

Federal Procurement of Energy-Efficient Products

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- 42 USC 8259b & 8262g
- FAR 23.203 & 52.223-15
- EO 13834 §2g

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Energy-Efficient Products and Energy-Saving Technologies

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The Federal Energy Management Program (FEMP) provides information about energy-efficient products and energy-saving technologies that can help agencies meet federal [laws and requirements](#).

Energy-Efficient Product Procurement

Five [legal authorities](#) require agencies to procure energy-efficient products. By procuring and properly installing energy- and water-efficient products, agencies can meet their federal efficiency program requirements, reduce energy and water consumption, and save money.

Get Started

- [Find covered product categories](#) that meet federal procurement requirements.
- [Get contract language](#) for product purchases.
- Use [energy and cost savings calculators](#).
- Search for [low standby power computers](#).
- Review federal [product efficiency programs](#).

Savings Potential: >\$500 million per year



LBNL-42719

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Estimated Savings from Energy-Efficient Federal Purchasing

Francis X. Johnson and Jeffrey Harris

**Environmental Energy
Technologies Division**

March 2000



LBNL-5898e

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Program Potential: Estimates of Federal Energy Cost Savings from Energy Efficient Procurement

Prepared for the Federal Energy Management Program by:
Margaret Taylor and K. Sydney Fujita

Environmental Energy Technologies Division

September 2012

Procurement Guidance

Purchasing Energy-Efficient Water-Cooled Electric Chillers

Home » Facility & Fleet Optimization » Energy Efficient Products » Product Search » Purchasing Energy-Efficient Water-Cooled Electric Chillers

The Federal Energy Management Program (FEMP) provides acquisition guidance for water-cooled electric chillers, a product category covered by FEMP efficiency requirements. Federal laws and requirements mandate that agencies purchase ENERGY STAR-qualified or FEMP-designated products in all product categories covered by these programs and in any acquisition actions that are not specifically exempted by law.

FEMP's acquisition guidance and efficiency requirements apply to water-cooled chillers that provide space cooling in federal buildings. Product performance must be measured in accordance with AHRI 550/580 test procedures. Free-cooling, condensersless, and combination chiller-heat pump units are excluded.

This acquisition guidance was updated in July 2018.

Find Product Efficiency Requirements

Federal purchases must meet or exceed the minimum efficiency requirements in Table 1.

Chiller Type	Capacity (tons)	Full-Load Optimized Applications (Products must meet both levels)		Part-Load Optimized Applications (Products must meet both levels)	
		Full-Load Efficiency	Integrated Part-Load Value (IPLV)	Full-Load Efficiency	Integrated Part-Load Value (IPLV)
Positive Displacement	< 75	0.736	0.600	0.760	0.500
	75 to 149	0.715	0.560	0.750	0.490
	150 to 299	0.651	0.540	0.680	0.440
Centrifugal	300 to 399	0.610	0.520	0.625	0.410
	≥ 400	0.540	0.500	0.585	0.380
	< 150	0.610	0.550	0.695	0.440
Centrifugal	150 to 299	0.610	0.550	0.635	0.400
	300 to 399	0.560	0.520	0.595	0.390
	≥ 400	0.560	0.500	0.585	0.380
Centrifugal	≥ 600	0.560	0.500	0.585	0.380

Make a Cost-Effective Purchase: Reduce Operating Costs by Buying a FEMP-Designated Product

FEMP has calculated that a 125-ton water-cooled positive displacement chiller meeting the required 0.715 kW/ton efficiency level saves money if priced no more than \$8,200 above the less efficient model. The best available model saves the average user more: \$13,000 above the less efficient model. Table 2 compares three types of product purchases and calculates the lifetime cost savings of purchasing efficient models. Federal purchasers can assume products that meet FEMP-designated efficiency requirements are life cycle cost-effective. FEMP provides cost calculators that enable comparison between the cost-effectiveness of chillers of different efficiency levels.

Performance	Best Available	Required Model	Less Efficient
Full Load Efficiency (kW/ton)	0.700	0.715	0.737
Annual Energy Use (kwh)	175,500	178,900	184,300
Annual Energy Cost (\$/yr)	\$15,800	\$16,100	\$16,600
Lifetime Energy Cost (23 years)	\$282,100	\$287,300	\$296,200
Lifetime Energy Cost Savings	\$13,000	\$8,200	-----

View the Performance and Model Assumptions for Table 2

Determine When FEMP-Designated Products Are Cost-Effective

An efficient product is cost-effective when the lifetime energy savings (from avoided energy costs over the life of the product, discounted to present value) exceed the additional up-front cost (if any) compared to a less efficient option. FEMP considers up-front costs and lifetime energy savings when setting required efficiency levels. Federal purchasers can assume that ENERGY STAR-qualified products and products that meet FEMP-designated efficiency requirements are life cycle cost-effective. In high-use applications or when energy rates are above the federal average, purchasers may save more if they specify products that exceed federal efficiency requirements, as shown in the Best Available column above.

