



U.S. Department of Energy
**Energy Efficiency
and Renewable Energy**

Bringing you a prosperous future where energy
is clean, abundant, reliable, and affordable

Building Technologies Program

**U.S. DOE Appliance Standards Program
Challenges and Opportunities
for Global Coordination**

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Legislative History of Standards Program

Energy Policy and Conservation Act (EPCA), 1975

Set test procedures, conservation targets (followed by standards if targets are not set) and appliance labeling

National Energy Policy Conservation Act, 1978

Amended EPCA from targets to standards

National Appliance Energy Conservation Act (NAECA), 1987

Set standards and schedule for DOE to conduct rulemakings

NAECA amendment, 1988

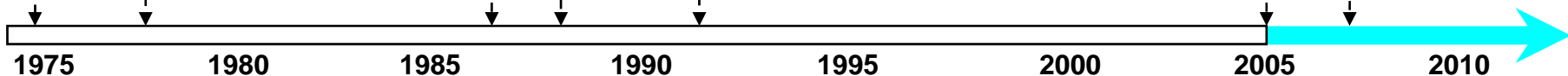
Added Fluorescent ballasts

Energy Policy Act of 1992

Amended EPCA to expand coverage to certain commercial and industrial equipment

Energy Policy Act of 2005 (EPACT 2005)

Energy Independence and Security Act of 2007 (EISA 2007)

