U.S. Coal Supply and Demand: 2001 Review

by

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Overview

With the dawning of a new century came the beginning of a new era in the coal industry. Instead of the traditional practice of only buying and selling produced coal in the United States, a coal futures market was established. The New York Mercantile Exchange began trading coal futures in July of 2001. Even in this new era, many of the old issues that have beset the coal industry still remain, as was evident in 2001.

Coal production increased to a record level in 2001 according to preliminary data from the Energy Information Administration. Production in 2001 rose by 4 percent from 2000 to 1,121.3 million short tons (Table 1), just barely surpassing the prior record level of 1,117.5 million short tons set in 1998. Overall coal consumption remained essentially unchanged. The additional production was used to replenish the depleted stockpiles that had resulted after 2 years of declining coal production and increasing coal consumption.

Driven by the electric power industry—the impetus of all coal production—coal consumption in 2001 in the United States totaled 1,081.1 million short tons, the same level as in 2000. The electric power industry (utilities and nonutility power producers) used 969.0 million short tons of coal, 90 percent of total U.S. consumption. Coal-based electric power accounted for 51 percent of total electric generation. A decrease of 13.6 million short tons in coal consumed to generate electricity between 2001 and 2002 was for the most part a response to the milder-than-normal weather across most of the country and to the slowdown in the U.S. economy during the year. Coal use in the non-electricity sector rose as other industrial consumption pushed the total sector to grow by 14 percent to reach a total of 112.1 million short tons. [It should be noted that in 2001 data on coal consumption was collected for the first time from the new coal synfuel plants that have proliferated as a result of the IRS Section 29 tax credit. For more specific information, see the consumption section of this article.]

U.S. coal imports increased in 2001 by more than 58 percent, achieving a record level of 19.8 million short tons. The record level of imports was a consequence of some utilities using imported low-sulfur coal to help meet stricter sulfur emission requirements of Phase II of the 1990 Clean Air Act Amendments (CAAA), which became effective January 1, 2000, as well as some utilities turning to imported coal in response to the tight domestic coal supply market experienced during most of the year. U.S. coal exports declined to a level not seen in over 22 years. Coal exports in 2001 totaled 48.7 million short tons, a decline of 17 percent from the 2000 level, with both steam and metallurgical coal exports dropping in 2001.

Year-end coal stocks in 2001 increased in both the consuming and producing sectors. Consumer stocks increased by 29.0 million short tons while producer and distributor stocks rose by 2.0 million short tons, replacing much of the stock decrease experienced in 2000.

In response to the tight supply market during the year, the delivered price of coal reversed the downward trend that started more than a decade ago. On an annual basis, the average utility price per ton of coal delivered to utilities rose by 2 percent in 2001, the price of coking coal increased by 4 percent, and the price of other industrial steam grew by 3 percent. Reflecting further recovery in world coal export prices from the lows reached in late 1999 and early 2000 and the limited availability of coking coal in the international market, the average price of U.S. coal exports—measured in free alongside ship (f.a.s.) value—increased by 6 percent, while the price of coal imports rose by almost 13 percent.

Production

Coal production in 2001 totaled 1,121.3 million short tons, rising 4 percent from 2000 (Figure 1 and Table 1). The increase of 47.7 million short tons in production was fueled primarily by a replenishment in coal stocks. In a departure from the trend of the past several years, production levels in all regions increased (Figure 2 and Table 2).

Even with the increase in production in 2001, there were several issues that had a dampening effect on the total coal production level. Labor shortages, equipment problems, geological problems, permitting and bonding issues, legal issues, and weather related phenomena all played a role in

Table 1. U.S. Coal Supply, Disposition, and Prices, 1998-2001
(Million Short Tons and Nominal Dollars per Short Ton)

