Coal Production 1989

Energy Information Administration
Office of Coal, Nuclear, Electric and Alternate Fuels
U.S. Department of Energy
Washington, DC 20585

MASTER

DISTRIBUTION OF THIS DOCUMENT IS UNLIMITED

This report was prepared by the Energy Information Administration, the independent statistical and analytical agency within the Department of Energy. The information contained herein should not be construed as advocating or reflecting any policy position of the Department of Energy or any other organization.

Contacts

General information for this document may be obtained from Robert M. Schnapp (202/254-5392), Director of the Coal Division, Office of Coal, Nuclear, Electric and Alternate Fuels, Energy Information Administration, or from Noel C. Balthasar (202/254-5400), Chief of the Coal Data Systems Branch.

Specific information about the data in this report may be obtained from Bruce F. Quade (202/254-5461), John G. Colligan (202/254-5465), Clyde E. Boykins (202/254-5406), Jerome A. Sanderson (202/254-5463), and Joyce E. Morrison (202/254-5468). For information about the feature article, contact Eugene R. Slatick (202/254-5384) and Michelle Bowles (202/254-5378). For specific information about the demonstrated reserve base data, contact Richard Bonskowski (202/254-5383).

Preface

Coal Production 1989 provides comprehensive information about U.S. coal production, the number of mines, prices, productivity, employment, reserves, and stocks to a wide audience including Congress, Federal and State agencies, the coal industry, and the general public. The data presented in this report were collected and published by the Energy Information Administration (EIA), to fulfill its data collection and dissemination responsibilities as specified in the Federal Energy Administration Act of 1974 (Public Law 93-275), as amended.

The 1989 coal production and related data presented in this report were obtained from Form EIA-7A, "Coal Production Report," submitted by companies owning mining operations that produced, processed, or prepared 10,000 or more short tons of coal in 1989. This survey originated at the Bureau of Mines, U.S. Department of the Interior. In 1977, the responsibility for taking the survey was transferred to the EIA under the Department of Energy Organization Act (Public Law 95-91). The data cover 3,511 of the 4,357 U.S.

coal mining operations active in 1989. These mining operations accounted for over 99 percent of total U.S. coal production and represented 81 percent of all U.S. coal mining operations in 1989. This issue is the 14th annual report published by EIA and continues the series formerly included as a chapter in the *Minerals Yearbook* published by the Bureau of Mines.

This report also includes data for the demonstrated reserve base of coal in the United States on January 1, 1990. This is the 10th annual summary on minable coal, pursuant to Section 801 of Public Law 95-620, the Powerplant and Industrial Fuel Use Act of 1978.

The Office of Coal, Nuclear, Electric and Alternate Fuels gratefully acknowledges the cooperation of the respondents in supplying the information presented in this report and appreciates the valuable assistance of the State coal mining agencies, the State geological and mineral survey offices, the U.S. Geological Survey, U.S. Department of the Interior, and the Mine Safety and Health Administration, U.S. Department of Labor.

A continuous mining machine, capable of mining 8 to 15 tons of coal per minute, is being moved to a new coal face.

Contents

	Page
Feature Article: U.S. Coal Production in the 1980's: An Overview	1
Executive Summary.	11
Number of Mines and Production	15
Average Mine Prices	39
Productivity and Employment	55
Recoverable Reserves	69
Appendices	
A. Demonstrated Reserve Base	79
B. State Coal Facts	87
C. Reference Tables and Maps	123
D. Explanatory Notes	131
E. Form and Instructions	141
Glossary	147

Tables

	Page
FE1. U.S. Coal Production and Related Statistics, 1980-1989	2
FE2. Peak Year of Coal Production by State, from Earliest Records Through 1989	4
FE3. U.S. Coal Production, Disposition, and Prices, Selected Years, 1980-2000	8
1. Total U.S. Coal Production and Number of Mines by State and Type of Mining, 1989	12
2. U.S. Coal Production and Number of Mines by State and Type of Mining, 1989	17
3. U.S. Coal Production and Number of Mines by District and Type of Mining, 1989	19
4. U.S. Coal Production and Number of Mines by State and County and Type of Mining, 1989	20
5. U.S. Coal Production and Number of Mines by State, Type of Mining, and Mine Production Range, 1989	25
6. U.S. Coal Production by State and Coal Rank, 1989	27
7. U.S. Production of Bituminous Coal by State and Coal Group, 1989	28
8. U.S. Production of Subbituminous Coal by State and Coal Group, 1989	29
9. U.S. Production of Lignite Coal by State and Coal Group, 1989	29
10. Pennsylvania Anthracite Production by County and Coal Group, 1989	30
11. U.S. Coal Production by Coalbed Thickness and Type of Mining, 1989	30
12. U.S. Coal Production and Coalbed Thickness by Major Coalbeds and Type of Mining, 1989	32
13. U.S. Coal Production by Mine Production Range and Type of Mining, 1988, 1989	33
14. Number of U.S. Coal Mines by Mine Production Range and Type of Mining, 1988, 1989	33
15. U.S. Coal Production by State and Type of Mining, 1988, 1989	34
16. Number of U.S. Coal Mines by State and Type of Mining, 1988, 1989	35
17. U.S. Coal Production by District and Type of Mining, 1988, 1989	36
18. Number of U.S. Coal Mines by District and Type of Mining, 1988, 1989	37
19. U.S. Coal Production and Average Mine Price by State and Type of Mining, 1989	41
20. U.S. Coal Production and Average Mine Price by District and Type of Mining, 1989	42
21. U.S. Coal Production and Average Mine Price by State and Disposition, 1989	43
22. U.S. Coal Production and Average Mine Price by District and Disposition, 1989	44
23. U.S. Coal Production, Number of Mines and Average Mine Price by State and County, 1989	45
24. U.S. Coal Production and Average Mine Price by State and Coal Rank, 1989	50
25. Average Mine Price of U.S. Coal by State and Type of Mining, 1988, 1989	51
26. Average Mine Price of U.S. Coal by District and Type of Mining, 1988, 1989	52
27. Average Mine Price of U.S. Coal by Mine Production Range and Type of Mining, 1988, 1989	53
28. U.S. Coal Mining Productivity by State, 1989	57
29. U.S. Underground Coal Mining Productivity by State, 1989	58
30. U.S. Surface Coal Mining Productivity by State, 1989	59
31. U.S. Coal Mining Productivity by District, 1989	60
32. U.S. Underground Coal Mining Productivity by District, 1989	61
33. U.S. Surface Coal Mining Productivity by District, 1989	62
34. Average Number of Miners Working Daily at U.S. Coal Mines by State and Type of Mining, 1988, 1989	63
35. Average Number of Miners Working Daily at U.S. Coal Mines by District and Type of Mining, 1988, 1989	64
36. Average Number of Miners Working Daily at U.S. Coal Mines by Mine Production Range and Type of Mining, 1988, 1989	65
37. U.S. Coal Mining Productivity by State and Type of Mining, 1988, 1989	66
38. U.S. Coal Mining Productivity by District and Type of Mining, 1988, 1989	67
39. Recoverable Coal Reserves and Average Recovery Percentage at U.S. Mines by State and Type of Mining, 1989	71
40. Recoverable Coal Reserves and Average Recovery Percentage at U.S. Mines by District and Type of Mining, 1989	72
41. Recoverable Coal Reserves at U.S. Mines by State and Type of Mining, 1988, 1989	73
42. Recoverable Coal Reserves at U.S. Mines by District and Type of Mining, 1988, 1989	74
43. Recoverable Coal Reserves at U.S. Mines by Mine Production Range and Type of Mining, 1988, 1989	75
A1. Demonstrated Reserve Base of Coal by Rank	80
A2. Demonstrated Reserve Base of Coal by Potential Method of Mining	81
A3. Demonstrated Reserve Base of Coal by Rank, Potentially Minable by Underground Methods	82
A4. Demonstrated Reserve Base of Coal by Rank, Potentially Minable by Surface Methods	83

B1.	Coal Production Trends by State	88
B2.	Rankings for Coal Consumption, Reserves, and Production by Coal-Producing State	89
B3.	U.S. Coal Production Ranked by State, 1987-1989	90
B4.	U.S. Coal Consumption Ranked by State, 1987-1989	91
B5.	U.S. Demonstrated Reserve Base on January 1, 1990, by Mining Method and Ranked by State Total	92
B6.	Alabama Coal Facts	93
B7.	Alaska Coal Facts	94
B8.	Arizona Coal Facts	95
B9.	Arkansas Coal Facts	96
B10.	California Coal Facts	97
B11.	Colorado Coal Facts	98
B12.	Illinois Coal Facts	99
B13.	Indiana Coal Facts	100
B14.	Iowa Coal Facts	101
B15.	Kansas Coal Facts	102
B16.	Kentucky Coal Facts	103
B17.	Louisiana Coal Facts	104
B18.	Maryland Coal Facts	105
B19.	Missouri Coal Facts	106
B20.	Montana Coal Facts	107
B21.	New Mexico Coal Facts	108
B22.	North Dakota Coal Facts	109
B23.	Ohio Coal Facts	110
B24.	Oklahoma Coal Facts	111
B25.	Pennsylvania Coal Facts	112
B26.	Tennessee Coal Facts	113
B27.	Texas Coal Facts	114
B28.	Utah Coal Facts	115
B29.	Virginia Coal Facts	116
B30.	Washington Coal Facts	117
B31.	West Virginia Coal Facts	118
B32.	Wyoming Coal Facts	119
C1.	Classification of Coals by Rank	128
D1.	Sources of Data for Total U.S. Coal Production and Number of Mining Operations	133
D2.	Summary of EIA Revisions to Demonstrated Reserve Base of Coal	135

Illustrations

		Page
FE1.	Trends in Coal Production and Demand in the 1980's	6
1.	Coal Production by Region, 1989	13
2.	U.S. Coal Production and Number of Mines by Type of Mining and by Region, 1980-1989 ..	16
3.	U.S. Coal Production by State, 1989	18
4.	U.S. Coal Production by Coal Rank and Coalbed Thickness, 1980-1989	31
5.	Average Mine Price of U.S. Coal by Type of Mining and Coal Rank, 1980-1989	40
6.	U.S. Coal Mining Productivity by Type of Mining and by Region, 1980-1989	56
7.	Recoverable Coal Reserves at U.S. Mines by Type of Mining and by Region, 1980-1989 ...	70
C1.	Coal-Bearing Areas of the United States	123
C2.	Coal-Producing Districts	124

U.S. Coal Production in the 1980's: An Overview

by Eugene R. Slatick and Michelle D. Bowles

Introduction

The U.S. coal industry can lay claim to some impressive production statistics in the decade of the 1980's. The decade began with production rising above 800 million short tons for the first time in history. Annual production increased to new record levels five more times, reaching nearly 1 billion short tons at the end of the decade. Coal miners set new records for productivity every year, achieving this by working fewer mines with a work force that declined dramatically over the period. The price of coal declined during the decade, but it was generally higher than in the past, giving production an average annual value of over \$21 billion, more than twice as high as in the 1970's.

Nearly 9 billion short tons of coal--over 1 cubic mile of solid coal--were produced during the 1980's. This was one-third more than in the previous decade, and it raised the cumulative coal production for the last 100 years to about 54 billion short tons. Nevertheless, the remaining coal reserves are estimated to be abundant enough to keep the Nation self-sufficient in coal well into the next century, and beyond, at the current rate of production.

The Demand for Coal

There was one overriding reason for the dramatic rise in U.S. coal production in the 1980's: a strong growth in the domestic demand for electricity. More than 7 out of every 10 tons of coal produced during the period were used to generate electricity. This was about 1 ton more than in the 1970's and 2 tons more than in the 1960's. Over half of the electricity generated annually in the 1980's was derived from coal.

The relationship between the coal industry and the electric utility industry dates back about a century, when the first practical electrical generating station went into operation. It has grown closer as technological strides raised the power generation levels from pulverized coal-firing, the principal coal-combustion method for generating electricity. Over the years, electric utilities have consumed increasingly larger amounts of coal, and since the 1950's they have been the most important market for coal. Their reliance on coal has risen markedly since the 1970's due to rising costs of oil and natural gas, triggered by oil embargoes and a slowdown in the development of nuclear power.

U.S. coal production was spurred to record levels in the 1980's by a growing demand for electricity. This power plant in Louisiana is one of nearly 500 power plants in the United States that generate electricity from coal.

Both total electricity generation and coal-generated electricity rose almost steadily in the decade of the 1980's. Total electricity generation grew from 2,286 billion kilowatthours in 1980 to 2,781 billion kilowatthours in 1989, increasing at an average annual rate of over 2 percent and setting new records in all but 1 year. At the same time, coal-generated electricity rose from 1,162 billion kilowatthours to 1,552 billion kilowatthours, growing at a faster annual average rate of over 3 percent and reaching record levels in all but 2 years of the decade. As a result, coal's share of electricity generation increased from 51 percent in 1980 to 56 percent in 1989. This is reflected in the substantially larger amount of coal consumed by utilities: 766 million short tons in 1989 as compared with 569 million short tons in 1980. Virtually all of this coal was produced from U.S. coal mines; less than 1 percent was imported.

By the end of the decade, nine States relied on coal for over three-fourths of their generating capability. An additional 14 States depended on coal for 50 to 70 percent of their electricity generation.

Because of its strong relationship with electricity generation, the trend of coal production in the 1980's was

very closely aligned with that of utility coal consumption, except for a pronounced drop in 1983. That anomaly was the only time in the decade when annual production fell below 800 million short tons. It stemmed from the fact that coal consumption was down in 1982, largely because of an economic recession. Consequently, consumers carried large coal stockpiles into 1983, when the stocks were drawn down at the expense of mine production. A decline in the coal export market in 1983 also curtailed coal production.

The amount of coal produced for consumers other than electric utilities was comparatively small, but it helped bolster the level of production in the 1980's. Generally, about 14 percent of the coal produced was used by various manufacturing industries, ranging from coke and coal gasification plants to cement plants and paper mills. Less than 1 percent went to residential and commercial consumers. Over 10 percent of the annual coal output was for the export market, where the United States ranked as the world's leading coal exporter until 1984, when Australia gained first place. Those coal exports, valued at \$4 to \$6 billion annually, helped the Nation's balance of payments.

Table FE1. U.S. Coal Production and Related Statistics, 1980-1989

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
Production (million short tons)										
Total	830	824	838	782	896	884	890	919	950	981
Mining Method										
Underground	338	317	339	300	352	351	360	373	382	394
Surface	492	507	499	482	544	533	530	546	568	587
Region										
Appalachian	444	433	433	383	444	427	429	443	449	464
Interior	176	167	178	174	198	188	197	202	193	198
Western	209	224	227	225	254	269	265	274	308	318
Federally Administered Lands										
Total	93	138	130	124	136	184	190	195	225	236
Federal Coal Leases	69	116	101	99	116	159	167	171	199	209
Indian Coal Lease	24	22	29	25	20	25	23	24	26	27
Coal Rank										
Anthracite	6	5	5	4	4	5	4	4	4	3
Bituminous	629	608	620	569	650	614	620	637	638	660
Subbituminous	148	160	161	151	179	193	190	200	224	231
Lignite	47	51	52	58	63	72	76	78	85	86
Average Value (dollars per short ton)										
Total	24.65	26.40	27.25	25.98	25.61	25.20	23.79	23.07	22.07	21.82
Underground	33.50	35.78	35.78	34.47	33.36	32.91	30.33	29.63	28.97	28.44
Surface	18.78	20.60	21.46	20.68	20.59	20.13	19.34	18.58	17.43	17.38
Number of Mines^a										
Total	3,969	4,140	4,098	3,405	3,566	3,355	3,175	3,030	2,915	2,821
Mining Method										
Underground	1,887	2,020	1,991	1,638	1,763	1,695	1,640	1,563	1,463	1,426
Surface	2,082	2,120	2,107	1,767	1,803	1,660	1,535	1,467	1,452	1,395
Region										
Appalachian	3,498	3,641	3,592	2,971	3,141	2,962	2,809	2,672	2,563	2,484
Interior	337	365	372	311	303	278	256	255	248	235
Western	134	134	134	123	122	115	110	103	104	102
Large Mines ^b										
Total	323	299	322	294	337	343	350	363	349	359
Underground	170	156	169	154	179	186	186	188	181	190
Surface	153	143	153	140	158	157	164	175	168	169
Percentage of Production	60	57	61	65	65	67	69	71	72	73
Longwall Mining Installations	NA	NA	112	118	112	108	101	102	92	95

See footnotes at end of the table

Table FE1. U.S. Coal Production and Related Statistics, 1980-1989—Continued

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
Employment (thousands)^a										
Total	229	229	217	176	178	169	155	143	135	131
Mining Method										
Underground	151	152	141	112	112	107	98	90	85	84
Surface	78	78	76	64	66	62	56	53	51	48
Region										
Appalachian	171	172	162	126	130	122	111	102	97	96
Interior	40	39	37	35	32	32	29	28	25	23
Western	18	19	17	15	16	15	14	13	13	12
Productivity (short tons per miner hour)										
Total	1.9	2.1	2.1	2.5	2.6	2.7	3.0	3.3	3.6	3.7
Mining Method										
Underground	1.2	1.3	1.4	1.6	1.7	1.8	2.0	2.2	2.4	2.5
Surface	3.2	3.4	3.4	3.8	4.0	4.2	4.6	5.0	5.3	5.6
Region										
Appalachian	1.4	1.5	1.5	1.8	1.9	1.9	2.1	2.3	2.4	2.5
Interior	2.3	2.4	2.4	2.7	2.8	2.8	3.1	3.3	3.5	3.8
Western	5.6	6.2	6.3	7.6	8.3	8.6	9.3	10.4	11.0	11.6
Fatalities	133	153	122	70	125	68	89	63	52	62
Average Coal Quality										
Production										
Heat Content (million Btu per short ton)	22.4	22.3	22.2	22.1	22.0	21.9	21.9	21.9	21.8	21.8
Utility Coal										
Heat Content (million Btu per short ton)	21.3	21.1	21.2	21.1	21.1	21.0	21.1	21.1	20.9	20.8
Sulfur Content (percentage by weight)	1.6	1.5	1.5	1.5	1.5	1.4	1.4	1.4	1.3	1.3
Ash Content (percentage by weight)	11.1	11.1	10.7	10.4	10.4	10.0	10.0	10.0	9.9	9.9
Coal Disposition (million short tons)										
Domestic Consumption										
Total	703	733	707	737	791	818	804	837	884	889
Electric Utilities	569	597	594	625	664	694	685	718	758	766
Exports	92	113	106	78	81	93	86	80	95	101

^a Annual production over 10,000 short tons each.

