Agenda

1. Program Overview
2. Legislative Requirements
3. Standards Rulemaking Process
4. Fans/Blowers/Fume Hoods
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1. Program Overview
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Appliance Standards Program Maximizes Energy Savings

Strategies

- Expand
  - scope by covering new products

- Enhance
  - test procedures to capture all energy and enable innovation

- Leverage
  - DOE R&D and international best practices

- Accelerate
  - rulemaking schedules

- Enforce
  - compliance to standards
What does the program cover?

• Over 60 products are covered by DOE’s appliance standards program. These are known as “covered products.”

• Covered products are responsible for 79% of residential building energy consumption, 46% of commercial building energy consumption, and approximately 19% of industrial energy consumption.

  – In 2009, the Nation’s 113 million households and 5.4 million commercial buildings consumed approximately 39.2 quadrillion Btu (quads) of energy annually, about 41 percent of the U.S. total.
  – Residential buildings use 22 percent of the U.S. total and commercial buildings use 19 percent. Industrial equipment and processes comprises 29 percent of the national total.
What does the Program do?

- Establishes test procedures for measuring the energy efficiency of covered products.
  - Energy efficiency is often difficult to define, and requires different metrics for different products.
  - Test procedures must be carefully developed, so they can’t be gamed.

- Establishes the mandatory standard levels for the energy efficiency of covered products.
  - The standard is defined in terms of the test procedures established by the Program.
  - Manufacturers must test their products using the DOE test procedure, and it must meet the standard level to be sold in the U.S.

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(c) Dishwashers. (1) The Estimated Annual Operating Cost (EAO) for dishwashers must be rounded to the nearest dollar per year and is defined as follows:

(i) When cold water (50°F) is used,

(A) For dishwashers having a truncated normal cycle as defined in section 1.15 of appendix C to this subpart, EAOC = (Ec x S) + (Ec x N x (M - (Eo / 2))).

(B) For dishwashers not having a truncated normal cycle, EAO = (Ec x S) + (Ec x N x M)

Where,

Ec = the representative average unit cost of electrical energy, in dollars per kilowatt-hour, as provided by the Secretary.

See the Federal Register, August 29, 2003.

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<table>
<thead>
<tr>
<th>Product class</th>
<th>Standard level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential water heaters*</td>
<td>For tanks with a Rated Storage Volume at or below 55 gallons:</td>
</tr>
<tr>
<td>Gas-fired Storage</td>
<td>EF = 0.675 - (0.0015 x Rated Storage Volume in gallons).</td>
</tr>
<tr>
<td>Electric Storage</td>
<td>EF = 0.960 - (0.0003 x Rated Storage Volume in gallons).</td>
</tr>
<tr>
<td>Oil-fired Storage</td>
<td>EF = 0.68 - (0.0019 x Rated Storage Volume in gallons),</td>
</tr>
<tr>
<td>Gas-fired Instantaneous</td>
<td>EF = 0.82 - (0.0019 x Rated Storage Volume in gallons).</td>
</tr>
<tr>
<td></td>
<td>For tanks with a Rated Storage Volume above 55 gallons:</td>
</tr>
<tr>
<td></td>
<td>EF = 0.8012 - (0.00078 x Rated Storage Volume in gallons).</td>
</tr>
<tr>
<td></td>
<td>EF = 2.057 - (0.00113 x Rated Storage Volume in gallons).</td>
</tr>
</tbody>
</table>

See the Federal Register, April 16, 2010.
What does the Program do?

- Enforces the standards.
  - DOE can order manufacturers to take corrective action if their products do not meet the standard levels.
  - This can include ordering them not to sell the products in the United States.

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June 3, 2010

**DOE Requires Manufacturers to Halt Sales of Heat Pumps and Air Conditioners Violating Minimum Appliance Standards**

Today, the Department of Energy announced that three manufacturers -- Aspen Manufacturing, Inc., Summit Manufacturing, and Advanced Distributor Products -- must stop distributing 61 heat pump models and 1 air conditioner model that DOE has determined do not comply with federal energy conservation standards. The manufacturers also must notify all of their customers that have been sold noncompliant units. The Department determined that these models were noncompliant based on certification information submitted to DOE for these manufacturers.
What does the Program do?

