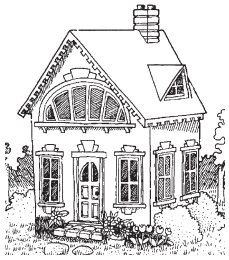
ROCKY MOUNTAIN INSTITUTE

Home Energy Brief



#6 WASHERS, DRYERS & MISC. APPLIANCES

Doing laundry is one of the most energy-intensive activities in the home. The average American household spends about $150 annually to run its clothes washer and dryer. Miscellaneous appliances and household electric gadgets—everything from TVs and hair dryers to waterbed heaters and hot tubs—add another $200 a year to the average electric bill.

Most of these appliances can be operated more efficiently and cheaply without any loss of performance—indeed, certain efficiencies can actually produce cleaner, fresher clothes. And, as with almost all appliances, newer models coming on the market feature energy-saving options that can make them even cheaper to run.

WASHING MACHINES

Since heating the water to wash clothes accounts for most (85–90%) of the energy demand, minimizing the use of hot water is a simple way to reduce energy use—and utility bills.

Operating Your Washer Efficiently

As the table below shows, **low-temperature washing** saves a good deal of energy and money. Warm water is effective for washing most loads (though not for oily stains); a warm pre-soak may be necessary for really dirty clothes, but this is still more efficient than a hot-water wash cycle. Cold-water washing can be adequate in many cases, especially if you use an enzymatic detergent. Regardless of the wash temperature, always select the cold-water rinse—warm or hot water in the rinse cycle doesn't make clothes any cleaner. Colder temperatures are easier on your clothes, too.

HOT, WARM, OR COLD?

Wash/Rinse Setting	*Electricity Use (kWh/year)*	*Cost ($/year)*
Hot/cold	1,547	128
Warm/cold	825	68
Cold/cold	103	9

Adapted from Residential Appliances *(1994), E SOURCE. Assumes typical 39-gallon model, 380 cycles/year, and water heated electrically at a cost of 8.3¢/kWh.*

Here are a few other tips for increasing energy efficiency:

- Wash full loads. If you don't have enough dirty laundry to fill up the washer, adjust the setting to a lower water level. Using the small-capacity setting can cut water use by up to 50%,
- Locate the washing machine close to your hot water tank, if possible, to reduce the heat lost in long pipe runs. Insulate exposed pipes.
- Turn your hot-water heater thermostat down to 120°F, if it isn't there already. Each 10°F reduction in water temperature will cut the cost of washing clothes (and everything else requiring hot water) by up to 13%.

New Washers

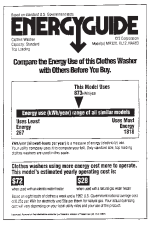
Energy efficiency should be a major consideration when shopping for a **new washer**, since an efficient model can pay for its extra cost in just a few years (the average lifespan is 13 years). Energy Guide labels (see next page) are helpful in estimating energy costs, although their estimates are based on standard cycles without the use of optional energy-saving controls. Also note that while compact models rate well, they are designed to wash smaller loads—it's still more efficient to do one full standard-size load than a couple of compact washer loads.

In the past decade, the energy efficiency of standard top-loading washers has doubled. Most new models offer various **controls** over wash and rinse

temperatures, load size, and presoak cycles, and some also feature a "suds saver" option that saves soapy water from one cycle to the next. Certain high-end machines automatically sense load size, the dirtiness of the water, and even fabric type, and adjust the water level and wash cycles accordingly. It's also worth looking for a model with a faster spin speed, which extracts more water so less energy is needed for drying (if you use a dryer).

The vast majority of domestic washers sold in North America are vertical-axis machines, meaning that the washing drum is mounted vertically and clothes are loaded from the top. **Horizontal-axis** (H-axis) washers use 30–60% less water and 50–70% less energy because the horizontal drum tumbles the clothes through the water at the bottom, permitting a much lower fill level. Other advantages are lower drying costs (thanks to faster spin cycles), less detergent use per load, and better performance.

H-axis machines are popular in Europe, and it's likely that they will become the norm in the U.S. during the next decade as manufacturers push to meet federal efficiency standards. In the meantime, they cost at least $200 more than comparable V-axis models. Frigidaire manufactures an H-axis washer for White-Westinghouse and Gibson, Maytag and Whirlpool will enter the market by 1996, and Staber Industries has developed a *top*-loading H-axis model. A few European front-loading models (AEG, Mieli, and Asko) are available in the U.S., although they're considerably more expensive.


ENERGY GUIDE

Compare the Energy Use of this Clothes Washer with Others Before You Buy.