Item	1998	1999	2000	2001
Production by Region				
Appalachian	460.4	425.6	419.4	428.9
Interior	168.4	162.5	143.5	147.7
Western	488.8	512.3	510.7	544.7
Total	1,117.5	1,100.4	1,073.6	1,121.3
Consumption by Sector				
Electric Power	937.8	946.8	982.6	969.0
Electric Utilities	910.9	894.1	859.3	818.4
Other Power Producers[a]	26.9	52.7	123.3	150.6
Coke Plants	28.2	28.1	28.9	26.6
Other Industrial Plants	67.4	64.7	65.2	80.9
Residential/Commercial Users	4.9	4.9	4.1	4.6
Total	1,038.3	1,044.5	1,080.9	1,081.1
Year-End Coal Stocks				
Electric Power	120.5	136.5	102.0	131.2
Coke Plants	2.0	1.9	1.5	1.4
Other Industrial Plants	5.5	5.6	4.6	4.5
Producers/Distributors	36.5	39.5	31.9	33.9
Total	164.6	183.5	140.0	171.1
U.S. Coal Trade				
Exports	78.0	58.5	58.5	48.7
Steam Coal	31.0	26.3	25.7	23.3
Metallurgical Coal	47.1	32.1	32.8	25.4
Imports	8.7	9.1	12.5	19.8
Net Exports	69.3	49.4	46.0	28.9
Average Delivered Price				
Electric Utilities	25.64	24.72	24.28	24.77
Coke Plants	46.06	45.85	44.37	45.91
Other Industrial Plants	32.30	31.59	31.44	32.28
Average Free Alongside Ship (f.a.s.) Price				
Exports	38.89	36.50	34.90	36.97
Steam Coal	30.24	29.91	29.67	31.88
Metallurgical Coal	44.58	41.91	38.99	41.63
Imports	32.18	30.77	30.10	34.00

[a] Includes coal consumed at utility coal-fired power plants sold to nonutilities during 1998, 1999, 2000, and 2001. Coal consumption by cogenerators are included in the other industrial end-use sector.

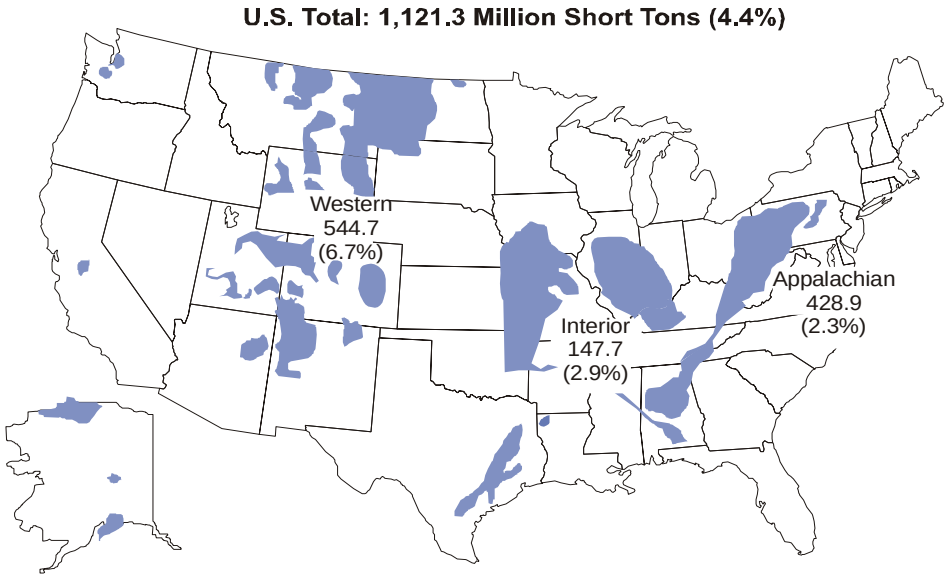
Notes: Totals may not equal sum of components due to independent rounding. Sum of net exports, stock changes, and consumption may not equal production, primarily because the supply and disposition data are obtained from different surveys.

Sources: **Production, consumption, stocks, and prices**: Energy Information Administration, *Quarterly Coal Report, July-September 2001*, DOE/EIA-0121(2000/3Q) (Washington, DC, March 2002); *Coal Industry Annual 2000*, DOE/EIA-0584(2000) (Washington, DC, January 2002); *Electric Power Monthly, January 2002*, DOE/EIA-0226(2002/01) (Washington, DC, February 2002); and Federal Energy Regulatory Commission Form 423, "Cost and Quality of Fuels for Electric Utilities." **Exports and imports**: U.S. Department of Commerce, Bureau of the Census, "Monthly Report EM 545" and "Monthly Report IM 145."

influencing the amount of coal mined in 2001. Labor shortages of qualified experienced workers, particularly in the East and to some extent in the Powder River Basin (the Powder River Basin is an area of thick subbituminous coal fields encompassing parts of northeastern Wyoming and southeastern Montana), added to some companies' production problems. In some cases, equipment problems occurred as companies delayed regularly scheduled maintenance to continue providing coal in times of tight supplies.

