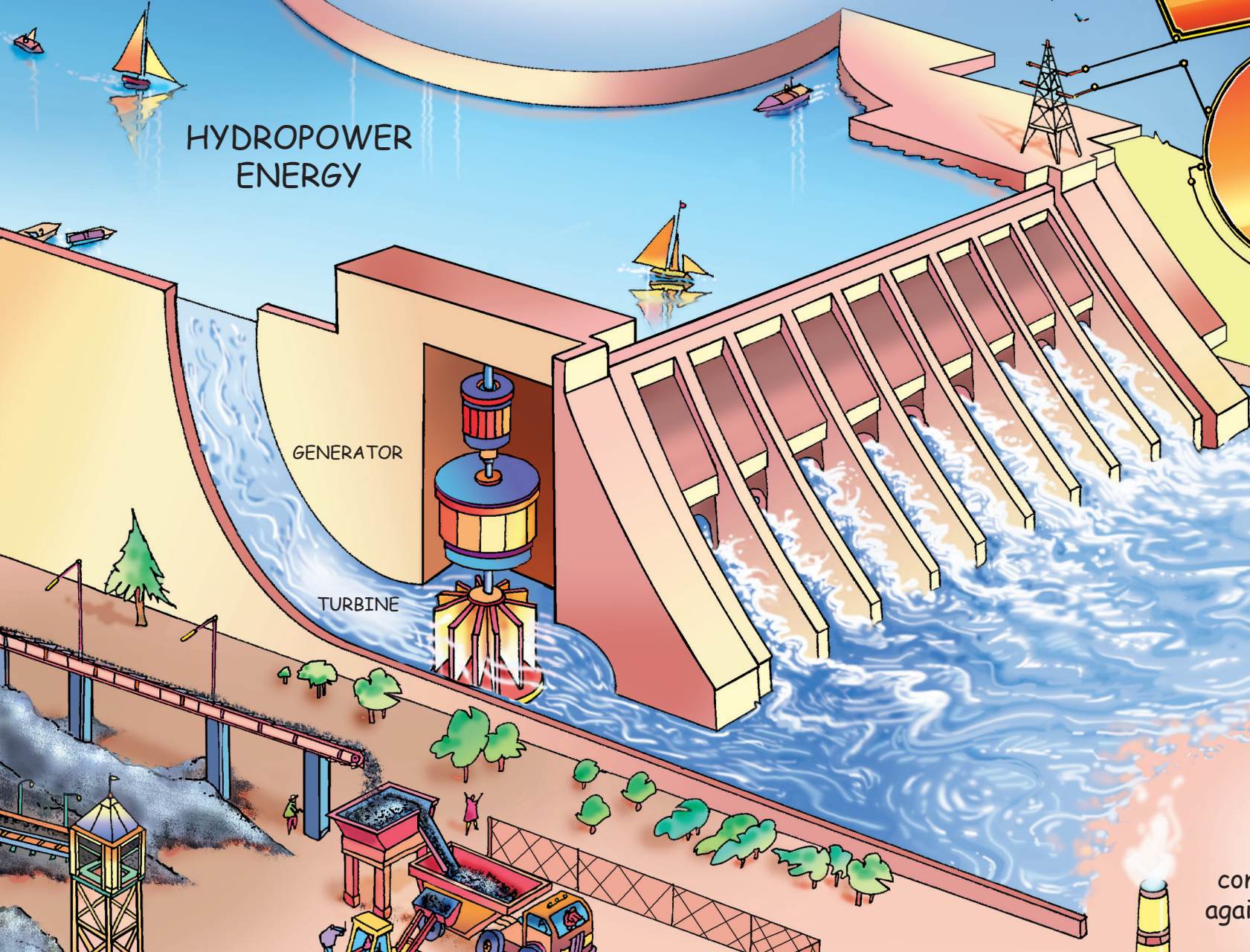


ELECTRICAL GENERATION

Hydropower

Hydroelectric power uses either falling water or the force of a natural river current to generate electricity. Water, from behind a dam, flows through a pipe called a penstock and pushes against the blades of a turbine causing them to spin.