- Working with EPA, leads test procedure development and some testing/verification for ENERGY STAR.
  - **DOE generally uses the same test procedure for appliance standards and ENERGY STAR.**
  - **DOE conducts some testing and enforcement for ENERGY STAR products that don’t meet the required efficiency levels.**
  - **DOE has tested over 260 products through its pilot verification program to ensure that products bearing the ENERGY STAR logo deliver the energy savings consumers expect.**
What does the Program do?

- Working with FTC, calculates energy-usage values for Energy Guide labels on appliances.
  - *DOE generally bases the calculations on results from DOE test procedures.*
  - *Manufacturers must file data reports with FTC and must contain the ratings for the appliances.*
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Statutory Requirements

- **EPCA (1975)**
  - Energy Policy and Conservation Act set test procedures, conservation targets (followed by standards if targets were not set) and appliance labeling

- **EPCA (1978)**
  - Amended EPCA from targets to standards
  - DOE was authorized to set mandatory energy efficiency standards for 13 household appliances and products

- **NAECA (1987)**
  - Set standards and schedule for DOE to conduct rulemakings

- **NAECA Amendment (1988)**
  - Added fluorescent lamp ballasts

- **EPACT 1992**
  - Expanded coverage to certain commercial and industrial equipment
  - Established a labeling program for commercial products and allowed for the future development of standards for many other products.
Statutory Requirements (Continued)

- **EPACT 2005**
  - Expanded the Department’s authority to regulate other product areas.
  - Prescribed 18 new energy conservation standards
  - Prescribed test procedures for 11 products
  - Directed DOE to develop standards for 6 products
  - Added semi-annual congressional reporting requirement

- **EISA 2007**
  - Added new covered products
  - Prescribed 14 new energy conservation standards
  - Directed DOE to develop standards for 13 products
  - Requires 19 new or revised test procedures
  - Requires regular rulemaking reviews.
    - Not later than six years after issuance of a final rule establishing or amending a standard, DOE must either publish a notice of proposed rulemaking to amend the standard or a notice of determination that an amended standard is not warranted.
    - DOE must review all test procedures at least once every seven years.
  - Requires consideration of standby power for residential products after July 1, 2010
DOE’s Authority on Labeling for Commercial Products


| Authority | Under §6315(a) DOE is required to prescribe a labeling rule, if DOE has prescribed a test procedure under §6314. For electric motors and air conditioning and heating equipment, DOE must prescribe a rule no later than 12 months after DOE has established a test procedure. |
| Covered Products Include | • “Covered” equipment with an established test procedure under §6314  
• Specific labeling rules for electric motors and air conditioning and heating equipment (incl. freezers, ice makers, and walk-in coolers and freezers) |
| Label Requirements | DOE’s rule must include requirements to assist purchasers in making purchasing decisions such as (1) directions for display of label, (2) attachment of label, and (3) information on energy efficiency. |
| Authority Restrictions | DOE must determine that labeling will likely be technologically and economically feasible, result in significant energy savings, and assist consumers in making purchasing decisions. |
 Covered Products: 1975-2005

