Renewable –vs- Nonrenewable Resources

Energy Sources – Renewable and Nonrenewable Resources

- **Renewable** = can be replenished fairly easily
  - **Renewable Energy** = Derived from resources like the sun and wind, that can easily be replenished
- **Non-renewable** = can not be replenished (or at least not in our life time)
  - **Non-renewable Energy** = energy sources like coal and oil, that can not be replaced over a useful period of time.

Renewable Energy/Resources

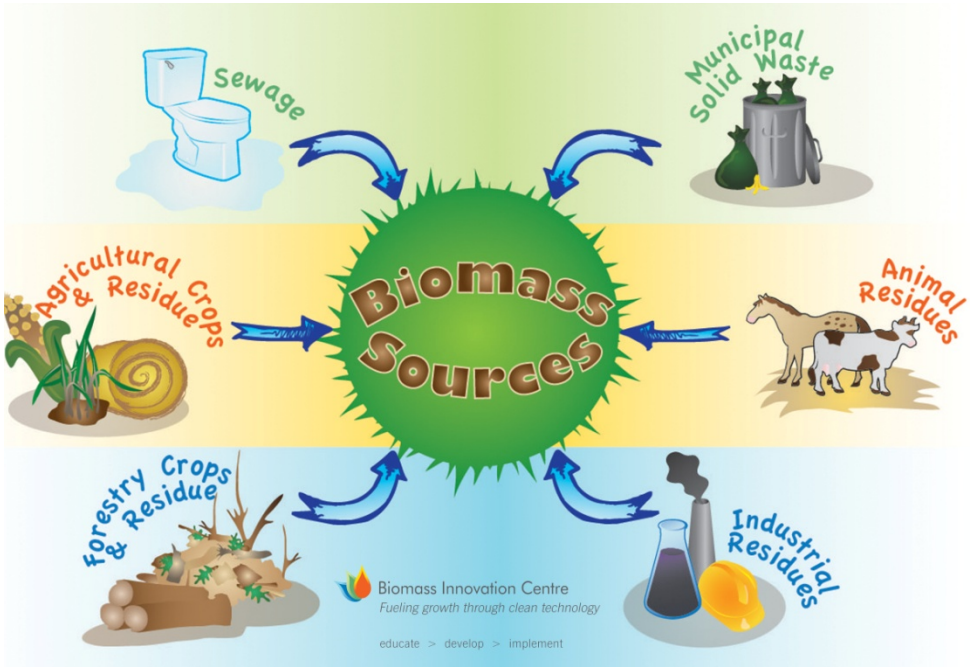
Biomass - organic material made from plants and animals (microorganisms).

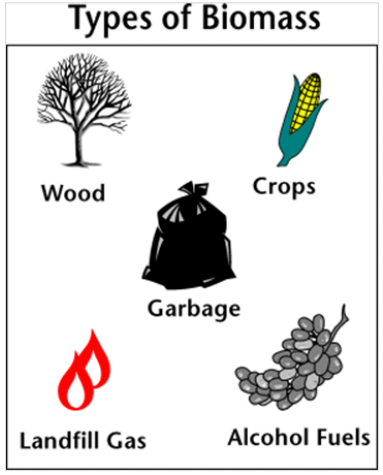
Pros:

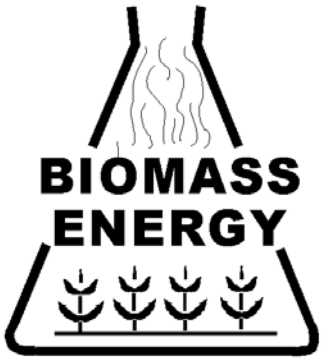
- Cleaner burning than oil
- Abundant
- renewable

Cons:

- Causes food prices to rise because we use grains to make ethanol
- Greenhouse gas producer
- Not efficient to transport the raw material







