

Energy Independence and Security Act of 2007: Title III – Energy Savings through Improved Standards for Appliances and Lighting

Policy Description

ACEEE estimates that the appliance and lighting standards provisions in the Energy Independence and Security Act of 2007 will save at least 2.0 quadrillion Btu's in 2030, which is 1.6% of total projected nationwide energy use that year. The bill will save approximately 177 billion kWh per year in 2030 and reduce peak electric demand by 33,000 MW. Annual carbon dioxide emissions will be cut by around 135 million metric tons.¹

Subtitle A – Appliance Energy Efficiency:

The energy bill contains new or updated standards for the following appliances:

- External power supplies (the small black boxes attached to the power cords of many electronic products) – new federal standard based on standards adopted in various states
- Residential boilers – updates existing federal standard
- Clothes washers – updates existing federal standard; sets water efficiency standards
- Dishwashers – updates existing federal standard; sets water efficiency standards
- Dehumidifiers – updates existing federal standard
- Walk-in coolers (refrigerators) and freezers – new federal standard based on California, Maryland, and Rhode Island standards
- Electric motors – updates existing federal standard and extends coverage to more motors

Additionally, the DOE must issue a new standard for the electricity usage of furnace fans and incorporate energy use from standby mode and off mode into future standards for covered appliances.

Finally, the bill allows regional standards to be set for heating and cooling equipment by granting the following:

- Authority for the Secretary to set a national minimum standard and one additional Federal regional standard for residential furnaces;

¹ Savings estimates are conservative since they do not include additional rulemakings required by the regular reviews provision.

- Authority for the Secretary to set a national minimum standard and one or two additional Federal regional standards for residential central air conditioners and heat pumps;
- Development, by rule, or enforcement plans for any Federal regional standard, and;
- New authority for states to enforce an applicable Federal regional standard.
- Regional standards are authorized only if significant additional energy savings will be achieved and only if the law's existing criteria for economic justification and technical feasibility are fully met.

Subtitle B – Lighting Energy Efficiency:

The energy bill contains new or updated standards for the following lighting products:

- Incandescent reflector lamps (light bulbs) – extends 1992 reflector standards to more lamp types
- Metal halide lamp fixtures (commonly used in high-ceiling commercial and industrial applications) – new federal standard based on those of California, New York, and other states
- General service lamps (light bulbs) – The biggest energy-saver among the standards in the bill is the standard for common light bulbs, requiring them to use about 25-30% less energy than today's most common incandescent bulbs by 2012-2014 (phasing in over several years) and at least 60% less energy by 2020.

Sources:

- “Appliance Efficiency Standards in the 2007 Energy Bill: Key Facts”, Appliance Standards Awareness Project and American Council for an Energy Efficient Economy, December 2007, http://www.standardsasap.org/documents/2007EnergyBill_Standardsfactsheet.pdf
- U.S. Congress. House. *Energy Independence and Security Act of 2007*. H.R.6. 110th Cong., 1st sess.

Policy Design

Goals:

- Update existing standards or implement new standards for the energy usage of selected appliances.
- Improve the efficiency of general service lighting.

Timing: Effective dates for each federal standard:

- External power supplies – July 2008
- Residential boilers – September 2012
- Clothes washers – January 2011
- Dishwashers – January 2010

- Dehumidifiers – October 2012
 - Walk-in coolers (refrigerators) and freezers – January 2009
 - Electric motors – December 2010
 - Incandescent reflector lamps – January 2008
 - Metal halide lamp fixtures – January 2009
 - General service lamps - 2012-2014 and 2020
 - After July 1, 2010, energy use in standby mode and off mode must be incorporated into any updated standards for products covered in this bill.
 - DOE must issue an electricity use standard for furnace fans by 2014.
- **Parties Involved:** DOE, manufacturers, consumers, states

Implementation Mechanisms

Efficiency standards apply to all new appliances manufactured on or after the effective date.

Related Policies/Programs in Place

Minimum standards of energy efficiency for many major appliances were established by the U.S. Congress in the Energy Policy and Conservation Act (EPCA) of 1975, and had been subsequently amended by succeeding energy legislation, including the Energy Policy Act of 2005. Laws require the U.S. Department of Energy (DOE) to set appliance efficiency standards at levels that achieve the maximum improvement in energy efficiency that is technologically feasible and economically justified. The DOE website lists updates and final rulings for 18 residential products and 11 pieces of commercial equipment.

Under the general rules of federal preemption, states which had set standards prior to federal enactment may enforce their state standards up until the federal standards become effective. States that have not yet set standards are preempted immediately.

