

# BOC Technical Webinar Series

---



## New Lighting Standards

*Welcome! We will begin momentarily.*

**The webinar audio is provided via phone line.**

**Dial: 877-594-8353**

**Passcode: 63757295#**

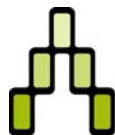
# Today's Sponsors



Premier Sponsor



Executive Sponsor



BETTERBRICKS



The power of action.



PUGET SOUND ENERGY



A Sempra Energy utility



SOUTHERN CALIFORNIA EDISON

An EDISON INTERNATIONAL Company

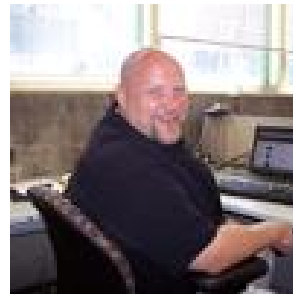


Pacific Gas and Electric Company





# New Lighting Standards



Presented by: Andrew Pultorak, LC, MIES  
Lighting Design Lab, Seattle, WA



# Lighting Design Lab



## New Lighting Standards

Presented By:

Andrew Pultorak, LC, MIES  
Lighting Specialist



Today

## Why Lighting Legislation?

### Energy Legislation

EPACT

CBTD

EISA and GSL

DOE GSFL and DOE IRL Lamp Rule Making

EISA and Metal Halide Fixtures

### What's Next

ACESA

DOE Labeling

FTC Labeling

### Resources

### Questions



To know and love





# Why change?

## Improve Lighting

Safety, productivity, aesthetics, fairly easy



## Save Money

Energy costs, maintenance costs, payback under 3 years



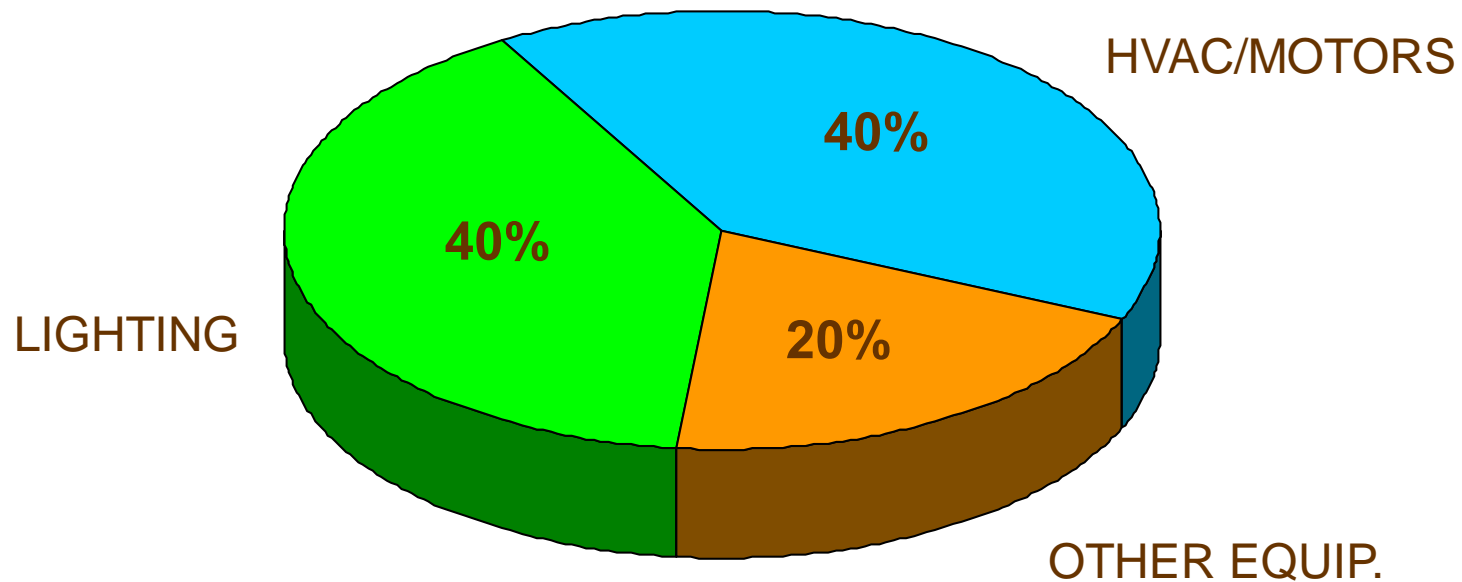
## Save Energy

Pollution, better Public Relations





# Why?



## Average Commercial Buildings Electric Usage

According to US DOE



# Energy Legislation

**EPACT:** Energy Policy Act of 2005 (signed into law August 2005)

**EISA:** Energy Independence and Security Act of 2007 (HR 2454)  
(signed into law December 2007)

**DOE IRL:** US Department of Energy standard for  
Incandescent Reflector Lamps

**DOE GSFL:** US Department of Energy standard for  
General Service Fluorescent Lamps

**ACESA:** American Clean Energy and Security Act of 2009



# EPACT History

## Energy Policy Act 1992

### Lighting Element:

Labeling incandescent A-line and screw-based CFLs with energy cost info (buy lumens not watts)



