



The Parker Ranch installation in Hawaii

What's Next for Lighting Programs?

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DOE's Appliance Standards Program for Lighting Equipment and Products

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Overview of Today's DOE Appliance Standards

Brief History of Federal Lighting Legislation

Recent Lighting Rulemaking

Lighting Rulemaking in Progress

Future Rulemaking & Pending Federal Energy Legislation

DOE's Appliance Standards are a Key Policy Strategy for U.S. Energy Strategy

“Energy efficiency can be improved very quickly...Appliance standards, ka-BOOM, can be had right away.” DOE Secretary Chu, March 2, 2009, *National Geographic*

President Obama's address at the DOE, February 5, 2009 put appliance standards at the forefront of his energy plan. In the Presidential Memorandum he stated....“We will save through these simple steps over the next 30 years the amount of energy produced over a two-year period by all the coal-powered plants in America. This will save consumers money, this will spur innovation and this will conserve tremendous amounts of energy.

“I am going to be looking at those [federal appliance standards] because I have become more convinced that they are not as aggressive as they could be. So we will look at making them more aggressive.” DOE Secretary Chu, March 3, 2009 at an Alliance to Save Energy Conference

- DOE has issued seven energy conservation standards since President Obama took office that established or amended standards for:
 1. 14 Products with standards prescribed by EISA 2007
 2. Ranges and Ovens
 3. GSFL and IRL Lamps
 4. Commercial Package Boilers and Very Large Commercial Package AC & HP
 5. Refrigerated Beverage Vending Machines
 6. Commercial Clothes Washers
 7. Small Electric Motors
- Between 2010 and 2030 the seven appliance standards issued since the Obama administration took office could save consumers a total of \$248 billion dollars off their utility bills, roughly equivalent to what residential consumers spend on energy bills for an entire year.

DOE's Appliance Standards will be Accelerated

- In January 2006, DOE adopted a 5-year plan to address both the backlog and new EPACK 2005 rulemakings.
- DOE will issue one standard for all backlog products by June 2011, while meeting all the EPACK 2005 deadlines.
 - 20 products plus small electric motors (a positive determination)
- Plan reviewed rulemaking process and made improvements
 - Staggered rulemakings and “valley-filling”
 - Product bundling
 - Streamlined document review
- Plan reflects a 6-fold increase over average of previous 18 years – the highest-ever level of standards activities

DOE is scheduled to complete final rules for another 14 products over the next 2 years

