



Raven, Berg, Hassenzahl: Environment, 7th Edition
Chapter 11 Fossil Fuels

1. What factors contributed to oil's reputation as an "ideal" energy source throughout the 20th century?
- 1) it was cheap
 - 2) it was relatively environmentally friendly
 - 3) it was easy to transport and use
 - 4) all of these
- a) 1
 - b) 2
 - c) 3
 - d) 4
 - e) Both 2 and 3
 - f) Both 1 and 3

Ans: f

Difficulty: Easy

Response:

Chapter Opener; 11.0

2. What does the term "Peak Oil" refer to?
- a) the time period during which the rate of oil use is highest
 - b) the point in time at which the maximum amount of oil is being pumped from underground
 - c) an environmentally friendly synthetic oil with much lower greenhouse gas emissions than conventional oil
 - d) the time period during which oil refineries operate at their highest capacity
 - e) the time period during which international economies based on petroleum products arose

Ans: b

Difficulty: Easy

Response:

Chapter Opener; 11.0

3. Fill in the blanks to complete the following sentence: Although less than _____ of the world's population lived in highly developed countries in 2008, these people used _____ of the commercial energy consumed worldwide.

- a) 50%, 90%
- b) 40%, 70%
- c) 20%, 60%
- d) 20%, 90%
- e) 40%, 60%

Ans: c

Difficulty: Easy

Response:

Energy Consumption; 11.1.1

4. Which of these fossil fuels was/were formed from the remains of ancient microscopic algae and aquatic organisms?

- a) oil
- b) natural gas
- c) gas hydrates
- d) methane
- e) all of these

Ans: e

Difficulty: Easy

Response:

How Fossil Fuels Formed; 11.2.1

5. Which of these fossil fuels is composed primarily of methane?

- a) oil
- b) natural gas
- c) coal
- d) tar sands
- e) lignite

Ans: b

Difficulty: Easy

Response:

How Fossil Fuels Formed; 11.2.1



6. Combustion of which of these fossil fuels is/are linked to global warming?
- a) oil
 - b) natural gas
 - c) coal
 - d) methane
 - e) all of these

Ans: e

Difficulty: Easy

Response:

Fossil Fuels, The Carbon Cycle, and Climate; 11.2.2

7. Which fossil fuel reserves will most likely last the longest?
- a) oil
 - b) natural gas
 - c) coal
 - d) peat
 - e) uranium

Ans: c

Difficulty: Easy

Response:

Coal Reserves; 11.3.1

8. Which fossil fuel is most abundant in North America?
- a) oil
 - b) natural gas
 - c) uranium
 - d) coal
 - e) peat

Ans: d

Difficulty: Easy

Response:

Coal Reserves; 11.3.1

9. The type of fossil fuel made from the remains of ancient plants that lived millions of years ago is:
- a) peat
 - b) coal
 - c) oil
 - d) natural gas
 - e) synfuel

Ans: b

Difficulty: Easy

Response:

How Fossil Fuels Formed; 11.2.1

10. Anthracite coal:
- a) causes the most air pollution
 - b) has the highest sulfur content
 - c) is very hard and burns cleanly
 - d) is the most abundant grade of coal
 - e) is very soft and burns at high temperatures

Ans: c

Difficulty: Easy

Response:

Coal; 11.3

11. Bituminous coal:
- a) is the most common grade of coal
 - b) causes the least amount of air pollution of any type of coal
 - c) is very soft and burns at high temperatures
 - d) is very hard and burns cleanly
 - e) has the lowest sulfur content of any type of coal

Ans: a

Difficulty: Easy

Response:

Coal; 11.3



12. Lignite coal:
- a) is the most common grade of coal
 - b) causes the least amount of air pollution of any type of coal
 - c) is very soft and has a relatively low heat value
 - d) is very hard and burns cleanly
 - e) has the lowest sulfur content of any type of coal

Ans: c

Difficulty: Easy

Response:

Coal; 11.3

13. At the current rate of consumption, the world's coal reserves could last for possibly another:
- a) 20 years
 - b) 50 years
 - c) 100 years
 - d) 200 years
 - e) 500 years

Ans: d

Difficulty: Easy

Response:

Coal Reserves; 11.3.1

14. The legislation that has regulated mining activities in the United States since 1977 is the:
- a) Wilderness Act
 - b) Clean Water Act
 - c) Endangered Species Act
 - d) Surface Mining Control and Reclamation Act
 - e) Soil Conservation Service Act

Ans: d

Difficulty: Easy

Response:

Environmental Impacts of the Mining Process; 11.3.4



15. Scrubbers in smoke stacks remove large amounts of what major air pollutant?
- a) carbon dioxide
 - b) sulfur oxides
 - c) nitric acid
 - d) sodium oxides
 - e) mercury

