



The Cost of COMFORT

Teaching Guide

Before the meeting

- Call your local utility and request the "average cost per kilowatt-hour" in your locality.
- Secure a sheet of paper and a pencil for each person attending.
- Make a copy of the cost chart and a copy of the Energyguide for each participant. (Copy on the front and back of one sheet.)
- Secure one of the following to use in discussing the cost of operation:
 - flip chart (large size)
 - chalk board
 - overhead projector.
- If you choose to use the "money supply" method, make a copy of the money sheet for each participant.

The Lesson

Our daily lives are so dependent on appliances, both gas and electric, that it is hard to imagine living without them. However, there is a cost they bring with the comfort and convenience provided. How to choose and use these appliances is a necessary part of energy conservation management. This lesson will address the cost of operating major appliances and the labeling programs that help consumers select energy-efficient appliances.

Purpose

The purpose of this lesson is to increase:

- 1. Awareness of the cost of operating major appliances.**
- 2. Understanding of the labeling programs that will help you purchase an energy-efficient appliance.**

Roll call

What is the first electric major appliance you purchased? Approximate year?

or

What have you done to lower electric operating costs in your household?

Definitions

Major appliances are those that operate off 120 volts and/or 240 volts, have operating wattage ranging from less than 1000 watts to over 5000 watts. Examples are ranges, refrigerators, washers, dryers, microwaves, room air conditioners, disposers, compactors, freezers, and dehumidifiers.

Activity No. 1

- Ask the group to answer the following questions about their understanding of energy costs. Pass out a sheet of paper and pencil at this time.

What is happening to the cost of operating our home appliances?

Answers:

- a. decreasing;
- b. increasing;
- c. increasing.

- a. **The amount of electricity to operate most items is:**
decreasing increasing about the same
- b. **Electricity cost per kilowatt hour to you is:**
decreasing increasing about the same
- c. **Our total utility bill is gradually:**
decreasing increasing about the same

Activity No. 2

If you have not shopped for a new appliance recently, you may not realize how energy standards are directing what is for sale today. In this lesson, we will look at the energy requirements the manufacturer must meet for appliances, and we will calculate what it costs to operate these appliances.

How Operating Costs Are Figured

- Discuss the energy standard for the appliance. The energy standard information is given after each appliance. Note: The order of appliance discussion and completion of the energy cost chart are identical.
- Write out the cost of operation per day on a tablet, board, or overhead transparency.

The hours of appliance operation used, number of loads per week, or KWH used have been researched from various sources and are the best information we have to use in determining cost today.

Example:

Air conditioner

$$12 \text{ KWH/day} \times \$ \text{ ______ /KWH} = \$ \text{ ______}$$

Dryer

$$2.5 \text{ KWH/day} \times \$ \text{ ______ /KWH} = \$ \text{ ______}$$

The most accurate cost of operation will come when the cost per KWH is that quoted by the local utility company.

The national average cost per KWH today is about \$.087; hence, I used \$.08 (or 8¢) in my calculations.

- Next have the participants take money from their supply or fill in the cost chart.
- Calculate the cost per week and place the amount in the chart.
- Proceed to the next appliance.
- When all appliances have been covered, total the daily and weekly costs.

Air Conditioners (room)

Air conditioners are labeled with an EER (energy efficiency ratio) or SEER (seasonal energy efficient ratio) number. These ratios measure how efficiently the unit uses electricity and cuts operating costs. The higher the EER for a cooling unit (BTUH) the better the buy.

Energy standard (DOE): *(Set by the Department of Energy.)*

- A EER of 10 or greater in 1992.
- A proposed EER of 11 for 1998.

Cost per day (based on \$.08 KWH):

12 KWH/day x \$.08/KWH = \$.96

- Have participants take \$.96 from their money supply or put the cost in the chart.

Cost per week:

\$.96/day x 7 days = \$6.72

Clothes Dryers

Energy standard (DOE):

- Electric ignition pilot for gas dryers in 1988.
- Use of automatic-drying cycle in 1994 (the machine determines when clothes are dry).
- Eliminate time-dry cycle (where you set a minute clock).

Cost per load:

2.5 KWH/load x \$.08/KWH = \$.20

- Have participants take \$.20 from their money supply or put the cost in the chart.

