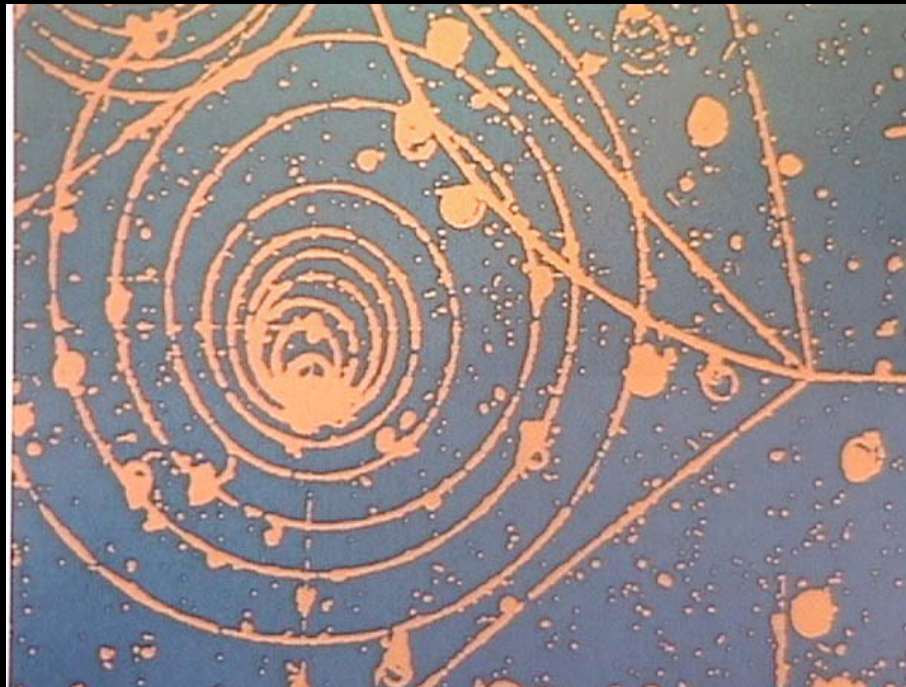


# Understanding Energy Units: The Basics

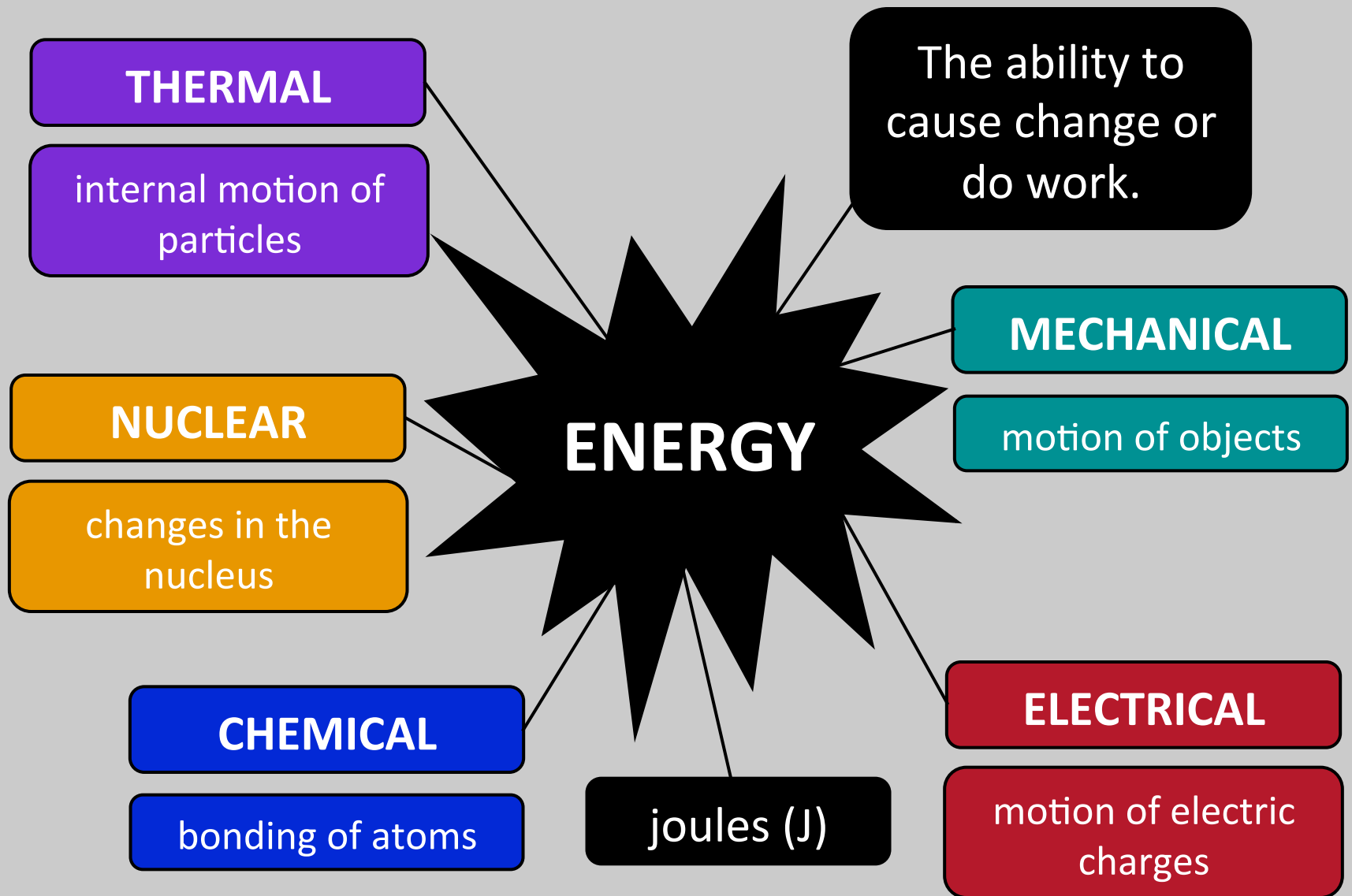
# Energy: Work & Power

## The Law of Conservation of Energy

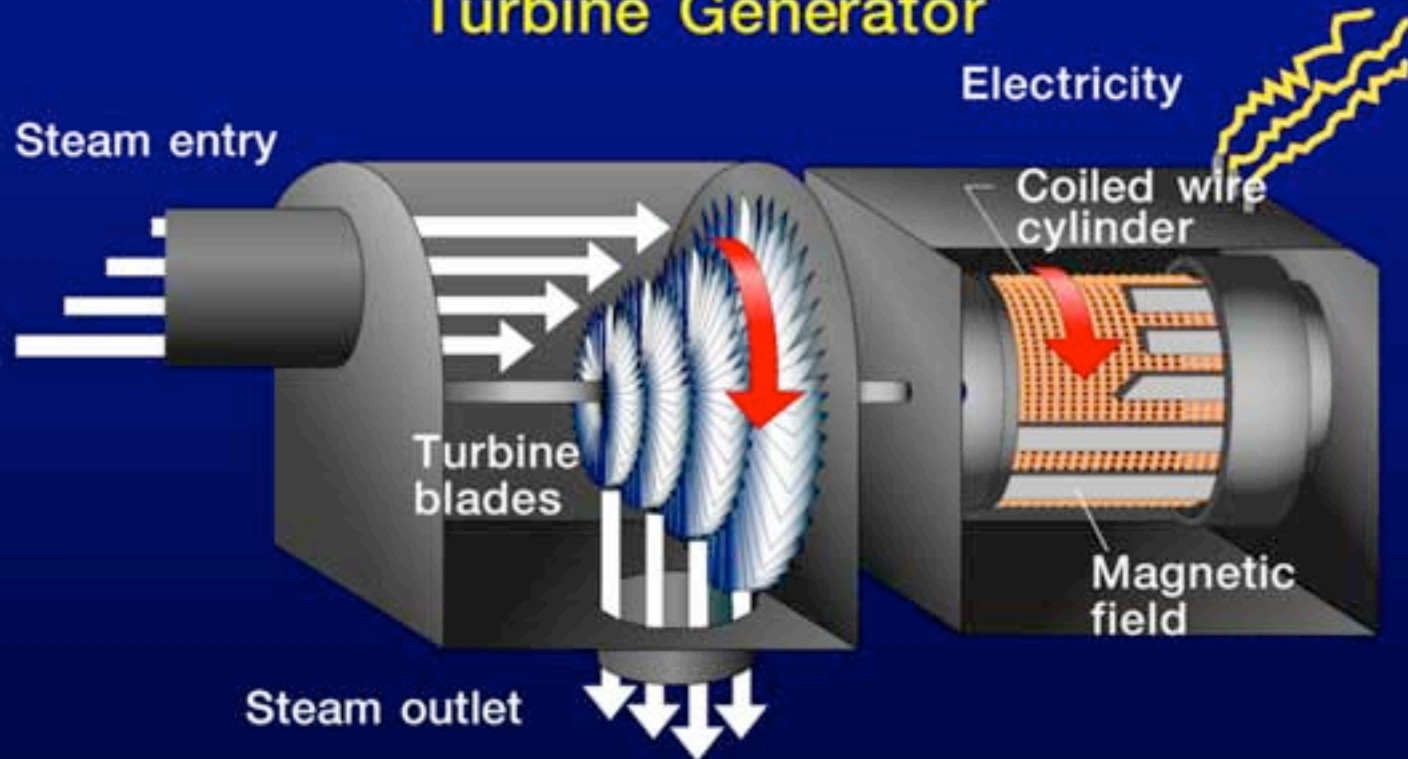
Energy is conserved. Energy may change form but it may not be created or destroyed (in closed systems, in which energy cannot enter or leave the system).



# Forms of Energy



## Turbine Generator





# Organic Sedimentary Rock

## Coal



Bituminous



Anthracite

- Peat --> Lignite --> Coal
- Coal: Bituminous & Anthracite

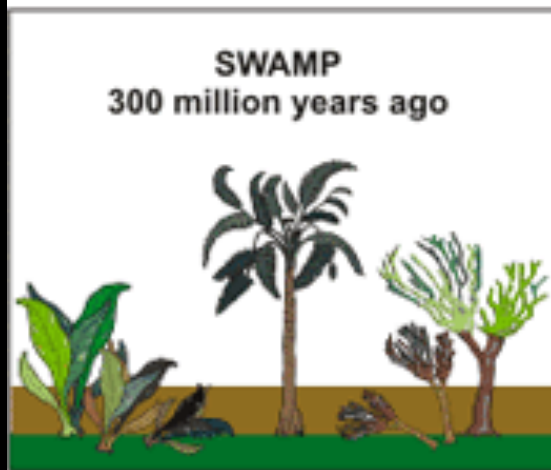
# Organic Sedimentary Rock



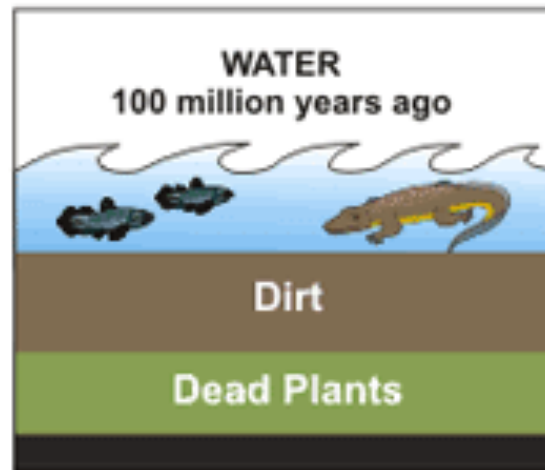
Model of a Pennsylvanian Coal Swamp

# Organic Sedimentary Rock

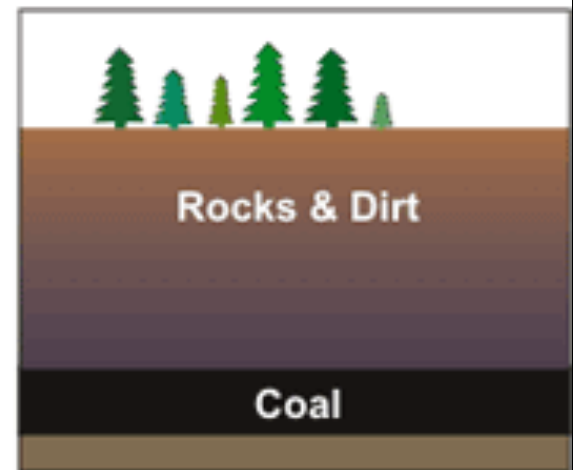
## HOW COAL WAS FORMED



Before the dinosaurs, many giant plants died in swamps.

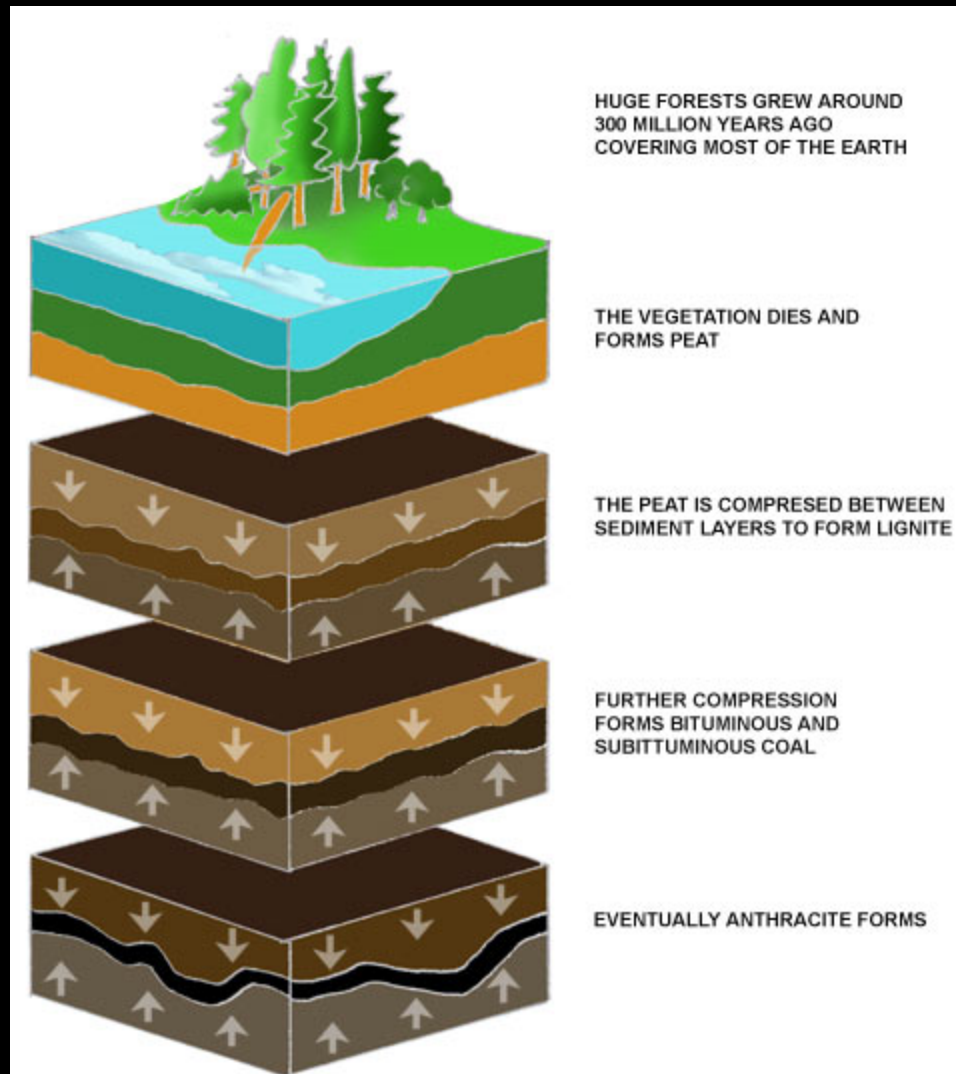


Over millions of years, the plants were buried under water and dirt.