^b Annual production over 500,000 short tons each.

^c At mines that produced over 10,000 short tons per year.

NA = Not Available.

Note: Total may not equal sum of components because of independent rounding.

Sources: Energy Information Administration, *Coal Production* (various issues); *Quarterly Coal Report* (various issues); *Cost and Quality of Fuels for Electric Utility Plants* (various issues); U.S. Department of the Interior, Minerals Management Service, *The 1988 Report on Receipts from Federal and Indian Leases*, and predecessor annual reports; U.S. Department of Labor, Mine Safety and Health Administration, *Injury Experience in Coal Mining* (various annual issues); annual longwall census made by *Coal* magazine, and predecessor *Coal Mining and Processing*.

Coal-Producing Regions

All three coal-producing regions--the Appalachian, Interior, and Western--contributed to the higher levels of coal production achieved in the 1980's, but to varying degrees. The Appalachian Region retained its historical role as the Nation's major source of coal, supplying about 40 percent of the coal produced during the decade. It was the principal source of bituminous coal, including coking coal, and anthracite. Production from the region averaged over 400 million short tons per year, reaching a record 464 million short tons at the end of the decade. Although most of Appalachia's coal was shipped to domestic power plants, it also supplied about 90 percent of the coal exported.

Coal production from the several basins composing the Interior Region rose from an annual average of less

than 180 million short tons in the first half of the 1980's to nearly 200 million short tons in the second half. Most of the increase reflected the growing use of lignite mined in Texas and consumed by power plants located near the mines. The demand for bituminous coal, mined chiefly in the northern part of the region, was hampered by the coal's generally high sulfur content.

Of the three coal-producing regions, the Western Region not only accounted for most of the additional coal produced in the 1980's, but it was also the fastest growing. Rising from over 200 million short tons in 1980 to over 300 million short tons in 1989, the West's share of total coal production advanced from 25 percent at the beginning of the decade to 32 percent at the end. Low-sulfur subbituminous coal accounted for most of the output from this region, which consists of scattered coal basins. Domestic electric power plants were the principal markets for Western coal, although some of it was also exported.

Coal-Producing States

During the decade of the 1980's, record amounts of coal were produced in 16 of the 27 coal-producing States. More than half of these peaks in production occurred in western States.

The Nation's top three coal-producing States were Kentucky, Wyoming, and West Virginia. Production from each of these States averaged well over 100 million short tons annually, with their combined tonnage accounting for over two-fifths of the national total. Kentucky led the Nation until Wyoming gained first place in 1988. West Virginia was third-largest throughout the decade. However, based on the energy content and value of the coal produced, both Kentucky and West Virginia ranked above Wyoming. This was because Wyoming's coal is nearly all subbituminous coal, which has a lower heat content and mine price than the bituminous coal produced in Kentucky and West Virginia. Yet, in other aspects, coal mining in Wyoming can be described with superlatives. Wyoming was the source of about half of the coal produced in the West, and it had the Nation's thickest coalbeds (averaging over 70 feet), the largest and most productive surface coal mines, and vast reserves of low-sulfur coal.

Several of the other coal-producing States were notable for different reasons. Louisiana became a coal producer in 1985, when a lignite surface mine was opened to supply a power plant constructed near the mine. Texas retained its commanding position as the Nation's leading producer of lignite by nearly doubling its annual output from 29 million short tons in 1980 to 54 million short tons in 1989, all consumed by power plants in the State.

In the anthracite region of northeastern Pennsylvania, an area that once knew a large mining industry, annual production dropped to less than 4 million short tons as the decade progressed. In Alaska, by contrast, the output from the State's only coal mine nearly doubled, totaling over 1 million short tons, with the beginning of coal exports to Korea in 1985.

Arizona remained the only State with a coal-slurry pipeline, the 273-mile-long, 18-inch-wide Black Mesa line. It carried over 4 million short tons of bituminous coal annually from a mine in northeastern Arizona to a power plant in southern Nevada. Alabama and New Mexico led the Nation in the production of coalbed methane, which supplements the supply of natural gas. In California, a single small mine produced lignite solely for its content of montan wax, the only commercial U.S. source of this industrial wax. In another novel use of coal, resin was extracted from some of the bituminous coal produced in Utah.

Table FE2. Peak Year of Coal Production by State, from Earliest Records Through 1989

State	Year	Quantity (thousand short tons)
Alabama	1989	27,992
Alaska	1988	1,745
Arizona	1988	12,398
Arkansas	1907	2,670
California	1880	237
Colorado	1981	19,897
Georgia	1903	417
Illinois	1918	89,291
Indiana	1984	37,555
Iowa	1917	8,966
Kansas	1918	7,562
Kentucky	1989	167,389
Louisiana	1989	2,983
Maryland	1907	5,533
Michigan	1907	2,036
Missouri	1984	6,733
Montana	1988	38,881
New Mexico	1989	23,702
North Carolina	1922	79
North Dakota	1988	29,731
Ohio	1970	55,351
Oklahoma	1978	6,070
Oregon	1904	112
Pennsylvania	1918	277,377
Anthracite	1917	99,612
Bituminous Coal	1918	178,551
South Dakota	1941	71
Tennessee	1972	11,260
Texas	1989	53,854
Utah	1989	20,102
Virginia	1988	45,886
Washington	1988	5,170
West Virginia	1947	176,157
Wyoming	1989	171,558
U.S. Total	1989	980,729

Note: In the 1980s, no coal was produced in Michigan, North Carolina, Oregon, or South Dakota. Georgia had no coal production after 1984.

Source: Bureau of Mines, U.S. Department of the Interior, Minerals Yearbook, and Energy Information Administration, *Coal Production*, various issues.

Federal and Indian Coal

During the 1980's, the percentage of the Nation's coal output from Federal and Indian lands was larger than in previous decades. Production from these lands rose from 93 million short tons in 1980 to 236 million short tons in 1989. Their share of total production increased from 11 to 24 percent. During the period, royalties from this production totaled about \$990 million from Federal coal leases and about \$220 million from Indian coal leases.

About 70 percent of the coal from Federal leases was produced in Wyoming. All of the other coal mined from Federal leases was confined to Western States, except for a very small amount from Alabama and Kentucky. Indian coal reserves were leased in Arizona, New Mexico, and Montana. At the end of 1989, coal

leases totaled about 236,000 acres on Federal land and 156,000 acres on Indian land.

Mines

During the decade, the number of active coal mines that annually produced over 10,000 short tons each dropped from about 4,000 in the early 1980's to fewer than 3,000 in 1989. (Another 1,000 or more smaller mines were also active, but their combined output was only about 1 percent of the total.) About half of the mines were surface operations and half underground. Nationally, surface mines produced about 60 percent of the coal. But on a regional basis the amount of surface-mined coal increased westwards, from 40 percent in the Appalachian Region, to 60 percent in the Interior Region, and 90 percent in the Western Region.

Nearly 90 percent of the active mines were in the Appalachian Region. With most of the mine closings also occurring in this region, the number of active Appalachian coal mines fell from about 3,500 to 2,500 over the decade. By comparison, the decrease in the other regions was smaller. The number of active mines dropped from 337 to 235 in the Interior Region and from 134 to 102 in the Western Region.

In about half of the coal-producing States, coal was mined by both surface and underground mines. In six western States production was only from surface mines. Utah had the distinction of having only underground coal mines.

Although the total number of mines dropped over the decade, more coal was produced than ever before because there were more large mines, defined as those producing over 500,000 short tons annually. At the beginning of the decade, large mines accounted for 8 percent of the total number of mines and held a 60-percent share of the coal produced. At the end of the decade, they accounted for 13 percent of the total number and provided over 70 percent of production. The trend to larger mines, which began in earlier decades, was made possible by greater mechanization, the use of large-capacity equipment, and, especially in the West, access to large blocks of coal to form mining units.

The biggest coal mines were surface mines, several of which produced more than 10 million short tons per year. Most of these large operations were in the sparsely populated, generally flat areas of the West, where they had the advantage of working thick coalbeds that are covered by relatively thin overburden. The largest coal mine, both in the Nation and North America, was the Black Thunder mine in Wyoming's Powder River Basin. In 1989, this mine alone produced about 30 mil-

lion short tons, an amount greater than the output of 17 smaller coal-producing States. The largest underground mines, located in the Appalachian and Interior regions, produced as much as 5 million short tons per year.

Employment

The record-breaking levels of coal production in the 1980's were achieved with a work force that became smaller as the decade progressed. It decreased by more than 40 percent during the period, from nearly 230,000 at the beginning to 131,000 at the end. For the decade, an average of 176,000 miners were employed annually in the coal industry. Only in the 1960's was the average level of employment lower, at 150,000, but those miners produced 40 percent less coal.

The record amounts of coal produced in the 1980's reflect the efforts of miners like these. Although the size of the work force dropped during the decade, productivity rose.

The decreased number of coal miners needed in the 1980's reflects not only the continuing advances made in mechanizing nearly all phases of mining but also an increase in surface mining, which requires fewer workers. Compared with 1980, about 67,000 fewer miners were employed at underground mines in 1989, a drop of over 40 percent. At surface mines the labor force decreased by about 30,000, or nearly 40 percent.

The coal mining force in the Appalachian Region, with over 70 percent of the Nation's coal miners, experienced the greatest loss of jobs during the 1980's. Coal mine employment in the region fell from more than 170,000 at the start of the decade to less than 100,000 at the end. The loss of coal-mining jobs was less severe in other regions, falling from 40,000 to 23,000 in the Interior Region and from 18,000 to 12,000 in the Western Region.

According to a survey of the coal mining workforce made by the U.S. Bureau of Mines, the average miner in 1986 was 39 years old and had 11 years of coal mining experience. He or she had been with the same company for 8 years and in the same job for half of the time. Over three-fourths of the miners had a high school or better education. More than 3,000 women were employed in production work at coal mines, a slightly larger number than those with office jobs.

Productivity

While coal mine employment dropped sharply in the 1980's, productivity made decidedly strong gains. Miners produced coal at a higher rate at both underground and surface mines in all regions. Rising each year, their average hourly productivity nearly doubled as it increased from 1.9 short tons in 1980 to a record 3.7 short tons in 1989. Productivity rose from 1.2 to 2.5 short tons at underground mines, and from 3.2 to 5.6 short tons at surface mines.

This dramatic rise in productivity can be attributed to several factors. Beginning with technology, efficiency was improved through the use of increased haulage capacity and better mining equipment. Longwall mining systems became more productive because many worked in larger panels of coal, containing as much as 1 million short tons, that enabled more coal to be produced before downtime was needed to move the equipment to a new panel. Some longwall systems were equipped with electrohydraulic roof supports, which can be moved faster by fewer miners.

The increase in productivity also reflects the successful adaptation of mining practices with the health and safety standards and reclamation laws enacted in the 1960's and 1970's. Initially, these regulations interfered with productivity, diverting some workers and equipment from production activities. Some new safety procedures had to be incorporated into mining practices, and reclamation work had to become a part of surface mining operations. The stricter safety standards led to a better safety record in the 1980's. Total coal miner fatalities in the decade numbered less than 1,000, compared with 1,500 in the 1970's.

Figure FE1. Trends in Coal Production and Demand in the 1980's

Over 70 percent of U.S. coal produced in the 1980's was used by domestic power plants, which relied on coal for half of the electricity generated annually. The pronounced drop in coal output in 1983 was the consequence of a decline in coal consumption in 1982, which resulted in a drawdown of large coal stockpiles in 1983 at the expense of production, and a decline in coal exports.

Sources: Energy Information Administration, *Coal Production*, (various issues); *Quarterly Coal Report* (various issues)

Gains in overall productivity can also be credited to the closing of small, less efficient coal mines, which shifted a larger share of production to larger, more efficient mines. The large mines in the West, which produce from thick coalbeds, contributed significantly to the greater productivity in surface mining.

Still another factor that had a favorable effect on productivity was the decrease in major strikes during the 1980's. The only major strike of the United Mine Workers of America (UMWA) occurred in 1981, closing many mines for 72 days. By contrast, in the 1970's, the UMWA walked out three times, causing a loss of over 180 workdays. Of the several local strikes in the 1980's, the dispute between the UMWA and the Pittston Coal Group in 1989 attracted the most attention.

Major Coal Companies

Of the numerous companies that produced coal in the 1980's, the top three were the Peabody Holding Company, Consolidation Coal Company, and Amax Coal Company. Their combined share of production averaged nearly one-fifth of the total. In the late 1980's, Peabody produced over 80 million short tons annually from mines in 10 States. Consolidation Coal, operating in 8 States, averaged over 50 million short tons per year. Amax averaged about 37 million short tons annually from mines in 6 States.

Coalbeds

Coal was mined from more than 300 coalbeds in the 1980's. The greatest number of coalbeds mined was in the Appalachian Region, with over 60 mined in West Virginia alone. However, about one-third of U.S. coal production was from only four coalbeds: the Wyodak, Pittsburgh, No. 6, and No. 9. It is estimated that these four coalbeds contain approximately one-fourth of the U.S. demonstrated coal reserve base of 473 billion short tons.

The Wyodak is a bed of low-sulfur subbituminous coal located in the Powder River Basin of northeastern Wyoming. Averaging 70 feet in thickness, it is the thickest coalbed mined in the United States, and in places yields about 100,000 short tons of coal per acre. Because of the increased mining in the Powder River Basin, the

The Nation's thickest coalbeds are in Wyoming's Powder River Basin. The Wyodak coalbed shown here is over 70 feet thick, has a low sulfur content, and is economical to mine.

amount of coal extracted from the Wyodak more than tripled during the decade, from 40 million short tons in 1980 to 143 million short tons in 1989.

The Pittsburgh is a bed of bituminous coal averaging 5 to 6 feet in thickness and underlying the northern part of the Appalachian Region. Its sulfur content generally is over 1 percent, by weight. Contrasting with the relatively recent mining of the Wyodak, the Pittsburgh was one of the first coalbeds mined in the United States. Because its coal helped fuel early industrial development, the Pittsburgh coalbed has been acclaimed as the most important coalbed in the Nation. An average of 55 million short tons were produced annually from this bed during the decade.

Both the No. 6 and No. 9 coalbeds, which average about 6 feet in thickness, are in the Illinois Basin, in the northern part of the Interior Region. The coal in both beds is bituminous in rank and has a relatively high sulfur content, generally over 3 percent by weight. Some 40 to 50 million short tons of coal were mined annually from these beds.

Coal Rank

All ranks of coal, except anthracite, were produced in larger quantities during the 1980's. Bituminous coal production, centered in the Appalachian Region, continued to predominate with an average of over 600 million short tons mined annually. However, its share of the total output decreased from three-fourths in 1980 to two-thirds by 1989. This was due mostly to substantial increases in production of subbituminous coal and, to a lesser extent, lignite. The steadily rising output of these low-rank coals stems from the large-scale development that began in the 1970's, when their low surface-mining costs and low sulfur content made them economically and environmentally attractive fuels for power plants.

Subbituminous coal was produced only in the Western Region, chiefly in Wyoming. During the decade, the output of this coal rose almost steadily, from 148 million short tons in 1980 to 231 million short tons in 1989. Although lignite was also produced in the Western Region, its greatest development was in the Interior Region, specifically in Texas. Total lignite production during the period nearly doubled, from 47 million short tons to 86 million short tons. In striking contrast, anthracite production continued to wane, dropping from 6 million short tons in 1980 to 3 million short tons in 1989. The contrasting production trends for lignite and anthracite are underscored by the facts that in 1970, lignite production was only 8 million short tons, and that before 1950, anthracite production was over 40 million short tons annually.

Heat Content

Although coal production rose in the 1980's, the average heat content of the output declined because of a faster increase in output of low-rank coals, which have a lower heat content. Consequently, the average heat content of total production decreased from 22.4 million Btu per short ton in 1980 to 21.8 million Btu per short ton in 1989. Most of the impact of this was at power plants, where the heat content of the coal consumed dropped from 21.3 million Btu per short ton in 1980 to 20.8 million Btu per short ton in 1989. By comparison, the heat content of coal for other consumers and the coal exported remained relatively stable. Although the average heat content of coal declined, the total energy content of the coal produced rose markedly over the decade, from 18.6 quadrillion Btu in 1980 to 21.3 quadrillion Btu in 1989, because of the increased tonnage.