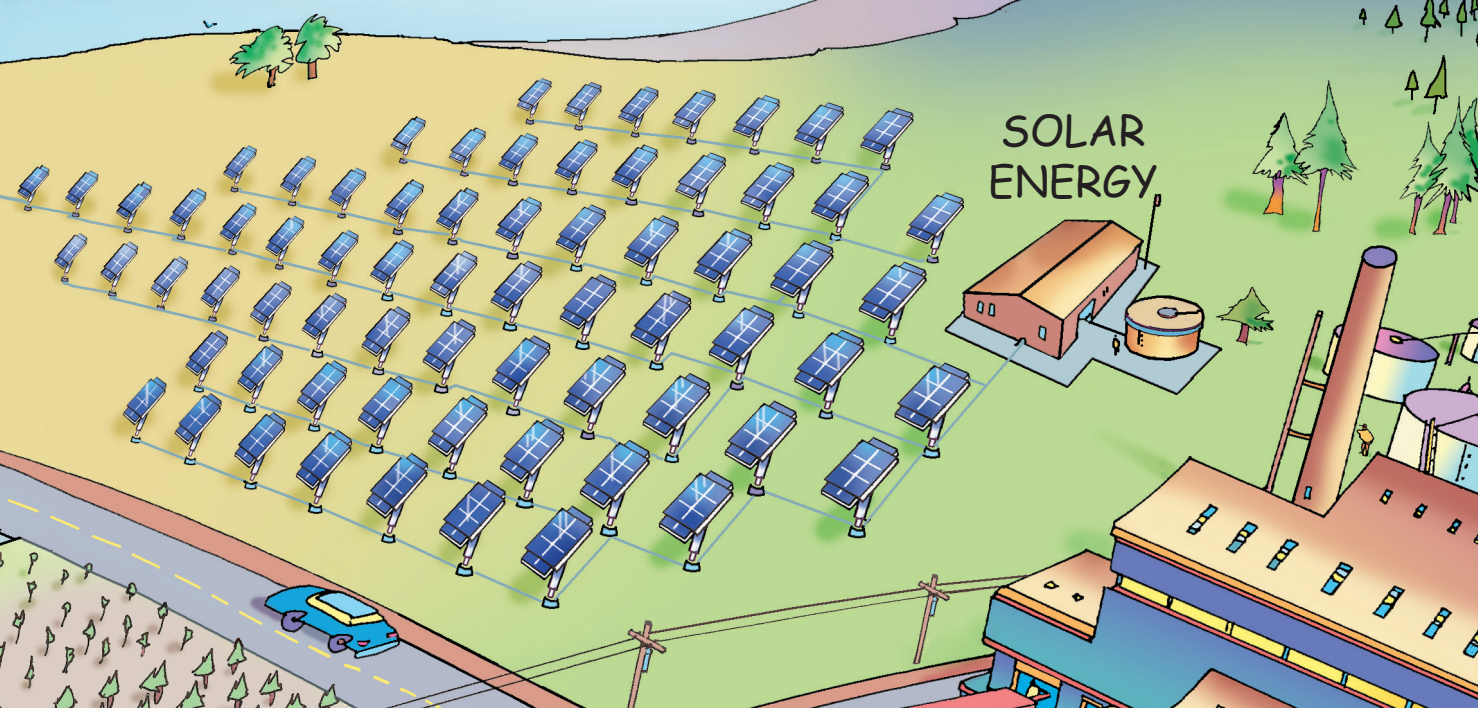
HYDROPOWER ENERGY



Solar Energy

Primary solar energy technologies — photovoltaics, solar thermal electric systems and solar heating and cooling systems — capture the sun's energy to produce electricity or heat. Photovoltaic (PV) solar cell systems, one of the fastest growing technologies, use semiconductor material to convert sunlight directly into electricity. They have no moving parts and produce no pollution during operation. Electricity can be stored in batteries for use when the sun isn't shining.

