

**Submission of the
Energy Information Administration
U. S. Department of Energy
March 10, 2005
Energy and Natural Resources Committee
Conference on the Future of Coal**

Mr. Chairman and Members of the Committee:

I appreciate the opportunity to appear before you today to briefly discuss the long-term outlook for US coal markets. I am Alan Beamon, Director of the Coal and Electric Power Division, and my office is responsible for the Energy Information Administration's (EIA) long-term projections for electricity and coal markets. I am joined today by two EIA colleagues, Betsy O'Brien and Rich Bonskowski, whose work focuses on recent coal market data.

The projections I will be discussing are based on the reference case of the *Annual Energy Outlook 2005*, which was released last December. The reference case of the *AEO2005* is based on current laws and regulations and the complete publication, including more than 30 additional scenarios, is now available on EIA's website.

Consumption

Driven by growing needs for electricity generation, total US coal consumption is projected to increase by 413 million tons (38 percent) in the reference case forecast, rising from 1,095 million tons in 2003 to 1,508 million tons in 2025. Because of the continued growth in the use of coal for power generation, the share of coal used for electricity generation is projected to rise slightly from 92 percent in 2003 to 94 percent in 2025.

Overall, coal consumption in the electric power sector is expected to grow as existing coal-fired plants are used more intensively and new plants are added after 2011. Nationally, capacity utilization for coal plants (excluding combined heat and power) is expected to rise from 72 percent in 2003 to over 80 percent in 2025. Only 3 gigawatts of coal-fired capacity are expected to be retired in our forecast and 87 gigawatts of new capacity, including 16 gigawatts of coal integrated gasification combined cycle capacity, are expected to be added.

Coal is expected to maintain its share of US electricity generation, falling only slightly from 51 percent of total US electricity generation in 2003 to 50 percent in 2025.

Production, Export and Imports

Increased coal production in the West is expected to be the primary supply source for the growing power sector needs (**Figure1**). Little change is projected for

Appalachian coal production. This region has been mined extensively, and increases in demand are likely to be met with coal from other areas. In the Interior region (primarily coal from the Illinois basin and Texas lignite), production is projected to increase by 36 million tons from 2003 to 2025. Western coal production, which has grown steadily since 1970, is projected to continue to increase through 2025, especially in the Powder River Basin, where vast reserves are contained in thick seams accessible to surface mining.

Easing of rail transportation bottlenecks will be key for coal producers in the West to take advantage of market opportunities presented by slower growth in Appalachian production, fuel switching at existing power plants, and demand from new power plants expected to be built in the West and Southeast regions.

Following a trend that began in the early 1990s, U.S. coal exports are expected to continue to decline gradually, falling from 43 million tons in 2003 to 26 million tons in 2025. The key factor in this decline is the growing availability of low-cost supplies of coal from China, Colombia, Indonesia, Russia, and Australia, which satisfied much of the growth in international demand for steam coal since the mid-1990s, and low-cost supplies of coking coal from Australia which supplanted substantial amounts of U.S. coking coal in world markets. The U.S. share of total world coal trade is projected to fall from 6 percent in 2003 to 3 percent in 2025, as international competition intensifies and imports of coal to Europe and the Americas grow more slowly or decline.

Also, following a trend that began in the early-1990s, U.S. imports of low-sulfur coal are projected to grow from 25 million tons in 2003 to 46 million tons in 2025. The addition and expansion of existing coal import facilities and the need to meet tighter emission targets are expected to make coal imports an increasingly attractive option for U.S. coal-fired power plants located near the Gulf Coast and the Atlantic seaboard. Much of the additional import tonnage is expected to originate from mines in Colombia, Venezuela, and Indonesia.

Prices

Driven by 6.3 percent annual growth in coal mining productivity, the average minemouth price of coal declined 4.9 percent annually between 1990 and 1999. However, since 1999, coal mining productivity growth has slowed to 1.3 percent per year, and minemouth coal prices have remained virtually unchanged. In the *AEO2005*, minemouth coal prices are projected to rise initially, reaching \$18.61 per ton in 2005, in response to strong growth in the demand for coal in the electric power sector (**Figure 2**). We project that, after 2005, the combination of moderate growth in demand, continued improvements in mining productivity, and a continuing shift to low-cost coal from Wyoming's Powder River Basin causes the average minemouth price to fall slightly under \$17.00 per ton between 2010 and 2020. However, after 2020, the addition of new coal plants to meet baseload generating needs causes the use of coal to again grow more rapidly and the minemouth price of coal increases to \$18.26 per ton in 2025.