### Intent:

Encourage use of more energy-efficient screw-based lamps

Minimum efficacies for incandescent R30 & R40, plus incandescent PAR lamps, effective 10/31/95



Encourage use of more energy efficient halogen reflector lamps

Minimum efficacies and color rendering standards (CRI) for straight and U-bend fluorescent, effective for 4-ft and 8-ft lamps

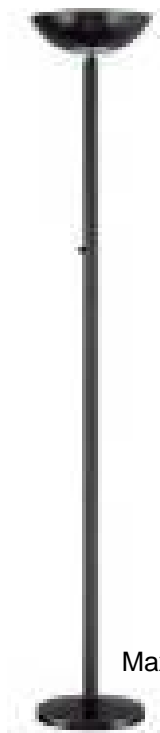


Eliminate availability of full wattage T12 halophosphor fluorescent lamps and encourage use of reduced wattage ES types or use of more efficient rare earth types, like T8s



# EPACT 2005

## First Lighting Products to be Affected



Max 190W



Must meet Energy Star 2.0  
(ES label NOT required)



Must meet Energy Star 2.0  
(ES label NOT required)

Became Effective January 1, 2006





EPACT 2005

## Mercury Vapor Lamp Ballasts

Mercury Vapor Lamp Ballasts OR Luminaires Containing such Ballasts for  
for *general illumination* \* applications may not be manufactured, marketed,  
sold or imported into the United States.

Intended replacement: MH (Metal Halide)

\*2007 EISA legislation provides for continued use in specialty applications provided the ballast is marked %Not  
for general illumination+and identifies the specialty application.

Became Effective January 1, 2008



## EPACT 2005

### Ballasts Operating Energy Saver T12 Fluorescent Lamps

Federal Ballast Rule in 2000 aimed at replacing the standard T12 MAGNETIC ballasts and lamps, set minimum BEFs (ballast efficiency factors) that only electronic ballasts could meet. Only included full wattage lamps were covered.

Now, new efficiency standards for ballasts operating ES lamps go into effect.

By 2010, ballast manufacturers cannot manufacture replacement ballasts that do not pass the new Ballast Efficacy Factors (BEF) requirements.\*

\*Exceptions

Dimming ballasts that dim to 50% or less

T12-HO ballasts capable of starting down to -20° F

Low power factor ballasts (<.90) labeled for use in residential applications only

**Became Effective July 1, 2009**



# EPACT 2005

## Ballast Regulations added to 2000 Federal Ballast Rule

Action	Per 2000 Ballast Rule: BEF Standards for operation of <u>full-wattage</u> T12 Lamps	Per 2005 EPAct: BEF Standards for operation of <u>energy-saving</u> T12 Lamps
<b>Ballast manufacturers can no longer make ballasts that do not pass the new requirements for use in new fixtures.</b>	<b>April 1, 2005</b>	<b>July 1, 2009</b>
<b>Ballast manufacturers cannot sell ballasts that do not pass the new requirements to U.S. fixture manufacturers.</b>	<b>July 1, 2005</b>	<b>October 1, 2009</b>
<b>Fixture manufacturers cannot sell fixtures that include ballasts that do not pass the new requirements.</b>	<b>April 1, 2006</b>	<b>July 1, 2010</b>
<b>Ballast manufacturers cannot manufacture replacement ballasts that do not pass the new requirements.</b>	<b>July 1, 2010</b>	<b>July 1, 2010</b>



# EPACT 2005

## How It May Impact You

Replace the magnetic ballasts with higher-efficiency ballasts as they fail



*and as a building owner there's local AND federal help...*



CBTD

# The Energy Efficient Commercial Buildings Tax Deduction

New Construction or Renovation  
AND  
Building Owners or Tenants are eligible



Lighting



HVAC



Building Envelope





## CBTD



Reduces the initial cost of investing in energy-efficient lighting and other building systems.

Tax incentives up to \$1.80 per square foot!\*\*

Bill introduced recently to increase the allowance to  
**\$3.00 per square foot!!!**

Allows a larger portion of the capital investment to be depreciated in the first year.

Can be claimed in a single tax year instead of amortized over a period of years.

