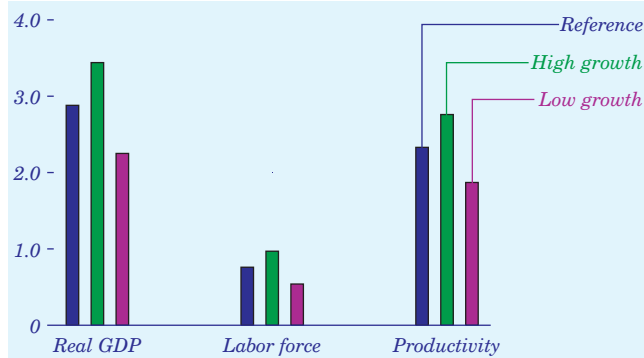


Trends in Economic Activity

Strong Economic Growth Is Expected To Continue Through 2030

Figure 24. Average annual growth rates of real GDP, labor force, and productivity, 2005-2030 (percent per year)

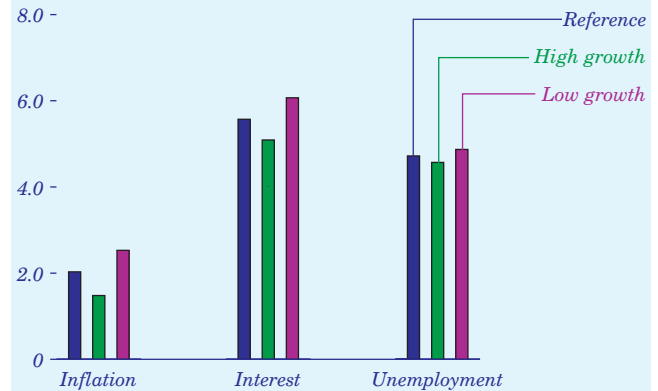


AEO2007 presents three views of economic growth for the projection period from 2005 through 2030. In the reference case, the Nation's economic growth, measured in terms of real GDP, is projected to average 2.9 percent per year (Figure 24). The labor force is projected to grow by 0.8 percent per year on average; labor productivity growth in the nonfarm business sector is projected to average 2.3 percent per year; and investment growth is projected to average 3.8 percent per year. Disposable income grows by 3.1 percent per year in the reference case and disposable income per capita by 2.3 percent per year. Nonfarm employment grows by 1.0 percent per year, while employment in manufacturing shrinks by 0.5 percent per year.

The high and low economic growth cases show the effects of alternative economic growth assumptions on the energy market projections. In the high growth case, real GDP growth is projected to average 3.4 percent per year as a result of higher assumed growth rates for the labor force (1.0 percent per year), nonfarm employment (1.3 percent), and productivity (2.8 percent). With higher productivity gains and employment growth, projected inflation and interest rates are lower than in the reference case. In the low growth case, slower growth in real GDP growth is projected, averaging 2.2 percent per year, as a result of lower assumed growth rates for the labor force (0.5 percent per year), nonfarm employment (0.6 percent per year), and productivity (1.9 percent per year). Consequently, the low growth case projects higher inflation and interest rates and slower growth in industrial output.

Inflation, Interest, and Jobless Rates Fall Below Historical Averages

Figure 25. Average annual inflation, interest, and unemployment rates, 2005-2030 (percent per year)

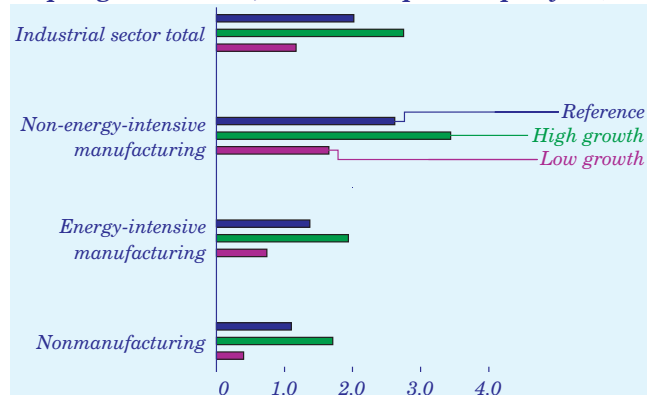


Common indicators for inflation, interest rates and employment are, respectively, the all-urban consumer price index (CPI-U), the interest rate (yield) on 10-year U.S. Treasury notes, and the unemployment rate, which are widely viewed as barometers of conditions in the markets for goods and services, credit, and labor, respectively. In *AEO2007*, the projected average annual inflation rate over the 2005-2030 period, as measured by the all-urban CPI, is 2 percent in the reference case, 1.5 percent in the high economic growth case, and 2.5 percent in the low growth case (Figure 25). Annual yields on the 10-year Treasury note are projected to average 5.6 percent in the reference case, 5.1 percent in the high growth case, and 6.1 percent in the low growth case. The projections for average unemployment rates are 4.7 percent in the reference case, 4.6 percent in the high growth case, and 4.9 percent in the low growth case. Relative to the reference case, the higher inflation, interest, and unemployment rates in the low growth case and the lower rates in the high growth case depend on different assumptions about labor productivity and population growth rates.

