



## **How Much Electricity Does a Light Bulb Use and What will it Cost Me?**

We (the Village of Paw Paw) are often asked... "How do I know how much electricity a home appliance or device is using and what is the charge for that use?" The answer requires some understanding of terms and an example is provided at the end of this information.

### **Guide to a Kilowatt hour & more about Energy**

Kilowatt Hour - This is what you pay for when you buy energy from the local utility

company.

A kilowatt-hour (kWh) is a unit for measuring energy. It is, as its name suggests, one kilowatt of power used over a period of one hour.

#### **Some examples - (See chart below for the math equation)**

A light bulb is typically 60 watts; leave it on for an hour you have used 60 watt hours, or .06 kWh

A typical personal computer uses approximately 70 watts. In addition, a 17" monitor uses another 80 watts. That comes to 150 watts in an hour, or .15 kWh. If you have the same computer on for only 4 minutes (say, to check your e-mail), that would come to .01 kWh.

With an LCD monitor that uses only 35 watts, an hour of usage will come to .105 kWh.



## kilowatt-hour

A quantitative measure of electric current flow equivalent to one thousand watts being used continuously for a period on one hour; the unit most commonly used to measure electrical energy, as opposed to kilowatt, which is simply a measure of available power. Customer billings for all but the largest consumers are usually based in part or in total on the number of kilowatt-hours of electricity used. The standard unit of current flow used in

physics is the joule, but since a joule is only equivalent to one watt-second, kilowatt-hour has become a much more convenient standard.

A kilowatt-hour of energy typically costs between two and twenty cents depending on where and when it is purchased and by whom. This much energy will operate a 40-watt lightbulb for a full day, a 19" color television for about four hours, a personal computer for 2-1/2 hours, an electric hairdryer for 30 to 60 minutes, an electric razor for 36 hours, a clothes dryer for 15 minutes, a microfurnace heater for 40 minutes, a clock radio for up to several days, a portable stereo for as long as a week, and a telephone answering machine for as long as a month.

While most consumers express surprise at the relatively low cost of energy for these common devices, environmental experts and energy planners alike caution that customer costs for energy in North America, which are among the lowest in the world, don't necessarily reflect the real cost of energy. Some claim that future costs of undoing any environmental damage done through most types of commercial energy generation could add dramatically to the total cost of energy over the long term.

## Amperes, Volts, Watts, Horsepower & BTUs

The many measures used in discussing energy, power and heat are all related and are not that complicated when you take a close look at them. After this you should know what a kWh is. If not, read more about [kWh](#).

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## Brief overview

1 watt = 1 volt X 1 ampere

1 watt = 3.41 BTU

746 watts = 1 horsepower

**Volt:** Measure of electrical potential

**Ampere:** Measure of current.

## Measures of power

- Watts, Kilowatts, Megawatts and Gigawatts (terms go up in measures of 1,000)  
1 kilowatt (kW)= 1,000 watts  
1 megawatt (MW)= 1,000 kW  
1 gig watt (GW)= 1,000MW
- Horsepower (see above)

## Measures of energy

- Watt hours, kilowatt hours  
1 kilowatt hour = the amount of energy donated to a load of one kW in one hour.

## Measures of heat

- BTU: quantity of heat needed to raise the temperature of 1 pound of water 1F. It is approximately the amount of heat created by lighting a common kitchen match.

**Converting one unit into another** (see next page)



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## Converting one unit into another

To Convert a measure of	Into	Use this equation:
Kilowatts	Watts	Kilowatts x 1000
Watts	Kilowatts	Watts x 0.001
Megawatts	Kilowatts	Megawatts x 1000
Kilowatts	Megawatts	Kilowatts x 0.001
Gigawatts	Megawatts	Gigawatts x 1000
Megawatts	Gigawatts	Megawatts x .001
Gigawatts	Watts	Gigawatts x 1 billion
Watts	Btu/hour	Watts x 3.413
Btu/hour	Watts	Btu/hour x 0.293
Kilowatts	Btu/hour	Kilowatts x 3414
Btu/hour	Kilowatts	Btu/hour x 0.000293
Watts	Horsepower	Watts x 0.00134
Horsepower	Watts	Horsepower x 746
Kilowatts	Horsepower	Kilowatts x 1.34
Horsepower	Kilowatts	Horsepower x 0.746

## AC/DC – What's the Diff?

**Electricity** is the movement of electrons in a current.

**Current** is the flow rate of charges through a wire. Current is measured in amperes, and is sometimes called amperage, though engineers frown on this term.

**Voltage** is a measure of power. Voltage in itself is not entirely dangerous. It is amperage that kills people.

A **watt** is a measure of power x current. Learn more about [power terms](#)

**Alternating current (AC)** is the kind of electrical current commonly used to power all your household items, available from plug outlets in your wall. Alternating current is the most efficient transmission of energy. Its most common form is a sine wave, meaning a very "smooth" wave. Other forms of alternating current are triangular and square waves. The magnitude of alternating current varies in a cyclical form.

**Direct current**, on the other hand is a current whose polarity remains constant (with no variation). Direct current is most commonly available in batteries.

### **Why is AC more commonly used?**

It is much better suited to transmission over long distances. With direct current, there is a potential loss of power relational to the distance it travels.



### **Energy Use Calculator**

To calculate typical home appliances and tools and devices type the following web address into your web browser:

<http://www.thesolarguide.com/calc.aspx>

#### **Example: Figure the energy used and multiply by the cost**

Watts is a rate, if something (say a light bulb) is rated at 72 watts per hour; it will be rated 72 watts 3 hours from now (as long as it's still running). Kilowatt hour is a unit of energy. Just turn watts into kilowatts by dividing wattage by 1000, then multiply by the hours the thing is running to get kilowatt hours. So... If a device is rated 72 watts and it runs for 6 hours, 0.432 kilowatt hours of energy is used. [72 divided by 1,000 = 0.072 times 6 = 0.432 kilowatt hours]. Multiply this by the rate your utility charges per kilowatt hour and you'll know the cost for running that device for 6 hours.

Since electrical energy fluctuates from month to month because of changing fuel-cost adjustments (the cost of one electrical power company buying electrical power from other companies to make sure they have enough energy to supply you and your neighbors), call your local utility to determine the current electrical charge per kilowatt hour.

**Information provided by the Village of Paw Paw  
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