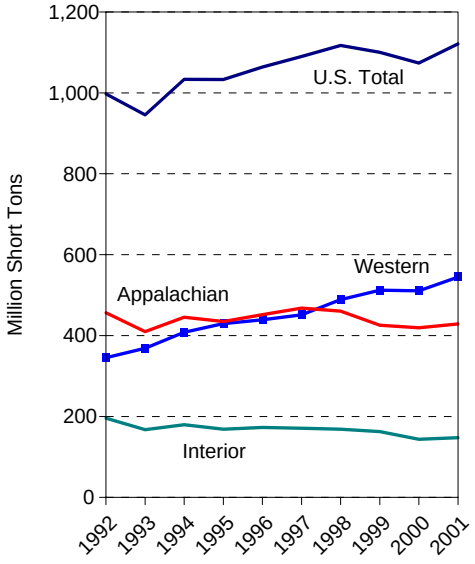
Geological problems including sandstone intrusions in some underground mines slowed production, particularly in Appalachia and to a lesser extent in the West. The bonding problems experienced in 2001 were a result of financial problems at some of the insurance companies that provide reclamation bonds for mines. A few of these companies were declared insolvent for insurance purposes and, as a consequence, some mining companies had to scramble to replace the bonds or face closure of their mines.

Figure 1. Coal Production by Coal-Producing Region, 2001
(Million Short Tons and Percent Change from 2000)



Source: Energy Information Administration.

Figure 2. Coal Production by Region, 1992-2001



Sources: Energy Information Administration, *Quarterly Coal Report*, July-September *2001*, DOE/EIA-0121(2001/3Q) (Washington, DC, March 2002); *Coal Production*, DOE/EIA-0118, various issues; and *Coal Industry Annual 2000*, DOE/EIA-0584(2000) (Washington, DC, January 2002).

The suspension of the issuing of Section 404 water permits by the Army Corp of Engineers in early October caused some permitting problems. These general permits are required before existing operations can move into new mining areas, or before a new mine can open, thereby delaying coal production that might have otherwise entered the marketplace. Weather-related issues also affected the production level as floods impacted both transportation (spring floods of the upper Mississippi) and production (summer floods in southern West Virginia). Milder temperatures over portions of the United States during the year helped to keep electricity demand down.

Appalachian Region

Coal production in the Appalachian Region was 428.9 million short tons in 2001, an increase of 2 percent as geological and other production-related problems plagued some of the mines in the region. Two-thirds of the 9.5-million-short-ton increase in 2001 was accounted for by the three major coal producing States in the region—Eastern Kentucky, Pennsylvania, and West Virginia. Coal production in West Virginia, the largest coal producing State in the region, rose by 2.1 million short tons (1 percent) to a level of 160.4 million short tons. Even though coal production increased slightly in West Virginia in 2001, it was still constrained in part by a lawsuit that had been brought by an environmental group in Federal court involving mountaintop removal and valley fills. Although the legal controversy was seemingly resolved with a circuit court ruling that the original suit should have been filed in State court, the finding has been appealed. Eastern Kentucky's production rose by 2.3 million short tons to end the year at 107.2 million short tons. In 2001, Pennsylvania produced 76.4 million short tons, 2 percent higher than the previous year. Ohio, the fourth largest coal producing State in the Appalachian Region, reversed a 3-year declining trend by increasing

Table 2. U.S. Coal Production by Coal-Producing Region and State, 1998-2001
(Million Short Tons)