*AND...*

\* building must be completed by December 31, 2013

\*\* for all three systems, otherwise cap is .60 per square foot



## Just *SOME* of the fine print

**All Systems:** project must be ~~certified~~ to reduce total annual energy and power costs to at least **50% less** than a Reference Building satisfying the requirements of ASHRAE/IESNA 90.1-2001 solely through changes to the building's lighting, HVAC/hot water and building envelope.

Indoor lighting systems 16-2/3%	HVAC/hot water systems 16-2/3%	Building envelope features 16-2/3%
------------------------------------	-----------------------------------	---------------------------------------

**Partial Systems:** project must be ~~certified~~ to reduce total annual energy and power costs to at least **10-20% less** than a Reference Building satisfying the requirements of ASHRAE/IESNA 90.1-2001. These savings must be achieved solely through changes to **one** of the three qualifying building systems or features.

Indoor lighting systems 20%	HVAC/hot water systems 20%	Building envelope features 10%
--------------------------------	-------------------------------	-----------------------------------

**'Interim Lighting Rule':** The total amount that can be deducted is capped at between \$0.30 and \$0.60/sq.ft on the below sliding scale based on a 25-40% reduction below the maximum allowable lighting power density (W/sq.ft.) in ASHRAE/IESNA 90.1-2001\*

\* unless space is a warehouse, then indoor lighting must achieve 50% reduction in LPD to achieve .60/sq. ft.



# EISA

## EISA: Energy Independence and Security Act of 2007

signed into law December 19, 2007



*“To create clean energy jobs, achieve energy independence, reduce global warming pollution and transition to a clean energy economy.”*





EISA

## Lighting Sections



Section 321: Energy Efficiency Standards for General Service Incandescent lamps



Section 322: Incandescent Reflector Lamp Efficiency Standard



Section 322: Standards for Fluorescent Lamps



Section 324: Metal Halide lamp FIXTURES



# Is the Incandescent being banned?

**The Boston Globe**

AP Associated Press

**Bill would ban incandescent bulbs**



**FAQ: The End of the Light Bulb as We Know It**

By MARIANNE LAVELLE

**The New York Times**

**Kissing Edison's Light Bulb Goodbye**

By JAMES KANTER

**WorldNetDaily**

Morning Edition

YOUR GOVERNMENT AT WORK

**Congress bans incandescent bulbs**

Massive energy bill phases out Edison's invention by 2014

**The Seattle Times**

**Incandescent lights out?**

*Hoarder buys 3,000 bulbs*



# Is the Incandescent being banned?

õ not *EXACTLY*

EISA 2007 is NOT banning the incandescent lamp but has established '**efficiency standards**' for all light bulbs sold in or imported into the United States.



EISA 2007 will require that manufacturers improve the performance of the following lamps over a TWO YEAR phase in period, STARTING JANUARY 1, 2012.



# What is considered an INCANDESCENT

## According to EISA: Section 321

A standard incandescent or halogen type lamp that:

- “ Is intended for general service applications,
  - “ Has a medium screw bases,
  - “ Has a lumen range of 310-2600 (40 - 100W in today's wattages), and
  - “ Is capable of operating at least partially in the range of 110-130 volts.
- either a standard or %modified spectrum+\* lamp (technically defined by the law).

\* (i) is not a colored incandescent lamp; and

(ii) when operated at the rated voltage and wattage of the incandescent lamp:

(I) has a color point with (x,y) chromaticity coordinates on the Commission Internationale de l'Éclairage (C.I.E.) 1931 chromaticity diagram that lies below the black-body locus;

*and*

(II) has a color point with (x,y) chromaticity coordinates on the C.I.E. 1931 chromaticity diagram that lies at least 4 MacAdam steps (as referenced in IESNA LM16) distant from the color point of a clear lamp with the same filament and bulb shape, operated at the same rated voltage and wattage.+



## EISA Schedule for General Service Incandescent

**Beginning on Jan. 1, 2012:** ALL general service lamps, CFL, LED, incandescent OR halogen light source AND lamps used to satisfy lighting applications traditionally served by general service incandescent lamps must have a minimum color rendering index (CRI) rating of:

- “ 80 if *not a* modified spectrum lamp; or
- “ 75 if a modified spectrum lamp

**Beginning on Jan. 1, 2012:** bulbs with a rated lighting output of 1,490 to 2,600 lumens (current 100-watt bulbs) may consume a maximum of 72 watts

**Beginning on Jan. 1, 2013:** bulbs with a rated lighting output of 1,050 to 1,489 lumens (current 75-watt bulbs) may consume a maximum of 53 watts

**Beginning on Jan. 1, 2014:** bulbs with a rated lighting output of 750 to 1,049 lumens (current 60-watt bulbs) may consume a maximum of 43 watts, and bulbs with a rated lighting output of 310 to 749 lumens (current 40-watt bulbs) may consume a maximum of 29 watts

NOTE: The lumen ranges for *modified spectrum* lamps lumen ranges are 25% lower but with the same maximum wattages.

