



What's a Watt?

A **watt** is a measure of electricity. If you have 10, 100-watt bulbs all on at the same time, the “demand” or instantaneous measure of the power required for the job, is 1,000 watts, also called 1 kilowatt, or kW. If you keep them lit for one full hour, you have used 1,000 watt-hours of electricity, also called a kilowatt-hour or kWh. The typical American home uses about 840 kWh per month.

Megawatt: One megawatt equals one million watts, or 1,000 kilowatts, roughly enough electricity for the instantaneous demand of 750 homes at once. That number fluctuates (some say one megawatt is enough for 1,000 homes) because electrical demand changes based on the season, the time of day, and other factors.

Gigawatt: You guessed it, one billion watts.

Voltage: Hard to describe, but just as it takes pressure to move water through a pipe, it takes voltage to move electricity across a wire. Transmission lines usually carry power at 500, 230 or 115 kV. It is “stepped down” into lower voltage (69 kV and lower) by transformers at substations and along distribution lines for final delivery to homes and businesses. It comes into your house at 220 volts, and most of your household plugs carry 110 volts.

Capacity: How much electricity an electrical facility can carry or generate. Usually applied to generators, transmission lines, substation equipment and distribution lines.

Energy vs Capacity: If you're filling up a bucket with water from a garden hose, the amount of water moving through the hose is the “energy” or wattage, and the water pressure inside the hose is the voltage. The size of the hose is the capacity.

The Electrical Grid: Continuing the water analogy, envision the electrical grid as a big pressurized water system with hundreds of pumps (generators) pumping water into the system through long pipes (transmission lines), and literally millions of customers sucking water out through smaller straws (utility distribution systems). There are hundreds of places (substations) where valves and adapters (switches and transformers) are used to break the large volumes of water down into smaller units under less pressure

for delivery through the straws. The ISO's job is to make sure that in the high-pressure system, the water pressure (voltage) and the RPMs of all the pumps (frequency) remain constant, even though inflow and outflow (measured in wattage) are both changing minute by minute.

Frequency: Much like radio signals, electric generators can be “tuned” to produce power that vibrates at different frequencies. In the United States, virtually all electricity is generated and transmitted at 60-hertz or 60 cycles. Motors and other electrical equipment in the U.S. are calibrated to run at 60Hz. As the frequency fluctuates, it can damage all manner of electrical equipment. Frequency can be affected by a variety of factors and must be monitored closely to make sure it doesn't fluctuate.

Load: The load is the energy use; the ISO refers to utilities like PG&E as “load-serving entities” because that's what they do, they serve a load. Load is frequently confused with demand, which is actually how much power the load requires.

Demand: The number of kilowatts or megawatts delivered to the load at a given instant.

Market Participant (MP): Any entity that buys, sells, trades, transmits or distributes electricity in the California ISO control area. This includes utilities, generating companies, transmission owners, energy-trading companies and Scheduling Coordinators.

Scheduling Coordinator (SC): Entities that buy or sell power through the California ISO have to do so through a Scheduling Coordinator. The SC is specifically authorized by the ISO to handle this type of transaction. SCs may be a subsidiary of the company they represent, or hired as agents to represent the company.

Investor Owned Utility (IOU): This title usually applies to one or all of the big three utilities in California: Pacific Gas and Electric (PG&E), Southern California Edison (SCE) and San Diego Gas and Electric (SDG&E). It refers to the fact that these are private companies, owned by stockholders, as opposed to municipal utilities, like Los Angeles Department of Water and Power (LADWP).