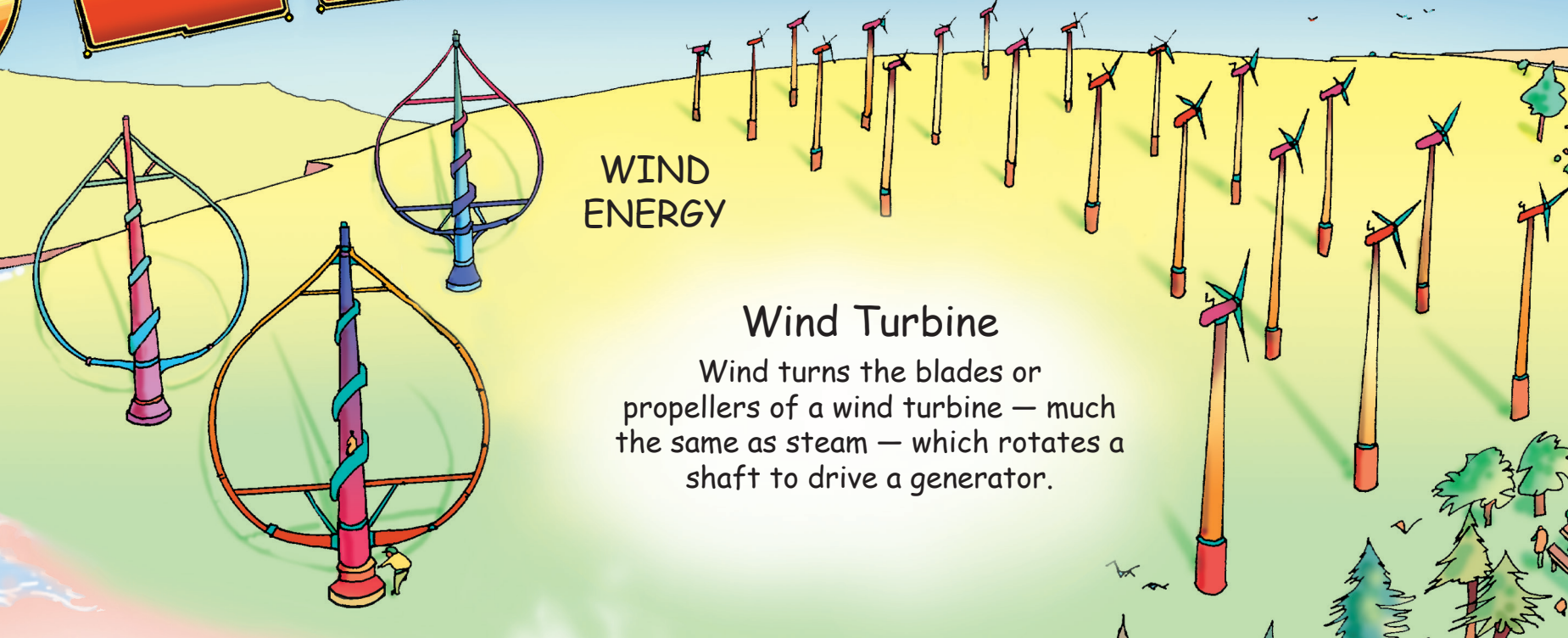
SOLAR ENERGY



WIND ENERGY

Wind Turbine

Wind turns the blades or propellers of a wind turbine — much the same as steam — which rotates a shaft to drive a generator.



Condenser

After the steam has traveled through the turbine it usually goes through a condenser where it is cooled off and becomes water again. The cooled water then goes back into the boiler where it is reheated and the process repeats over and over.

