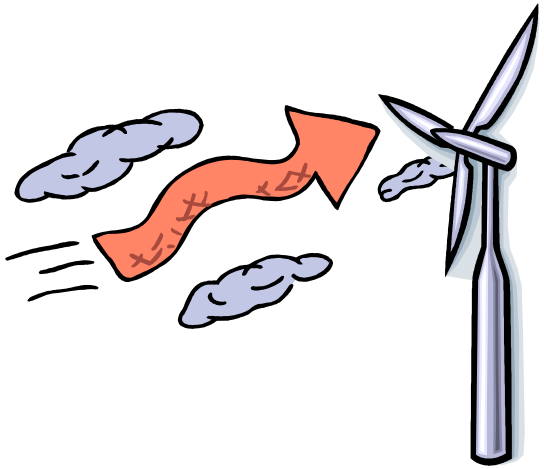
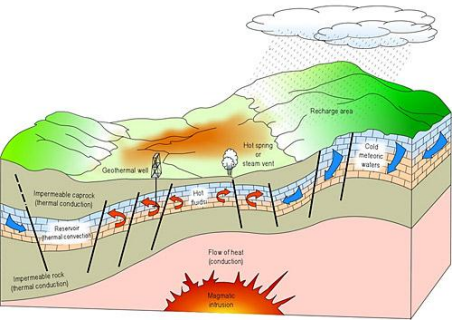
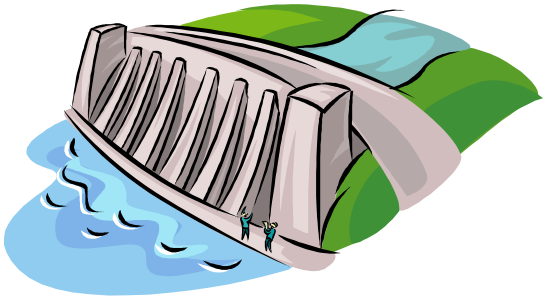


Alternative Energy Resources

Identify alternative energy resources such as wind, solar, hydroelectric, geothermal, and biofuels