Cost per week (based on 8 loads/week):

\$.20/load x 8 loads = \$1.60

Dishwashers

Energy standard (DOE):

- Include an air-dry cycle in 1988.
- Limit energy usage to 0.46 KWH/load in 1994.
- Manufacturers have used the following to meet DOE energy reduction:
 - less water
 - less to heat
 - more filters
 - more spray levels of water
 - built-in water temperature boosters

Cost of electricity per load (based on \$.08/KWH):

■ To run machine (one load) = .52 KWH/load x \$.08 = \$.04

■ To heat water (10 gallons) = .15

■ Total for one load (no detergent)= \$.19

- Have participants take \$.19 from their money supply or put the cost in the chart.

Cost per week (based on 6.2 loads/week):

\$.19/load x 6.2 loads = \$1.18

Freezers

Energy standard (DOE):

- A 25 to 30 percent average EER reduction in 1993. For example, a 27.5 cu. ft. freezer (automatic defrost) should use no more than 801 KWH/year.

Cost per day (based on \$.08/KWH):

2.80 KWH/day x \$.08/KWH = \$.23

- Have participants take \$.23 from their money supply or put the cost in the chart.

Cost per week:

$$$.23/\text{day} \times 7 \text{ days} = \$1.61$$

Furnace Fan

Energy standard (DOE):

- No standard.

Cost to operate 12 hours a day:

$$6 \text{ KWH}/\text{day} \times \$.08/\text{KWH} = \$.48$$

- Have participants take \$.48 from their money or put the cost in the chart.

Microwaves

Energy standard (DOE):

- None at the present time.
- Proposed standard for 1998.

Cost of operation:

$$.19 \text{ KWH}/\text{day} \times \$.08/\text{KWH} = \$.02$$

- Have participants take \$.02 from their money or put the cost in the chart.

Cost per week:

$$$.02/\text{day} \times 7 \text{ days} = \$.14$$

Ranges and Ovens

Energy standard (DOE):

- None at the present time.
- Proposed standard for 1998.

Cost of operation:

$$1.6 \text{ KWH}/\text{day} \times \$.08/\text{KWH} = \$.13$$

- Have participants take \$.13 from their money or put the cost in the chart.

Cost per week:

$$$.13 \text{ day} \times 7 \text{ days} = \$.91$$

Refrigerators

Energy standard (DOE):

- A 25-percent average EER reduction in 1993.
Example: A 20.4 cu. ft. with top freezer should use no more than 681 KWH/year. This is about the same as burning a 75-watt lamp all day.
- Energy efficiency will increase by an additional 20 percent in 1998. This will be about the same as burning a 58-watt lamp all day.

Cost per day:

$$4.36 \text{ KWH}/\text{day} \times \$.08 \text{ KWH} = \$.35$$

- Have participants take \$.35 from their money or put the cost in the chart.

Cost per week:

$$$.35/\text{day} \times 7 \text{ days} = \$2.45$$

Televisions

Energy standard (DOE):

- None at the present time.
- Proposed standards for 1998.

Cost per day:

$$.9 \text{ KWH/day} \times \$0.08 \text{ KWH} = \$0.07$$

- Have participants take \$.07 from their money or put the cost in the chart.

Cost per week:

$$\$0.07/\text{day} \times 7 \text{ days} = \$0.49$$

Washers

Energy standard (DOE):

- All machines must have an unheated rinse-water option.
- Limit energy usage to 1.18 cu. ft./KWH/cycle.

Cost of electricity to operate washer (one load):

$$.248 \text{ KWH/load} \times \$0.08 \text{ KWH} = \$0.02 \text{ load}$$

Cost of electricity to heat 20 gallons of water for a hot wash is \$.29

- Have participants take \$.02 and \$.29 from their money or put the costs in the chart.

Cost per week (based on 8 loads/week):

$$\$0.31/\text{load} \times 8 \text{ loads} = \$2.48$$

Water Heaters (with normal recovery rate)

Cost per day:

$$11.56 \text{ KWH/day} \times \$0.08/\text{KWH} = \$0.92$$

- Have participants take \$.92 from their money or put the cost in the chart.

Cost per week:

$$\$0.92/\text{day} \times 7 \text{ days} = \$6.44$$

Summary

Whenever possible, use the Energyguide while shopping and purchase the most energy efficient appliance that meets your needs.

- Show the Energyguide and explain how to use it. This can be done by using an example on an overhead projector or passing out copies for discussion purposes.

