



The Solutions Network

Rochester, New York

Buying Energy Efficient Products

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DOE

Federal Energy Management Program

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Overview of Presentation



- Federal Purchasing Background & Statistics
- Federal Purchasing Requirements
- How to Buy & Save with Efficient Products
 - FEMP Procurement Recommendations
 - FEMP Low Standby Recommendations
 - Individual Agency Policies

Economic Significance

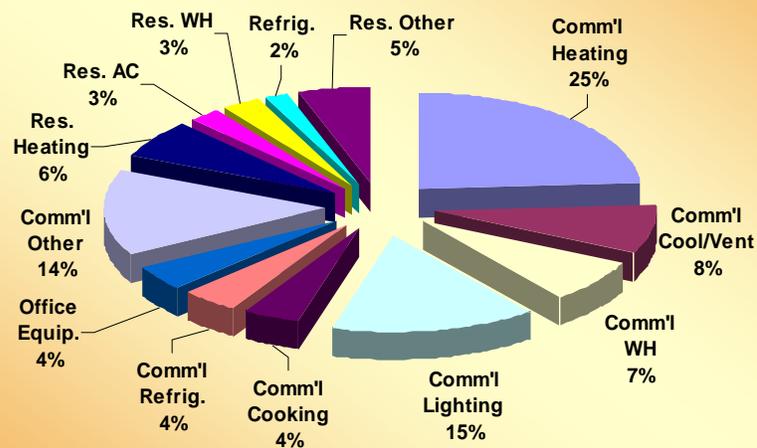


- US federal government is the world's biggest buyer
- Federal agencies spend:
 - \$3.5 billion/year for energy (facilities only)
 - over \$10 billion/year for energy-related products
- State and local spending is 4-5 X more
 - \$12 billion/year on energy bills
 - \$50 billion/year for energy-using products
- Efficient products can save 30%-50%
- Aggregate savings potential: \$1 billion/year

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How is Energy Used in Federal Buildings?

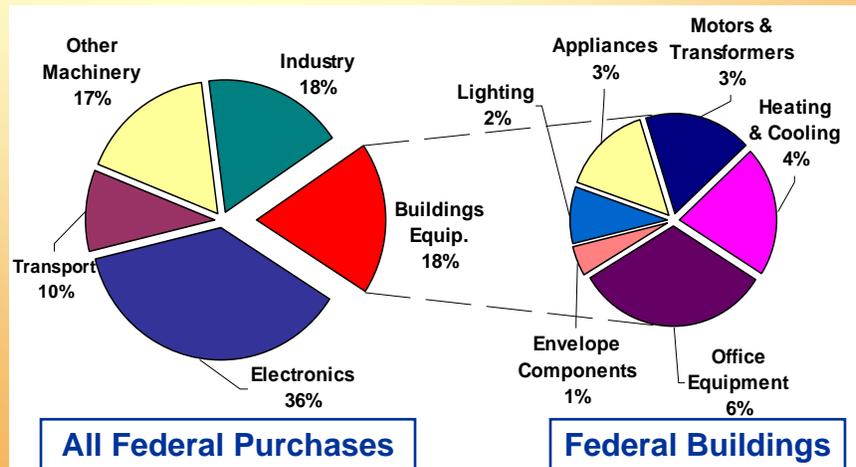


(First End-Use Estimate, Adapted from CBECS)

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Estimated Federal Purchases of Energy-Related Products



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Why Buy Energy Efficient Products?

