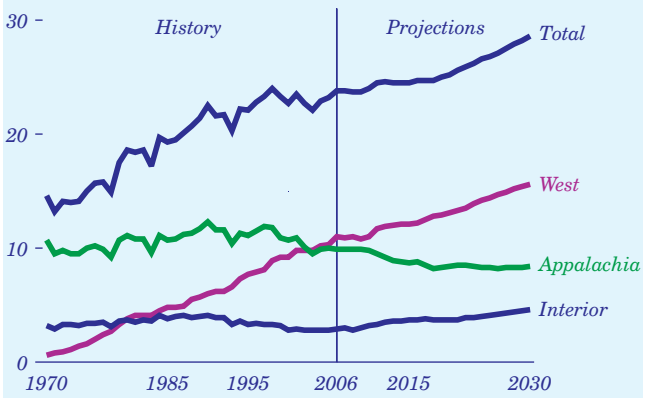
Western Coal Production Continues To Increase Through 2030

Figure 93. Coal production by region, 1970-2030 (quadrillion Btu)



In the *AEO2008* reference case, increasing coal use for electricity generation at existing plants and construction of a few new coal-fired plants lead to annual production increases that average 0.3 percent per year from 2006 to 2015, when total production is 24.5 quadrillion Btu. In the absence of restrictions on CO_2 emissions, the growth in coal production is even stronger from 2015 to 2030, averaging 1.0 percent per year, as a substantial number of new coal-fired power plants and several CTL plants are brought on line.

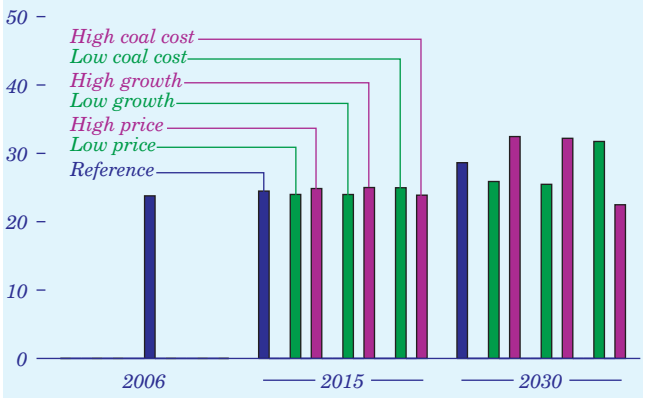
Western coal production, which has grown steadily since 1970, continues to increase through 2030 (Figure 93). Much of the projected growth is in output from the Powder River Basin, where producers are well positioned to increase production from the vast remaining surface-minable reserves.

Appalachian coal production declines slightly in the reference case. Although producers in Central Appalachia are well situated to supply coal to new generating capacity in the Southeast, that portion of the Appalachian basin has been mined extensively, and production costs have been increasing more rapidly than in other regions. The eastern portion of the Interior coal basin (Illinois, Indiana, and western Kentucky), with extensive reserves of mid- and high-sulfur bituminous coals, benefits from the new coal-fired generating capacity in the Southeast.

Production of low-Btu lignite in the Interior and Western supply regions also increases substantially, primarily to meet the energy and feedstock requirements of new coal-fired power plants and CTL plants in Texas, Montana, and North Dakota.

Long-Term Production Outlook Varies Considerably Across Cases

Figure 94. U.S. coal production, 2006, 2015, and 2030 (quadrillion Btu)

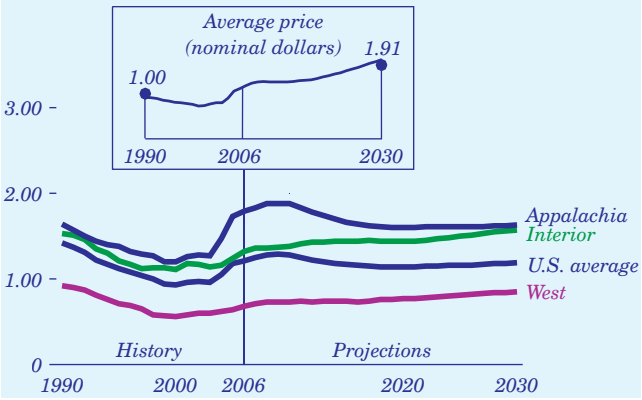


In most of the *AEO2008* cases, U.S. coal production is projected to increase from 2006 to 2030; however, different assumptions about economic growth (which mainly affect overall electricity demand) and about the costs of producing fossil fuels (which primarily determine the mix of supply sources for generation and petroleum products) lead to different results. The reference case projects a 20-percent increase from 2006 to 2030, whereas the alternative cases show changes that range from a decrease of 5 percent to an increase of 36 percent (Figure 94). Because the level of uncertainty is lower in the near term, the projected changes in coal production from 2006 to 2015 show significantly less variation, ranging from virtually no change to an increase of 5 percent.