Coal Quality

Unquestionably, coal output in the 1980's played a vital role in the Nation's economy. But coal is an imperfect fuel, with environmental drawbacks due to its natural composition. Of foremost concern is the sulfur present in coal and the emissions of sulfur dioxide formed when coal is burned. This gas and the nitrogen oxides also produced during combustion are converted to sulfur and nitric acids, which can lead to the formation of acid rain. Other pollutants are particulates, derived from incombustible material in coal and composed mostly of silica and alumina. Sulfur dioxide emissions from power plants are controlled by flue gas scrubbers. Emissions of nitrogen oxides are usually controlled by reducing the amount of air during combustion and by lowering combustion temperatures. Particulates are generally removed by electrostatic precipitators. In the 1980's, research and development was underway to improve the performance of these techniques and to produce innovative nonpolluting technology for generating electricity from high-sulfur coal.

The quality of coal delivered to power plants provides a measure of the quality of coal consumed over the decade. In general, it has improved. The sulfur content, by weight, declined from 1.6 percent in 1980 to 1.3 percent in 1989. The ash content dropped from 11.1 percent to 9.9 percent.

That air quality controls have been effective is shown by studies made by the Environmental Protection Agency. Data for 1980-1988, the most recent available, show that emissions of sulfur oxides from coal-fired power plants dropped by 8 percent even though 33 percent more coal was consumed. The decrease was

largely attributable to a greater number of power plants equipped with scrubbers and meeting new air quality standards, and a reduction in the average sulfur content of the coal consumed.

Price

The average mine price per short ton of coal declined during the 1980's, falling from a peak of \$27 in 1982 to about \$22 in 1989. The trend was influenced by competition within the industry, economic conditions, and the heat content of the coal produced. Taking into account the change in heat content and eliminating the effects of inflation, the real minemouth price of coal fell by about one-third during the 1980's.

The price of underground-mined coal ranged from a high of \$36 per short ton in 1981 and 1982 to a low of \$28 per short ton in 1989. A ton of surface-mined coal, by contrast, was priced at \$21 in 1982 and \$17 in 1989.

Appalachian coal was the highest priced and Western coal the lowest. The difference reflects the facts that Appalachian production was mostly from underground mines, which are more costly to operate, that the bituminous coal produced has a higher heat content, and that the coal markets are nearby.

Western coal was lower priced not only because much of it was produced by large-scale, economically efficient surface mines, but also because it has a lower heat content and requires long-distance transportation to consumers.

Table FE3. U.S. Coal Production, Disposition, and Prices, Selected Years, 1980-2000

	1980	1989	1995*	2000*
	(million short tons)			
Production	830	981	1,078	1,175
Consumption				
Electric Utilities	569	766	851	920
Other	133	124	128	127
Total	703	889	979	1,047
Exports	92	101	102	131
	(1989 dollars per short ton)			
Average Mine Price	36	22	24	26

* Projected.

Note: Total may not equal sum of components because of independent rounding.

Sources: Energy Information Administration, *Coal Production 1980*, DOE/EIA-0119(80); *Coal Production 1989*, DOE/EIA-0118(89); *Quarterly Coal Report October-December 1989*, DOE/EIA-0121(89/4Q); *Annual Outlook for U.S. Coal 1990*, DOE/EIA-0333(90).

The Next Decade and Beyond

The decade of the 1990's will see annual coal production rise above 1 billion short tons. As in the 1980's, most of the coal will be used to generate electricity.

Research and development will go forward into the 1990's, investigating all parts of the "coal chain," from mine to consumer. Computer-assisted mining systems under development have the potential of advancing mining technology through automation, robotics, and networking programs that can monitor a variety of mining activities, resulting in improved health, safety, productivity, reliability, and economy. Progress in coal

preparation, mined-land reclamation, as well as in understanding the human factors involved in coal mining, will help shape the future of the coal industry.

Clean coal technology, a term that entered the energy vocabulary in the 1980's, also holds an important role in creating a bright future for coal. This technology offers a new generation of high-efficiency, clean-burning coal processes. Many of them are more efficient and less costly than conventional processes.

All these efforts are responding to past problems with some of the most sophisticated technology available today. They are aimed at balancing the competing goals of attaining both energy sufficiency and environmental quality from coal.

Mining technology is advancing through the use of computers. This computer is monitoring methane and coal dust in a mine to detect conditions that could be dangerous to health and safety.

References

- Coal* (and predecessor *Coal Mining and Processing*). Maclean Hunter Publishing Co. (Chicago, IL.)
- Energy Information Administration. *Annual Energy Review 1989*. DOE/EIA-0384(89). (Washington, DC, May 1990.)
- Energy Information Administration. *Annual Outlook for U.S. Coal 1990*. DOE/EIA-0333(90). (Washington, DC, May 1990.)
- Energy Information Administration. *Coal Distribution* DOE/EIA-0125(89/4Q) and prior issues. (Washington, DC, January-December 1989.)
- Energy Information Administration. *Coal Production 1989*. DOE/EIA-0018(89) and prior issues. (Washington, DC.)
- Energy Information Administration. *Cost and Quality of Fuels for Electric Utility Plants 1989*. DOE/EIA-0191(89) and prior issues. (Washington, DC.)
- Energy Information Administration. *Electric Power Annual 1988* DOE/EIA-0348(88) and prior issues. (Washington, DC.)
- Energy Information Administration. *Inventory of Power Plants in the United States 1989*. DOE/EIA-0095(89) and prior issues. (Washington, DC.)
- Energy Information Administration. *Monthly Energy Review*. DOE/EIA-0035. (Washington, DC.)
- Energy Information Administration. *Quarterly Coal Report October-December 1989*. DOE/EIA-0121(89/4Q) and prior issues. (Washington, DC.)
- Keystone Coal Industry Manual*. Maclean Hunter Publishing Co. (Chicago, IL.)
- Keystone News Bulletin* (Monthly). Maclean Hunter Publishing Co. (Chicago, IL.)
- Quarterly Review of Methane from Coal Seams Technology*. Gas Research Institute. (Golden, CO.)
- U.S. Department of Energy, Assistant Secretary for Fossil Energy. *Clean Coal Technology. The New Coal Era*. DOE/FE-0193-P (Washington, DC, November 1989, revised June 1990.)
- U.S. Department of Energy, Assistant Secretary for Fossil Energy. *Clean Coal Technology Demonstration Program. Annual Report to Congress*. DOE/FE-0195P. (Washington, DC, March 1990.)
- U.S. Department of the Interior, Bureau of Mines, *Information Circular 9192*, "Characterization of the 1986 Coal Mining Workforce." (Minneapolis, MN.)
- U.S. Department of the Interior, Bureau of Mines, *Minerals Yearbook*. (Washington, DC.)
- U.S. Department of the Interior, Bureau of Mines, *Research 88*. (Washington, DC.)
- U.S. Department of the Interior, Bureau of Mines, *Research 89-90*. (Washington, DC.)
- U.S. Department of the Interior, Minerals Management Service, Royalty Management Program. *Mineral Revenues: The 1989 Report on Receipts from Federal and Indian Leases* (and prior issues). (Washington, DC.)
- U.S. Department of Labor, Mine Safety and Health Administration. *Injury Experience in Coal Mining* (Annual). (Denver, CO.)
- U.S. Environmental Protection Agency. *National Air Pollutant Emission Estimates 1940-1988*. EPA-450/4-90-001 (March 1990). (Research Triangle Park, NC.)

Executive Summary

Total Coal Production

Coal production in the United States during 1989 reached a record level of nearly 981 million short tons (Table 1), an increase of about 30 million short tons over 1988. This was the third consecutive year that total production has risen by this amount (30 million), and the pattern continued the increased production trend since 1985. Current projections call for continued increases over the next few years.

The principal reason for the increased production was to meet the demand from the coal-fired power plants which generated an all-time record amount of electricity in 1989. Also in 1988, electric utilities had sizeable stock withdrawals, partly to generate more coal-fired electricity to replace hydroelectric power generation during the drought of 1988. Another reason for increased production was the higher demand for exports of both steam and metallurgical coal to European markets. In response to this higher demand and to offset the decreases in European production, U.S. coal exports increased. One important reason for the increased reliance on U.S. coal, was that one of the other historical suppliers (Australia), experienced labor problems and the amount of their exports to Europe decreased in 1989. Also, the demand for coal in Europe was strong due to new electric plants coming on line and the low rate of exchange of the dollar, which helped make U.S. exports relatively cheaper.

There were 27 States mining coal during the year. Seven States reached record levels of production in 1989: Alabama, Kentucky, Louisiana, New Mexico, Texas, Utah, and Wyoming. The top three State coal producers were Wyoming (172 million short tons), Kentucky (167 million) and West Virginia (154 million). A majority (61 percent) of the Nation's coal was produced in mines East of the Mississippi, but as the larger Western mines continue to produce greater

amounts of low sulfur subbituminous coal, this majority has and will decrease.

The number of coal mines fell to 3,620, continuing the trend of the last 10 years. During this time smaller mines have been closed due to falling prices and competition from larger and more efficient mines.

Survey Highlights

Tables 2 through 43 in this report include data from mining operations that produced, prepared and processed 10,000 or more short tons during the year. These mines yielded 978 million short tons, or 99.7 percent of the coal production in 1989, and are the concern of the data and analysis below.

- Wyoming led the Nation with 172 million short tons of coal production. This was the second consecutive year that Wyoming was the Nation's top producer. However, Kentucky had the greatest gross increase in tons for the year (about 10 million tons).
- The number of active mines dropped 3 percent from 1988, to 2,821. The greatest decline in mines was in the Appalachian Region, which had 79 fewer mines.
- The average number of miners working daily fell 3 percent this year, to 131,497 workers.
- Productivity reached 3.70 short tons per hour, an all-time record.
- Bituminous coal accounted for over two-thirds of total production, subbituminous coal accounted for about a quarter, lignite, 9 percent, and Pennsylvania anthracite less than 1 percent.
- The average mine price of coal fell for the seventh consecutive year, to \$21.82 per short ton.

Table 1. Total U.S. Coal Production¹ and Number of Mines by State and Type of Mining, 1989
(Thousand Short Tons)

Coal-Producing State	Type of Mining				Total	
	Underground		Surface		Number of Mines	Production
	Number of Mines	Production	Number of Mines	Production		
Alabama	15	16,327	90	11,665	105	27,992
Alaska	-	-	1	1,582	1	1,582
Arizona	-	-	2	11,935	2	11,935
Arkansas	-	-	7	70	7	70
California	-	-	1	41	1	41
Colorado	16	8,511	7	8,612	23	17,123
Illinois	30	39,337	18	19,930	48	59,267
Indiana	6	2,519	54	31,122	60	33,641
Iowa	1	36	4	394	5	430
Kansas	-	-	5	856	5	856
Kentucky Total	670	99,067	429	68,322	1,099	167,389
Kentucky, Eastern	644	75,746	358	49,993	1,002	125,739
Kentucky, Western	26	23,321	71	18,328	97	41,649
Louisiana	-	-	2	2,983	2	2,983
Maryland	2	1,842	29	1,533	31	3,376
Missouri	-	-	9	3,378	9	3,378
Montana	-	-	9	37,742	9	37,742
New Mexico	1	45	7	23,657	8	23,702
North Dakota	-	-	13	29,566	13	29,566
Ohio	14	10,824	170	22,865	184	33,689
Oklahoma	1	40	20	1,713	21	1,753
Pennsylvania Total	156	39,607	525	30,989	681	70,596
Anthracite	84	513	107	2,835	191	3,348
Bituminous	72	39,095	418	28,154	490	67,248
Tennessee	68	4,688	30	1,792	98	6,480
Texas	-	-	15	53,854	15	53,854
Utah	21	20,102	-	-	21	20,102
Virginia	271	36,044	94	6,962	365	43,006
Washington	-	-	4	5,039	4	5,039
West Virginia	461	113,202	312	40,378	773	153,580
Wyoming	4	1,645	26	169,913	30	171,558
Appalachian Total²	1,631	298,279	1,608	166,178	3,239	464,457
Interior Total²	64	65,253	205	132,627	269	197,880
Western Total²	42	30,304	70	288,088	112	318,391
East of the Miss. River	1,693	363,456	1,751	235,559	3,444	599,015
West of the Miss. River	44	30,379	132	351,334	176	381,714
U.S. Total	1,737	393,835	1,883	586,893	3,620	980,729

¹ Excludes silt, culm, refuse bank, slurry dam, and dredge production except for Pennsylvania anthracite.

² For a definition of coal-producing regions, see Appendix C.

Note: Total may not equal sum of components because of independent rounding.

Source: Energy Information Administration, Form EIA-7A, "Coal Production Report."

Production

Out of 981 million short tons of coal produced in the U.S. in 1989, nearly 978 million short tons of it came from mines that produced a minimum of 10,000 short tons (Table 2). Of that 978 million short tons, 585 million short tons came from surface mining operations, and 393 million short tons came from underground mines. Virtually all the underground production was concentrated East of the Mississippi, where over 90 percent of the total underground production occurred. While there was a substantial amount of surface production in the East (40 percent of total surface production), a small number (47) of surface mines in Wyoming, Texas and Montana accounted for 45 percent of the national surface production. Increased demand for low

sulfur, subbituminous coal produced in the West will result in the continuation of the phenomenon of the last few years, i.e., more tonnage from fewer mines and more emphasis on the larger surface mines. Production in 1990 is expected to top 1 billion short tons.

Increasing use of longwall techniques in underground mines contributed to productivity increase. Twenty-five to 30 percent of the total underground production utilized longwall techniques. The primary mining method was still the use of continuous mining machines which accounted for over half of the underground production.

Wyoming led the Nation in production in 1989. Production in Wyoming rose 5 percent to almost 172 million short tons, 170 million of which came from surface

mines. Wyoming's Campbell County, the Nation's top producing county, mined about 144 million short tons. The second-largest producing State, Kentucky, mined about 166 million short tons, followed by West Virginia with a little over 153 million.

Figure 1. Coal Production by Region, 1989
(Million Short Tons)

Source: Energy Information Administration, Form EIA-7A, "Coal Production Report."

Number of Mines

The number of active coal mines in the United States fell 3 percent, to 2,821 mines (1,426 underground and 1,395 surface mines). Most of these mines are located in the Appalachian Region, which has almost 90 percent of all mines nationally. These mines accounted for almost half of U.S. production. Conversely, a relatively small number (64) of surface mines in the Western Region account for nearly 30 percent of total production. The Appalachian Region lost 79 mines, for a total of 2,484. The number of surface mines in the Interior and Western Regions fell, but the number of underground operations rose.

Mines

In 1989, there were 209 mines that produced one million or more short tons. Although these mines represented only 7 percent of the total active mines, they accounted for almost two-thirds of the total national production. As in recent years, Thunder Basin Coal Company's Black Thunder surface mine in Wyoming produced the most coal of any single mine, close to 30 million short tons. Consolidation Coal Company's Bailey No. 1 mine in Pennsylvania continued as the Nation's top producing underground mine with 6 million tons.

Coal Rank

More than two-thirds (657 million short tons) of the coal mined in the United States in 1989 was bituminous coal. Most bituminous coal is produced in the Appalachian Region; Kentucky led in state bituminous coal production with more than 166 million short tons. Subbituminous coal accounted for 24 percent of production, about 231 million short tons. Wyoming produced the most subbituminous coal in 1989, more than 169 million short tons. Texas was the leading producer of lignite, mining close to 54 million short tons out of a national yield of 86 million short tons. Pennsylvania anthracite production declined 7 percent in 1989 to under 3 million short tons, less than 1 percent of national coal production.

Major Coalbeds

A major coalbed is one from which at least 10 million short tons of coal are produced in a year. The 19 major coalbeds in 1989 yielded more than 578 million short tons, about 59 percent of national production. The three leading coalbeds, as in 1988, were the Wyodak in Wyoming (over 143 million short tons), the Pittsburgh in the northern Appalachian Region (60 million short tons), and the No. 6 in Illinois (50 million short tons), for a combined total of over 253 million short tons.

Average Mine Price

The average mine price is determined by taking the ratio of the f.o.b. value of coal produced at the mine to the total production tonnage. The average mine price of U.S. coal fell for the seventh straight year, to

\$21.82 per short ton. This was the first time since the late seventies that an average ton of coal sold for less than \$22.00. Factors contributing to the falling price were the growing demand for low cost, low sulfur, subbituminous coal and lignite, improved mining technology, and increased productivity. Subbituminous coal and lignite are cheaper to produce, and are abundant West of the Mississippi, where electric utility coal demand has been on the rise. Subbituminous coal and lignite made up about one-third of the output in 1989, and cost \$10.16 and \$9.91 per short ton, respectively, as compared to \$27.40 per short ton for bituminous coal. The price of surface-mined coal fell 5 cents in 1989, to \$17.38 per short ton, while the price of underground coal dropped 53 cents, to \$28.44 per short ton.

Productivity

Productivity is measured by the amount of coal produced by a miner in an hour. At 3.7 tons per miner per hour, productivity in 1989 set a record for the third year in a row, an increase of over 4 percent. The primary reason for this was the surge in Western surface mining, where conditions favor the more efficient mechanized techniques. Productivity in Western surface mining climbed to nearly 15 short tons an hour. In the East increased use of techniques such as longwall mining and continuous mining contributed to the improved efficiency in underground production.