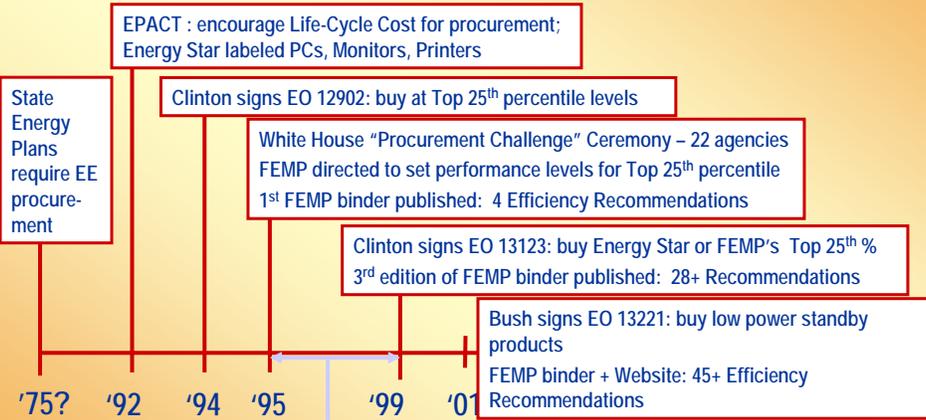


- Save energy and money ...
 - ... using funds *already budgeted* for normal equipment purchase, replacement
- Market leadership
 - aggregate buyer demand for efficient products
 - expand product offerings at competitive prices
- Reduce air pollution + CO₂ emissions
- Energy-efficient ⇔ “green” purchasing

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Federal E.E. Purchasing Policy: A Brief History



Developed Efficiency Recommendations; outreach strategies; training workshops; GSA + DLA product coding; efficiency criteria in federal guide specs

Federal Purchasing Policies



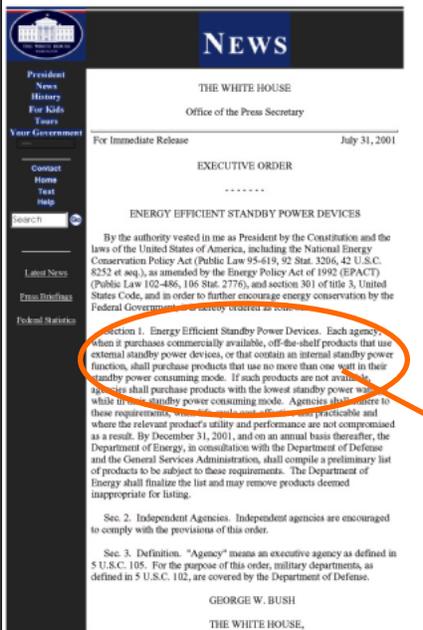
**ATTENTION!!!
PROCUREMENT OFFICIALS**

FAR Part 23.203 now REQUIRES energy efficient purchasing

• Agencies shall select, where life-cycle cost-effective, ENERGY STAR® and other ...products in the upper 25 percent of energy efficiency as designated by FEMP. “ Executive Order 13123, Sec. 403(b)

• Agencies shall purchase ENERGY STAR® or other energy-efficient items listed on the Department of Energy’s Federal Energy Management Program (FEMP) Product Energy Efficiency Recommendations product list; and ... items which meet FEMP’s standby power wattage recommendation or document the reason for not purchasing such items.” FAR 23203(a)

Executive Order: Energy Efficient Standby Power Devices
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NEWS

THE WHITE HOUSE
Office of the Press Secretary

For Immediate Release July 31, 2001

EXECUTIVE ORDER

ENERGY EFFICIENT STANDBY POWER DEVICES

By the authority vested in me as President by the Constitution and the laws of the United States of America, including the National Energy Conservation Policy Act (Public Law 95-619, 92 Stat. 3206, 42 U.S.C. 8252 et seq.), as amended by the Energy Policy Act of 1992 (EPACT) (Public Law 102-486, 106 Stat. 2776), and section 301 of title 3, United States Code, and in order to further encourage energy conservation by the Federal Government...

Section 1. Energy Efficient Standby Power Devices. Each agency... shall purchase products that use no more than one watt in their standby power consuming mode. If such products are not available, agencies shall purchase products with the lowest standby power consumption while in their standby power consuming mode. Agencies shall adhere to these requirements, where practicable and where the relevant product's utility and performance are not compromised as a result. By December 31, 2001, and on an annual basis thereafter, the Department of Energy, in consultation with the Department of Defense and the General Services Administration, shall compile a preliminary list of products to be subject to these requirements. The Department of Energy shall finalize the list and may remove products deemed inappropriate for listing.

Sec. 2. Independent Agencies. Independent agencies are encouraged to comply with the provisions of this order.

Sec. 3. Definition. "Agency" means an executive agency as defined in 5 U.S.C. 105. For the purpose of this order, military departments, as defined in 5 U.S.C. 102, are covered by the Department of Defense.

