

Chapter 5 Energy Resources

5.1 Natural Resources

- ▶ What do the water you drink, the paper you write on, and the air you breathe have in common?
 - they are all one of Earth's resources.

• Natural Resource is any natural material that is used by humans



- water
- petroleum
- minerals
- forests
- Animals

• the energy we get from many of our natural resources ultimately comes from the sun.

▶ Renewable Resources:

- ones that can be replaced at the same rate at which it is being used.

Examples: water
forests

▶ Nonrenewable Resources:

~~water~~

- a resource that forms at a rate much slower than the rate at which it is consumed

▶ Conserving Natural Resources

- How can we conserve natural resources?
 - by reducing the amounts that we use.
- most natural resources that provide us energy are nonrenewable.
- 2 ways people can conserve energy.
 - turning off lights
 - turning off water
- recycling is the process of reusing materials from waste or scrap
- recycling helps conserve energy because it takes less energy to recycle products than to make new ones.
- 3 products that are recyclable
 - ① plastic
 - ② glass
 - ③ paper

5.2 Fossil Fuels :

- Energy Resources:
 - natural resources that humans use to generate energy.
- most of the energy we use comes from

• It is very important to conserve fossil fuels b/c they are nonrenewable.

Types of fossil fuels:

• all living things are made up of the element carbon

• most of this carbon exists as hydrogen-carbon compounds called hydrocarbons.

▲ liquid form = petroleum

• petroleum

- accounts for more than 40% of the world's energy.

▲ gaseous form = natural gas

• methane

- main component of natural gas.

▲ solid fossil fuel = coal

• Coal is used as a major energy back in history for heat, transportation by train

- We now use it less b/c it was a pollutant.

How Do Fossil Fuels Form:

• Burned remains, ancient organisms

Where are Fossil Fuels Found:

• 1/2 of the petroleum used by the United States comes from other countries.

▶ How Do we obtain Fossil Fuels

- We remove petroleum and natural gas from the Earth's crust by drilling wells.
- Soil and rock are stripped from the Earth's surface to expose underlying coal by surface mining or strip mining.

▶ Problem w / Fossil Fuels

- Coal mining destroys habitats and pollutes water.
- Producing, transporting, and using petroleum can result in oil spills, and air pollution.

5:3 Alternative Resources:

▶ Splitting the Atom: Fission

- Two main problems with fossil fuels
 - ① Availability is limited
 - ② Environmental consequences
- Nuclear Energy
 - the energy released by a fission or fusion reaction
- Joule
 - the SI unit of measurement for all forms of energy.
- Fission
 - the process by which the nuclei of radioactive atoms are split into two or more

smaller nuclei.

- 2 reasons we use fossil fuels instead of Nuclear Energy

① produce dangerous radioactive waste.

② potential for accidental release of radiation into environment when the plant over heats

* cooling towers are created to help prevent over heating.

▶ Combining Atoms: Fusion

- the joining of two or more nuclei to form a larger nucleus = Fusion

- Fusion happens naturally on the Sun.

- Fusion Advantage -

- produces few dangerous wastes.

- Fusion Disadvantage -

- very high temperature are required for reaction to take place

- No known material can withstand such high temperatures.

▶ Chemical Energy :

- Fuel cells produce chemical energy by combining hydrogen and oxygen.

- Water is the only byproduct of fuel cells.

- Chemical energy - is the energy released when a chemical compound reacts to produce new compounds

▶ Solar Energy:

- energy received by Earth from the sun in the form of radiation

Renewable resource

- Solar cells and solar voltaic cells are used for changing sunlight into electrical energy.

- Solar panels -

- large panels made of solar cells wired together.
- used for electrical energy

- Solar collectors -

- dark colored boxes w/ glass or plastic tops.
- used to heat water

*Disadvantage -

- not enough sunny days
- very expensive

▶ Wind Power:

- the use of a windmill to drive an electrical generator

Renewable

▶ Hydroelectric Energy:

- energy produced by falling water

*Advantage -

- inexpensive
- renewable

* Disadvantage -

- not available everywhere



Power From Plants:

- Biomass - organic matter that can be used as a source of energy.
 - Burning is the most common way to release biomass.
- plants containing sugar/starch can be made into alcohol.
- alcohol + Gasoline = Gasohol

* ADVANTAGE

* Renewable *

* DISADVANTAGE

- producing Biomass requires land that could be used for growing food.

▶ Energy from within Earth:

- geothermal energy
 - energy produced by the heat within Earth.
- geysers
 - natural vents that discharge geothermal steam or water into the air.