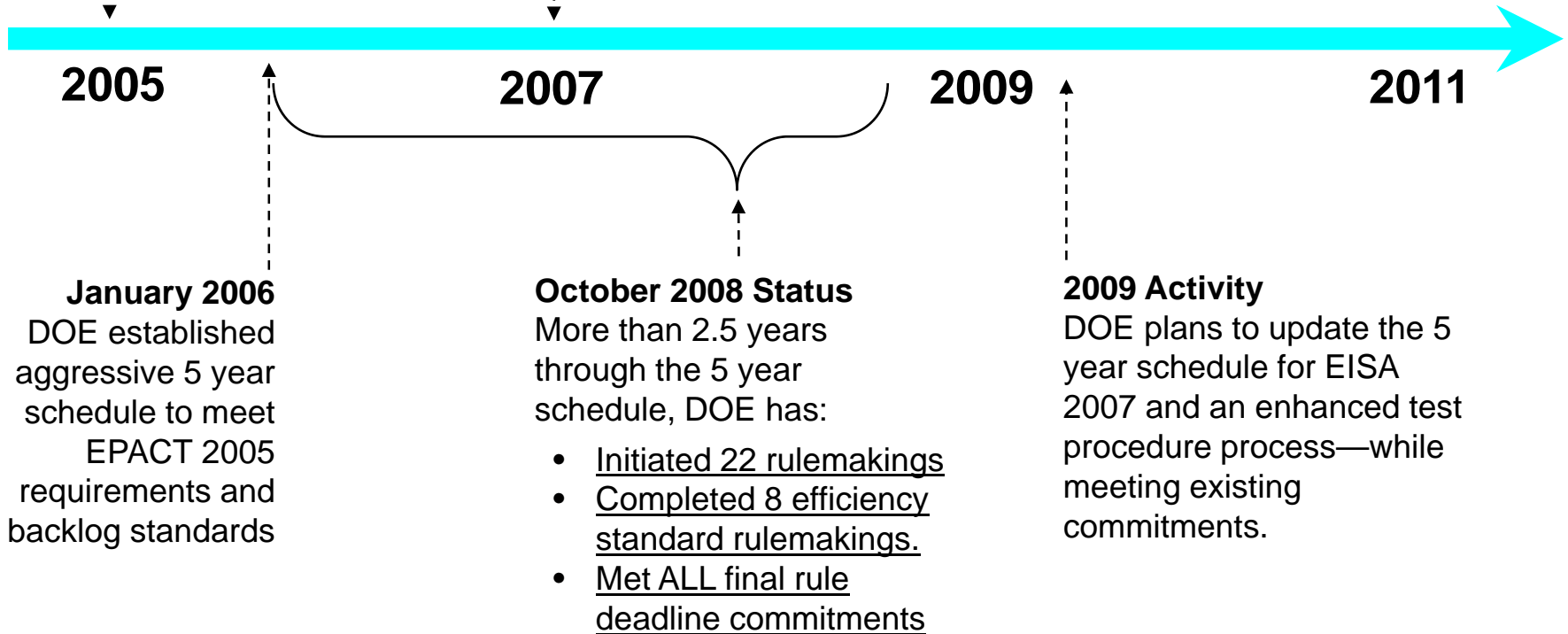




Focus on Recent and Current Events

Energy Policy Act of 2005

Energy Independence and Security Act of 2007





Standards Program Pre-EPACT 2005



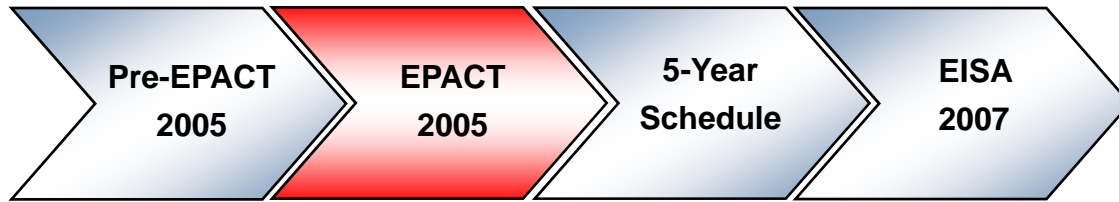
Prior to EPACT 2005, DOE had a product backlog consisting of past statutory requirements from NAECA and EPACT 1992.

The backlog included:

- 25 energy conservation standards rulemakings
- 18 products – appliances and commercial equipment
- 2 determination analyses from EPACT 1992



The Energy Policy Act of 2005 Amendments



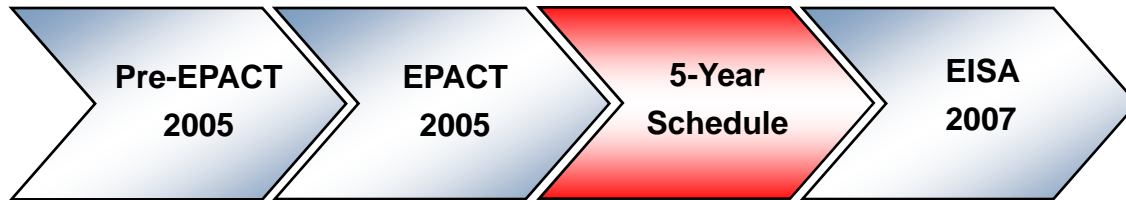
Added new residential products and commercial / industrial equipment.

- Prescribed 15 new energy conservation standards
- Set 11 test procedures “based on” industry standards and methods
- Directed DOE to develop 10 new standards for 6 different products

| | Backlog | EPACT 2005 | Total including EPACT 2005 |
|----------------------------|---------|------------|----------------------------|
| Energy Standards (“to do”) | 25 | 10 | 35 |
| Products Covered | 18 | 6 | 24 |



5-Year Schedule Implemented



- In January 2006, DOE adopted a 5-year plan to address both the backlog and new EPACT 2005 rulemakings.
- DOE will issue one standard for all backlog products by June 2011, while meeting all the EPACT 2005 deadlines.
 - 18 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



The Energy Independence and Security Act of 2007 Amendments



- Added new residential products and commercial / industrial equipment
 - Prescribed 18 new energy conservation standards
 - Directed DOE to develop standards for 10 products
- Requires 16 new or revised test procedures
 - Including standby and off-mode for 13 products
- Requires regular rulemaking reviews:
 - Every 6 years for energy conservation standards
 - Every 7 years for test procedures
- Standby power must be considered in all residential product standards adopted after July 1, 2010 (also, test procedures to measure it).



Ongoing Energy Conservation Standards Activities

| Product | Driver | Scheduled Completion |
|---|------------|----------------------|
| 1. Package Terminal Air Conditioners and Heat Pumps | Backlog | COMPLETED |
| 2. Distribution Transformers | Backlog | COMPLETED |
| 3. Furnaces and Boilers, Residential | Backlog | COMPLETED |
| 4. Small Furnace | Backlog | COMPLETED |
| 5. Mobile Home Furnaces | Backlog | COMPLETED |
| 6. Small Electric Motors Small (Determination) | Backlog | COMPLETED |
| 7. 15 Product EPACT 2005 En Masse Standard | EPACT 2005 | COMPLETED |
| 8. Ceiling Light Fan Kits | EPACT 2005 | COMPLETED |
| 9. Commercial Refrigeration Equipment | EPACT 2005 | January 2009 |
| 10. EISA 2007 En Masse Standard | EISA 2007 | January 2009 |
| 11. Clothes Washers, Commercial | EPACT 2005 | March 2009 |
| 12. Ranges and Ovens (Electric and Gas) and Microwave Ovens | Backlog | March 2009 |
| 13. Refrigerated Bottle or Canned Beverage Vending Machines | EPACT 2005 | August 2009 |
| 14. Incandescent Reflector Lamps | Backlog | June 2009 |



