

Chemical Engineering 310

Review for Exam 1

Big Picture

- World Energy Sources
- World Energy Use
- President Benson's talk

Equipment

- BYU Heating Plant
- IPP
- Cycles (Rankine, IGCC, NGCC)

Sources of Energy

- Oil
 - Petroleum
 - Tar Sands
 - Oil Shale
- Natural Gas
- Coal
- Nuclear
- Renewables
 - Hydroelectric
 - Biomass
 - Solar
 - Wind
 - Geothermal
 - Other

Uses of Energy

- Electricity
- Heat Engines
- Transportation
- Household

Energy Costs

- Nominal vs. Real \$
- Capital, operating, and maintenance costs
- Fuel Costs (i.e., \$/MBtu)
- Electricity
 - Installation costs
 - Net production costs vs. source

Energy Forecasts

- Previous forecasts
- Near term (25 years)
 - DOE
 - Doom & Gloom
- Long term (50-100 years)

New Technology

- Power
 - Higher efficiency combustion systems
 - Fuel cells
- Transportation
 - Hybrid and electric vehicles
 - Biofuels
 - Hydrogen-powered vehicles

Environment

- Major emissions
 - What they are
 - What fuels produce them
 - What is being done to reduce them
- Trends in emissions
- Ways to clean up or reduce emissions
- CO₂ issues
 - Production
 - Possible effects
 - Sequestration
- Challenges with renewables

Security

- Dependence on imports
- Susceptibility to terrorist activities

Thought Essay

Terminology