By 2020 all bulbs will have to be at least **70% more** efficient than today's incandescent bulbs.



## EISA Schedule for General Service Incandescent

Current Wattage	Rated Lumen Ranges	Maximum Rated Wattage	Minimum Rated Lifetime	Effective Date (Manufactured on or after)
100	1490-2600	72	1,000 hours	1/1/2012 (CA ONLY: 1/1/2011)
75	1050-1489	53	1,000 hours	1/1/2013 (CA ONLY: 1/1/2012)
60	750-1049	43	1,000 hours	1/1/2014 (CA ONLY: 1/1/2013)
40	310-749	29	1,000 hours	1/1/2014 (CA ONLY: 1/1/2013)





## An optionõ

Replace with:



750 . 1049 lumens (60W)



# The GSIL exemptionsõ

Appliance lamp  
black light  
bug  
colored  
Infrared  
left-hand thread  
marine  
marine signal  
mine service  
plant light  
reflector  
rough service  
shatter-resistant  
sign service  
silver bowl  
showcase  
3-way  
traffic signal  
vibration service

G shape with  $\geq 5$ -inch diameter

T shape of  $\leq 40W$  and  $> 10$ -inch length

B, BA, CA, F, G16-1/2, G25, G30, S and M14 lamps of  $\leq 40W$

Candelabra incandescent and other lights not having a medium Edison screw base



# The exemptionsqexemptionsõ

## Exemption Reversal Condition

The Act includes a provision whereby sales of certain exempted lamps will be monitored by the US DOE between 2010 and 2025:

**rough service  
vibration service  
2601-3300 lumen general service (150W)  
3-way and  
shatter-resistant lamps**

For each of these lamp types, if sales *double* above the increase modeled for a given year· signaling that consumers are shifting from standard incandescent to these incandescents and thereby not saving energy· the lamp type will lose its exemption.



## DOE GSFL & DOE IRL Lamp Rule Making

GSFL: General Service Florescent Lamp  
IRL: Incandescent Reflector Lamp

The Energy Policy and Conservation Act requires that any new or amended energy conservation standard that the DOE prescribes for covered consumer and/or commercial products, including general service fluorescent lamps (GSFL) and incandescent reflector lamps (IRL), must be designed to **“achieve the maximum improvement in energy efficiency . . . which the Secretary determines is technologically feasible and economically justified.”** Furthermore, the new or amended standard must **“result in significant conservation of energy.”**



## GSFL & IRL

GSFL: General  
IRL: Incandescent Lamp

Incandescent Lamp  
Lamp

The Energy Policy Act of 1992 amended the energy conservation standards for commercial products including incandescent reflector lamps. **improvement in technological** amended standards

amended energy conservation standards for incandescent lamps (GSFL) and **level the maximum** determines is **of energy.**



**HUH??**



# GSFL & DOE IRL Lamp Rule Making

## Highlights

Covers the same lamp families covered by EPCACT 1992:

Incandescent (& Halogen) Reflector Lamps (IRL)

General Service Fluorescent Lamps (GSFL)

Declared that the R20, BR30, ER30, BR40 and ER40 lamps  
exempted by EISA 2007 continue to be exempt

Adds 4-ft. T5 standard and HO fluorescent lamps with  
miniature bi-pin bases

Becomes Effective July 14, 2012



# What is considered a FLUORESCENT

## According to EPCA

General Service Fluorescent Lamps are:

Fluorescent lamps which can be used to satisfy the majority of fluorescent applications \*

\* See the GSFL exemptions slide



# Current DOE GSFL standards

## FLUORESCENT LAMPS

Lamp Type	Nominal Lamp Wattage	Minimum CRI	Minimum Average Lamp Efficacy (LPW)	Effective Date (Period of Months)
4-foot medium bi-pin ....	>35 W	69	75.0	36
	≤35 W	45	75.0	36
2-foot U-shaped .....	>35 W	69	68.0	36
	≤35 W	45	64.0	36
8-foot slimline .....	65 W	69	80.0	18
	≤65 W	45	80.0	18
8-foot high output .....	>100 W	69	80.0	18
	≤100 W	45	80.0	18