Employment

The average number of miners working daily fell 3 percent in 1989, to about 131,000. Recent trends had declines of about 5 percent in the number of miners annually. The greatest losses were in the Interior Region, with over 2,200 mining jobs lost. Among Interior surface miners, the change has been the most dramatic: from 13,000 surface miners in 1988 to just over 10,000 in 1989, a 21 percent drop. In the top producing States, the number of jobs rose 6 percent in Wyoming, remained about the same in Kentucky, and rose 2 percent in West Virginia.

Reserves

The two principal types of coal reserves are the Demonstrated Reserve Base (DRB) and recoverable reserves. DRB is an estimate of all potentially minable coal regardless of the legal, technical or economic restrictions. (DRB is more fully explained in Appendix A.) Recoverable reserves are the amount of coal that can be produced at an active site. About 15.3 billion short tons are recoverable by current methods of surface mining, and 7.4 billion short tons are recoverable by existing underground methods. Recoverable reserves fell about 4 percent in 1989. Wyoming has the greatest amount in recoverable reserves, about 6.3 billion short tons, followed by West Virginia with 2.3 billion short tons, and Kentucky and Montana, with about 1.5 billion short tons each.

Number of Mines and Production

Hydraulic excavators can selectively excavate, mine, and handle coal at surface mines.

Figure 2. U.S. Coal Production and Number of Mines by Type of Mining and by Region, 1980-1989

Source: Energy Information Administration, Form EIA-7A, "Coal Production Report."

Table 2. U.S. Coal Production¹ and Number of Mines by State and Type of Mining, 1989
(Thousand Short Tons)

Coal-Producing State	Type of Mining				Total	
	Underground		Surface		Number of Mines	Production
	Number of Mines	Production	Number of Mines	Production		
Alabama	12	16,307	68	11,581	80	27,888
Alaska	-	-	1	1,582	1	1,582
Arizona	-	-	2	11,935	2	11,935
Arkansas	-	-	1	39	1	39
California	-	-	1	41	1	41
Colorado	14	8,502	7	8,612	21	17,115
Illinois	29	39,328	16	19,917	45	59,246
Indiana	6	2,519	52	31,112	58	33,631
Iowa	1	36	2	391	3	427
Kansas	-	-	4	854	4	854
Kentucky Total	545	98,591	319	67,881	864	166,472
Kentucky, Eastern	519	75,270	261	49,625	780	124,895
Kentucky, Western	26	23,321	58	18,256	84	41,577
Louisiana	-	-	2	2,983	2	2,983
Maryland	1	1,834	22	1,509	23	3,343
Missouri	-	-	8	3,377	8	3,377
Montana	-	-	8	37,742	8	37,742
New Mexico	1	45	6	23,657	7	23,702
North Dakota	-	-	11	29,555	11	29,555
Ohio	14	10,824	134	22,701	148	33,525
Oklahoma	1	40	15	1,686	16	1,728
Pennsylvania Total	77	39,326	342	30,216	419	69,542
Anthracite	10	259	57	2,630	67	2,889
Bituminous	67	39,067	285	27,585	352	66,653
Tennessee	48	4,597	20	1,770	68	6,367
Texas	-	-	14	53,849	14	53,849
Utah	20	20,099	-	-	20	20,099
Virginia	243	35,919	64	6,847	307	42,766
Washington	-	-	3	5,039	3	5,039
West Virginia	411	113,006	248	40,137	659	153,143
Wyoming	3	1,645	25	169,913	28	171,558
Appalachian Total²	1,325	297,082	1,159	184,387	2,484	461,469
Interior Total²	63	65,244	172	132,466	235	197,710
Western Total²	38	30,292	64	288,076	102	318,368
East of the Miss. River	1,386	362,251	1,285	233,672	2,671	595,922
West of the Miss. River	40	30,367	110	351,257	150	381,625
U.S. Total	1,426	392,618	1,395	584,929	2,821	977,547

¹ Excludes silt, culm, refuse bank, slurry dam, and dredge production except for Pennsylvania anthracite. Excludes mines producing less than 10,000 short tons of coal during the year.

² For a definition of coal-producing regions, see Appendix C.

Note: Total may not equal sum of components because of independent rounding.

Source: Energy Information Administration, Form EIA-7A, "Coal Production Report."

Figure 3. U.S. Coal Production by State, 1989

Note: Production for Arkansas and California was less than 0.1 million short tons.
Source: Energy Information Administration, Form EIA-7A, "Coal Production Report."

Table 3. U.S. Coal Production¹ and Number of Mines by District and Type of Mining, 1989
(Thousand Short Tons)

Coal-Producing District	Type of Mining				Total	
	Underground		Surface		Number of Mines	Production
	Number of Mines	Production	Number of Mines	Production		
District 1	46	21,612	242	24,127	288	45,739
District 2	27	23,576	72	6,223	99	29,799
District 3	79	34,859	108	7,633	187	42,492
District 4	14	10,824	134	22,701	148	33,525
District 6	4	7,921	5	368	9	8,289
District 7	95	14,938	12	524	107	15,462
District 8	1,020	166,042	455	87,880	1,475	253,923
District 9	26	23,321	58	18,256	84	41,577
District 10	29	39,328	16	19,917	45	59,246
District 11	6	2,519	52	31,112	58	33,631
District 12	1	36	2	391	3	427
District 13	30	17,051	74	12,299	104	29,351
District 14	-	-	5	342	5	342
District 15	1	40	39	62,448	40	62,488
District 16	-	-	1	27	1	27
District 17	15	8,547	7	9,040	22	17,588
District 18	-	-	8	35,178	8	35,178
District 19	3	1,645	25	169,913	28	171,558
District 20	20	20,099	-	-	20	20,099
District 21	-	-	11	29,555	11	29,555
District 22	-	-	8	37,742	8	37,742
District 23	-	-	4	6,621	4	6,621
District 24 ²	10	259	57	2,630	67	2,889
District 1-23² Total	1,416	392,359	1,338	582,298	2,754	974,658
U.S. Total	1,426	392,618	1,395	584,929	2,821	977,547

¹ Excludes silt, culm, refuse bank, slurry dam, and dredge production except for Pennsylvania anthracite. Excludes mines producing less than 10,000 short tons of coal during the year.

² District 24 is the anthracite-producing district in Pennsylvania. Districts 1-23 represent the total U.S. production of bituminous, subbituminous coal, and lignite. See Appendix C.

Note: Total may not equal sum of components because of independent rounding.

Source: Energy Information Administration, Form EIA-7A, "Coal Production Report."

Table 4. U.S. Coal Production¹ and Number of Mines by State and County and Type of Mining, 1989
(Thousand Short Tons)

Coal-Producing State and County	Type of Mining				Total	
	Underground		Surface		Number of Mines	Production
	Number of Mines	Production	Number of Mines	Production		
Alabama	12	16,307	68	11,581	80	27,888
Blount	-	-	5	202	5	202
Cullman	-	-	1	453	1	453
Fayette	1	2,022	1	14	2	2,036
Jackson	-	-	1	28	1	28
Jefferson	5	4,500	9	2,272	14	6,771
Marion	1	20	6	292	7	311
Tuscaloosa	3	6,907	17	3,014	20	9,921
Walker	2	2,857	23	4,721	25	7,578
Winston	-	-	5	587	5	587
Alaska	-	-	1	1,582	1	1,582
Yukon River	-	-	1	1,582	1	1,582
Arizona	-	-	2	11,935	2	11,935
Navajo	-	-	2	11,935	2	11,935
Arkansas	-	-	1	39	1	39
Sebastian	-	-	1	39	1	39
California	-	-	1	41	1	41
Amador	-	-	1	41	1	41
Colorado	14	8,502	7	8,612	21	17,115
Delta	1	517	-	-	1	517
Fremont	2	499	-	-	2	499
Garfield	1	125	-	-	1	125
Gunnison	2	860	-	-	2	860
Jackson	-	-	1	27	1	27
La Plata	1	160	-	-	1	160
Las Animas	2	855	-	-	2	855
Mesa	1	134	-	-	1	134
Moffat	1	2,201	2	6,496	3	8,696
Montrose	-	-	1	47	1	47
Pitkin	1	935	-	-	1	935
Rio Blanco	1	1,365	-	-	1	1,365
Routt	1	851	3	2,043	4	2,895
Illinois	29	39,328	16	19,917	45	59,246
Christian	1	1,876	-	-	1	1,876
Clinton	1	2,762	-	-	1	2,762
Coles	1	12	-	-	1	12
Douglas	1	1,051	-	-	1	1,051
Edgar	-	-	1	233	1	233
Franklin	4	7,540	-	-	4	7,540
Fulton	-	-	1	504	1	504
Gallatin	2	1,702	1	531	3	2,233
Jackson	-	-	1	2,160	1	2,160
Jefferson	2	3,573	-	-	2	3,573
Logan	1	1,329	-	-	1	1,329
Macoupin	2	2,809	-	-	2	2,809
McDonough	-	-	1	516	1	516
Perry	1	204	6	11,114	7	11,318
Randolph	3	4,725	1	1,404	4	6,129
Saline	4	4,877	3	2,895	7	7,772
Sangamon	1	173	-	-	1	173
Schuyler	-	-	1	560	1	560
St Clair	2	1,295	-	-	2	1,295
Wabash	1	1,787	-	-	1	1,787
Washington	1	1,862	-	-	1	1,862
White	1	1,751	-	-	1	1,751
Indiana	6	2,519	52	31,112	58	33,631
Clay	-	-	8	2,112	8	2,112
Daviess	-	-	11	4,671	11	4,671
Dubois	-	-	2	581	2	581
Gibson	1	1,215	2	1,237	3	2,452
Greene	2	591	5	2,021	7	2,612
Knox	1	366	1	255	2	622
Pike	1	72	6	5,209	7	5,282
Spencer	-	-	3	535	3	535
Sullivan	1	275	2	2,653	3	2,927
Vermillion	-	-	1	1,447	1	1,447
Vigo	-	-	4	1,415	4	1,415
Warrick	-	-	7	8,976	7	8,976

See Footnotes at end of table.

**Table 4. U.S. Coal Production¹ and Number of Mines by State and County
and Type of Mining, 1989 (Continued)**
(Thousand Short Tons)

Coal-Producing State and County	Type of Mining				Total	
	Underground		Surface		Number of Mines	Production
	Number of Mines	Production	Number of Mines	Production		
Iowa	1	36	2	391	3	427
Lucas	1	36	-	-	1	36
Marion	-	-	2	391	2	391
Kansas	-	-	4	854	4	854
Crawford	-	-	3	624	3	624
Linn	-	-	1	230	1	230
Kentucky	545	98,591	319	67,881	864	166,472
Bell	22	2,488	15	2,256	37	4,744
Boyd	-	-	1	603	1	603
Breathitt	-	-	10	6,199	10	6,199
Butler	-	-	5	937	5	937
Caldwell	-	-	1	48	1	48
Carter	-	-	2	109	2	109
Christian	-	-	2	540	2	540
Clay	1	261	5	441	6	702
Daviess	-	-	7	1,529	7	1,529
Elliott	-	-	2	37	2	37
Floyd	63	5,627	14	4,140	77	9,767
Greenup	-	-	1	90	1	90
Hartan	97	12,650	20	1,513	117	14,162
Henderson	2	1,647	2	1,356	4	3,003
Hopkins	6	3,398	18	6,909	24	10,306
Jackson	-	-	3	265	3	265
Johnson	10	1,772	2	76	12	1,848
Knott	33	4,893	22	3,739	55	8,633
Knox	23	483	9	567	32	1,050
Laurel	-	-	3	47	3	47
Lawrence	1	15	4	164	5	179
Lee	-	-	5	167	5	167
Leslie	15	6,654	5	1,663	20	8,317
Letcher	34	6,386	26	3,715	60	10,100
Magoffin	5	375	12	1,884	17	2,259
Martin	20	7,854	10	4,917	30	12,772
McLean	-	-	3	468	3	468
Muhlenberg	5	3,847	8	2,675	13	6,522
Ohio	1	114	9	1,539	10	1,653
Owsley	-	-	6	175	6	175
Perry	14	2,565	22	8,608	36	11,173
Pike	167	22,442	45	6,762	212	29,204
Pulaski	-	-	2	313	2	313
Union	5	6,396	1	118	6	6,513
Webster	7	7,919	2	2,138	9	10,057
Whitley	14	806	13	1,142	27	1,948
Wolfe	-	-	2	33	2	33
Louisiana	-	-	2	2,983	2	2,983
De Soto	-	-	1	2,880	1	2,880
Red River	-	-	1	103	1	103
Maryland	1	1,834	22	1,509	23	3,343
Allegany	-	-	13	836	13	836
Garrett	1	1,834	9	673	10	2,506
Missouri	-	-	8	3,377	8	3,377
Barton	-	-	1	527	1	527
Bates	-	-	1	186	1	186
Putnam	-	-	1	41	1	41
Ralls	-	-	1	76	1	76
Randolph	-	-	2	2,399	2	2,399
Vernon	-	-	2	148	2	148
Montana	-	-	8	37,742	8	37,742
Big Horn	-	-	4	20,044	4	20,044
Musselshell	-	-	1	16	1	16
Richland	-	-	1	288	1	288
Rosebud	-	-	2	17,395	2	17,395
New Mexico	1	45	6	23,657	7	23,702
Colfax	1	45	1	455	2	500
McKinley	-	-	2	8,183	2	8,183
San Juan	-	-	3	15,019	3	15,019

See Footnotes at end of table.

Table 4. U.S. Coal Production¹ and Number of Mines by State and County and Type of Mining, 1989 (Continued)
(Thousand Short Tons)

Coal-Producing State and County	Type of Mining				Total	
	Underground		Surface		Number of Mines	Production
	Number of Mines	Production	Number of Mines	Production		
North Dakota	-	-	11	29,555	11	29,555
Bowman	-	-	1	2,015	1	2,015
McLean	-	-	1	6,725	1	6,725
Mercer	-	-	5	14,757	5	14,757
Oliver	-	-	3	5,862	3	5,862
Stark	-	-	1	195	1	195
Ohio	14	10,824	134	22,701	148	33,525
Athens	-	-	1	151	1	151
Belmont	2	2,098	12	2,614	14	4,712
Carroll	-	-	7	874	7	874
Columbiana	4	529	14	778	18	1,307
Coshocton	-	-	8	2,118	8	2,118
Gallia	-	-	1	23	1	23
Guernsey	-	-	3	138	3	138
Harrison	1	516	8	2,216	9	2,732
Hocking	-	-	6	238	6	238
Holmes	-	-	5	593	5	593
Jackson	1	48	7	1,232	8	1,280
Jefferson	-	-	14	1,818	14	1,818
Lawrence	-	-	2	642	2	642
Mahoning	-	-	1	193	1	193
Meigs	2	3,942	-	-	2	3,942
Monroe	1	1,981	-	-	1	1,981
Muskingum	1	33	9	1,189	10	1,222
Noble	-	-	5	3,361	5	3,361
Perry	1	1,161	3	408	4	1,568
Stark	-	-	3	164	3	164
Tuscarawas	-	-	18	2,230	18	2,230
Vinton	1	517	6	1,675	7	2,192
Washington	-	-	1	47	1	47
Oklahoma	1	40	15	1,688	16	1,728
Craig	-	-	6	662	6	662
Haskell	-	-	2	207	2	207
Latimer	-	-	1	243	1	243
Le Flore	-	-	2	96	2	96
Muskogee	-	-	2	138	2	138
Okmulgee	1	40	-	-	1	40
Rogers	-	-	2	343	2	343
Pennsylvania	77	39,326	342	30,216	419	69,542
Allegheny	3	822	3	331	6	1,152
Armstrong	11	3,621	28	1,516	39	5,137
Beaver	-	-	2	377	2	377
Bedford	-	-	1	24	1	24
Blair	-	-	1	143	1	143
Butler	4	959	14	1,052	18	2,011
Cambria	4	2,153	13	2,401	17	4,554
Carbon	-	-	1	57	1	57
Centre	1	687	6	386	7	1,073
Clarion	-	-	12	2,729	12	2,729
Clearfield	1	79	57	5,761	58	5,840
Clinton	-	-	3	202	3	202
Columbia	-	-	2	64	2	64
Dauphin	-	-	1	17	1	17
Elk	-	-	7	335	7	335
Fayette	-	-	16	573	16	573
Fulton	-	-	1	93	1	93
Greene	14	15,311	6	321	20	15,632
Indiana	16	7,860	20	1,390	36	9,250
Jefferson	3	673	29	2,107	32	2,780
Lawrence	-	-	8	1,080	8	1,080
Luzerne	-	-	15	613	15	613
Lycoming	-	-	1	254	1	254
Mercer	-	-	3	359	3	359
Northumberland	2	23	3	71	5	94
Schuylkill	8	236	34	1,769	42	2,005
Somerset	7	1,641	33	4,203	40	5,844
Sullivan	-	-	1	39	1	39
Tioga	-	-	1	139	1	139

See Footnotes at end of table.