<table>
<thead>
<tr>
<th>NAECA (1975)</th>
<th>EPACT 1992</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Refrigerators, Freezers and Refrigerator-Freezers</td>
<td>1. General service incandescent lamp</td>
</tr>
<tr>
<td>2. Room Air Conditioners</td>
<td>2. General service fluorescent lamp</td>
</tr>
<tr>
<td>3. Central Air Conditioners and Central Air Conditioning Heat Pumps</td>
<td>3. Incandescent reflector lamp</td>
</tr>
<tr>
<td>4. Residential Water heaters</td>
<td>4. Electric Motors and Pumps</td>
</tr>
<tr>
<td>5. Pool heaters (Gas Fired)</td>
<td>5. Small commercial package air conditioning and heating equipment</td>
</tr>
<tr>
<td>6. Direct heating equipment</td>
<td>6. Large commercial package air conditioning and heating equipment</td>
</tr>
<tr>
<td>7. Furnaces</td>
<td>7. Single package vertical air conditioners and single package vertical heat pumps</td>
</tr>
<tr>
<td>8. Residential Boilers</td>
<td>8. Commercial warm air furnaces</td>
</tr>
<tr>
<td>10. Mobile Home Furnace</td>
<td>10. Storage water heaters, instantaneous water heaters, and unfired hot water storage tanks</td>
</tr>
<tr>
<td>11. Dishwashers</td>
<td>11. Packaged terminal air conditioners and packaged terminal heat pumps</td>
</tr>
<tr>
<td>12. Residential Clothes washers</td>
<td>12. Showerheads</td>
</tr>
<tr>
<td>13. Clothes dryers</td>
<td>13. Faucets</td>
</tr>
<tr>
<td>15. Fluorescent lamp ballasts</td>
<td>15. Urinals</td>
</tr>
<tr>
<td></td>
<td>17. High-intensity discharge lamps</td>
</tr>
<tr>
<td></td>
<td>18. Small Electric Motors</td>
</tr>
</tbody>
</table>
### Covered Products: 2005-Present

<table>
<thead>
<tr>
<th>EPACT 2005</th>
<th>EISA 2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Ceiling Fans</td>
<td>1. 2,601-3,300 Lumen General Service Incandescent Lamps</td>
</tr>
<tr>
<td>2. Ceiling Fan Light Kits</td>
<td>2. 3-Way Incandescent Lamps</td>
</tr>
<tr>
<td>3. Medium Base Compact Fluorescent Lamps</td>
<td>3. Rough Service Lamps</td>
</tr>
<tr>
<td>4. Dehumidifiers</td>
<td>4. Shatter-Resistant Lamps</td>
</tr>
<tr>
<td>5. Very large commercial package air conditioning and heating equipment (ASHRAE)</td>
<td>5. Vibration Service Lamps</td>
</tr>
<tr>
<td>6. Unit Heaters</td>
<td>6. Candelabra base incandescent lamp</td>
</tr>
<tr>
<td>7. Automatic commercial ice makers</td>
<td>7. Intermediate base incandescent lamp</td>
</tr>
<tr>
<td>8. Commercial refrigerators, freezers, and refrigerator-freezers</td>
<td>8. Metal Halide Lamp Ballasts</td>
</tr>
<tr>
<td>9. Refrigerated Beverage Vending Machines</td>
<td>9. Metal halide Lamp Fixtures</td>
</tr>
<tr>
<td>10. Commercial clothes washers</td>
<td>10. Microwave Ovens</td>
</tr>
<tr>
<td>12. Furnace Fans</td>
<td>12. External Power Supplies, non-Class A</td>
</tr>
<tr>
<td>13. Illuminated Exit Signs</td>
<td>13. LED Lamps</td>
</tr>
<tr>
<td>14. Mercury Vapor Lamp Ballasts</td>
<td>14. OLED Lamps</td>
</tr>
<tr>
<td>15. Torchières</td>
<td></td>
</tr>
<tr>
<td>16. Traffic Signal Modules and Pedestrian Modules</td>
<td></td>
</tr>
<tr>
<td>17. Commercial Prerinse Spray Valves</td>
<td></td>
</tr>
<tr>
<td>18. External Power Supplies, Class A</td>
<td></td>
</tr>
</tbody>
</table>
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EPCA directs DOE to consider seven factors when setting standards.