This Model Uses
873 kWh/year

Energy use (kWh/year) range of all similar models

Less Energy
287

More Energy
1014

Clothes washers using more energy cost more to operate. This model's estimated yearly operating cost is:

$72

$201

Energy Guide Labels, required on all new washing machines (but not dryers), provide useful information about energy costs and relative efficiency.

CLOTHES DRYERS

Clothes dryers account for 5% of all domestic electricity use. In homes that have one, the dryer is typically the second-biggest electricity-using appliance after the refrigerator, costing about $85 a year to operate.

Even if you live in a damp or cold climate, strictly speaking, a clothes dryer is an unnecessary appliance most of the time. **Drying clothes outside** on a line performs the same function without using fossil fuels or generating pollution—and it's free. Unless it's actually raining or the temperature is well below freezing, your clothes will generally dry in a day or less. They'll also smell fresher and last longer. In wet or cold weather, you can still bypass the dryer by hanging clothes inside, although this isn't advisable if your house has a moisture problem.

Dryer Efficiency

Your clothes dryer need not be such an energy hog. Here are some tips for operating it more efficiently:

- Run only full loads, as small loads are less economical. However, don't overfill the machine—air needs to be able to circulate around the clothes.
- Dry heavy clothes separately from light clothing.
- Dry two or more loads in a row, to make use of the heat already in the dryer.
- Don't overdry clothes. If your machine has a moisture sensor, use it. If it has a timer, consider shortening the drying time.
- Use the cool-down cycle (if there is one) to allow the clothes to finish drying with the residual heat in the dryer.
- Clean the fluff out of the filter before (and, if necessary, during) every load to allow air to circulate better. Regularly clean the lint from vent hoods and lint kits, too.
- Check the outside dryer vent. If it doesn't close tightly, replace it with one that does (a new one will cost $15–$20). You'll keep outside air from leaking in, reducing heating and/or cooling bills.
- If you have an electric dryer, install a lint kit ($5–$10) to vent the exhaust heat and humidity into the house in winter—an easy project. (Exhaust fumes rule out this option for gas dryers.)
- Locate your dryer in a heated space. Putting it in a cold or damp basement will make the dryer work harder to get your clothes dry.

New Dryers

New dryers aren't required to display Energy Guide labels, making it hard to compare the energy efficiency of different models in the showroom.

The single biggest factor in determining a dryer's energy cost is whether it runs on **electricity** or **natural gas**. Although gas dryers are slightly less efficient than electric ones, gas is much cheaper than electricity in most parts of the country, and burning gas is less polluting than burning fossil fuels in a power plant to generate electricity. The bottom line: drying a load of laundry in a gas dryer will cost 15–25¢, compared to 31–40¢ in an electric one.

The actual technology of drying clothes varies little from one model to another, with energy savings being obtained chiefly through what the industry calls "termination controls"—in other words, controls that shut the machine off sooner than it otherwise would have. These include simple **timers** (which require the user to guess how long a given load will take to dry), more advanced **temperature sensors** (which indirectly estimate dryness), and sophisticated **moisture sensors** (which directly measure dryness). On average, a moisture sensor will reduce energy use by 15%—worth about $12 a year—and will be gentler on your clothes by avoiding overdrying. While temperature sensors sometimes overdry clothes, they still average 10% savings over timers.

In years to come, **microwave** technology may offer the first big breakthrough in dryer efficiency. Two California companies have jointly developed a prototype microwave clothes dryer that uses up to 12% less energy than conventional ones, but this model is still in the testing phase.

MISCELLANEOUS APPLIANCES

Small appliances and electronics account for 14% of the average household's total energy consumption. The table on the next page lists the average energy use of a variety of small and large appliances—and reveals that some consume much more energy than their size or importance would suggest.

Read the product literature before you buy any appliance, since the wattage demand can vary greatly between different models.

Waterbeds

A **waterbed** typically uses nearly as much electric-

AVERAGE ELECTRICITY USE OF MISCELLANEOUS APPLIANCES

Appliance	*Average kWh used per year*	*Average cost per year, in $*	*Appliance*	*Average kWh used per year*	*Average cost per year, in $*
Air conditioner (room)	1,070	86	Safety outlets (5 GFIs)	48	4
Air conditioner (central)	3,230	258	Sauna/spa/hot tub	2,300	184
Aquarium, terrarium	600	48	Stereo/radio	75	6
Car engine block-heater	500	40	Space heater	500	40
Coffee maker	100	8	Sump pump	40	3
Clock	25	2	Swimming pool pump	2,020	162
Dehumidifier	400	32	Telephone (cordless)	36	3
Electric blanket	120	10	Telephone answering machine	36	3
Exhaust fan	15	1	Television, black & white	50	4
Fan (whole-house)	80	6	Television, cable box	144	12
Fan (ceiling)	50	4	Television, color (when turned on)	197	16
Fan (room)	20	2	Television, color (when turned off)	33	3
Furnace fan	600	48	Toaster oven	50	4
Hair dryer	50	4	Vacuum	25	2
Home computer	130	10	Vacuum (cordless)	36	3
Hot tub heater	480	38	VCR	40	3
Humidifier	100	8	Waterbed	960	77
Iron	50	4	Well pump	360	29
Pipe and gutter heater	100	8			
Pool pump	1,500	120			

