



FEMP's Energy Efficient Products Program

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DOE's Energy Efficiency Renewable Energy
Federal Energy Management Program



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Outline

- **Energy-Efficient Procurement Policies**
- **How to ID Energy-Efficient Products**
 - Standby Power Devices
 - ENERGY STAR®
 - Product Efficiency Recommendations
- **Are EE Products Cost-Effective?**
- **Where to Find Energy-Efficient Products?**



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Energy Efficient Procurement Policies

3 Reasons....

Historical Policies: Legislative, Executive, Regulatory

Environmental Benefits

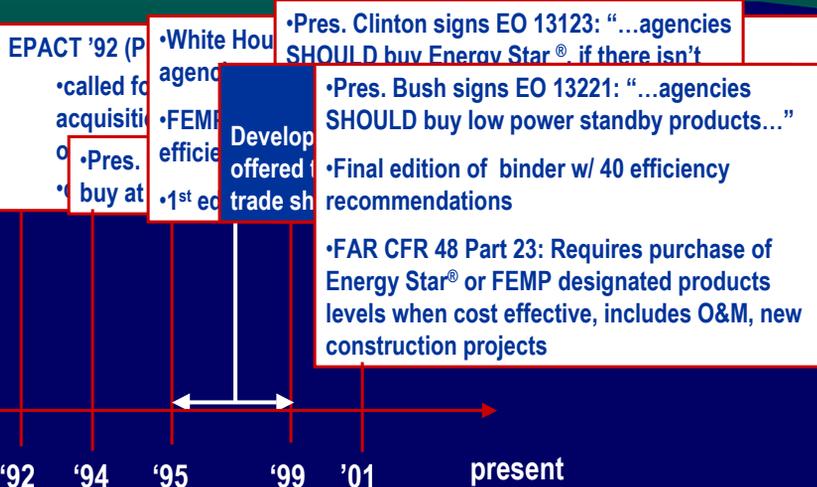
Energy and Money Savings



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Reason #1: The Timeline "Historical Policy"



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Reason#2 Environmental Benefits

- **Air pollution**
 - **10,000 Btu/h room AC, 11.7 vs. 9.0 EER:**
 - SO₂ down 3 lbs./yr.
 - NO_x down 1.1 lbs./yr.
- **Greenhouse gas reduction**
 - **same room AC example:**
 - CO₂ down 290 lbs./yr.



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Reason#3 Energy and Money Savings

- **US federal government is the world's biggest buyer**
- **Federal agencies spend:**
 - over \$10 billion/year for energy-related products
 - \$3.5 billion/year for energy (facilities only)
- **State and local spending is 4-5 X more**
- **Energy-Efficient purchasing**
 - Re-directs funds
 - Policies can impact purchasing behavior
 - Leverage future savings



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How to ID Energy Efficient Products

What's New? - Standby Power Devices

ENERGY STAR®

FEMP's *Product Efficiency Recommendations*



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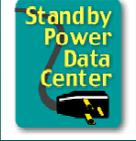
E.O. 13221: Energy-Efficient Standby Power Devices

- Directed Federal agencies to purchase products that use minimal standby power
 - ≤ 1 watt where available
 - Where not available, purchase products with low standby power
- Directed DOE/FEMP to develop a preliminary list of products by December 31, 2001
 - Update annually
 - Work toward integration of low standby in ENERGY STAR specifications



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E.O. 13221: Energy-Efficient Standby Power Devices

- What is standby power?
 - Electricity used by equipment and appliances when they are switched off or not performing their primary purpose
- Which products use standby power?
 - Office equipment, many appliances, TVs, VCRs, among many other household products



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FEMP Product List

- Office Equipment (computers, lap tops, monitors, faxes, copiers, printers)
- Phone Equipment (powered, cell, cordless)
- Video (TV, VCR, DVD)
- Major Appliances (room A/C, clothes washer, dishwasher, microwave)
- Other (ceiling fans w/remote, portable power tools, desktop halogen lamp, exercise equipment)



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Why Should You Buy Low Standby Products?