Ongoing Energy Conservation Standards Activities (cont.)

| Product | Driver | Scheduled Completion |
|--|-----------|------------------------|
| 15. General Service Fluorescent Lamps | Backlog | June 2009 |
| 16. External Power Supplies, non-Class A (Determination) | EISA 2007 | December 2009 |
| 17. Small Electric Motors | Backlog | February 2010 |
| 18. Water Heaters, Residential | Backlog | March 2010 |
| 19. Direct Heating Equipment | Backlog | March 2010 |
| 20. Pool Heaters | Backlog | March 2010 |
| 21. High-Intensity Discharge Lamps (Determination) | Backlog | June 2010 |
| 22. Refrigerators, Residential | EISA 2007 | December 2010 |
| 23. Fluorescent Lamp Ballasts | Backlog | June 2011 |
| 24. Room Air Conditioners | Backlog | June 2011 |
| 25. Clothes Dryers | Backlog | June 2011 |
| 26. Central Air Conditioners and Heat Pumps | Backlog | June 2011 |
| 27. Battery Chargers | EISA 2007 | July 2011 |
| 28. External Power Supplies, Class A | EISA 2007 | July 2011 |
| 29. ASHRAE 90.1 Products | EISA 2007 | July 2009 / July 2011* |

*DOE will adopt as uniform national energy standards the amendments in ASHRAE 90.1 within 18 months of the date of publication of ASHRAE Standard 90.1 or set more stringent standards not later than 30 months after the date of publication of the amendment to the ASHRAE/IES Standard 90.1 for the product.



Ongoing *Test Procedure* Activities

| Product | Driver | Scheduled Completion |
|--|-----------------|----------------------|
| 1. Battery Chargers (standby) | EISA | December 2008 |
| 2. External Power Supplies (standby) | EISA | December 2008 |
| 3. Fluorescent Lamp Ballasts (standby) | EISA | March 2009 |
| 4. Clothes Dryers (standby) | EISA | March 2009 |
| 5. Room Air-Conditioners (standby) | EISA | March 2009 |
| 6. Microwave Ovens (standby) | EISA | April 2009 |
| 7. Metal Halide Lamp Fixtures (Ballasts, active and standby) | EISA | June 2009 |
| 8. Residential Clothes Washers (standby) | EISA | June 2009 |
| 9. Incandescent Reflector Lamps | Std. Rulemaking | June 2009 |
| 10. General Service Incandescent Lamps | Std. Rulemaking | June 2009 |
| 11. General Service Fluorescent Lamps | Std. Rulemaking | June 2009 |
| 12. Small Electric Motors | EPCA | June 2009 |

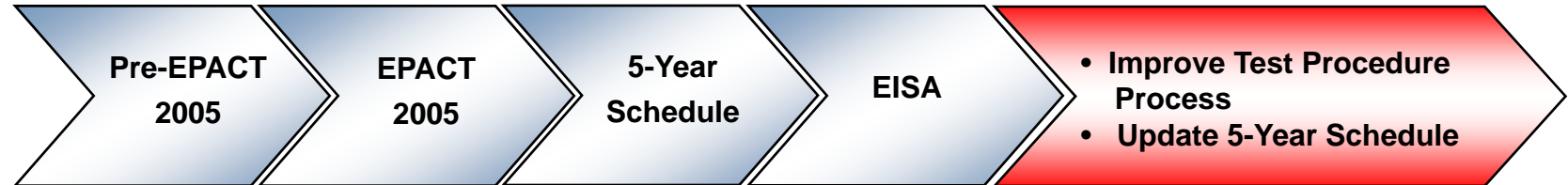


Ongoing *Test Procedure* Activities (cont.)