Claim an Exception to Federal Purchasing Requirements

Products meeting ENERGY STAR or FEMP-designated efficiency requirements may not be life cycle cost-effective.

This cost calculator is a screening tool that estimates a product's lifetime energy cost savings at various efficiency levels.

Learn more about the calculator assumptions and definitions.

Project Type

Is this a new installation or a replacement?
 New Replacement

How many chillers will you purchase?

1

Energy Cost Savings

You save \$53,022!

You Can Spend

Up to \$53,022 more per unit

A chiller of the efficiency you specified will save \$53,022 in lifetime avoided energy costs.

Performance Factors

What is the new design condition?
 Full Load Partial Load

What is the cooling capacity of the new chiller? 10 tons

What is the full-load efficiency of the new chiller?
 10. EER

What is the partial-load efficiency of the new chiller?
 15. EER

Cost Factors

What is the current cost of energy?
 \$ 0.09 per kWh

What are the annual hours of operation in equivalent full-load hours?
 2000 hours

	BASE MODEL	FEMP MIN. EFFICIENCY REQUIREMENT	BEST AVAILABLE	YOUR CHOICE
LIFETIME ENERGY COSTS	\$282,355	\$229,333	\$174,725	\$229,333
ANNUAL ENERGY COSTS	\$17,280	\$14,035	\$10,693	\$14,035
ANNUAL ENERGY USE (KWH)	192,000	155,945	118,812	155,945
EFFICIENCY (EER)	12.5	15.39	20.2	15.39
LIFETIME ENERGY COST SAVINGS*	\$0	\$53,022	\$107,630	\$53,022

*Note that these savings have been discounted to present value and non-discounted savings would be higher.

CALCULATE

RELOAD DEFAULTS

Electric Chillers, Air-Cooled and Water-Cooled

The table below includes minimum efficiency requirements for the following FEMP-designated covered product categories: [electric chillers, air-cooled](#); and [electric chillers, water-cooled](#).

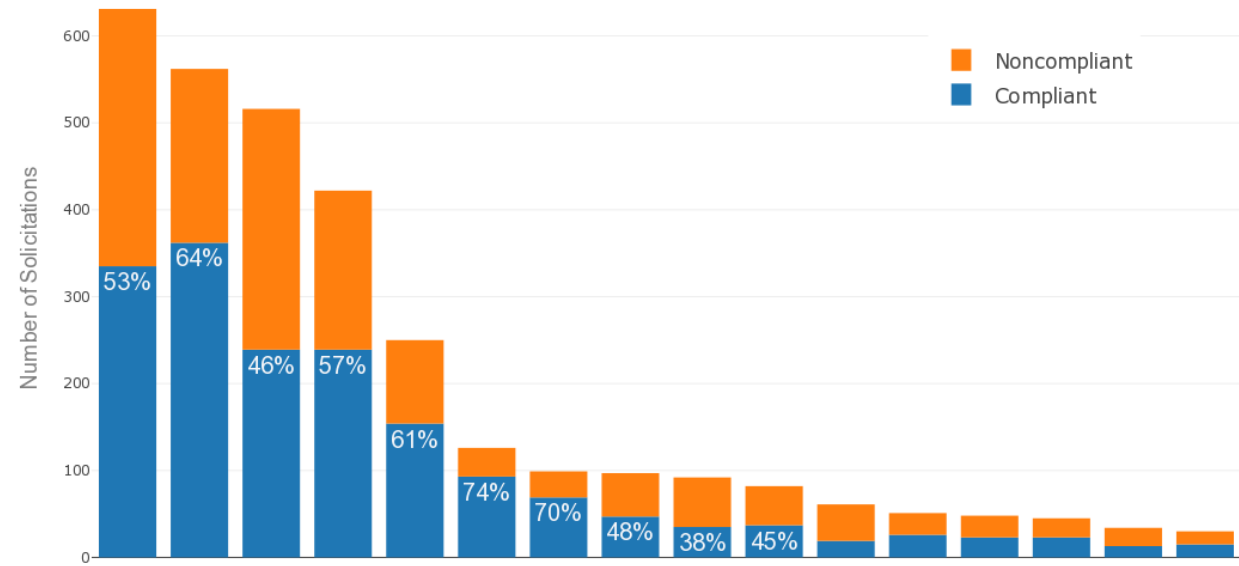
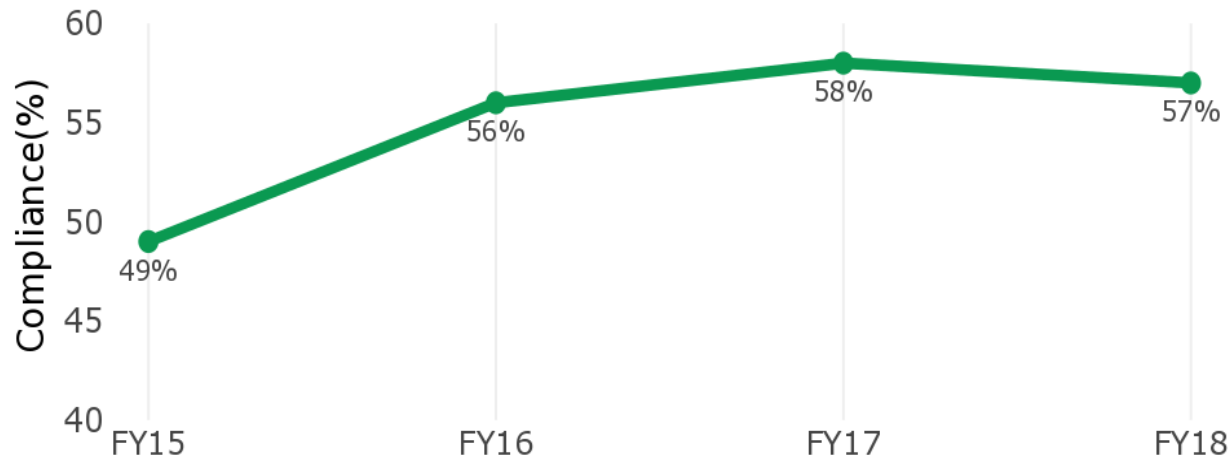
These ASHRAE 90.1-2013 Table 6.8.1-3 equipment types are excluded: air-cooled absorption, single effect; water-cooled absorption, single effect; absorption double effect, indirect fired; and absorption double effect, direct fired chillers.