Table 4. U.S. Coal Production¹ and Number of Mines by State and County and Type of Mining, 1989 (Continued)
(Thousand Short Tons)

Coal-Producing State and County	Type of Mining				Total	
	Underground		Surface		Number of Mines	Production
	Number of Mines	Production	Number of Mines	Production		
Pennsylvania (Continued)						
Venango	-	-	3	545	3	545
Washington	3	5,262	12	780	15	6,042
Westmoreland	-	-	5	484	5	484
Tennessee	48	4,597	20	1,770	68	6,367
Anderson	8	1,244	1	41	9	1,285
Bledsoe	1	22	1	124	2	147
Campbell	11	695	8	750	19	1,445
Claiborne	6	1,486	2	114	8	1,600
Fentress	-	-	2	135	2	135
Grundy	-	-	1	55	1	55
Marion	2	79	-	-	2	79
Morgan	2	186	-	-	2	186
Rhea	1	49	-	-	1	49
Scott	3	241	1	12	4	253
Sequatchie	14	594	4	539	18	1,133
Texas	-	-	14	53,849	14	53,849
Atascosa	-	-	1	2,984	1	2,984
Bastrop	-	-	1	221	1	221
Freestone	-	-	1	5,670	1	5,670
Grimes	-	-	1	3,482	1	3,482
Harrison	-	-	2	3,064	2	3,064
Hopkins	-	-	1	2,035	1	2,035
Leon	-	-	1	8,065	1	8,065
Milam	-	-	1	5,829	1	5,829
Panola	-	-	1	8,554	1	8,554
Rusk	-	-	1	3,928	1	3,928
Titus	-	-	1	9,729	1	9,729
Webb	-	-	2	287	2	287
Utah	20	20,099	-	-	20	20,099
Carbon	13	8,477	-	-	13	8,477
Emery	6	8,563	-	-	6	8,563
Sevier	1	3,059	-	-	1	3,059
Virginia	243	35,919	64	6,847	307	42,766
Buchanan	122	18,018	14	987	136	19,005
Dickenson	42	4,943	11	876	53	5,819
Lee	13	2,215	5	263	18	2,479
Russell	5	705	2	67	7	772
Scott	1	41	-	-	1	41
Tazewell	23	2,723	-	-	23	2,723
Wise	37	7,273	32	4,655	69	11,928
Washington	-	-	3	5,039	3	5,039
King	-	-	1	141	1	141
Lewis	-	-	1	1,812	1	1,812
Thurston	-	-	1	3,086	1	3,086
West Virginia	411	113,006	248	40,137	659	153,143
Barbour	7	1,585	9	687	16	2,272
Boone	52	17,219	16	5,726	68	22,945
Braxton	8	2,705	1	163	9	2,868
Brooke	1	1,181	3	126	4	1,307
Clay	4	709	2	129	6	837
Fayette	8	987	12	881	20	1,868
Gilmer	1	46	-	-	1	46
Grant	4	4,088	3	694	7	4,782
Greenbrier	8	548	6	346	14	895
Harrison	6	2,401	15	531	21	2,933
Kanawha	13	3,144	12	3,015	25	6,160
Lewis	3	130	4	326	7	456
Logan	64	7,577	17	5,907	81	13,484
Marion	4	5,220	8	240	12	5,460
Marshall	3	6,740	-	-	3	6,740
Mason	-	-	1	196	1	196
McDowell	64	6,317	6	449	70	6,766
Mineral	1	200	2	246	3	446
Mingo	37	10,381	27	7,364	64	17,745
Monongalia	14	15,917	18	1,245	32	17,162
Nicholas	26	3,120	28	5,579	54	8,698
Ohio	-	-	2	242	2	242

See Footnotes at end of table

Table 4. U.S. Coal Production¹ and Number of Mines by State and County and Type of Mining, 1989 (Continued)
(Thousand Short Tons)

Coal-Producing State and County	Type of Mining				Total	
	Underground		Surface		Number of Mines	Production
	Number of Mines	Production	Number of Mines	Production		
West Virginia (Continued)						
Preston	16	2,601	28	1,899	44	4,500
Raleigh	20	7,730	2	61	22	7,791
Randolph	9	1,582	3	256	12	1,838
Taylor	-	-	1	64	1	64
Tucker	-	-	2	315	2	315
Upshur	2	1,551	5	216	7	1,766
Wayne	-	-	3	809	3	809
Webster	8	1,082	8	1,593	16	2,675
Wyoming	28	8,245	4	832	32	9,077
Wyoming	3	1,645	25	169,913	28	171,558
Campbell	-	-	14	143,865	14	143,865
Carbon	1	1,561	3	3,233	4	4,794
Converse	-	-	2	6,100	2	6,100
Hot Springs	-	-	1	52	1	52
Lincoln	-	-	2	4,776	2	4,776
Sheridan	-	-	1	111	1	111
Sweetwater	2	85	2	11,776	4	11,860
U.S. Total	1,426	392,618	1,395	584,929	2,821	977,547

¹ Excludes silt, culm, refuse bank, slurry dam, and dredge production except for Pennsylvania anthracite. Excludes mines producing less than 10,000 short tons of coal during the year.

Note: Total may not equal sum of components because of independent rounding.

Source: Energy Information Administration, Form EIA-7A, "Coal Production Report."

**Table 5. U.S. Coal Production¹ and Number of Mines by State,
Type of Mining, and Mine Production Range, 1989**
(Thousand Short Tons)

Coal-Producing State and Type of Mining	Mine Production Range									
	500,000 tons and over		200,000 to 499,999 tons		100,000 to 199,999 tons		50,000 to 99,999 tons		10,000 to 49,999 tons	
	Number of Mines	Production	Number of Mines	Production	Number of Mines	Production	Number of Mines	Production	Number of Mines	Production
Alabama	15	20,997	10	3,796	9	1,152	14	1,082	32	861
Underground	9	16,199	-	-	-	-	1	76	2	31
Surface	6	4,797	10	3,796	9	1,152	13	1,006	30	830
Alaska	1	1,582	-	-	-	-	-	-	-	-
Surface	1	1,582	-	-	-	-	-	-	-	-
Arizona	2	11,935	-	-	-	-	-	-	-	-
Surface	2	11,935	-	-	-	-	-	-	-	-
Arkansas	-	-	-	-	-	-	-	-	1	39
Surface	-	-	-	-	-	-	-	-	1	39
California	-	-	-	-	-	-	-	-	1	41
Surface	-	-	-	-	-	-	-	-	1	41
Colorado	10	15,158	4	1,337	4	523	-	-	3	98
Underground	7	7,186	2	769	4	523	-	-	1	24
Surface	3	7,971	2	567	-	-	-	-	2	73
Illinois	38	58,172	3	854	1	173	-	-	3	46
Underground	23	38,487	2	622	1	173	-	-	3	46
Surface	15	19,685	1	233	-	-	-	-	-	-
Indiana	22	26,138	14	5,189	11	1,690	6	456	5	158
Underground	2	1,749	2	641	-	-	2	129	-	-
Surface	20	24,389	12	4,548	11	1,690	4	327	5	158
Iowa	-	-	1	312	-	-	1	79	1	36
Underground	-	-	-	-	-	-	-	-	1	36
Surface	-	-	1	312	-	-	1	79	-	-
Kansas	-	-	2	517	2	336	-	-	-	-
Surface	-	-	2	517	2	336	-	-	-	-
Kentucky Total	78	84,185	137	40,473	155	21,400	163	11,842	331	8,571
Underground	45	47,939	78	21,814	110	15,030	118	8,533	194	5,275
Surface	33	36,246	59	18,660	45	6,369	45	3,310	137	3,296
Kentucky, Eastern	55	52,166	116	33,581	142	19,743	156	11,330	311	8,075
Underground	32	27,518	71	19,459	108	14,772	115	8,282	193	5,239
Surface	23	24,648	45	14,122	34	4,971	41	3,048	118	2,836
Kentucky, Western	23	32,019	21	6,892	13	1,656	7	512	20	496
Underground	13	20,421	7	2,355	2	258	3	251	1	37
Surface	10	11,598	14	4,538	11	1,398	4	262	19	460
Louisiana	1	2,880	-	-	1	103	-	-	-	-
Surface	1	2,880	-	-	1	103	-	-	-	-
Maryland	1	1,834	1	315	4	496	5	392	12	306
Underground	1	1,834	-	-	-	-	-	-	-	-
Surface	-	-	1	315	4	496	5	392	12	306
Missouri	2	2,891	-	-	2	322	1	76	3	87
Surface	2	2,891	-	-	2	322	1	76	3	87
Montana	6	37,438	1	288	-	-	-	-	1	16
Surface	6	37,438	1	288	-	-	-	-	1	16
New Mexico	5	23,202	1	455	-	-	-	-	1	45
Underground	-	-	-	-	-	-	-	-	1	45
Surface	5	23,202	1	455	-	-	-	-	-	-
North Dakota	7	28,746	1	489	1	195	2	124	-	-
Surface	7	28,746	1	489	1	195	2	124	-	-
Ohio	17	19,192	23	7,343	25	3,528	27	1,942	56	1,519
Underground	7	9,802	2	613	2	308	-	-	3	100
Surface	10	9,390	21	6,730	23	3,220	27	1,942	53	1,418
Oklahoma	-	-	3	876	2	277	6	416	5	160
Underground	-	-	-	-	-	-	-	-	1	40
Surface	-	-	3	876	2	277	6	416	4	120
Pennsylvania Total	30	37,245	46	14,142	48	6,561	80	6,152	215	5,441
Underground	23	31,620	15	5,235	8	1,108	10	846	21	518
Surface	7	5,625	31	8,908	40	5,453	70	5,306	194	4,923
Pennsylvania Anthracite	-	-	2	502	5	636	8	625	52	1,127
Underground	-	-	-	-	-	-	1	93	9	166
Surface	-	-	2	502	5	636	7	532	43	961
Pennsylvania Bituminous	30	37,245	44	13,640	43	5,925	72	5,528	163	4,314
Underground	23	31,620	15	5,235	8	1,108	9	753	12	352
Surface	7	5,625	29	8,406	35	4,818	63	4,775	151	3,962

See Footnotes at end of table.

**Table 5. U.S. Coal Production¹ and Number of Mines by State,
Type of Mining, and Mine Production Range, 1989 (Continued)**
(Thousand Short Tons)

Coal-Producing State and Type of Mining	Mine Production Range									
	500,000 tons and over		200,000 to 499,999 tons		100,000 to 99,999 tons		50,000 to 99,999 tons		10,000 to 49,999 tons	
	Number of Mines	Production	Number of Mines	Production	Number of Mines	Production	Number of Mines	Production	Number of Mines	Production
Tennessee	1	848	5	1,478	16	2,245	14	912	32	884
Underground	1	848	3	866	12	1,676	9	586	23	621
Surface	-	-	2	612	4	569	5	326	9	263
Texas	10	53,075	3	715	-	-	1	60	-	-
Surface	10	53,075	3	715	-	-	1	60	-	-
Utah	9	17,203	7	2,578	1	192	1	96	2	30
Underground	9	17,203	7	2,578	1	192	1	96	2	30
Virginia	10	12,496	48	13,159	57	7,824	91	6,462	101	2,826
Underground	9	11,982	35	9,916	47	6,444	77	5,497	75	2,080
Surface	1	513	13	3,243	10	1,380	14	965	26	746
Washington	2	4,898	-	-	1	141	-	-	-	-
Surface	2	4,898	-	-	1	141	-	-	-	-
West Virginia	72	88,425	100	30,286	129	18,996	131	9,609	227	6,127
Underground	53	69,016	71	21,643	90	12,948	80	6,060	117	3,339
Surface	19	19,409	29	8,643	39	5,749	51	3,549	110	2,788
Wyoming	20	170,720	1	362	2	255	2	117	3	104
Underground	1	1,561	-	-	-	-	1	65	1	19
Surface	19	169,159	1	362	2	255	1	52	2	85
Appalachian Total²	201	233,202	349	104,101	430	60,246	518	37,883	986	26,038
Underground	135	168,819	197	57,732	267	37,255	292	21,348	434	11,928
Surface	66	64,383	152	46,369	163	22,991	226	16,535	552	14,110
Interior Total²	96	175,175	47	15,356	32	4,557	22	1,599	38	1,023
Underground	38	60,657	11	3,617	3	432	5	379	6	158
Surface	58	114,518	36	11,738	29	4,125	17	1,220	32	865
Western Total²	62	310,882	15	5,508	9	1,306	5	338	11	333
Underground	17	25,950	9	3,347	5	715	2	162	5	118
Surface	45	284,932	6	2,161	4	591	3	177	6	215
East of the Miss. River	284	349,531	387	117,037	455	63,765	531	38,851	1,014	26,739
Underground	173	229,476	208	61,349	270	37,686	297	21,727	438	12,011
Surface	111	120,055	179	55,687	185	26,078	234	17,124	576	14,728
West of the Miss. River	75	369,728	24	7,928	16	2,344	14	969	21	655
Underground	17	25,950	9	3,347	5	715	2	162	7	194
Surface	58	343,778	15	4,581	11	1,629	12	808	14	461
U.S. Total	359	719,259	411	124,965	471	66,108	545	39,820	1,035	27,394
Underground	190	255,426	217	64,696	275	38,401	299	21,889	445	12,205
Surface	169	463,833	194	60,268	196	27,707	246	17,931	590	15,189

¹ Excludes silt, culm, refuse bank, slurry dam, and dredge production except for Pennsylvania anthracite. Excludes mines producing less than 10,000 short tons of coal during the year.

² For a definition of coal-producing regions, see Appendix C.

Note: Total may not equal sum of components because of independent rounding.

Source: Energy Information Administration, Form EIA-7A, "Coal Production Report."

Table 6. U.S. Coal Production¹ by State and Coal Rank, 1989
(Thousand Short Tons)

Coal-Producing State	Coal Rank								Total	
	Bituminous		Subbituminous		Lignite		Anthracite		Number of Mines	Production
	Number of Mines	Production	Number of Mines	Production	Number of Mines	Production	Number of Mines	Production		
Alabama	80	27,888	-	-	-	-	-	-	80	27,888
Alaska	-	-	1	1,582	-	-	-	-	1	1,582
Arizona	2	11,935	-	-	-	-	-	-	2	11,935
Arkansas	1	39	-	-	-	-	-	-	1	39
California	-	-	-	-	1	41	-	-	1	41
Colorado	18	10,592	3	6,522	-	-	-	-	21	17,115
Illinois	45	59,246	-	-	-	-	-	-	45	59,246
Indiana	58	33,631	-	-	-	-	-	-	58	33,631
Iowa	3	427	-	-	-	-	-	-	3	427
Kansas	4	854	-	-	-	-	-	-	4	854
Kentucky Total	864	166,472	-	-	-	-	-	-	864	166,472
Kentucky, Eastern	780	124,895	-	-	-	-	-	-	780	124,895
Kentucky, Western	84	41,577	-	-	-	-	-	-	84	41,577
Louisiana	-	-	-	-	2	2,983	-	-	2	2,983
Maryland	23	3,343	-	-	-	-	-	-	23	3,343
Missouri	8	3,377	-	-	-	-	-	-	8	3,377
Montana	-	-	7	37,454	1	288	-	-	8	37,742
New Mexico	5	12,486	2	11,216	-	-	-	-	7	23,702
North Dakota	-	-	-	-	11	29,555	-	-	11	29,555
Ohio	148	33,525	-	-	-	-	-	-	148	33,525
Oklahoma	16	1,728	-	-	-	-	-	-	16	1,728
Pennsylvania	352	66,653	-	-	-	-	67	2,889	419	69,542
Tennessee	68	6,367	-	-	-	-	-	-	68	6,367
Texas	2	287	-	-	12	53,562	-	-	14	53,849
Utah	20	20,099	-	-	-	-	-	-	20	20,099
Virginia	307	42,766	-	-	-	-	-	-	307	42,766
Washington	1	141	2	4,898	-	-	-	-	3	5,039
West Virginia	659	153,143	-	-	-	-	-	-	659	153,143
Wyoming	5	2,060	23	169,498	-	-	-	-	28	171,558
Appalachian Total²	2,417	458,580	-	-	-	-	67	2,889	2,484	461,469
Interior Total²	221	141,165	-	-	14	56,545	-	-	235	197,710
Western Total²	51	57,313	38	231,171	13	29,884	-	-	102	318,368
East of the Miss. River	2,604	593,033	-	-	-	-	67	2,889	2,671	595,922
West of the Miss. River	85	64,025	38	231,171	27	86,429	-	-	150	381,625
U.S. Total	2,689	657,059	38	231,171	27	86,429	67	2,889	2,821	977,547

¹ Excludes silt, culm, refuse bank, slurry dam, and dredge production except for Pennsylvania anthracite. Excludes mines producing less than 10,000 short tons of coal during the year.

² For a definition of coal-producing regions, see Appendix C.

Note: Total may not equal sum of components because of independent rounding.

Source: Energy Information Administration, Form EIA-7A, "Coal Production Report."