Ans: b

Difficulty: Easy

Response:

Making Coal a Cleaner Fuel; 11.3.6

16. The concern about global warming is directly related to increased levels of what chemical in the atmosphere?
- a) mercury
 - b) carbon dioxide
 - c) sulfur oxide
 - d) nitrogen oxide
 - e) chlorofluorocarbon

Ans: b

Difficulty: Easy

Response:

Fossil Fuels, The Carbon Cycle, and Climate; 11.2.2

17. Today the world's main energy source is:
- a) coal
 - b) hydroelectric
 - c) natural gas
 - d) nuclear
 - e) oil

Ans: e

Difficulty: Easy

Response:

Oil and Natural Gas; 11.4



18. Tar sands, oil shales, and gas hydrates are examples of:

- a) fossil fuels
- b) synfuels
- c) evaporates
- d) petrochemicals
- e) strata

Ans: b

Difficulty: Easy

Response:

Synfuels and Other Potential Fossil-Fuel Resources; 11.5

19. What is the current state of Carbon Capture and Storage (CCS) technology for use in coal power plants?

- a) CCS technology is ready to be implemented on a large scale
- b) CCS technology is not yet ready for testing in power plants
- c) CCS technology is being tested on a very small scale
- d) CCS technology has been tested many times and was found to be inadequate for meeting current capture and storage needs
- e) The theory of CCS technology is established, but an adequate design of a CCS mechanism has not been developed

Ans: c

Difficulty: Easy

Response:

Capture and Storage of Carbon from Coal; 11.3.7

20. How has the burning of fossil fuels affected the global carbon cycle?

- a) less carbon is stored underground
- b) carbon is stored underground for longer periods of time
- c) the amount of carbon taken up by plants has decreased
- d) the total amount of carbon on earth has increased
- e) the carbon cycle has slowed down

Ans: a

Difficulty: Easy

Response:

Fossil Fuels, The Carbon Cycle, and Climate; 11.2.2

21. The greatest increase in worldwide energy consumption in the last few years is related to:
- a) American fascination with driving SUVs
 - b) economic development in China and India
 - c) use of fertilizers and pesticides in agriculture
 - d) increase in population in Africa
 - e) global warming

Ans: b

Difficulty: Medium

Response:

Consumption, and Policy; Energy Consumption; 11.1.1

22. China is quickly becoming a major player in the global market of oil consumption for all of these reasons *except*:
- a) China has developed technology for converting coal into oil
 - b) China's economic growth is exploding
 - c) China's motor vehicle ownership per capita is increasing
 - d) China has a population of over 1 billion people
 - e) mass transit primarily uses oil as a source of energy

Ans: a

Difficulty: Medium

Response:

Environmental Impacts of Synfuels; 11.5.1

23. A major reason that global energy consumption is increasing is that:
- a) energy prices keep falling
 - b) developing countries are using more energy as they improve their standard of living
 - c) the world's population growth is slowing
 - d) global energy reserves are increasing
 - e) farmers in developing countries depend on the energy of animals for plowing and other work

