

# Answers To Selected Teaching Activities

## Activity 1: Renewable Energy Basics

1. Definitions, examples, and specific advantages and disadvantages are listed in the Facts About Renewable Energy section.
2. The primary fossil fuel energy sources are petroleum, natural gas, and coal.
3. The main advantage of fossil fuels is that they are relatively abundant, and therefore, relatively inexpensive.
4. The primary disadvantage of fossil fuels is that they are more polluting than renewable energy sources. The burning of fossil fuels also produces carbon dioxide, which some fear is causing global warming. This, however, is only a theory, and has not been confirmed by scientific evidence.

## Activity 2: Graphing Energy Facts

### Part A

1. Make sure students have neatly labeled, colored graphs.
2. Primary energy sources are basic sources of energy, such as coal, natural gas, hydropower, wind, petroleum, etc. Secondary sources, such as electricity, require primary sources of energy to generate power.
3. Petroleum (46.9 percent to 40.4 percent). This large decrease occurred because the price of oil increased significantly in the 1970s. As price increased, consumers bought less, switched to substitutes, etc.
4. Nuclear power. Nuclear power is clean and relatively cost effective. While much of the increased capacity in nuclear power prior to the 1970s was already planned, the oil price increases certainly encouraged the increased use of nuclear power. However, the Three Mile Island incident in 1979 caused much public opposition to nuclear energy. Since then no new plants have been ordered. The growth in the amount of nuclear generated electrical power has tapered off in recent years and could possibly diminish in the future, as older power plants are retired. The future looks brighter for coal, although the current fear of global warming is causing second thoughts about relying more and more on coal.
5. The major reason is that, compared to other sources of energy, renewable sources are relatively more expensive.

### Part B:

1. Make sure student graphs are neatly labeled and use several colors.
2. Hydropower: 85.9 percent, Geothermal 3.0 percent, Biomass (Municipal Waste to Energy) 2.3 percent, Biomass (Other, especially wood and wood waste) 6.7 percent, Solar Thermal 0.5 percent, Wind 1.6 percent.
3. Hydropower. It is relatively cost effective compared to the other sources.
4. Solar Thermal
5. Answers will vary.

## Activity 3: Trends In R & D Spending

1. Make sure students label the axes correctly. You may have to help students determine the range of R & D on the vertical axis. A workable range is \$0 to \$900.