GEORGE W. BUSH
THE WHITE HOUSE

file:///U:/HEA_DOC/1-WAT.../Executive Order Energy Efficient Standby Power Devices.htm 3/1/02



July 2001 Executive Order 13221 on Standby Power

"...Each agency... shall purchase products that use no more than one watt in their standby power consuming mode... where cost effective..."

Product Energy Efficiency Recommendations



- More than 45 Products Covered
- Office Equipment
- Residential Appliances & Equipment
- Commercial Appliances & Equipment
- Lighting Technologies
- Construction Products
- Water Using Technologies



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On-Line Cost Savings Calculators

<http://www.eren.doe.gov/femp/procurement/calc-index.html>



**FEMP's ENERGY COST CALCULATOR FOR
COMMERCIAL BOILERS (Closed Loop, Space Heating Applications Only)**

Vary equipment size, energy cost, hours of operation, and /or efficiency level.

INPUT SECTION

Input the following data (If any parameter is missing, calculator will set to default value). Defaults

| | | |
|-------------------------------------|-------------------|------------------|
| Project Type | New Installation | New Installation |
| Deliverable Fluid | Water | Water |
| Fuel Used | No. 2 oil | Gas |
| Existing Capacity * | MBtu/h | — |
| Existing Thermal Efficiency * | % Et | — |
| New Capacity | 5000 MBtu/h** | 5000 MBtu/h |
| New Thermal Efficiency | 80 % Et | 80% Et |
| Energy Cost | \$.80 per gallons | \$0.40 per therm |
| Quantity of Boilers to be Purchased | 1 unit(s) | 1 unit |
| Annual Hours of Operation*** | 1500 hours | 1500 hours |

* Existing values should only be entered when Project Type is a replacement.
 ** 1 MBtu/h = 1000 Btu/h; 1 Therm = 100,000 Btu; 1.4 Therms = 140,000 Btu
 *** Value entered should be equivalent full load hours (e.g., 1000 hours @ 30% load equals 500 hours).

Calculate Reset

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Cost Savings Calculators (continued)



Calculate Reset

OUTPUT SECTION

| Performance per Boiler | Your Choice | Existing Boiler | Base Model | FEMP Recommended Level | Best Available |
|--|-------------|-----------------|------------|------------------------|----------------|
| Thermal Efficiency | 80 % Et | | 78 | 83 | 85.5 |
| Annual Energy Use [gallons] | 66964 | | 66681 | 64543 | 62656 |
| Annual Energy Costs | \$53571 | \$ | \$54944 | \$51634 | \$50124 |
| Lifetime Energy Costs | \$1200526 | \$ | \$1231295 | \$1157117 | \$1123278 |
| Lifetime Energy Cost Savings | \$30769 | \$ | \$0 | \$74178 | \$108017 |
| Lifetime Energy Cost Savings for 1 Boiler(s) | \$30769 | \$ | \$0 | \$74178 | \$108017 |

Your selection of a 5000 MBtu/h water boiler will have an energy cost savings of \$30769 over an estimated life of 25 years as compared to the base model.

Assumptions

- \$0.06/kWh is the federal average electricity price in the U.S.
- \$0.04/therm is the federal average gas price in the U.S.
- \$0.66/gallon is the federal average fuel oil price in the U.S.
- Future electricity price trends and a discount rate of 3.1% are based on federal guidelines.
- Lifetime energy cost is the sum of the discounted value of annual energy costs based on an assumed boiler life of 25 years.
- The average heating value for No. 2 oil is 140,000 Btu/gallon.

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Overcome first-cost bias



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Life-cycle Cost Example: Rooftop Air Conditioner



- Energy Savings:
3,800 kWh/year
- Energy Cost Savings:
\$220/year
- Lifetime Energy Cost Savings: \$2,200
– Using NIST 2003 Discount Rate of 3.3%
- Estimated Cost Increase: \$700 to \$750
- Payback: Approximately 3 years
- Lifetime CO₂ savings = 8 cars driving for one year



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Lowering Standby Power



- What is it?
 - The electricity used when a device is turned off or not performing its primary purpose.
- Why is this an issue?
 - Number of devices which use standby power is growing rapidly
 - Each device consumes 1 to 40 watts
 - Estimated at 70 watts per home
 - Accounts for 600 kWh/year or 3% of a household's electricity use