Table 7. U.S. Production¹ of Bituminous Coal by State and Coal Group,² 1989
(Thousand Short Tons)

Coal-Producing State	Coal Group							Total Bituminous Production	
	Low Volatile Production	Medium Volatile Production	High Volatile Production				Bituminous Volatile Content/ Group Unknown Production		
			Subgroup A	Subgroup B	Subgroup C	High Volatile Subgroup Unknown			High Vola- tile Total
Alabama	-	12,182	12,705	100	41	2,860	15,706	-	27,888
Arizona	-	-	-	11,935	-	-	11,935	-	11,935
Arkansas	39	-	-	-	-	-	-	-	39
Colorado	-	935	1,062	429	7,649	517	9,657	-	10,592
Illinois	-	-	14,716	17,552	13,217	13,760	59,246	-	59,246
Indiana	-	-	2,225	7,144	17,682	6,580	33,631	-	33,631
Iowa	-	-	-	-	427	-	427	-	427
Kansas	-	-	-	277	60	517	854	-	854
Kentucky Total	-	-	90,193	32,296	17,320	26,663	166,472	-	166,472
Kentucky, Eastern	-	-	79,289	12,705	12,620	20,281	124,895	-	124,895
Kentucky, Western	-	-	10,904	19,591	4,700	6,382	41,577	-	41,577
Maryland	3,137	-	(*)	101	-	105	206	-	3,343
Missouri	-	-	527	2,488	136	227	3,377	-	3,377
New Mexico	-	-	500	-	11,986	-	12,486	-	12,486
Ohio	-	-	14,147	9,278	3,801	6,299	33,525	-	33,525
Oklahoma	-	303	834	282	309	-	1,426	-	1,728
Pennsylvania	7,667	18,226	36,787	3,488	-	484	40,759	-	66,653
Tennessee	-	-	6,357	-	-	10	6,367	-	6,367
Texas	-	-	-	-	-	287	287	-	287
Utah	-	-	-	15,681	4,418	-	20,099	-	20,099
Virginia	-	15,992	26,361	373	-	41	26,774	-	42,766
Washington	-	-	141	-	-	-	141	-	141
West Virginia	19,244	6,894	125,483	196	38	1,287	127,004	-	153,143
Wyoming	-	-	-	-	2,060	-	2,060	-	2,060
Appalachian Total ³	30,048	53,294	301,129	26,241	16,500	31,366	375,237	-	458,580
Interior Total ³	39	303	29,207	47,333	36,531	27,753	140,823	-	141,165
Western Total ³	-	935	1,703	28,045	26,114	517	56,379	-	57,313
East of the Miss. River	30,048	53,294	328,975	70,527	52,100	58,088	509,690	-	593,033
West of the Miss. River	39	1,237	3,064	31,091	27,045	1,548	62,749	-	64,025
U.S. Total	30,088	54,532	332,039	101,618	79,145	59,636	572,439	-	657,059

¹ Excludes silt, culm, refuse bank, slurry dam, and dredge production except for Pennsylvania anthracite. Excludes mines producing less than 10,000 short tons of coal during the year.

² Refer to the Classification of Coals by Rank table in Appendix C for Coal Group definitions.

³ For a definition of coal-producing regions, see Appendix C.

(*) Less than 500 short tons.

Note: Total may not equal sum of components because of independent rounding.

Source: Energy Information Administration, Form EIA-7A, "Coal Production Report."

Table 8. U.S. Production¹ of Subbituminous Coal by State and Coal Group,² 1989
(Thousand Short Tons)

Coal-Producing State	Coal Group				Total Subbituminous Production
	Subbituminous A Production	Subbituminous B Production	Subbituminous C Production	Subbituminous Group Unknown Production	
Alaska	-	-	1,582	-	1,582
Colorado	6,522	-	-	-	6,522
Montana	16	29,720	7,718	-	37,454
New Mexico	11,216	-	-	-	11,216
Washington	-	-	4,898	-	4,898
Wyoming	8,605	13,393	147,500	-	169,498
U.S. Total	26,359	43,113	161,698	-	231,171

¹ Excludes silt, culm, refuse bank, slurry dam, and dredge production except for Pennsylvania anthracite. Excludes mines producing less than 10,000 short tons of coal during the year.

² Refer to the Classification of Coals by Rank table in Appendix C for Coal Group definitions.

Note: Total may not equal sum of components because of independent rounding.

Source: Energy Information Administration, Form EIA-7A, "Coal Production Report."

Table 9. U.S. Production¹ of Lignite Coal by State and Coal Group,² 1989
(Thousand Short Tons)

Coal-Producing State	Coal Group			Total Lignite Production
	Lignite A Production	Lignite B Production	Lignite Group Unknown Production	
California	41	-	-	41
Louisiana	2,983	-	-	2,983
Montana	288	-	-	288
North Dakota	29,555	-	-	29,555
Texas	47,096	6,466	-	53,562
U.S. Total	79,962	6,466	-	86,429

¹ Excludes silt, culm, refuse bank, slurry dam, and dredge production except for Pennsylvania anthracite. Excludes mines producing less than 10,000 short tons of coal during the year.

² Refer to the Classification of Coals by Rank table in Appendix C for Coal Group definitions.

Note: Total may not equal sum of components because of independent rounding.

Source: Energy Information Administration, Form EIA-7A, "Coal Production Report."

Table 10. Pennsylvania Anthracite Production¹ by County and Coal Group², 1989
(Thousand Short Tons)

County	Coal Group				Total Anthracite Production
	Meta-anthracite Production	Anthracite Production	Semianthracite Production	Anthracite Group Unknown Production	
Carbon	-	57	-	-	57
Columbia	-	64	-	-	64
Dauphin	-	17	-	-	17
Lackawanna	-	-	-	-	0
Luzerne	-	613	-	-	613
Northumberland	-	47	47	-	94
Schuylkill	-	2,005	-	-	2,005
Sullivan	-	-	39	-	39
Total	-	2,803	86	-	2,889

¹ Includes silt, culm, refuse bank, slurry dam, and dredge production. Excludes mines producing less than 10,000 short tons of coal during the year.

² Refer to the Classification of Coals by Rank table in Appendix C for Coal Group definitions.

Note: Total may not equal sum of components because of independent rounding.

Source: Energy Information Administration, Form EIA-7A, "Coal Production Report."

Table 11. U.S. Coal Production¹ by Coalbed Thickness and Type of Mining, 1989
(Thousand Short Tons)

Coalbed Thickness (Inches)	Type of Mining		Total Production
	Underground Production	Surface Production	
7-12	-	3,210	3,210
13-18	-	7,407	7,407
19-24	1,274	23,214	24,488
25-30	9,507	28,136	37,643
31-36	20,341	32,100	52,441
37-42	39,070	28,073	67,144
43-48	48,697	31,162	79,858
49-54	49,286	16,646	65,932
55-60	44,414	26,783	71,197
61-66	30,125	13,129	43,254
67-72	42,296	27,353	69,649
73-78	26,282	7,183	33,464
79-84	23,487	18,836	42,324
85-90	11,571	4,599	16,171
91-96	11,506	7,120	18,626
97-102	6,096	4,729	10,825
103-108	3,778	7,854	11,632
109-114	3,374	1,377	4,751
115-120	11,167	4,508	15,675
> 120	10,348	291,508	301,856
U.S. Total	392,618	584,929	977,547

¹ Excludes silt, culm, refuse bank, slurry dam, and dredge production except for Pennsylvania anthracite. Excludes mines producing less than 10,000 short tons of coal during the year.

Note: Total may not equal sum of components because of independent rounding.

Source: Energy Information Administration, Form EIA-7A, "Coal Production Report."

Figure 4. U.S. Coal Production by Coal Rank and Coalbed Thickness, 1980-1989

Note: Scale has been enlarged to show detail in the coalbed plot.

Source: Energy Information Administration, Form EIA-7A, "Coal Production Report."

Table 12. U.S. Coal Production¹ and Coalbed Thickness by Major Coalbeds² and Type of Mining, 1989

Coalbed ID Number ³ Coalbed Name ⁴	Production (Thousand Short Tons)			Thickness (Inches)		
	Underground	Surface	Total	Average ⁵	Low	High
Major Coalbeds Total	260,116	318,227	578,343	273.10	7	1,386
1699 Wyodak	-	143,305	143,305	861.25	336	1,386
0036 Pittsburgh	53,350	6,666	60,016	70.24	24	172
0484 No. 6	34,897	15,448	50,145	77.74	24	107
0489 No. 9	28,723	15,929	44,652	59.77	11	100
0084 Lower Kittanning	9,490	17,845	27,335	54.42	7	148
1569 Beulah-Zap	-	26,105	26,105	171.70	62	210
0111 Hazard No. 5-A	9,556	15,854	25,410	66.62	18	197
0071 Upper Freeport	15,917	8,129	24,046	57.50	12	102
0135 Hazard No. 4	18,568	2,766	21,334	45.07	23	100
0168 Lower Elkhorn	19,915	1,334	21,250	55.03	16	120
1808 Rosebud	-	20,557	20,557	288.38	273	360
0157 Elkhorn No. 1	14,012	3,700	17,711	57.34	15	112
0151 Elkhorn No. 3	14,055	2,723	16,778	47.61	16	108
0344 Pocahontas No. 3	15,595	35	15,631	54.58	28	66
0103 Stockton-Lewiston	7,159	8,435	15,593	66.57	16	120
0483 No. VI	-	13,394	13,394	61.55	24	84
0121 Winifrede	6,878	5,358	12,236	70.65	28	149
0280 Blue Creek	10,633	873	11,506	70.47	12	96
0080 Middle Kittanning	1,568	9,771	11,339	38.13	12	84
Other Coalbeds	132,502	266,702	399,204	117.74	7	1,560
U.S. Total	392,618	584,929	977,547	209.66	7	1,560

¹ Excludes silt, culm, refuse bank, slurry dam, and dredge production except for Pennsylvania anthracite. Excludes mines producing less than 10,000 short tons of coal during the year.

² A major coalbed is defined here as a coalbed from which 10 million or more short tons were produced during the year. The category "Other Coalbeds" includes all coalbeds from which less than 10 million short tons were produced during the year. In some regions coalbeds are characteristically discontinuous or uncorrelatable from one location to another, and production is identified by the geologic formations, coal groups, or coal zones of the native rock where the coalbeds occur. These types of coalbeds are found primarily in the Rocky Mountain States and in the Gulf Coast lignite belt. Coalbeds of these types are included in "other coalbeds," even though production may exceed 10 million tons, because numerous separate coalbeds contribute to the totals.

³ The coalbed ID number is a unique code assigned by EIA to each correlated coalbed or to coal-bearing geologic formations, coal groups, or coal zones.

⁴ The coalbed name given is the name most commonly used in the State having the greatest production from that coalbed. The States having the greatest production for each coalbed are: eastern Kentucky (coalbeds 0111, 0135, 0151, 0157, 0168); West Virginia (0036, 0084, 0103, 0121, 0344); Pennsylvania (0071); Ohio (0080); western Kentucky (0489); Indiana (0483); Illinois (0484); North Dakota (1569); Montana (1808); Wyoming (1699). In some other States where these are major producing beds, the following alternate coalbed names are preferred: 0111, Coalburg (West Virginia); 0121, Hazard No. 5 (Eastern Kentucky); 0151, Jellico (Tennessee); Taggart (Virginia); Cedar Grove (West Virginia); 0157 Upper Standiford (Virginia); 0168 No. 2 Gas (West Virginia); 0484, No. 11 (western Kentucky); 0483, No. 12 (western Kentucky).

⁵ Average thickness is the bed thickness weighted by bed production.

Note: Total may not equal sum of components because of independent rounding.

Source: Energy Information Administration, Form EIA-7A, "Coal Production Report."

Table 13. U.S. Coal Production¹ by Mine Production Range and Type of Mining, 1988, 1989
(Thousand Short Tons)

Mine Production Range (Thousand Short Tons)	1989						1988		
	Type of Mining				Total		Production		
	Underground		Surface		Production	Percent Change from Previous Year ²	Type of Mining		Total
	Production	Percent Change from Previous Year ²	Production	Percent Change from Previous Year ²			Underground	Surface	
Over 1000	198,840	7.38	417,269	5.91	616,109	6.38	185,174	393,971	579,145
500 to 1000	56,586	.52	46,564	-9.51	103,150	-4.27	56,291	51,459	107,750
200 to 500	64,696	1.11	60,268	8.64	124,965	4.61	63,987	55,473	119,460
100 to 200	38,401	-3.57	27,707	-8.13	66,108	-5.54	39,823	30,160	69,983
50 to 100	21,889	2.69	17,931	-6.62	39,820	-1.72	21,315	19,202	40,517
10 to 50	12,205	-12.79	15,189	-3.22	27,394	-7.73	13,995	15,695	29,690
U.S. Total	392,618	3.16	584,929	3.35	977,547	3.28	380,584	565,961	946,545

¹ Excludes silt, culm, refuse bank, slurry dam, and dredge production except for Pennsylvania anthracite. Excludes mines producing less than 10,000 short tons of coal during the year.

² Percent changes are calculated using unrounded data.

Note: Total may not equal sum of components because of independent rounding.

Source: Energy Information Administration, Form EIA-7A, "Coal Production Report."

Table 14. Number of U.S. Coal Mines¹ by Mine Production Range and Type of Mining, 1988, 1989

Mine Production Range (Thousand Short Tons)	1989						1988		
	Type of Mining				Total		Number of Mines		
	Underground		Surface		Number of Mines	Percent Change from Previous Year ²	Type of Mining		Total
	Number of Mines	Percent Change from Previous Year ²	Number of Mines	Percent Change from Previous Year ²			Underground	Surface	
Over 1000	108	5.88	101	8.60	209	7.18	102	93	195
500 to 1000	82	3.80	68	-9.33	150	-2.60	79	75	154
200 to 500	217	2.84	194	6.01	411	4.31	211	183	394
100 to 200	275	0	196	-5.31	471	-2.28	275	207	482
50 to 100	299	.67	246	-9.23	545	-4.05	297	271	568
10 to 50	445	-10.82	590	-5.30	1,035	-7.75	499	623	1,122
U.S. Total	1,426	-2.53	1,395	-3.93	2,821	-3.22	1,463	1,452	2,915

¹ Excludes silt, culm, refuse bank, slurry dam, and dredge production except for Pennsylvania anthracite. Excludes mines producing less than 10,000 short tons of coal during the year.

² Percent changes are calculated using unrounded data.

Source: Energy Information Administration, Form EIA-7A, "Coal Production Report."

Table 15. U.S. Coal Production¹ by State and Type of Mining, 1988, 1989
(Thousand Short Tons)

Coal-Producing State	1989						1988		
	Type of Mining				Total		Production		Total
	Underground	Percent Change from Previous Year ²	Surface	Percent Change from Previous Year ²	Production	Percent Change from Previous Year ²	Underground	Surface	
Alabama	16,307	9.95	11,581	-0.19	27,888	5.50	14,830	11,603	26,434
Alaska	-	-	1,582	-9.30	1,582	-9.30	-	1,745	1,745
Arizona	-	-	11,935	-3.73	11,935	-3.73	-	12,398	12,398
Arkansas	-	-	39	-84.57	39	-84.57	-	255	255
California	-	-	41	-23.91	41	-23.91	-	54	54
Colorado	8,502	24.06	8,612	-4.76	17,115	7.67	6,854	9,042	15,896
Illinois	39,328	2.09	19,917	-7.5	59,246	1.12	38,522	20,068	58,590
Indiana	2,519	4.56	31,112	7.95	33,631	7.69	2,409	28,821	31,231
Iowa	36	-	391	17.33	427	28.08	-	333	333
Kansas	-	-	854	16.25	854	16.25	-	735	735
Kentucky Total	98,591	4.80	67,881	8.49	166,472	6.27	94,079	62,571	156,650
Kentucky, Eastern	75,270	10.22	49,625	3.24	124,895	7.34	68,288	48,066	116,354
Kentucky, Western	23,321	-9.58	18,256	25.86	41,577	3.18	25,791	14,505	40,295
Louisiana	-	-	2,983	3.22	2,983	3.22	-	2,889	2,889
Maryland	1,834	-9.42	1,509	25.31	3,343	3.53	2,024	1,204	3,229
Missouri	-	-	3,377	-19.00	3,377	-19.00	-	4,169	4,169
Montana	-	-	37,742	-2.93	37,742	-2.93	-	38,881	38,881
New Mexico	45	-79.89	23,657	9.63	23,702	8.71	224	21,578	21,802
North Dakota	-	-	29,555	-56	29,555	-56	-	29,721	29,721
Ohio	10,824	-3.88	22,701	.53	33,525	-.94	11,260	22,581	33,842
Oklahoma	40	-	1,888	-20.76	1,728	-18.90	-	2,131	2,131
Pennsylvania Total	39,326	.54	30,216	-.89	69,542	-.08	39,114	30,487	69,601
Anthracite	259	-25.10	2,630	-4.67	2,889	-6.94	345	2,759	3,105
Bituminous	39,067	.77	27,585	-.51	66,653	.24	33,768	27,728	66,496
Tennessee	4,597	-.35	1,770	-1.46	6,367	-.66	4,613	1,796	6,409
Texas	-	-	53,849	3.00	53,849	3.00	-	52,281	52,281
Utah	20,099	10.66	-	-	20,099	10.66	18,163	-	18,163
Virginia	35,919	-4.41	6,847	-14.05	42,766	-6.10	37,577	7,966	45,543
Washington	-	-	5,039	-2.54	5,039	-2.54	-	5,170	5,170
West Virginia	113,006	2.94	40,137	15.99	153,143	6.07	109,777	34,605	144,383
Wyoming	1,645	44.58	169,913	4.32	171,558	4.60	1,138	162,876	164,014
Appalachian Total³	297,082	3.34	164,387	3.84	461,469	3.52	287,484	158,309	445,793
Interior Total³	65,244	-2.22	132,466	4.98	197,710	2.49	66,722	126,187	192,909
Western Total³	30,292	14.84	288,076	2.35	318,368	3.42	26,378	281,465	307,843
East of the Miss. River	362,251	2.27	233,672	5.40	595,922	3.48	354,206	221,703	575,909
West of the Miss. River	30,387	15.12	351,257	2.03	381,625	2.96	26,378	344,258	370,636
U.S. Total	392,618	3.16	584,929	3.35	977,547	3.28	380,584	565,961	946,545

¹ Excludes silt, culm, refuse bank, slurry dam, and dredge production except for Pennsylvania anthracite. Excludes mines producing less than 10,000 short tons of coal during the year.

² Percent changes are calculated using unrounded data.