WATER VAPOR

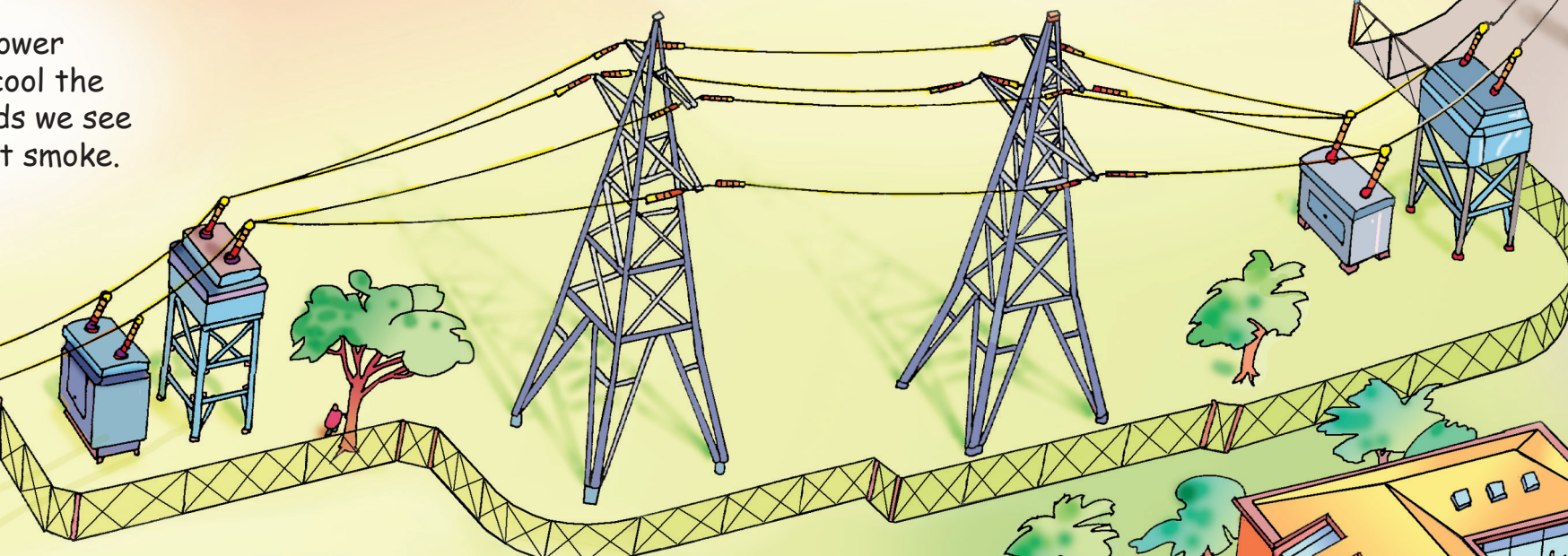
Cooling Tower

Water from the cooling tower is used in the condenser to cool the steam. The billowy, white clouds we see at power plants are steam, not smoke.



Distribution

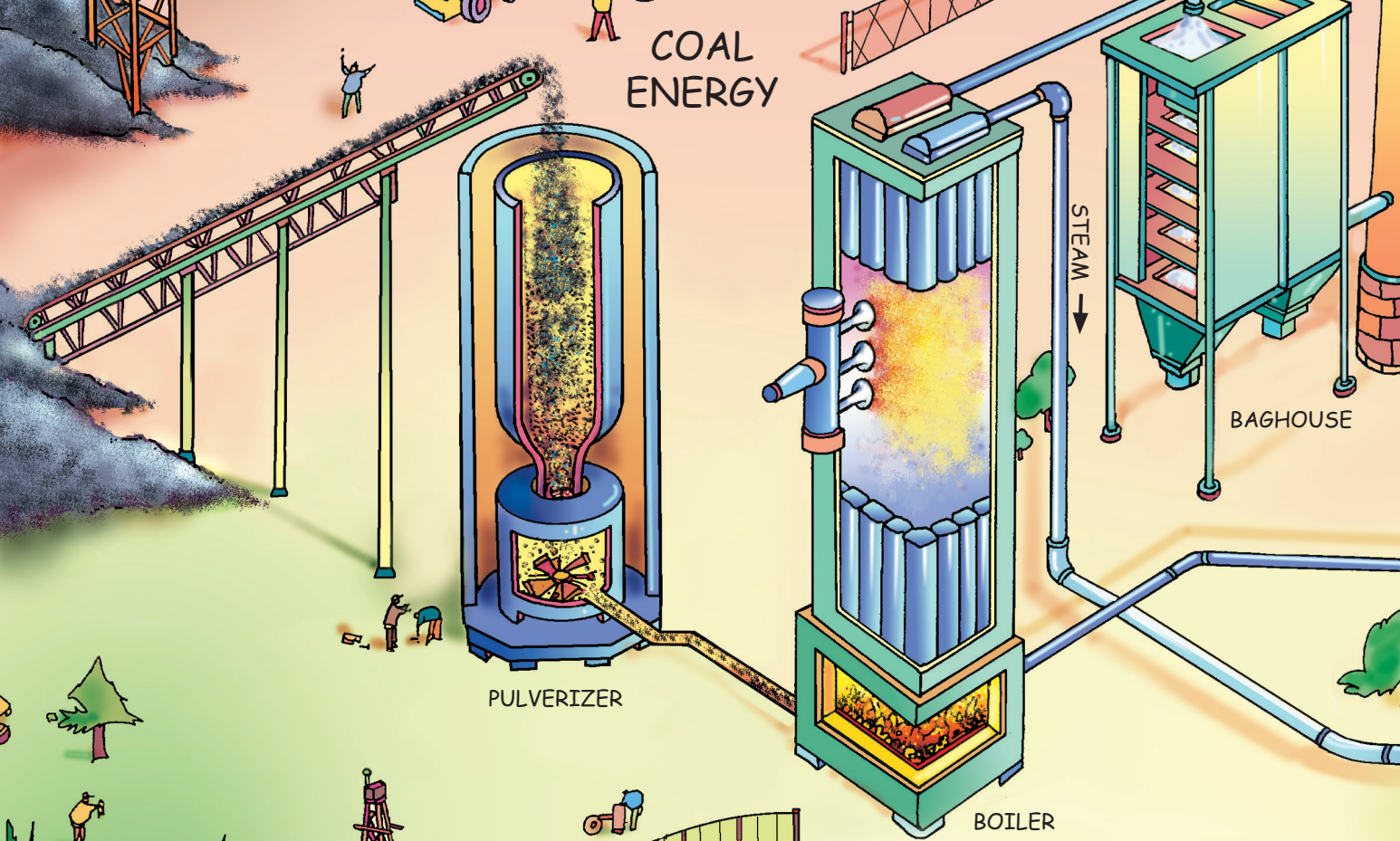
Step-down transformers, located at substations near the final destination, reduce the voltage so electricity can be carried on smaller distribution lines to the customer. (Most distribution lines are installed underground where they are safer and less visible.) Small transformers on poles or on the ground reduce voltage to 120 - 240 Volts for residential customers.