Wind Energy

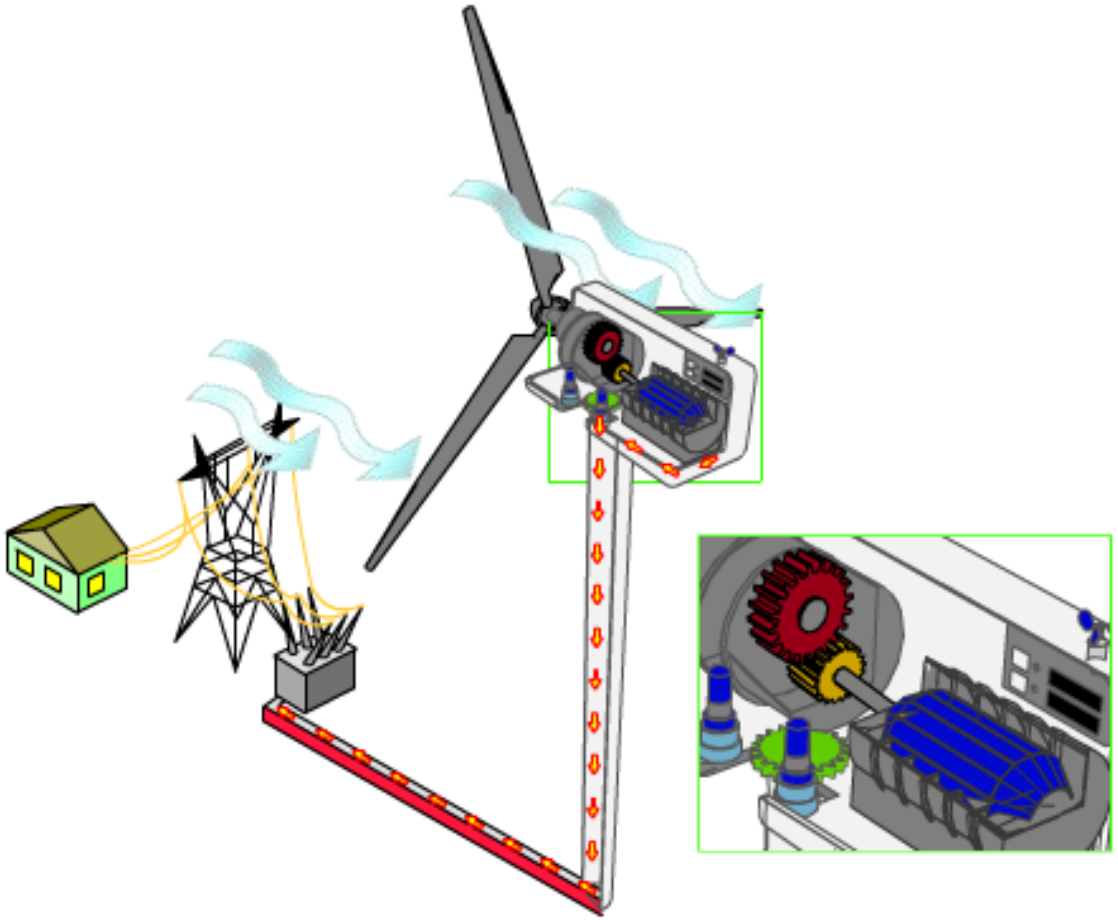
Turning in the wind

Windmills collect energy from moving air

Turning gears change wind to electricity

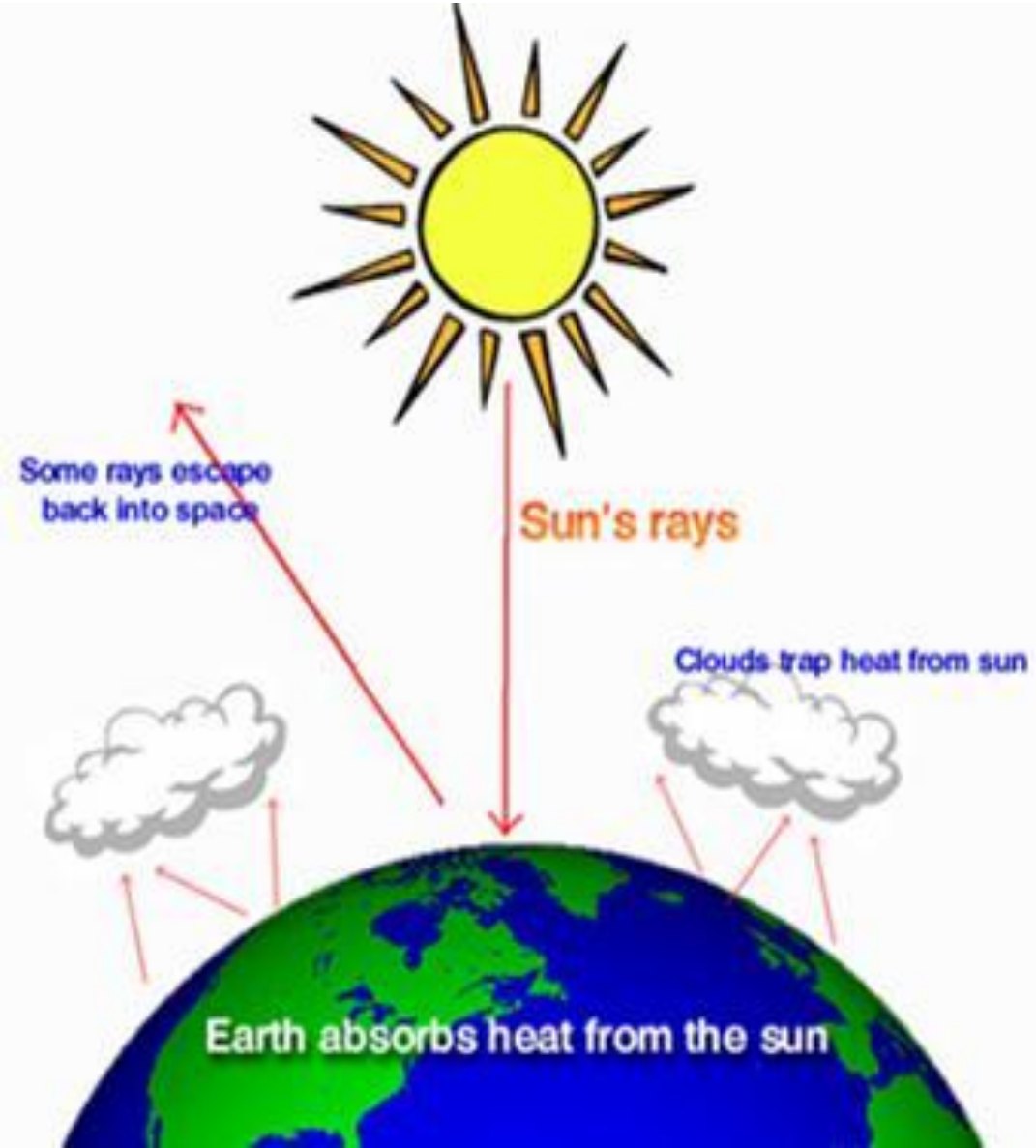
Gather the wind …

How it works



http://www1.eere.energy.gov/windandhydro/wind_how.html#inside

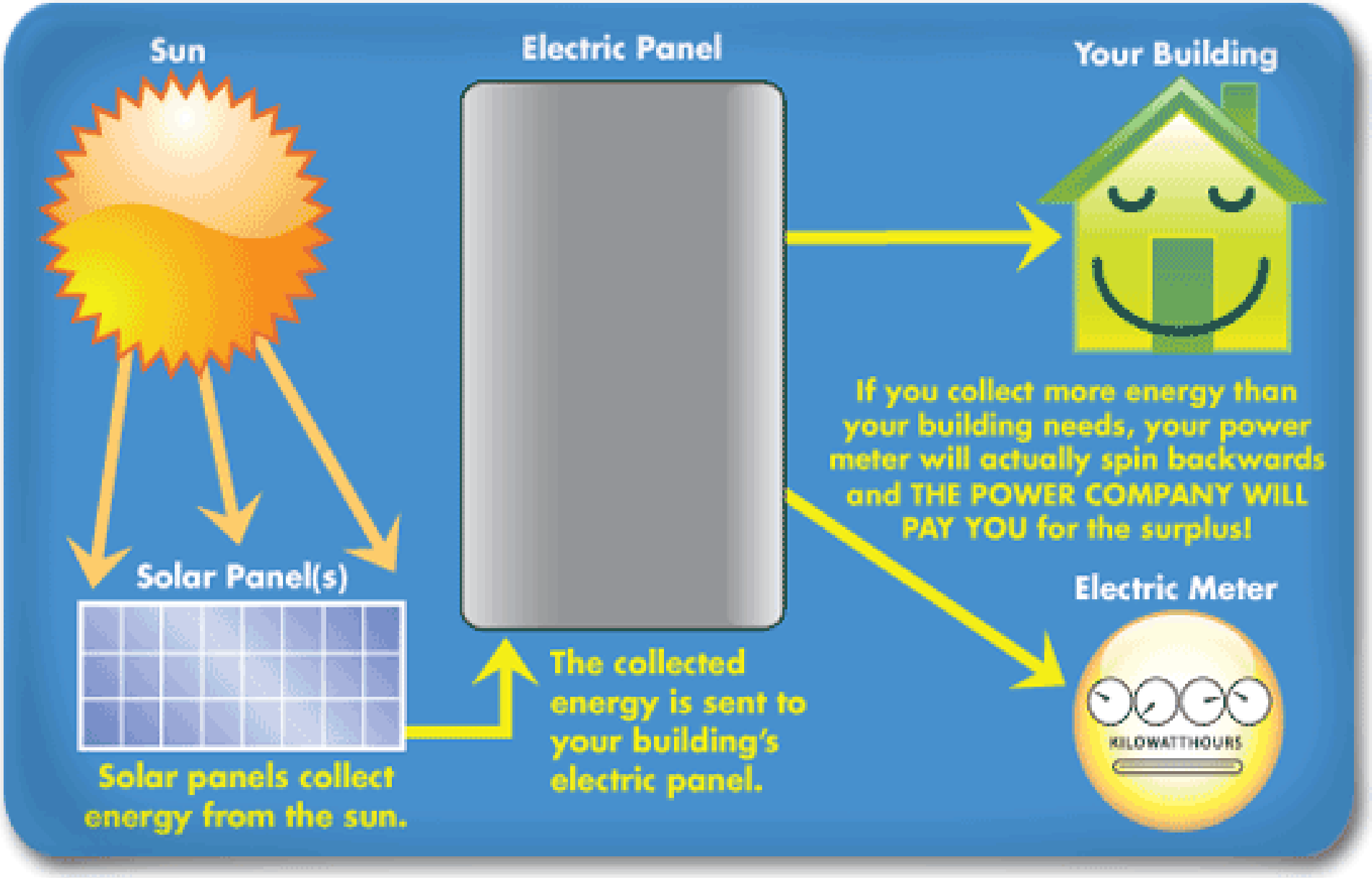
Solar Energy



Sun's radiation is sent to Earth

- The Earth absorbs some heat and reflects the rest.
- Our atmosphere traps the sun
- We can collect the energy using solar panels