Across the cases, regional coal production trends generally follow the national trend. As a result, the projected regional shares of total coal production in 2030 (from the Appalachian, Interior, and Western supply regions) do not vary by much among the reference, high and low price, and high and low economic growth cases. In the high coal cost case, however, the combination of higher mining and transportation costs and slow growth in total U.S. coal demand leads to a sizable drop in projected output from Wyoming's Powder River Basin, which is by far the most important coal-producing area in the West. As a result, the Western share of total U.S. coal production declines slightly in the high coal cost case, from 46 percent in 2006 to 45 percent in 2030. In the other cases, the West's share of total coal production in 2030 ranges from a low of 54 percent to a high of 60 percent.

Minemouth Coal Prices in the Western and Interior Regions Rise Steadily

Figure 95. Average minemouth price of coal by region, 1990-2030 (2006 dollars per million Btu)



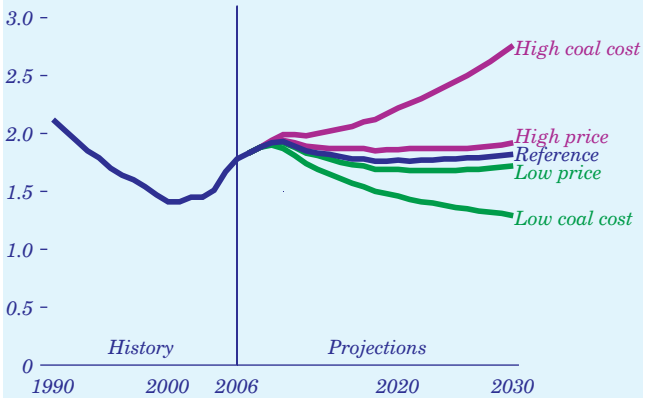
Strong growth in production in the Interior and Western supply regions, combined with limited improvement in coal mining productivity, results in minemouth price increases of 0.7 and 0.9 percent per year, respectively, for the two regions from 2006 through 2030. Average minemouth prices in Appalachia decline by 0.4 percent per year over the same period, as a result of falling output levels and a shift to lower cost production in the northern part of the basin.

The U.S. average minemouth price for coal drops slightly between 2006 and 2020, from $1.21 to $1.14 per million Btu (2006 dollars), as mine capacity utilization declines and production shifts away from the higher cost mines of Central Appalachia. After 2020, rising natural gas prices and requirements for additional generating capacity result in the construction of 65 gigawatts of new coal-fired generating capacity. The combination of new investment in mining capacity to meet the demand growth, a continued low rate of productivity improvement, and rising utilization of mining capacity leads to an increase in the average minemouth price, to $1.19 per million Btu in 2030.

From 1990 to 1999, the average minemouth price of coal declined by 4.5 percent per year (Figure 95). Increases in U.S. coal mining productivity of 6.3 percent per year helped to reduce mining costs and contributed to the price decline. Since 1999, U.S. coal mining productivity has declined by 0.8 percent per year, and the average minemouth coal price has increased by 3.7 percent per year. In the *AEO2008* reference case, coal mining productivity rises at an average rate of 0.6 percent per year from 2006 to 2030, more closely reflecting the trend of the past several years.

Higher Mining and Transportation Costs Raise Delivered Coal Prices

Figure 96. Average delivered coal prices, 1990-2030 (2006 dollars per million Btu)



Alternative assumptions for coal mining and transportation costs affect delivered coal prices and demand. Two alternative coal cost cases developed for *AEO2008* examine the impacts on U.S. coal markets of alternative assumptions about mining productivity, labor costs, and mine equipment costs on the production side, and about railroad productivity and rail equipment costs on the transportation side.

In the high coal cost case, the average delivered coal price in 2006 dollars is $2.76 per million Btu in 2030—52 percent higher than in the reference case (Figure 96). As a result, U.S. coal consumption is 4.8 quadrillion Btu (16 percent) lower than in the reference case in 2030, reflecting both a switch from coal to natural gas, nuclear, and renewables in the electricity sector and reduced CTL production. In the low coal cost case, the average delivered price in 2030 is $1.29 per million Btu—29 percent lower than in the reference case—and total coal consumption is 2.1 quadrillion Btu (7 percent) higher than in the reference case.

Because the high and low economic growth cases and the high and low price cases use the reference case assumptions for coal mining and rail transportation productivity and equipment costs, they show smaller variations in average delivered coal prices than do the two coal cost cases. Different coal price projections in the high and low economic growth cases (with price paths very close to the reference case) and high and low price cases result mainly from higher and lower projected levels of demand for coal. In the price cases, higher and lower fuel costs for both coal producers and railroads contribute to the variations in projected coal prices.