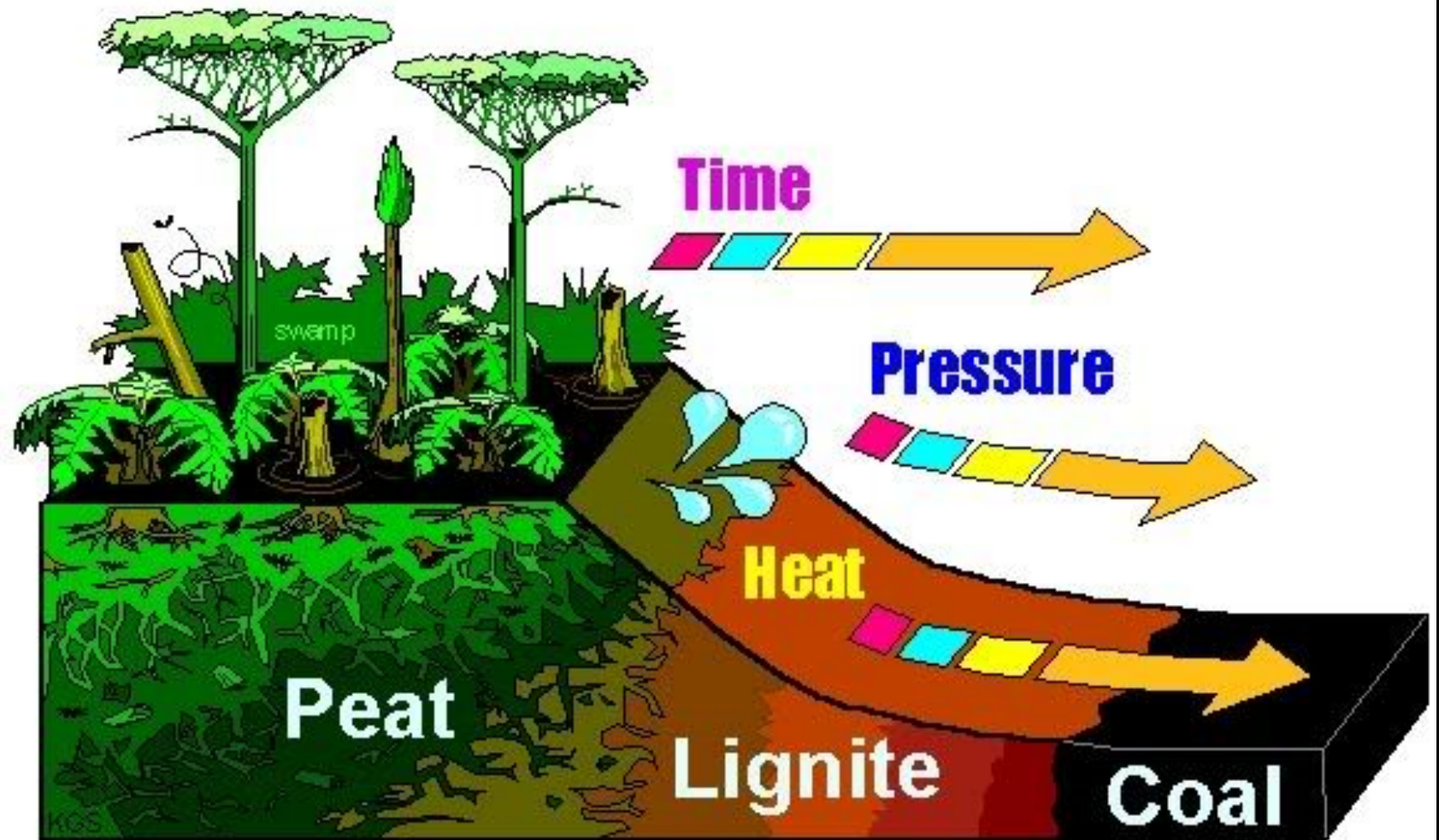
Heat and pressure turned the dead plants into coal.