Collecting Solar Energy



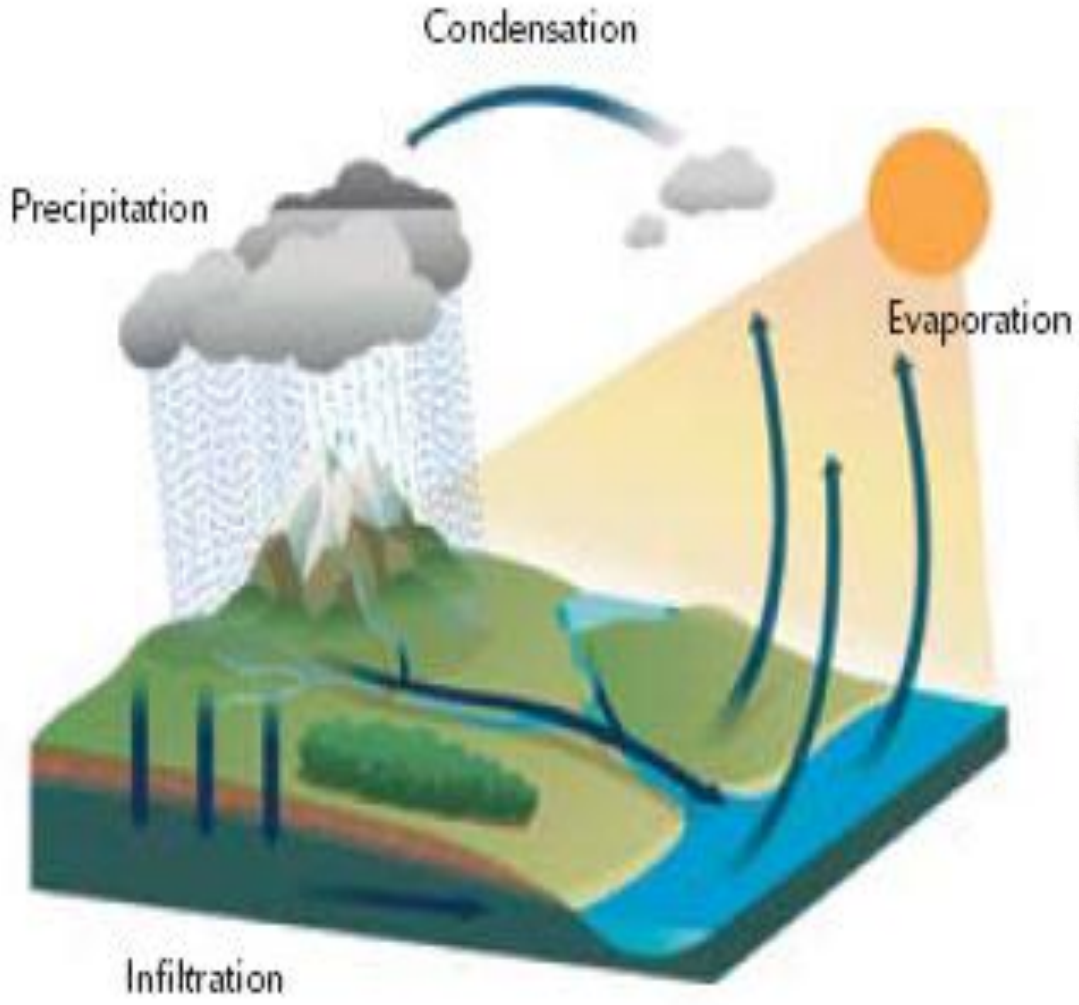
Solar Panels collect solar energy

Water Energy

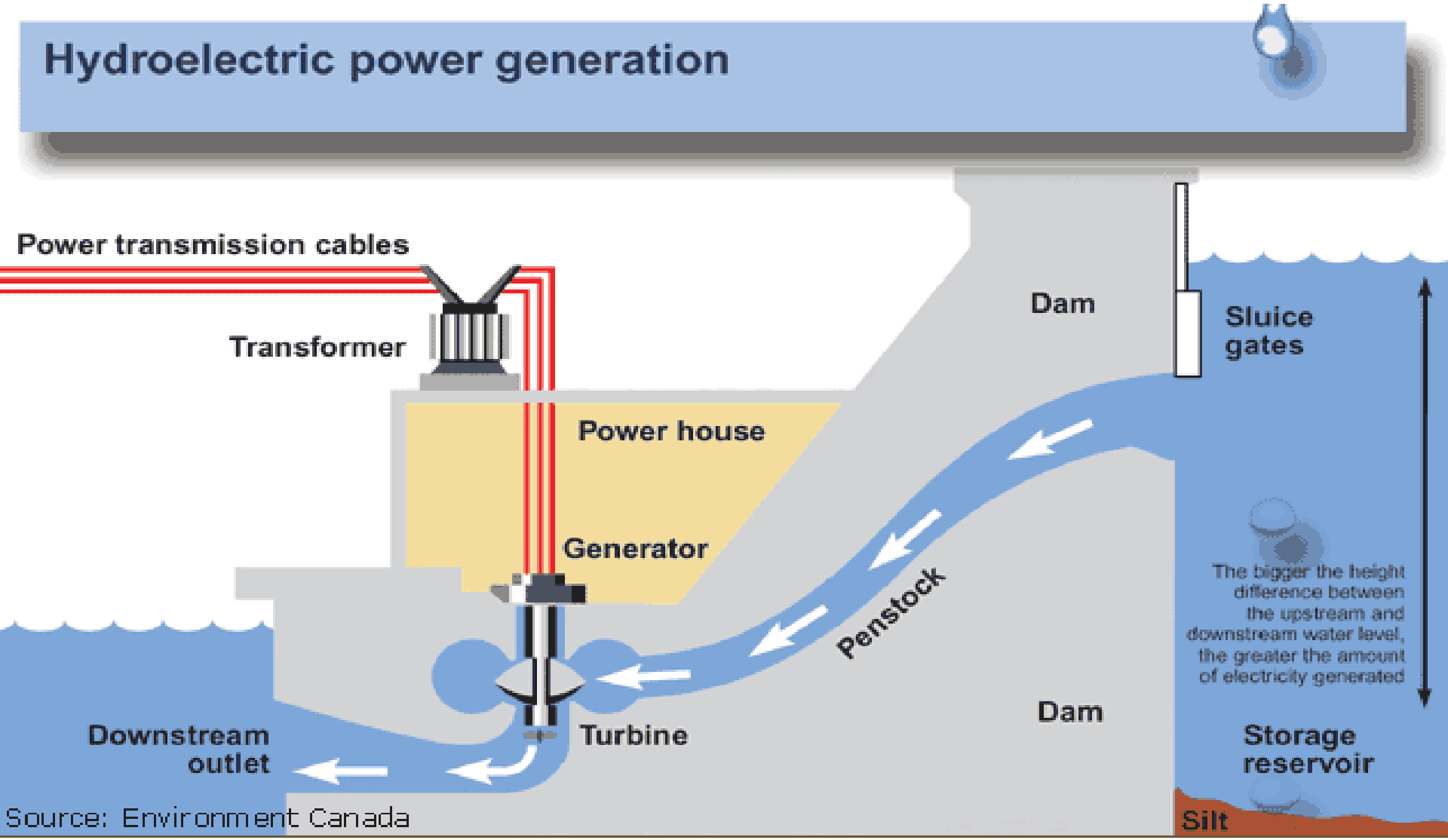
Turbines collect energy from water in several ways