Existing state standards not yet preempted by federal standards:

- External power supplies: AZ (2008), CA (2007/2008), CT (2008), MA (2008), OR (2008), RI (2007), VT (2008), WA (2008)
- Walk-in coolers (refrigerators) and freezers: CA (2007), CT (2009), RI (2008)
- General service incandescent lamps: CA (2006), NV (Starting January 1, 2012, general purpose lights sold in the state must produce at least 25 lumens per watt)
- State regulated incandescent reflector lamps: CA (2007), MA (2008), OR (2008), RI (2008), VT (2008), WA (2008)
- Metal halide lamp fixtures: CA (2006/2008), NY (2008), OR (2008), RI (2008)

Sources:

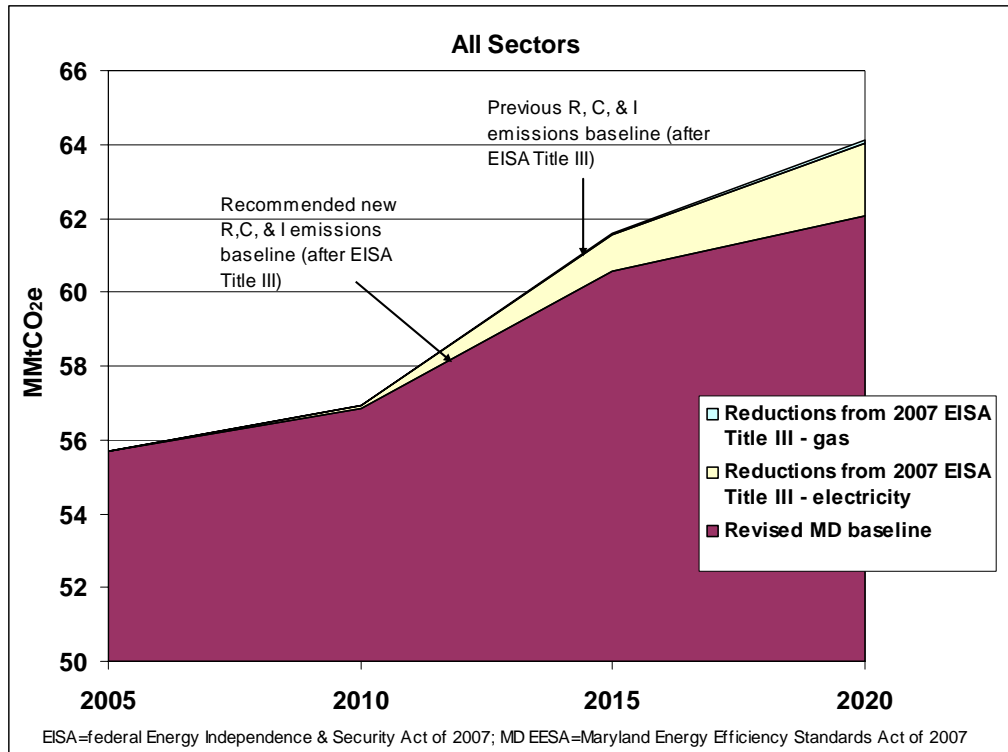
- “Appliances and Commercial Equipment Standards”, U.S. Department of Energy, Energy Efficiency and Renewable Energy: Building Technologies Program, http://www.eere.energy.gov/buildings/appliance_standards/residential_products.html.
- “Appliance/Equipment Efficiency Standard: Federal Appliance Standards”, Database of State Incentives for Renewables & Efficiency, Last reviewed: January 7, 2008, http://www.dsireusa.org/library/includes/incentivesearch.cfm?Incentive_Code=US04R&Search=TableType&type=Appliance&CurrentPageID=7&EE=1&RE=0.
- “Energy Efficiency Standards Adopted and Pending by State”, Appliance Standards Awareness Project and Northeast Energy Efficiency Partnerships, Updated February 2008, <http://www.standardsasap.org/documents/StatestandardsstatusgridFebruary2008update.pdf>.

Type(s) of GHG Reductions

Reduction in greenhouse gas (GHG) emissions (largely CO₂) from avoided electricity production and natural gas combustion.

Estimated GHG Reductions and Net Costs or Cost Savings

	GHG Reductions (MMtCO ₂ e)			Gross Costs (Million \$)	Gross Benefits (Million \$)	Net Present Value 2008–2020 (Million \$)	Cost-Effectiveness (\$/tCO ₂ e)
	2012	2020	Total 2008–2020				
EISA (Maryland only)	0.4	2.1	11.4	NA	NA	NA	NA



Data Sources:

- Annual Energy Outlook 2008 with Projections to 2030 (Early Release), Year-by-Year Reference Case Tables (2005-2030): Table 2. Energy Consumption by Sector and Source, Release Date: December 2007. (This version does not include savings from EISA 2007.)
- [ACEEE 2007] "Energy Bill Savings Estimates as passed by the Senate: ACEEE's assessment of the potential energy, carbon, and economic savings," American Council for Energy Efficient Economy, Preliminary Analysis, December 14, 2007, Accessed March 19, 2008 from <http://www.aceee.org/energy/national/EnergyBillSavings12-14.pdf>.
- [ACEEE 2006] Steven Nadel, Andrew deLaski, Maggie Eldridge, and Jim Kleisch (March 2006). "Leading the Way: Continued Opportunities for New State Appliance and Equipment Efficiency Standards," Report Number ASAP-6/ACEEE-A062, ASAP and ACEEE, page 13. Available at: <http://www.aceee.org/pubs/a062.htm>.
- [DOE 2002] "U.S. Lighting Market Characterization, Volume I: National Lighting Inventory and Energy Consumption Estimate." Prepared by Navigant Consulting, Washington, D.C.: U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, Building Technologies Program, September 2002, page 35.