Coal-Producing Region and State	1998	1999	2000	2001
Appalachian Total	**460.4**	**425.6**	**419.4**	**428.9**
Alabama	23.0	19.5	19.3	19.2
Kentucky, Eastern	116.7	110.0	104.9	107.2
Maryland	4.1	3.8	4.5	4.6
Ohio	28.0	22.5	22.3	25.3
Pennsylvania Total	81.0	76.4	74.6	76.4
Anthracite	5.2	4.8	4.6	3.9
Bituminous	75.8	71.6	70.0	72.5
Tennessee	2.7	3.0	2.7	3.3
Virginia	33.7	32.3	32.8	32.5
West Virginia	171.1	158.0	158.3	160.4
Northern	44.6	38.8	37.6	37.9
Southern	126.5	119.2	120.7	122.5
Interior Total	**168.4**	**162.5**	**143.5**	**147.7**
Arkansas	*	*	*	*
Illinois	39.7	40.4	33.4	33.8
Indiana	36.8	34.0	28.0	37.1
Kansas	0.3	0.4	0.2	0.2
Kentucky, Western	33.6	29.6	25.8	25.4
Louisiana	3.2	3.0	3.7	3.6
Mississippi	–	*	0.9	0.6
Missouri	0.4	0.4	0.4	0.4
Oklahoma	1.7	1.7	1.6	1.6
Texas	52.6	53.1	49.5	45.0
Western Total	**488.8**	**512.3**	**510.7**	**544.7**
Alaska	1.3	1.6	1.6	1.5
Arizona	11.3	11.8	13.1	13.4
Colorado	29.6	30.0	29.1	33.4
Montana	42.8	41.1	38.4	39.1
New Mexico	28.6	29.2	27.3	29.6
North Dakota	29.9	31.1	31.3	30.5
Utah	26.1	26.4	26.7	27.0
Washington	4.6	4.1	4.3	4.6
Wyoming	314.4	337.1	338.9	365.6
U.S. Total	**1,117.5**	**1,100.4**	**1,073.6**	**1,121.3**

* = Less than 50 thousand short tons.
Notes: Totals may not equal sum of components due to independent rounding.
Sources: Energy Information Administration, *Coal Industry Annual 2000*, DOE/EIA-0584(2000) (Washington, DC, January 2002); and *Quarterly Coal Report, July-September 2001*, DOE/EIA-0121(2000/3Q) (Washington, DC, March 2002).

coal production more than any State in the region—3.0 million short tons—to reach 25.3 million short tons in 2001. Maryland and Tennessee had slight increases in their coal production in 2001, while Alabama and Virginia had slight decreases.

Interior Region

The Interior Region increased coal production in 2001 by 4.2 million short tons (3 percent) to a level of 147.7 million short tons, reversing a 4-year downward trend. Reflecting the opening of four new mines in 2001 in Indiana, as well as the first full year of production by four other coal mines in the State, the greatest increase (33 percent) in tonnage in the Interior Region, was registered by Indiana. Indiana accounted for the entire increase in the Interior Region offsetting a decline in production in Texas, the largest coal-producing State in the region. Indiana's increase of 9.1 million short tons was more than double the decline in production of 4.5 million short tons in Texas. Coal production in Western Kentucky dropped slightly by 0.4 million short tons (2 percent) in 2001, while production in Illinois increased marginally by 1 percent. Coal production in Texas decreased by 9 percent to 45.0 million short tons. The decline in Texas coal production reflects the continuing displacement of State-produced lignite by Powder River

Basin coal at several electric generating facilities in the State. All other States in the Interior Region fluctuated slightly from their respective 2000 levels.