- Dams control the water flow and use that control to move turbines
- Turbines are placed in streams and rivers to take advantage of natural water flow
- Turbines are placed in oceans to collect energy from the tides and waves.

Driven by the water cycle and used by people for many years.

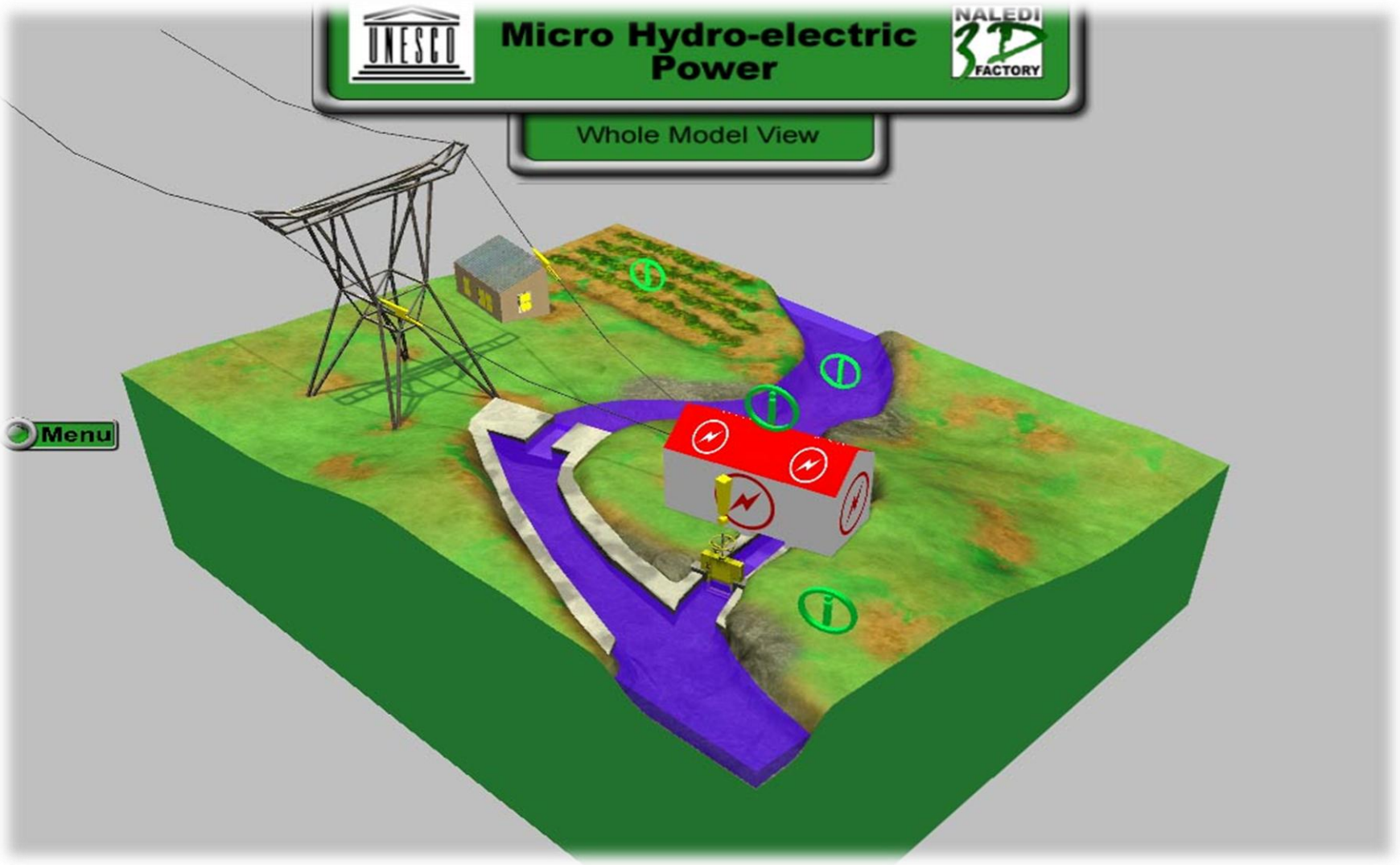


Energy from water = Hydropower



http://ga.water.usgs.gov/edu/hyhowworks.html