³ For a definition of coal-producing regions, see Appendix C.

Note: Total may not equal sum of components because of independent rounding.

Source: Energy Information Administration, Form EIA-7A, "Coal Production Report."

Table 16. Number of U.S. Coal Mines¹ by State and Type of Mining, 1988, 1989

Coal-Producing State	1989						1988		
	Type of Mining				Total		Number of Mines		
	Underground		Surface		Number of Mines	Percent Change from Previous Year ²	Type of Mining		Total
	Number of Mines	Percent Change from Previous Year ²	Number of Mines	Percent Change from Previous Year ²			Underground	Surface	
Alabama	12	0	68	4.62	80	3.90	12	65	77
Alaska	-	-	1	0	1	0	-	1	1
Arizona	-	-	2	0	2	0	-	2	2
Arkansas	-	-	1	-66.67	1	-66.67	-	3	3
California	-	-	1	0	1	0	-	1	1
Colorado	14	16.67	7	-12.50	21	5.00	12	8	20
Illinois	29	3.57	16	-11.11	45	-2.17	28	18	46
Indiana	6	20.00	52	-13.33	58	-10.77	5	60	65
Iowa	1	-	2	-33.33	3	0	-	3	3
Kansas	-	-	4	0	4	0	-	4	4
Kentucky Total	545	-5.71	319	-12.12	864	-8.18	578	363	941
Kentucky, Eastern	519	-6.32	261	-14.71	780	-9.30	554	306	860
Kentucky, Western	26	8.33	58	1.75	84	3.70	24	57	81
Louisiana	-	-	2	100.00	2	100.00	-	1	1
Maryland	1	-50.00	22	0	23	-4.17	2	22	24
Missouri	-	-	8	-20.00	8	-20.00	-	10	10
Montana	-	-	8	0	8	0	-	8	8
New Mexico	1	0	6	-25.00	7	-22.22	1	8	9
North Dakota	-	-	11	10.00	11	10.00	-	10	10
Ohio	14	7.69	134	-11.26	148	-9.76	13	151	164
Oklahoma	1	-	15	-28.57	16	-23.81	-	21	21
Pennsylvania Total	77	-1.28	342	-3.39	419	-3.01	78	354	432
Anthracite	10	25.00	57	1.79	67	4.69	8	56	64
Bituminous	67	-4.29	285	-4.36	352	-4.35	70	298	368
Tennessee	48	-11.11	20	-13.04	68	-11.69	54	23	77
Texas	-	-	14	0	14	0	-	14	14
Utah	20	0	-	-	20	0	20	-	20
Virginia	243	-3.19	64	-15.79	307	-6.12	251	76	327
Washington	-	-	3	0	3	0	-	3	3
West Virginia	411	1.23	248	26.53	659	9.47	406	196	602
Wyoming	3	0	25	-7.41	28	-6.67	3	27	30
Appalachian Total³	1,325	-3.28	1,159	-2.85	2,484	-3.08	1,370	1,193	2,563
Interior Total³	63	10.53	172	-9.95	235	-5.24	57	191	248
Western Total³	38	5.56	64	-5.88	102	-1.92	36	68	104
East of the Miss. River	1,386	-2.87	1,285	-3.24	2,671	-3.05	1,427	1,328	2,755
West of the Miss. River	40	11.11	110	-11.29	150	-6.25	36	124	160
U.S. Total	1,426	-2.53	1,395	-3.93	2,821	-3.22	1,463	1,452	2,915

¹ Excludes silt, culm, refuse bank, slurry dam, and dredge production except for Pennsylvania anthracite. Excludes mines producing less than 10,000 short tons of coal during the year.

² Percent changes are calculated using unrounded data.

³ For a definition of coal-producing regions, see Appendix C.

Source: Energy Information Administration, Form EIA-7A, "Coal Production Report."

Table 17. U.S. Coal Production¹ by District and Type of Mining, 1988, 1989
(Thousand Short Tons)

Coal-Producing District	1989						1988		
	Type of Mining				Total		Production		
	Underground		Surface		Production	Percent Change from Previous Year ²	Type of Mining		Total
	Production	Percent Change from Previous Year ²	Production	Percent Change from Previous Year ²			Underground	Surface	
District 1	21,612	0.96	24,127	5.23	45,739	3.17	21,406	22,927	44,333
District 2	23,576	4.49	6,223	-14.76	29,799	-.22	22,563	7,301	29,864
District 3	34,859	-1.07	7,633	14.66	42,492	1.43	35,234	6,657	41,891
District 4	10,824	-3.88	22,701	.53	33,525	-.94	11,260	22,581	33,842
District 6	7,921	15.16	368	46.96	8,289	16.28	6,878	250	7,129
District 7	14,938	-1.93	524	9.49	15,462	-1.58	15,231	479	15,710
District 8	166,042	4.55	87,880	5.77	253,923	4.97	158,812	83,087	241,899
District 9	23,321	-9.58	18,256	25.86	41,577	3.18	25,791	14,505	40,295
District 10	39,328	2.09	19,917	-.75	59,246	1.12	38,522	20,068	58,590
District 11	2,519	4.56	31,112	7.95	33,631	7.69	2,409	28,821	31,231
District 12	36	-	391	17.33	427	28.08	-	333	333
District 13	17,051	8.25	12,290	.26	29,351	4.75	15,752	12,267	28,020
District 14	-	-	342	-52.98	342	-52.98	-	727	727
District 15	40	-	62,448	1.16	62,488	1.22	-	61,733	61,733
District 16	-	-	27	-67.25	27	-67.25	-	82	82
District 17	8,547	20.77	9,040	-5.66	17,588	5.57	7,078	9,583	16,660
District 18	-	-	35,178	5.30	35,178	5.30	-	33,408	33,408
District 19	1,645	44.58	169,913	4.32	171,558	4.60	1,138	162,876	164,014
District 20	20,099	10.66	-	-	20,099	10.66	18,163	-	18,163
District 21	-	-	29,555	-.56	29,555	-.56	-	29,721	29,721
District 22	-	-	37,742	-2.93	37,742	-2.93	-	38,881	38,881
District 23	-	-	6,621	-4.25	6,621	-4.25	-	6,915	6,915
District 24 ³	259	-25.10	2,630	-4.67	2,889	-6.94	345	2,759	3,105
District 1-23 ³ Total	392,359	3.19	582,298	3.39	974,658	3.31	380,239	563,202	943,441
U.S. Total	392,618	3.16	584,929	3.35	977,547	3.28	380,584	565,961	946,545

¹ Excludes silt, culm, refuse bank, slurry dam, and dredge production except for Pennsylvania anthracite. Excludes mines producing less than 10,000 short tons of coal during the year.

² Percent changes are calculated using unrounded data.

³ District 24 is the anthracite-producing district in Pennsylvania. Districts 1-23 represent the total U.S. production of bituminous, subbituminous coal, and lignite. See Appendix C.

Source: Energy Information Administration, Form EIA-7A, "Coal Production Report."

Table 18. Number of U.S. Coal Mines¹ by District and Type of Mining, 1988, 1989

Coal-Producing District	1989						1988		
	Type of Mining				Total		Number of Mines		Total
	Underground		Surface		Number of Mines	Percent Change from Previous Year ²	Type of Mining		
	Number of Mines	Percent Change from Previous Year ²	Number of Mines	Percent Change from Previous Year ²			Underground	Surface	
District 1	46	-8.00	242	0	288	-1.37	50	242	292
District 2	27	0	72	-14.29	99	-10.81	27	84	111
District 3	79	5.33	108	24.14	187	15.43	75	87	162
District 4	14	7.69	134	-11.26	148	-9.76	13	151	164
District 6	4	0	5	0	9	0	4	5	9
District 7	95	-2.06	12	20.00	107	0	97	10	107
District 8	1,020	-3.95	455	-6.57	1,475	-4.78	1,062	487	1,549
District 9	26	8.33	58	1.75	84	3.70	24	57	81
District 10	29	3.57	16	-11.11	45	-2.17	28	18	46
District 11	6	20.00	52	-13.33	58	-10.77	5	60	65
District 12	1	-	2	-33.33	3	0	-	3	3
District 13	30	-11.76	74	4.23	104	-.95	34	71	105
District 14	-	-	5	-37.50	5	-37.50	-	8	8
District 15	1	-	39	-13.33	40	-11.11	-	45	45
District 16	-	-	1	-50.00	1	-50.00	-	2	2
District 17	15	15.38	7	0	22	10.00	13	7	20
District 18	-	-	8	-20.00	8	-20.00	-	10	10
District 19	3	0	25	-7.41	28	-6.67	3	27	30
District 20	20	0	-	-	20	0	20	-	20
District 21	-	-	11	10.00	11	10.00	-	10	10
District 22	-	-	8	0	8	0	-	8	8
District 23	-	-	4	0	4	0	-	4	4
District 24 ³	10	25.00	57	1.79	67	4.69	8	56	64
District 1-23 ³ Total	1,416	-2.68	1,338	-4.15	2,754	-3.40	1,455	1,396	2,851
U.S. Total	1,426	-2.53	1,395	-3.93	2,821	-3.22	1,463	1,452	2,915

¹ Excludes silt, culm, refuse bank, slurry dam, and dredge production except for Pennsylvania anthracite. Excludes mines producing less than 10,000 short tons of coal during the year.

² Percent changes are calculated using unrounded data.

³ District 24 is the anthracite-producing district in Pennsylvania. Districts 1-23 represent the total U.S. production of bituminous, subbituminous coal, and lignite. See Appendix C.

Source: Energy Information Administration, Form EIA-7A, "Coal Production Report."

Average Mine Prices

Modern mining machines, such as this longwall-type, spray water to reduce dust to a minimum and to help conserve machine life.

Figure 5. Average Mine Price of U.S. Coal by Type of Mining and Coal Rank, 1980-1989

Source: Energy Information Administration, Form EIA-7A, "Coal Production Report."

Table 19. U.S. Coal Production¹ and Average Mine Price² by State and Type of Mining, 1989
(Thousand Short Tons, Dollars Per Short Ton)

Coal-Producing State	Type of Mining				Total	
	Underground		Surface		Production	Average Mine Price
	Production	Average Mine Price	Production	Average Mine Price		
Alabama	16,307	38.96	11,581	44.31	27,888	41.18
Alaska	-	-	1,582	w	1,582	w
Arizona	-	-	11,935	w	11,935	w
Arkansas	-	-	39	w	39	w
California	-	-	41	w	41	w
Colorado	8,502	26.02	8,612	21.29	17,115	23.64
Illinois	39,328	28.66	19,917	27.20	59,246	28.17
Indiana	2,519	27.22	31,112	23.26	33,631	23.55
Iowa	36	w	391	w	427	w
Kansas	-	-	854	27.00	854	27.00
Kentucky Total	98,591	25.06	67,881	24.84	166,472	24.97
Kentucky, Eastern	75,270	25.69	49,625	25.96	124,895	25.80
Kentucky, Western	23,321	23.03	18,256	21.79	41,577	22.48
Louisiana	-	-	2,983	w	2,983	w
Maryland	1,834	w	1,509	w	3,343	24.73
Missouri	-	-	3,377	w	3,377	w
Montana	-	-	37,742	10.27	37,742	10.27
New Mexico	45	w	23,657	w	23,702	23.42
North Dakota	-	-	29,555	7.36	29,555	7.36
Ohio	10,824	37.30	22,701	27.24	33,525	30.49
Oklahoma	40	w	1,688	w	1,728	28.46
Pennsylvania Total	39,326	31.75	30,216	26.19	69,542	29.33
Anthracite	259	37.13	2,630	43.50	2,889	42.93
Bituminous	39,067	31.71	27,585	24.54	66,653	28.74
Tennessee	4,597	w	1,770	w	6,367	26.98
Texas	-	-	53,849	10.91	53,849	10.91
Utah	20,099	21.46	-	-	20,099	21.46
Virginia	35,919	28.31	6,847	24.11	42,766	27.64
Washington	-	-	5,039	w	5,039	w
West Virginia	113,006	29.49	40,137	26.42	153,143	28.69
Wyoming	1,645	w	169,913	w	171,558	8.63
Appalachian Total³	297,082	\$29.45	164,387	\$27.45	461,469	\$28.74
Interior Total³	65,244	26.58	132,466	18.71	197,710	21.31
Western Total³	30,292	22.55	288,076	11.03	318,368	12.12
East of the Miss. River	362,251	28.94	233,672	26.43	595,922	27.95
West of the Miss. River	30,367	22.54	351,257	11.37	381,625	12.25
U.S. Total	392,618	28.44	584,929	17.38	977,547	21.82

¹ Excludes silt, culm, refuse bank, slurry dam, and dredge production except for Pennsylvania anthracite. Excludes mines producing less than 10,000 short tons of coal during the year.

² Average Mine Price is calculated by dividing the total free on board (f.o.b.) mine value of the coal produced by the total production.

³ For a definition of coal-producing regions, see Appendix C.

w Withheld to avoid disclosure of individual company data.

Note: Total may not equal sum of components because of independent rounding.

Source: Energy Information Administration Form EIA-7A, "Coal Production Report."

Table 20. U.S. Coal Production¹ and Average Mine Price² by District and Type of Mining, 1989
(Thousand Short Tons, Dollars Per Short Ton)

Coal-Producing District	Type of Mining				Total	
	Underground		Surface		Production	Average Mine Price
	Production	Average Mine Price	Production	Average Mine Price		
District 1	21,612	w	24,127	w	45,739	27.66
District 2	23,576	31.63	6,223	26.51	29,799	30.56
District 3	34,859	27.44	7,633	21.54	42,492	26.38
District 4	10,824	37.30	22,701	27.24	33,525	30.49
District 6	7,921	w	368	w	8,289	w
District 7	14,938	30.06	524	29.96	15,462	30.06
District 8	166,042	27.53	87,880	26.37	253,923	27.13
District 9	23,321	23.03	18,256	21.79	41,577	22.48
District 10	39,328	28.66	19,917	27.20	59,246	28.17
District 11	2,519	27.22	31,112	23.26	33,631	23.55
District 12	36	w	391	w	427	w
District 13	17,051	38.22	12,299	43.22	29,351	40.32
District 14	-	-	342	w	342	w
District 15	40	w	62,448	w	62,488	12.80
District 16	-	-	27	w	27	w
District 17	8,547	26.02	9,040	21.59	17,588	23.74
District 18	-	-	35,178	21.82	35,178	21.82
District 19	1,645	w	169,913	w	171,558	8.63
District 20	20,099	21.46	-	-	20,099	21.46
District 21	-	-	29,555	7.36	29,555	7.36
District 22	-	-	37,742	10.27	37,742	10.27
District 23	-	-	6,621	w	6,621	w
District 24 ³	259	37.13	2,630	43.50	2,889	42.93
District 1-23³ Total	392,359	\$28.44	582,298	\$17.27	974,658	\$21.76
U.S. Total	392,618	28.44	584,929	17.38	977,547	21.82

¹ Excludes silt, culm, refuse bank, slurry dam, and dredge production except for Pennsylvania anthracite. Excludes mines producing less than 10,000 short tons of coal during the year.

² Average Mine Price is calculated by dividing the total free on board (f.o.b.) mine value of the coal produced by the total production.

³ District 24 is the anthracite-producing district in Pennsylvania. Districts 1-23 represent the total U.S. production of bituminous, subbituminous coal, and lignite. See Appendix C.

^w Withheld to avoid disclosure of individual company data.

Note: Total may not equal sum of components because of independent rounding.

Source: Energy Information Administration, Form EIA-7A, "Coal Production Report."

Table 21. U.S. Coal Production¹ and Average Mine Price² by State and Disposition, 1989
(Thousand Short Tons, Dollars Per Short Ton)

Coal-Producing State	Disposition				Total	
	Open Market ³		Captive ⁴		Production	Average Mine Price
	Production	Average Mine Price	Production	Average Mine Price		
Alabama	26,997	w	891	w	27,888	41.18
Alaska	1,581	w	2	w	1,582	w
Arizona	11,935	w	-	-	11,935	w
Arkansas	39	w	-	-	39	w
California	-	-	41	w	41	w
Colorado	16,989	w	125	w	17,115	23.64
Illinois	59,193	28.17	53	26.93	59,246	28.17
Indiana	33,631	23.55	(*)	-	33,631	23.55
Iowa	427	w	-	-	427	w
Kansas	854	27.00	-	-	854	27.00
Kentucky Total	163,499	24.89	2,973	29.20	166,472	24.97
Kentucky, Eastern	123,293	25.70	1,602	33.42	124,895	25.80
Kentucky, Western	40,205	22.42	1,371	24.27	41,577	22.48
Louisiana	103	w	2,880	w	2,983	w
Maryland	3,254	w	88	w	3,343	24.73
Missouri	987	w	2,390	w	3,377	w
Montana	33,149	10.50	4,593	8.64	37,742	10.27
New Mexico	23,702	23.42	-	-	23,702	23.42
North Dakota	26,253	6.93	3,302	10.78	29,555	7.36
Ohio	25,349	26.59	8,176	42.58	33,525	30.49
Oklahoma	1,728	28.46	-	-	1,728	28.46
Pennsylvania Total	63,145	28.41	6,397	38.43	69,542	29.33
Anthracite	2,781	w	108	w	2,889	42.93
Bituminous	60,365	w	6,288	w	66,653	28.74
Tennessee	6,226	w	141	w	6,367	26.98
Texas	11,157	11.89	42,692	10.65	53,849	10.91
Utah	13,115	23.45	6,984	17.72	20,099	21.46
Virginia	42,748	27.64	19	19.34	42,766	27.64
Washington	141	w	4,898	w	5,039	w
West Virginia	144,232	28.26	8,911	35.63	153,143	28.69
Wyoming	167,194	8.54	4,364	12.16	171,558	8.63
Appalachian Total⁵	435,245	\$28.17	26,224	\$38.27	461,469	\$28.74
Interior Total⁵	148,324	24.27	49,386	12.43	197,710	21.31
Western Total⁵	294,059	11.86	24,309	15.36	318,368	12.12
East of the Miss. River	568,274	27.49	27,648	37.55	595,922	27.95
West of the Miss. River	309,354	12.04	72,271	13.18	381,625	12.25
U.S. Total	877,628	22.04	99,919	19.92	977,547	21.82

¹ Excludes silt, culm, refuse bank, slurry dam, and dredge production except for Pennsylvania anthracite. Excludes mines producing less than 10,000 short tons of coal during the year.