- It's required by E.O. 13221 and soon by the FAR
- It's an Opportunity to Lead by Example
 - Federal government's efforts on standby are prompting significant industry improvements
- It's a good investment
 - Estimated savings (after 5 years):
 - 230 GWh/yr. for feds
 - 5300 GWh/yr. nationally (= electricity needs of 60,000 homes)
- It's easy
 - Check FEMP's web site for a list of low standby products
- To be incorporated into GSA and DLA product listings in the next few months



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Energy Star®

- DOE and EPA cooperative labeling programs
 - DOE - "white goods" (appliances)
 - EPA - all other products (electronics, lighting, HVAC)
- Creates allies with manufacturers and retailers
- Est. efficiency specifications and levels
- Collaborates with FEMP on Top 25th %ile
- www.energystar.gov/products, 1-888-STAR-YES



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Products Covered (Partial List) by Energy Star®

Central Air Conditioners
Commercial Rooftop UAC
Commercial Heat Pumps
Compact Fluorescent Lamps
Distribution Transformers (Low voltage)
Exit Signs
Geothermal Heat Pumps
Home Electronics (DVD, VCR, TV, Audio)
Office Products (PC, Monitor, Fax, Scanner, Copier)
Refrigerators
Residential Clothes Washers
Residential Dishwashers
Residential Electric Water Heaters
Residential Gas Water Heaters
Residential Boilers
Residential Air Source Heat Pumps
Residential Furnaces



Residential Air Conditioners
Roof Products
Room Air Conditioners
Thermostats



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FEMP's Product Efficiency Recommendations

- Identifies top 25th %-ile of efficiency
- Publishes (40 current) Product Energy Efficiency Recommendations
 - (19 of 40) Energy Star® = FEMP levels
- Directs agencies to fed. supply sources: GSA & DLA
- Offers tips for proper equipment selection, sizing, controls, features, accessories, etc.
- Provides cost-effectiveness - is it really "worth it"?



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FEMP's Analysis: Determining the "top" 25th %ile

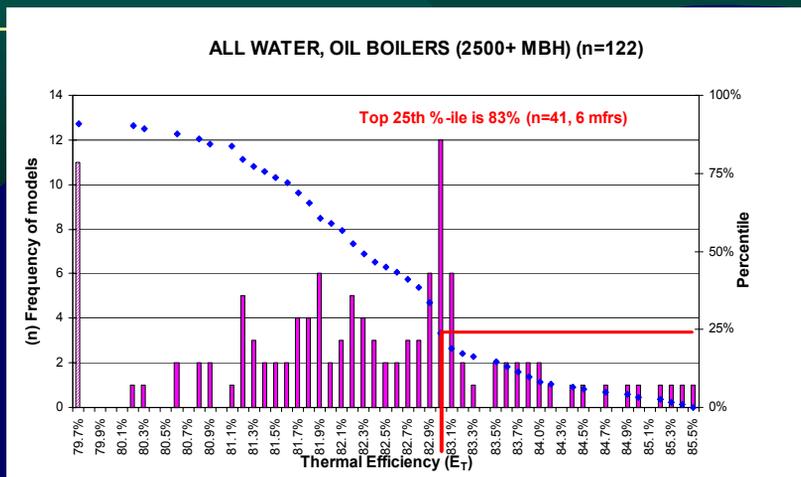
- Obtain/construct product databases
- Establish size and type classes
- Rank best to worst efficiencies
- Draw line at 75th %ile
 - bottom is min. standard established by DOE (NAECA) or ASHRAE (90.1)
- Other similar programs? If so, compare levels
- Apply "3 manufacturer" rule



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Example of Freq. Histogram: Draw line at "top" 25th %ile



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Products Covered by FEMP

- | | |
|---|---|
| <ul style="list-style-type: none"> Air Cooled Chillers Compact Fluorescent Lamps Distribution Transformers (Med/Low) Exit Signs Faucets Fluorescent Ballasts Fluorescent Lamps Fluorescent Luminaires Ground Source Heat Pumps Industrial HID Luminaires Ice Making Machines Motors Office Products Pumping Systems | <ul style="list-style-type: none"> Refrigerators Residential Clothes Washers Residential Dishwashers Residential Elec. Water Heaters Residential Gas Water Heaters Residential Windows Roof Products Room Air Conditioners Showerheads Toilet Urinals Water Cooled Chillers |
|---|---|



