

## **Objectives**

- What is energy?
- Fossil fuels
  - Oil
  - Coal
  - Natural gas
- Combustion
- Hydroelectric
- Nuclear

# What is Energy?

In the energy industry, energy is the capacity

to do work.

 Work and heat represent energy being transferred to or from a substance.

 The quantity of energy decreases when when work is done by something, and increases when work is done on something.



#### **Fossil Fuels**

- Contain chemical energy.
- Composed of hydrocarbons
- Nonrenewable
- Types of fossil fuels
  - Coal
  - Natural Gas
  - Petroleum



### Combustion

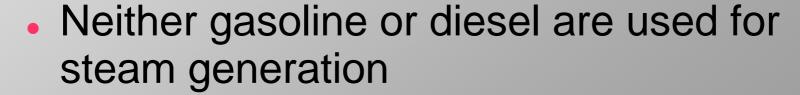


- Is a chemical reaction in which a fuel combines rapidly with oxygen
- Necessary factors in combustion
  - Fuel
  - Oxygen
  - Heat

### Oil

- Used for firing steam power plants
- Distillate fuel oils are:
  - Clean and free of sediment
  - Comparatively low viscosity
  - Free of inorganic ash







#### Coal

- North American coal can be ranked as:
  - Content
  - Heating Value
  - grade
- Factors that affect how well coal burns:
  - Amount of water
  - Volitile matter
  - Carbon content

#### **Natural Gas**

- Main ingredient is methane
- Burns cleaner than oil
- Undesirable contents:
  - Sand
  - Hydrogen sulfide
- Natural as is transported by pipeline.
  (225,000 miles in the US).



# Hydroelectric

- Construction of plants depends on:
  - Elevation
  - Water flow
  - Water volume
  - Precipitation levels
- Renewable



#### Nuclear

- Enrichment facilities enrich uranium to the appropriate composition for nuclear reactor rods
- Uranium reactor rods are radioactive, and transportation is controlled
- Radioactive waste must be stored for thousands of years before they are safe



### Review

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