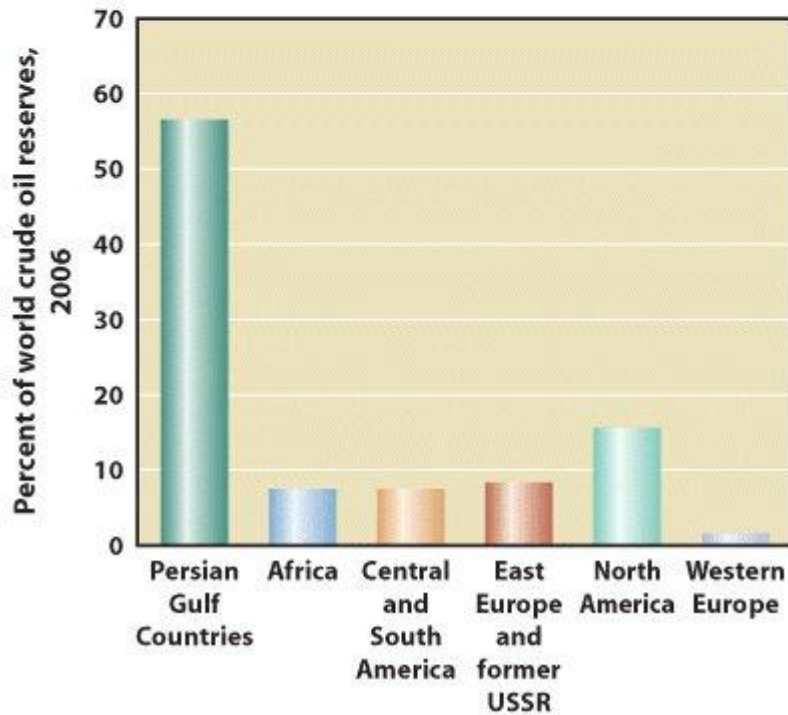
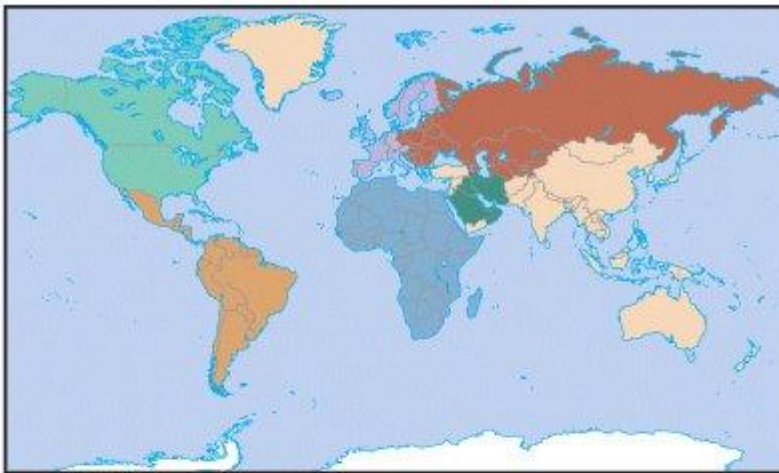
Ans: b

Difficulty: Medium

Response:

Consumption, and Policy; Energy Consumption; 11.1.1

24. Based on the figure below, which region of the world has the third-largest oil deposits?



- a) North America
- b) Africa
- c) Asia and Oceania
- d) East Europe and former U.S.S.R.
- e) South and Central America

Ans: d

Difficulty: Medium

Response:

Oil and Natural Gas; Reserves of Oil and Natural Gas; 11.4.2

25. All of the following statements are true about surface mining *except*:
- a) It accounts for 60% of the coal mined in the United States.
 - b) It is also known as strip mining.
 - c) It is generally safer for miners than other coal mining processes.
 - d) It is a less expensive mining process than subsurface mining.
 - e) It is the most hazardous type of mining for workers.

Ans: e

Difficulty: Medium

Response:

Coal Mining; 11.3.2

26. Which of the following compounds may be released by burning coal without emission controls?
- a) carbon dioxide
 - b) nitrogen oxides
 - c) mercury
 - d) sulfurous oxide
 - e) all of these

Ans: e

Difficulty: Medium

Response:

Environmental Impacts of Burning Coal; 11.3.5

27. Which of the following fuels produces the greatest quantity of CO₂ per unit of heat energy produced?
- a) methane
 - b) natural gas
 - c) coal
 - d) oil
 - e) wood

Ans: c

Difficulty: Medium

Response:

Environmental Impacts of Burning Coal; 11.3.5

28. In areas experiencing acid precipitation, the pH of the rain may be:

- a) 2.1
- b) 5.6
- c) 7.0
- d) 7.9
- e) 11.9

Ans: a

Difficulty: Medium

Response:

Environmental Impacts of Burning Coal; 11.3.5

29. Natural gas may be used in all of the following except:

- a) cogeneration
- b) transportation
- c) commercial cooling
- d) plastics and paints
- e) generation of electricity

Ans: d

Difficulty: Medium

Response:

Oil and Natural Gas; 11.4

30. It is hypothesized that undiscovered large oil deposits are located:

- a) below ocean basin trenches
- b) under the continental shelves
- c) in locations where natural gas will not be found
- d) in the continental United States
- e) in locations where volcanoes are common

Ans: b

Difficulty: Medium

Response:

Reserves of Oil and Natural Gas; 11.4.2

31. Petrochemicals are used in the production of all of the following *except*:

- a) paints
- b) fertilizers
- c) medicines
- d) synthetic fibers
- e) lightweight concrete

Ans: e

Difficulty: Medium

Response:

Oil and Natural Gas; 11.4



32. Which of the following techniques is used to identify structural traps that might contain oil and natural gas?
- 1) mining
 - 2) watch plate tectonic
 - 3) satellite imaging
 - 4) drill test holes and obtain rock samples
- a) 1
 - b) 2
 - c) 3
 - d) 4
 - e) Both 2 and 4

Ans: d

Difficulty: Medium

Response:

Exploration for Oil and Natural Gas; 11.4.1

33. In fluidized-bed combustion of coal, what is mixed with coal to remove which major air pollutant?
- a) sand; nitrogen oxides
 - b) limestone; carbon dioxide
 - c) sand; sulfur oxides
 - d) limestone; sulfur oxides
 - e) water; sulfur oxides

Ans: d

Difficulty: Medium

Response:

Making Coal a Cleaner Fuel; 11.3.6

34. Which of these statements about coal is *false*?
- a) Some types of coal contain a lot of sulfur.
 - b) Subsurface mining accounts for about 40% of the coal mined in the U.S.
 - c) Coal powered the steam engine during the Industrial Revolution.
 - d) Coal produces far less SO₂ than natural gas or oil.
 - e) Coal supplies about 20% of the energy used in the United States.