| Product | Driver | Scheduled Completion |
|---|-------------------------|----------------------|
| 13. Furnaces and Boilers (standby) | EISA | September 2009 |
| 14. Walk-In Coolers and Walk-In Freezers | EISA | December 2009 |
| 15. Residential Refrigerators | Std. Rulemaking | December 2010 |
| 16. Fluorescent Lamp Ballasts (active mode) | Std. Rulemaking | June 2011 |
| 17. Battery Chargers (active mode) | Std. Rulemaking | June 2011 |
| 18. Televisions | Petition for Rulemaking | TBD |



Test Procedure Process Improvement



- DOE is revising its 5-year schedule to incorporate EISA requirements. In this revision, DOE will:
 - Meet all previous commitments
 - Develop test procedure process improvements, similar to standards rulemaking process improvements
 - Engage stakeholders, and build upon DOE and industry best practices for test procedure development
 - Create a process for developing, reviewing and updating test procedures that will be able to accommodate changes in designs and technologies



Scheduled Test Procedures Not Yet Initiated

| Product | Driver | Projected Completion |
|--|-----------------|----------------------|
| 1. Residential Water Heaters (standby) | EISA | March 2010 |
| 2. Direct Heating Equipment (standby) | EISA | March 2010 |
| 3. Pool Heaters (standby) | EISA | March 2010 |
| 4. Room A/C and Clothes Dryers | Std. Rulemaking | August 2010 |
| 5. Dishwashers (standby) | EISA | March 2011 |
| 6. Kitchen Ranges and Ovens (standby) | EISA | March 2011 |
| 7. Dehumidifiers (standby) | EISA | March 2011 |



Test Procedure Reviews Due No Later Than 2014

| Products | |
|-------------------------------------|--|
| 1. Showerheads | 9. Packaged Terminal Air Conditioners And Heat Pumps |
| 2. Faucets | 10. Commercial Warm Air Furnaces |
| 3. Water Closets | 11. Commercial Water-cooled AC & Water Source HP |
| 4. Urinals | 12. Commercial Water Heaters |
| 5. Water Heaters | 13. Med. Voltage Dry-type And Liquid Immersed Distribution Transformers |
| 6. Small Furnaces | 14. HID Lamps |
| 7. Mobile Home Furnaces | 15. Ceiling Fan Light Kits |
| 8. Electric Motors, 1-200 Hp | 16. Automatic Ice Makers |



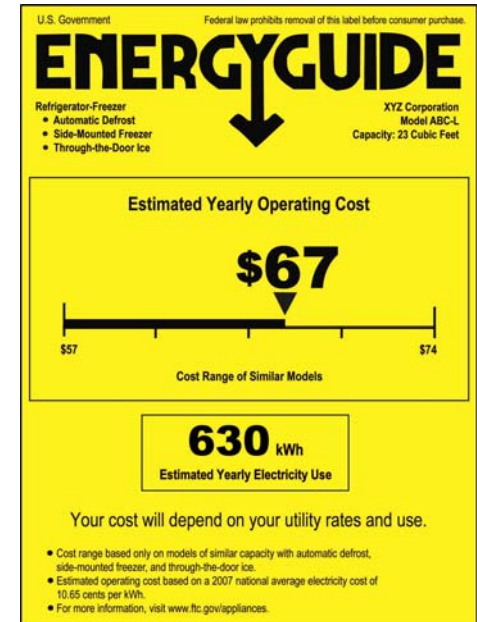
Test Procedure Reviews Due No Later Than 2014 (cont.)

| Products | |
|--|---|
| 17. Electric Motors, 1-500 Hp | 24. Commercial Refrigeration Equipment |
| 18. Small Commercial Package Air Conditioners And Heat Pumps (<135kbtu/Hr) | 25. Clothes Washers (Commercial) |
| 19. Commercial Pre-rinse Spray Valves | 26. Very Large Commercial Package Air Conditioning And Heating Equipment |
| 20. Illuminated Exit Signs | 27. Ceiling Fans |
| 21. Traffic Signal Modules And Pedestrian Modules | 28. Compact Fluorescent Lamps |
| 22. Refrigerated Bottle Or Canned Beverage Vending Machines | 29. Unit Heaters |
| 23. Large Commercial Package Air Conditioners And Heat Pumps (135-240kbtu/Hr) | 30. Torchieres |