The meaning of all information found on the Energyguide is shown on the handout.

- “Walk” the participants through the guide.

Whenever a breakdown occurs with a major appliance, consider that the ones on the market today will use less energy than the old one.

This lesson has dealt with electrically operated appliances. In general, gas-operated appliances will cost less to operate.

Before December 27, 1994

ENERGYGUIDE

Estimates on the scale are based on a national average electric rate of 8.9¢ per kilowatt hour and a natural gas rate of 58¢ per therm.

Only standard size CLOTHES WASHERS are used in the scale.

Model with lowest energy cost: **\$106** THIS MODEL: **\$144** Model with highest energy cost: **\$144**

Model with lowest energy cost: **\$37** THIS MODEL: **\$51** Model with highest energy cost: **\$51**

Your cost will vary depending on your local energy rate and how you use the product. The energy cost is based on U.S. Government standard tests.

How much will this model cost you to run yearly?

with an electric water heater					with a gas water heater								
Loads of clothes per week	2	4	6	8	10	12	Loads of clothes per week	2	4	6	8	10	12
Estimated yearly energy cost shown below	2e	4e	6e	8e	10e	12e	Estimated yearly energy cost shown below	2g	4g	6g	8g	10g	12g
Cost per kilowatt hour	\$7	\$13	\$20	\$26	\$33	\$40	Cost per 100 cubic feet	30¢	35¢	\$11	\$14	\$18	\$22
	\$132	\$264	\$396	\$528	\$660	\$792		\$330	\$385	\$1210	\$1540	\$1980	\$2420
	\$165	\$330	\$495	\$660	\$825	\$990		\$330	\$385	\$1210	\$1540	\$1980	\$2420
	\$198	\$396	\$594	\$792	\$990	\$1188		\$330	\$385	\$1210	\$1540	\$1980	\$2420
	\$231	\$462	\$693	\$924	\$1155	\$1386		\$330	\$385	\$1210	\$1540	\$1980	\$2420
	\$264	\$528	\$792	\$1056	\$1320	\$1584		\$330	\$385	\$1210	\$1540	\$1980	\$2420
	\$297	\$594	\$891	\$1188	\$1485	\$1782		\$330	\$385	\$1210	\$1540	\$1980	\$2420
	\$330	\$660	\$990	\$1320	\$1650	\$1980		\$330	\$385	\$1210	\$1540	\$1980	\$2420
	\$363	\$726	\$1089	\$1452	\$1815	\$2178		\$330	\$385	\$1210	\$1540	\$1980	\$2420
	\$396	\$792	\$1188	\$1584	\$1980	\$2376		\$330	\$385	\$1210	\$1540	\$1980	\$2420
	\$429	\$858	\$1287	\$1716	\$2145	\$2574		\$330	\$385	\$1210	\$1540	\$1980	\$2420
	\$462	\$924	\$1392	\$1848	\$2310	\$2736		\$330	\$385	\$1210	\$1540	\$1980	\$2420
	\$495	\$990	\$1485	\$1980	\$2475	\$2940		\$330	\$385	\$1210	\$1540	\$1980	\$2420
	\$528	\$1056	\$1578	\$2112	\$2640	\$3108		\$330	\$385	\$1210	\$1540	\$1980	\$2420
	\$561	\$1122	\$1671	\$2244	\$2805	\$3366		\$330	\$385	\$1210	\$1540	\$1980	\$2420
	\$594	\$1188	\$1764	\$2376	\$2970	\$3534		\$330	\$385	\$1210	\$1540	\$1980	\$2420
	\$627	\$1254	\$1857	\$2508	\$3135	\$3702		\$330	\$385	\$1210	\$1540	\$1980	\$2420
