

Solid State Lighting (SSL)

Technology Trends & Early Business Cases

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Business and Environmental Trends

- Consumer demand for electricity projected to grow at an average rate of 1.5% per year through 2030

(Source: US Dept of Energy Administration, 2006)

- 45% growth in energy consumption over the next decade

(Source: National Action Plan for Energy Efficiency, 2006)

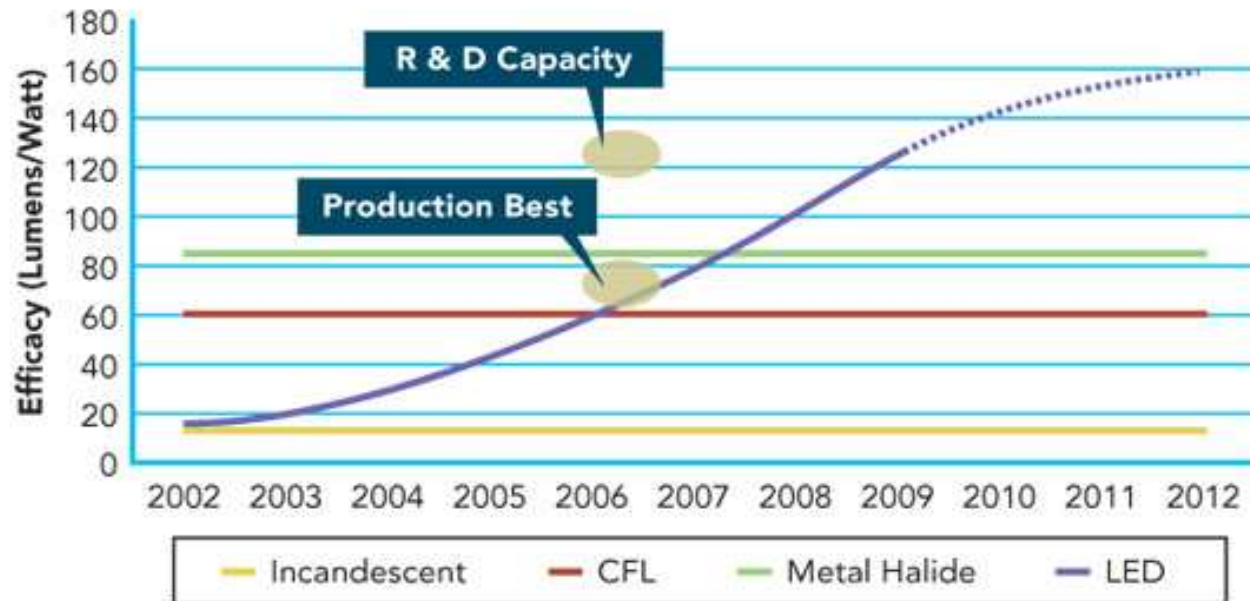
- Passing of HR.6 Energy Independence and Security Act

(Source: US DOE, December 19, 2007)

– Phase-out of the incandescent bulb by 2014

- Institute ***mandatory*** CFL recycling programs

Critical Performance Milestone met 100 Lumens per watt



Sources: Solid State Lighting News: Oct 23, 2007

Business and Environmental Trends...continued

- Technology has exceeded critical performance milestone (Source: LED Magazine, Nov 29, 2007)
 - 130 lumens per watt in lab
 - Lamp prototype that produces 659 lumens from 5.8 watts with CRI of 91.2
- LED market for general lighting to reach \$1.4 Billion in 2012 (Source: Solid State Lighting Design - Research by Data Beans)

LED – 2007 Early Business Cases

From Laboratory To Market

Ann Arbor, Michigan

Relume & Cree X/Lamp



- 25 Lamps Replaced:
 - HPS 250 watt with 50 watt cobra heads
 - MH 100 watt with 50 globes
- Results:
 - 98% positive feedback from city merchants
 - Same light output/dark sky friendly
 - Three-year payback, \$100 annual savings per year
 - 10-12 year life expectancy

Oakland, CA

Beta LED/PG&E



- 15 Lamps Replaced :
 - HPS 100 watt with 59 watt cobra heads
 - Compared 10 on LED street and; 5 each on LED/HPS street
- Results:
 - Favorable feedback from residents
 - Enhanced CRI; 56% higher illumination
 - Improved photopic/scotopic
 - Reduction of 150 kWh/year

General Illumination Replacement

Before



Incandescent 65W - 5,135 watts

After



LR6 – 12 Watts – Par 38 948 watts

2008 LED Research Strategy

Collaborate with DOE/EPA?

- Urging greater collaboration
- Projects underway across the country
- Establish Standards by Q4 08
 - Utilities; Electric Co-ops
 - Private Sector
 - Universities
 - Entrepreneurship Centers

Research Topics?

- Life tests to evaluate products
 - Parking Lots/Street Lamps
 - Par 38 Fixtures; MR-16s
 - Drive current/ambient temp
 - Retrofit bulbs in track lighting
- Billing Innovation
 - Interest in rebates
 - Finance on bill
 - Pay with energy savings