**Chapter 12 Reading Guide**

**Module 34**

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| 1. Fossil Fuel | 2. Nonrenewable Energy Resource | 3. Nuclear Fuel | 4. Commercial Energy Source |
| 5. Subsistence Energy Source | 6. Energy Carrier | 7. Turbine | 8. Electrical Grid |
| 9. Combined Cycle | 10. Capacity | 11. Capacity Factor | 12. Cogeneration |

**Module 35**

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| 1. Coal | 2. Petroleum | 3. Crude Oil | 4. Oil Sands |
| 5. Bitumen | 6. CTL (coal to liquid) | 7. Energy Intensity | 8. Hubbert Curve |
| 9. Peak Oil |  |  |  |

**Module 36**

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| 1. Fission | 2. Fuel Rod | 3. Control Rod | 4. Radioactive Waste |
| 5. Becquerel (Bq) | 6. Curie | 7. Nuclear Fusion |  |

**Module 34**

1. *Opening Story -* What is the overall problem with our current reliance on fossil fuels?
2. How are fossil fuels originally formed?
3. Using Figure 34.1, rank the fossil fuels in order of (worldwide) usage, and list a few activities each is used for.
4. In the US "energy system", what are the inputs? What are the outputs? (pg 401)
5. What types of considerations go into choosing the best energy source for a particular situation?
6. Explain how electricity is generated and distributed, and why it is so useful and powerful for modern society.
7. How can technologies like combined cycle and cogeneration in power plants increase efficiency?
8. *Working Towards Sustainability -* Even though TED doesn't directly reduce energy use, it can still help reduce consumption. How is this, and what does it say about the larger social process of moving to energy sustainability?

**Module 34 Review**

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**Module 35**

1. Describe the process of coal formation, including the different types and their properties.
2. What are the advantages of coal usage, and how is it generally used?
3. What harmful products are released when coal is burned?
4. How can coal washing and waste ash storage cause problems?
5. How does petroleum form, and what is typically like by the time it is extracted?
6. How is crude oil refined into various products such as tar, asphalt, gasoline, diesel, etc?
7. What is the significance of the Hubbert curve and the concept of "peak oil" for our society?

**Module 35 Review Questions**

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**Module 36**

1. How is nuclear fission (decay) used to generate electricity?
2. How does the energy content of 1 gram of 235U compare to 1 gram of coal? What is the significance of this?
3. Explain how fission can occur in a self-sustaining chain reaction.
4. How are fuel rods and control rods used to control the temperature of the water in a nuclear power plant?
5. What are the environmental impacts of mining Uranium to produce nuclear fuel?
6. What are the major advantages of nuclear power?
7. Describe what led to the Three Mile Island and Chernobyl accidents, as well as their effects on surrounding areas.
8. Why is high-level nuclear waste considered more dangerous than the other 2 types?
9. *Do the Math -* You have 180 g of a substance with a half-life of 265 years. After 1,325 years, what mass remains?
10. Why is nuclear waste so difficult to dispose of, and how do nuclear plants currently store their waste?

**Module 36**

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**Chapter 12 Review**

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