

The electricity industry has a language all its own. Knowing the meaning of a few key terms makes it easier to understand how the electricity system works.

Alberta Interconnected Electric System (AIES)

The system or highway of transmission towers and wires that delivers electricity from generators around the province to our homes, businesses, farms and industry. It is this transmission highway that powers Alberta's economy and our quality of life. The Alberta Electric System Operator (AESO) is mandated to manage the AIES and ensure power supply and demand are balanced at all times.

AC vs. DC

Electricity flows in two ways, either as alternating current (AC) or direct current (DC). The difference is the direction power moves through the transmission lines. In DC, the power moves in a single direction or forward. In AC, the power switches directions, sometimes going forward and then backwards—about 60 times per second. The power that comes from wall outlets is AC. Alberta's transmission system has been built to work with the AC that our power plants generate. Converter stations are needed to connect an AC system to a DC system. These converter stations require additional infrastructure to be built.

Interconnection

An electrical connection to the transmission system by a generator or large commercial or industrial customer.

Intertie

The high voltage power lines and other transmission system equipment that connect two neighbouring power systems. Interties allow us to import power into Alberta when provincial demand exceeds supply and export surplus power to other areas when provincial supply exceeds demand. Alberta currently has two interties—one with British Columbia and one with Saskatchewan.

Kilowatt hour/megawatt hour

Power is measured in watts, with one kilowatt (kW) equaling 1000 watts. Imagine 10 lamps, lit with 100 watt bulbs for one hour. At the end of the hour, the lamps will have used one kilowatt hour of electricity. Electricity retailers typically bill households in kilowatt hours. A megawatt (MW) is equal to 1000 kilowatts. A megawatt hour measures the amount of electricity a generator produces in one hour.

Load

The total amount of electricity required to meet customer demand at any moment. It can be measured for an overall system or at specific points along the electric system like at a city, town or home.

Peak electricity demand

Refers to how much electricity customers need and use. The demand for electricity is measured each hour. The highest hourly consumption of electricity during a year is called peak demand. The peak demand for power is reported in megawatts (MW) and measures the amount of electricity necessary to serve all Alberta customers during times when they use the most power. In Alberta, the highest hourly consumption of power typically occurs during the winter months.

Reliability

The ability of a system to respond to the changing demand for power from consumers. Reliability also describes the ability of a system to withstand sudden disturbances such as when equipment is hit by lightning, or the unanticipated failure of equipment or facilities that are part of the interconnected power grid.

Supply/demand balance

One of the most important things to remember about electric systems is that the supply and demand for power must always be in balance. Electricity cannot be stored efficiently so it must be used at the same instant it is produced. The AESO's system controllers are responsible for ensuring there is adequate power on the electric system and that supply and demand balance at all times.

Transmission facility owner (TFO)

Transmission facility owners (TFO) own and operate high voltage power lines and equipment within specific service areas that link generating units to large customer loads and distribution systems.

Congestion and Constraint

Congestion occurs when too much power is run through transmission lines at a particular time, causing constraint; a reduction in the ability of some generators to move their power to specific locations. A congested transmission system is one that cannot serve the needs of customers even when running at full capacity because the path between generators and consumers is constrained.