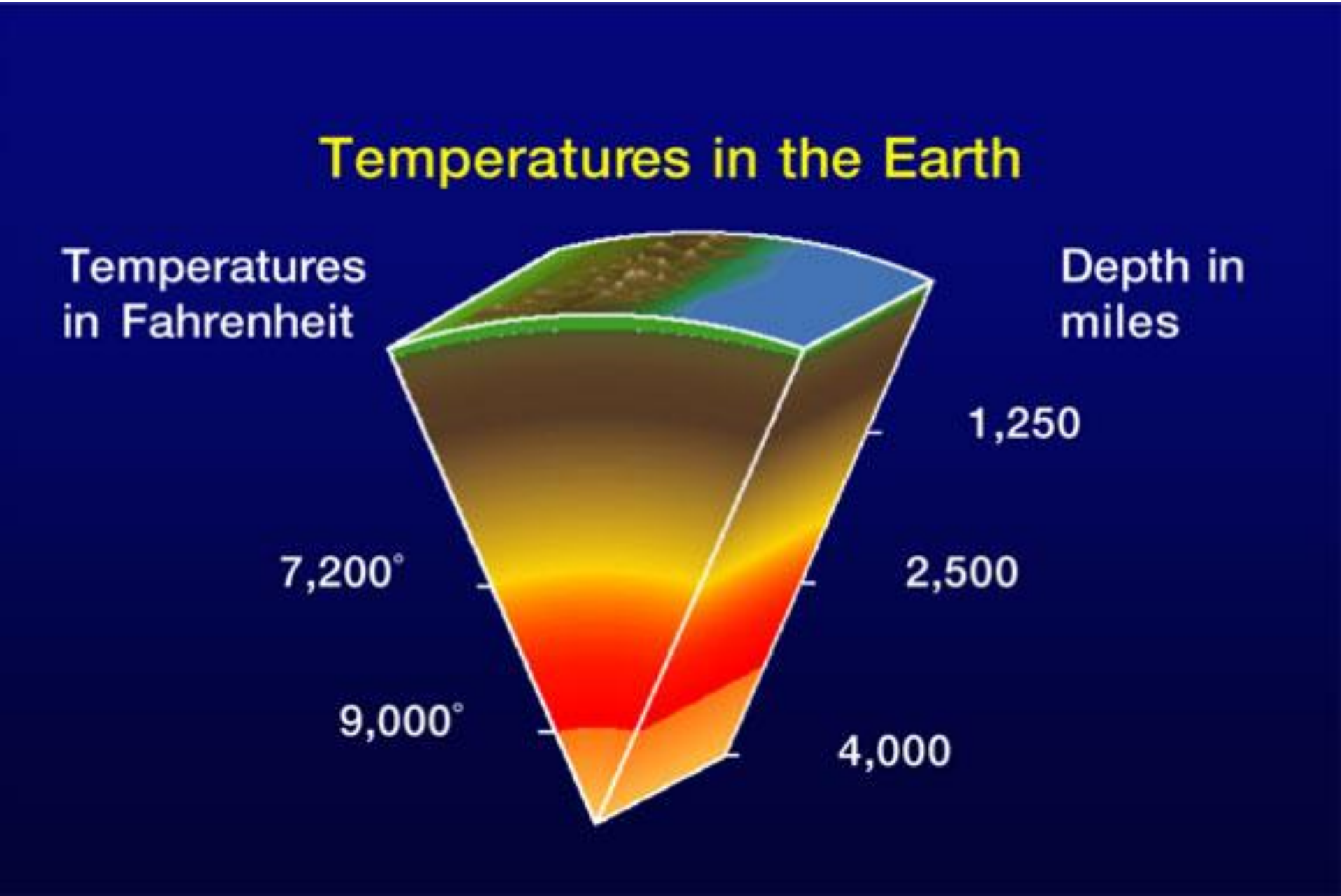
Water in streams and rivers can use turbines to collect the energy.



San Francisco's Tidal Power

San Francisco did research to find the best place to use their ocean turbines. They believe they can provide up to 400MW of power.

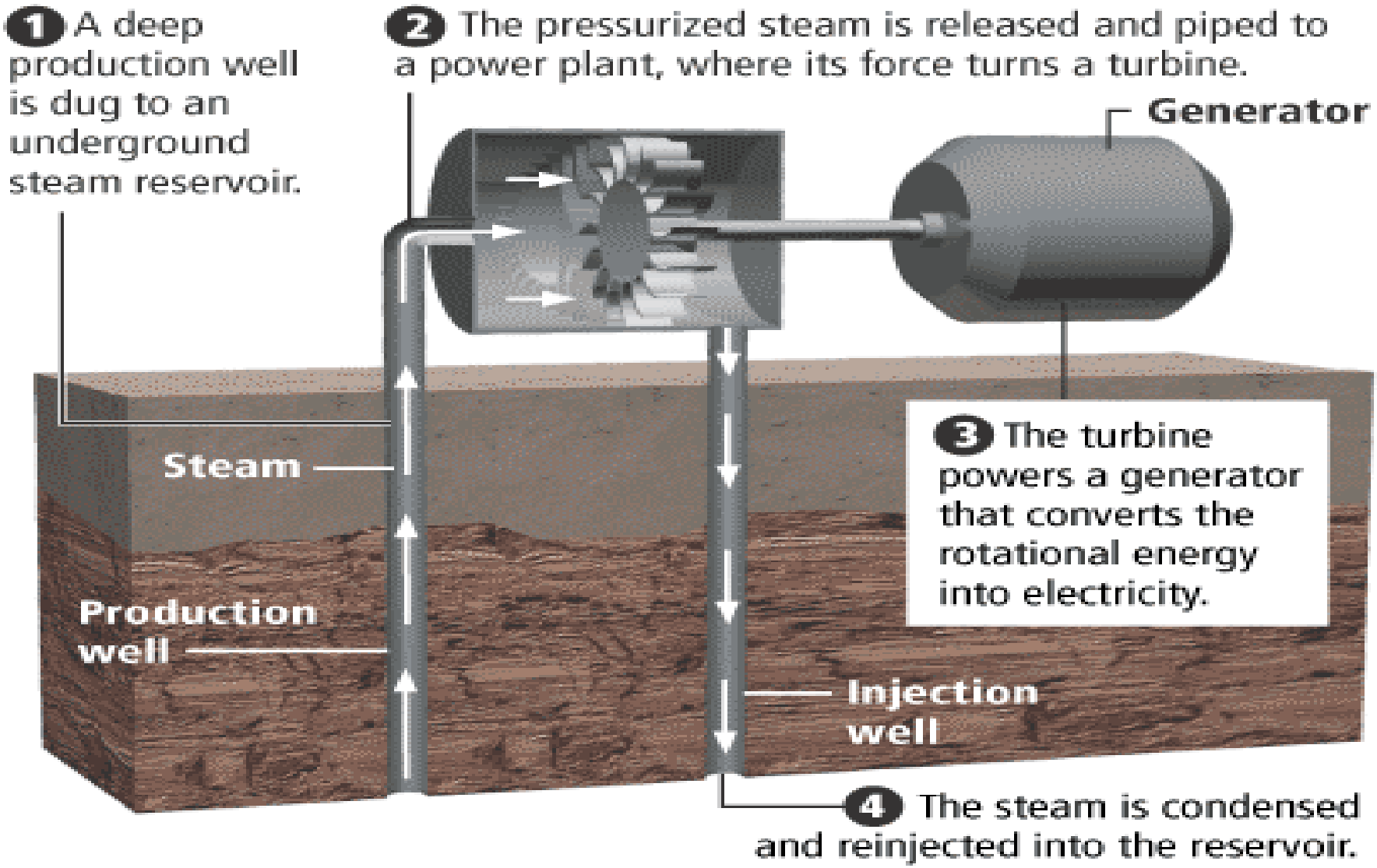
Geothermal – Energy from the Earth



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.

