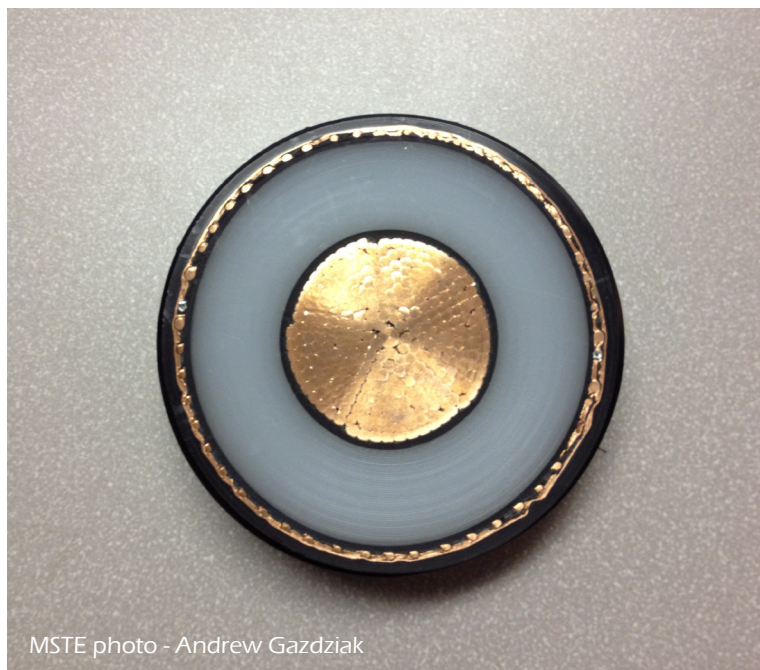




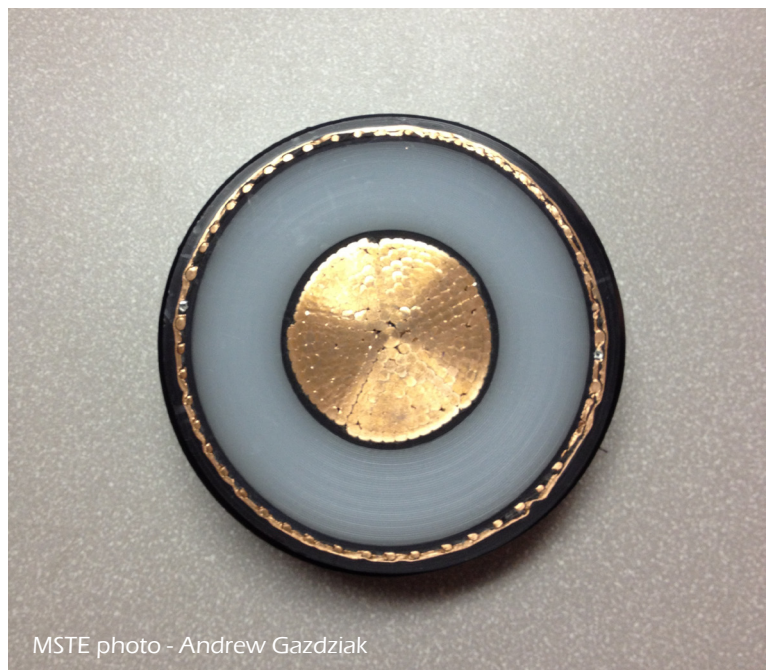
MSTE photo - Ji-Young Kim



MSTE photo - Ji-Young Kim



MSTE photo - Andrew Gazdziak



MSTE photo - Andrew Gazdziak



CC BY 2.0 - Rhys Asplundh



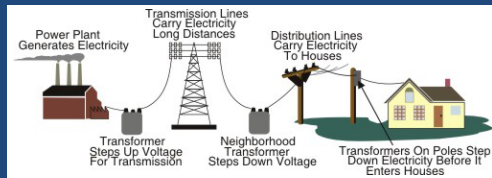
CC BY 2.0 - Rhys Asplundh

Transformer

Transmission and Distribution

The power grid transports energy at many different voltages. These range from 120V to over 700,000V.

Transformers change the voltage of the transported energy. A transformer can convert a high voltage, low current line into a lower voltage, higher current line. Transformers are visible in many places in our communities. Transformers like the one in the photo step down voltage from high to lower voltage before it enters neighborhoods. Other transformers step it down again before it enters homes and buildings.



Source: National Energy Education Development Project (public domain)

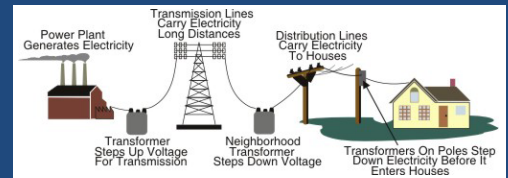


Transformer

Transmission and Distribution

The power grid transports energy at many different voltages. These range from 120V to over 700,000V.

Transformers change the voltage of the transported energy. A transformer can convert a high voltage, low current line into a lower voltage, higher current line. Transformers are visible in many places in our communities. Transformers like the one in the photo step down voltage from high to lower voltage before it enters neighborhoods. Other transformers step it down again before it enters homes and buildings.



Source: National Energy Education Development Project (public domain)



Underground Jacketed Cable

Transmission and Distribution

High voltage underground jacketed cables move electricity over long distances in areas where overhead transmission lines are not practical. In areas where storms cause frequent power outages, underground cable helps prevent storm damage. Since the cable is underground, extra insulation is needed around the conductor to keep it from coming in contact with the ground. More shielding layers and a jacket surround the insulation to protect the copper core from corrosion and electromagnetic interference. Underground transmission cable is much more expensive than overhead lines and is more difficult to repair, but underground lines use less land than the towers that carry overhead lines.



Underground Jacketed Cable

Transmission and Distribution

High voltage underground jacketed cables move electricity over long distances in areas where overhead transmission lines are not practical. In areas where storms cause frequent power outages, underground cable helps prevent storm damage. Since the cable is underground, extra insulation is needed around the conductor to keep it from coming in contact with the ground. More shielding layers and a jacket surround the insulation to protect the copper core from corrosion and electromagnetic interference. Underground transmission cable is much more expensive than overhead lines and is more difficult to repair, but underground lines use less land than the towers that carry overhead lines.



Smart Meter

Transmission and Distribution

Utilities install meters on homes and other buildings so they know how much to bill the customers. Until recently, the meter just counted the number of kilowatt hours (kWh) of electricity used, and a utility employee visited the meter each month to read the dials. The photo shows the circuit board inside a smart meter. These new meters measure energy use in hourly intervals and are now being installed in many regions throughout the U.S. and Canada. A smart meter also allows the power company to read the meter remotely and to send information to the meter to troubleshoot and solve problems. Smart meters, together with other technologies that allow consumers to track their energy use, are part of a plan to make the electrical grid safer, greener, more economical, more efficient, and more reliable.



Smart Meter

Transmission and Distribution

Utilities install meters on homes and other buildings so they know how much to bill the customers. Until recently, the meter just counted the number of kilowatt hours (kWh) of electricity used, and a utility employee visited the meter each month to read the dials. The photo shows the circuit board inside a smart meter. These new meters measure energy use in hourly intervals and are now being installed in many regions throughout the U.S. and Canada. A smart meter also allows the power company to read the meter remotely and to send information to the meter to troubleshoot and solve problems. Smart meters, together with other technologies that allow consumers to track their energy use, are part of a plan to make the electrical grid safer, greener, more economical, more efficient, and more reliable.