Historically, from 1980 to 2005, inflation has averaged 3.5 percent per year, the average yield on 10-year Treasury notes has been 7.7 percent per year, and the unemployment rate has averaged 6.2 percent. In the reference case and also in the high and low economic growth cases for *AEO2007*, projected gains in labor productivity are generally higher than the historical averages of the 1980s, leading to more optimistic projections for inflation, interest, and unemployment rates.

Output Growth for Energy-Intensive Industries Is Expected To Slow

Figure 26. Sectoral composition of industrial output growth rates, 2005-2030 (percent per year)

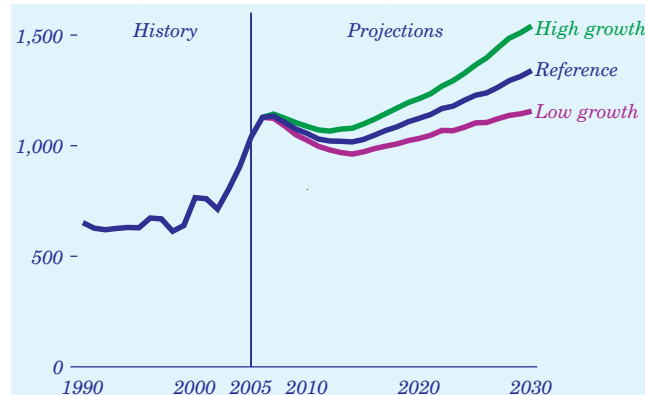


The industrial sector (all non-service industries) has shown slower output growth than the economy as a whole in recent decades, with imports meeting a growing share of demand for industrial goods. That trend is expected to continue in the *AEO2007* reference case. The average annual growth rate for real GDP from 2005 to 2030 is 2.9 percent in the reference case, whereas the industrial sector averages 2.0 percent. Within the industrial sector, manufacturing output is projected to grow more rapidly than nonmanufacturing output (which includes agriculture, mining, and construction). With higher energy prices and more foreign competition expected, the energy-intensive manufacturing sectors are projected to grow by only 1.4 percent per year from 2005 through 2030, compared with a projected 2.6-percent average annual rate of growth for the non-energy-intensive manufacturing sectors (Figure 26). The energy-intensive manufacturing sectors include food, paper, bulk chemicals, petroleum refining, glass, cement, steel, and aluminum.

In the high economic growth case, output from the industrial sector as a whole is projected to grow by an average of 2.8 percent per year, still below the projected average of 3.4 percent for real GDP. In the low economic growth case, with real GDP growth projected to average 2.2 percent per year from 2005 through 2030, industrial output averages 1.2 percent annual growth. In both cases, the highest growth rates are expected for the non-energy-intensive manufacturing segment of the industrial sector, with lower rates projected for the energy-intensive manufacturing and nonmanufacturing segments.

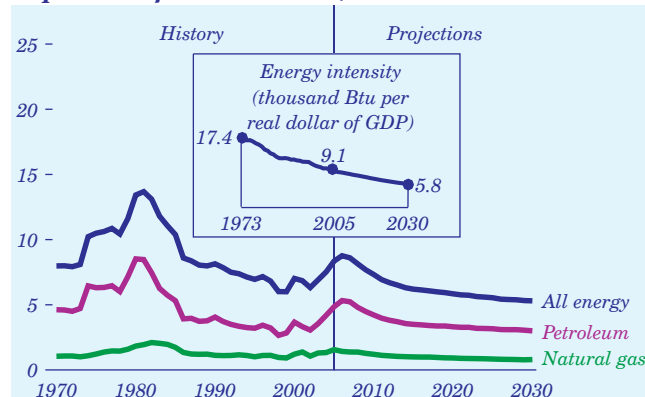
Energy Expenditures Relative to GDP Are Projected To Decline

Figure 27. Energy expenditures in the U.S. economy, 1990-2030 (billion 2005 dollars)



Total expenditures for energy services in the U.S. economy were \$1.0 trillion in 2005. In the *AEO2007* projections, energy expenditures in 2030 rise to \$1.3 trillion (2005 dollars) in the reference case and \$1.5 trillion in the high economic growth case (Figure 27). For the economy as a whole, ratios of energy expenditures to GDP in 2005 were 8.4 percent for all energy, 4.8 percent for petroleum, and 1.6 percent for natural gas. Although recent developments in the world oil market have pushed the expenditure shares upward, in the reference case they are expected to decline from current levels as the energy intensity of the U.S. economy—measured as energy consumption (thousand Btu) per dollar of real GDP—continues to decline and world oil prices return to a relatively lower price path. Total energy expenditures are projected to equal 5.3 percent of GDP in 2030, petroleum expenditures 3.0 percent, and natural gas expenditures less than 1 percent (Figure 28).