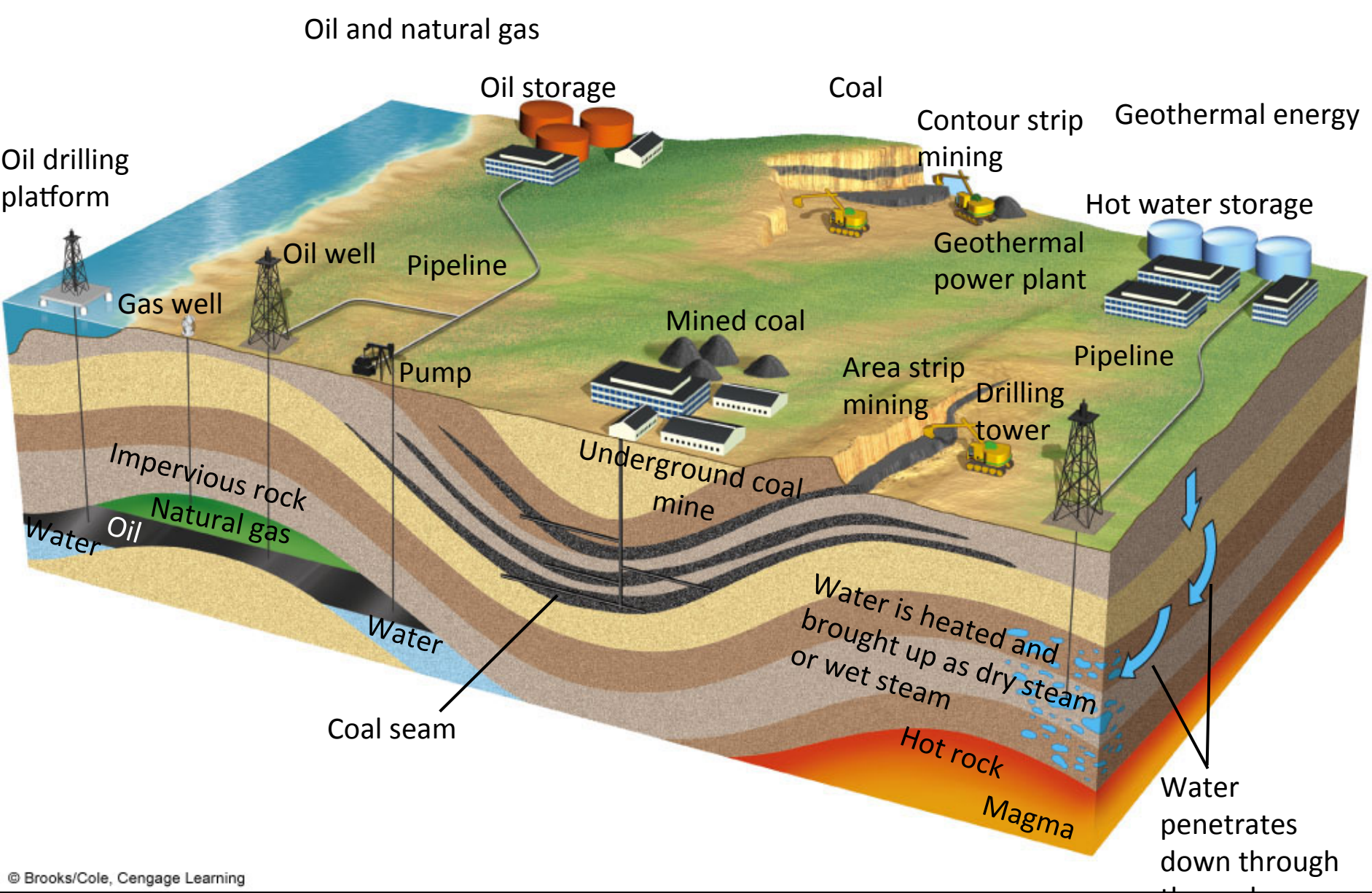
# Organic Sedimentary Rock





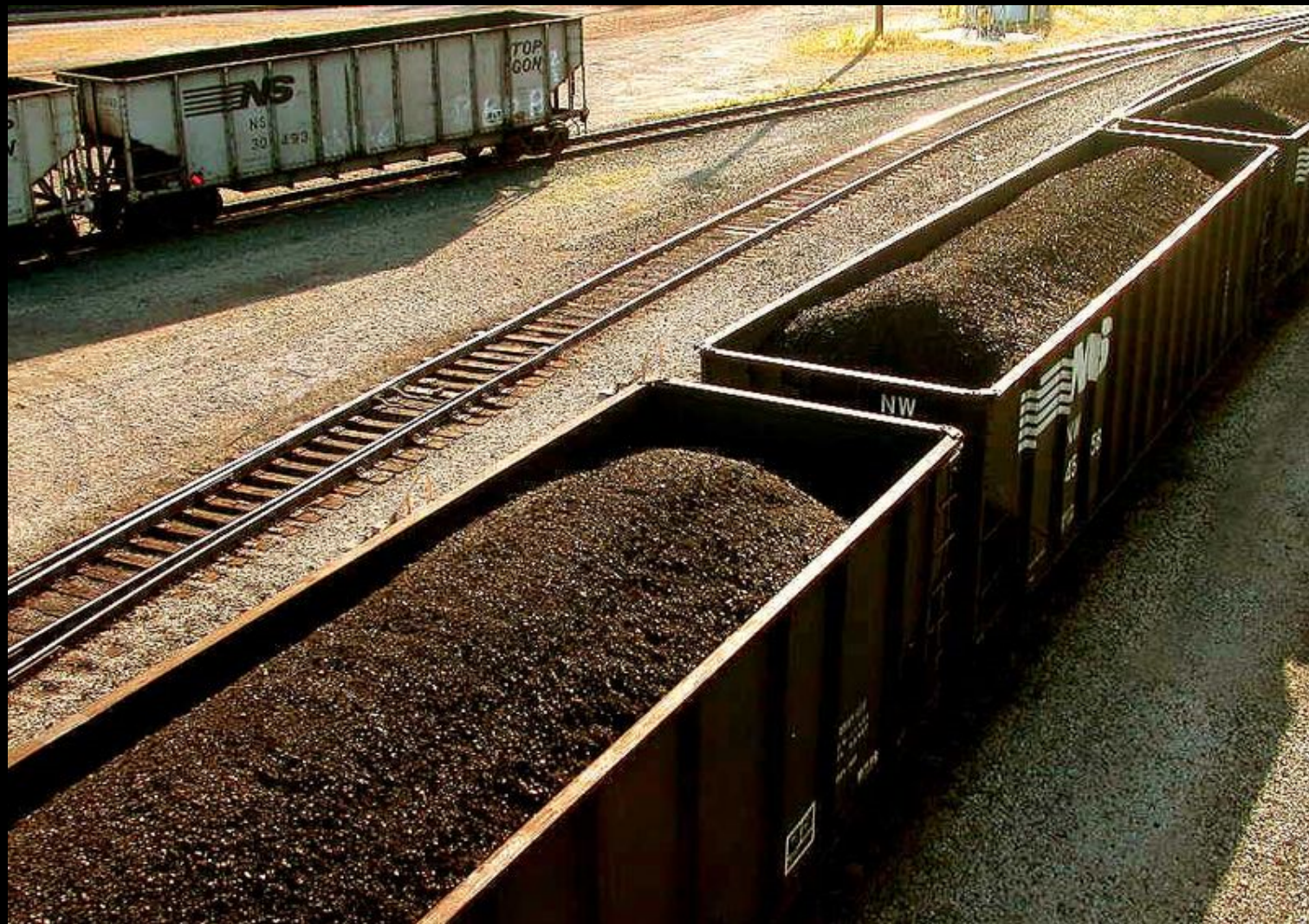
# Organic Sedimentary Rock







# Coal





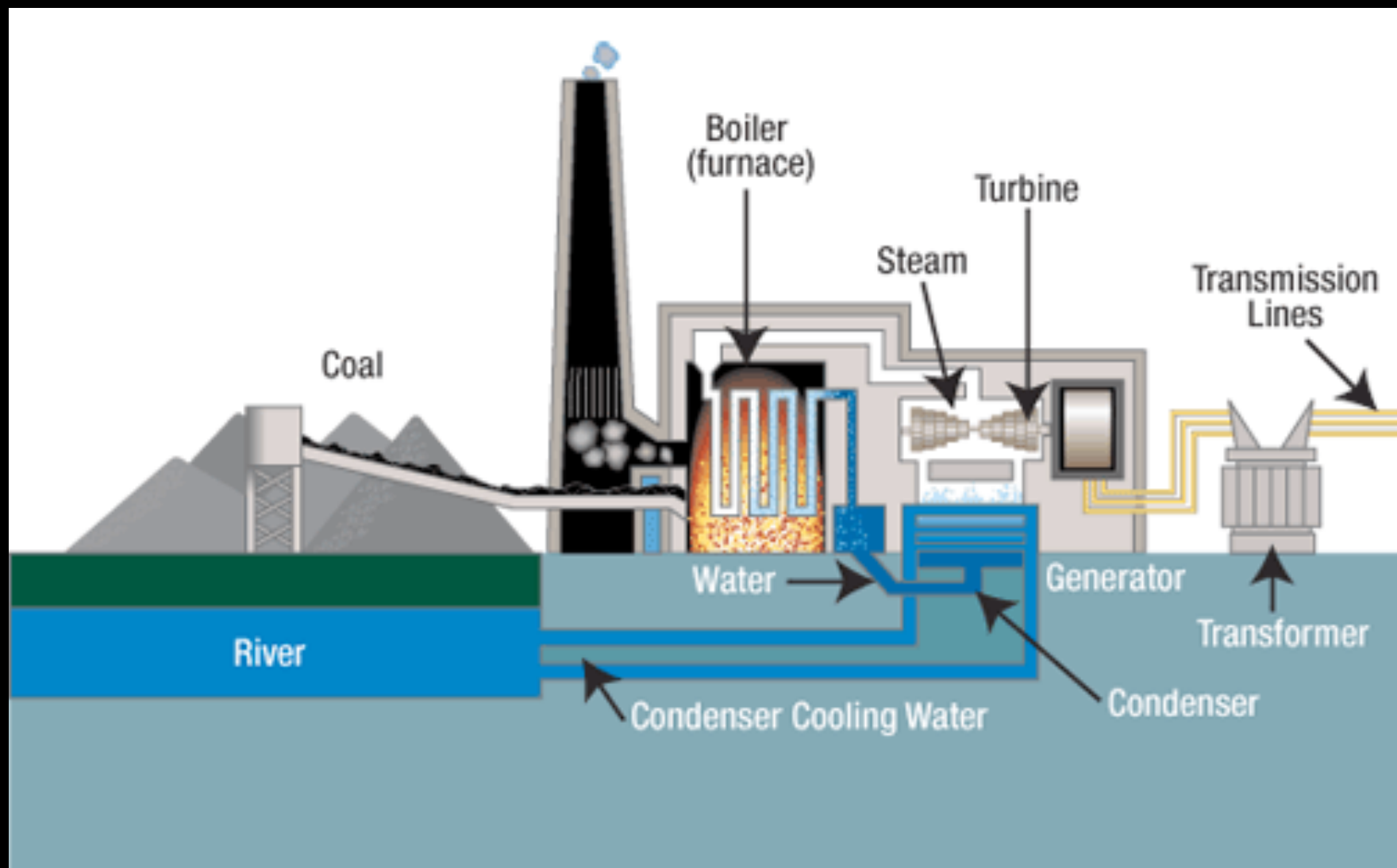
# Coal



**Xcel's Cherokee Power Plant near 64th and Washington streets.**

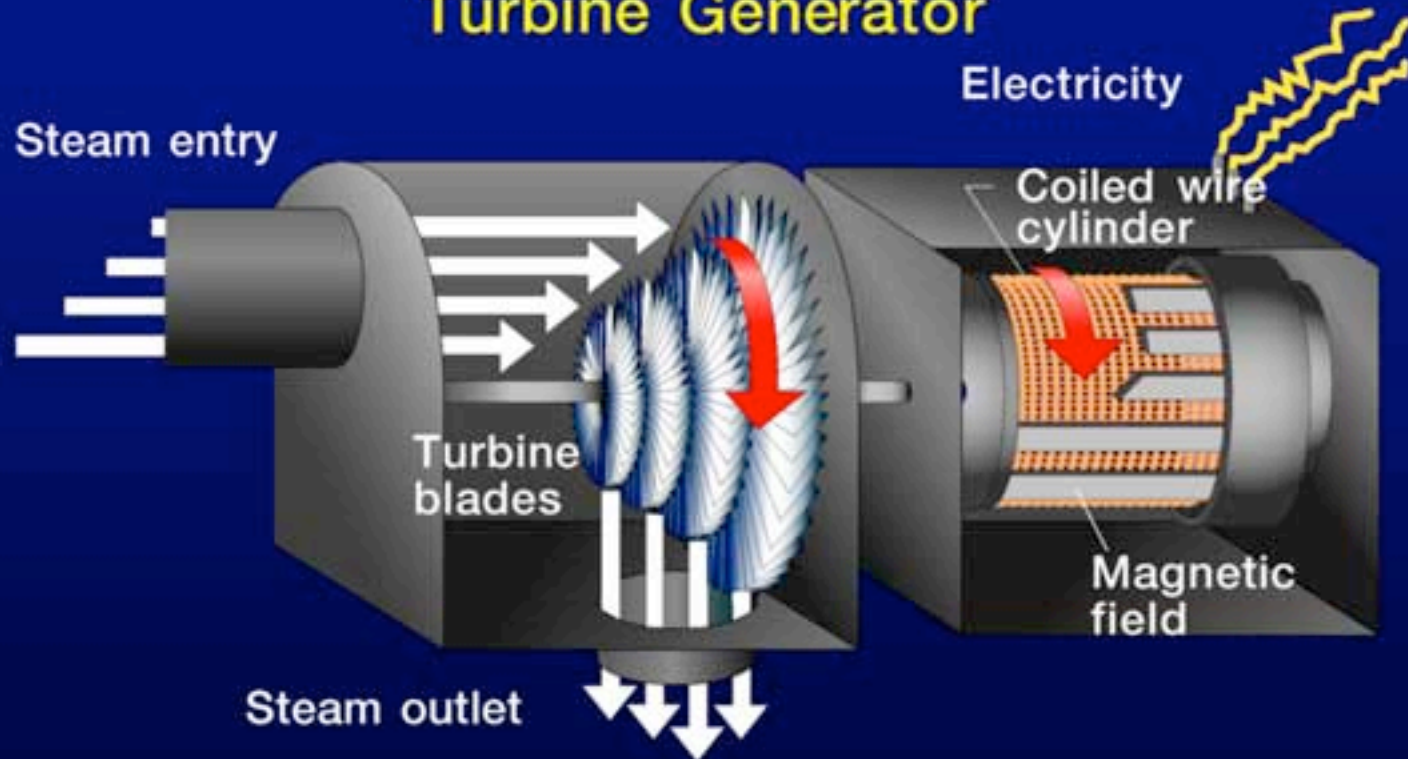
**Plant Description:** Cherokee Station is a coal-fired, steam-electric generating station with four operating units.

**Fuel Source:** Low-sulfur coal supplied by several mines in western Colorado, including Twentymile Mine, ColoWyo Mine, West Elk Mine and Powderhorn Mine.

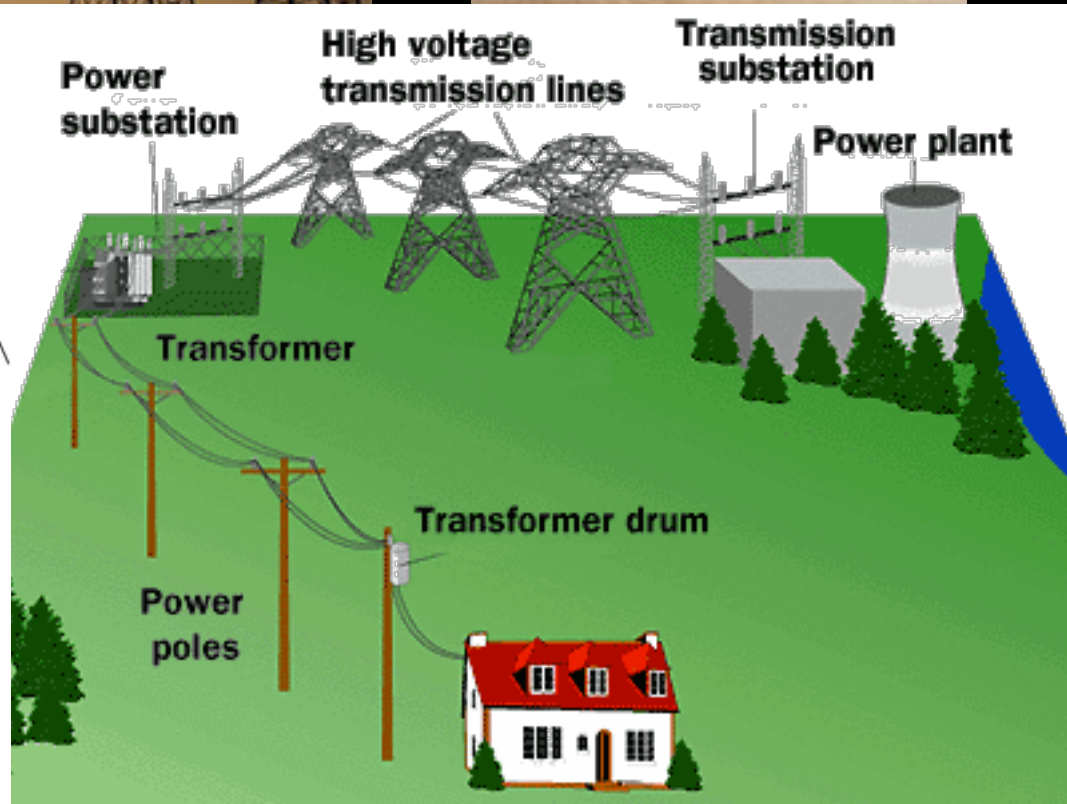
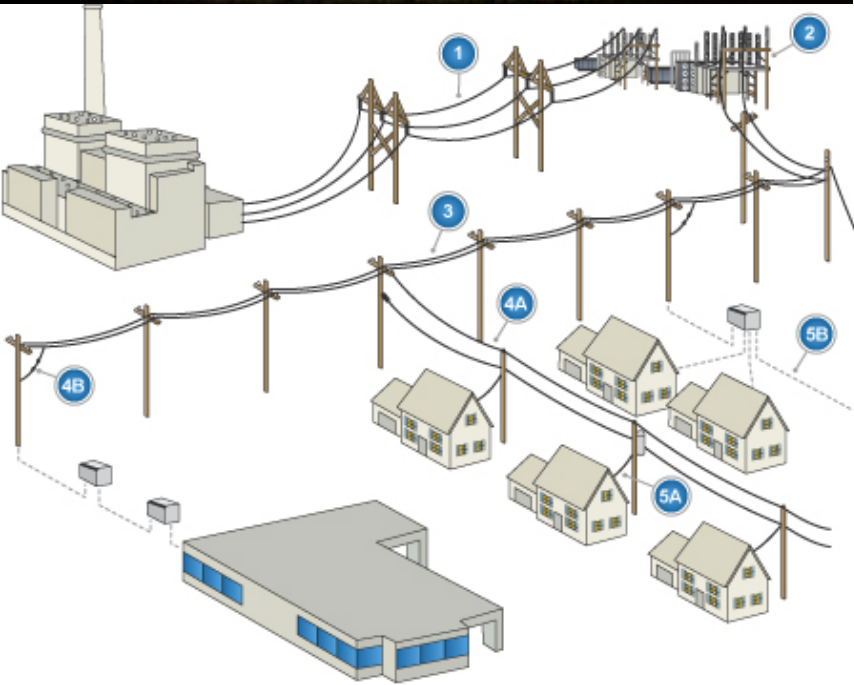