These CRI minimum ratings have not changed



# Future DOE GSFL standards

Lamp Type	Correlated Color Temperature	Energy Conservation Standard lm/W
4-Foot (T8-T12) Medium Bi-pin ~ 25W	m4,500K	89
	> 4,500K and m7,000K	88
2-Foot (T8-T12) U-Shaped ~ 25W	m4,500K	84
	> 4,500K and m7,000K	81
8-Foot (T8-T12) Slimline ~ 52W	m4,500K	97
	> 4,500K and m7,000K	93
8-Foot (T8-T12) High Output	m4,500K	92
	> 4,500K and m7,000K	88
4-Foot (T5) Miniature Bi-pin Standard Output ~ 26W	m4,500K	86
	> 4,500K and m7,000K	81
4-Foot (T5) Miniature Bi-pin High Output ~ 49W	m4,500K	76
	> 4,500K and m7,000K	72

Becomes Effective July 14, 2012



# The GSFL exemptions

Fluorescent lamps designed to promote ~~plant~~ **plant growth**+

Fluorescent lamps specifically designed for cold temperature installations

Colored fluorescent lamps

Impact-resistant fluorescent lamps

Reflectorized or aperture lamps

Fluorescent lamps designed for use in reprographic equipment

Lamps primarily designed to produce radiation in the ultra-violet region of the spectrum

Lamps with a CRI (color rendering index) of 87 or greater

\* emphasis added



# Which GSFLs will go away?

## T12 4-ft. & 2-ft U-lamps with Medium Bi-pin Bases

All 4-ft. T8 basic 700 Series lamps at 2800 lumens fail

Some 700 Series 2 ft. U-lamps pass; all 2-ft. 800 Series U-lamps pass

## T12 8-ft. Slimline with Single Pin Bases

All 75W F96T12 lamps fail

Most 60W F96T12/ES fail

## T12 8-ft. 800mA HO with RDC Bases

All 110W F96T12 HO lamps fail

All 95W F96T12/ES/HO fail

\* very few very high lumen rare earth phosphor lamps will pass



# Which GSFLs will go away?

## T8 4-ft. & 2-ft. U-lamps with Medium Bi-Pin Bases

All 4-ft. T8 basic 700 Series lamps at 2800 lumens fail  
Some 700 Series 2 ft. U-lamps pass; all 2-ft. 800 Series U-lamps pass

## T8 8-ft. Slimline with Single Pin Bases

All pass except some 700/SP Series

## T8 8-ft. HO with RDC Bases

All pass except some 700/SP Series  
All 95W F96T12/ES/HO fail

## T5 4-ft. with Miniature Bi-Pin Bases

All pass



# Future DOE IRL standards

## Incandescent Reflector Lamps

Lamp watts	Lamp type	Diameter	Volts	Minimum efficacy (lumens/W), expressed as range for 40-205W
40-205	Standard spectrum	>2.5 in. (PAR30, PAR38, BR30, ER30, BR40, R40)	>125 (130V)	18.4-31.9
			<125 (120V)	16.0-27.6
		<2.5 in. (R20, PAR20)	>125 (130V)	15.4-26.7
			<125 (120V)	13.5-23.4
40-205	Modified spectrum	Standards approximately 17% less stringent as standard spectrum lamps.		

\* BR30, BR40 & ER40 lamps rated at 65W

ER30, BR30, BR40 & ER40 lamps rated at m50W

R20 lamps rated at m45W

Effective July 14, 2012



## The IRL exemptions

R, PAR, ER, BR, PBR or similar shape

with wattages less than 40 watts

with diameters less than or equal to 2.25 inches

with voltages less than 115V or greater than 130V

that are colored lamps

that are rough or vibration service lamps



## How the IRL standards might impact YOU

All of today's *current* standard PAR halogen lamps will be eliminated\*  
and  
likely that all 130V PAR halogen lamps will be eliminated

### THE BAD

- Need a substitute
- Substitutes cost more
- Change is difficult

### THE GOOD

- Manufacturers fighting to be leader
- Forces better technology
- Saves energy
- Saves money in long run
- Better technology gets cheaper over time

\* few of today's halogen reflector lamp (PAR20, PAR30 and PAR38) can meet the standards.



# Likely IRL replacements

Advanced incandescent with special coatings including halogen bulbs

ie: Infrared-coated halogen reflector lamps: IRC (Philips), IR (Sylvania) or HIR (GE)

Compact Fluorescent Lamps (CFLs)

Light-Emitting Diodes (LEDs)

## **A FEW OPTIONS**

Been using a 50W R20 lamp?

Use 45W R20 or any halogen PAR20

Been using a BR40 lamps > 65W and < 205W lamps?