Equipment Type	Size Category	Units	Minimum Efficiency	
			Path A (Full-Load Optimized Applications)	Path B (Part-Load Optimized Applications)
Air-cooled	<150 t	EER (Btu/W)	≥10.40 FL ≥13.69 IPLV	≥9.70 FL ≥15.81 IPLV
Air-cooled	≥150 t	EER (Btu/W)	≥10.50 FL ≥14.00 IPLV	≥9.70 FL ≥16.10 IPLV
Water-cooled, electrically operated positive displacement	<75 t	kw/t	≤0.73 FL ≤0.60 IPLV	≤0.78 FL ≤0.50 IPLV
Water-cooled, electrically operated positive displacement	≥75 t and <150 t	kw/t	≤0.72 FL ≤0.56 IPLV	≤0.75 FL ≤0.49 IPLV
Water-cooled, electrically operated positive displacement	≥150 t and <300 t	kw/t	≤0.65 FL ≤0.54 IPLV	≤0.68 FL ≤0.44 IPLV
Water-cooled, electrically operated positive displacement	≥300 t and <600 t	kw/t	≤0.61 FL ≤0.52 IPLV	≤0.62 FL ≤0.41 IPLV
Water-cooled, electrically operated positive displacement	≥600 t	kw/t	≤0.56 FL ≤0.50 IPLV	≤0.58 FL ≤0.38 IPLV
Water-cooled, electrically operated centrifugal	<150 t	kw/t	≤0.61 FL ≤0.55 IPLV	≤0.69 FL ≤0.44 IPLV
Water-cooled, electrically operated centrifugal	≥150 t and <300 t	kw/t	≤0.61 FL ≤0.55 IPLV	≤0.63 FL ≤0.40 IPLV
Water-cooled, electrically operated centrifugal	≥300 t and <400 t	kw/t	≤0.56 FL ≤0.52 IPLV	≤0.59 FL ≤0.39 IPLV
Water-cooled, electrically operated centrifugal	≥400 t and <600 t	kw/t	≤0.56 FL ≤0.50 IPLV	≤0.58 FL ≤0.38 IPLV
Water-cooled, electrically operated centrifugal	≥600 t	kw/t	≤0.56 FL ≤0.50 IPLV	≤0.58 FL ≤0.38 IPLV

Download table

Solicitation Review

Annual FAR Compliance



Number of Solicitations & Compliance by Agency

Procurement Community Survey

- Objective
 - *Gather information to improve FEMP resources for supporting energy-efficient procurement practices*
- Goals are to identify
 - *Key participants (**roles**) in procurement process*
 - Who participates in the procurement process?
 - What impact do they have on the energy-efficient-related aspects of the process?
 - ***Rules** that guide procurement behavior*
 - What rules does each participant take into account when making decisions that impact energy-efficient procurement practices?
 - ***Tools** that inform acquisition practices*
 - What tools/resources do the participants in the procurement process use and why do they use them?
 - How could these tools/resources be improved?
 - What other tools/resources would participants like to have access to?

Project Timeline

- Pilot phase (ongoing until March/April 2019)
 - *5 to 10 30-minute interviews*
 - *Responses are being used to refine survey design*
- Survey phase (April - August 2019)
 - *Anonymous online survey (paper version available by request)*
 - *Aimed at broad federal procurement community*
 - Procurement officers
 - Specifiers (e.g., project managers who specify items for procurement)
 - Other roles identified during pilot phase

You Can Help!

- Participate in pilot interviews
- Recommend key procurement actors
- Publicize and support the effort within your networks