	\$660	\$1320	\$1950	\$2640	\$3300	\$3870		\$330	\$385	\$1210	\$1540	\$1980	\$2420
	\$693	\$1386	\$2043	\$2772	\$3465	\$4038		\$330	\$385	\$1210	\$1540	\$1980	\$2420
	\$726	\$1452	\$2136	\$2904	\$3630	\$4206		\$330	\$385	\$1210	\$1540	\$1980	\$2420
	\$759	\$1518	\$2229	\$3036	\$3795	\$4374		\$330	\$385	\$1210	\$1540	\$1980	\$2420
	\$792	\$1584	\$2322	\$3168	\$3960	\$4542		\$330	\$385	\$1210	\$1540	\$1980	\$2420
	\$825	\$1650	\$2415	\$3300	\$4125	\$4710		\$330	\$385	\$1210	\$1540	\$1980	\$2420
	\$858	\$1716	\$2508	\$3432	\$4305	\$4878		\$330	\$385	\$1210	\$1540	\$1980	\$2420
	\$891	\$1782	\$2601	\$3564	\$4490	\$5046		\$330	\$385	\$1210	\$1540	\$1980	\$2420
	\$924	\$1848	\$2694	\$3696	\$4675	\$5214		\$330	\$385	\$1210	\$1540	\$1980	\$2420
	\$957	\$1914	\$2787	\$3828	\$4860	\$5382		\$330	\$385	\$1210	\$1540	\$1980	\$2420
	\$990	\$1980	\$2880	\$3960	\$5040	\$5550		\$330	\$385	\$1210	\$1540	\$1980	\$2420
	\$1023	\$2046	\$2973	\$4092	\$5225	\$5718		\$330	\$385	\$1210	\$1540	\$1980	\$2420
	\$1056	\$2112	\$3066	\$4224	\$5410	\$5886		\$330	\$385	\$1210	\$1540	\$1980	\$2420
	\$1089	\$2178	\$3159	\$4356	\$5595	\$6054		\$330	\$385	\$1210	\$1540	\$1980	\$2420
	\$1122	\$2244	\$3252	\$4488	\$5780	\$6222		\$330	\$385	\$1210	\$1540	\$1980	\$2420
	\$1155	\$2310	\$3345	\$4620	\$5965	\$6390		\$330	\$385	\$1210	\$1540	\$1980	\$2420
	\$1188	\$2376	\$3438	\$4752	\$6150	\$6558		\$330	\$385	\$1210	\$1540	\$1980	\$2420
	\$1221	\$2442	\$3531	\$4884	\$6335	\$6726		\$330	\$385	\$1210	\$1540	\$1980	\$2420
	\$1254	\$2508	\$3624	\$5016	\$6520	\$6894		\$330	\$385	\$1210	\$1540	\$1980	\$2420
	\$1287	\$2574	\$3717	\$5148	\$6705	\$7062		\$330	\$385	\$1210	\$1540	\$1980	\$2420
	\$1320	\$2640	\$3810	\$5280	\$6890	\$7230		\$330	\$385	\$1210	\$1540	\$1980	\$2420
	\$1353	\$2706	\$3903	\$5412	\$7075	\$7398		\$330	\$385	\$1210	\$1540	\$1980	\$2420
	\$1386	\$2772	\$3996	\$5544	\$7260	\$7566		\$330	\$385	\$1210	\$1540	\$1980	\$2420
	\$1419	\$2838	\$4089	\$5676	\$7445	\$7734		\$330	\$385	\$1210	\$1540	\$1980	\$2420
	\$1452	\$2904	\$4182	\$5808	\$7630	\$7902		\$330	\$385	\$1210	\$1540	\$1980	\$2420
	\$1485	\$2970	\$4275	\$5940	\$7815	\$8070		\$330	\$385	\$1210	\$1540	\$1980	\$2420
	\$1518	\$3036	\$4368	\$6072	\$8000	\$8238		\$330	\$385	\$1210	\$1540	\$1980	\$2420
	\$1551	\$3102	\$4461	\$6204	\$8185	\$8406		\$330	\$385	\$1210	\$1540	\$1980	\$2420
	\$1584	\$3168	\$4554	\$6336	\$8370	\$8574		\$330	\$385	\$1210	\$1540	\$1980	\$2420
	\$1617	\$3234	\$4647	\$6468	\$8555	\$8742		\$330	\$385	\$1210	\$1540	\$1980	\$2420
	\$1650	\$3300	\$4740	\$6600	\$8740	\$8910		\$330	\$385	\$1210	\$1540	\$1980	\$2420
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	\$1716	\$3432	\$4926	\$6864	\$9110	\$9246		\$330	\$385	\$1210	\$1540	\$1980	\$2420
