Energy-Wise Laundering and Appliance Use[1]

State of Florida Governor's Energy Office[2]

Few people know how much energy their home appliances use. Many are concerned about the increasing number of small appliances used in their homes and the amount of energy those appliances consume. By knowing how much is used by the various appliances in your home, you can concentrate on limiting the use of large energy users and save the most energy and money. Table 1 shows estimated monthly and yearly energy consumption for a wide range of electric household appliances and their approximate operating cost per month, at $.06 per kilowatt hour (kwh).

You will notice right away that the big energy users are the heating and cooling systems, water heater, range, refrigerator/freezer, washing machine, clothes dryer and dishwasher. Other pamphlets are available in this series on heating, cooling, water heating, and cooking and refrigeration. Information on how to obtain these publications is listed on the back of this pamphlet. This pamphlet will cover measures you can take to save energy in the use of laundry and other appliances.

CLOTHES WASHERS

The big energy user in washing clothes is the hot water, not the power used to operate the machine. Look at Table 1, and you will see the estimated energy used each year per household for an automatic washing machine, including the how water, is 2500 kwh, while the machine itself uses only about 108 kwh per year. All that hot water is not really necessary, especially with the new cold water detergents. Some wash loads need only cold water for proper cleaning; all loads can be effectively rinsed in cold water.

Clothes requiring hot water int he wash cycle (130°F or 54°C) include color-fast cottons, white or light-colored cottons that are heavily soiled, clothes with grease, oil, perspiration or deodorant stains, and diapers. Warm water (100°-110°F or 38°-43°C) should be used for permanent press or wash and wear fabrics and for knit or woven synthetics. Cold water (80°F or 26°C) can be used for washing woolens, bright or dark-colored clothing, and clothing with milk, fruit juice or blood stains. Pretreating and presoaking fabrics that are moderately or heavily soiled will also enable the use of cold water. Use of cold water may require about 1-1/2 times more detergent; be sure, though, to dissolve the detergent in water before adding it to the washer and read any special instructions on the container. Avoid too many suds, which can require additional rinse cycles. Longer agitation periods and water softeners may also improve results. Disinfectants generally are not needed unless someone in the family is sick. Use of a "suds-saver" switch can allow you to reuse hot, soapy water for another load.

Another energy-saving clothes washing strategy is sorting loads of clothes. Less energy is needed to wash clothes with the same degree of soil, of the same weight, and requiring the same water temperature. Separate clothing by color, fabric type, amount of soil and tendency to lint. Be sure to check garment labels for washing instructions; you will be surprised how few clothes need hot water.

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Table 1. Average Appliance Use and Energy Cost.

Electric Product	Estimated kwh Used Per Month	Estimated Monthly Cost (at $.06/kwh)	Estimated kwh Per Year
Food Preparation			
Broiler Rotisserie	7	$.42	84
Coffee Maker	9	$.54	108
Dishwasher			
Without hot water expense	30	$1.80	360
With hot water expense	175	$10.80	2100
Frying Pan	8	$.48	96
Microwave Oven	16	$.96	192
Range (with oven)	58	$3.48	696
Range (with self-cleaning oven)	61	$3.66	732
Toaster	3	$.18	36
Food Preservation			
Refrigerator, Manual 12 cu. ft.	78	$4.68	936
Refrigerator/Freezer Manual, 12-14 cu.ft.	125	$7.50	1500
Refrigerator/Freezer Frostfree, 14-17 cu.ft.	170	$10.20	2040
Refrigerator/Freezer Frostfree, 17-20 cu.ft.	205	$12.30	2460
Freezer Manual 14.5-17.5 cu.ft.	135	$8.10	1620
Freezer Frostfree 14.5-17.5 cu.ft.	188	$11.28	2256
Laundry Services			
Dryer	75	$4.50	900
Hand Iron	5	$.30	60
Automatic Washing Machine	9	$.54	108
Automatic Washing Machine (including hot water)	208	$12.48	2500
Health and Beauty			
Hair Dryer	2	$.12	24
Hair Roller	1	$.06	12
Shaver	.15	$.01	1.8
Home Entertainment			
Radio	7	$.42	84
Radio/Record Player	9	$.54	108

Table 1. Average Appliance Use and Energy Cost.

