

## Senate Energy and Technology Committee Hearings Re: Energy Optimization Standard

Tuesday, October 25, 2011, Senate Hearing Room, Ground Floor, Boji Tower

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LumaSmart is an innovator of LED light fixtures, LED light engines and various electronic assemblies. LumaSmart LED lighting products allow end users to save energy, save money, and promote a cleaner environment: LED lights use 50% to 90% less energy, last much longer than traditional light sources, and contain no mercury or CFCs. LumaSmart's headquarters and manufacturing facilities are located in Macomb, MI. LumaSmart is also a founding member of the Michigan Solid State Lighting Association.

Key Points: Energy Optimization from a Michigan Lighting Manufacturer's Perspective:

1. Energy Optimization Standard ("EOS") has been a tremendous success relative to creating awareness, changing mindsets, and incentivizing implementation of "clean" and/or "green" technology on the part of consumers and businesses.
2. EOS has fostered and helped jump-start a Green/Clean Tech sector of consultants, financiers, and manufacturers.
3. EOS implementation and utility rebates emanating from EOS play a major role in what products manufacturers develop and market.
4. Challenges with implementation (with any new program) arise. Key Learnings relative to lighting and EOS:
  - A. Energy optimization incentives do not always encourage cost savings optimization (i.e. minimization of life-cycle costs or optimal use of funds):
    - 1) Lights prescribed by utility incentive programs may not provide the best energy reduction.
    - 2) Maintenance costs play a major role in overall operating cost: Fluorescent lights, prescribed by utility incentives programs, do not last as long as other energy efficient light sources (lamp degradation, ballast failures). In many applications, other longer lasting light sources (which are incentivized on a custom basis) may be favored from a life-cycle cost perspective when maintenance costs are factored in. See Attachment A for example.
    - 3) Lights prescribed (fluorescents) may not be best for application, further increasing costs:
      - i. Fragility, cold temps, frequent switching – decreases life of light, increases maintenance costs.
      - ii. Mercury content – potential cleanup costs, recycling costs.
    - 4) Custom incentives are available for other energy-efficient lighting products, but prescriptive list creates presumption in mind of customer that manufacturers have to overcome in order to level playing field. Moreover, custom incentives are calculated at 8 cents per kilowatt hour, while in reality, most customers pay between 11 and 14 cents per kilowatt hour for electricity.

- B. Energy optimization has an economic effect on Michigan manufacturers:
  - 1) All Fluorescent lamps and ballasts prescribed are made overseas. As mentioned earlier, the prescriptive list gives a greater “share of voice” in marketplace to fluorescents. See Attachment B. And when fluorescent lights require replacement more frequently than other light sources, more money goes to purchase foreign-made products.
- C. Streetlights, funded by municipalities, are a great opportunity for energy optimization. There are an estimated 300,000 street lights in Michigan, many of which require replacing. On a per light basis, replacing streetlights with energy-efficient street lighting will save, on average, \$100 per year in electricity and \$100 per year in maintenance costs.
- D. Lighting projects compete with other energy-efficient/clean energy projects for funding, including solar, wind, HVAC, Controls, materials, etc. Many customers cannot understand why the state or federal governments incentivize/subsidize wind and solar energy projects for a building or facility before that building or facility has first reduced its electricity demand by way of more efficient technologies (windows, HVAC, lighting, etc.)
- E. Lessors of buildings see little benefit to rebate programs when tenants pay electric and gas bills. Other states and cities around the country are considering implementing efficiency disclosure rules for selling real estate to encourage lessors to participate in energy optimization programs.

Summary

Michigan EOS is moving in the right direction. Further steps can be taken to maximize cost savings.

Thank you!

