BUILDING IN ALASKA

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Appliance Energy Use and Costs in Alaska

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To be thrifty consumers, we need to know how much electricity, in kilowatt-hours (kWh) our appliances use. To aid in determining this, the following electric usage chart was developed. The average energy use in watts is in the second column. In the third column, the average number of hours per month that the device is utilized is given (one full year equals 8,760 hours), and the total costs of running the appliance for a month and a year are in the fifth and sixth columns.

This guide was developed as an informational tool to help Alaskans estimate and reduce their electrical costs. A home energy audit available from most Alaska electric companies is always a good idea to address areas of greatest electrical cost.

Usually the biggest costs come from using electricity as heat. You should find the most cost-effective fuel for space and water heating for your community. Using a timer when plugging in your car will save enough electricity to pay for the timer, so consider this option. Plugging cars in is a highly variable cost, but car heaters use from 400 to 1600 watts when plugged in. Use of an energy monitoring device such as a Kill-a-watt or TED (The Energy Detective) is highly recommended.

For more information, contact your local Cooperative Extension Service office or Rich Seifert, Extension Housing and Energy Specialist, at 907-474-7201 or ffrds@uaf.edu.

Visit the Cooperative Extension Service website at www.uaf.edu/ces or call 1-877-520-5211

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Appliance Energy Use and Costs

This fact sheet provides information about the energy use and associated energy costs of common home appliances for a standard sized house for a family of four. The average costs are based on a regional assessment of heating loads and electrical costs. Listed wattages are averages only; wattage on your individual appliances may vary.
Kilowatt-hours (kWh) = Watts/1000 x hours

Appliance	Watts	Average Hour Use Per Month	kWh Used Per Month	Average Cost Per Month	Average Cost Per Year
Heating/Cooling					
Electric Furnace[1]	15000	228	3413	$751	$9,011
Electric Wall Heater	1500	150	225	$50	$594
Electric Baseboard - 4 foot	1000	150	150	$33	$396
Electric Baseboard - 8 foot	2000	150	300	$66	$792
Electric Portable Space Heater	1500	150	225	$50	$594
Electric Portable Space Heater	1000	150	150	$33	$396
Air Conditioner (Central)	6000	90	540	$119	$1,426
Air Conditioner (Window Unit)	1100	90	99	$22	$261
Fan – Ceiling	80	150	12	$3	$32
Fan – Portable	115	150	17	$4	$45
Heat Pump: Standard	5000	150	750	$165	$1,980
Furnace Blower Motor (1/3 HP): PSC[2]	452	146	66	$14	$174
Furnace Blower Motor (1/3 HP): BPM[3]	260	146	38	$8	$100
Heat Recovery Ventilator	65	540	35	$8	$93
Water Heating					
Electric Tank Water Heater	4500	75	337	$74	$890
Hot Tub – Electric Heater (240v)	5000	183	915	$201	$2,416
Hot Tub Pump (Circulation)	1000	183	183	$40	$483

Lighting

Incandescent Lamp	100	150	15	$3	$40
Incandescent Lamp	75	150	11	$2	$30
Incandescent Lamp	60	150	9	$2	$24
Fluorescent Lamp	27	150	4	$1	$11
Fluorescent Lamp	20	150	3	$1	$8
Fluorescent Lamp	15	150	2	$0	$6
Halogen Torchiere	300	150	45	$10	$119
Fluorescent Torchiere	63	150	9	$2	$25
Flood Light (Exterior)	150	60	9	$2	$24
Indoor Grow Light	600	360	216	$48	$570
Street Light (HPS)	400	360	144	$32	$380

Miscellaneous Appliances

Air Cleaner	50	275	14	$3	$37
Bathtub with Jets	75	20	2	$0	$4
Electric Blanket	190	80	15	$3	$40
Fish Tank (20 gallon)	86	720	63	$14	$166
Hair Dryer – Hand Held	1500	4	5	$1	$13
Heat Lamp	250	10	3	$1	$8
Humidifier (Portable)	60	180	11	$2	$29
Iron	1000	5	5	$1	$13
Sewing Machine	100	10	1	$0	$3
Vacuum Cleaner	1000	5	5	$1	$13

Kitchen

Blender	200	20	4	$1	$11
Bread Maker	600	15	9	$2	$24
Coffee Maker	1200	12	14	$3	$37
Crock Pot	100	20	2	$0	$5
Dishwasher (excludes water use)					
With Air Dry	200	25	5	$1	$13
With Heat Dry	1200	25	30	$7	$79
Electric Grill	1250	5	6	$1	$16
Exhaust Fan	40	25	1	$0	$3
Freezer	300	170	51	$11	$135
Frying Pan (Electric)	1150	10	11	$2	$29
Garbage Disposal	375	1	0	$0	$1
Microwave Oven	1400	15	21	$5	$55
Range (Electric)					$0

Oven	2660	15	40	$9	$106
Large Burner	2400	15	36	$8	$95
Small Burner	1300	15	19	$4	$50
Toaster	1000	3	3	$1	$8
Refrigerator/Freezer*					
Lowest Energy Star rating, side-by-side GE[4]	2000	24	48	$11	$127
Highest Energy Star rating: Bottom Freezer by Samsung[5]	2000	20	39	$9	$103
Consumer Reports Best Buy-Kenmore[6]	2000	19	38	$8	$101
(Pre 1992)	600	215	129	$28	$341
Off-grid spec Sun Frost RF-16 Refrigerator (AC power mode)[7]	600	24	14	$3	$38
Chest freezer: Energy Star highest rated, by Woods	4000	9	35	$8	$91

Laundry

Clothes Dryer - Electric	4600	20	92	$20	$243
Clothes Washer Standard (C/C)	N/A	(20 loads) 10	4	$1	$10
Clothes Washer Standard (W/C) *	N/A	(20 loads) 10	42	$9	$111
Clothes Washer Efficient (C/C)	N/A	(20 loads) 10	3	$1	$7
Clothes Washer Efficient (W/C) *	N/A	(20 loads) 10	11	$3	$30

* Includes cost of water heating.