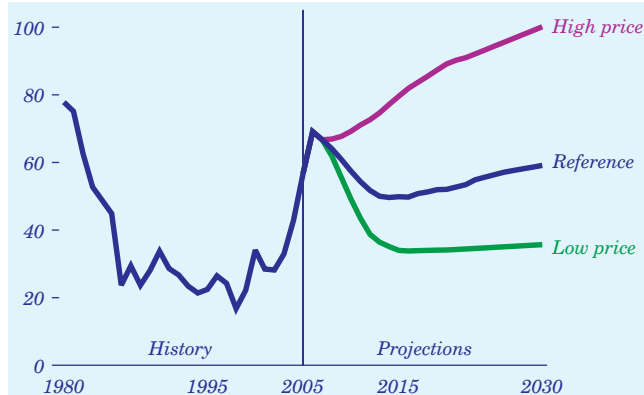
Figure 28. Energy expenditures as a share of gross domestic product, 1970-2030 (nominal expenditures as percent of nominal GDP)



International Oil Markets

Oil Price Cases Show Uncertainty in Prospects for World Oil Markets

Figure 29. World oil prices, 1980-2030 (2005 dollars per barrel)



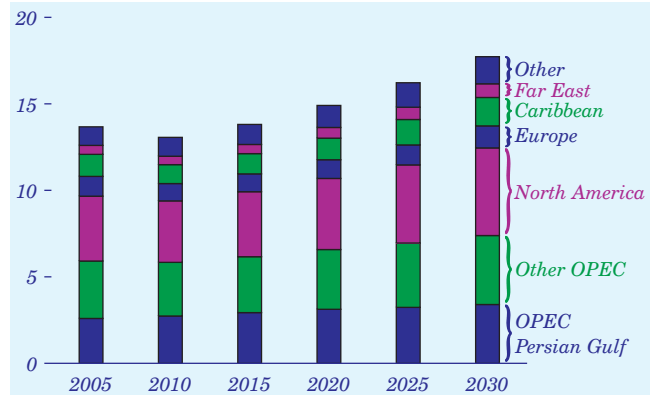
World oil price projections in the *AEO2007*, in terms of the average price of imported low-sulfur, light crude oil to U.S. refiners, are higher for 2006-2014 than those presented in the *AEO2006*. The higher price path reflects lower estimates of oil consumers' sensitivity to higher prices (given that the demand for oil has continued to grow despite the high prices of 2005-2006), an anticipation of lower levels of future investment in production capacity in key resource-rich regions due to political instability, access restrictions, and a reassessment of OPEC producers' ability to influence prices during periods of volatility.

The historical record shows substantial variability in world oil prices, and there is arguably even more uncertainty about future prices in the long term. *AEO2007* considers three price cases to illustrate the uncertainty of prospects for future world oil resources and economics. In the reference case, world oil prices moderate from current levels to about \$50 per barrel in 2014, before rising to \$59 per barrel in 2030 (2005 dollars). The low and high price cases reflect a wide range of potential world oil price paths, ranging from \$36 to \$100 per barrel in 2030 (Figure 29), but they do not bound the set of all possible future outcomes.

In all three price cases, non-OPEC suppliers produce at maximum capacity based on world oil price levels. Thus, the variation in price paths has the greatest impact on the need for OPEC supply in the long term. In 2030, OPEC is expected to supply 47.6 million barrels per day in the reference case and 54.7 million barrels per day in the low price case, but only 33.3 million barrels per day in the high price case—less than current OPEC production levels.

Oil Imports in 2030 Approach 18 Million Barrels per Day

Figure 30. U.S. gross petroleum imports by source, 2005-2030 (million barrels per day)



Total U.S. gross petroleum imports increase in the reference case from 13.7 million barrels per day in 2005 to 17.7 million in 2030 (Figure 30), deepening U.S. reliance on imported oil in the long term. In 2030, gross petroleum imports account for 66 percent of total U.S. petroleum supply in the reference case, up from 60 percent in 2005.