Uncertainties

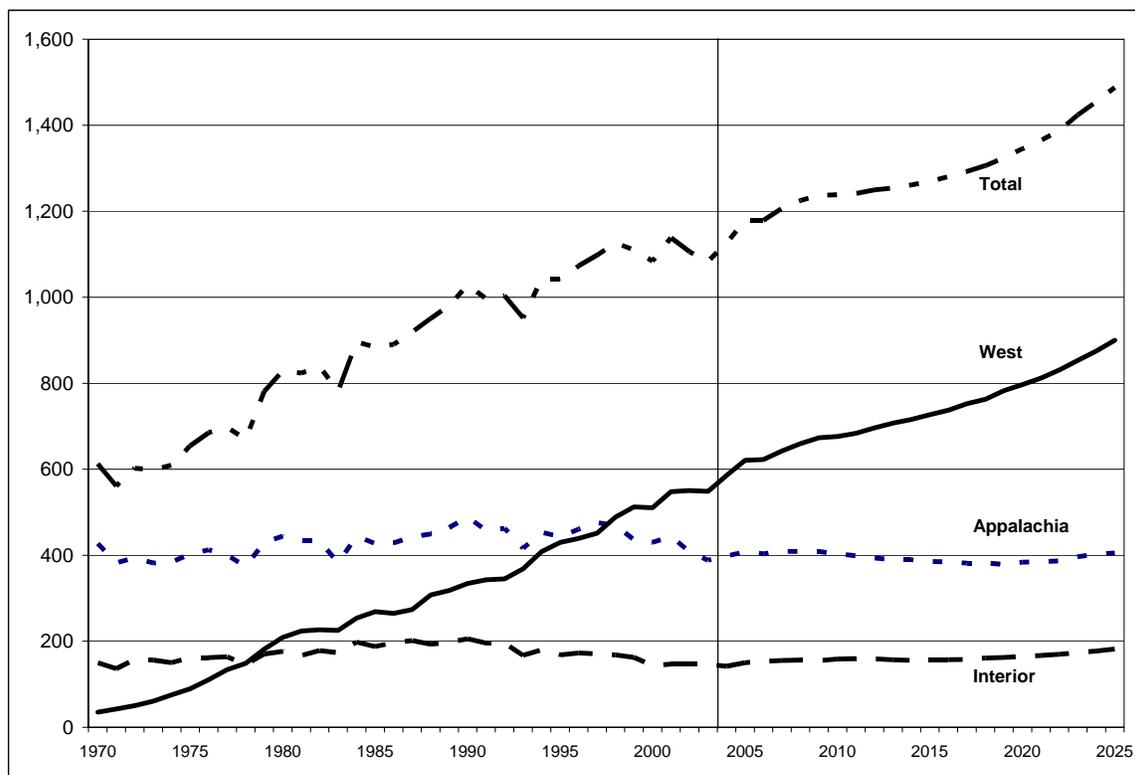
Of course, many forces could influence future U.S. coal production and consumption. Three key factors are electricity demand growth, natural gas prices and environmental regulations. Over the last 30 years, the rate of growth in electricity sales has been slowing. After growing 4.2 percent annually in the 1970s and 2.6 percent annually in the 1980s, the rate of growth slowed to 2.3 percent annually in 1990s. This year's *AEO2005* assumes this slowing growth trend will continue and electricity sales increase at a 1.8 percent annual rate between 2003 and 2025. Over these 22 years, even small changes in this annual growth rate could lead to a much larger or smaller market for new coal generating plants and the coal needed to fuel them. For example, in the *AEO2005*, in alternative economic growth cases, the annual growth in electricity sales between 2003 and 2025 ranges between 1.6 percent and 2.1 percent. In the slower growth case, only 50 gigawatts of new coal capacity is projected to be added, while in the faster growth case, 126 gigawatts of new coal capacity is projected to be added. Put in coal production terms, total coal production in 2025 in the slower growth case is projected to be 1,373 million tons, while in the faster growth case it reaches 1,597 million tons.

The price of natural gas will also be important in the future of U.S. coal markets. Throughout the 1990s, the price of natural gas to power plants averaged below \$3 per thousand cubic feet. These low natural gas prices made new, low-cost, efficient natural gas combined cycle power plants competitive with coal generated power. Since 2000, the situation has changed and new coal-fired power plants are increasingly competitive. While natural gas prices are projected to remain well above \$3 per thousand cubic feet in the *AEO2005*, higher or lower prices than those projected would impact coal markets. For example, the sensitivity of coal capacity additions and production to natural gas prices can be seen by comparing the results from the reference and restricted natural gas supply cases in the *AEO2005*. In the reference case, wellhead natural gas prices are projected to be \$4.79 per thousand cubic feet in 2025, while in the restricted natural gas supply case they are \$6.29 per thousand cubic feet. In the reference case, 87 gigawatts of new coal capacity is added while in the restricted natural gas supply case, 143 gigawatts of new coal capacity is added. Further, in the reference case, total coal production in 2025 is projected to be 1,488 million tons in 2025, while it is 1,615 million tons in the restricted natural gas supply case.

