Review Sheet – Energy and the Environment

- Fossil fuels
  - Natural gas, Petroleum, Coal
- Fossil fuel composition (Carbon, Hydrogen, Nitrogen, Sulfur, Minerals)
- Products of Combustion
  - Primary pollutants
    - Carbon Dioxide (majority), Carbon Monoxide, Sulfur Dioxide, Nitrogen Oxides , Lead
  - Secondary Pollutants
    - Difference between primary and secondary
  - Particulate matter
    - Primary particles
    - Secondary particles
- Health and environmental effects of
  - CO_2, CO, SO_2, NO_x, Lead
  - PM
    - Very Small (smaller than 0.1 μm)
    - Intermediate (between 0.1 μm and 2 μm) Most dangerous
    - Coarse size (larger than 2 μm)

- **Global and Regional effects of Secondary Pollutants**
  - Greenhouse effect - What is it?
  - Greenhouse gases and GWP
    - CO_2, H_2O, CH_4, N_2O, Other gases [CFC-12, HCFC-22, Perfluoromethane (CF_4), Sulfur hexafluoride (SF_6)]
  - CO_2 and temperature fluctuations (pre industrial and current concentrations and temperature changes)
  - Global warming:
    - What is it?

        - Difference between greenhouse effect and Global warming
        - Factors affecting Global climate change
        - Potential consequences on global temperature, change in sea levels, polar icecaps, precipitation levels etc.
        - What is known for certain?
        - What is likely but uncertain?
        - What is uncertain?
    - Solutions for global warming

- **Acid Rain and Ozone**
    - Acid Deposition, Basic chemistry of formation, gases responsible for acid deposition
        - Wet deposition
        - Dry Deposition
        - pH scale (ranges from 0 to 14)
            - pH of 7 is neutral
            - pH less than 7 is acidic
            - pH greater than 7 is basic
        - Effects of acid rain on human health, vegetation, aquatic life, visibility, and materials,
    - Ozone
        - Good Ozone (stratospheric ozone) Vs. Bad Ozone (ground level ozone)
        - Ozone Hole (Dobson units)
        - Effects of Ozone depletion – basic chemistry
        - Ground level Ozone and Photochemical smog formation- Basic chemistry
        - Health and Environmental effects
        - Your power in protecting the environment