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# Fluorescent T8 vs. LED T8 Installation

## Replacing 250W High Bay

Attachment A

### 4 Lamp, T8 High Bay FL T8

### 4 Lamp LED High Bay LED T8

<b>Initial Cost</b>	
Fixture	\$175.00
Installation	\$60.00
Disposal	<u>\$15.00</u>
<b>TOTAL INSTALL PER FIXTURE</b>	<b>\$250.00</b>
Less Utility Incentives	<u>\$50.00</u>
	<b>\$200.00</b>
128W per fx 5600 hr/year, \$0.125 per KWH	
Year 1 Energy Consumption	\$89.96
Year 1 Maintenance	<u>\$0.00</u>
Cumulative Cost	<b>\$289.96</b>
Year 2 Energy Consumption	\$89.96
Year 2 Maintenance	<u>\$0.00</u>
Cumulative Cost	<b>\$379.92</b>
Year 3 Energy Consumption	\$89.96
Year 3 Maintenance	<u>\$100.00</u>
Cumulative Cost	<b>\$569.88</b>
Year 4 Energy Consumption	\$89.96
Year 4 Maintenance	\$0.00
Cumulative Cost	<b>\$659.84</b>
Year 5 Energy Consumption	\$89.96
Year 5 Maintenance	<u>\$0.00</u>
Cumulative Cost	<b>\$749.80</b>
Year 6 Energy Consumption	\$89.96
Year 6 Maintenance	<u>\$100.00</u>
Cumulative Cost	<b>\$939.76</b>
Year 7 Energy Consumption	\$89.96
Year 7 Maintenance	<u>\$0.00</u>
Cumulative Cost	<b>\$1,029.72</b>
Year 8 Energy Consumption	\$89.96
Year 8 Maintenance	<u>\$0.00</u>
Cumulative Cost	<b>\$1,119.68</b>
Year 9 Energy Consumption	\$89.96
Year 9 Maintenance	<u>\$100.00</u>
Cumulative Cost	<b>\$1,309.64</b>
Year 10 Energy Consumption	\$89.96
Year 10 Maintenance	<u>\$0.00</u>
Cumulative Cost	<b>\$1,399.60</b>

<b>Initial Cost</b>	
Fixture	\$450.00
Installation	\$60.00
Disposal	<u>\$15.00</u>
<b>TOTAL INSTALL PER FIXTURE</b>	<b>\$525.00</b>
Less Utility Incentives	<u>\$98.00</u>
	<b>\$427.00</b>
76W per fx 5600 hr/year, \$0.125 per KWH	
Year 1 Energy Consumption	\$53.35
Year 1 Maintenance	<u>\$0.00</u>
Cumulative Cost	<b>\$480.35</b>
Year 2 Energy Consumption	\$53.35
Year 2 Maintenance	<u>\$0.00</u>
Cumulative Cost	<b>\$533.70</b>
Year 3 Energy Consumption	\$53.35
Year 3 Maintenance	<u>\$0.00</u>
Cumulative Cost	<b>\$587.05</b>
Year 4 Energy Consumption	\$53.35
Year 4 Maintenance	\$0.00
Cumulative Cost	<b>\$640.40</b>
Year 5 Energy Consumption	\$53.35
Year 5 Maintenance	<u>\$0.00</u>
Cumulative Cost	<b>\$693.75</b>
Year 6 Energy Consumption	\$53.35
Year 6 Maintenance	<u>\$0.00</u>
Cumulative Cost	<b>\$747.10</b>
Year 7 Energy Consumption	\$53.35
Year 7 Maintenance	<u>\$0.00</u>
Cumulative Cost	<b>\$800.45</b>
Year 8 Energy Consumption	\$53.35
Year 8 Maintenance	<u>\$0.00</u>
Cumulative Cost	<b>\$853.80</b>
Year 9 Energy Consumption	\$53.35
Year 9 Maintenance	<u>\$100.00</u>
Cumulative Cost	<b>\$1,007.15</b>
Year 10 Energy Consumption	\$53.35
Year 10 Maintenance	<u>\$0.00</u>
Cumulative Cost	<b>\$1,060.50</b>



## LIGHTING INCENTIVES WORKSHEET

Note: If your lighting project is not listed as one of the measures below, you may apply for a custom measure.