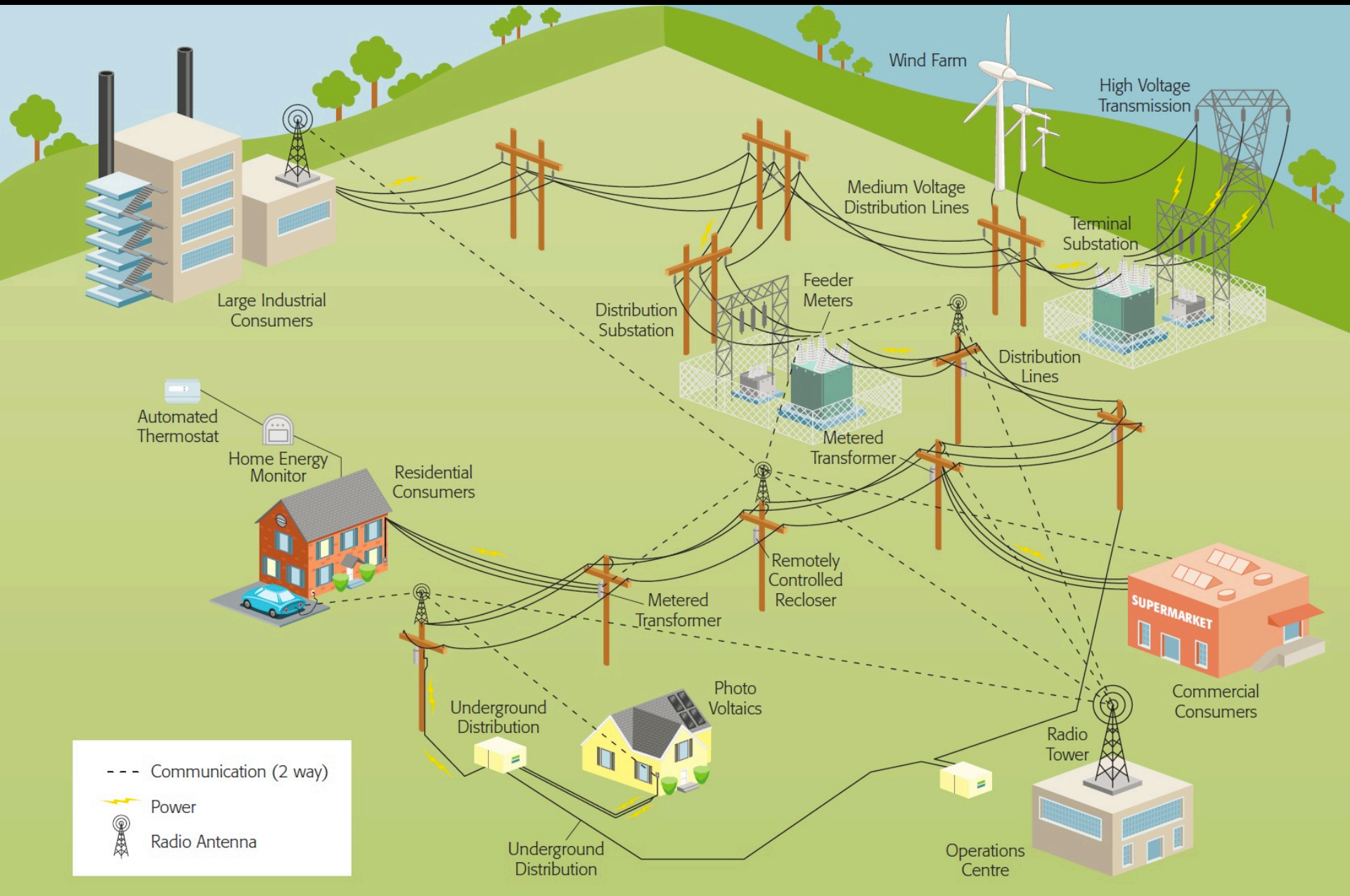


## Turbine Generator



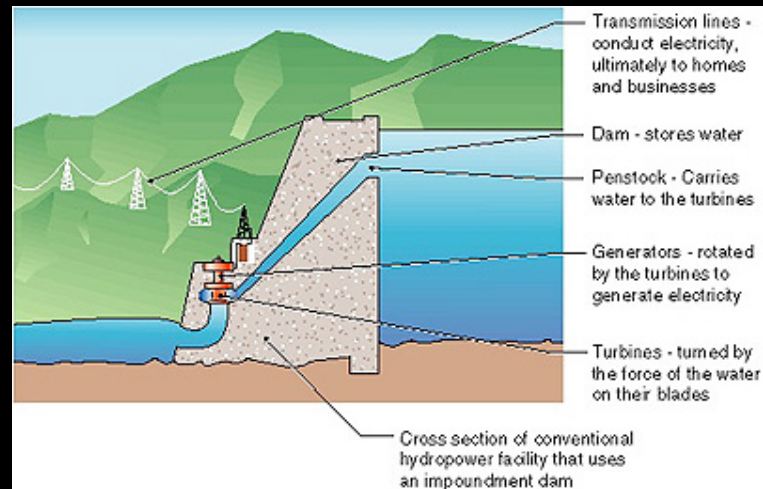
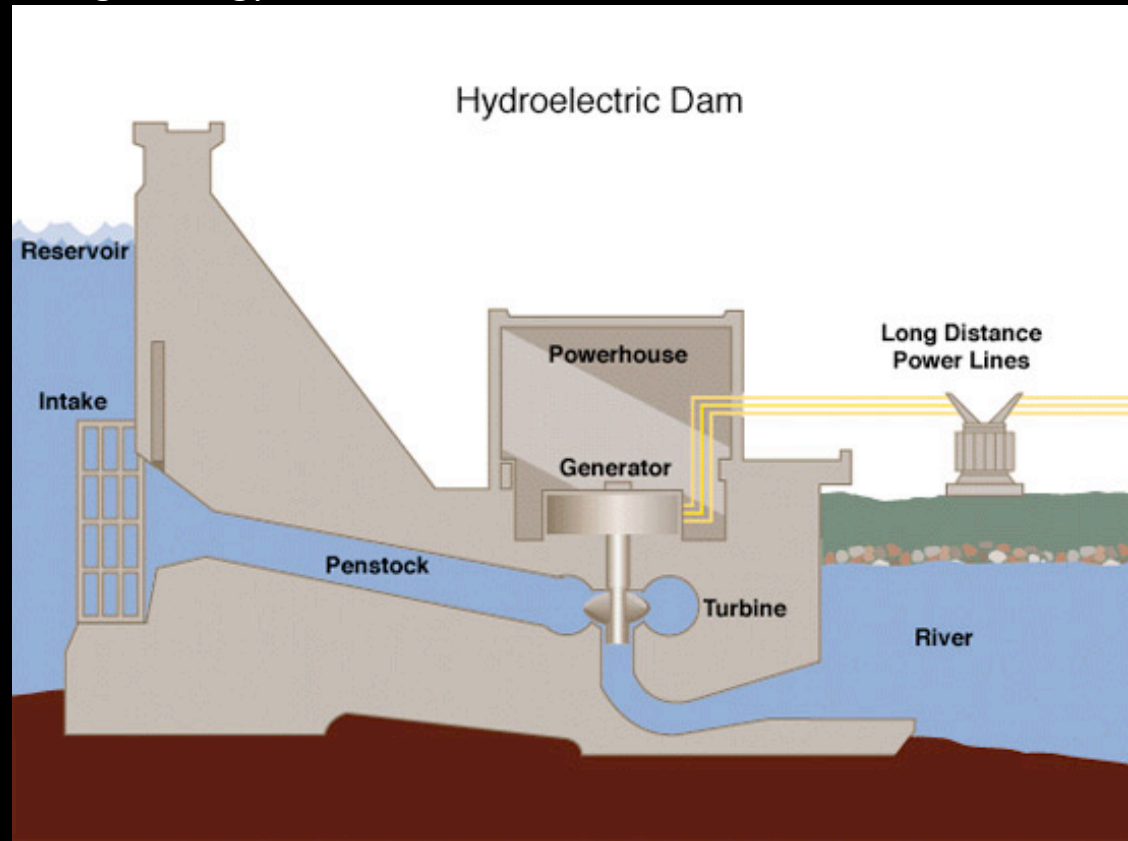






# Hydroelectric Power





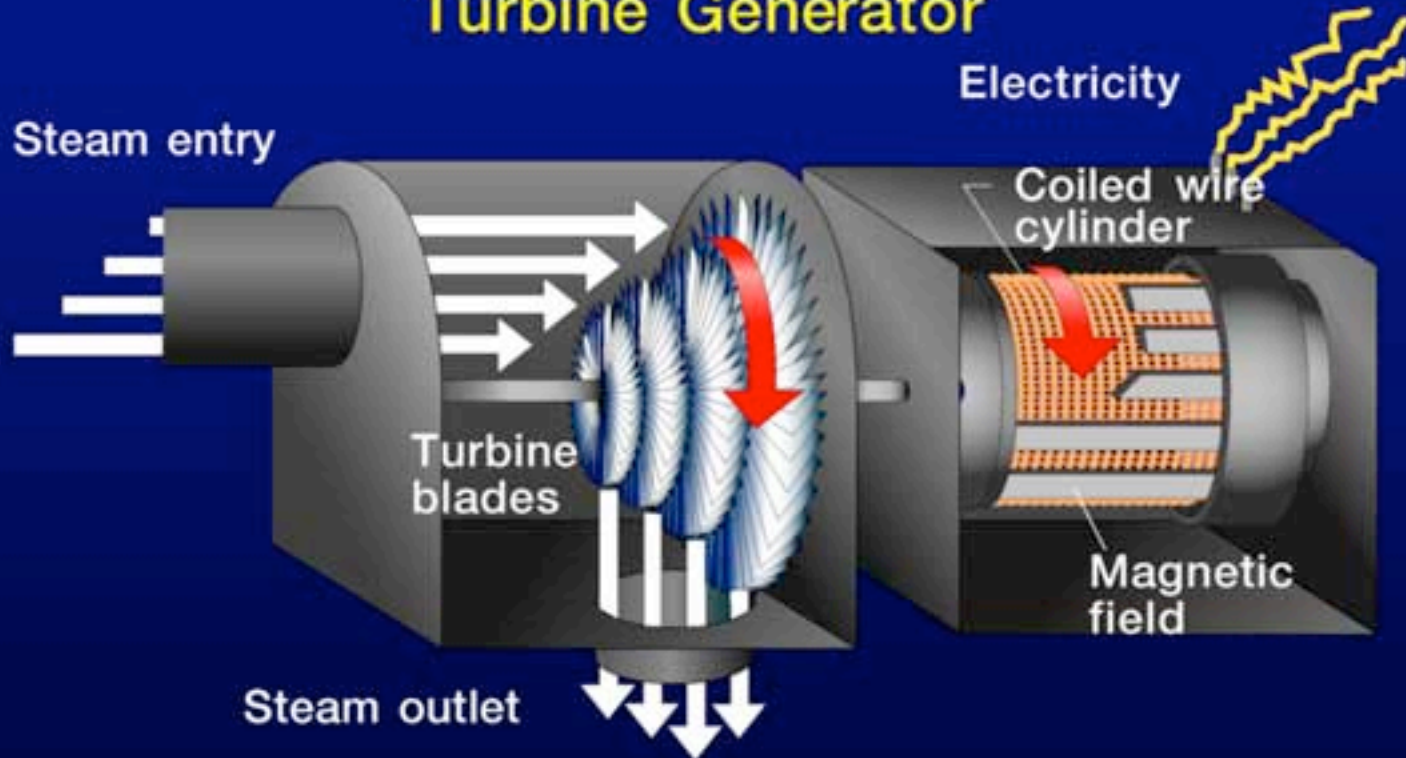




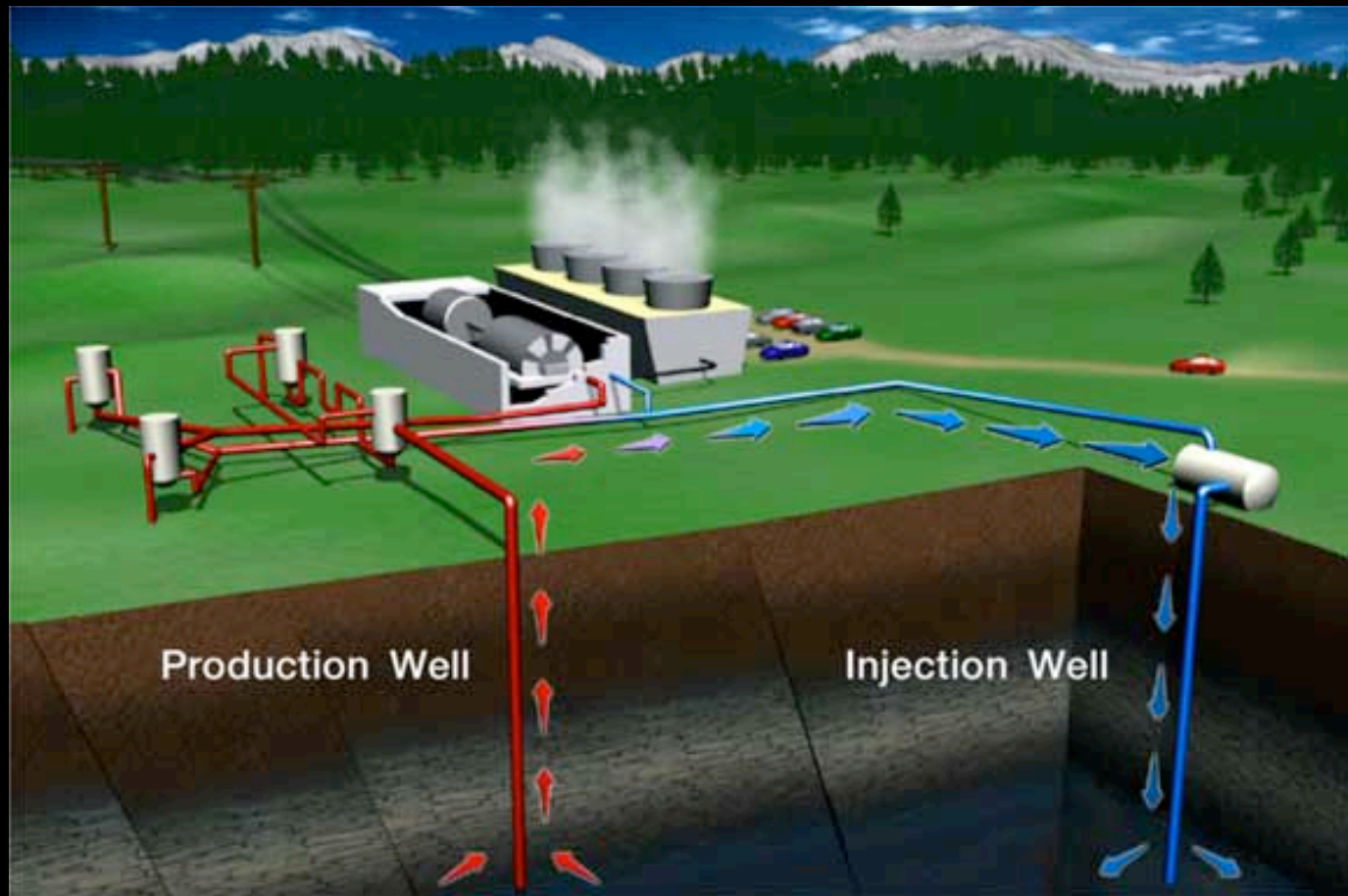
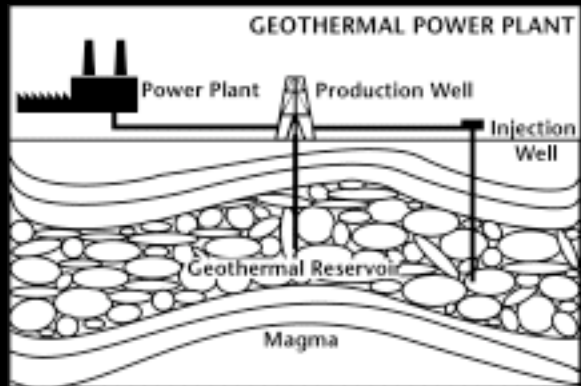


The Three Gorges Dam in China, the largest hydro-electric power station in the world.

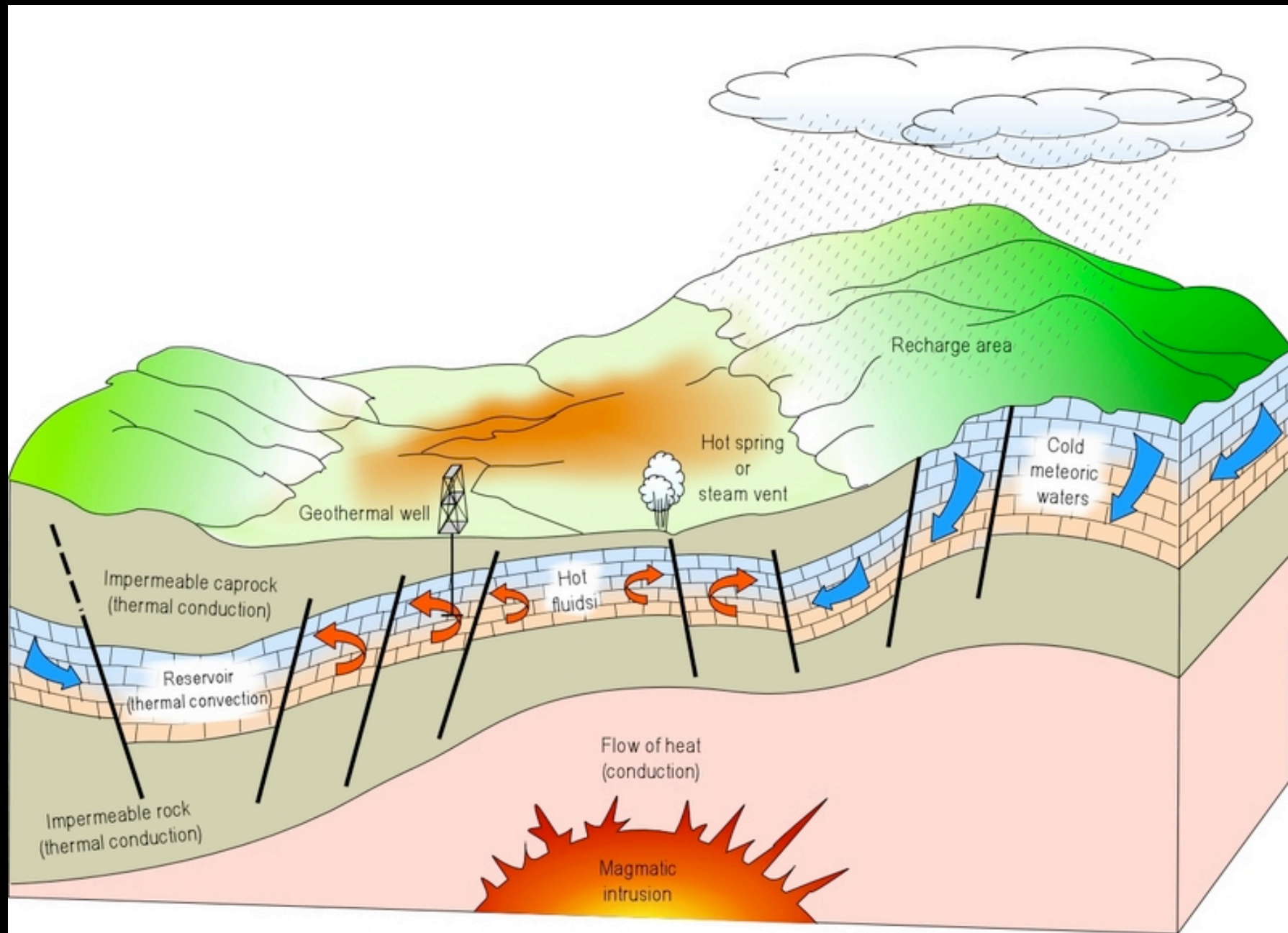
## Turbine Generator



# Geothermal Power









# HARNESSING GEOTHERMAL ENERGY

Geothermal power could theoretically satisfy all the world's energy needs. Trouble is, it's expensive to do the deep drilling necessary to tap the heat.