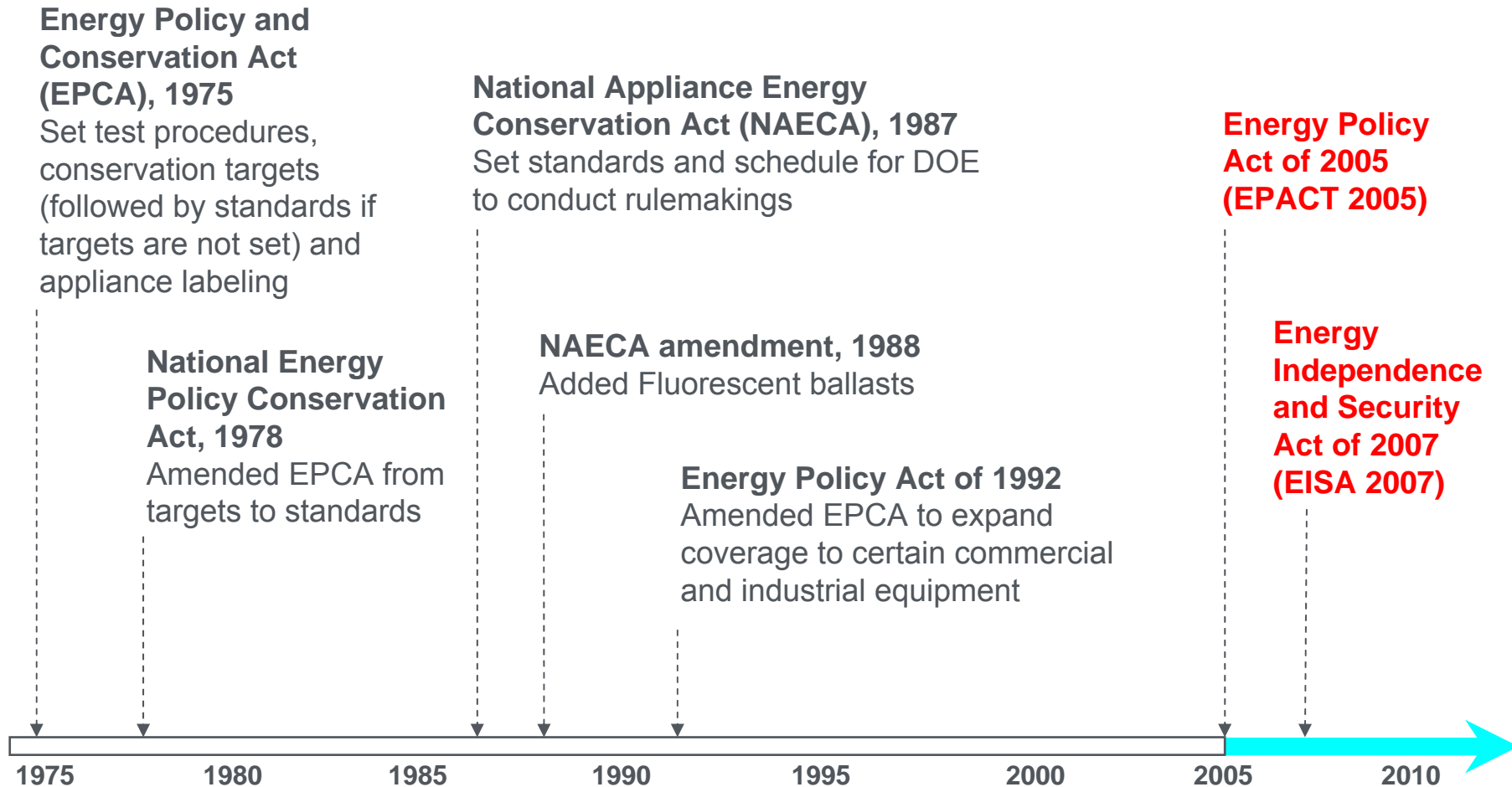
•Four Products with Final Rules in 2010

- Water Heaters (Residential)
- Direct Heating Equipment
- Pool Heaters
- Refrigerators (Residential)

•Ten Products with Final Rules in 2011

- Microwave Ovens
- Residential Furnaces and Mobile Home Furnaces
- Fluorescent Lamp Ballasts
- Clothes Dryers (Residential)
- Room Air Conditioners
- Central Air Conditioners and Heat Pumps (Residential)
- Battery Chargers
- External Power Supplies (Class A)
- ER, BR, and Small Diameter Incandescent Reflector Lamps
- Residential Clothes Washers

•The standards that will be issued in the next 2 years (11 rulemakings, 14 appliances) could save consumers approximately the same amount as the seven final rules issued to date.



Energy Policy Act of 1992

- Labeling incandescent and screw-based CFLs with energy cost information.
- Minimum efficacies for incandescent R30 & R40, plus incandescent PAR lamps, effective 10/31/95.
- Minimum efficacies and color rendering standards for straight and U-bend fluorescent, effective for 4-ft and 8-ft lamps 10/31/95.

This is the legislation that eliminated the 150R40/FL, F40/CW, FB40/CW and F96T12/CW lamps.

EPAct 2005

- Exit Signs must meet ENERGY STAR V2.0.
- Torchieres are limited to 190W max.
- Medium base CFLs must meet ENERGY STAR V2.0
- Mercury Vapor Lamp Ballasts for general illumination applications may not be manufactured or imported
 - Late in 2005, a notice in the Federal Register clarified that this also includes new luminaires containing such ballasts.
 - 2007 EISA legislation provides for continued use in specialty applications provided the ballast is marked “Not for general illumination” and identifies the specialty application.
- New efficiency requirements for ballasts operating ‘Energy Saver’ T12 fluorescent lamps go into effect.
- By 2010, ballast manufacturers cannot manufacture replacement ballasts that do not pass the new Ballast Efficacy Factors (BEF) requirements. This essentially eliminates electro magnetic ballasts.



EISA 2007

- Minimum lumens/watt for most types of general service incandescent lamps (phased in 2012-2014)
- Minimum lumens/watt for 40-205W incandescent reflector lamps. Included BR/ER lamps with exemptions for BR30, BR40, ER40 and R20 lamps
- Ballast requirements for metal halide lamp fixtures operated with lamps $\geq 150W$ but $\leq 500W$. Fixtures shall contain one of the following:
 - A pulse-start metal halide ballast with a minimum ballast efficiency of 88% or
 - A magnetic probe-start ballast with a minimum ballast efficiency of 94% or
 - A non-pulse-start electronic ballasts with:
 - ✓ A minimum ballast efficiency of 92% for wattages $> 250W$.
 - ✓ A minimum ballast efficiency of 90% for wattages $\leq 250W$.
 - Several exemptions identified.
 - Effective January 1, 2009.

