

Chapter 16 – Review Questions

Read Chapter 16 and answer the following questions on a separate sheet of paper.

ANSWERS MUST BE HANDWRITTEN! Typed responses will not be accepted.

1. If we continue to use oil reserves at the current rate of 2.8% per year, what are three consequences? To keep using oil at the projected rate of increase, how much oil would have to be discovered every 10 years?
2. What supplies 99% of the energy we use? What percentage of the remaining 1% of the energy we use comes from nonrenewable energy, and what percentage comes from renewable energy in the world? In the United States?
3. What are indirect forms of solar energy produced with the help of direct solar energy?
4. What is *net energy*, and why is it important in evaluating an energy resource? Why is the net energy for oil from the Middle East high and that for nuclear power low?
5. What is *petroleum*, or *crude oil*? How is oil extracted from the earth's crust?
6. What happens to crude oil at a refinery? What are *petrochemicals*?
7. What five countries have most of the world's oil reserves? What percentage of the world's oil reserves is found in the United States? What percentage of the world's oil does the United States use? What percentage of oil used in the United States is imported?
8. How long are known and projected supplies of conventional oil expected to last in the world and in the United States?
9. List the advantages and disadvantages of drilling for oil and natural gas in Alaska's Arctic National Wildlife Refuge.
10. What are the advantages and disadvantages of using conventional oil as an energy resource?
11. What are the advantages and disadvantages of using heavy oil from oil sand and oil shale as an energy resource?
12. What is *natural gas*? Distinguish between *liquefied petroleum gas* (LPG), *coal bed methane gas*, *methane hydrate*, and *liquefied natural gas* (LNG).
13. What three countries have most of the earth's reserves of conventional natural gas? What percentage does the United States have?
14. How long are known and projected supplies of natural gas expected to last in the world and in the United States?
15. What are the advantages and disadvantages of using conventional natural gas as an energy resource?
16. What is *coal*, and how is it formed? Distinguish among *lignite*, *bituminous*, and *anthracite* coal. How is coal extracted from the earth's crust? What are the two major uses of coal?
17. What four countries have the largest coal reserves? What percentage of the world's coal reserves does the United States have?
18. How long are known and projected supplies of coal expected to last in the world and in the United States?

19. What are the advantages and disadvantages of using coal as an energy resource?
20. What are the advantages and disadvantages of converting solid coal into gaseous and liquid fuels?
21. Describe how a *nuclear fission reactor* works. What are the major components of a *light-water nuclear reactor* system, and what role does each play?
22. What is the *nuclear fuel cycle*? What effect does this cycle have on the net energy ratio for nuclear energy?
23. List three reasons why commercial nuclear power plants were developed in the United States after World War II. List seven factors that have contributed to the leveling off of the use of nuclear power plants to produce electricity.
24. How far did radioactive clouds generated by the Chernobyl nuclear power plant explosion and fires eventually travel?
25. List the major advantages and disadvantages of using conventional nuclear fission to produce electricity. Compare the advantages and disadvantages of using nuclear power and burning coal to produce energy.
26. How vulnerable are U.S. nuclear power plants to terrorist attack? Describe the threat from terrorist attacks on high-level radioactive wastes stored in pools of water or in dry casks at a nuclear power plant.
27. What are the options for dealing with *high-level radioactive waste*?
28. List the advantages and disadvantages of the proposed site for storing high-level nuclear wastes at Yucca Mountain in Nevada.
29. Describe the threat from terrorists stealing or buying radioactive materials used in medicine, industry, and research facilities and using the material to make dirty radioactive bombs.
30. What are three options for retiring (decommissioning) worn-out nuclear power plants?
31. Can nuclear power lessen our dependence on imported oil and help reduce global warming? Explain.
32. List the Arguments for against use of *pebbles bed modular reactors*.
33. What are the advantages and disadvantages of using each of *breeder nuclear fission* and *nuclear fusion* as energy resources?
34. What are the arguments for and against continuing large-scale government subsidies for research and development of conventional nuclear power, breeder fission, and nuclear fusion in the United States and in other countries?