



Energy Facts

Energy Efficient Appliances

Appliances and equipment have a tremendous effect on your home energy costs. Hot water heaters, stoves, refrigerators, dishwashers, and clothes dryers can contribute to excessively high energy bills when they operate inefficiently. Poorly sized and inefficient heating and cooling systems can lead to high costs for home heating needs.

Learning to choose appliances wisely means understanding energy use, learning to read the government-required EnergyStar labels, and then acting on that information. This bulletin provides techniques to help you effectively evaluate your current appliance energy use and information regarding energy efficiency ratings for comparing new appliances.

The energy efficiency of similar appliances can vary significantly. It is usually more cost effective to purchase appliances with high efficiencies. Determining and comparing the energy efficiency of different models is fairly easy because federal regulations require many appliances to display EnergyGuide labels.

A label containing pertinent energy-use information is required for furnaces, refrigerators, freezers, water heaters, washing machines, dishwashers, room and central air conditions, heat pumps, and fluorescent lamp ballasts. EnergyGuide labels indicate either the annual estimated cost of operating the system or a standardized energy efficiency ratio.

Regular Maintenance is Important

You can maximize the efficiency of appliances you already own by regular maintenance, tune ups, and system upgrades. Examples are:

- Check air filters in heating and cooling systems monthly during the seasons they are in use
- Clean air vents, baseboards, and radiators and keep furniture, carpets, and drapes away
- Release trapped air from hot water radiators once or twice a season by opening the valve and draining until nothing but water comes out
- Follow prescribed maintenance in product owners' manuals
- Install an insulating jacket on your hot water heater, insulate hot water pipes, and lower the water heater temperature (check dishwasher requirements carefully however)
- Defrost refrigerators that do not defrost automatically to eliminate ice build up on interiors coils; clean external coils with a vacuum to keep them dust and lint free
- Clean dryer filter after each use or as necessary
- Hire a furnace technician for furnace tune ups
- Install a setback thermostat on the furnace

Home Appliance Energy Use

If you want a general estimate of how much electricity your present home appliances use, refer to Table 1 that provides energy consumption (wattage) of typical home appliances. These estimates give you a better understanding of where you are using or over-using electricity, and where you might save fuel and money through conservation. If your appliance does not appear on the list below or you desire a more exact figure based on the specific appliance you own, use the following process to estimate the amount of energy it consumes.

First you must know how many **watts** the appliance uses. A standard light bulb tells you right on the top as it says 60, 75, or 100 watts. For appliances, however, you have to take an extra step because the labels, located on the back or bottom of the appliance, will only show amperage (amp) usage. If the **wattage** used is not shown, find how many **amps** the appliance uses so you can calculate the watts as shown below.

$$\text{Amps x (multiply) Volts = Watts}$$

Here is an example calculation to assist you: the label on a hair dryer states that it uses 12.5 amps. The standard voltage used in American homes is 120 volts. (Furnaces and electric stoves can run on 220 volts.)

$$12.5 \text{ amps x } 120 \text{ volts} = 1,500 \text{ watts for the hair dryer}$$

Let's say you own this hair dryer and you have four teenage children who wash and dry their hair every morning. Each one uses the dryer for about ten minutes, plus you and your spouse use it as well. The total use is **one hour** each day. Here is the calculation for usage of the hair dryer:

$$\text{Watts x Hours/day x Days/week x Weeks/year / by 1,000 (one kilowatt hour) x Kwh rate*}$$

$$1,500 \text{ x } 1 \text{ hr x } 52 \text{ weeks} = 546,000 \text{ watts/year divided by } 1,000 = 546 \text{ kilowatt hrs x } .14 \text{ Kwh rate} = \$76.44$$

*You can get your kilowatt hourly rate from your power company or it may be listed on your utility bill.

Make Wise Investments in Home Appliances

Most consumers look for the greatest return for the least investment. This does not necessarily mean that you should buy the least expensive product or system. In fact, spending a bit more money initially for an energy efficient appliance is often more economical in the long run because your investment will pay for itself in energy savings. The EnergyGuide labels indicate either the annual estimated cost of operating the system, or a standardized energy efficiency ratio. Pertinent energy-use information is listed in the product literature as well.