Electric Product	Estimated kwh Used Per Month	Estimated Monthly Cost (at $.06/kwh)	Estimated kwh Per Year
Television B&W Tube Type	18	$1.08	216
Television B&W Solid State	8	$.48	96
Television Color Tube Type	44	$2.64	528
Television Color Solid State	27	$1.62	324
Housewares			
Clock	1.5	$.09	18
Vacuum Cleaner	4	$.24	48
Heating and Cooling (all electric; Central Florida home)			
Water Heater	257	$15.40	3080
Central A/C, 6 mos. (in Florida)	1320	$79.20	7920
Window Fan	28	$1.68	170
Space Heating, 4 mos.	1155	$69.30	4620
Electric Blanket	21	$1.26	126

CLOTHES DRYERS

It is estimated (see Table 1) that the average family will use about 900 kwh of power each year for the convenience of an automatic clothes dryer. How long has it been since you used your solar clothes dryer (the clothesline)? In the past, many housing developments and municipalities prohibited the use of clotheslines by local ordinance; as of July 1, 1980, Florida law (F.S.553.909.Section 8) makes such decrees illegal. Line dry your clothes as much as possible; make sure, though, to hang them carefully to minimize wrinkles.

When using the automatic clothes dryer, dry full loads of the same type of material (e.g., towels in one load, sheets and whites in another); this allows more even drying and can prevent overdrying of lightweight fabrics and underdrying of heavy clothes. Usually, a full load of clothes from the washer will be about right for the dryer. Do not overload the dryer, overloading increases drying time and causes wrinkles, which will require ironing. To avoid having to iron clothes, take them from the dryer while they still contain a little moisture, or as soon as the cycle is completed, and fold or hang them carefully. Using a moisture-controlled cycle (which automatically turns the dryer off when the clothes are dry) will prevent overdrying, which also causes wrinkles and may cause shrinkage in many fabrics.

IRONING

Use of the iron generally ranges between 60 and 144 kwh per year; however, modern permanent press fabrics can relieve the homemaker of a large part of this chore. Try to do all of your ironing in one session instead of ironing one item each time you need it. Although warm-up and cool-down periods can be used for delicate fabrics when ironing many items, this procedure wastes energy. Avoid heating up the iron several times, but do remember to turn it off when finished or if interrupted for a long period of time.

DISHWASHERS

An automatic dishwasher is estimated to use about 2100 kwh per year if you count the energy expended to heat the water; energy used to run the machine itself only accounts for about 363 kwh a year.

Table 2. Cost recovery worksheet.

1. Are the units comparable in size and features?	_____
2. What is the price of the energy-efficient model?	$_____
3. How often will you use the product? (refer to Table 1, ask your local utility company, or chart your own usage pattern)	_____
4. What is your local energy rate? a. How much will it cost to run the energy-efficient model each year (listed on the label)?	$_____/kwh $_____/therm (gas) $_____
5. How long do you expect to keep the appliance?	_____yrs.
With this information, you can figure your energy savings.	
1. The cost of the energy-efficient model:	$_____
2. Minus the cost of standard model:	$_____
3. Equals the added cost to buy the energy-efficient model:	$_____(A)
4. The yearly energy cost of the standard model:	$_____
5. Minus the yearly energy cost of the energy-efficient model:	$_____
6. Equals the yearly savings from the energy-efficient model:	$_____(B)
7. Multiply the savings (B) by the number of years you expect to keep the appliance to get total energy savings (C):	$_____(C)
8. Subtract from figure (C) the price difference between models (A):	$_____
9. This figure is the expected energy cost savings over the life of the appliance:	$_____

Unlike an automatic clothes washer, however, the dishwasher does require hot water. Detergents used to wash dishes will not dissolve properly if the water temperature is much below 140°F (60°C). Instead, concentrate on washing only full loads of dishes. After a meal, rinse the dishes in cold water and stack them in the dishwasher until you have a full load. Take care not to block the soap dispenser of spray arms. Try to run the machine at night or in the early morning on hot days so that heat and moisture from its use will not add to the air conditioning load of the house during hours of peak demand.