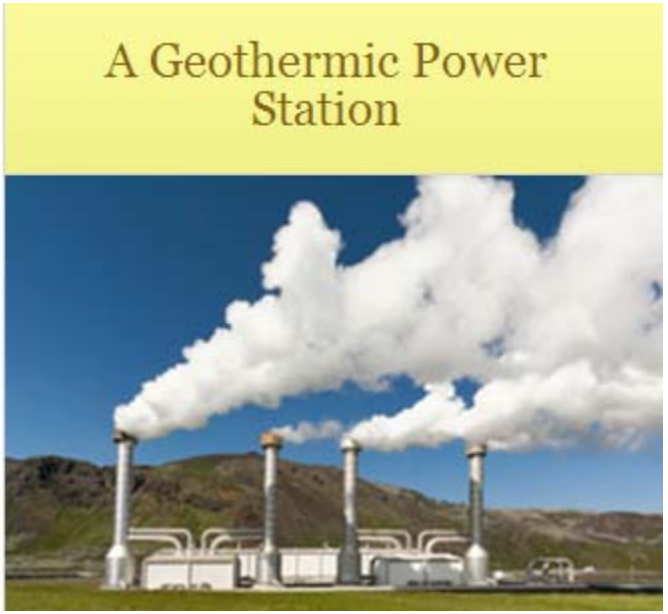
Geothermal - Temperatures hotter than the sun's surface are continuously produced inside the Earth by the slow decay of radioactive particles, a process that happens in all rocks.

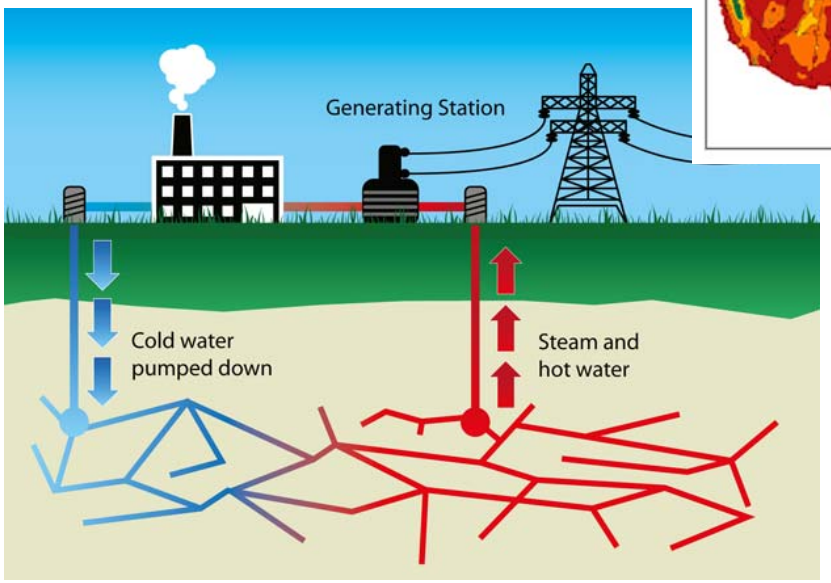
Pros:

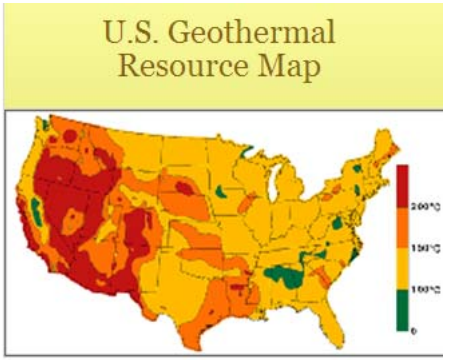
- Low greenhouse gas producer
- Renewable in some places
- Energy and cost efficient

Cons:

- Few geothermal fields that are not on protected land







Hydropower - energy from moving water

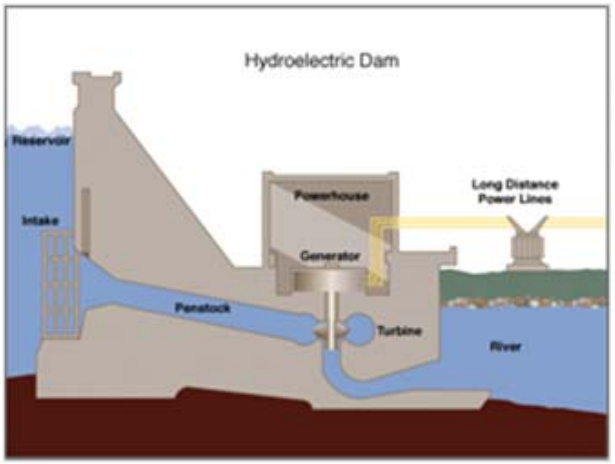
Pros:

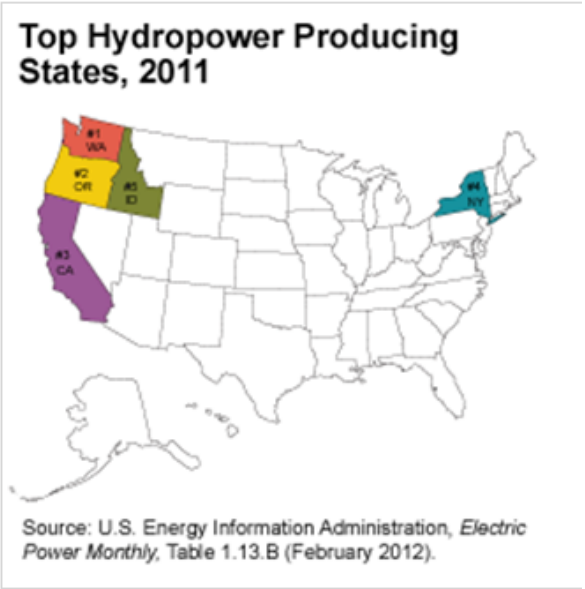
- No greenhouse gases
- Can generate lots of electricity
- Renewable

Cons:

- Can damage environment where dam is built (can change the natural water temperatures, chemistry, flow characteristics, and silt loads, all of which can lead to significant changes in the ecology (living organisms and the environment) and rocks and land forms of the river upstream and downstream.
- Expensive to build

Fish Ladder at the Bonneville Dam on the Columbia River Separating Washington and Oregon





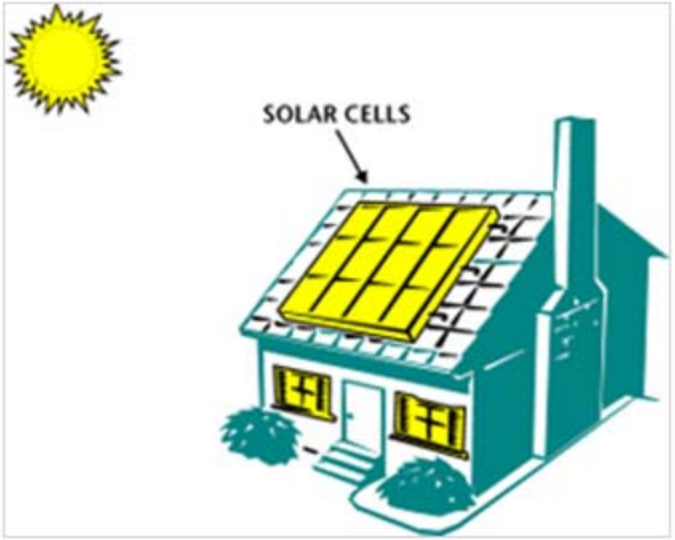
Solar Power - the sun's rays (solar radiation) that reach the Earth. This energy can be converted into other forms of energy, such as heat and electricity.

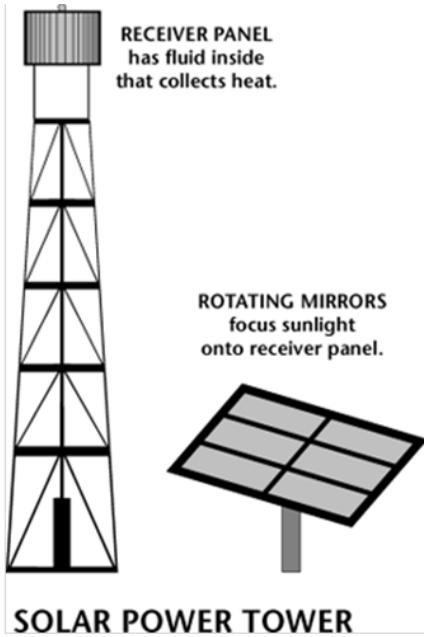
Pros:

- No greenhouse gases released
- When located on buildings have limited impact on environment
- Renewable

Cons:

- Expensive investment to install
- Not effective in areas with limited light





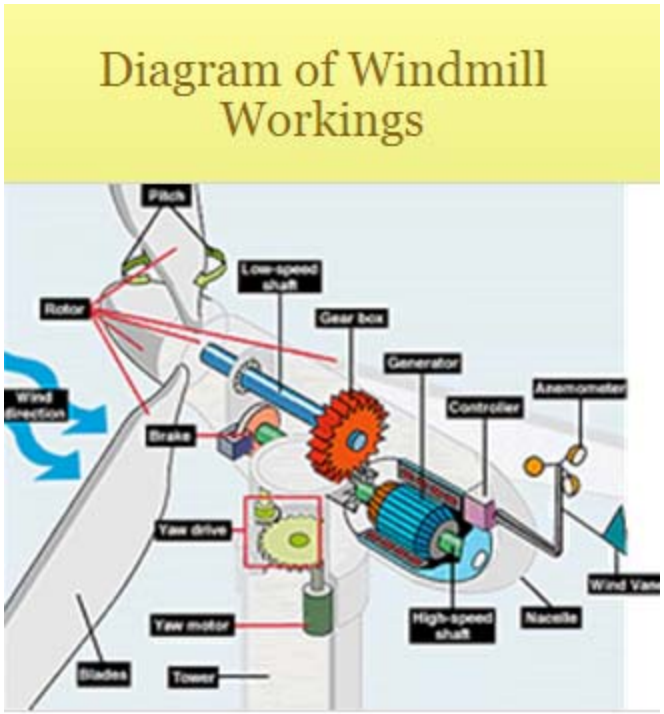
Wind Power - wind turbines use blades, the wind flows over the blades creating lift, like the effect on airplane wings, which causes them to turn. The blades are connected to a drive shaft that turns an electric generator to produce electricity.

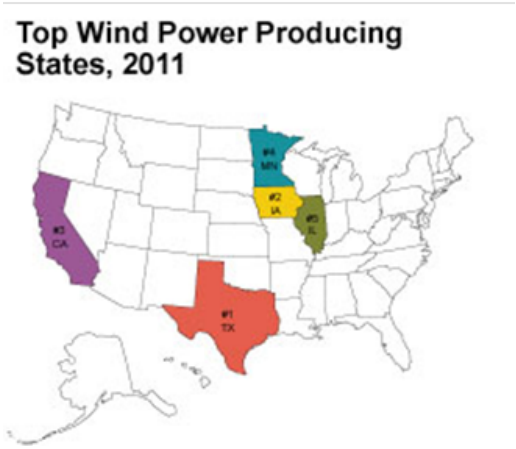
Pros:

- No greenhouse gases produced
- Renewable in some places

Cons:

- Limited to areas of reliable high winds
- High initial cost (but not as much as solar)
- Extensive land use
- Harms bats and migrating birds





Non-Renewable Energy/Resources

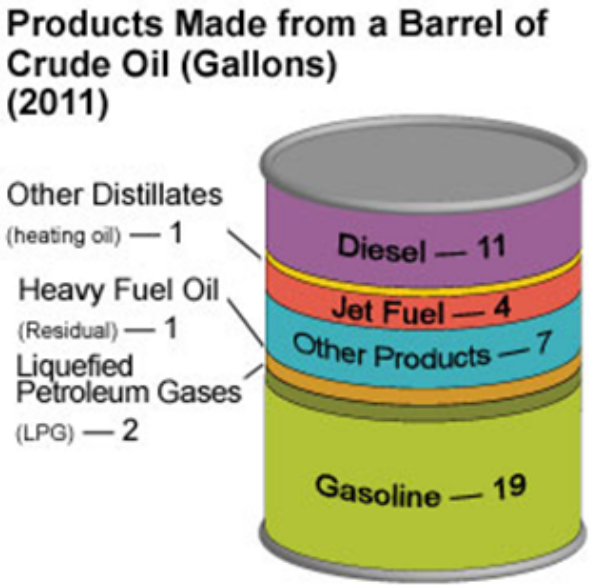
Oil (Petroleum) - Crude oil is a smelly, yellow-to-black liquid and is usually found in underground areas called reservoirs.