	\$1749	\$3498	\$5019	\$6996	\$9295	\$9414		\$330	\$385	\$1210	\$1540	\$1980	\$2420
	\$1782	\$3564	\$5112	\$7128	\$9480	\$9582		\$330	\$385	\$1210	\$1540	\$1980	\$2420
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	\$1881	\$3762	\$5391	\$7524	\$10035	\$10086		\$330	\$385	\$1210	\$1540	\$1980	\$2420
	\$1914	\$3828	\$5484	\$7656	\$10220	\$10254		\$330	\$385	\$1210	\$1540	\$1980	\$2420
	\$1947	\$3894	\$5577	\$7788	\$10405	\$10422		\$330	\$385	\$1210	\$1540	\$1980	\$2420
	\$1980	\$3960	\$5670	\$7920	\$10590	\$10590		\$330	\$385	\$1210	\$1540	\$1980	\$2420
	\$2013	\$4026	\$5763	\$8052	\$10775	\$10774		\$330	\$385	\$1210	\$1540	\$1980	\$2420
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	\$2145	\$4290	\$6135	\$8580	\$11515	\$11518		\$330	\$385	\$1210	\$1540	\$1980	\$2420
	\$2178	\$4356	\$6228	\$8712	\$11700	\$11718		\$330	\$385	\$1210	\$1540	\$1980	\$2420
	\$2211	\$4422	\$6321	\$8844	\$11885	\$11898		\$330	\$385	\$1210	\$1540	\$1980	\$2420
	\$2244	\$4488	\$6414	\$8976	\$12070	\$12090		\$330	\$385	\$1210	\$1540	\$1980	\$2420
	\$2277	\$4554	\$6507	\$9108	\$12255	\$12270		\$330	\$385	\$1210	\$1540	\$1980	\$2420
	\$2310	\$4620	\$6600	\$9240	\$12440	\$12442		\$330	\$385	\$1210	\$1540	\$1980	\$2420
	\$2343	\$4686	\$6693	\$9372	\$12625	\$12636		\$330	\$385	\$1210	\$1540	\$1980	\$2420
	\$2376	\$4752	\$6786	\$9504	\$12810	\$12822		\$330	\$385	\$1210	\$1540	\$1980	\$2420
	\$2409	\$4818	\$6879	\$9636	\$12995	\$13002		\$330	\$385	\$1210	\$1540	\$1980	\$2420
	\$2442	\$4884	\$6972	\$9768	\$13180	\$13174		\$330	\$385	\$1210	\$1540	\$1980	\$2420
	\$2475	\$4950	\$7065	\$9900	\$13365	\$13368		\$330	\$385	\$1210	\$1540	\$1980	\$2420
	\$2508	\$5016	\$7158	\$10032	\$13550	\$13566		\$330	\$385	\$1210	\$1540	\$1980	\$2420
	\$2541	\$5082	\$7251	\$10164	\$13735	\$13752		\$330	\$385	\$1210	\$1540	\$1980	\$2420
	\$2574	\$5148	\$7344	\$10296	\$13920	\$13938		\$330	\$385	\$1210	\$1540	\$1980	\$2420
	\$2607	\$5214	\$7437	\$10428	\$14105	\$14136		\$330	\$385	\$1210	\$1540	\$1980	\$2420
	\$2640	\$5280	\$7530	\$10560	\$14290	\$14322		\$330	\$385	\$1210	\$1540	\$1980	\$2420
	\$2673	\$5346	\$7623	\$10692	\$14475	\$14508		\$330	\$385	\$1210	\$1540	\$1980	\$2420
	\$2706	\$5412	\$7716	\$10824	\$14660	\$14694		\$330	\$385	\$1210	\$1540	\$1980	\$2420
	\$2739	\$5478	\$7809	\$10956	\$14845	\$14880		\$330	\$385	\$1210	\$1540	\$1980	\$2420
	\$2772	\$5544	\$7902	\$11088	\$15030	\$15066		\$330	\$385	\$1210	\$1540	\$1980	\$2420
	\$2805	\$5610	\$7995	\$11220	\$15215	\$15252		\$330	\$385	\$1210	\$1540	\$1980	\$2420
	\$2838	\$5676	\$8088	\$11352	\$15400	\$15440		\$330	\$385	\$1210	\$1540	\$1980	\$2420
	\$2871	\$5742	\$8181	\$11484	\$15585	\$15626		\$330	\$385	\$1210	\$1540	\$1980	\$2420
	\$2904	\$5808	\$8274	\$11616	\$15770	\$15810		\$330	\$385	\$1210	\$1540	\$1980	