2009 rulemaking for general service fluorescent lamps (GSFL) and incandescent reflector lamps (IRL)

- GSFL energy conservation standards for:
 - 4 ft, 8ft, 8ft HO, and U-bend FL lamps
 - Includes T12, T8 and T5 lamps
 - **4.3 quads/\$12.8 billion NPV over 30 yrs**
- IRL energy conservation standards for:
 - Halogen PAR38, PAR30, PAR20 lamps
 - **1.4 quads/\$5.1 billion NPV over 30 years**
- **Published in the Federal Register July 14, 2009**
- **Effective July 14, 2012**
- IRL subset of ER, BR and small diameter lamps were excluded from the rulemaking, but DOE is considering a separate rulemaking for these lamps. If rulemaking is undertaken, DOE will strive to complete the final rule for these products in 2011.



Standards for general service fluorescent lamps (GSFL)

Lamp Type	Correlated Color Temperature	Energy Conservation Standard lm/W
4-Foot (T8-T12) Medium Bi-pin ≥25W	≤ 4,500K	89
	> 4,500K and ≤ 7,000K	88
2-Foot (T8-T12) U-Shaped ≥25W	≤ 4,500K	84
	> 4,500K and ≤ 7,000K	81
8-Foot (T8-T12) Single Pin Slimline ≥52W	≤ 4,500K	97
	> 4,500K and ≤ 7,000K	93
8-Foot (T8-T12) High Output	≤ 4,500K	92
	> 4,500K and ≤ 7,000K	88
4-Foot (T5) Miniature Bi-pin Standard Output ≥26W	≤ 4,500K	86
	> 4,500K and ≤ 7,000K	81
4-Foot (T5) Miniature Bi-pin High Output ≥49W	≤ 4,500K	76
	> 4,500K and ≤ 7,000K	72

Standards for incandescent reflector lamps (IRL)

Lamp Wattage	Lamp Type	Diameter	Voltage	Minimum LPW*; expressed here as a range for 40W through 205W, as LPW is derived from a formula based on lamp watts
40-205W	Standard Spectrum	> 2.5 inches (PAR30, PAR38, BR30 & ER30, BR40 & ER40)	≥ 125 (130V)	6.8 X lamp watts ^{0.27} 18.4 to 31.9 LPW
			< 125 (120V)	5.9 X lamp watts ^{0.27} 16.0 to 27.6 LPW
		≤ 2.5 inches (R20 & PAR20)	≥ 125 (130V)	5.7 X lamp watts ^{0.27} 15.4 to 26.7 LPW
			< 125 (120V)	5.0 X lamp watts ^{0.27} 13.5 to 23.4 LPW
40-205W	Modified Spectrum	Standards are approximately 17% less stringent than for standard spectrum lamps.		

Current exemptions to IRL Standards:

Lamps that are 50W or less: ER30, BR30, BR40, and ER40

Lamps that are 65W exactly: BR30, BR40, and ER40

Lamps that are 45W or less: R20

*LPW=lumens per watt.

Published Notice of Data Availability (NODA) for 5 exempted lamp types

- NODA published December 18, 2008 announcing the completion of DOE's model of future lamp sales (shipments) for 5 exempted lamp types (rough service lamps, vibration service lamps, 3-way incandescent lamps, 2,601–3,300 lumen general service incandescent lamps, and shatter-resistant lamps).
- Starting in 2010 and through 2025, DOE will track actual sales data for the 5 lamp types and compare the yearly data to the shipments model.
- When annual sales for any of the 5 lamp types exceeds the model by at least 100% (more than double the anticipated sales), DOE will initiate regulatory action on that lamp.

Current rulemakings in progress include the following:

- High intensity discharge (HID) determination (Backlog)
 - Notice of determination to proceed with full rulemaking due June 2010.
- Fluorescent lamp ballasts (Backlog Cycle 2)
 - Energy conservation standard due June 2011.
 - Test procedure for active mode energy consumption.
 - Test procedure for standby and off-mode energy consumption (EISA 2007 requirement).
- Metal halide lamp fixtures (EISA 2007)
 - Energy conservation standard due January 2012
 - Test procedure for metal halide lamp ballasts including standby and off-mode, energy consumption published March 9, 2010.

Future Lighting Rulemaking (EISA 2007)

- Compact fluorescent lamps
- General service light emitting diode (LED) lamps
- General service organic light emitting diode (OLED) lamps



Pending Federal Energy Legislation

- General outdoor lighting
 - Provides definitions and establishes energy conservation standards/test procedures for pole-mounted products including street lighting fixtures, parking lot lighting fixtures and controls).
- High-output double-ended quartz halogen lamps
 - Minimum efficiency of 27 lumens/watt (6,000 – 14,000 lumens initial rated output)
 - Minimum efficiency of 34 lumens/watt (15,000 – 40,000 lumens initial rated output)
- Bans the manufacturer of general purpose mercury vapor lamps after 2016.



DOE Appliances and Commercial Equipment Standards Web Site:
http://www1.eere.energy.gov/buildings/appliance_standards/

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