Equipment Type	Incentive	Unit	# of Units	Incentive Calculated
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### Compact Fluorescents and LEDs (Incandescent/Halogen to CFL or LED)

CFL - Screw-in (≤ 31 Watts)	\$1.50	Lamp		
CFL - Screw-in (> 31 Watts)	\$8.00	Lamp		
CFL Reflector Flood Lamps	\$8.00	Lamp		
Compact Fluorescent Fixture	\$22.00	Fixture		
42W 8 Lamp High Bay Compact Fluorescent Fixture	\$35.00	Fixture		
ENERGY STAR® Qualified LED Recessed Down Light	\$15.00	Lamp		

### Standard Linear Fluorescent Retrofit (T12 to T8)

1 Lamp, 4ft T8	\$4.00	Fixture		
2 Lamp, 4ft T8	\$7.00	Fixture		
3 Lamp, 4ft T8	\$10.00	Fixture		
4 Lamp, 4ft T8	\$13.00	Fixture		
1 Lamp, 8ft T8	\$4.00	Fixture		
2 Lamp, 8ft T8	\$7.00	Fixture		
1 Lamp, 2ft T8	\$3.00	Fixture		
2 Lamp, 2ft T8	\$4.00	Fixture		
3 Lamp, 2ft T8	\$6.00	Fixture		
4 Lamp, 2ft T8	\$8.00	Fixture		
1 Lamp, 3ft T8	\$3.00	Fixture		
2 lamp, 3ft T8	\$4.00	Fixture		
3 Lamp, 3ft T8	\$5.00	Fixture		
4 Lamp, 3ft T8	\$7.00	Fixture		

### U-Lamp Fluorescent Retrofit (T12 to T8)

1 Lamp, T12 U-Lamp to T8 U-Lamp	\$3.00	Fixture		
2 Lamp, T12 U-Lamp to T8- U-Lamp	\$4.00	Fixture		
1 Lamp, T12 U-Lamp to T8 2 Lamp 2ft Linear	\$3.00	Fixture		
2 Lamp, T12 U-Lamp to T8 4 Lamp 2ft Linear	\$4.00	Fixture		



**LIGHTING INCENTIVES WORKSHEET**

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Equipment Type	Incentive	Unit	# of Units	Incentive Calculated
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**High Output (HO) Linear Fluorescents (8FT T12HO to T8HO)**

1 Lamp, 8ft T8 HO	\$9.00	Fixture		
2 Lamp, 8ft T8 HO	\$17.00	Fixture		

**High Performance (HP) and Low Wattage (LW) 4-foot Linear Fluorescents. All lamps are 4ft unless otherwise stated.**

LW T8 (Lamps Only, 4ft Linear or U-Lamp ) NOTE: Reservation Application is required for all LW T8 lamp only projects.	\$0.75	Lamp		
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1 Lamp HP T8, replacing T8	\$2.00	Fixture		
2 Lamp HP T8, replacing T8	\$3.00	Fixture		
3 Lamp HP T8, replacing T8	\$4.00	Fixture		
4 Lamp HP T8, replacing T8	\$5.00	Fixture		

1 Lamp LW HP T8, replacing T8	\$3.00	Fixture		
2 Lamp LW HP T8, replacing T8	\$5.00	Fixture		
3 Lamp LW HP T8, replacing T8	\$7.00	Fixture		
4 Lamp LW HP T8, replacing T8	\$9.00	Fixture		

1 Lamp HP T8, replacing T12	\$4.00	Fixture		
2 Lamp HP T8, replacing T12	\$7.00	Fixture		
3 Lamp HP T8, replacing T12	\$10.00	Fixture		
4 Lamp HP T8, replacing T12	\$13.00	Fixture		

1 Lamp LW HP T8, replacing T12	\$5.00	Fixture		
2 Lamp LW HP T8, replacing T12	\$8.00	Fixture		
3 Lamp LW HP T8, replacing T12	\$12.00	Fixture		
4 lamp LW HP T8, replacing T12	\$15.00	Fixture		