Products Covered by FEMP Low-Standby Recommendations



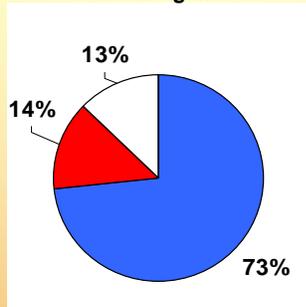
- Consumer electronics
 - **TV, VCR, TV-VCR combo, audio**
- Office Equipment
 - **Desktop PC, laptop, monitor, printer, copier, fax, multifunction, scanner**
- White Goods*
 - **Microwave**
- <http://oahu.ibl.gov>

* New dishwasher test method and label will include standby in annual energy consumption.

Savings from Low-Standby*



Federal Agencies

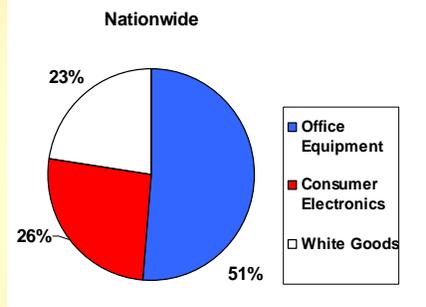


Federal government agencies

- 230 GWh/year; \$14 million annually
- enough electricity to serve ~20,000 homes

* After 5 years

Nationwide



Nationally

- 4000 GWh/year; \$300 million annually
- enough electricity to serve ~350,000 homes

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When & How to Buy Energy Efficient Products



When...

- ✓ Buying new equipment
- ✓ Replacing old equipment
- ✓ Consider early replacement

How...

- ✓ Look for the ENERGY STAR label
- ✓ Compare energy use from EnergyGuide label to FEMP's *Recommendation*
- ✓ Get energy use data from manufacturer and compare to *Recommendation*

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Making Energy Efficiency Your Agency's Default Choice



| Organization | Products covered in guide spec | Est. annual savings from one year's installations | Est. annual savings in 2010 from ten years' installations | Est. cumulative savings by 2010 from ten years' installations |
|------------------------------|--|---|---|---|
| U.S. Army Corps of Engineers | Water-cooled electric chillers | \$750,000 | \$7,500,000 | \$41,250,000 |
| U.S. Navy | Liquid-filled distribution transformers | \$750,000 | \$7,500,000 | \$41,250,000 |
| State of Wisconsin | Distribution transformers, electric motors | \$80,000 | \$800,000 | \$4,400,000 |
| Arcom (MASTERSPEC®) | Water-cooled electric chillers | \$1,500,000 | \$15,000,000 | \$82,500,000 |

Source: Coleman, ACEEE-2000

NAVFAC Example



Appendix G – Technical Evaluation Manual NAVFACINST. 11101.85H
Navy Housing

Project Standards

1.1 MAJOR APPLIANCE

The **Contractor shall provide** the following **Energy Star labeled equipment** in accordance with specifications listed, one each per dwelling unit: [Note: All replacement appliances shall be Energy Star labeled.]

1.1.1 Refrigerator

Refrigerators shall conform to UL250, two-door, top-mounted frost-free freezer type, with adjustable shelves, separate refrigerator and freezer temperature controls, energy savings switch, separate meat tender and vegetable crispers, and four rollers. [Icemakers are desirable.] Models with ice through the door are prohibited. Minimum refrigerator size shall be 20 Cu. Ft. (nominal size) and consume not more than 590 kwh/year.

Make Efficiency the Norm



- Require energy efficient products in:
 - Your agency's guide specifications
 - Project specifications for building construction or renovation
 - Service and maintenance contracts
 - Use “drop-in” language
- New rule of thumb:

“Buy the efficient product unless you can show that a less efficient product is cheaper on a life-cycle basis!”

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How Can You Find Out More?



- Call our hotline at (800)363-3732
- Visit these web sites
 - <http://www.eere.energy.gov/femp/technologies/eeproducts.cfm>
 - www.energystar.gov/products
 - http://www.eere.energy.gov/femp/technologies/eep_standby_power.cfm

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