Use 65W BR40 or halogen PAR38



## DOE estimated savings

30 Year period (2012-2042)



**.2 to 1.1 gigawatts**



**1.8 to 6.2 gigawatts**

gigawatt = 1 billion watts



# EISA Section 324

## Metal Halide Ballasts Defined by EISA

### **PROBE-START METAL HALIDE BALLAST**

A ballast that:

(A) starts a probe-start metal halide lamp that contains a third starting electrode (probe) in the arc tube

AND

(B) does not generally contain an igniter but instead starts lamps with high ballast open circuit voltage. Lamps shall be started by first providing a high voltage pulse for ionization of the gas to produce a glow discharge.

### **PULSE-START METAL HALIDE BALLAST**

An electronic or electromagnetic ballast that starts a pulse-start metal halide lamp with high voltage pulses.



# EISA Section 324

## Metal Halide Fixtures

Prohibits the sale of a metal halide fixture ranging from 150W . 500w unless the ballast in the fixture is greater than 88% efficient

Ballast Type	Wattage	Ballast Efficiency
Magnetic Probe Start	150W . 500W	94%
Pulse Start	150W . 500W	88%
Non Pulse Start Electronic	150W . 250W	90%
Non Pulse Start Electronic	251W . 500W	92%

\*

Applies to FIXTURES manufactured on or after January 1, 2009  
(additional reviews in 2012 to be effective 2015 and another review in 2015 to be effective 2022)



# The MH Fixture Exemptions

Fixtures with regulated lag ballasts

Fixtures with electronic ballasts to operate at 480V

Fixtures that meet all the following criteria:

Are only rated for 150W lamps

*and*

Are rated for use in wet locations

*and*

Contain a ballast that is rated to operate at ambient air temperatures above 50°C



# How EISA Affects MH Fixtures

Virtually eliminates the manufacturing of current 150W . 500W probe-start MH magnetic ballasted fixtures

Only impacts the sale of metal halide fixtures in the U.S. and U.S. territories

Sale of metal halide fixtures for markets outside of the United States does not need to comply

\* Does not affect replacement ballasts



## Benefits of Pulse-Start MH

- ” more energy efficient
- ” up to 16% improvement in lumen maintenance
- ” up to 50% greater system efficacy (l/w)
- ” up to 50% longer lamp life
- ” better CRI (85+)
- ” quicker start from cold (2 mins) / quicker re-strike time (4 mins)

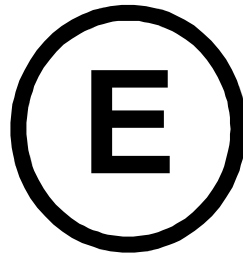


# Metal Halide Fixture Labeling

All new metal halide ballasts AND the metal halide fixture cartons

**MUST**

include a circle **E** label as prescribed by the Federal Trade Commission \*  
(required by EISA 2007)



\* The encircled capital letter **E** on metal halide ballasts must appear conspicuously, in color-contrasting ink (*i.e.*, in a color that contrasts with the background on which the encircled capital letter **E** is placed) on the surface that is normally labeled. It may be printed on the label that normally appears on the metal halide ballast, printed on a separate label, or stamped indelibly on the surface of the metal halide ballast. (SIMILAR LANGUAGE FOR PACKAGING, PRINTED MATERIAL AND ADVERTISING)



## What's Next

DOE will initiate TWO rulemakings to consider whether lamp standards should be made more stringent

**January 1, 2014:** (when the last efficiency standards go into effect) DOE must initiate a process to determine if any exempted lamp types should stop being exempted.

**January 1, 2020: MINIMUM 45 lumens per watt (l/w) BY 2020!** If rulemaking cannot produce savings greater than or equal to 45 lumens/watt then the Secretary shall prohibit the sale of ANY % general service lamp+(incandescent, compact fluorescent, light emitting diode) and ***“any other lamps the Secretary determines are used to satisfy lighting applications traditionally served by general service incandescent lamps” that does not meet a minimum efficacy standard of 45 lumens per watt (Referred to as “backstop requirement” which is an outright ban on certain general service lamps (last resort).***



# LED Integral Lamp Specs\*



AND



**Manufacturer must sign up to be an Energy Star partner.**

**Manufacturers must participate in DOE's Quality Advocates program and use the Lighting Facts label that is part of that program.**

**Lamp must be at least as energy efficient as comparable CFLs, with light output, color, and distribution equivalent to that of incandescent or halogen bulbs.**



**Manufacturer required to test 10 samples for at least 6,000 hours continuously, with an LM-79 test performed at the outset and end, to determine the lumen maintenance.**

**Different criteria are given depending on whether the lamp is omni-directional, decorative or directional.**

**A warranty must be provided for lamps covering material repair or replacement for a min of 3 years (DOP).**

\* Energy Star criteria for LED lamps applies *only* to integral+LED lamps i.e. lamps that are intended as replacements for conventional light bulbs.