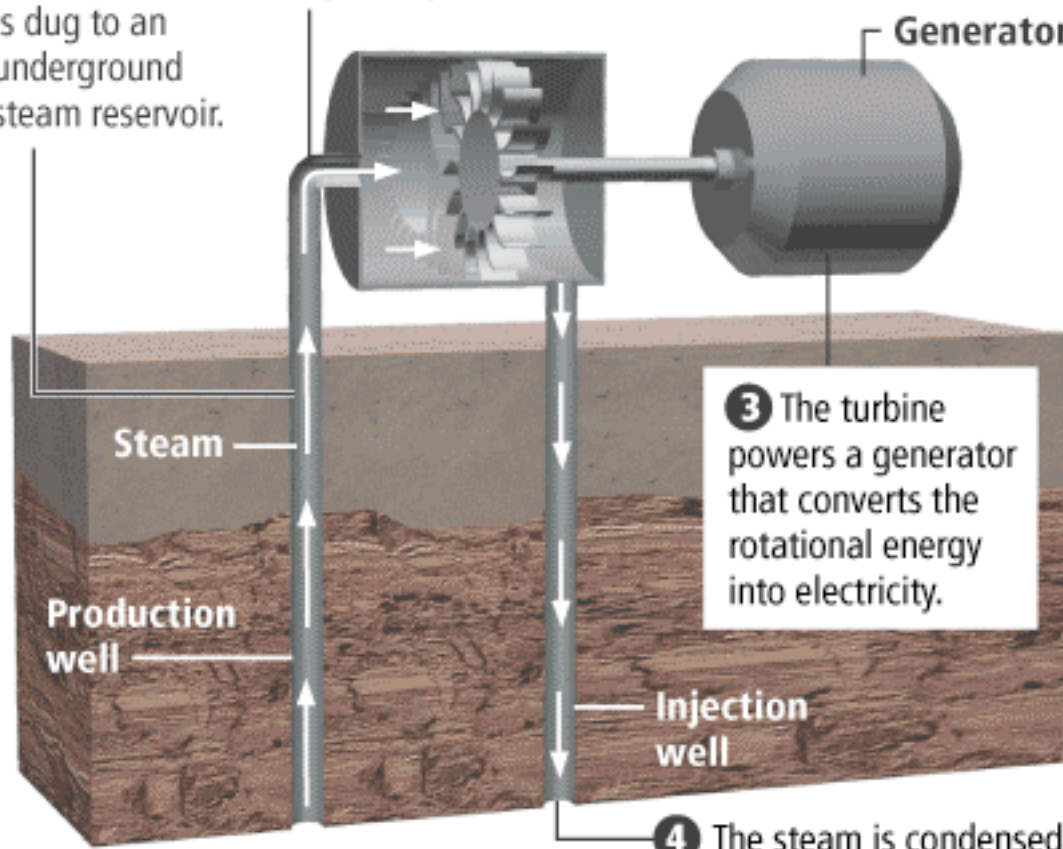
## HOW IT WORKS

**1** A deep production well is dug to an underground steam reservoir.

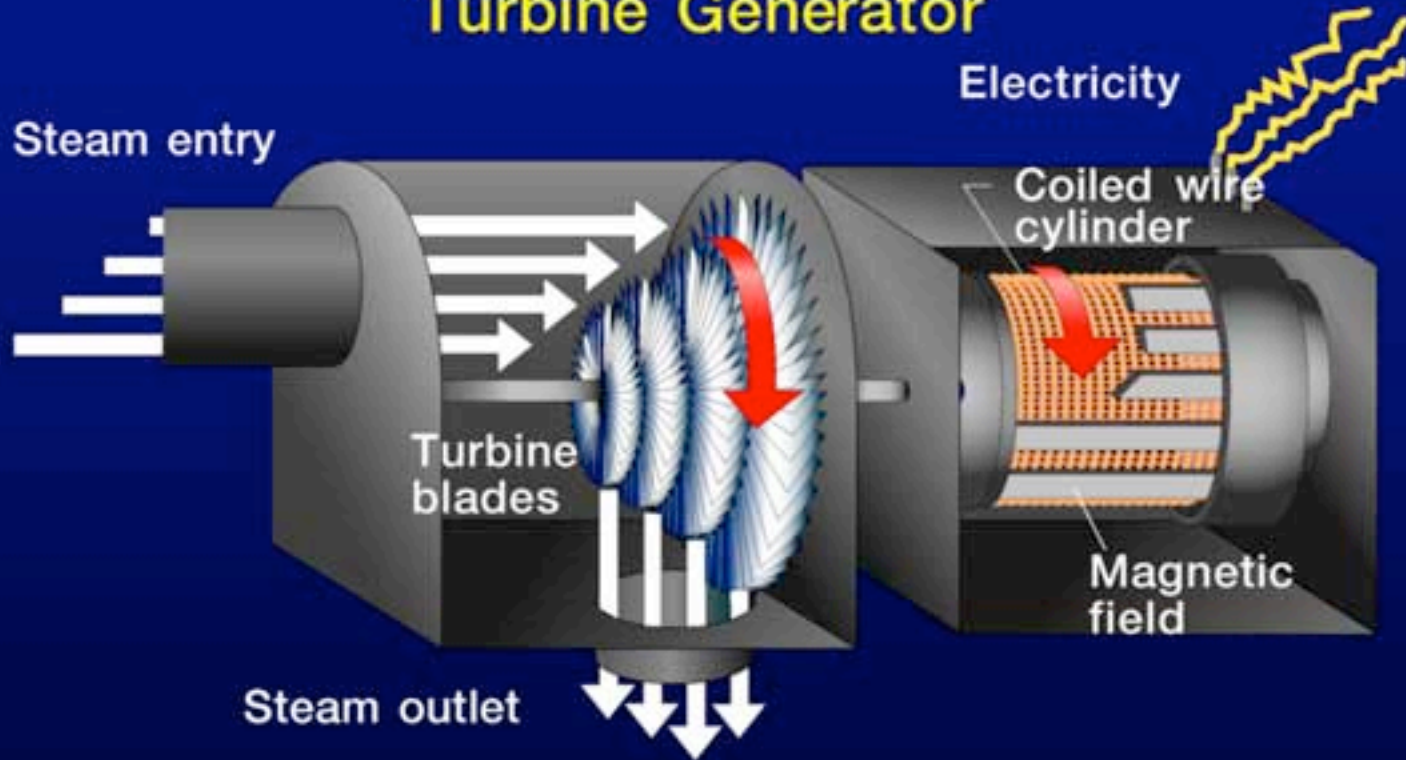
**2** The pressurized steam is released and piped to a power plant, where its force turns a turbine.

**3** The turbine powers a generator that converts the rotational energy into electricity.

**4** The steam is condensed and reinjected into the reservoir.



## Turbine Generator





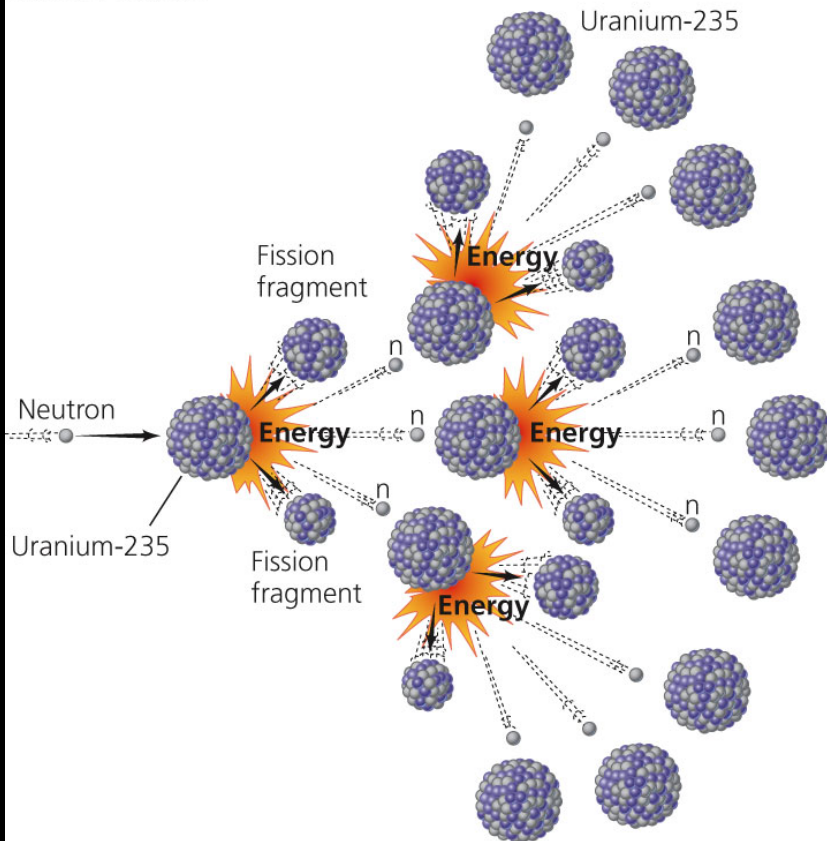




# Nuclear Power

# Fission of Uranium-235

## Nuclear fission



**Nuclear fission** occurs when the nuclei of certain isotopes with large mass numbers (such as uranium-235) are split apart into lighter nuclei when struck by a neutron and release energy plus two or three more neutrons. Each neutron can trigger an additional fission reaction and lead to a *chain reaction*, which releases an enormous amount of energy very quickly.



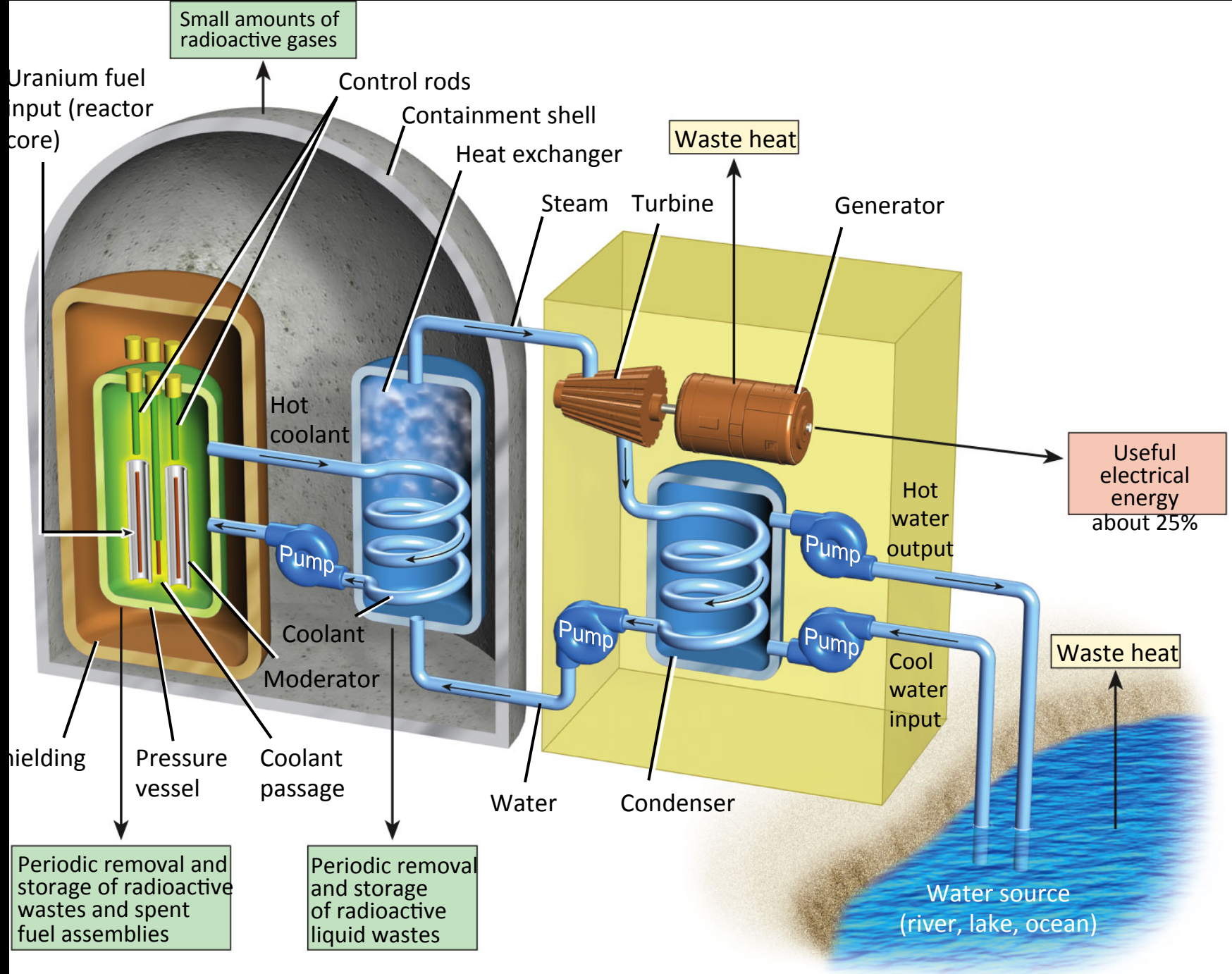
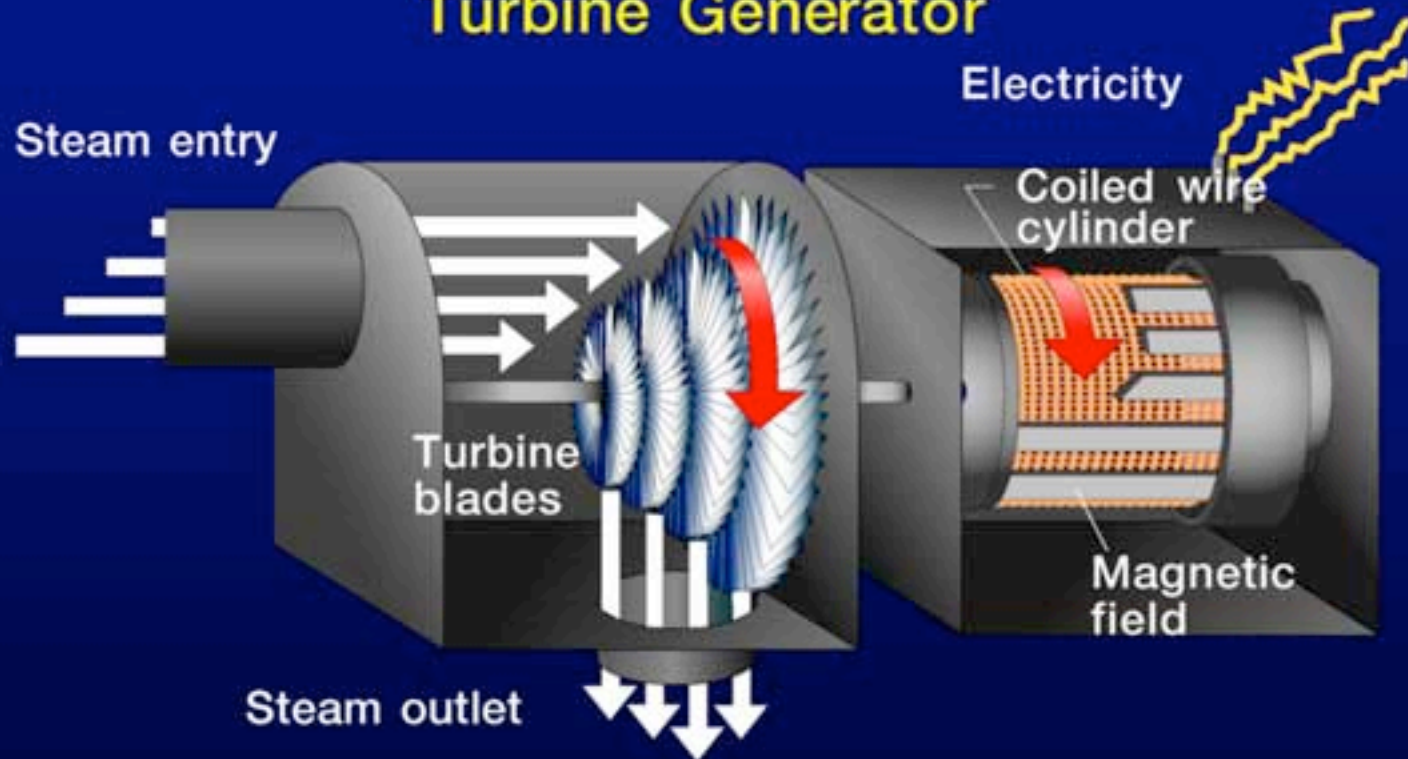


