

Chapter 17 – Review Questions

Read Chapter 17 and answer the following questions on a separate sheet of paper.

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

1. Describe the coming energy efficiency and renewable energy revolution.
2. How much of the energy used in the United States is wasted? What percentage is wasted because of the second law of thermodynamics, and what percentage is wasted unnecessarily?
3. What is *energy efficiency*? What are eight advantages of reducing energy waste?
4. What are four of the least efficient energy-using devices? Define *life cycle cost*. What is *net energy efficiency*, and what does measuring it tell us about using nuclear fuel or coal to generate electricity?
5. What is *cogeneration*, and how efficient is it compared with producing electricity by a conventional coal-burning or nuclear power plant? List two other ways to save energy in industry.
6. List three reasons that motor vehicle fuel efficiency is not being emphasized more than it is in the United States.
7. Explain why the real cost of gasoline to consumers in the United States is several times the price people pay at the pump.
8. List the advantages and disadvantages of each of hybrid-electric cars and fuel-cell cars.
9. How much of total U.S. energy consumption is used in buildings? Of that amount, what percentages are dedicated to (a) heating and cooling, (b) heating water, and (c) lighting?
10. Describe how we can save energy in homes by using (a) superinsulated houses, (b) straw bale houses, and (c) living roofs.
11. List seven ways to reduce energy waste in existing homes.
12. What are the six most efficient ways to heat a house? What is the least efficient way?
13. List two reasons why there is little emphasis on saving energy, despite its important benefits.
14. What are some encouraging developments that indicate increased use of renewable energy?
15. Distinguish between a *passive solar heating system* and an *active solar heating system*, and list the advantages and disadvantages of these systems for heating buildings. Describe six ways to cool houses naturally.
16. List the advantages and disadvantages of concentrating solar energy to produce high-temperature heat or electricity.
17. What are three benefits of using *solar cookers*?
18. What is a *solar cell*? List the advantages and disadvantages of using solar cells to produce electricity.
19. List the advantages and disadvantages of using *large-scale hydropower plants* to produce electricity. What are *micro-hydro generators*?
20. What are three other ways in which electricity can be generated using water?

21. According to a Stanford University study, tapping into 20% of the wind energy at the world's best wind energy sites could replace how many nuclear and coal-burning power plants? List the advantages and disadvantages of using wind to produce electricity.
22. List the advantages and disadvantages of (a) burning *solid biomass* as a source of energy, (b) using *ethanol* as a vehicle fuel, (c) using *biodiesel* as a vehicle fuel, and (d) using *methanol* as a vehicle fuel.
23. What is *geothermal energy*? Describe three types of *hydrothermal reservoirs*. List the advantages and disadvantages of using geothermal energy to produce heat and electricity.
24. What are three aspects of Iceland's plan to create a renewable energy economy? What are three problems that would limit attempts to create such an economy in the U. S.?
25. List the advantages and disadvantages of producing hydrogen from water or organic compounds and using the hydrogen as a source of energy.
26. How long does it usually take to phase in a new energy alternative to the point where it accounts for 10-20% of total energy use? What seven questions should we try to answer about each energy resource?
27. What is *micropower*, and what are its advantages over *macropower* electricity systems? Describe five types of micropower systems.
28. Summarize the three different economic approaches that can be used to stimulate or dampen the use of a particular energy resource. List the advantages and disadvantages of each approach.
29. List major ways various analysts have suggested to help make the transition to a more sustainable energy future by (a) improving energy efficiency (7 ways), (b) using more renewable energy (5 ways), and (c) reducing pollution and health risks from energy use (5 ways).
30. List ten things you can do to reduce your use and waste of energy.