Sources: Washington State Energy Office; The State of the Art: Appliances *(1990), E SOURCE;* Household Energy Consumption and Expenditures 1990*, Energy Information Administration; and "What Stays on When You Go Out?", Home Energy, July/August, 1993. Average costs are based on an electric rate of 8¢/kWh.*

ity as a refrigerator, costing about $77 per year to heat. The 17 million waterbeds in this country consume the electrical output of five large power plants.

If you have a waterbed, here are some tips to reduce its energy costs:

- Make the bed and cover it completely with a thick quilt. A quilted cover can halve your waterbed's heating bill.
- Insulate. Use one-inch foam or reflective wrap beneath and around the sides of the mattress (make sure the reflector is rated for your water heater temperature).
- Plug the heater into a timer and set it to turn off an hour or two before you get up and to come back on a few hours before you go to bed.

Televisions and Home Electronics

Televisions are not big energy consumers—a typical 19.5" set costs $17 a year to run, assuming average use—but nearly every household has at least one.

Most color televisions and VCRs have an instant-on feature that keeps the tubes constantly warmed up, so even when the television is turned off this feature is using up to 8 watts of electricity. According to one calculation, the electricity used by the instant-on feature of all the televisions in the U.S. drains as much electricity as the output of a Chernobyl-sized nuclear power plant! New solid-state sets take less time to warm up and so don't need the instant-on feature, but they still draw some power if for remote-control standby.

Small and "Phantom" Loads

Many appliances use electricity even when they're "off." A small amount of electricity is constantly consumed by such features as AC adapter plugs on cordless and rechargeable appliances, cable TV converter boxes, clocks on coffee makers, and so on. Even when your cordless vacuum, laptop computer, or rechargeable battery unit is fully charged, the adapter plug still draws a small amount of electricity. In a study of one typical California home, it was estimated that such **"phantom" loads** consume nearly 700 kWh a year, or nearly $60 worth of electricity. Unplug adapters when recharging is completed or when not in use.

Don't use **batteries** for electronic equipment when you can use line power instead. Electricity from disposable batteries is phenomenally expensive: it works out to $130 per kWh for D cell batteries. In comparison, electricity through the socket costs about 8¢ per kWh. It's well worth investing in AC adapters and rechargeable batteries.

For a rundown on the energy demands of home office equipment, see "Computers and Peripherals" in this Home Energy Briefs series.

RESOURCES

American Council for an Energy-Efficient Economy, 2140 Shattuck Avenue, Suite 202, Berkeley, CA 94704 (510/549-9914). Publishes *Consumer Guide to Home Energy Savings*, which lists brands and models of appliances and their annual energy use and cost.

Energy Efficiency and Renewable Energy Clearinghouse, PO Box 3048, Merrifield, VA 22116 (800/523-2929). Has free information on efficient appliances.

Florida Solar Energy Center, 300 State Road 401, Cape Canaveral, FL 32920-4099 (407/783-0300). Researches appliance efficiency.

New Consumer Institute, PO Box 51, Wauconda, IL 60084. Publishes *The Conscious Consumer*.

Massachusetts Audubon Society, Education Resources Office, 208 South Great Road, Lincoln, MA 01773 (617/259-9506). Publishes an appliances booklet.

Contact your local utility or energy office for information on rebates that may be available in your area on the purchase of new energy-efficient appliances.

For more on kitchen appliances and related home-energy measures, see Rocky Mountain Institute's forthcoming *Homemade Money: How to Save Energy and Dollars in Your Home*. Other titles in this series of Home Energy Briefs include *Lighting*; *Windows*; *Water Heating*; *Refrigerators and Freezers*; *Cooking Appliances and Dishwashers*; and *Computers and Peripherals*. Written by Maureen Cureton and Dave Reed.

To request additional copies please contact Rocky Mountain Institute, 1739 Snowmass Creek Road, Snowmass CO 81654-9199 Telephone: (970) 927-3851 Fax: (970) 927-3420