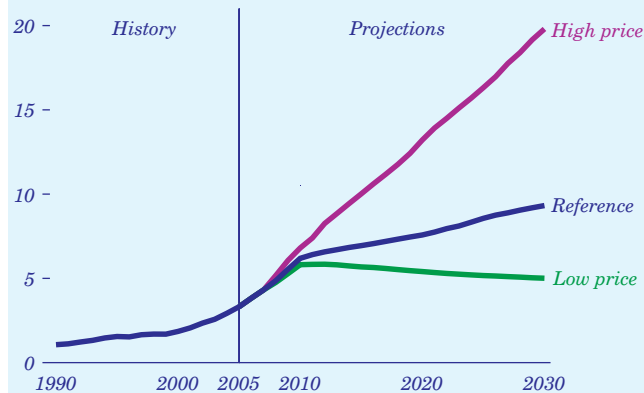
U.S. gross petroleum imports in the high world oil price case are 25 percent lower in 2030 than projected in the reference case, at 13.4 million barrels per day. The higher price assumptions lead to increased profitability from domestic production and reduced demand. In the low world oil price case, imports increase to 20.8 million barrels per day in 2030. The projected import shares of total U.S. petroleum supply in 2030 are 54 percent in the high price case and 72 percent in the low price case.

Of the increase in gross imports in the reference case, 37 percent comes from OPEC suppliers. West Coast refiners increase their imports of crude oil from the Far East, to replace a decline in Alaskan oil supplies. Canada and Mexico continue to be important sources of U.S. petroleum supply. Much of the Canadian contribution comes from the development of its enormous oil sands resource base.

Across the three price cases, U.S. gross petroleum imports shift toward heavier crude oil and fewer refined petroleum products. Vigorous growth in demand for lighter, low-sulfur petroleum in developing countries means that U.S. refiners are likely to import smaller volumes of low-sulfur, light crude oil and to increase the technical complexity of their refining operations.

Unconventional Resources Gain Market Share as Prices Rise

Figure 31. Unconventional resources as a share of the world liquids market, 1990-2030 (percent)



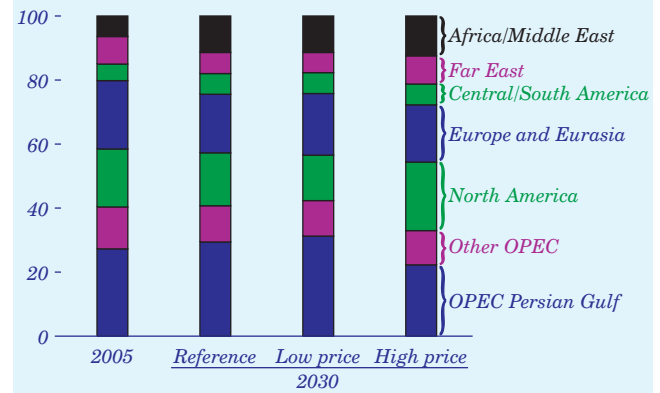
The world's total production of liquid fuels from unconventional resources in 2005 was 2.8 million barrels per day, equal to about 3 percent of total liquids production. Production from unconventional sources included 1.1 million barrels per day from oil sands in Canada, 600,000 barrels per day from very heavy oils in Venezuela, and 260,000 barrels per day of ethanol (172,000 barrels per day oil equivalent) in the United States. In the *AEO2007* reference case, unconventional production is projected to make up 9 percent of total liquids production (10.9 million barrels per day) in 2030.

Unconventional liquids production grows twice as fast in the high price case as in the reference case (Figure 31), because unconventional supplies are more competitive with conventional sources when market prices are higher. In the high price case, unconventional production increases to about 20.1 million barrels per day worldwide in 2030, representing 20 percent of total liquids production around the world. In the low price case, unconventional production totals only 6.4 million barrels per day in 2030, or 5 percent of total production.

More than 80 percent of the world's unconventional resources are controlled by non-OPEC nations. The total volumes of liquids production in non-OPEC countries are fairly constant across the three world oil price cases in *AEO2007*, but non-OPEC unconventional production is significantly higher in the high price case.

World Liquids Supply Is Projected To Remain Diversified in All Cases

Figure 32. World liquids production shares by region, 2005 and 2030 (percent)



In 2005, OPEC producers in the Persian Gulf accounted for 27 percent of the world's total oil supply, and other OPEC producers accounted for 13 percent. Europe and Eurasia produced 21 percent of the total supply, North America 18 percent, and the rest of the world 20 percent (Figure 32). In the reference case projections, those regional shares remain relatively constant though 2030.

The largest change in regional production share is projected for non-OPEC suppliers in Africa and the Middle East, which increase their share of the world total from 6 percent in 2005 to 11 percent in 2030 in the reference case. OPEC producers in the Persian Gulf are projected to increase their share of the total by 2 percentage points from 2005 to 2030, and the share of OPEC producers in other regions is projected to fall by 2 percentage points.

In the low and high oil price cases, the OPEC Persian Gulf share in 2030 varies from 31 percent to 22 percent, respectively, as compared with 29 percent in the reference case. The changes across the three cases reflect an expectation that OPEC suppliers will vary their production levels in attempts to influence world oil prices. In the projections, OPEC revenues and profits from oil exports vary by less than export volumes across the cases.