Fig. 15-20a,

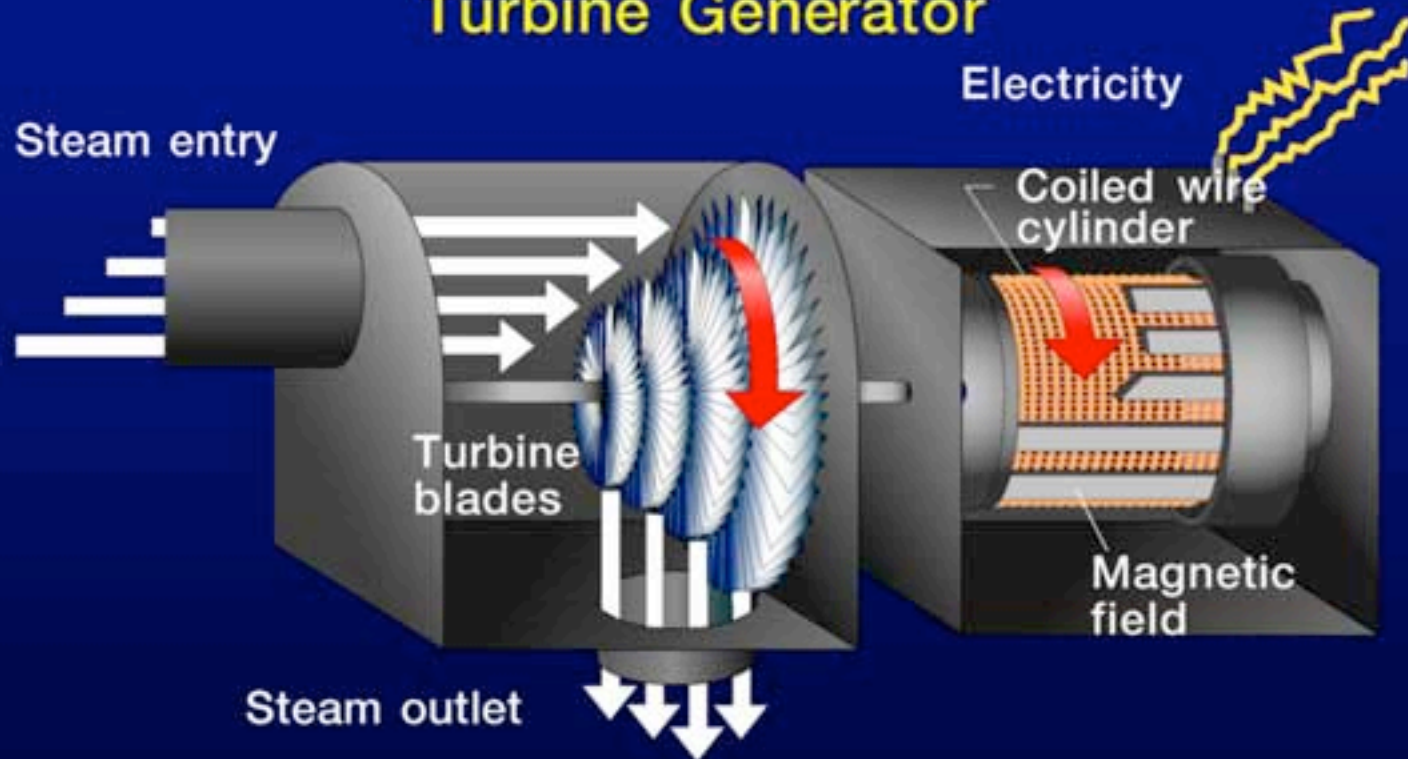


## Turbine Generator

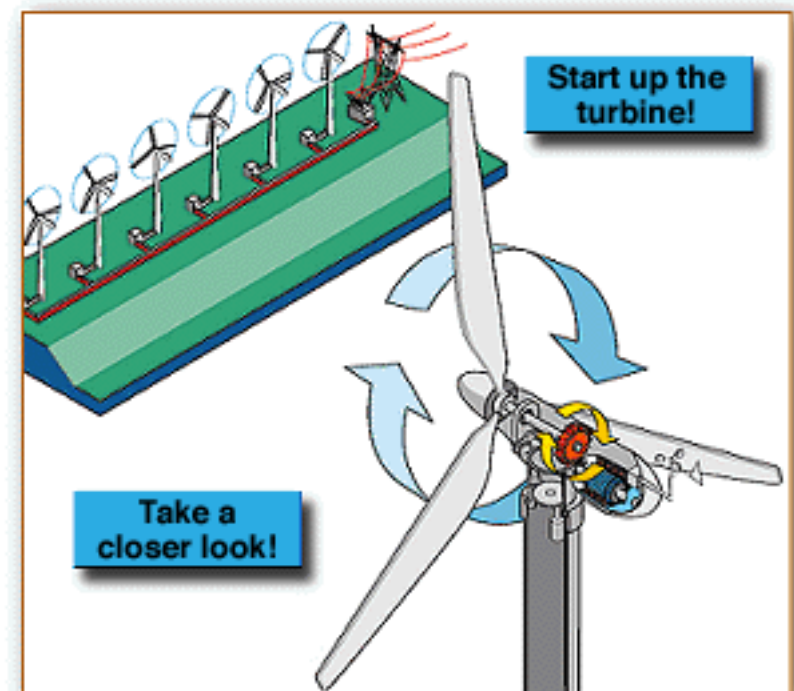
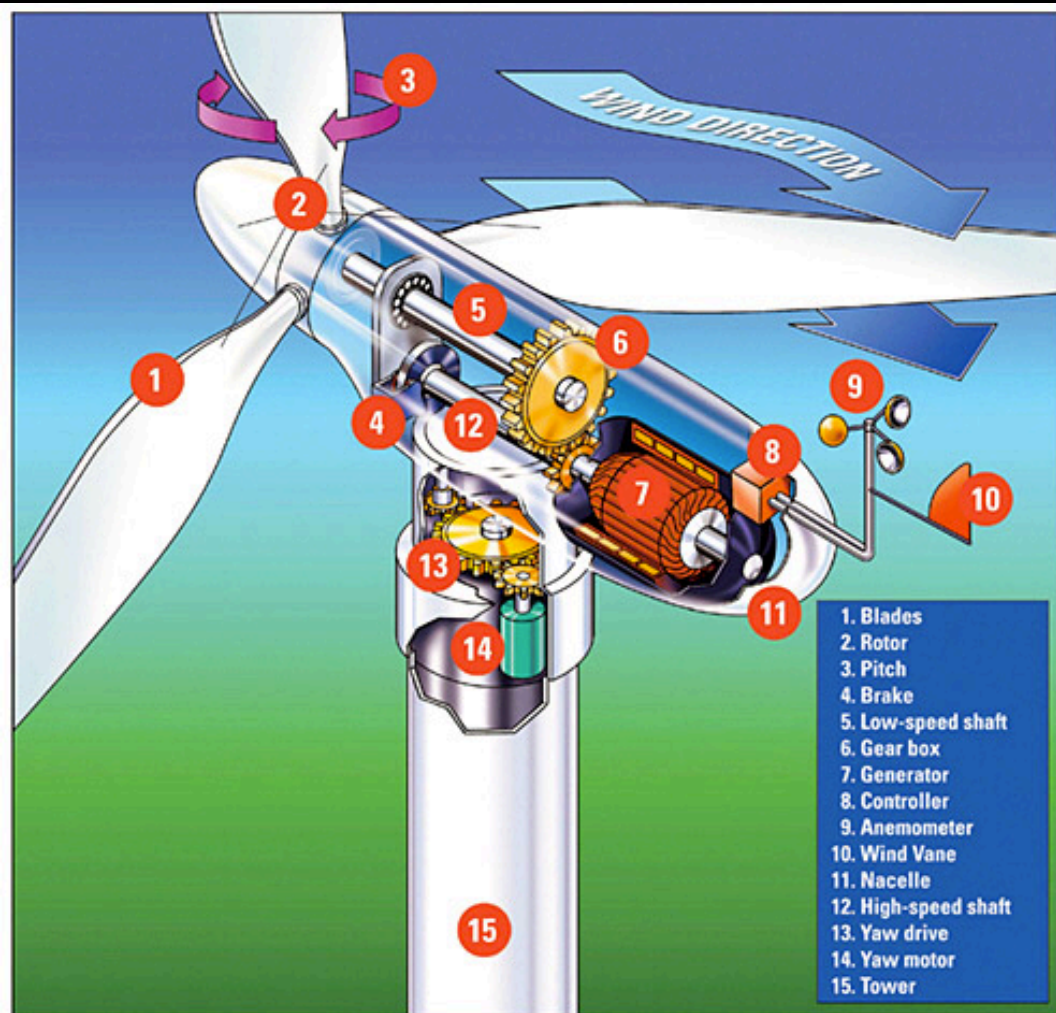


