Powering the Grid

Structure

- Typical 500kV (500,000 volts) structure height is 160 – 200 feet single poles or lattice towers.
- Most 500kV towers are made of galvanized steel to support large loads (wind, ice, and conductors).
- Transmission conductors carry current from generator (source) to load (substation), where it is reduced to usable power and placed on distribution lines as energy for end users.
- Conductors are typically made of aluminum, steel, and copper.
- Other structures help carry the conductor in angles and straight lines (tangent) to minimize costs and impacts.
- Larger wires can carry larger capacity but require much larger structures.

Reliability

- Reliability standards are federally mandated by the North American Electric Reliability Corporation (NERC).
- Utilities must report periodically to NERC to ensure standards are implemented and maintained.
- The regional "main grid" transmission system must be able to survive the single worst condition.

Transmission line along a street

Transmission Lines

A 500kV line carries 1,000 to 1,500 Megawatts, enough to power about 1-1.5 million homes.

Higher voltage is more efficient for long distance bulk energy transmission.