Another good way to save energy while using tan automatic dishwasher is to turn off the heating element during the drying cycle. Some newer machines have an energy saver switch or cycle which will do this automatically. Opening the door of the dishwasher slightly will speed up the drying process, although this does add moisture to the air. One last tip: Keep the dishwasher drains and filters clear of debris to avoid reducing the efficiency of the unit.

TV, RADIO/STEREO

Be sure your TV, radio, and stereo are off when no one is watching or listening. Color TV sets are especially expensive to operate - they consume 33% more energy than black and white sets.

SMALL APPLIANCES

Using small appliances instead of large ones for small jobs makes sense, especially in food preparation (ask for the "Refrigeration and Cooking" pamphlet). Some items, like electric clocks, are low energy users and some, like electric hair dryers and carving knives, are not in use long enough to consume a lot of energy. Other small appliances, such as electric blankets, save a lot of energy by reducing the use of large appliances.

Remember to turn off appliances when they are not in use, though. Even small energy users can be wasteful if not turned off.

APPLIANCE MAINTENANCE

Maintaining your appliances is important. Change the vacuum cleaner bag frequently to keep the machine at full suction, increasing effectiveness. Oil household appliances where and when the instruction books recommend. This not only prolongs the life of a unit, it allows it to work more efficiently. Clean or replace filters periodically; clogged filters reduce air flow to the appliance and cut down efficiency. Repair or replace appliances that are not working properly; they do not work as efficiently and may waste energy.

APPLIANCE LABELING PROGRAM

The federal government now requires manufacturers of refrigerators, freezers, dishwashers, water heaters, clothes washers, room air conditioners and freezers to attach an ENERGYGUIDE label to each new appliance. These labels give the customer the estimated energy cost of a particular unit and provide a range of costs for other units as a comparison. To use the guide to find out how long it may take to recover the added cost of buying a more expensive, energy-efficient unit, you first need to answer a few questions (Table 2).

To find out how soon the extra cost will be paid back in savings due to increased energy efficiency, use Equation 1.

$$\frac{\text{Price Difference (A)}}{\text{Energy Cost Savings (B)}} = \text{Years to recover added cost}$$

Equation 1.

Naturally, actual costs and savings will be different for you because your appliance use patterns may not fit a national average. However, the labels are very useful in comparing the cost effectiveness of buying a more expensive, energy-efficient unit.

LAUNDRY AND APPLIANCE CHECKLIST

- **Some fabrics can be drip-dried.** Be careful to avoid water damage to your floors.
- **Use water softeners for medium and hard water.** The harder the water, the higher the wash water temperature will have to be to get clothes clean.
- **If cold water is used, pretreat stains, spots and greasy areas with detergents or pretreating aids.**
- **If clothes appear dirty after several cold water washings, alternate washings from cold to warm water.**
- **Try to wash clothes late at night or in the early morning.**
- **Always wash a full load, if possible.** Adjust water levels for various load sizes.
- **The washer should be located near the water heater, if possible.**
- **Make sure light and heavy fabrics are separated before drying them.** These different fabrics need special drying times.
- **Dry clothes in consecutive loads** in order to take advantage of the heat from previous loads.
- **Clean the dryer's lint filter** either just before or just after each load. Lint cuts down on the air circulation and causes the dryer to work harder.
- **Dry only full loads, but do not overload.** This causes wrinkling in the clothes, which will then require ironing.
- **Remove clothes promptly from the dryer** and fold or hang them up carefully.

OTHER RESIDENTIAL ENERGY INFORMATION AVAILABLE

1. **Consumer Pamphlets on:**

   Cooling
   Attic ventilation
   Heating

Hot water use
Solar water heating
Solar decision checklist
Waste heat recovery
Refrigeration and cooking
Lighting
Laundry and small appliances

2. **A Residential Energy Workbook** to help you:

   a. organize a year-round, total energy program for the entire family;

   b. determine where the real savings are in your own home;

   c. keep an accurate record of your progress.

3. **Technical Reports** that cover some of the "Consumer Pamphlet" topics in more detail and may be helpful to you (as a do-it-yourselfer), to you contractor, or to your architect in making design decisions about some of the more expensive retrofits.