Market Trends

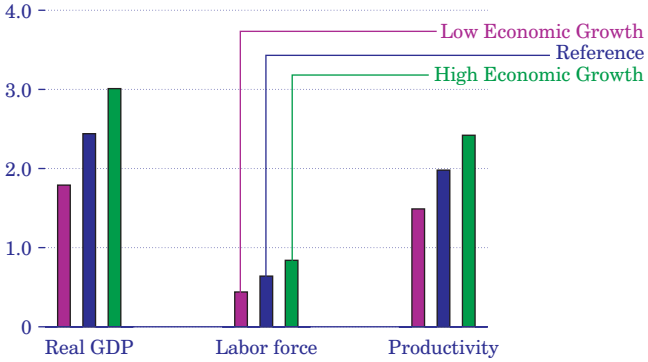
The projections in *AEO2010* are not statements of what will happen but of what might happen, given the assumptions and methodologies used. The projections are business-as-usual trend estimates, reflecting known technology and technological and demographic trends. *AEO2010* generally assumes that current laws and regulations are maintained throughout the projections. Thus, the projections provide a baseline starting point that can be used to analyze policy initiatives. However, EIA does not propose or advocate future legislative or regulatory changes.

While energy markets are complex, energy models are simplified representations of energy production and consumption, regulations, and producer and consumer behavior. Projections are highly dependent on the data, methodologies, model structures, and assumptions used in their development. Behavioral characteristics are indicative of real-world tendencies rather than representations of specific outcomes.

EIA has endeavored to make these projections as objective, reliable, and useful as possible; however, energy markets are subject to much uncertainty. Many of the events that shape energy markets cannot be anticipated, including severe weather, political disruptions, strikes, and technological breakthroughs. In addition, future developments in technologies, demographics, and resources cannot be foreseen with certainty. Many key uncertainties in the *AEO2010* projections are addressed through alternative cases.

Real gross domestic product returns to its pre-recession level by 2011

Figure 31. Average annual growth rates of real GDP, labor force, and productivity in three cases, 2008-2035 (percent per year)



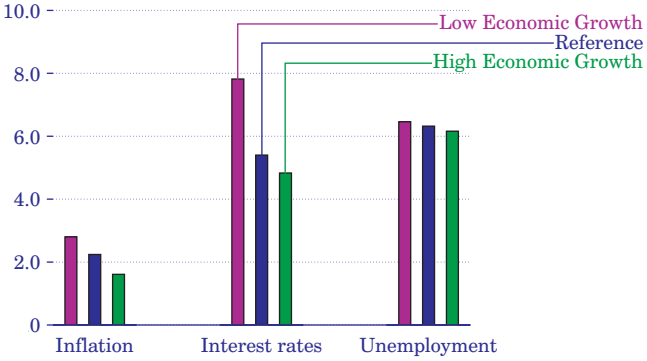
AEO2010 presents three views of economic growth (Figure 31). The rate of growth in real GDP depends on assumptions about labor force growth and productivity. In the Reference case, growth in real GDP averages 2.4 percent per year.

GDP growth is considerably slower in the near term as a result of the recent recession. The U.S. economy has seen 10 recessions since 1947 [*78*]. The 2007-2009 recession is projected to be the longest, with four consecutive quarters of negative growth, and also the deepest since 1957. In the *AEO2010* Reference case, economic recovery accelerates in 2011, while employment recovers more slowly. Real GDP returns to its pre-recessionary level by 2011, but unemployment rates do not return to pre-recessionary levels until 2019.

The *AEO2010* High and Low Economic Growth cases examine the impacts of alternative assumptions on the economy. The High Economic Growth case includes more rapid expansion of the labor force, nonfarm employment, and productivity, with real GDP growth averaging 3.0 percent per year from 2008 to 2035. With higher productivity gains and employment growth, inflation and interest rates are lower in the High Economic Growth case than in the Reference case. In the Low Economic Growth case, real GDP growth averages 1.8 percent per year from 2008 to 2035, with slower growth rates for the labor force, nonfarm employment, and labor productivity. Consequently, the Low Economic Growth case shows higher inflation and interest rates and slower growth in industrial output.

Inflation, interest rates remain low, unemployment exceeds 6 percent

Figure 32. Average annual inflation, interest, and unemployment rates in three cases, 2008-2035 (percent per year)



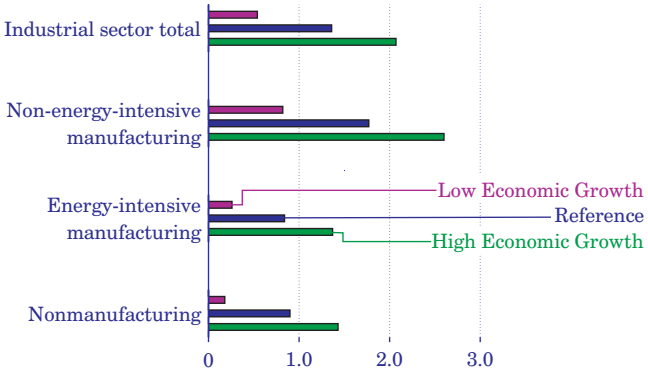
In the Reference case, annual consumer price inflation averages 2.2 percent, the annual yield on the 10-year Treasury note averages 5.4 percent, and the average unemployment rate is 6.3 percent (Figure 32). In the High Economic Growth case, population, technological change, and productivity grow faster than in the Reference case, leading to faster growth in capital stock, labor force, and employment. Potential output growth is faster, and as a result the real GDP annual growth rate is 0.5 percent higher than in the Reference case. In the Low Growth case, productivity, technological change, population, labor force, and capital stock grow more slowly, and real GDP growth is 0.5 percent lower than in the Reference case.

