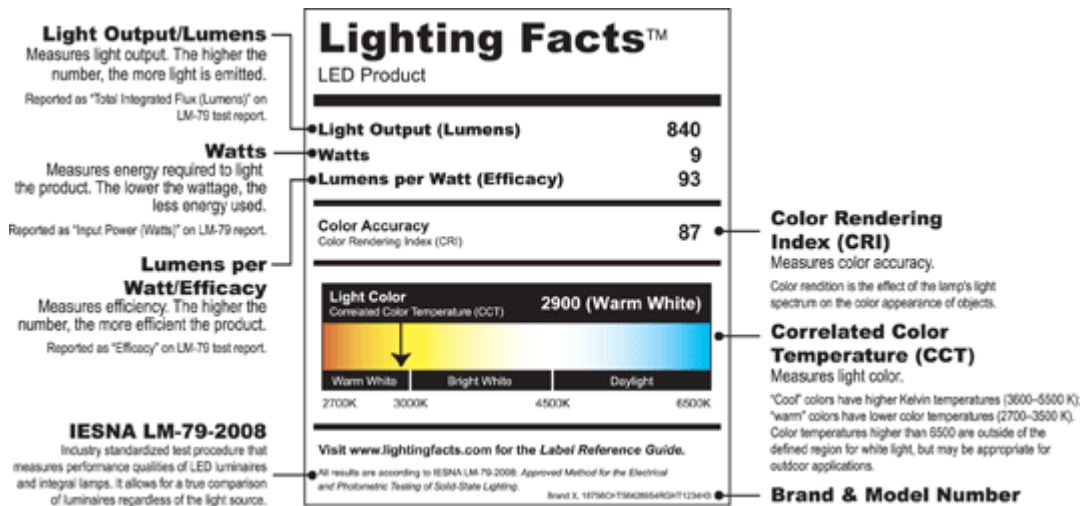
- This program provides third party information detailing product performance in real world applications. To meet program criteria, the product must save energy, match or improve illumination and be cost effective for the user.
- <http://www1.eere.energy.gov/buildings/ssl/gatewaydemo.html>





# DOE - Quality Advocates

- Formation of the Quality Advocates group to actively police LED products using the CALiPER Program.
- This group introduced the Lighting Facts Label (similar to food nutritional labels) to ensure accurate information about product performance is on packaging and marketing materials.
- [http://apps1.eere.energy.gov/buildings/publications/pdfs/ssl/quality\\_advocates\\_09fs.pdf](http://apps1.eere.energy.gov/buildings/publications/pdfs/ssl/quality_advocates_09fs.pdf)





# DOE - ENERGY STAR

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- ENERGY STAR is using a two-phased approach to list/endorse qualified LED products. Goal of ENERGY STAR is to accelerate acceptance of quality SSL products into the marketplace; avoid buyer dissatisfaction and provide a tool for product differentiation.
- [energystar.gov/index.cfm?c=lighting.pr](http://energystar.gov/index.cfm?c=lighting.pr) what are





# Integration and System Approach

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- It's about more than the LED bulb; need to consider circuit board, heat sink, etc.
- Existing standards will need to be revised and improved as new products emerge.
- The technology is not at the stage where lights can “switched-out” but there is emphasis on research and development.





# What is Alliant Energy doing?

- Pilot program in 2009 to test LED applications
  - In collaboration with the Iowa Utility Board and the Iowa Energy Center
- Anticipating the expansion of ENERGY STAR LED product lists which may lead to cash rewards for additional technologies.
- Business cash rewards for some types of LED lighting:
  - LED replacement exit signs \$5 each (IA and MN only)
  - LED strip display case/task lighting (per linear foot) \$2 each (IA only)
  - LED refrigerator case lights (per linear foot) \$2 each (IA only)
  - LED traffic lights \$20-\$50 each (IA only)





# LED Holiday Lighting Pilot (Iowa)

- NEW! Alliant Energy residential electric customers in IA eligible for cash reward on LED holiday light strings
  - \$5 per string (not to exceed 50% of purchase price)
  - Must be ENERGY STAR rated
  - Maximum 15 strings per residential account per year
  - Must purchase between October 1 and December 25, 2009
- Are you a lighting retailer?
  - Be sure to stock ENERGY STAR rated LED holiday light strings
  - Promote cash reward to customers
  - Claim form will soon be available online at [alliantenergy.com/forms](http://alliantenergy.com/forms)





# LED Holiday Lighting (Wisconsin)

- Alliant Energy residential electric customers in WI eligible for instant cash-back reward on LED holiday light strings through Focus on Energy.
  - \$3 per string
  - Maximum 12 strings per residential account per year
  - Must be ENERGY STAR rated
  - Must purchase between October 11 and December 31, 2009 or while supplies last.
  - For more information, call 1-800-762-7077





# Sources of Information

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- Office of Energy Efficiency and Renewable Energy (EERE) – <http://www1.eere.energy.gov/buildings/ssl/>
- Lighting Facts - <http://www.lightingfacts.com/default.aspx?cp=label>
- ENERGY STAR – [energystar.gov/lighting](http://energystar.gov/lighting)
- Alliant Energy – [alliantenergy.com/rewards](http://alliantenergy.com/rewards)





# Questions?

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## Presenters

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## Additional Resource

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Change A Light campaign

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