Western Region

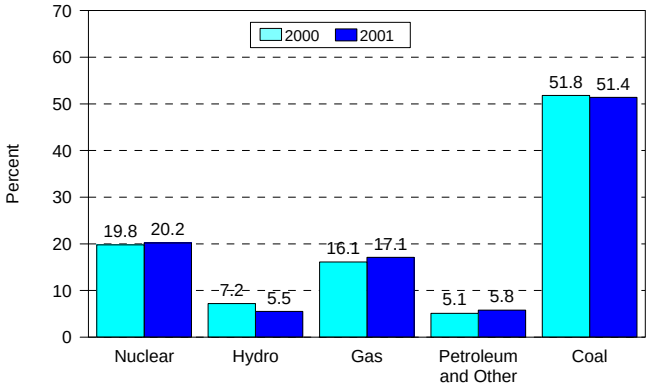
Although some of the regularly scheduled maintenance in the region had been postponed, resulting in some equipment failure in 2001, coal production in the Western Region still increased by 34.1 million short tons to 544.7 million short tons (7 percent). Coal production in this region, as well as in the entire United States, was dominated by Wyoming, which accounted for two-thirds of the regional production and almost one third of total U.S. production in 2001. Wyoming produced 365.6 million short tons of coal—only 1 percent less than the next three largest coal-producing States combined (West Virginia, Kentucky, and Pennsylvania). In 2001, Wyoming, continuing a 9-year trend of increasing coal production, grew by 26.7 million short tons (8 percent). The continued penetration of Powder River Basin coal into the eastern electric power markets has helped to drive Wyoming production to record levels for another year as shown by deliveries of Wyoming coal into West Virginia for testing in utility boilers in 2001. Even though Wyoming had another record year of coal production in 2001, coal transportation problems out of the Powder River Basin arose regarding the use of joint rail lines by the two Class 1 railroads out of the area. Due to the large amount of coal transported from the Powder River Basin by rail over a joint-rail line, scheduling conflicts occurred for the use of the line by Burlington Northern and the Union Pacific.

Montana, the second leading coal producing State in the Western Region, had an increase in production of 0.8 million short tons, resulting in a total of 39.1 million short tons, about 11 percent of Wyoming's production level. With the exception of slight declines in coal production for Alaska and North Dakota (0.1 million short tons and 0.8 million short tons, respectively) production levels in the other States in the Western Region increased in 2001. Colorado produced 33.4 million short tons, an increase of 15 percent, as the West Elk mine recovered from a fire it experienced in 2000. New Mexico registered an increase of 2.3 million short tons in 2001 (8 percent), as production began at a new underground mine and the problems experienced in the State in 2000 (localized miners strike and equipment problems) did not reoccur. Both Arizona and Utah had increases in coal production of 0.3 million short tons or 2 percent and 1 percent, respectively.

Consumption

Coal consumption in the United States in 2001 remained flat at a level of 1,081.1 million short tons (Table 1). More than 89 percent of all coal was consumed in the electric power sector. The 969.0 million short tons of coal consumed in this sector were used to produce 51 percent of all electricity generated in the United States (Figure 3).

Figure 3. Share of Electric Power Industry Net Generation by Energy Source, 2000 vs. 2001

