

# Earth Systems II – Unit 8 Study Guide

es2u8sg (Energy Resources)

<http://solarcooking.org/>

<http://www.kidwind.org/materials/buildingwindmills.html>

## Learning Objectives

1. Describe the nature and origin of coal, and evaluate its extraction. Use, and future depletion. **564-565**
  - a. How does coal form?
  - b. What are the four types of coal and their properties?
  - c. Describe the two ways coal is mined.
  - d. What four countries contain the most coal?
2. Describe the nature and origin of petroleum and evaluate its extraction, use, and future depletion. **565-574**
  - a. Describe how oil is formed?
  - b. What is the "reserves-to-production ratio" and how is it used?
  - c. What is meant by "Hubbert's peak"?
  - d. Summarize how crude oil is refined.
3. Outline and assess environmental, political, social, and economic impacts of fossil fuel use. **575-581**
  - a. What are the primary emissions from fossil fuels and why are they a concern?
  - b. Describe several ways that coal and oil extraction and transport can alter or threaten the environment?
4. Describe solar energy and the ways it is harnessed, and evaluate its advantages and disadvantages. **623-627**
  - a. Use a Venn diagram to compare and contrast passive versus active solar.
  - b. How does a photovoltaic cell generate electricity?
5. Describe wind energy and the ways it is harnessed, and evaluate its advantages and disadvantages. **627-633**
  - a. Describe how a wind turbine converts kinetic energy to electrical energy.
  - b. List and describe wind power's pros and cons.

## Vocabulary

coal crude oil strip mining Hubbert's peak biomass energy active solar passive solar  
Calorie watt BTU acid drainage refining distillation photovoltaic cells turbine peat NIMBY

## Assignments (check off as you complete them)

- Readings **/10**
- Notebook **10pts**
  - Notes on Learning Objectives (2-column)
  - "Energy Crossroads" (video response)
    1. Why should a non-environmentalist be concerned about the "carbon economy"?
    2. If there is a way out of the "carbon economy", what could it look like?
  - Case Study "Rated MPG for Confusion"
  - Activity - "Making a Solar Cooker"
  - "Winds of Change" video response
- Lab: "Calories in Sunlight" **10pts**
- Lab: "Wind Power" **10pts**
- Vocabulary Quiz **15pts**
- Test **20pts**

## Going Further: (extra credit)

**Research Question: "Is producing Corn Ethanol Energy Efficient?" Write a two paragraph summary supporting or refuting this question. Be sure to document your sources!**