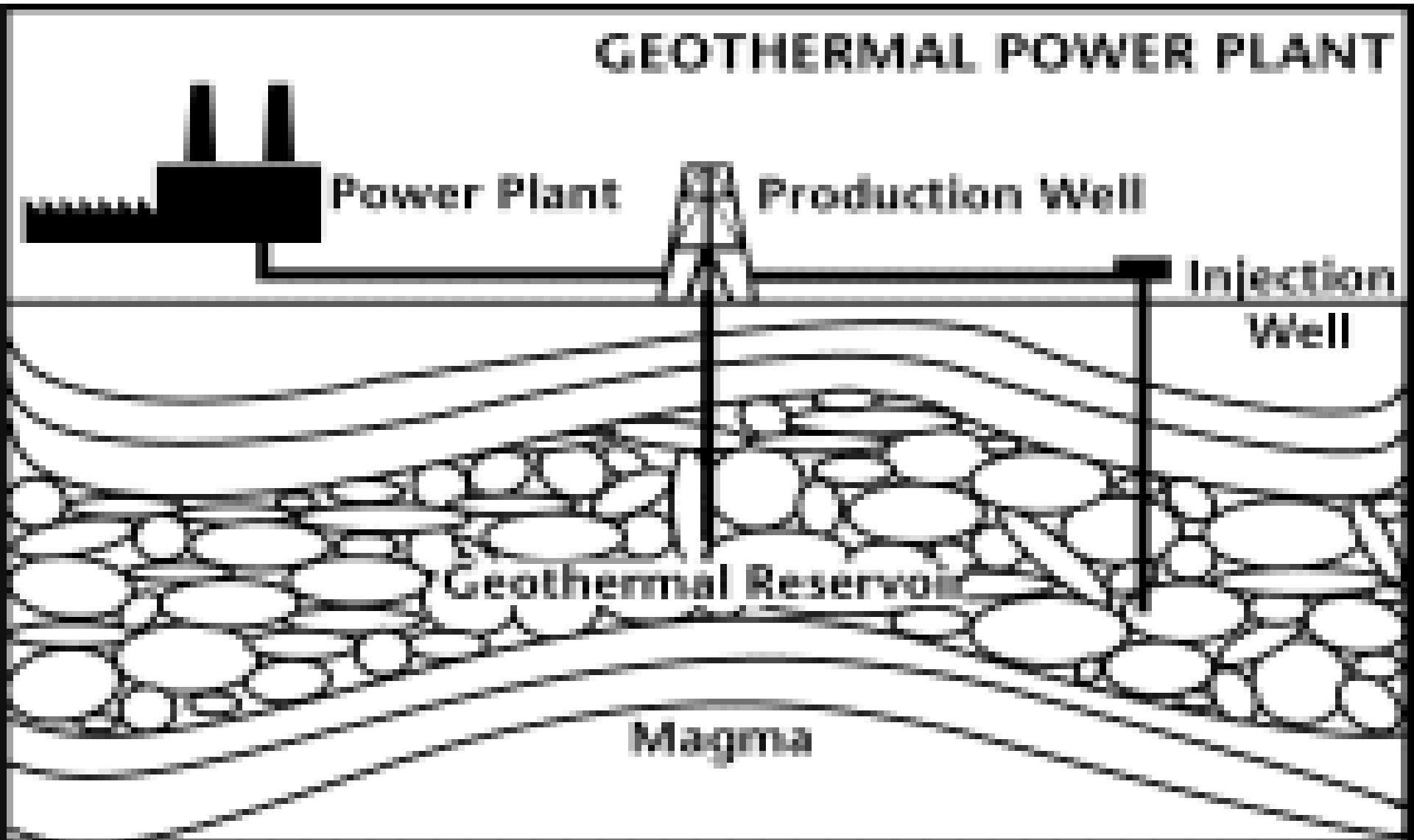
HOW IT WORKS

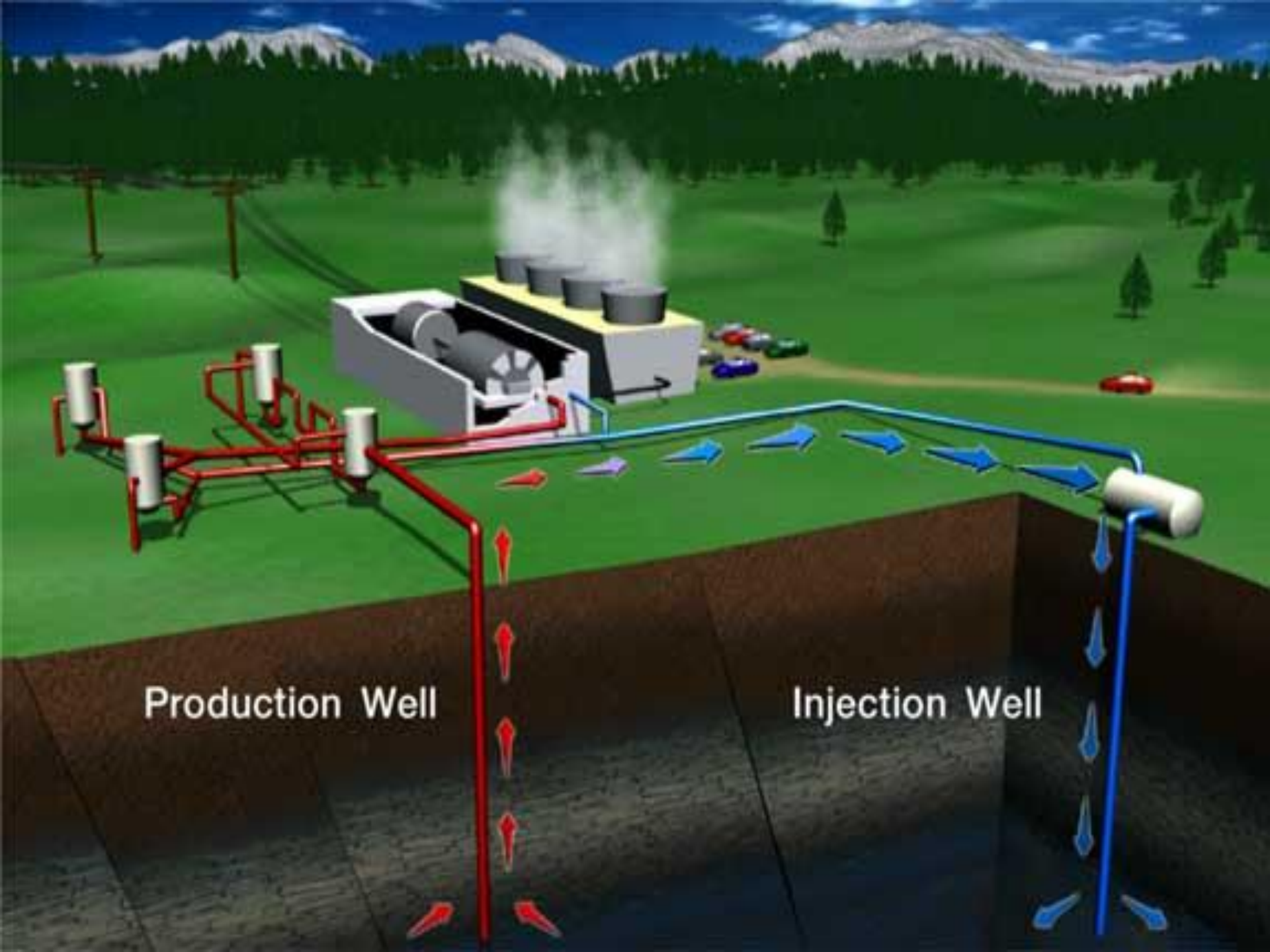


Source: U.S. Department of Energy

SEATTLE P-I

Use the Heat from the Earth's Magma