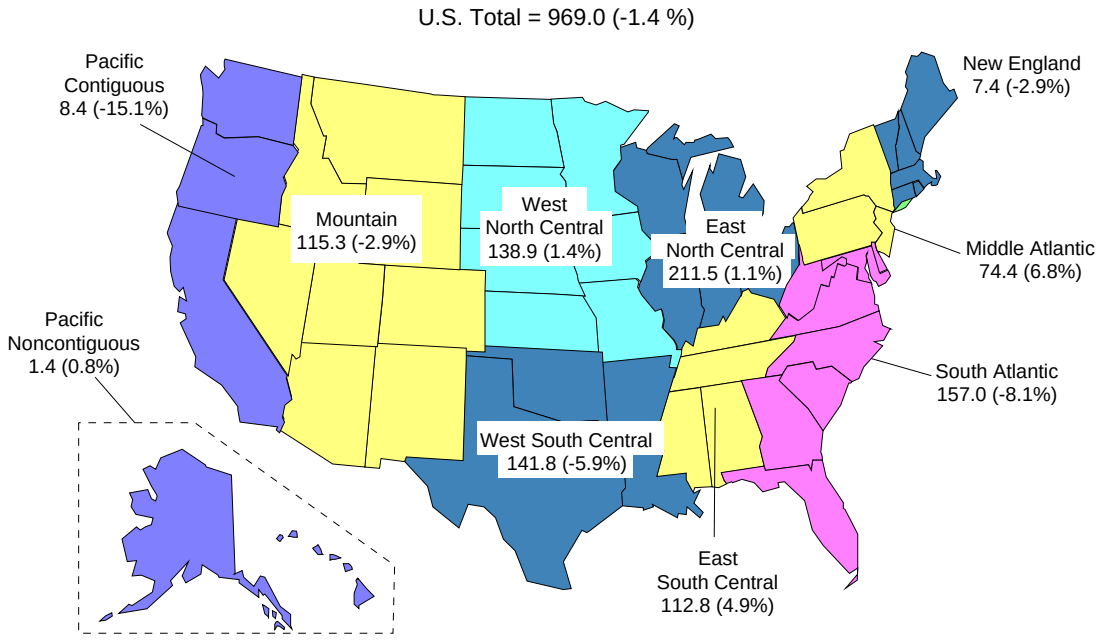


Sources: Energy Information Administration, *Electric Power Monthly, January 2002*, DOE/EIA-0226(2002/01) (Washington, DC, February 2002); Form EIA-860B, "Annual Electric Generator Report – Nonutility," EIA-900, "Monthly Nonutility Power Report."

Two factors affected the decline in coal consumption for power generation in 2001. The decrease of 13.6 million short tons for the generation of electricity was in part a result of a slowdown in the national economy in 2001. The other factor affecting the lower level of consumption was the milder than normal weather experienced over many portions of the country. With the exception of the Pacific Census Division, all other Census Divisions had experienced warmer winter weather in 2001. Two of the five Census Divisions that rely on coal for a large portion of total electricity generation, the South Atlantic and the Mountain Census Divisions, experienced milder weather during the year. The South Atlantic experienced a decrease in heating-degree days of 9 percent relative to 2000. This decrease resulted in a drop in coal consumption for power generation of 13.9 million short tons for the year. The Mountain Census Division had a decline of 4 percent in heating-degree days, contributing to a decrease of 3.4 million short tons in coal consumption. Another Census Division that is less dependent on coal-based generation, the West South Central, also experienced milder weather during 2001 with a 5-percent decline in heating-degree days. This drop contributed to a decrease of 8.8 million short tons of coal consumption for electric generation.

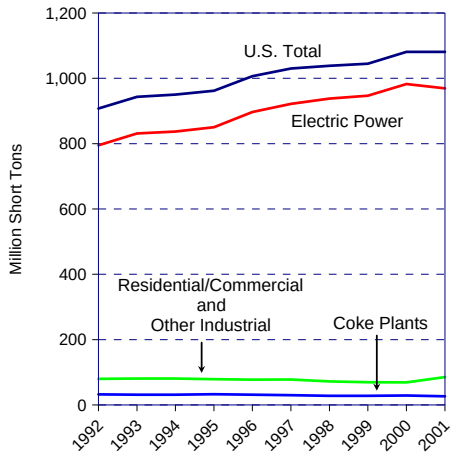
Overall coal use in the non-electric power sector increased in 2001. Coal consumption in the residential and commercial sector increased slightly, while consumption by coke plants declined and consumption at other industrial plants increased

Figure 4. Electric Power Sector Consumption of Coal by Census Division, 2001
(Million Short Tons and Percent Change from 2000)



Sources: Energy Information Administration, *Electric Power Monthly, January 2002,* DOE/EIA-0226(2002/01) (Washington, DC, February 2002); Form EIA-860B, "Annual Electric Generator Report – Nonutility," and EIA-900, "Monthly Nonutility Power Report."

Figure 5. Coal Consumption by Sector, 1992-2001



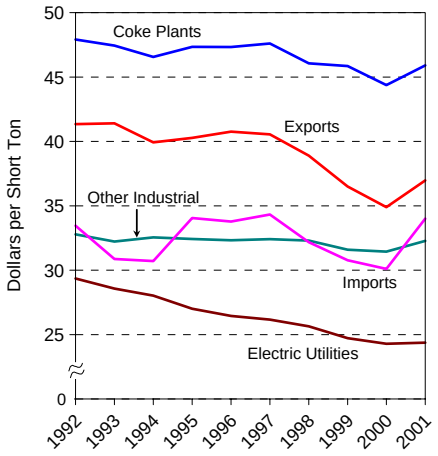
Sources: Energy Information Administration, *Quarterly Coal Report, July-September 2001*, DOE/EIA-0121(2002/3Q) (Washington, DC, March 2002); *Coal Industry Annual 2000*, DOE/EIA-0584(2000) (Washington, DC, January 2002); and *Electric Power Monthly, January 2002*, DOE/EIA-0226(2002/01) (Washington, DC, February 2002).