Appliance Labeling - EnergyGuide

- EnergyGuide appliance labeling is managed by the Federal Trade Commission (FTC)
 - Clothes washers, dishwashers, refrigerators, freezers, water heaters, window air conditioners, central air conditioners, furnaces, boilers, heat pumps, and pool heaters
- In a recent rulemaking the FTC considered a categorical label - a five-star label (similar to A to G label), but decided not to adopt this approach
- EISA 2007 tasked FTC with, among other things:
 - labeling for metal halide lamp fixtures
 - considering changes for light bulb labels
 - considering labels for consumer electronics





Appliance Labeling – ENERGY STAR

- ENERGY STAR voluntary program is jointly managed by the US DOE and US EPA
- Recognizes top performing energy-efficient products in their market
 - Appliances – e.g., Battery Chargers; Clothes Washers; Dehumidifiers
 - Heating & Cooling – e.g., Air-source Heat Pumps; Boilers; Central AC; Ceiling Fans; Dehumidifiers
 - Home Envelope – e.g., Home Sealing (Insulation and Air Sealing); Windows, Doors, & Skylights
 - Home Electronics – e.g., Battery Chargers; Cordless Phones; DVD Products; Televisions
 - Office Equipment – e.g., Computers; Copiers and Fax Machines; Monitors; Printers
 - Lighting – e.g., Compact Fluorescent Light Bulbs (CFLs); Residential Light Fixtures
 - Commercial Food Service – e.g., Dishwashers; Fryers; Hot Food Holding Cabinets; Ice Machines





Consumer Reports: ENERGY STAR has lost some luster

CR Findings:

- DOE refrigerator test procedures are out of date;
- DOE refrigerator test procedures do not include the energy used to make ice;
- Manufacturers exclude a significant amount of energy by defining it as ice-maker energy; and
- ENERGY STAR criteria, as a result, are lax.

CR Recommendations:

- Update test procedures;
- Require independent verification of test results;
- Consider graded system for energy labeling; and
- Better police and enforce standards.

DOE Response:

- Refrigerator test procedure has been misinterpreted;
- Current test procedure doesn't include energy used for making and harvesting ice but other ice-maker related energy use is to be measured;
- DOE is clarifying existing test procedure and is updating the test procedure through formal rulemaking
- DOE is meeting with manufacturers to correct testing errors
- DOE is evaluating a comprehensive test procedure development, enforcement and verification program
- DOE is analyzing all CR recommendations, including independent testing and graded systems for Energy Star



Challenges

- Demanding Current Schedule of Reviews/Updates
 - Resources required to meet *scheduled* statutory deadlines prescribed by EPCA and EISA and other legal requirements.
 - Must incorporate stand-by and off-mode power consumption.
- Unscheduled Future Activities
 - Petitions for waivers, petitions for rulemakings, and determinations to cover new product categories will necessitate development of additional test-procedures and standards.





Strong Commitment to Appliance Standards

- One of DOE's most effective energy-saving programs
- A five year schedule, starting January 2006, that increased the average rate of final rule standards **six-fold**.
 - DOE committed to issuing 23 standards by June 2011.
 - Since January 2006, DOE has meet all final rule commitments.
- The standards program has achieved substantial benefits:*
 - Through 2005: 7.5 quads energy savings
 - Through 2020: 34 quads energy savings; \$93B NPV
 - Through 2030: 54 quads energy savings; \$125B NPV
- DOE is also very busy meeting all statutory and court ordered completion dates

*Includes federal residential energy efficiency standards that have gone into effect since 1988, or took effect by the end of 2007.



Opportunities for DOE

- In 2009, DOE will engage stakeholders in updating the 5-year plan, providing a means to explore international collaboration in the context of statutory obligations
- Mandated 7-year test procedure and 6-year standards review cycles offer ongoing opportunities for global collaboration
- Energy efficiency is a high priority with broad support in Congress and the Administration
- Manufacturers and Energy Efficiency Advocacy Organizations have had some successes in reaching consensus on efficiency standards that are presented to DOE or Congress



My Purpose Here....

- DOE seeks to better understand potential opportunities of standards and test procedure collaboration with international partners, both public and private
- DOE is interested in success stories and lessons-learned from past collaborations, such as the Asia Pacific Partnership
- DOE is encouraging participation in the International Partnership for Energy Efficiency Cooperation for high-level collaboration



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