Quantification Methods:

- Estimate annual federal energy savings by sector (residential, commercial, and industrial) by applying assumptions to ACEEE’s preliminary “Energy Bill Savings Estimates as passed by the Senate” assessment (ACEEE 2007) for the applicable sector(s) for each measure covered in the assessment (see Key Assumptions).
- Compare the ACEEE assessment with the AEO energy forecast and determine the energy savings impacts overall and by sector, expressed as a percent of US projected electricity consumption for each sector
- Reduce the energy consumption for each sector in the state by the percentage reduction at the federal level for the analogous sector
- Find the difference between the projected energy consumption in the state and the energy consumption reduced for the federal Energy Bill
- Find the resulting reductions in carbon dioxide emissions based on this difference in energy consumption

Key Assumptions:

- Allocation of the energy savings by sector for each measure are estimated as follows:

Section	Percentage by Sector		
	Residential	Commercial	Industrial
SEC. 301. EXTERNAL POWER SUPPLY EFFICIENCY STANDARDS.	50%	50%	0%
SEC. 303. RESIDENTIAL BOILERS.	100%	0%	0%
SEC. 304. FURNACE FAN STANDARD PROCESS.	100%	0%	0%
SEC. 306. REGIONAL STANDARDS FOR FURNACES, CENTRAL AIR CONDITIONERS, AND HEAT PUMPS.	60%	28%	12%
SEC. 310. STANDBY MODE.	100%	0%	0%
SEC. 311. ENERGY STANDARDS FOR HOME APPLIANCES.	100%	0%	0%
SEC. 312. WALK-IN COOLERS AND WALK-IN FREEZERS.	0%	100%	0%
SEC. 313. ELECTRIC MOTOR EFFICIENCY STANDARDS.	0%	50%	50%
SEC. 321. EFFICIENT LIGHT BULBS.	87%	11%	2%
SEC. 322. INCANDESCENT REFLECTOR LAMP EFFICIENCY STANDARDS.	76%	23%	0%
SEC. 324. METAL HALIDE LAMP FIXTURES.	0%	56%	31%

Section	Source for Allocation Assumption
SEC. 301. EXTERNAL POWER SUPPLY EFFICIENCY STANDARDS.	Estimated
SEC. 303. RESIDENTIAL BOILERS.	EISA 2007 text
SEC. 304. FURNACE FAN STANDARD PROCESS.	ACEEE 2006, page 13
SEC. 306. REGIONAL STANDARDS FOR FURNACES, CENTRAL AIR CONDITIONERS, AND HEAT PUMPS.	South Atlantic Region Sector Key Indicators data from the Annual Energy Outlook 2007 of the Energy Information Administration
SEC. 310. STANDBY MODE.	EISA 2007 text

SEC. 311. ENERGY STANDARDS FOR HOME APPLIANCES.

SEC. 312. WALK-IN COOLERS AND WALK-IN FREEZERS.

SEC. 313. ELECTRIC MOTOR EFFICIENCY STANDARDS.

SEC. 321. EFFICIENT LIGHT BULBS.

SEC. 322. INCANDESCENT REFLECTOR LAMP EFFICIENCY STANDARDS.

SEC. 324. METAL HALIDE LAMP FIXTURES.

EISA 2007 text
EISA 2007 text
Estimated
Conversation with ACEEE
DOE 2002, page 35. Incandescent reflector lamps sold for outdoor stationary lighting are not included.
DOE 2002, page 35. Metal halide lamps sold for outdoor stationary lighting are not shown here.

- The percentage of energy savings from a measure will be approximately the same on the federal level as on the state level.

Key Uncertainties

The energy savings in the ACEEE “Energy Bill Savings Estimates as passed by the Senate” analysis are potential savings; actual savings may vary significantly. In particular, the energy savings estimates for the following appliance standards should be used cautiously:

- Regional standards for furnaces, central air conditioners, and heat pumps – The bill contains provisions for additional efficiency standards on heating and cooling equipment to be enforced on a regional basis; however, the bill does not actually recommend specific standards.
- Furnace fan standard process – The bill requires a new standard to be set for furnace fan electricity usage by 2014, but does not specify how the standard should be designed.
- Standby mode – The bill specifies that standby mode and off mode must be incorporated into updated standards for certain products after 2010, but does not detail how they will be incorporated.

Additional efficiency standards may be set in the future that provide even greater energy savings than those quantified here.