# Wind Power

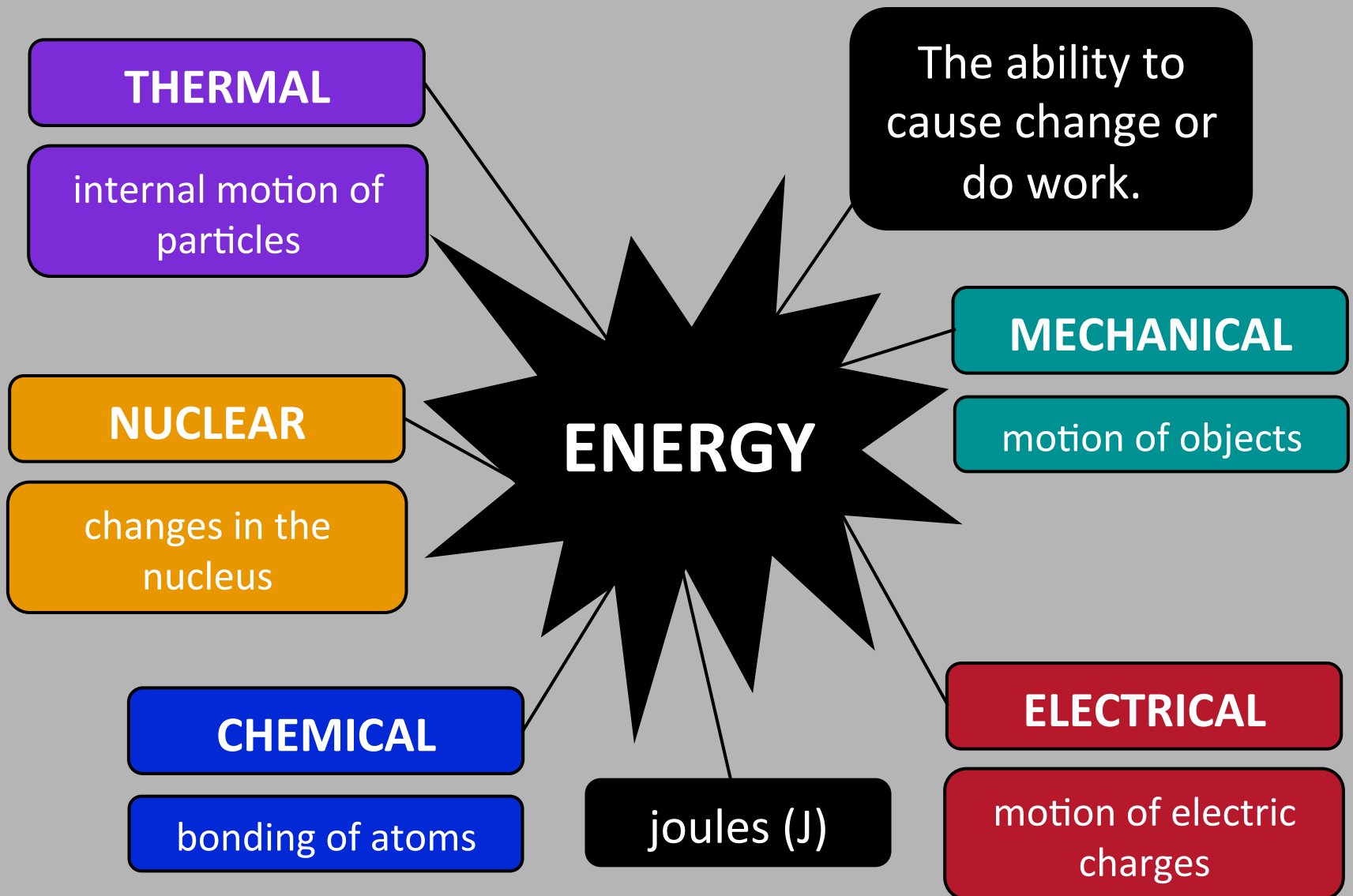
## Turbine Generator







# Forms of Energy



# Energy: Work & Power

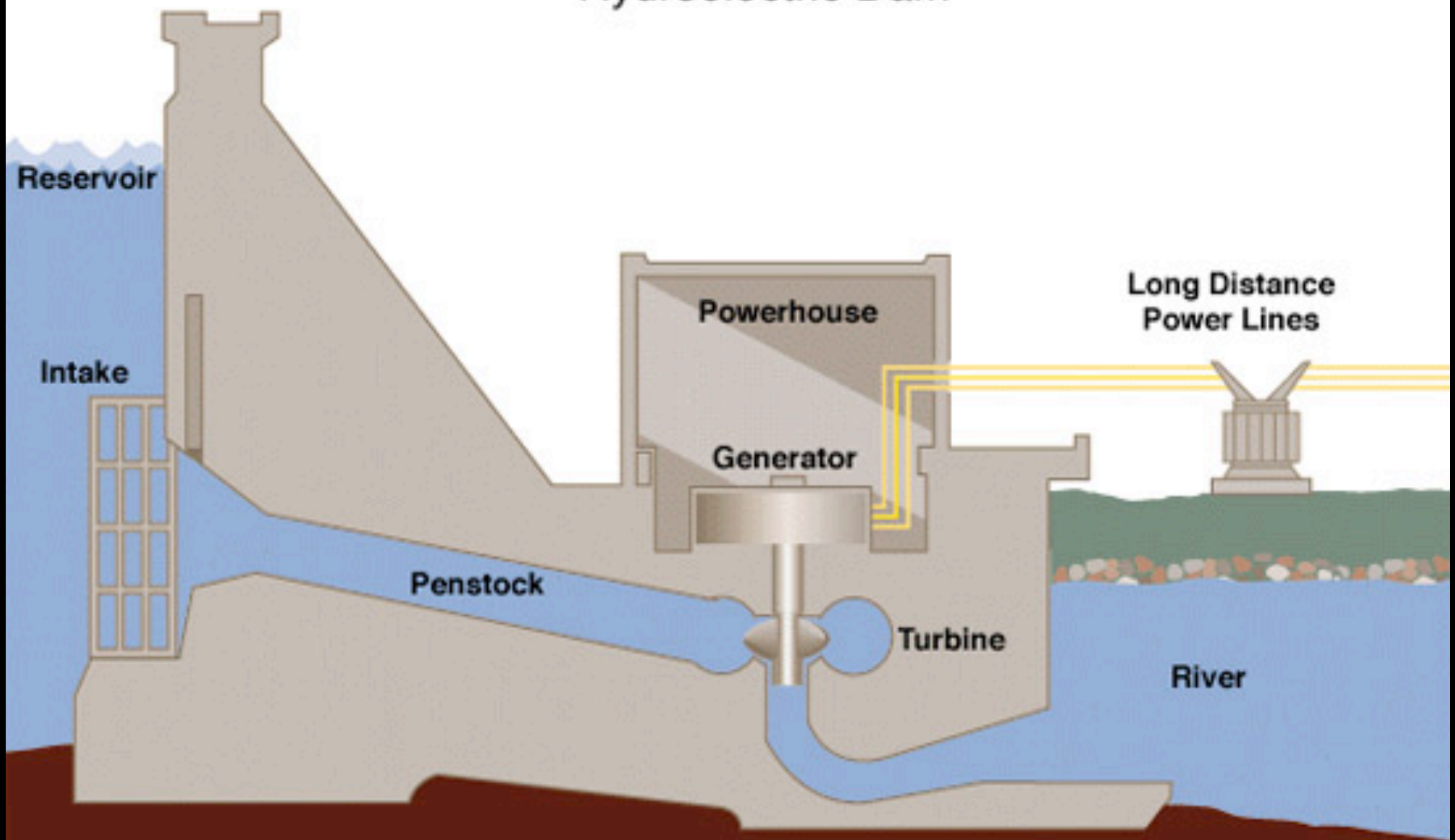
## The Law of Conservation of Energy

Energy is conserved. Energy may change form but it may not be created or destroyed (in closed systems, in which energy cannot enter or leave the system).





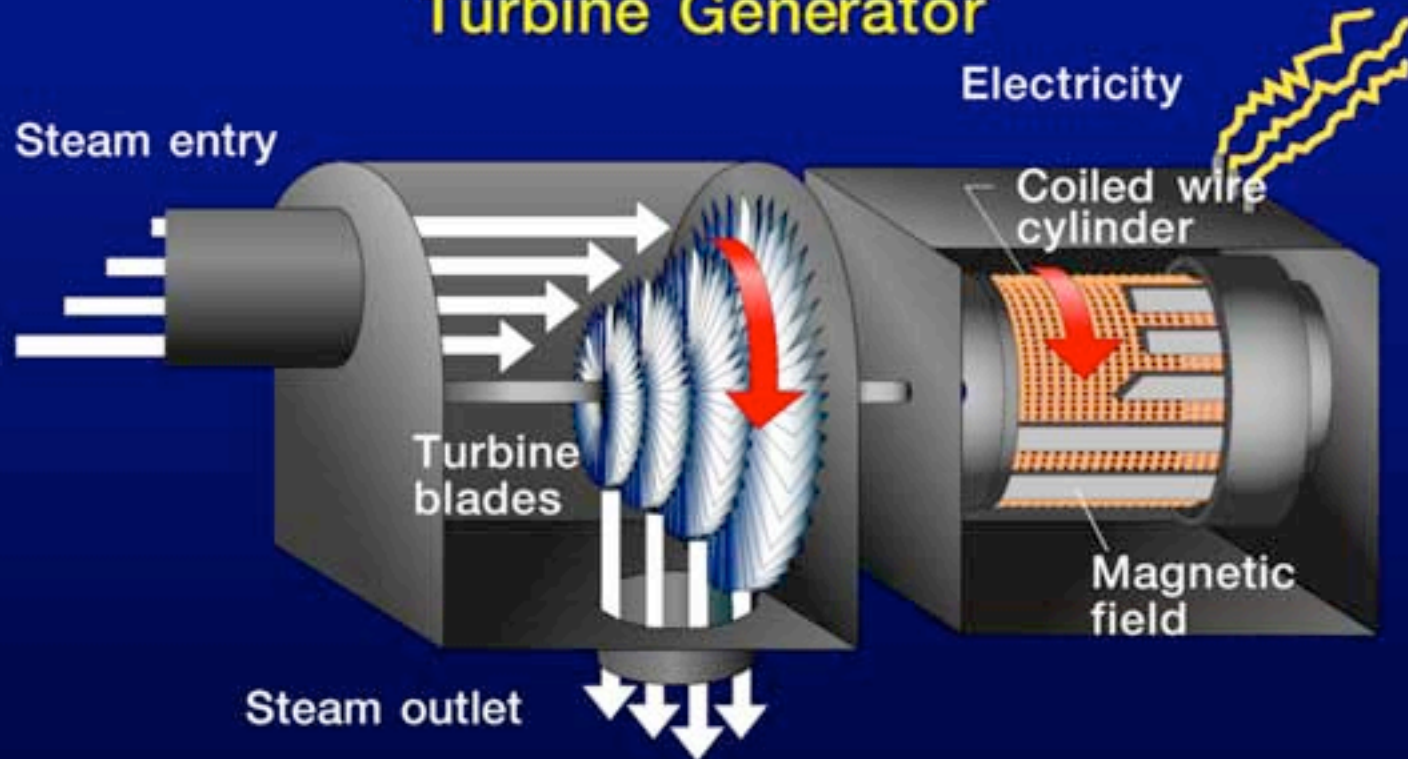
# Hydroelectric Dam



# Appliances- Clothes Dryer



## Turbine Generator





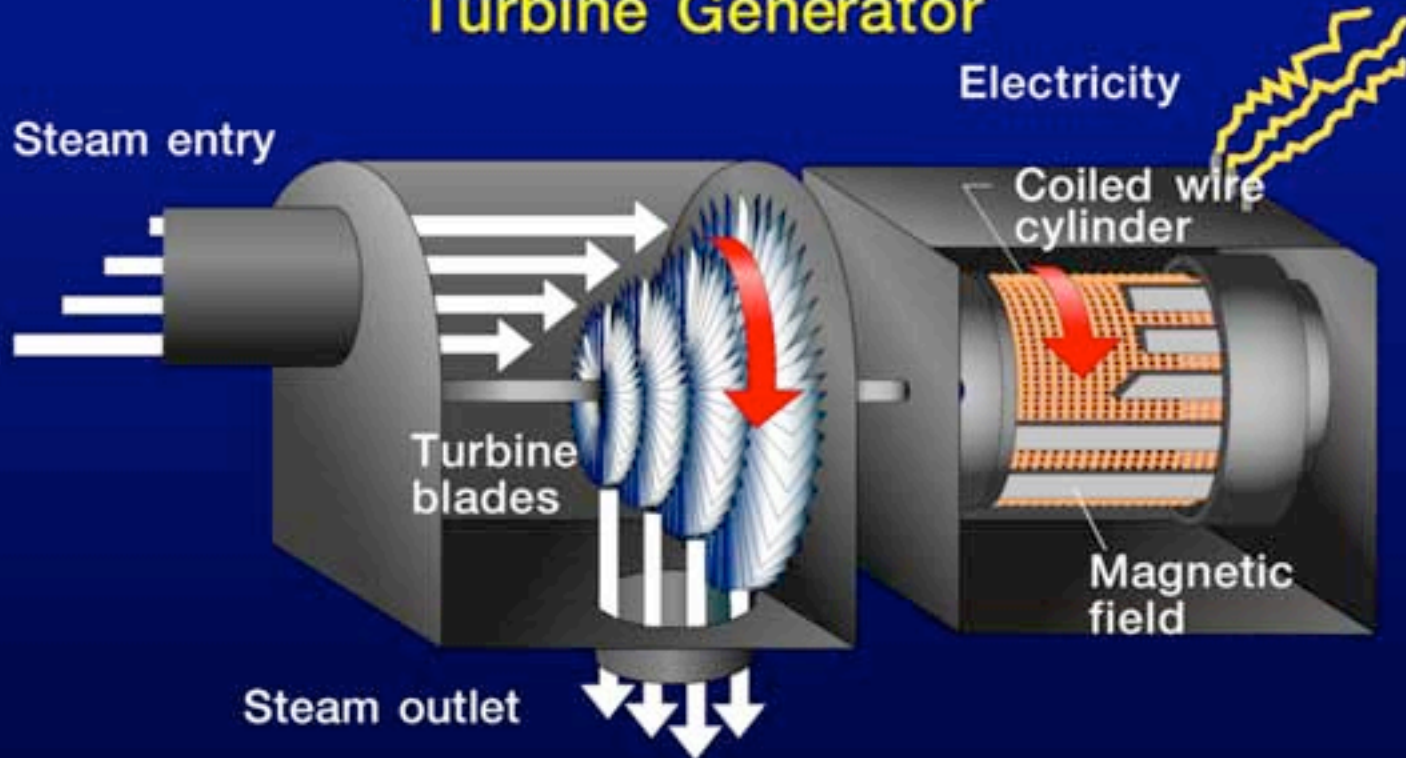
# Energy Servant



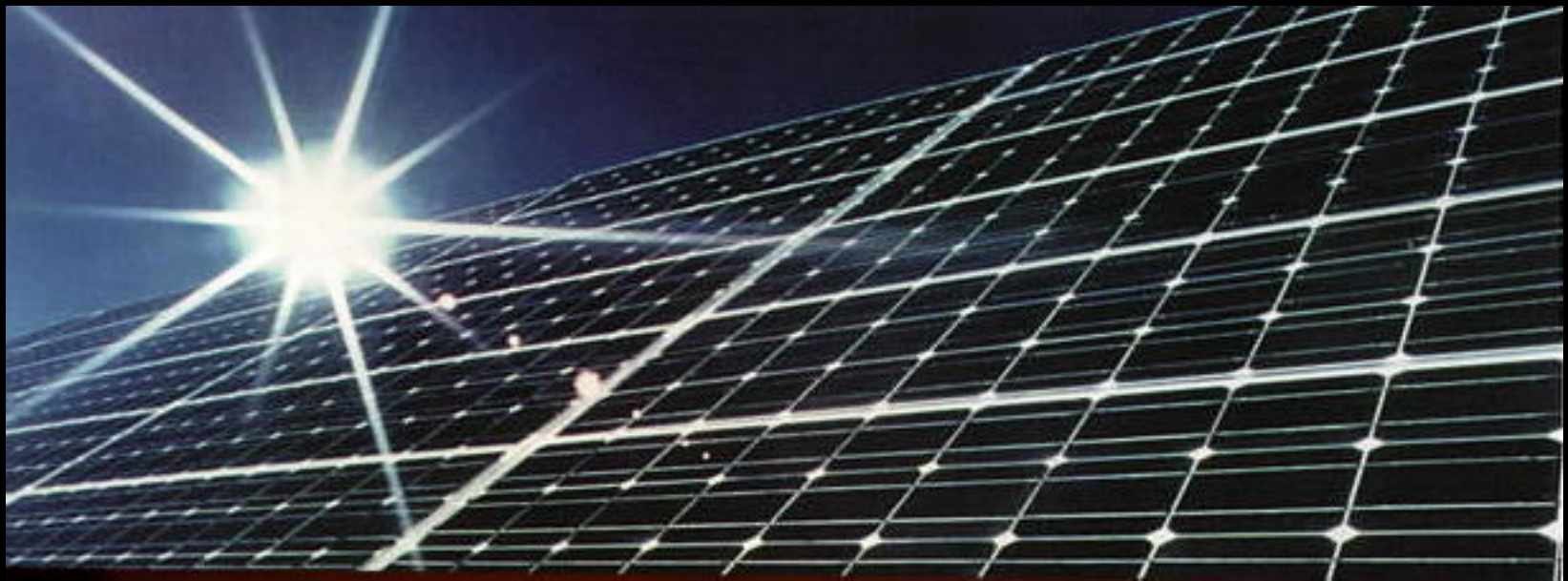
# Cherokee Generating Station



## Turbine Generator







### Electron and Current Flow in Solar Cells

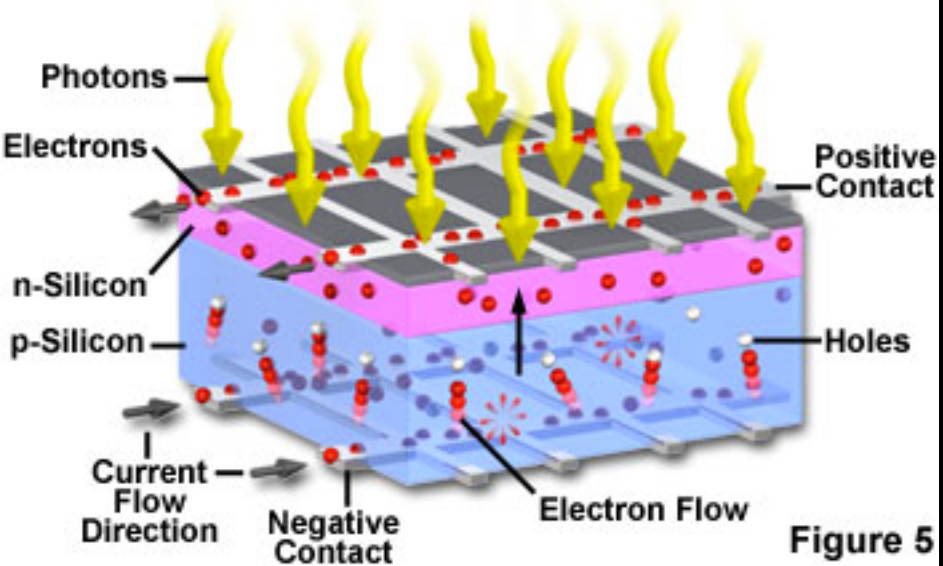
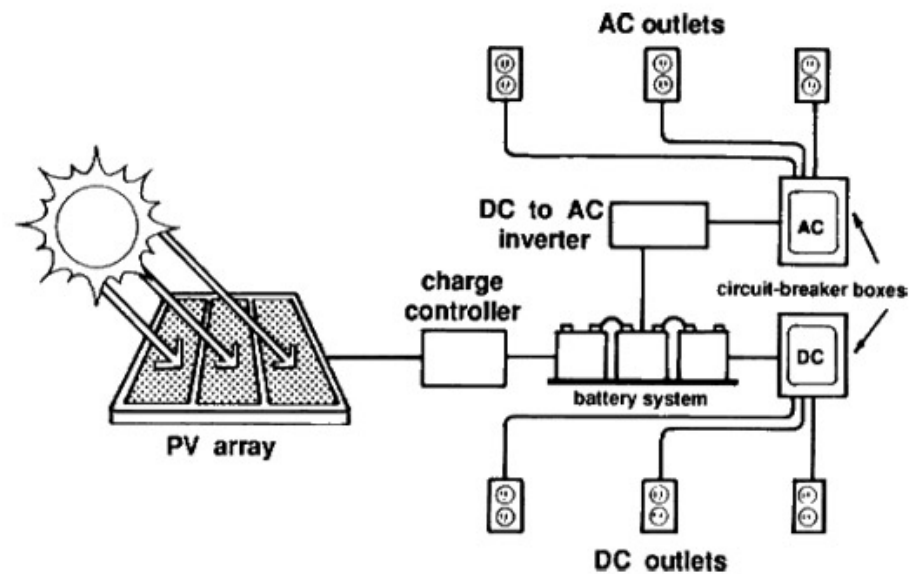