Electronics/Entertainment/Home Office

Computer with power management (pm)**	65	192	7	$1	$18
Computer without pm**	65	192	47	$10	$125
Computer Monitor with pm**	61	192	10	$2	$25

Computer Monitor Flats Screen with pm**	35	192	4	$1	v
Laptop with power management**	15	192	1	$0	$4
Printer, Laser with pm**	43	112	11	$2	$28
Printer, Laser without pm**	43	112	31	$7	$83
TV, analog, screen less than or = 40 in.	86	180	16	$3	$41
TV, analog, screen more than 40 in.	156	180	28	$6	$74
TV high def., screen less than or = 40 in.*	150	180	27	$6	$71
TV, high def., screen more than 40 in.	234	180	42	$9	$111
TV Set Top Receiver	21	720	15	$3	$40
DVD	22	45	1	$0	$3
Stereo system, portable	30	240	7	$2	$19
Stereo, (Tuner/receiver, speakers)	200	120	24	$5	$63
4 Cell phone chargers, not charging	6	720	4	$1	$11

*Varies: for a 32-in. set, 140-350 watts; ** power management (pm) is an internal energy-saving device

1. Assumes all heating done via electric
2. Single stage PSC (permanent split capacitor) motor, the most common model available for PSC blowers in lower-end furnaces. Assumes winter operation only.
3. BPM (Brushless Permanent Magnet) two-stage motors, which are the most common configuration for more upscale furnaces. Typically Uses 2 percent or less of the total energy consumed by the appliance. Assumes winter operation only.
4. Lowest efficiency large side-by-side model: GE model without icemaker, 25.39 ft3 total cooling space, auto defrost
5. Highest Energy Star rating for large residential style bottom-freezer models. Model is by Samsung. 25.84 cubic feet of usable storage.
6. *Consumer Reports*, August, 2008. Refrigerator is smaller than the other models listed, so its energy use is lower, though (2) is more efficient.
7. The Sun Frost is smaller than the other refrigerator/freezers noted at 14.31 cubic feet of usable storage space.

*All models were active as of August 29, 2008. Data was obtained from the Energy Star website at www.energystar.gov/index.cfm?c=refrig.pr_refrigerators

If you have appliances that are not listed in the table, or desire a more exact figure based on your household's actual energy consumption, you can use the formulas given below to estimate the amount of energy each appliance consumes and the annual cost for each appliance:

Annual kilowatt-hour consumption (kWh/year) = (avg w) × (1kw/1000w) × (hours used per day) × (days in use per year)

Annual cost for appliance = (kWh/year) × (cents per kWh)

The calculation follows in steps: Average appliance wattage (avg w) divided by 1000w (1 kilowatt (kw) = 1000 watts(w) multiplied by hours used per day (hours/day) equals daily kilowatt-hour consumption.

(Avg w/1000w) × (hours/day) =

Daily kilowatt-hour consumption

Multiply this result by the number of days you use the appliance during a year. Now you have the annual energy consumption.

(Daily kilowatt-hours) × (days/year) =

Annual kilowatt-hour consumption

To arrive at the annual cost for each appliance, multiply the annual kilowatt-hour consumption by your local utility's kilowatt-hour rate (see below).

(kWh/year) × (kilowatt-hour rate) =

Annual cost for appliance

The following formulas were used to determine the average kilowatt-hour rate for utilities in Anchorage, Fairbanks and Juneau.

Average kilowatt-hour rate in dollars per kWh = (1000 × (peak rate in dollars per kWh + off-peak rate in dollars per kWh)/2) + user fee)/1000

Fairbanks:
(1000 × (.1004+ $15)/1000 = 0.1154

Juneau:
(1000 × [(.0922+.0758)/2] + $8.50)/1000 = 0.0925

Anchorage (MLP):
(1000 × (.0993)+ $6.56)/1000 = 0.1059

Anchorage (Chugach):
(1000 × (.1074)+ $8.42)/1000 = 0.1158

Note: Both Anchorage utilities have a flat rate. Juneau rate varies between summer and winter.

A sample calculation using a 200-watt fan: Window fan: 200 watts(avg w) divided by 1000 equals .2 kw. Then multiply by 4 hours per day and 120 days per year, which equals 96 kWh (annual kWh consumption). If you live in Fairbanks, then multiply by 11.54 cents per kWh (Fairbanks kilowatt-hour rate) which is $11.08 a year.

You can usually find the wattage of most appliances stamped on the bottom or the back of the appliance, or on its "nameplate." The wattage listed is the maximum power drawn by the appliance. Since many appliances have a range of settings, the actual amount of power consumed depends on the setting used.

Estimating wattage: If the wattage is not listed on the appliance, you can still estimate it by finding the current draw (in amps) and multiplying that by the voltage used by the appliance. Current × voltage = wattage (Most appliances in the U.S. use 120 volts. Larger appliances, clothes dryers, electric cooktops use 240 volts.) The amps might be stamped on the unit in place of the wattage.

Also note that many appliances continue to draw power even when switched off. These "phantom loads" occur in most appliances that use electricity, such as VCRs, TVs, computers and kitchen appliances. Most phantom loads will increase the appliance's energy consumption a few watts.

Text based on information provided by Michael Lamb, Energy Efficiency and Renewable Energy Clearinghouse.
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