The electric transmission system moves power from the generating stations where it is produced to load centers where it is used. The transmission system moves electricity at high voltages. The voltage is reduced before the electricity can be used by business and residential consumers.

The high-voltage transmission system makes it possible to transport large amounts of electricity efficiently over long distances. Without it, electricity would have to be used close to where it is generated.

Generating stations produce electricity with voltages ranging from 2,300 to 24,000 volts. In switchyards or substations outside these plants are large transformers that raise, or step up, the voltage to levels suitable for transmission – 115,000 volts and higher.

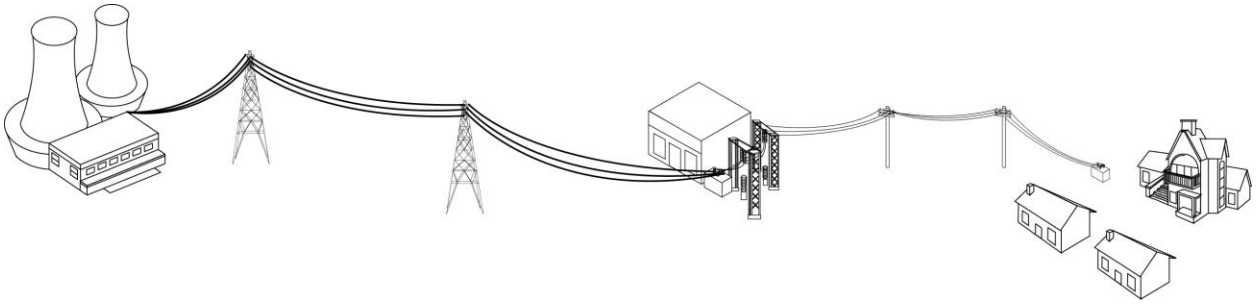
The electricity is transmitted from one point to another by conductors, which are cables that are made up of many strands of wire. These conductors are strung between large transmission towers. Interconnected transmission lines form a network so that if one line fails, others can take up the load.

Most of the North American transmission system operates on alternating current. These AC transmission lines carry three-phase current – three separate streams of electricity traveling through separate conductors.

At various points in the network, large transformers in substations reduce, or step down, the voltage to a level suitable for distribution. Substation transformers step down transmission voltages to feed the distribution system at voltages ranging from 4,160 to 34,500 volts.

Substations play an important role in the electrical system. In addition to transformers, substations contain switching devices and other electrical equipment. Devices called regulators, for example, react to changes in customer demand to help maintain a steady voltage. Capacitors momentarily store energy and reduce energy losses while helping to support voltage levels.

Conductors known as feeders leave substations in various directions, carrying power to local distribution points. Other transformers then reduce the voltage further for use by homes and businesses.



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