In the first 2 years of the Reference case projection, as the economy slowly recovers from the recession that began at the end of 2007, inflation and interest rates are below their 27-year projected averages of 2.2 and 5.4 percent, respectively, and unemployment rates are above their long-term average of 6.3 percent. The recession reduces household wealth, and unemployment remains high as people take longer than in past recessions to find employment. The unemployment rate returns to its 2007 rate of 5.8 percent in 2019. Annual gains in labor productivity average 2.0 percent, underpinning the projections for inflation and interest rates.

Energy prices for U.S. consumers grow by 2.4 percent per year from 2008 to 2035 in the Reference case, compared with 2.2-percent annual growth in overall consumer prices. For energy commodities, annual price increases average 2.5 percent per year.

Output growth for energy-intensive industries slows

Figure 33. Sectoral composition of industrial output growth rates in three cases, 2008-2035 (percent per year)



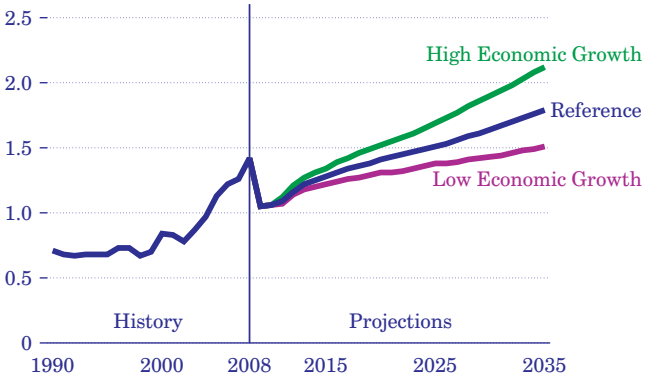
Industrial sector output has grown more slowly than the overall economy in recent decades, as imports have met a growing share of demand for industrial goods, whereas the service sector has grown more rapidly [*79*]. In the *AEO2010* Reference case, real GDP grows at an annual average rate of 2.4 percent from 2008 to 2035, while the industrial sector and its manufacturing component grow by 1.4 percent per year and 1.5 percent per year, respectively (Figure 33). With higher energy prices and greater foreign competition, the energy-intensive manufacturing sectors grow at a slower rate of 0.8 percent per year, which reflects a 0.6-percent annual decline for bulk chemicals and a 1.7-percent annual increase for food processing.

As the economy recovers from the recent recession, growth in U.S. manufacturing output in the Reference case accelerates from 2011 through 2020. After 2020, both GDP and manufacturing output return to growth rates closer to trend. Increased foreign competition, slow expansion of domestic production capacity, and higher energy prices increase competitive pressure on most manufacturing industries after 2020.

AEO2010 includes a range of possible economic outcomes resulting from different assumptions about growth in productivity, labor force, and population. Industrial output grows at annual average rates of 2.1 percent in the High Economic Growth case and 0.5 percent in the Low Economic Growth case.

Energy expenditures decline relative to Gross Domestic Product

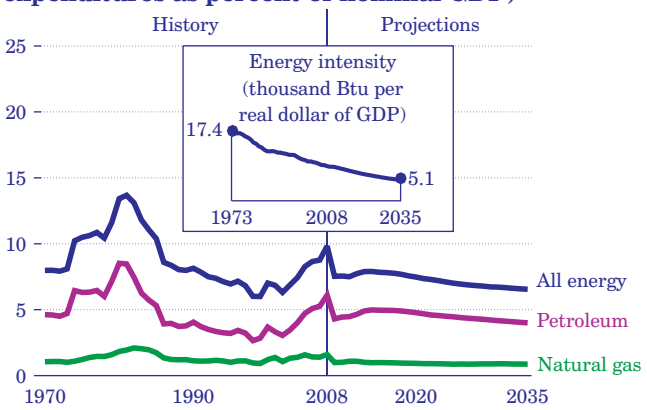
Figure 34. Energy expenditures in the U.S. economy in three cases, 1990-2035 (trillion 2008 dollars)



Total end-use expenditures for energy in the U.S. economy were $1.4 trillion in 2008. After falling in 2009, energy expenditures rise to $1.8 trillion (2008 dollars) in 2035 in the *AEO2010* Reference case, $2.1 trillion in the High Economic Growth case, and $1.5 trillion in the Low Economic Growth case (Figure 34). The energy intensity of the economy as a whole, measured as energy consumption (thousand Btu) per dollar of real GDP, was 8.6 in 2008. Structural shifts in the economy, improvements in energy efficiency, and rising world oil prices lead to a decline in U.S. energy intensity to 5.1 in 2035.

