

## Energy and the Economy

As energy costs have risen, so have fears that these higher costs will derail economic activity. Professor James Hamilton of the University of California at San Diego has noted that sharp increases in the price of oil have preceded each post-World War II recession in the United States. Yet, some analysts suggest that energy prices today put less pressure on the economy than they did in the past—because less energy is used to produce each unit of GDP; said another way, the economy’s “energy efficiency” has increased. But such a conclusion must be drawn with care.

The chart displays annual U.S. energy use relative to use in 1970. The top line shows aggregate energy use, which in 2007 was 50 percent more than in 1970. The bottom line shows energy use per unit of real GDP, which in 2007 was 50 percent less than in 1970. Correctly assessing these trends requires adding one more variable: labor productivity (that is, increases in GDP per hour of work). The chart’s center line adjusts roughly for productivity gains by displaying the quantity of energy consumed per capita. Since 1970 energy use per capita has risen and fallen with energy prices and the business cycle, with notable decreases during 1975, 1979-82, 1990-91, and 2001. Yet, the quantity of energy consumed per capita in 2007 was approximately unchanged from that in 1970.

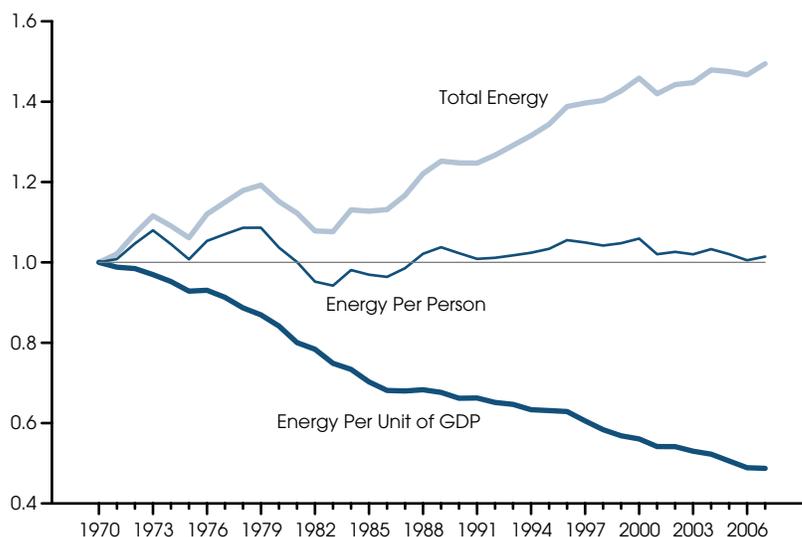
Energy use per capita is only a rough measure of the economy’s energy dependence because it does not separate the economy’s varied uses of energy. It does, however, emphasize an important underlying theme of America’s energy use: While energy efficiency has improved in almost every aspect of business and life at home, higher living standards have fully consumed that gain—overall energy use per person has changed little during the past four decades. Examples abound. In 1970, the average passenger automobile was driven 10,000 miles annually and consumed 737 gallons of fuel; in 2005, annual mileage was 12,400 using 554 gallons. In 1970, light trucks (then used almost exclusively by business) averaged 8,700 miles annually, consuming

866 gallons of fuel; in 2005, near-ubiquitous trucks and SUVs averaged 11,000 miles annually, consuming 612 gallons of fuel. For the typical household, heating and cooling comprises half of its housing-related energy usage. In 1970, the average new American single-family house was approximately 1,500 square feet; by 2005, the average home was 2,350 square feet. Appliances are more energy efficient, but there are more of them. Survey data for 1980 and 2001 show increases in the share of households with microwave ovens from 14 percent to 86 percent, dishwashers from 37 percent to 53 percent, personal computers from zero to 56 percent, and central air conditioning from 27 percent to 55 percent (the share of households with no air conditioning dropped from 42 percent in 1980 to 23 percent in 2001).

The constancy of the level of U.S. energy use per capita suggests caution when analyzing the impact of higher energy costs: Per-person energy intensity has changed little during the past four decades.

—Richard G. Anderson

**Energy Use in the United States 1970-2007**  
Annual Data, Normalized, 1970 = 100



Views expressed do not necessarily reflect official positions of the Federal Reserve System.