Ans: d

Difficulty: Medium

Response:

Environmental Impacts of Burning Coal; 11.3.5



35. All of these factors are important in the discovery of oil and natural gas deposits *except*:
- a) detection of structural traps
 - b) association with salt domes
 - c) association with remains of ancient forests
 - d) location of the right rock layer
 - e) identification of core samples containing microfossils

Ans: c

Difficulty: Medium

Response:

Exploration for Oil and Natural Gas; 11.4.1

36. Negative environmental impacts from oil and natural gas production may occur due to:
- a) release of particulates into the atmosphere
 - b) radical changes in the local topography
 - c) release of acids
 - d) accidental spills during transport
 - e) release of toxins

Ans: d

Difficulty: Medium

Response:

Environmental Impacts of Oil and Natural Gas; 11.4.4

37. Initially the Clean Air Act of 1990 required ____ of the nation's dirtiest coal burning plants to cut down on emissions.
- a) 50
 - b) 71
 - c) 111
 - d) 2300
 - e) 200

Ans: c

Difficulty: Medium

Response:

Making Coal a Cleaner Fuel; 11.3.6

38. Acid mine drainage:
- a) polluted steams
 - b) can cause dangerous landslides
 - c) are caused when sulfuric acid and dangerous dissolved materials wash from coal and metal mines into nearby lakes and streams
 - d) is produced when rainwater seeps through iron sulfide exposed in mine wastes
 - e) all of these

Ans: e

Difficulty: Medium

Response:

Environmental Impacts of the Mining Process; 11.3.4

39. One of the most destructive types of surface mining for the land itself:
- a) is mountaintop removal using a dragline
 - b) is associated with the increased risk of black-lung disease in miners
 - c) is regulated by the guidelines of the 1977 Surface Mining and Reclamation Act
 - d) is most common in the western United States
 - e) involves replacement of the overburden that is first removed

Ans: a

Difficulty: Medium

Response:

Environmental Impacts of the Mining Process; 11.3.4

40. Gas or methane hydrates in the arctic tundra show increasing promise as a limited energy supply for which two of these countries?
- a) United States and Iceland
 - b) Greenland and Finland
 - c) Germany and Ireland
 - d) Russia and Canada
 - e) Belgium and Holland

Ans: d

Difficulty: Medium

Response:

Synfuels and Other Potential Fossil-Fuel Resources; 11.5

41. Which of the following statements about fossil fuel use in China is *false*?
- a) For the first time ever, China recently imported more oil than Japan.
 - b) China recently became the world's second largest importer of oil.
 - c) China's projected carbon dioxide emissions in 2025 are more than half the total amount that is currently being emitted by all the nations of the world.
 - d) China has large amounts of natural oil reserves.
 - e) Per capita motor vehicle ownership is predicted to increase in the near future.

Ans: d

Difficulty: Medium

Response:

Environmental Impacts of Synfuels; 11.5.1

42. In the United States, a 55-mile-per-hour speed limit was enforced from 1974 to 1995. Which energy policy objective was this law designed to meet?
- a) Objective 1: Increase energy efficiency and conservation.
 - b) Objective 2: Secure future fossil-fuel energy supplies.
 - c) Objective 3: Develop alternative energy sources.
 - d) Objective 4: Meet the first three objectives without further damage to the environment.

Ans: a

Difficulty: Medium

Response:

Consumption, and Policy; Energy Policy; 11.1.2

43. Explain how the different types of fossil fuels (coal, oil, and natural gas) were formed.
- Ans: Coal deposits formed from the decaying remains of giant swampy forests of tree ferns, horsetails, and club mosses that grew year round in earth's milder climate. Heat and pressure changed these remains that are found in sedimentary rock to coal. Oil formed from sedimentary deposits of aquatic microorganisms that were depleted of oxygen in the decomposition process. Natural gas is formed the same way as oil, but at higher temperatures. Oil and natural gas deposits are often found together and they tend to accumulate in pools beneath nonporous or impervious rock layers.

Difficulty: Difficult

Response:

How Fossil Fuels Formed; 11.2.1