

ELECTRICITY CONSUMPTION

Electricity can be measured in several ways depending on what aspects of this phenomenon we want to study. The three basic measuring units in electricity are voltage (V), current (I) and resistance (R).

- Voltage is the pressure that pushes electrons in a circuit; it is measured in volts.
- Electrical current (I) is defined as electrons flowing between two points having a difference in voltage. Current is measured in amperes or amps (A).

$$\text{Current} = \text{Quantity of charge} / \text{time}$$

or

$$I = Q/t$$

- Resistance (R) is a property that slows the flow of electrons. It is measured in units called ohms (Ω). George Ohm was a German physicist who discovered that in many materials, especially metals, the current that flows through a material is proportional to the voltage. This relationship is called Ohm's Law and can be described using this formula:

$$\text{Voltage} = \text{Current} \times \text{Resistance}$$

which means also

$$I = V/R \text{ (Current is equal to the voltage divided by resistance)}$$

Electric power is measured in watts. Watts measure the amount of work done by a certain amount of current at a certain pressure or voltage.

$$1 \text{ watt} = 1 \text{ amp multiplied by } 1 \text{ volt}$$

$$1 \text{ amp} = 1 \text{ watt divided by } 1 \text{ volt}$$

The electric power in a circuit is equal to the voltage multiplied by the current:

$$\text{Power} = \text{Voltage} \times \text{Current}$$

or

$$P = V \times I$$

which means also

$$V = P/I$$

Electricity is unlike most consumer goods because it is produced in real time as customers demand it. Since demand fluctuates, it is continually reviewed and anticipated to ensure enough power is steadily available to meet the needs of consumers.

The basic unit of electric power is a watt. The higher the wattage, the more energy the electrical device will need to operate. For example, light bulbs are available in a range of wattages (ie: 60-watt, 100-watt and 150-watt), depending on the brightness of the light.

Of course, how long a bulb or other device is operating also determines the amount of electricity used. The standard measurement of electricity includes both the amount and duration of power used. This standard is the kilowatt hour (kWh), the amount of energy consumed by a load of 1,000 watts operating for one hour. Here's how the use of household appliances may impact residential electricity bills.

ELECTRICITY USE	AVERAGE USE	AVERAGE MONTHLY COST 6 CENTS/KWH
100 Watt bulb	6 hours/day	\$ 1.10
Microwave Oven	20 minutes/day	0.70
New Refrigerator	Continuous	3.40
Old Refrigerator	Continuous	7.25
Washing machine	8 loads /week	0.50
Computer & printer	3 hours/day	1.28
Television: 26" colour	4 hours/day	1.45
Furnace fan	Normal heat cycle	3.95

(Adapted from www.energy.gov.ab.ca)

READING COMPREHENSION

ACTIVITIES



● Answer the following questions.

- ① Why is electricity unlike most consumer goods?
- ② What is the basic unit of electric power?
- ③ What does the standard measurement of electricity include?
- ④ What is the kilowatt hour?

WRITING

● Solve the following problems.

- ① A 350-watt appliance runs with a current of 2.1 amps. How much voltage must be supplied to the appliance?
- ② A 1,500-watt appliance runs for 3 hours. How much electric energy is used by the appliance? If the electric company charges Euro 0.15/kilowatt-hour, what is the cost of running the appliance?

SPEAKING

● Talk about the electricity consumption of household appliances.