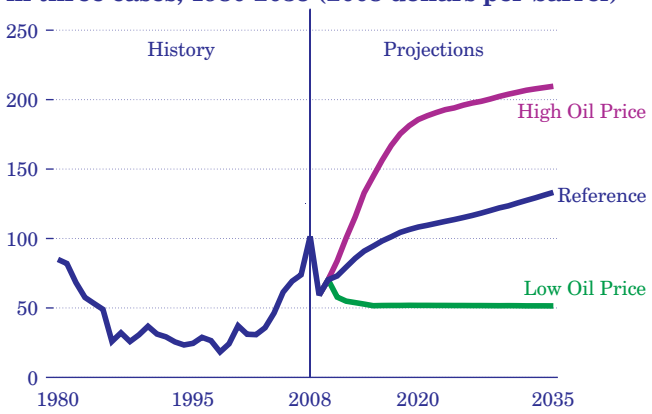
Since 2003, rising oil prices have pushed the share of energy expenditures as a percent of GDP upward; a 9.8-percent share in 2008 was the highest since 1986. In the *AEO2010* Reference case, as energy use becomes more efficient, its share declines to 6.5 percent of GDP by 2035 (Figure 35).

Figure 35. Energy end-use expenditures as a share of gross domestic product, 1970-2035 (nominal expenditures as percent of nominal GDP)



Oil price cases depict uncertainty in world oil markets

Figure 36. Average annual world oil prices in three cases, 1980-2035 (2008 dollars per barrel)



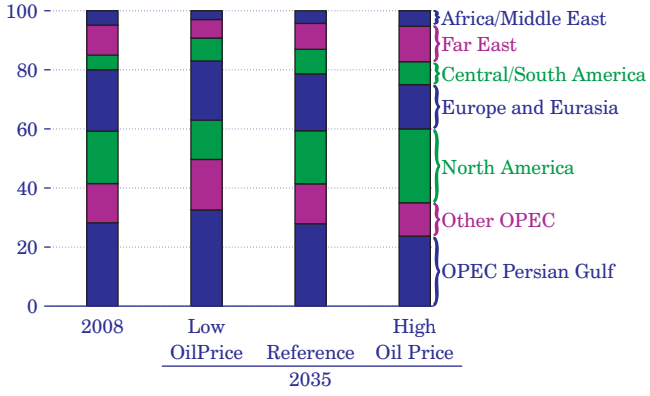
World oil price projections in *AEO2010*, defined in terms of the average price of low-sulfur, light crude oil delivered to Cushing, Oklahoma, span a broad range reflecting the inherent volatility and uncertainty of world oil prices (Figure 36). The *AEO2010* price paths are not intended to reflect absolute bounds for future oil prices, but rather to allow analysis of the implications of world oil market conditions that differ from those assumed in the Reference case. The *AEO2010* Reference case assumes a continuation of current trends in terms of economic access to non-OPEC resources and OPEC market share of world production.

The High Oil Price case depicts a future world oil market in which conventional production is restricted by political decisions and economic access to resources: use of quotas, fiscal regimes, and various degrees of access restrictions by the major producing countries decrease their oil production, and consuming countries turn to high-cost unconventional liquids production to satisfy demand. The OPEC share of liquids production is lower than in the Reference case.

The Low Oil Price case depicts a future world oil market in which non-OPEC producing countries develop stable fiscal policies and investment regimes directed at encouraging development of their resources. In the Low Price case, OPEC nations increase production in order to achieve approximately a 50-percent market share of total liquids production by 2035, up from approximately 42 percent in 2008.

World liquids supply remains geographically diversified

Figure 37. World liquids production shares by region in three cases, 2008 and 2035 (percent)



OPEC production decisions are the most significant factor underlying differences among the price cases. In the Reference case, OPEC conventional production maintains approximately a 40-percent share of total world liquids production through 2035, consistent with levels over the past 15 years. In the High Oil Price case, OPEC's share of world liquids production declines to 35 percent; in the Low Oil Price case, OPEC's share expands to almost 50 percent (Figure 37). In all the cases, total liquids production by countries in the Organization for Economic Cooperation and Development is between 21 and 27 million barrels per day in 2035, constrained mainly by resource availability rather than price or political concerns.

In the High Oil Price case, several non-OPEC countries with large resource holdings (including Russia, Brazil, Mexico, and Kazakhstan) either maintain or further restrict opportunities for investment in domestic resource development, limiting their contribution to the total world liquids supply. Political, fiscal, and resource conditions in each of those countries are unique. However, all will require domestic and foreign investment to develop new projects and maintain infrastructure, and all have recently either not encouraged such investment or indicated that they may enact future restrictions on foreign investment.

In the Low Oil Price case, several resource-rich nations outside OPEC, including Russia and Brazil, are assumed to change legislation or fiscal terms in order to encourage foreign investment in the development of their liquids resources. As a result, the largest increases in liquids supply among the non-OPEC countries occur in Russia, Brazil, and Kazakhstan.