Updated March 22, 2010 ... Effective August 31, 2010

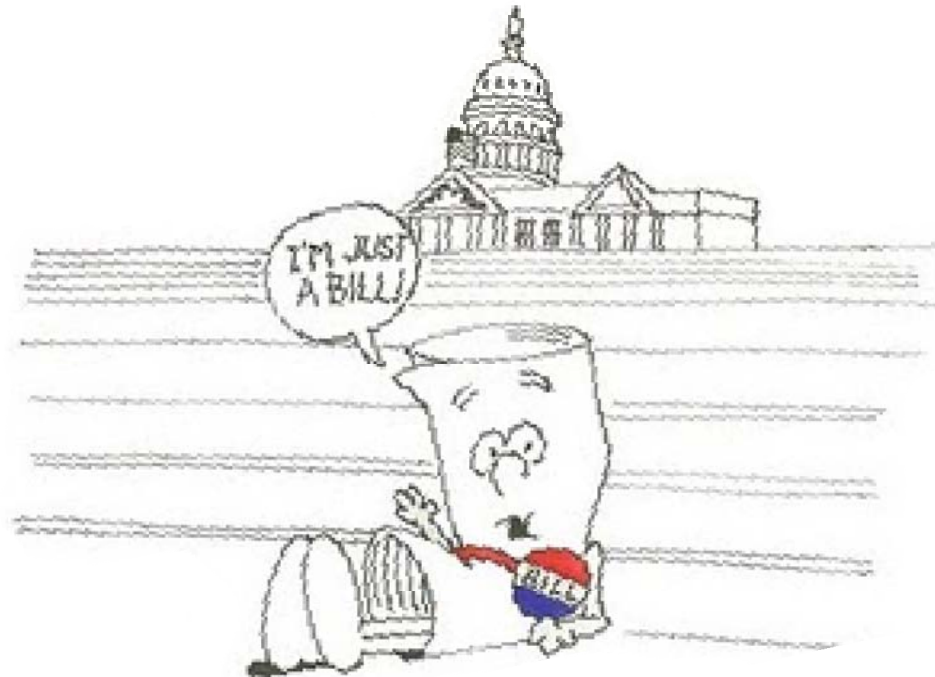




But waitõ thereç MORE!

## ACESA 2009

American Clean Energy and Security Act of 2009





## ACESA 2009

*“To create clean energy jobs, achieve energy independence, reduce global warming pollution and transition to a clean energy economy.”*

Section 161: Technical corrections to EISA 2007

Section 162: Technical corrections to EPACT 2005

Section 201: greater efficiency in building codes

Section 211: lighting efficiency standards

exemptions to current EISA standards are slated to expire in July 2013,  
per ACESA 2009 pending energy legislation



# DOE labeling for SSL\*

**Light Output/Lumens**  
Measures light output. The higher the number, the more light is emitted.  
Reported as "Total Integrated Flux (Lumens)" on LM-79 test report.

**Watts**  
Measures energy required to light the product. The lower the wattage, the less energy used.  
Reported as "Input Power (Watts)" on LM-79 report.

**Lumens per Watt/Efficacy**  
Measures efficiency. The higher the number, the more efficient the product.  
Reported as "Efficacy" on LM-79 test report.

**IESNA LM-79-2008**  
Industry standardized test procedure that measures performance qualities of LED luminaires and integral lamps. It allows for a true comparison of luminaires regardless of the light source.

**Registration Number**  
**Model Number**  
**Type**

Brand X

**lighting facts**<sup>CM</sup>  
A Program of the U.S. DOE

---

**Light Output (Lumens)** 840

**Watts** 9

**Lumens per Watt (Efficacy)** 93

---

**Color Accuracy**  
Color Rendering Index (CRI) 87

---

**Light Color**  
Correlated Color Temperature (CCT) 2900 (Warm White)

Warm White    Bright White    Daylight

2700K    3000K    4500K    6500K

---

All results are according to IESNA LM-79-2008: Approved Method for the Electrical and Photometric Testing of Solid-State Lighting. The U.S. Department of Energy (DOE) verifies product test data and results.

Visit [www.lightingfacts.com](http://www.lightingfacts.com) for the Label Reference Guide.

Registration Number: ABC435THK792023  
Model Number: 18756CHT56428954RQHT1234H3  
Type: 18756CHT56428954RQHT1234H3

**Brand**

Partner & Product Count	
Manufacturers	197
Retailers & Distributors	160
Lighting Pro	192
Products	1982
<small>Last updated 1/26/2011</small>	

**Color Rendering Index (CRI)**

Measures color accuracy.  
Color rendition is the effect of the lamp's light spectrum on the color appearance of objects.