Numerous proposals have been made to reduce power plant emissions of nitrogen oxides (NO_x), sulfur dioxide (SO₂), mercury (Hg), and carbon dioxide (CO₂). Efforts to reduce these emissions will fall primarily on coal generating plants. Depending on the stringency of the proposals, reducing each of these emissions, particularly carbon dioxide, could significantly impact the competitiveness of existing and new coal plants and the market for coal. The potential impact of the NO_x and SO₂ regulations proposed in the Environmental Protection Agency's Clean Air Interstate Rule (pCAIR) are examined in a special case in the *AEO2005*. In the pCAIR case, total coal production in 2025 falls slightly, about 1 percent, below the level projected in the reference case. In analyses with more stringent emission limits than those in pCAIR, or when CO₂ emission limits are included, much larger coal market impacts have been seen.

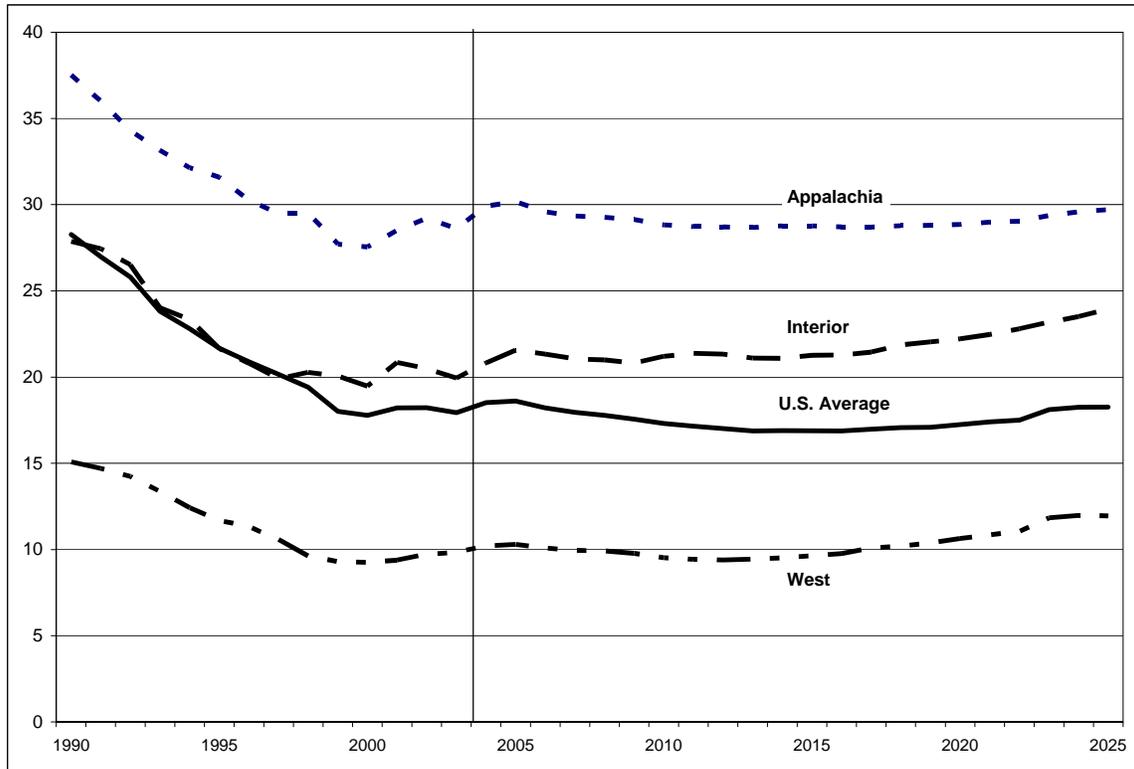
This completes my statement, Mr. Chairman. EIA appreciates your interest in our data and projections regarding coal markets, and we look forward to any questions you or the other Committee members may have.

Figure 1. Coal Production by Region, 1970-2025
(million short tons)



Source: National Energy Modeling System run, aeo2005.d102004a.

Figure 2. Average Minemouth Price of Coal by region, 1990-2025
 (2003 dollars per short ton)



Source: National Energy Modeling System run, aeo2005.d102004a.