Production Well
Injection Well

Locations where Geothermal Energy is present. Where Tectonic Plates meet.

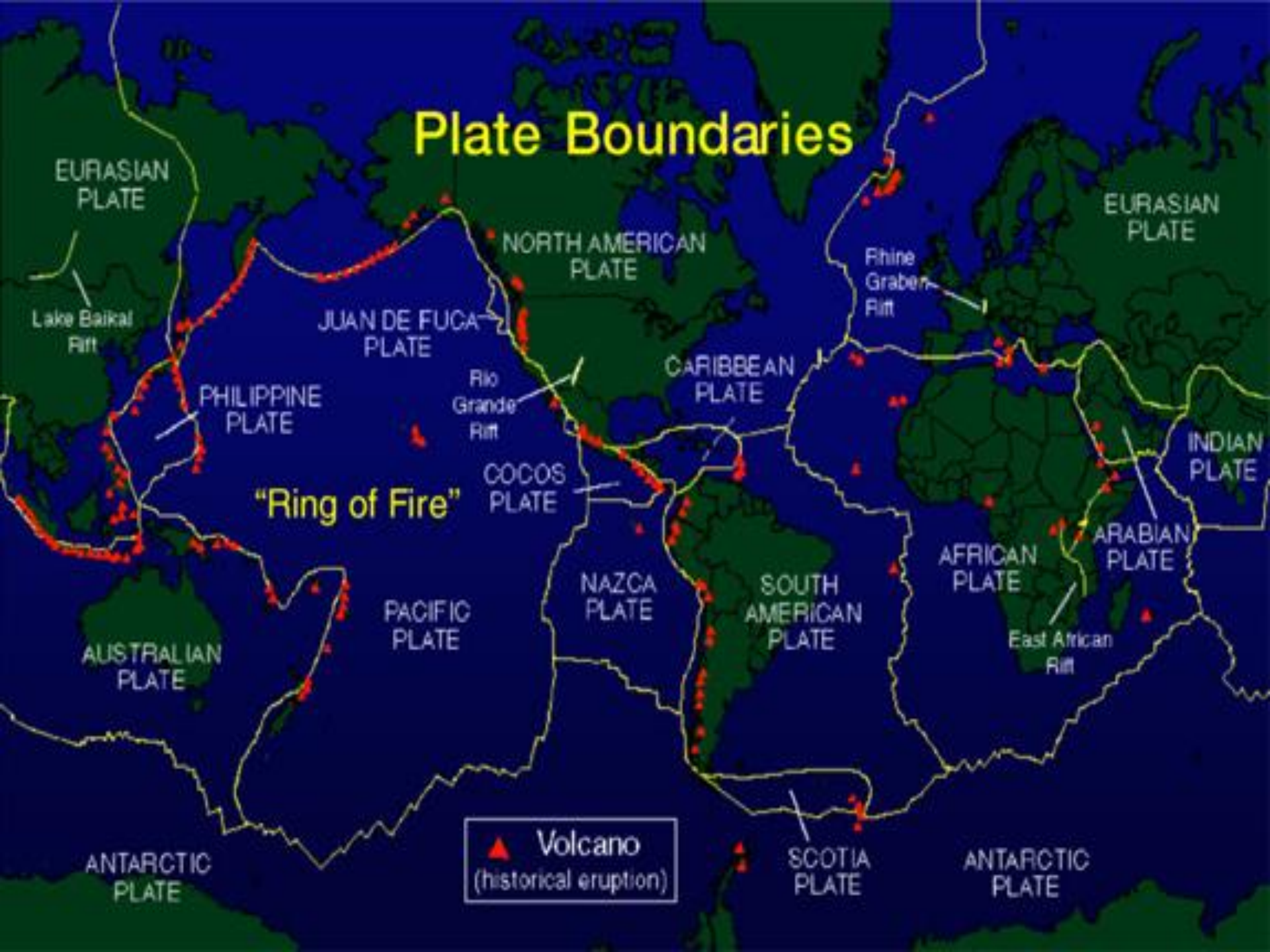
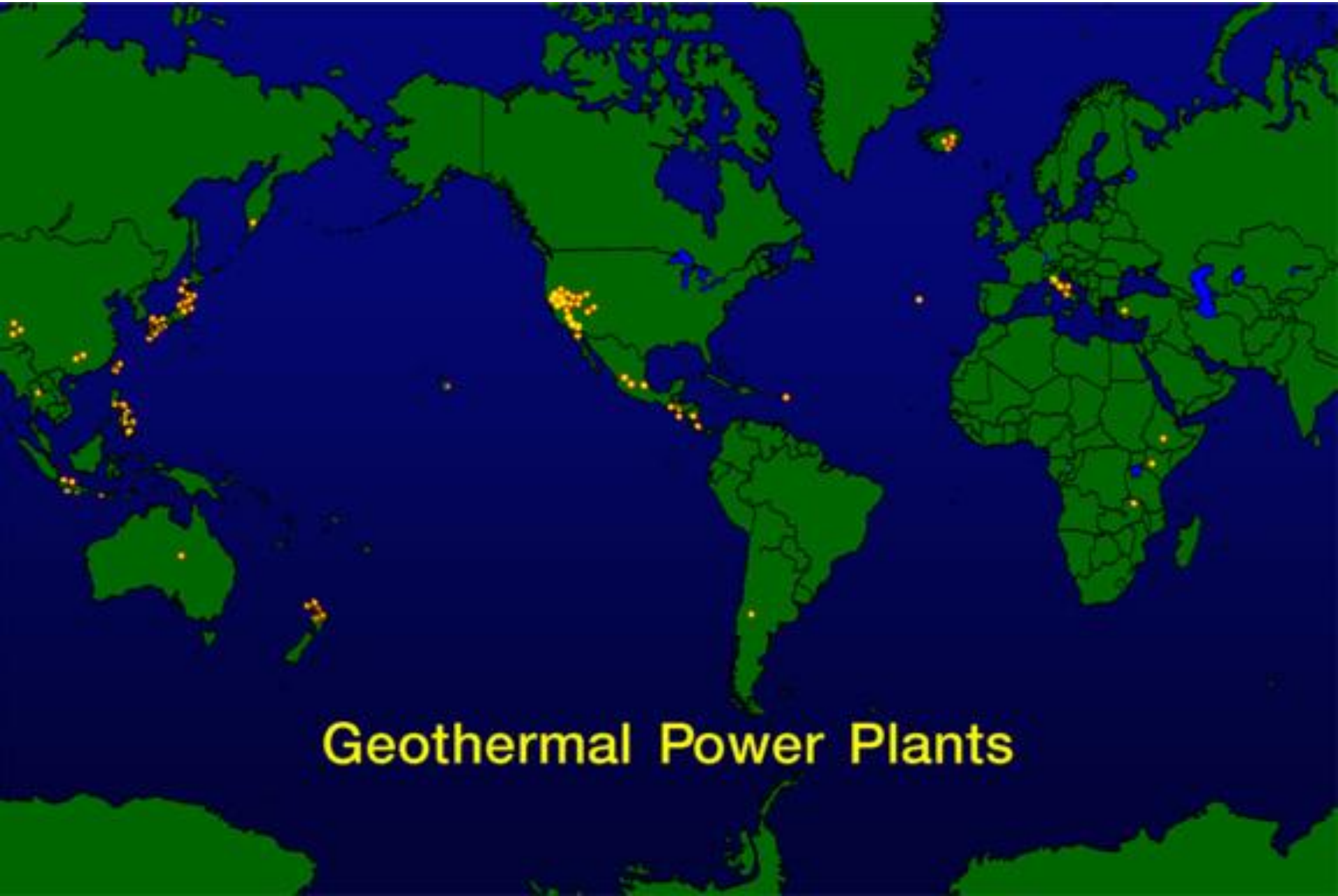