2 Lamp HP T8, replacing T12 8ft 1 lamp	\$5.00	Fixture		
4 Lamp HP T8, replacing T12 8ft 2 lamp	\$6.00	Fixture		
2 Lamp HP T8, replacing T12 HO 8ft 1 lamp	\$15.00	Fixture		
4 Lamp HP T8, replacing T12 HO 8ft 2 lamp	\$25.00	Fixture		



## LIGHTING INCENTIVES WORKSHEET

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Equipment Type	Incentive	Unit	# of Units	Incentive Calculated
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### Interior High-Intensity Discharge (HID) to Fluorescent Fixtures

3 Lamp T5 HO, replacing 250W HID	\$35.00	Fixture		
4 Lamp T5 HO, replacing 400W HID	\$65.00	Fixture		
6 Lamp T5 HO, replacing 400W HID	\$30.00	Fixture		
Two 6 Lamp T5 HO, replacing 1000W HID	\$110.00	Fixture		

4 Lamp 32W T8, replacing 250W HID	\$50.00	Fixture		
6 Lamp 32W T8, replacing 400W HID	\$70.00	Fixture		
8 Lamp 32W T8, replacing 400W HID	\$50.00	Fixture		
Two 8 Lamp 32W T8, replacing 1000W HID	\$150.00	Fixture		

Pulse Start Metal Halide 320W, replacing 400W Probe Start	\$30.00	Fixture		
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### Exterior or Garage HID to LED/Induction Lighting Retrofit (annual operating hours less than 8,760)

LED or Induction replacing ≤ 175W HID	\$20.00	Fixture		
LED or Induction replacing 176W to 250W HID	\$35.00	Fixture		
LED or Induction replacing 251W to 400W HID	\$55.00	Fixture		

### Exterior or Garage HID to LED/Induction Lighting Retrofit (annual operating hours equal to 8,760)

LED or Induction replacing ≤ 175W HID	\$50.00	Fixture		
LED or Induction replacing 176W to 250W HID	\$75.00	Fixture		
LED or Induction replacing 251W to 400W HID	\$120.00	Fixture		

### Exit Sign Conversion

LED Exit Signs Electronic Fixtures Retrofit or Replacement	\$12.50	Fixture		
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### Traffic Signal Conversion

LED Auto Traffic Signals	\$20.00	Signal		
LED Pedestrian Signals	\$15.00	Signal		



**LIGHTING INCENTIVES WORKSHEET**

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Equipment Type	Incentive	Unit	# of Units	Incentive Calculated
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**Controls**

Occupancy Sensors ( $\leq$ 500 Watts Controlled)	\$20.00	Sensor		
Occupancy Sensors ( $>$ 500 Watts Controlled)	\$50.00	Sensor		
Central Lighting Control (\$0.06 per Sq. Ft.)	\$600.00	10,000 Sq. Ft.		
Switching Controls for Multilevel Lighting (\$0.05 per Sq. Ft.)	\$500.00	10,000 Sq. Ft.		
Daylight Sensor Controls (\$0.09 per Sq. Ft.)	\$900.00	10,000 Sq. Ft.		
Exterior Lighting Bi-level Control w/Override, 150W to 1000W HID	\$50.00	Fixture		

**Miscellaneous Lighting**

Light Tube	\$35.00	Tube		
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**De-lamping (Note: a Reservation Application is required for all De-lamping projects)**

T12 2ft Lamp Removal (combined with T8/ballast retrofit)	\$3.00	Lamp Removed		
T12 3ft Lamp Removal (combined with T8/ballast retrofit)	\$4.00	Lamp Removed		
T12 4ft Lamp Removal (combined with T8/ballast retrofit)	\$5.00	Lamp Removed		
T12 8ft Lamp Removal (combined with T8/ballast retrofit)	\$10.00	Lamp Removed		

<b>Total Lighting Incentives:</b>	
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All lighting projects are expected to comply with the Illuminating Engineering Society of North America (IESNA) recommended lighting levels or the local code.  
 Note: PCB ballasts and certain lamps are hazardous materials and should be disposed of properly.