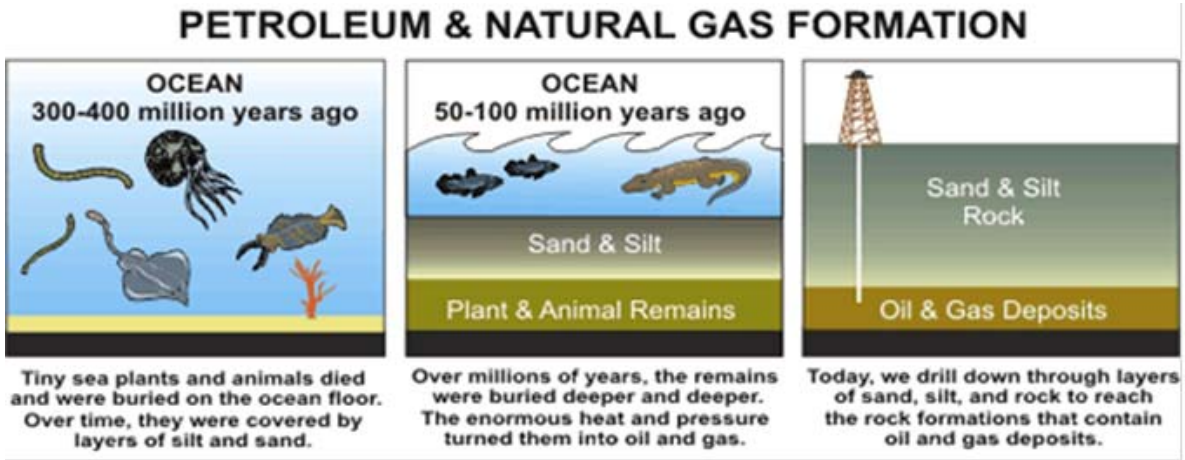
Pros:

- Easy to produce and transport
- High energy output

Cons:

- Non-renewable
- Region specific (causes lots of wars)
- Running out
- Environmental damage from spills
- High greenhouse gas (CO_2) producer





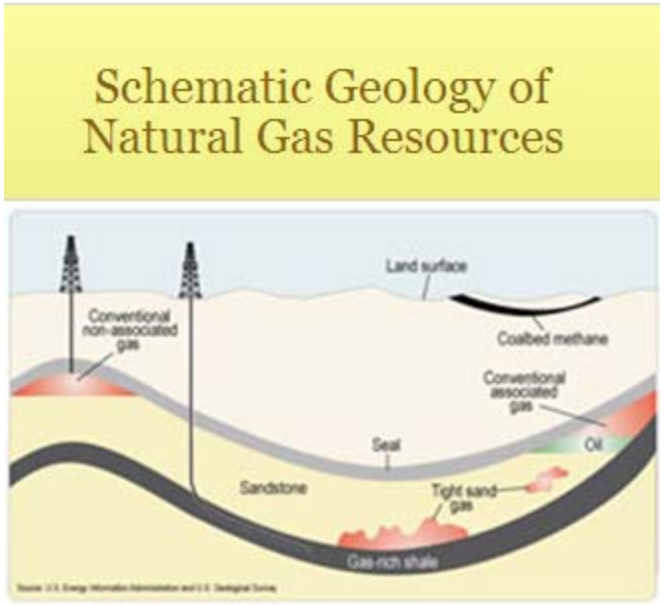
Natural Gas - main ingredient in natural gas is methane, a gas (or compound) composed of one carbon atom and four hydrogen atoms.