<table>
<thead>
<tr>
<th>EPCA Factors</th>
<th>DOE Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Economic impact on consumers and manufacturers</td>
<td>Life-Cycle Cost Analysis</td>
</tr>
<tr>
<td></td>
<td>Manufacturer Impact Analysis</td>
</tr>
<tr>
<td>2. Lifetime operating cost savings compared</td>
<td>Life-Cycle Cost Analysis</td>
</tr>
<tr>
<td>to increased cost for the product</td>
<td></td>
</tr>
<tr>
<td>3. Total projected energy savings</td>
<td>National Impact Analysis</td>
</tr>
<tr>
<td>4. Impact on utility or performance</td>
<td>Engineering Analysis</td>
</tr>
<tr>
<td></td>
<td>Screening Analysis</td>
</tr>
<tr>
<td>5. Impact of any lessening of competition</td>
<td>Manufacturer Impact Analysis</td>
</tr>
<tr>
<td>6. Need for national energy conservation</td>
<td>National Impact Analysis</td>
</tr>
<tr>
<td>7. Other factors the Secretary considers relevant</td>
<td>Environmental Assessment</td>
</tr>
<tr>
<td></td>
<td>Utility Impact Analysis</td>
</tr>
<tr>
<td></td>
<td>Employment Impact Analysis</td>
</tr>
</tbody>
</table>
DOE energy conservation standards are established by a three-phase rulemaking process: a framework and preliminary analysis, notice of proposed rulemaking (NOPR), and final rule.

**Framework and Preliminary Analysis**
- Market and Technology Assessment
- Screening Analysis
- Engineering Analysis
- Life-Cycle Cost and Payback Analysis
- National Impacts Analysis

**Notice of Proposed Rulemaking**
- LCC Subgroup Analysis
- Manufacturer Impact Analysis
- Utility Impact Analysis
- Environmental Assessment
- Employment Impact Analysis
- Regulatory Impact Analysis

**Final Rule**
- Revise All Analyses in Response to Comments
- Federal Register Publication

New streamlined process announced by DOE in November aims to reduce rulemaking schedule from 3 years to 2 years.
Rulemaking Process Steps

- Framework document provides:
  - Overview of the rulemaking process
  - Describes technical analyses
  - Seeks data to inform rulemaking process
  - Seeks comment on critical issues
Rulemaking Timelines Typically Include Test Procedures

Test Procedure

Energy Conservation Standard

Framework

NOPR

2011 2012 2013 2014

Final Rule

Preliminary Analysis

2011 2012 2013 2014

NOPR

Final Rule

2015 2016

Estimated ECS Final Rule Compliance Date
Mid 2017

Framework Document Public Meeting
February 22, 2012

TP NOPR Public Meeting
Planned – Sept. 2012

ECS Preliminary Analysis Public Meeting
Planned – January 2013

ECS NOPR Public Meeting
Planned – Oct. 2013
DOE strives to develop test procedures that are:

- Repeatable;
- Reproducible;
- Representative;
- Not overly burdensome to conduct;
- Applicable to anticipated future technologies;
- Resistant to circumvention;
- Harmonized with related TP; and
- Consistent with legal authority.
The approach to test-procedure development encourages continuous improvement of test procedures.

**Rulemaking Triggers:**
- Supporting a Standards Rulemaking
- Periodic Review
- Mandated Link to Industry Test Procedure
- Petition
- DOE Recognition of Need
- Deferral
- Stakeholder Comments
- Waivers

**A good Test Procedure should:**
- Be repeatable
- Be reproducible
- Be representative
- Not be overly burdensome
- Anticipate technology changes
- Discourage circumvention

**Reference industry and other test procedures?**
- Accurately measure current and future products?
- Compare well with field data?
- Address outstanding waivers?
- Address stakeholder questions?

**Scope of coverage, definitions**
- Test set up, test conditions, and output metrics
- Proposed method of testing
- Solicit comments on any significant changes proposed

**Prepare and present at Public Meeting**
- Review and summarize comments
- Explain basis for test procedure

**Promulgates final test procedure**
- Address NOPR comments
- Explain basis for test procedure
NOPR Analyses

NOPR Phase

Framework Document → Preliminary Analysis → NOPR → Final Rule


Engineering Analysis → Life-Cycle Cost & Payback Period Analyses → National Impact Analysis
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Recent Activity on Fans, Blowers, and Fume Hoods

• Proposed Coverage Determination Published in Federal Register on June 28, 2011

• Meeting at DOE with AMCA and Manufacturers on December 19, 2011
  http://energy.gov/sites/prod/files/AMCA_Ex_Part.pdf

• Framework Document Drafting in Progress
  – Public Comment Period and Public Meeting