For More Information:

Efficiency Recommendation

Room Air Conditioner Cost-Effectiveness Example (10,000 Btu/hr - louvered)

Performance	Base Model ^{a)}	Recommended Level	Best Available
EER	9.8	10.7	11.7
Annual Energy Use	765 kWh	700 kWh	640 kWh
Annual Energy Cost	\$46	\$42	\$38
Lifetime Energy Cost	\$480	\$440	\$400
Lifetime Energy Cost Savings	-	\$40	\$80

Definition

Lifetime Energy Cost is the sum of the discounted value of annual energy costs based on average usage and an assumed air conditioner life of 15 years. Future electricity price trends and a discount rate of 3.4% are based on federal guidelines (effective from April, 2000 to March, 2001).

a) The efficiency (EER) of the Base Model is just sufficient to meet current U.S. DOE national appliance standards.

Cost-Effectiveness Assumptions

Annual energy use in this example is based on the standard DOE test procedure for a louvered model with a cooling capacity of 10,000 Btu/hr and 750 operating hours per year. The assumed electricity price is 6¢/kWh, the federal average electricity price in the U.S.

* Lawrence Berkeley National Laboratory provided supporting analysis for this recommendation. Phone: (202) 644-7950



Are EE products cost Effective?

Cost-effectiveness analysis

Example of simple LCC calculations

FEMP's Cost Calculators



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Cost-effectiveness analysis

- How much analysis is “worth it”?
 - **small purchases:**
 - buy at ENERGY STAR® or FEMP-recommended levels OR
 - use back-of-envelope payback method:
 - $\text{payback period} = \text{price premium} / \text{est. annual savings}$
 - **large or frequent purchases**
 - Life Cycle Cost Analysis (LCCA), use FEMP's BLCC tool
- Simplified LCCA using *Recommendations*:
 - adjust “Cost-Effectiveness” examples
 - linear adjustments for usage, capacity, and energy prices



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Simplify Life-Cycle Cost Decisions

Boiler Cost-Effectiveness Example
 (5,000,000 Btu/h Gas-fired Water Boiler)

Performance	Base Model	Recommended Level	Best Available
Thermal Efficiency (Et)	78.0%	80.0%	83.2%
Annual Energy Use (therms)	96,200	93,700	90,100
Annual Energy Cost	\$38,500	\$37,500	\$36,100
Lifetime Energy Cost	\$654,000	\$638,000	\$613,000
Lifetime Energy Cost Savings	-	\$16,000	\$41,000

How much \$ is at stake?

Present-value of lifetime \$ savings (compare with Δ first-cost)

Definition: Lifetime sum of the annual energy cost over the assumed years. Based on a discount rate of 10% (effective March, 2002).

Conversion: 1 year, 1 Btu/h = 1 therm

Annual energy use in this example is based on 1,500 therms per year. The assumed gas price is 40¢/therm, the federal average.





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Overcome first-cost bias



80° C Rise/1,500 KVA Transformer
\$22,650

150° C Rise/1,500 KVA Transformer
\$16,750

THE LEFT ONE COSTS LESS.





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FEMP's energy cost calculators

FEMP's EN COMMERCIAL BOILER		OUTPUT SECTION					
Vary equipment size, energy cost, hour		Performance per Boiler	Your Choice	Existing Boiler	Base Model	FEMP Recommended Level	Best Available
Input the following data (if any parameter value). Project Type Deliverable Fluid Fuel Used Existing Capacity * Existing Thermal Efficiency * New Capacity New Thermal Efficiency Energy Cost Quantity of Boilers to be Purchased Annual Hours of Operation***		Thermal Efficiency	80 Et		75	80	83.2
		Annual Energy Use	93750		100000	93750	90144
		Annual Energy Costs	\$37500		\$40000	\$37500	\$36057
		Lifetime Energy Costs	\$580875		\$619600	\$580875	\$58522
		Lifetime Energy Cost Savings	\$38725		\$0	\$38725	\$61078
		Lifetime Energy Cost Savings for Boiler(s)	\$38725		\$0	\$38725	\$61078
		Your selection of a 5000 MBtu/h water boiler will have an energy cost savings of \$38725 over an estimated life of 25 years as compared to the base model.					
* Existing values should only be entered ** 1 MBtu/h = 1000 Ebt/h; 1 Therm = 100,000 Btu *** Value entered should be equivalent		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.					