Plate Boundaries
EURASIAN PLATE
Lake Baikal Rift
NORTH AMERICAN PLATE
JUAN DE FUCA PLATE
PHILIPPINE PLATE
Rio Grande Rift
CARIBBEAN PLATE
Rhine Graben Rift
EURASIAN PLATE
INDIAN PLATE
"Ring of Fire"
COCOS PLATE
ARABIAN PLATE
AFRICAN PLATE
NAZCA PLATE
SOUTH AMERICAN PLATE
PACIFIC PLATE
East African Rift
AUSTRALIAN PLATE
Volcano
(historical eruption)
SCOTIA PLATE
ANTARCTIC PLATE
ANTARCTIC PLATE

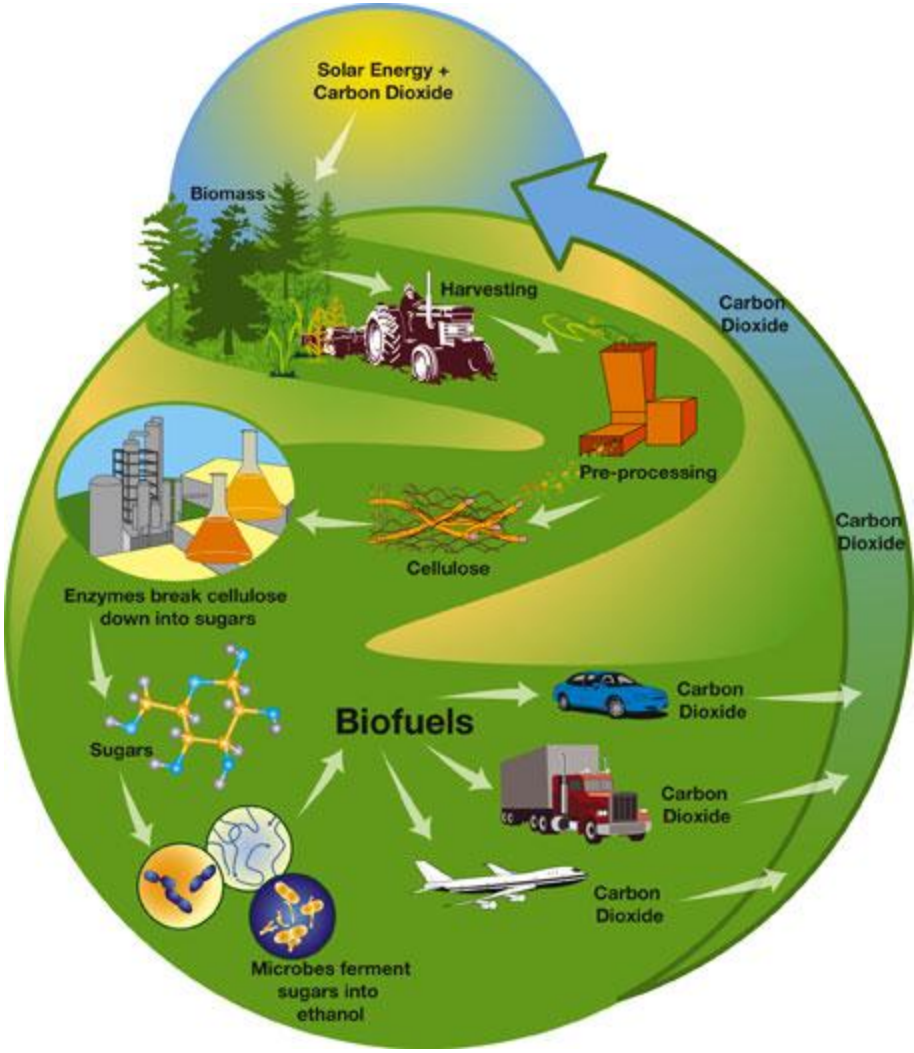
Using the Earth's Heat for Energy



Biofuels = Plants or animal by products

Fuel made from living things – usually plants

- Biofuels are produced from living organisms or organic or food waste products.
  - Wood burned for light and heat
  - Corn and Sugar changed to gas for vehicles
  - Recycled vegetable or animal fats can make diesel fuel



Biofuels

Biofuels made from plant waste, used vegetable oils, or corn, sugar and other crops