

# Unit 7 Study Guide

## Chapter 16

1. Where does 99% of the energy used to heat the Earth and all our buildings come from?
2. What **3** sources of energy provide the majority of the world's energy?
3. Which laws does the concept of **net energy** most closely reinforce?
4. What exactly is **net energy** anyhow?
5. Be able to define **petroleum**. Know what it consists of.
6. What are the components of **crude oil** and how are they separated?
7. What are **petrochemicals** and how are they used?
8. **Be familiar with the advantages and disadvantages of Oil, Oil Shale and Oil Sand** (see Figure 16-10 on page 365).
9. **Know the advantages and disadvantages of Conventional Natural Gas** (see Figure 16-11 on page 368).
10. Which countries have the largest reserves of natural gas?
11. What do some analysts see as the best fuel to help us make the **transition from oil** to improved energy efficiency and greater use of renewable energy?
12. **Know the advantages and disadvantages of using coal as an energy source** (see Fig 16-14, page 370).
13. What toxic substance is released into the atmosphere when coal is burned?
14. Be familiar with the stages of **coal formation** and the order of increasing heat and carbon content (see Figure 16-12 on page 368).
15. Which **countries** have the largest reserves of coal?
16. What is both the world's **most** abundant fossil fuel and **dirtiest** fossil fuel to burn?
17. What are **two major reasons** that burning solid coal is a popular means of producing electricity and high-temperature heat?
18. Which country gets around 80% of its electricity from nuclear power plants?
19. What 3 reasons did the **Atomic Energy Commission** use to convince utilities to use nuclear power to generate electricity (look on page 374)?
20. What's the **Price-Anderson Act** and what does it do?
21. How many new nuclear power plants have been ordered in the U.S. since 1978? Why?
22. What do **control rods** do?
23. Be aware of the **pros** and **cons** of nuclear energy.
24. Specifically, what impact does nuclear power have on water resources?
25. **Compare the trade-offs between coal and nuclear power plants in Figure 16-20 on page 376.**
26. Be familiar with what occurred at both **Three-Mile Island, Chernobyl, and Fukushima**.
27. In what state is Three-Mile Island located?
28. Know the proposed methods of disposing of high-level radioactive wastes on page 378.
29. In what country was the world's first full-sized commercial breeder reactor completed in 1986?
30. Why is nuclear energy considered **non-renewable**?
31. Be able to compute approximate time required for nuclear waste to be considered safe.

## Chapter 17

32. What is the quickest, cheapest, and cleanest way to provide more energy, reduce pollution and environmental degradation, and slow global warming?
33. What would a **sustainable society** focus on?
34. What type of space heating is most energy efficient (see Fig 17-4 on page 387)? What type is the least?
35. What percentage of the commercial energy used in the U.S. is wasted?
36. What is **life-cycle cost** ?
37. What is **cogeneration**?
38. Know the advantages of reducing unnecessary energy waste and improving energy efficiency listed in Fig 17-3 on page 386.
39. Know the order of the costs of electricity from different sources in 2004 listed in Table 17-1 on page 399. Especially know the cheapest and most expensive ones.

40. Know which energy sources are **renewable** and which are **nonrenewable** (“Think About It” homework paper).
41. Know the characteristics of **passive solar heating systems**.
42. Know the difference between passive and **active solar heating**.
43. Think about where and how solar energy can be stored.
44. What are **photovoltaic cells**? What are they made of?
- 45. See Fig 17-15 on page 397 to figure out the advantages and disadvantages of solar energy for high-temperature heat and electricity.**
- 46. Know the advantages and disadvantages of large-scale hydropower listed in Fig 17-20 on page 400.**
47. What is the world’s fastest growing energy resource?
48. What was the first country to use **wind turbines** to produce commercial electricity?
49. What are **wind farms**?
- 50. Be aware of the advantages and disadvantages of wind power listed in Fig 17-22 on page 403.**
- 51. Be familiar with the advantages and disadvantages of using ethanol fuel listed in Fig 17-27 on page 407.**
52. What source of energy is most common in less developed countries?
53. Why does burning biomass have a different impact on CO<sub>2</sub> concentrations than burning fossil fuels?
- 54. Know the advantages and disadvantages of using geothermal energy listed in Fig 17-32 on page 410.**
55. Be familiar with the story of Iceland and its vision of a renewable-energy economy in the case study on page 411.
- 56. Check out the advantages and disadvantages of using hydrogen fuel in table 17-33 on page 412.**
57. Know the strategies governments can use to help stimulate or dampen the short-term and long-term use of a particular energy resource.
58. Be familiar with the graph and accompanying text in Fig 17-34 on page 413.