Where to Buy/Find EE Products?



Where to Buy/Find EE Products? (Cont'd)

- **Federal supply agencies:**
 - **Defense Logistics Agency (DLA)**
 - not just for DoD!
 - lighting and A.C. products: 800-DLA-BULB
 - **General Services Administration (GSA)**
 - GSA FSS Schedules: look for ENERGY STAR®
 - on *GSA Advantage!* (via www.gsa.gov OR www.gsaadvantage.gov)
 - on vendor catalogues, price lists



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Where to Buy/Find EE Products? (cont'd)

- **Outside of supply agencies**
 - **Grainger Online, Office Depot**
 - **Look for the ENERGY STAR®**
 - **Contracting? Specify it!**
 - construction/renovation projects
 - standard purchasing contracts
 - O & M contracts



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GSA Advantage!
 ...Working for the U.S. Government

Thursday January 24, 2002
 Your search on 'monitors' produced 303 results

Search:

Items 1-25 of 303 [View 25 items](#) Sort By:

NSN/Mfr. Part No	Product	Price / Delivery	Qty
MT17CS	CTL 75LN 17" SVGA COLOR MONITOR (25) 17" SVGA MONITOR, 25, 1280x1024, 70KHZ, OSD, MPREI, ENERGY STAR, 16" VIEWABLE (More product details)	\$159.00 EA 7 Days	<input type="button" value="Add to Cart"/>
MT15T	CTL 5TS, 15" LCD MONITOR (297) 15" SVGA LCD MONITOR, 297, 1280x1024, OSD, MPREI, ENERGY STAR, 15" VIEWABLE (VESA compliant for wall mounting) (More product details)		<input type="button" value="Add to Cart"/>
MT21C	CTL 21DN, 21" SVGA MONITOR (25) 21" SVGA MONITOR, 31, 1800x1600, 102KHZ, OSD, MPREI, ENERGY STAR, 20" VIEWABLE (More product details)	\$479.00 EA 7 Days	<input type="button" value="Add to Cart"/>

www.gsaadvantage.gov
 GSA customers should look for and select products with Energy Star® symbol.

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GRAINGER.com Product search

keywords | Item # | manufacturer | more options

Order Form | Repair Parts Order | FindMRO | (Browse By Category)

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 Enter your user name and password here.
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Product Search Search Results

10 product matches.
 Refine your search for better results.

Refine Your Search?
 Dig deeper. Narrow the list of possible products by searching these results again, or try a new search.

(Refine By Category)

www.grainger.com even has Energy Star® products!

Looking for Repair Parts?

You searched > Keywords: energy star Results Page: 1
 Results Displayed: 1 - 10 of 10

Select	Item #	Enter Qty.	Notes	Description	Manufacturer	UM	Ship	Unit Price	Estimate Price
<input type="checkbox"/>	6YF86			Window Room A/C, Large 15100Btu, 115V, 10.7Eer, Energy Star	FRIGIDAIRE	1	Special Order	\$475.00	N/A
<input type="checkbox"/>	6YF89			Window Room A/C, Med 14000Btu, 10.7Eer, 115V, 12A, Energy Star	FRIEDRICH	1	Special Order	\$764.00	N/A
<input type="checkbox"/>	6YF90			Window Room A/C, Small 5400Btu, 10.7Eer, 4.6A, 115V, Energy Star	FRIEDRICH	1	Special Order	\$362.00	N/A

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What Can You Do?

- Educate yourself on energy efficient products
 - What products are covered?
 - Who sells EE products?
- Order your FREE copy of the FEMP binder (1-800-363-3732)
- Bookmark web sites
 - www.eren.doe.gov/femp/procurement
 - www.energystar.gov/products
- Use tools for Life Cycle Costing (FEMP's Cost Calc.)
- Promote EE Purchasing – spread the word!



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Need More Information?

ALISON THOMAS

Buying Energy Efficient Products

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www.eren.doe.gov/femp/procurement



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