Biomass

Biomass is derived from living things such as wood, agricultural products and debris. It is burned to produce heat in a boiler, creating steam to spin the blades of a turbine. It is also used to create liquid fuels.

COAL ENERGY



Transmission

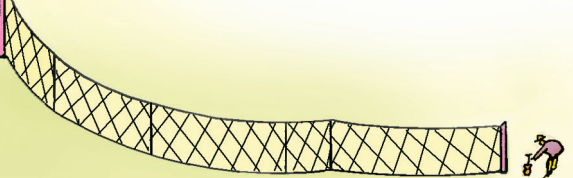
The electricity leaves the power plant and travels along cables to a step-up substation located nearby. The voltage is increased to 69,000 to 765,000 Volts. The voltage depends on the distance the power will travel and the amount of electricity desired.

Generator

The generator's magnet turns inside a stationary ring that is wrapped with wire. As the magnet is rotated, electric current is produced in the wire. When a wire of any electrically conductive material moves across a magnetic field, an electric current is produced in that wire.

Turbine

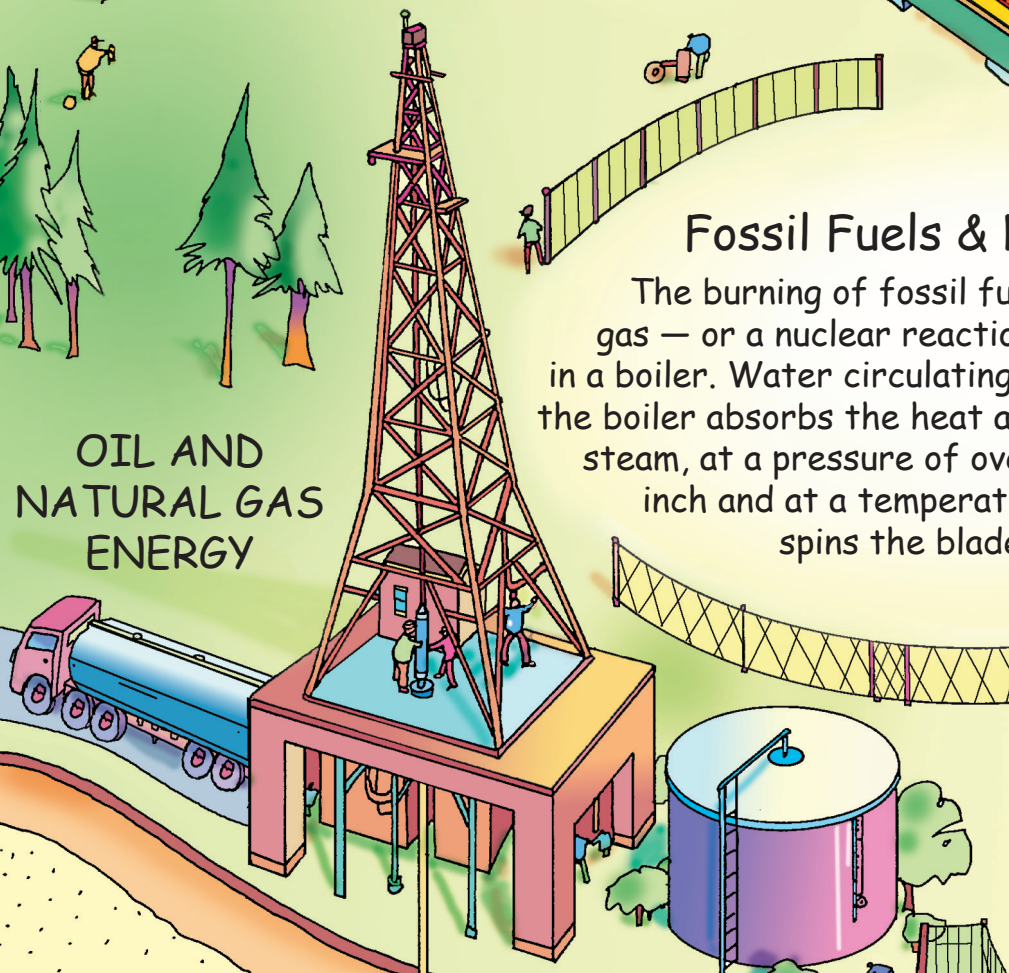
The spinning blades of the turbine rotate a shaft that drives a generator. The size of the turbine blades corresponds to the amount of steam or force needed to turn the blades. Smaller blades require more steam or force.