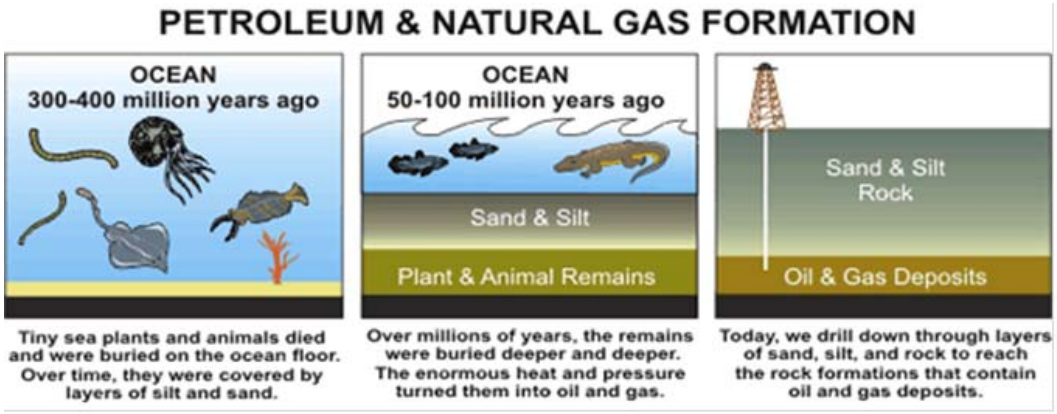
Pros:

- Abundant
- Fewer greenhouse gases than coal or oil

Cons:

- Expensive to transport
- Greenhouse gas producer
- Non-renewable
- Many of the areas that are now being explored and developed for natural gas production are wilderness areas, and development of these areas have large impacts on the area's environment, wildlife populations.





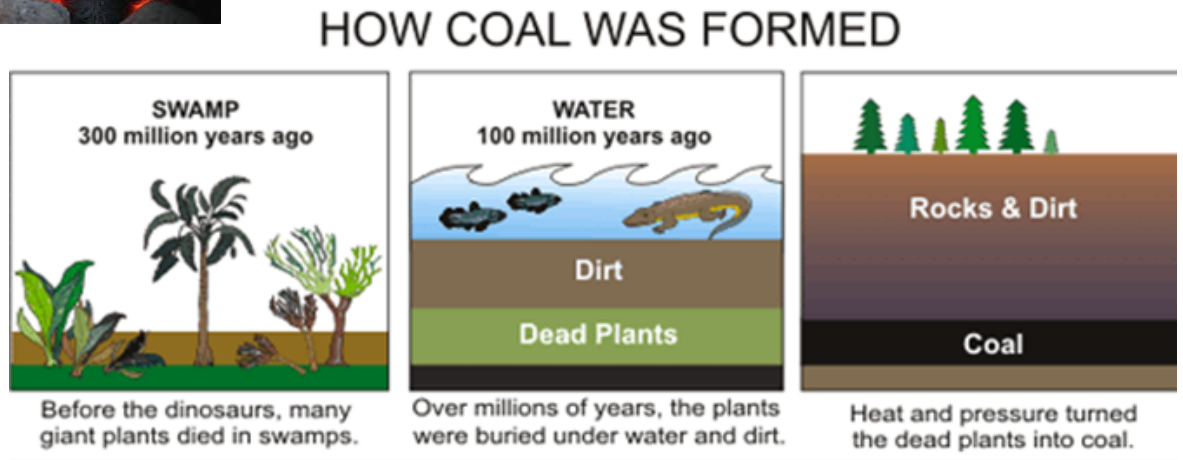
Coal - a combustible black or brownish-black sedimentary rock composed mostly of carbon and hydrocarbons. Most abundant fossil fuel produced in the U.S. The energy in coal comes from the energy stored by plants that lived hundreds of millions of years ago, when the Earth was partly covered with swampy forests.

Pros:

- Abundant
- High energy output

Cons:

- Non-renewable (it takes millions of years to create)
- Extraction is destructive to environment
- High greenhouse gas producer



Nuclear Power/Uranium - nuclear fission, atoms are split apart to form smaller atoms, releasing energy. Nuclear power plants use this energy to produce electricity.

Pros:

- No greenhouse gases
- Very efficient energy producer
- abundant

Cons:

- Expensive to build and maintain reactors
- Produces radioactive waste
- Difficult to dispose of waste
- Heated waste water is harmful to aquatic life
- Terrorism threat with spent fuel (nuclear weapons)