(Figure 5). Coal consumed at coke plants decreased in 2001 by 2.3 million short tons, a decline of 8.0 percent, as one of the coking plants in the country closed at the end of the third quarter. U.S. producers of coal coke experienced significant financial problems during 2001, with one producer filing for Chapter 11 bankruptcy and another placing its coke ovens up for sale. In 2001, other industrial coal consumption was 80.9 million short tons. The 2001 total of coal consumed by the other industrial sector includes coal used at the coal synfuel plants that began operating as a result of Section 29 of the tax code. Section 29 offers tax credits to manufacturers of a fuel that has significantly different chemical composition from the coal used to produce it. If these new plants had not been included in the 2001 totals, other industrial coal consumption would have decreased by 2 percent.

Coal Prices

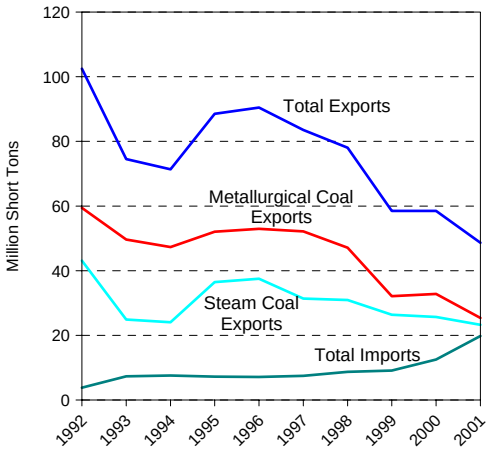
Overall, coal prices on an annual basis reversed the downward trend of the past several years. As a result of the tight coal supply market, there were increasing prices for the consuming sectors. The average price of utility coal on a delivered basis increased by 2 percent for an annual average of $24.77 per short ton (123.5 cents per million Btu). However, the average price of spot market coal, which accounts for approximately 20 percent of total deliveries for electric utilities, increased by more than 16 percent in 2001. Coking coal prices rose to $45.91 per short ton, a 4-percent increase over the 2000 price. The price of other industrial steam coal was higher by 3 percent in 2001 with an annual average price of $32.28 per short ton (Figure 6).

Figure 6. Delivered Coal Prices, 1992-2001
(Nominal Dollars)



Sources: Energy Information Administration, *Quarterly Coal Report, July-September 2001*, DOE/EIA-0121(2001/3Q) (Washington, DC, March 2002); *Coal Industry Annual 2000*, DOE/EIA-0584(2000) (Washington, DC, January 2002); *Electric Power Monthly, January 2002*, DOE/EIA-0226(2002/01) (Washington, DC, February 2002); and U.S. Department of Commerce, Bureau of the Census, "Monthly Report EM 545" and "Monthly Report IM 145."

Figure 7. U.S. Coal Exports and Imports, 1992-2001



Sources: U.S. Department of Commerce, Bureau of the Census, "Monthly Report EM 545" and "Monthly Report IM 145."

Exports and Imports

Exports. In 2001, total U.S. coal exports dropped from the 2000 level of 58.5 million short tons, ending the year at 48.7 million short tons, a level not seen since 1978 (Figure 7). The highly competitive world coal market was again dominated by Australia, the leading coal-exporting country. Two factors affected the drop in coal exports in 2001. They included: (1) the strong U.S. dollar that gave an edge to other coal-exporting countries when contract prices were negotiated, and (2) the tight supply market in the United States that resulted in increasing spot prices of coal, which influenced some producers to shift their output to the domestic market.

Metallurgical coal exports experienced the most dramatic drop, accounting for 75 percent of the total decline. Although metallurgical coal exports fell in 2001, the average price per ton increased 7 percent to $41.63, a level just slightly less than was seen in 1999. Of the major U.S. buyers of metallurgical coal, Canada and Italy were the only countries to increase their imports, while Brazil's share of metallurgical coal remained steady. France, the Netherlands, and the United Kingdom imported less U.S. metallurgical coal in 2001. Reflecting the competitiveness in the Asian market, U.S. exports of metallurgical coal to the region declined in 2001 by 82 percent. Neither Japan nor China imported any U.S. metallurgical coal in 2001, while South Korea's total was 65 percent less than in the prior year. With only three exceptions—Turkey, South Korea, and Egypt—the average price of metallurgical coal increased for every country in 2001.