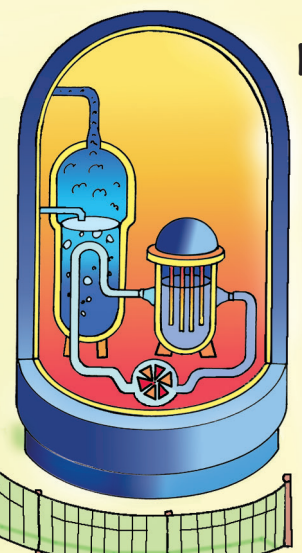
Fossil Fuels & Nuclear Energy

The burning of fossil fuels — coal, oil or natural gas — or a nuclear reaction, is used to produce heat in a boiler. Water circulating through pipes in the walls of the boiler absorbs the heat and is converted to steam. The steam, at a pressure of over 2,500 pounds per square inch and at a temperature of 1000 F (537.8 C), spins the blades of a turbine.

OIL AND NATURAL GAS ENERGY



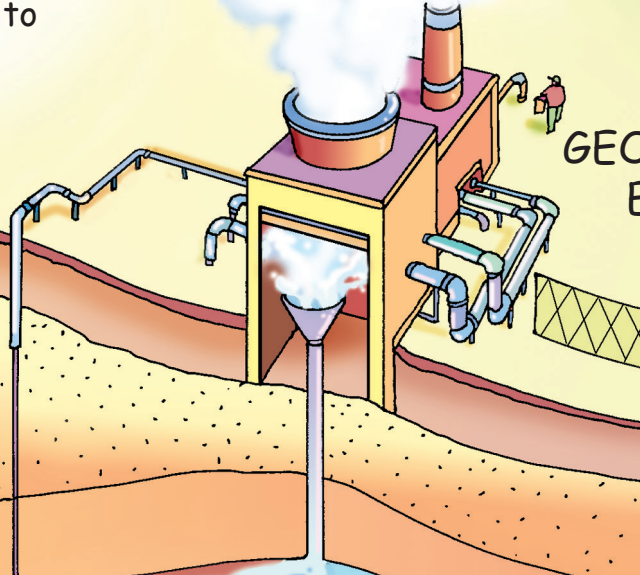
NUCLEAR ENERGY



Geothermal Energy

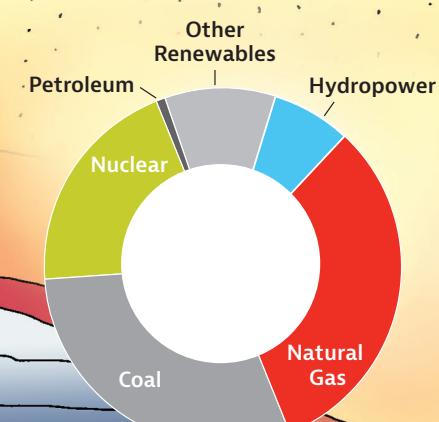
Sometimes steam used directly from underground geothermal sources spins the blades of a turbine to produce electricity.

GEOTHERMAL ENERGY



Uses

Electric power companies generate, transmit and then distribute electricity to residential communities, businesses, industrial companies and to commercial customers.
Use energy efficiently.



United States Fuel Mix 2017
Source: U.S. Energy Information Administration