Figure 5





Address:

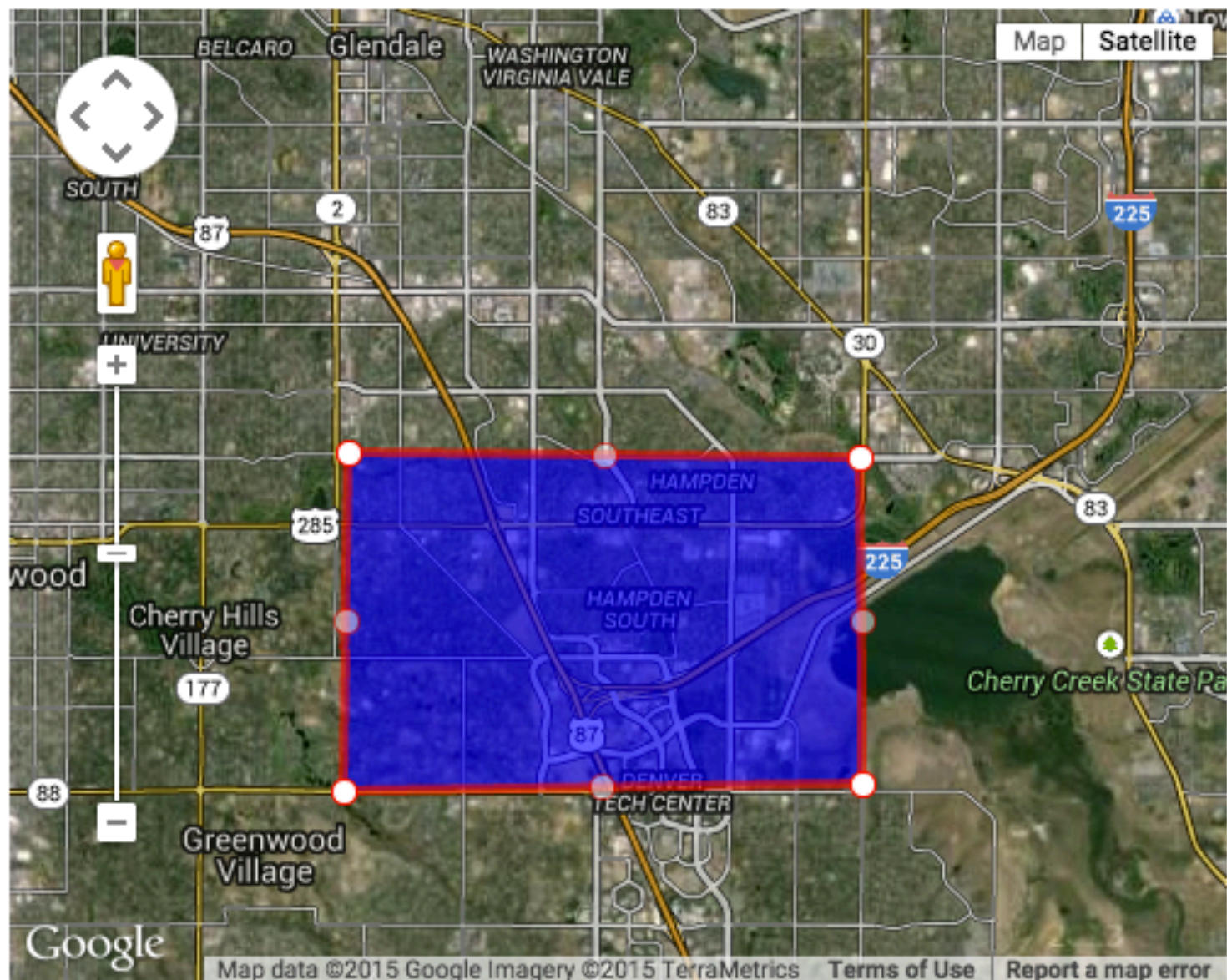
Go!

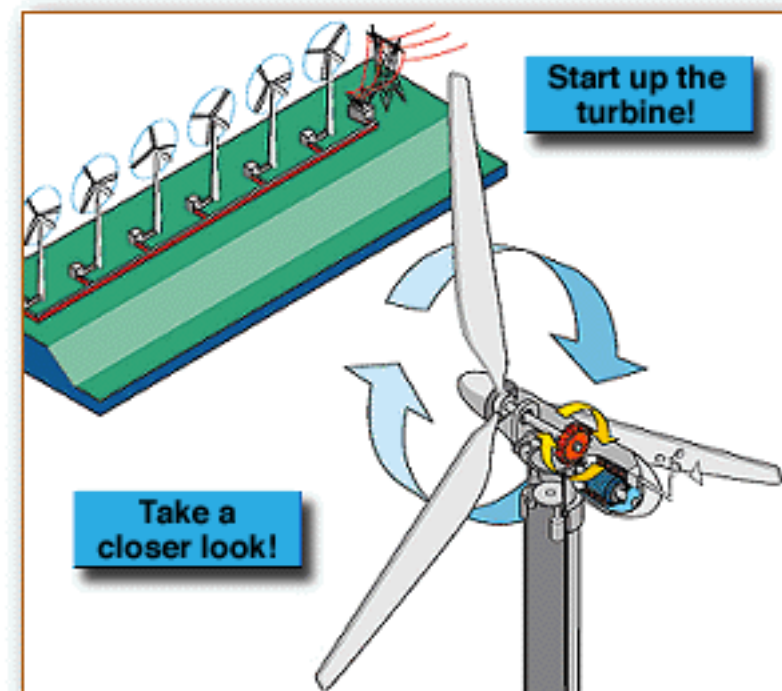
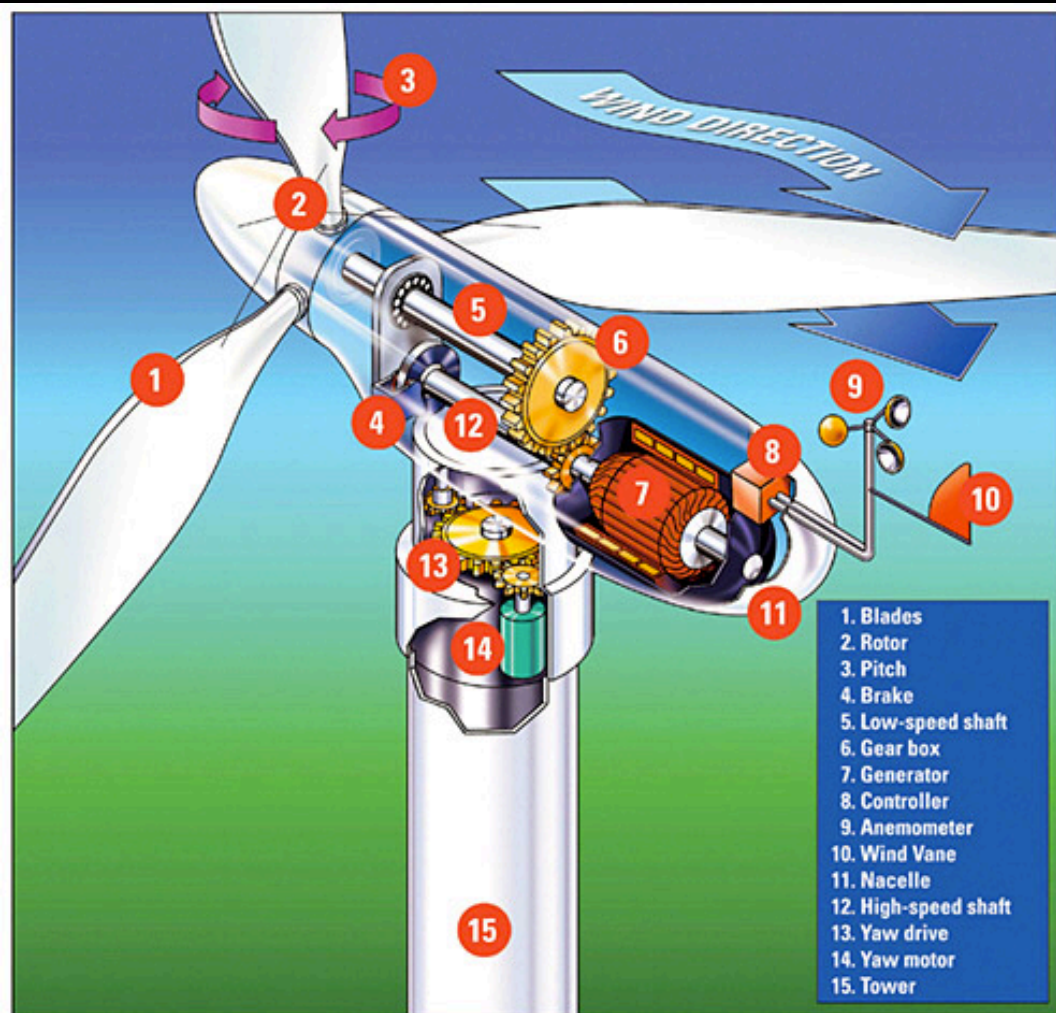
Zoom to Fit

Clear Last Point

Cl

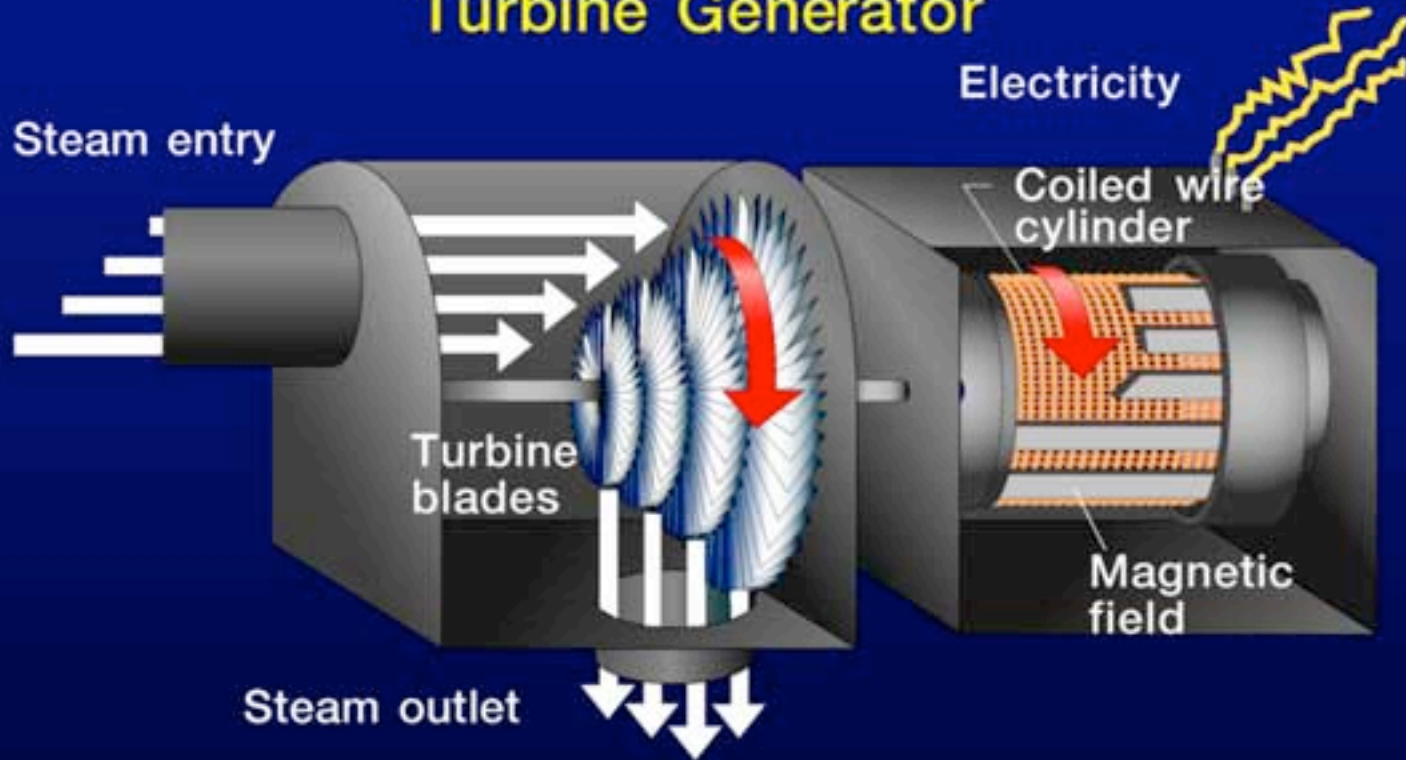
Area 24995232 meters<sup>2</sup>, 269046432 feet<sup>2</sup> 6176.46 acres 9.651 miles<sup>2</sup> 24.995 km<sup>2</sup>







## Turbine Generator



Address:

Go!

Zoom to Fit

Clear Last Point

Distance: 20.22 miles , 32.54 kilometers (km) , 106769 feet , 32543 meters