The market for U.S. steam coal exports dropped somewhat in 2001. Total steam coal exports were down by 9 percent to a level of 23.3 million short tons, down from 25.7 million short tons in 2000. Canada represented the largest steam coal export market for the United States, accounting for 59 percent of all steam coal exports in 2001, even with the 8 percent drop from the 2000 level. The one bright spot for U.S. steam coal exports in 2001 was Italy, which increased its take of U.S. steam coal from less than 100 thousand short tons in 2000, to 1.4 million short tons in 2001. The free alongside ship (f.a.s.) price of steam coal rose by 8 percent in 2001 to $31.88 per short ton, a level not seen since 1997.

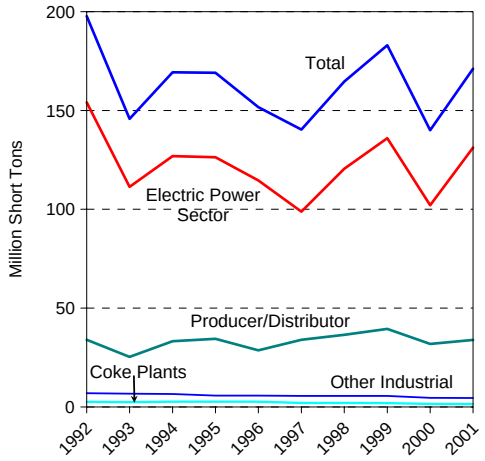
Imports. Coal imports, although an extremely small part of the total U.S. coal supply (less than 2 percent of total consumption), increased dramatically in 2001. Total coal imports were 19.8 million short tons, an increase of 58 percent. The rise in imports is attributable to both the heightened demand for low-sulfur coal to meet the stricter sulfur emission requirements of Phase II of the Clean Air Act Amendments (CAAA) of 1990 and to the tight coal supply market that existed for most of the year. Several eastern utilities turned to some nontraditional sources for imported coal, such as Poland and Russia, as the tight supply market pushed spot prices higher. Electric utilities accounted for more than 50 percent of all coal imports. The average price of U.S. coal imports for 2001 increased to $34.00, a 13-percent increase over the previous year. Colombia remained the largest supplier of U.S. coal imports with 11.2 million short tons, or 57 percent of all coal imports and only 1.3 million short tons less than total 2000 imports.

Venezuela and Canada followed with 3.3 million short tons and 2.6 million short tons, respectively.

Stocks

Coal stocks at the end of 2001 totaled 171.1 million short tons, an increase of 31.1 million short tons (Figure 8). Stocks held by coal producers and distributors rose by 2.0 million short tons, an increase of 6 percent. Industrial users, including coke plants, held a total of 6.0 million short tons, about the same level as in 2000. Coal stocks in the electric power sector increased by 29.2 million short tons in 2001, as many of the electric utilities rebuilt stockpiles that had dropped significantly in 2000.

Figure 8. Year-End Coal Stocks, 1992-2001



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Summary

In 2001, the U.S. coal industry experienced a record year of production due to a replenishment in coal stocks by the electric power sector. The negative factors that affected production are expected to change in 2002 as the economy recovers and increasing demand for reliable electricity sources push coal production levels up but at a lower growth rate than what was experienced in 2001. Factors contributing to increased coal demand and production (see Energy Information Administration's *Short-Term Energy Outlook*) include:

- Increases in U.S. coal exports
- Decreases in coal imports
- Return to economic growth
- Increases in natural gas prices
- Return to normal weather patterns

Coal prices ended the year 2001 at a higher level than had been seen in years, although they were below the levels that had been experienced earlier in the year. The question remains whether the coal industry can maintain prices throughout 2002, as effects of a coal futures market continue to grow. On the positive side for the coal industry, the threat of a strike by the United Mine Workers of America for 2002 has been removed since the membership ratified a new 5-year contract in December of 2001. Overall, the outlook for U.S. coal in 2002 is likely to be somewhat better than in 2001, with increasing economic growth and normal weather patterns pushing production to new levels.