2. R & D increases rapidly until 1980, then decreases rapidly throughout the 1980s. In 1991, it increases again.

3. Make sure students label the graph correctly and put a workable range of prices on the vertical axis ($0 to $40). You can have students graph the *real* price changes in oil, too, using 1987 dollars. See teacher directions for this activity.

4. Oil prices rose sharply in the 1970s. They then plunged in the mid-1980s, before increasing again at the end of the decade. The increase in R & D is explained by the observed dramatic rise in oil prices in the 1970s; the decrease in R & D parallels the fall in oil prices. Increases in R & D spending in FY91 can be partly explained by environmental concerns of burning fossil fuels.

Activity 4: Energy Efficiency

1. Energy efficiency measures the amount of energy it takes to do a certain amount of work or do a certain task.

2. Answers will vary. Examples: add insulation, install energy efficient appliances, turn down the thermostat, run dishwashers and washing machines only when fully loaded.

3. Answers will vary. Examples: Improved energy management such as better maintenance, improved insulation, conservation goals, lower thermostats, routine energy audits, use of computers to monitor energy consumption, heat recovery and heat exchange, improvements in electricity cogeneration, investment in energy efficient production technologies.

4. a 6.8 (81.1 - 74.3)
   b. 6.8/74.3 = 9.15 percent
   c. Energy efficiency has increased greatly.

5. “Energy efficiency” is a commonly used statistic to make comparisons among countries; however, it can be misleading since it does not take into account differences in life styles, population density, industry mix, and other factors. For example, Japan and Italy are small countries with high population densities. This makes energy-saving mass transit more practical. Italy and Japan also tax energy much more heavily (In Italy gas costs about $4 a gallon, of which $3 is tax!), which reduces energy consumption. The United States has a more extreme climate, which requires large amounts of energy for heating and cooling. Living standards also are higher in the United States, and it takes more energy to heat our larger homes. When corrected for differences in living space, the United States is among the most efficient of the other developed countries in residential heating. Another factor is that because energy is relatively abundant in the United States compared to Japan and Italy, we have developed industries that rely on high energy usage (“energy intensity”) in production.

Activity 8: Case Study: The Case of the Energy Subsidy

The Decision Worksheets for the various special interest groups will reflect the biases of the constituencies represented. Nevertheless, the consensus Decision Grid is likely to look something like the sample below.