

Mercury-free Lighting Equipment



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***EEB Conference, Mercury-containing lamps under the spotlight”,
Friday 27th June 2008, Brussels, Belgium***



How Does an LED Work?

Light-emitting diodes or LEDs, sometimes called Solid State Lighting, are illuminated by the movement of electrons in a semiconductor. There is no filament to burn out, so they tend to last a long time.



Advantages & Limits of LEDs

Advantages

- Long-lasting – 25,000 to 100,000 hours
- Mercury-free
- Significantly more energy-efficient in many applications
- Directional – good for lighting specific spots
- Cost is dropping



Disadvantages

- Not as energy-efficient as some other technologies such as linear fluorescents
- Directional -not good for general illumination
- Poor color quality
- High initial cost

Exit Signs

▶ Incandescent light bulbs

- ▶ Inefficient: use about 40 watts
- ▶ Bulbs last about 3000 hours (~4-6 months)



▶ Fluorescent lamps

- ▶ More efficient than incandescent (5-15 watts)
- ▶ Contain mercury (5-30 mg)
- ▶ Bulbs last about 7,500 -10,000 hours (9-12 months)



▶ LEDs

- ▶ Even more efficient (<1-5 watts)
- ▶ Bulbs last up to 100,000 hours (up to 10 years)

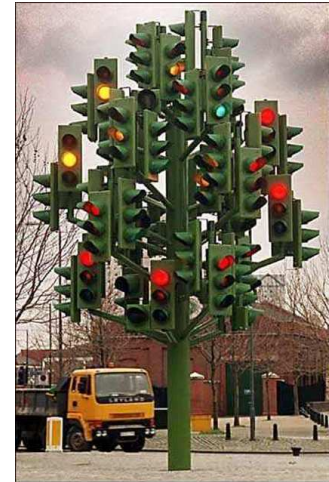


▶ Self-luminescent

- ▶ Use no energy

LED Traffic Signals

- ▶ **Save energy: 80-90% reduction**
 - ▶ Incandescent bulbs use ~150 watts
 - ▶ LEDs use 25 watts or less
- ▶ **Last 5-10 times longer**
 - ▶ Lowers maintenance costs, safer
 - ▶ Incandescents <1 year; LEDs 5-7 years



- ▶ **Mercury-free**
 - ▶ **Source: “Energy-Efficient Traffic Signals,”**
Consortium for Energy Efficiency Fact Sheet,
www.cee1.org/resrc/facts/led-fx.php3.
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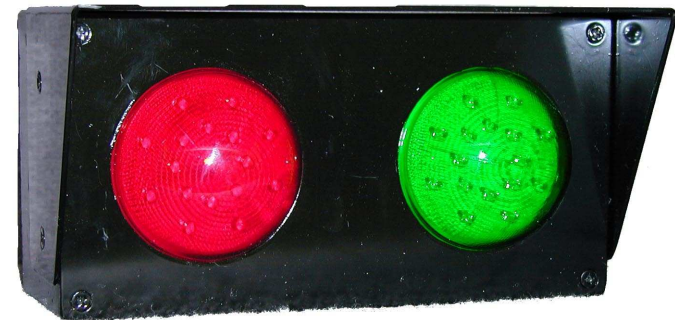
LED Traffic Signal Lights

- ▶ **New York City saved \$7 million/year replacing 150-watt incandescent traffic lights with 17-watt LEDs.**
- ▶ **Much lower maintenance costs (50,000-100,000 hours vs. 8000 hours)**
- ▶ **Safety benefits: fewer burned out lamps, less replacement time, improved visibility**



LED Signal Lighting

- ▶ **High initial cost = major barrier**
 - ▶ **Incandescent: \$2.50-\$3**
LEDs: \$110-\$600
 - ▶ **Rebates offered by several utilities**



LED Street Lighting

- ▶ **Replaces high-pressure sodium**
 - ▶ Saves energy (50-80%)
 - ▶ 4-5 year payback (Ann Arbor, MI)
 - ▶ Lasts up to 5 times longer
 - ▶ Mercury-free



LED Signs for Businesses

- ▶ Reduce energy use by 90% (saving \$150/year)
- ▶ Mercury-free
- ▶ Last 10+ years (100,000+ hours)
- ▶ No hazardous waste disposal required (although neon signs must be recycled)



LED Open Sign Pilot Project

- ▶ San Francisco Dept of Environment and PG&E launched neon sign replacement project in February 2005
- ▶ Cuts peak energy use
- ▶ Businesses offered free LED “open” signs

For more information, see
http://temp.sfgov.org/sfenvironment/articles_pr/2005/pr/020905.htm



Supervisor Aaron Peskin and Environment Commissioner Alan Mok (right) present LED open sign to the manager of Kay Cheung Seafood.



LED Night Lights



Exterior/Pathway Lighting



LED Elevator Lights



LED Underwater Lighting



LED Task Lighting



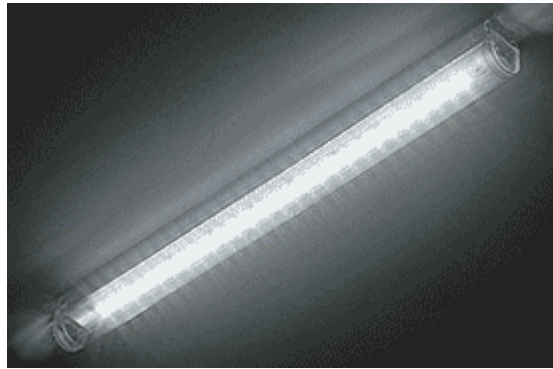
LED Track Lighting



LED Replacements for Compact Fluorescent Lamps (CFLs)



LED “Linear” Lamps?



LED Holiday Lighting



Questions?



Comments?



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