**Correlated Color Temperature (CCT)**

Measures light color.  
"Cool" colors have higher Kelvin temperatures (3600-5500 K); "warm" colors have lower color temperatures (2700-3500 K). Color temperatures higher than 6500 are outside of the defined region for white light, but may be appropriate for outdoor applications.

\*voluntary





# FTC labeling for all lamps\*

Brightness  
**820**  
 lumens

Estimated Energy Cost  
**\$7.49**  
 per year

Front

**Lighting Facts**  
 Per Bulb

---

**Brightness** **820 lumens**

---


**Estimated Yearly Energy Cost** **\$7.49**  
 Based on 3 hrs/day and 11.4 ¢/kWh.  
 Your cost will depend on your rates and use.

---

**Life in Years**  
 Based on 3 hrs/day. **1.4 yrs**

---

**Color Appearance**  
 Warm Cool

  
 2700 K

---

**Energy Used** **60 watts**

Back

**\*mandatory**  
Effective mid-2011





# FTC labeling for lamps with Hg\*

<b>Lighting Facts</b>	
Per Bulb	
<b>Brightness</b>	870 lumens
<b>Estimated Yearly Energy Cost</b>	<b>\$1.62</b>
Based on 3 hrs/day and 11.4 ¢/kWh. Your cost will depend on your rates and use.	
	
<b>Life in Years</b>	5.5 yrs
Based on 3 hrs/day.	
<b>Color Appearance</b>	
<p>Warm <span style="display: inline-block; width: 100px; border-bottom: 1px solid black; position: relative; top: -5px;"> <span style="position: absolute; left: 0; top: -5px;">▲</span> <span style="position: absolute; right: 0; top: -5px;">▼</span> </span> Cool</p> <p>2700 K</p>	
<b>Energy Used</b>	13 watts
<b>Contains Mercury</b>	
Manage according to local, state, and federal disposal laws. For information: <a href="http://epa.gov/bulbrecycling">epa.gov/bulbrecycling</a> or 1-800-XXX-XXXX.	

**\*mandatory**  
Effective mid-2011

Proposed Back Label for Bulbs Containing Mercury





## Web Resources

(1) Energy Policy Act of 2005:

[www.epa.gov/oust/fedlaws/publ\\_109-058.pdf](http://www.epa.gov/oust/fedlaws/publ_109-058.pdf)

(2) Commercial Lighting Tax deduction:

[www.lightingtaxdeduction.org](http://www.lightingtaxdeduction.org)

(3) EISA 2007 Legislation:

[http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=110\\_cong\\_bills&docid=f:h6enr.txt.pdf](http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=110_cong_bills&docid=f:h6enr.txt.pdf)



## Web Resources

(4) Energy Star (LED integral lamp standards):

[http://www.energystar.gov/ia/partners/manuf\\_res/downloads/IntegralLampsFINAL.pdf](http://www.energystar.gov/ia/partners/manuf_res/downloads/IntegralLampsFINAL.pdf)

(5) ACESA 2009 (only a bill):

[http://frwebgate.access.gpo.gov/cgi-in/getdoc.cgi?dbname=111\\_cong\\_bills&docid=f:h2454ih.txt.pdf](http://frwebgate.access.gpo.gov/cgi-in/getdoc.cgi?dbname=111_cong_bills&docid=f:h2454ih.txt.pdf)

(6) Lighting Facts Label: [www.lightingfacts.com](http://www.lightingfacts.com)

(7) Federal Trade Commission: [www.ftc.gov](http://www.ftc.gov)



## Web Resources

**and....**

For everything you could possibly ever want to know about lighting and more, visit the

Illuminating Engineering Society at: [www.ies.org](http://www.ies.org)



QUESTIONS?



# For more information



BOC Information

Phone: 206-292-4793 x2

Web: [www.theBOC.info](http://www.theBOC.info)

Email: [BOCinfo@theBOC.info](mailto:BOCinfo@theBOC.info)



# Earn BOC Continuing Education Hours

---



Webinars provide continuing education hours towards renewal of the BOC credential:

“1.0 hour for webinar attendance, and

“0.5 hour for completion of the webinar quiz

# Join Us for the Next Webinar

---



**Wednesday, March 16, 2011**  
**Lighting Controls for IEQ and Cost Savings**

**Thursday, July 21, 2011**  
**New Lighting Technology: A Showcase of  
Products and Applications**

**Thursday, September 8, 2011**  
**Low Cost/No Cost Lighting Strategies for  
Cost Savings**

**To register: [www.theBOC.info](http://www.theBOC.info)**