

UNDERSTANDING ELECTRICITY: A GUIDE TO INDUSTRY TERMINOLOGY



What's a Watt?

A watt is a measure of electricity. If you have ten 100-watt bulbs on at the same time, the "demand" or instantaneous measure of the power required for the job is 1,000 watts, also called one 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 because electrical demand changes based on the season, the time of day and other factors.

Voltage

Just as it takes pressure to move water through a pipe, it takes voltage to move electricity across a wire. The high-voltage transmission lines operated by the ISO carry power at 500, 230 or 115 kV. It is "stepped down" into lower voltage by transformers at substations and for delivery to homes and businesses. Final delivery by the utilities is at 220 volts; most household plugs carry 110 volts.

Capacity

The amount of 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 straws. The ISO's job is to make sure that the high-pressure system, the water pressure (voltage) and the pump output (frequency) remain constant even though inflow and outflow (measured in wattage) are changing minute by minute.



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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 per second (cps). If 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 by the ISO to make sure it remains very close to the 60 cps target.

Load

Load is the energy use; the ISO refers to utilities as Load Serving Entities (LSEs) because that’s what they do, serve 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

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 (SC).

Scheduling Coordinator

Entities that buy or sell power through the California ISO have to do so through a SC that 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 for the company.

Investor-Owned Utility (IOU)

The term investor-owned utility or IOU refers to the fact that these are private companies, owned by stockholders, as opposed to municipal utilities that are owned by the customers they serve.

The three largest utilities in California are: Pacific Gas and Electric (PG&E), Southern California Edison (SCE) and San Diego Gas and Electric (SDG&E).