Generally, two methods can be used to analyze the costs of energy efficiency investments:

- simple payback period, which is the amount of time required for the investment to pay for itself in energy savings
- full life-cycle cost, which is the total of all costs and benefits associated with an investment during its lifetime.

You can find an estimate of the simple payback period by dividing the total cost of the product by the yearly energy savings. For example, an energy-efficient clothes dryer that costs \$500 and saves \$100 per year in energy costs has a simple payback period of five years.

Computing life-cycle costs is more difficult. Life cycle costing is a method of economic evaluation where all values are expressed as present dollars. This method adds the discounted investment costs (less salvage value); operations, maintenance (nonfuel), and repair costs; replacement costs; and energy costs of an appliance. Refer to the "Life Cycle Costing Manual for the Federal Energy Management Program," NBS Handbook 135, Revised 1987, available from the Superintendent of Documents, U.S. Government Printing Office, Washington, Dc 20402.

Before making appliance purchase decisions, look at your budget, the expected payback period, and the estimated lives of alternatives. Products with payback periods that approach or exceed their projected life are usually not worthwhile. Compare the lifecycle costs of similar products including installation, if any, and operation and maintenance costs.

Table 1 Typical wattage usage ranges for household appliances

Here are some examples of the range of nameplate wattages for household appliances:

Aquarium = 50-1210 watts

Clock radio = 10

Coffee maker = 900-1200

Clothes washer = 350-500

Clothes dryer = 1800-5000

Dishwasher = 1200-2400 (using the drying feature increases energy consumption)

Dehumidifier = 785

Electric blanket - Single/Double = 60/100

Fans

 Ceiling = 65-175

 Window = 55-250

 Furnace = 750

 Whole house = 240-750

Hair dryer = 1200-1875

Heater (portable) = 750-1500

Clothes Iron = 1000-1800

Microwave oven = 750-1100

Personal Computer

 CPU - awake/asleep = 120/30 or less

 Monitor - awake/asleep = 150/30 or less

 Laptop = 50

Radio (stereo) = 400

Refrigerator (frost free, 16 cubic feet) = 1725

Televisions (color)

 19" = 110

 27" = 113

 36" = 133

 53"-61" Projection = 170

 Flat Screen = 120

Toaster = 800-1400

Toaster Oven = 1225

VCR/DVD = 17-21/20-25

Vacuum cleaner = 1000-1440

Water heater (40 gallon) = 4500-5500

Water pump (deep well) = 250-1100

Water bed (w/heater, no cover) = 120-380

Consult the U.S. Environmental Protection Agency (EPA) website about EnergyStar ratings for more information: <http://www.energystar.gov/>. Federal tax incentives for energy conservation expired long ago, but many states and some local governments may offer economic incentives or financial assistance to implement energy efficiency measures. And check with your local utility company to see what incentives it may offer.

Information for this fact sheet came from:

The Energy Efficiency and Renewable Energy Clearinghouse (EREC), P.O. Box 3048, Merrifield, VA 22116. Information was produced for the U.S. Department of Energy by the National Renewable Energy Laboratory (NREL), a DOE national laboratory. The statements contained are based on information known to EREC and NREL at the time of printing. No recommendation or endorsement of any product

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Other sources of information:

Air Conditioning and Refrigeration Institute (ARI)
4301 North Fairfax Drive, Suite 425, Arlington, VA
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American Council for an Energy Efficient Economy (ACEEE), 1001 Connecticut Avenue, NW, Suite 535, Washington, DC 20036

Association of Home Appliance Manufacturers (AHAM), Information Center, 20 North Wacker Drive, Chicago, IL 60606

Gas Appliance Manufacturers Association, Inc., 1901 North Moore Street, Suite 1100, Arlington, VA 22209



Energy Team Acknowledgments

The MSUE Energy Team, led by Eaton County Extension Director Mona Ellard, conceived, researched, wrote and published Energy Fact Sheets for the benefit of the citizens of Michigan. Support came from Sally Stuby, Regional Director, Southwest Region, and Karen Shirer, State Leader, Family and Consumer Sciences. The team members are: Randy Heatley, Patricia Miller, Cindy Straus, and Doug Woodard.



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