² Average Mine Price is calculated by dividing the total free on board (f.o.b.) mine value of the coal produced by the total production.

³ Open Market includes all coal sold on the open market to other coal companies or consumers.

⁴ Captive includes all coal used by the producing company or sold to affiliated or parent companies.

⁵ For a definition of coal-producing regions, see Appendix C.

(*) Less than 500 short tons.

^w Withheld to avoid disclosure of individual company data.

Note: Total may not equal sum of components because of independent rounding.

Source: Energy Information Administration, Form EIA-7A, "Coal Production Report."

Table 22. U.S. Coal Production¹ and Average Mine Price² by District and Disposition, 1989
(Thousand Short Tons, Dollars Per Short Ton)

Coal-Producing District	Disposition				Total	
	Open Market ³		Captive ⁴		Production	Average Mine Price
	Production	Average Mine Price	Production	Average Mine Price		
District 1	42,328	26.31	3,411	44.40	45,739	27.66
District 2	26,833	30.35	2,966	32.45	29,799	30.56
District 3	39,974	25.53	2,518	39.90	42,492	26.38
District 4	25,349	w	8,176	w	33,525	30.49
District 6	7,038	w	1,251	w	8,289	w
District 7	13,150	w	2,312	w	15,462	30.06
District 8	249,332	27.04	4,591	32.15	253,923	27.13
District 9	40,205	22.42	1,371	24.27	41,577	22.48
District 10	59,193	28.17	53	26.93	59,246	28.17
District 11	33,631	23.55	(*)	-	33,631	23.55
District 12	427	w	-	-	427	w
District 13	28,460	w	891	w	29,351	40.32
District 14	342	w	-	-	342	w
District 15	14,526	15.19	47,962	12.07	62,488	12.80
District 16	27	w	(*)	-	27	w
District 17	17,463	w	125	w	17,588	23.74
District 18	35,137	w	41	w	35,178	21.82
District 19	167,194	8.54	4,364	12.16	171,558	8.63
District 20	13,115	23.45	6,984	17.72	20,099	21.46
District 21	26,253	6.93	3,302	10.78	29,555	7.36
District 22	33,149	10.50	4,593	8.64	37,742	10.27
District 23	1,722	w	4,900	w	6,621	w
District 24 ⁵	2,781	w	108	w	2,889	42.93
District 1-23⁵ Total	874,847	\$21.97	99,811	\$19.93	974,658	\$21.76
U.S. Total	877,628	22.04	99,919	19.92	977,547	21.82

¹ Excludes silt, culm, refuse bank, slurry dam, and dredge production except for Pennsylvania anthracite. Excludes mines producing less than 10,000 short tons of coal during the year.

² Average Mine Price is calculated by dividing the total free on board (f.o.b.) mine value of the coal produced by the total production.

³ Open Market includes all coal sold on the open market to other coal companies or consumers.

⁴ Captive includes all coal used by the producing company or sold to affiliated or parent companies.

⁵ District 24 is the anthracite-producing district in Pennsylvania. Districts 1-23 represent the total U.S. production of bituminous, subbituminous coal, and lignite. See Appendix C.

(*) Less than 500 short tons.

w Withheld to avoid disclosure of individual company data.

Note: Total may not equal sum of components because of independent rounding.

Source: Energy Information Administration, Form EIA-7A, "Coal Production Report."

**Table 23. U.S. Coal Production¹, Number of Mines and Average Mine Price²
by State and County, 1989**
(Thousand Short Tons, Dollars Per Short Ton)

Coal-Producing State and County	Number of Mines	Production	Average Mine Price
Alabama	80	27,888	\$41.18
Blount	5	202	w
Cullman	1	453	w
Fayette	2	2,036	w
Jackson	1	28	w
Jefferson	14	6,771	43.40
Marion	7	311	29.76
Tuscaloosa	20	9,921	39.45
Walker	25	7,578	41.30
Winston	5	587	w
Alaska	1	1,582	w
Yukon River	1	1,582	w
Arizona	2	11,935	w
Navajo	2	11,935	w
Arkansas	1	39	w
Sebastian	1	39	w
California	1	41	w
Amador	1	41	w
Colorado	21	17,115	\$23.64
Delta	1	517	w
Fremont	2	499	w
Garfield	1	125	w
Gunnison	2	860	w
Jackson	1	27	w
La Plata	1	160	w
Las Animas	2	855	w
Mesa	1	134	w
Moffat	3	8,696	w
Montrose	1	47	w
Pitkin	1	935	w
Rio Blanco	1	1,365	w
Routt	4	2,895	17.43
Illinois	45	59,246	\$28.17
Christian	1	1,876	w
Clinton	1	2,762	w
Coles	1	12	w
Douglas	1	1,051	w
Edgar	1	233	w
Franklin	4	7,540	w
Fulton	1	504	w
Gallatin	3	2,233	w
Jackson	1	2,160	w
Jefferson	2	3,573	w
Logan	1	1,329	w
Macoupin	2	2,809	w
McDonough	1	516	w
Perry	7	11,318	w
Randolph	4	6,129	w
Saline	7	7,772	32.38
Sangamon	1	173	w
Schuyler	1	560	w
St Clair	2	1,295	w
Wabash	1	1,787	w
Washington	1	1,862	w
White	1	1,751	w
Indiana	58	33,631	\$23.55
Clay	8	2,112	23.83
Daviess	11	4,671	23.31
Dubois	2	581	w
Gibson	3	2,452	w
Greene	7	2,612	21.49
Knox	2	622	w
Pike	7	5,282	24.22
Spencer	3	535	w
Sullivan	3	2,827	w
Vermillion	1	1,447	w
Vigo	4	1,415	24.76
Warrick	7	8,976	23.69

See Footnotes at end of table.

**Table 23. U.S. Coal Production¹, Number of Mines and Average Mine Price²
by State and County, 1989 (Continued)**
(Thousand Short Tons, Dollars Per Short Ton)

Coal-Producing State and County	Number of Mines	Production	Average Mine Price
Iowa	3	427	w
Lucas	1	36	w
Marion	2	391	w
Kansas	4	854	\$27.00
Crawford	3	624	w
Linn	1	230	w
Kentucky	864	166,472	\$24.97
Bell	37	4,744	28.38
Boyd	1	603	w
Breathitt	10	6,199	28.84
Butler	5	937	21.43
Caldwell	1	48	w
Carter	2	109	w
Christian	2	540	w
Clay	6	702	27.55
Daviess	7	1,529	21.44
Elliott	2	37	w
Floyd	77	9,767	20.84
Greenup	1	90	w
Harlan	117	14,162	28.10
Henderson	4	3,003	20.19
Hopkins	24	10,306	24.07
Jackson	3	265	w
Johnson	12	1,848	22.92
Knott	55	8,633	23.87
Knox	32	1,050	28.51
Laurel	3	47	w
Lawrence	5	179	29.45
Lee	5	167	22.72
Leslie	20	8,317	23.95
Letcher	60	10,100	23.69
Magoffin	17	2,259	27.86
Martin	30	12,772	32.40
McLean	3	468	w
Muhlenberg	13	6,522	w
Ohio	10	1,653	19.82
Owsley	6	175	24.77
Perry	36	11,173	25.63
Pike	212	29,204	24.32
Pulaski	2	313	w
Union	6	6,513	24.50
Webster	9	10,057	22.95
Whitley	27	1,948	28.66
Wolfe	2	33	w
Louisiana	2	2,983	w
De Soto	1	2,880	w
Red River	1	103	w
Maryland	23	3,343	\$24.73
Allegany	13	836	18.21
Garrett	10	2,506	26.91
Missouri	8	3,377	w
Barton	1	527	w
Bates	1	186	w
Putnam	1	41	w
Ralls	1	76	w
Randolph	2	2,399	w
Vernon	2	148	w
Montana	8	37,742	\$10.27
Big Horn	4	20,044	11.77
Musselshell	1	16	w
Richland	1	288	w
Rosebud	2	17,395	w
New Mexico	7	23,702	\$23.42
Colfax	2	500	w
McKinley	2	8,183	w
San Juan	3	15,019	w
North Dakota	11	29,555	\$7.36
Bowman	1	2,015	w
McLean	1	6,725	w
Mercer	5	14,757	7.12

See Footnotes at end of table.

**Table 23. U.S. Coal Production¹, Number of Mines and Average Mine Price²
by State and County, 1989 (Continued)**
(Thousand Short Tons, Dollars Per Short Ton)

Coal-Producing State and County	Number of Mines	Production	Average Mine Price
North Dakota (Continued)			
Oliver	3	5,862	w
Stark	1	195	w
Ohio	148	33,525	\$30.49
Athens	1	151	w
Belmont	14	4,712	32.01
Carroll	7	874	19.12
Columbiana	18	1,307	20.12
Coshooton	8	2,118	31.56
Gallia	1	23	w
Guernsey	3	138	w
Harrison	9	2,732	31.20
Hocking	6	238	19.55
Holmes	5	593	w
Jackson	8	1,280	18.72
Jefferson	14	1,818	25.89
Lawrence	2	642	w
Mahoning	1	193	w
Meigs	2	3,942	w
Monroe	1	1,981	w
Muskingum	10	1,222	34.20
Noble	5	3,361	w
Perry	4	1,568	25.51
Stark	3	164	w
Tuscarawas	18	2,230	22.92
Vinton	7	2,192	26.38
Washington	1	47	w
Oklahoma	16	1,728	\$28.46
Craig	6	662	28.28
Haskell	2	207	w
Latimer	1	243	w
Le Flore	2	96	w
Muskogee	2	138	w
Okmulgee	1	40	w
Rogers	2	343	w
Pennsylvania	419	69,542	\$29.33
Allegheny	6	1,152	27.46
Armstrong	39	5,137	27.38
Beaver	2	377	w
Bedford	1	24	w
Blair	1	143	w
Butler	18	2,011	25.14
Cambria	17	4,554	32.65
Carbon	1	57	w
Centre	7	1,073	31.60
Clarion	12	2,729	24.59
Clearfield	58	5,840	23.29
Clinton	3	202	w
Columbia	2	64	w
Dauphin	1	17	w
Elk	7	335	23.40
Fayette	16	573	19.67
Fulton	1	93	w
Greene	20	15,632	32.19
Indiana	36	9,250	34.29
Jefferson	32	2,780	26.01
Lawrence	8	1,080	26.22
Luzerne	15	613	50.98
Lycoming	1	254	w
Mercer	3	359	w
Northumberland	5	94	29.74
Schuylkill	42	2,005	41.19
Somerset	40	5,844	19.51
Sullivan	1	39	w
Tioga	1	139	w
Venango	3	545	w
Washington	15	6,042	30.30
Westmoreland	5	484	31.16

See Footnotes at end of table.

**Table 23. U.S. Coal Production¹, Number of Mines and Average Mine Price²
by State and County, 1989 (Continued)**
(Thousand Short Tons, Dollars Per Short Ton)

Coal-Producing State and County	Number of Mines	Production	Average Mine Price
Tennessee	68	6,367	\$26.98
Anderson	9	1,285	24.19
Bledsoe	2	147	w
Campbell	19	1,445	24.47
Claiborne	8	1,600	34.67
Fentress	2	135	w
Grundy	1	55	w
Marion	2	79	w
Morgan	2	186	w
Rhea	1	49	w
Scott	4	253	25.35
Sequatchie	18	1,133	23.48
Texas	14	53,849	\$10.91
Atascosa	1	2,984	w
Bastrop	1	221	w
Freestone	1	5,670	w
Grimes	1	3,482	w
Harrison	2	3,064	w
Hopkins	1	2,035	w
Leon	1	8,065	w
Milam	1	5,829	w
Panola	1	8,554	w
Rusk	1	3,928	w
Titus	1	9,729	w
Webb	2	287	w
Utah	20	20,099	\$21.46
Carbon	13	8,477	24.03
Emery	6	8,563	w
Sevier	1	3,059	w
Virginia	307	42,766	\$27.64
Buchanan	136	19,005	27.00
Dickenson	53	5,819	29.22
Lee	18	2,479	28.84
Russell	7	772	w
Scott	1	41	w
Tazewell	23	2,723	28.94
Wise	69	11,928	27.26
Washington	3	5,039	w
King	1	141	w
Lewis	1	1,812	w
Thurston	1	3,086	w
West Virginia	659	153,143	\$28.69
Barbour	16	2,272	18.94
Boone	68	22,945	30.10
Braxton	9	2,868	18.41
Brooke	4	1,307	w
Clay	6	837	w
Fayette	20	1,868	25.29
Gilmer	1	46	w
Grant	7	4,782	w
Greenbrier	14	895	31.83
Harrison	21	2,933	31.66
Kanawha	25	6,160	28.49
Lewis	7	456	19.81
Logan	81	13,484	27.71
Marion	12	5,460	w
Marshall	3	6,740	w
Mason	1	196	w
McDowell	70	6,766	27.18
Mineral	3	446	w
Mingo	64	17,745	28.59
Monongalia	32	17,162	28.37
Nicholas	54	8,698	27.15
Ohio	2	242	w
Preston	44	4,500	21.81
Raleigh	22	7,791	33.94
Randolph	12	1,838	24.56
Taylor	1	64	w
Tucker	2	315	w
Upshur	7	1,766	21.31

See Footnotes at end of table.

**Table 23. U.S. Coal Production¹, Number of Mines and Average Mine Price²
by State and County, 1989 (Continued)**
(Thousand Short Tons, Dollars Per Short Ton)

Coal-Producing State and County	Number of Mines	Production	Average Mine Price
West Virginia (Continued)			
Wayne	3	809	w
Webster	16	2,675	22.31
Wyoming	32	9,077	30.23
Wyoming	28	171,558	\$8.63
Campbell	14	143,865	6.92
Carbon	4	4,794	w
Converse	2	6,100	w
Hot Springs	1	52	w
Lincoln	2	4,776	w
Sheridan	1	111	w
Sweetwater	4	11,860	w
U.S. Total	2,821	977,547	\$21.82

¹ Excludes silt, culm, refuse bank, slurry dam, and dredge production except for Pennsylvania anthracite. Excludes mines producing less than 10,000 short tons of coal during the year.

² Average Mine Price is calculated by dividing the total free on board (f.o.b.) mine value of the coal produced by the total production.

w Withheld to avoid disclosure of individual company data.

Note: Total may not equal sum of components because of independent rounding.

Source: Energy Information Administration, Form EIA-7A, "Coal Production Report."

Table 24. U.S. Coal Production¹ and Average Mine Price² by State and Coal Rank, 1989
(Thousand Short Tons, Dollars Per Short Ton)

Coal-Producing State	Coal Rank								Total	
	Bituminous		Subbituminous		Lignite		Anthracite		Production	Average Mine Price
	Production	Average Mine Price	Production	Average Mine Price	Production	Average Mine Price	Production	Average Mine Price		
Alabama	27,888	41.18	-	-	-	-	-	-	27,888	41.18
Alaska	-	-	1,582	w	-	-	-	-	1,582	w
Arizona	11,935	w	-	-	-	-	-	-	11,935	w
Arkansas	39	w	-	-	-	-	-	-	39	w
California	-	-	-	-	41	w	-	-	41	w
Colorado	10,592	w	6,522	w	-	-	-	-	17,115	23.64
Illinois	59,246	28.17	-	-	-	-	-	-	59,246	28.17
Indiana	33,631	23.55	-	-	-	-	-	-	33,631	23.55
Iowa	427	w	-	-	-	-	-	-	427	w
Kansas	854	27.00	-	-	-	-	-	-	854	27.00
Kentucky Total	166,472	24.97	-	-	-	-	-	-	166,472	24.97
Kentucky, Eastern	124,895	25.80	-	-	-	-	-	-	124,895	25.80
Kentucky, Western	41,577	22.48	-	-	-	-	-	-	41,577	22.48
Louisiana	-	-	-	-	2,983	w	-	-	2,983	w
Maryland	3,343	24.73	-	-	-	-	-	-	3,343	24.73
Missouri	3,377	w	-	-	-	-	-	-	3,377	w
Montana	-	-	37,454	w	288	w	-	-	37,742	10.27
New Mexico	12,485	w	11,216	w	-	-	-	-	23,702	23.42
North Dakota	-	-	-	-	29,555	7.36	-	-	29,555	7.36
Ohio	33,525	30.49	-	-	-	-	-	-	33,525	30.49
Oklahoma	1,728	28.45	-	-	-	-	-	-	1,728	28.46
Pennsylvania	66,653	28.74	-	-	-	-	2,889	42.93	69,542	29.33
Tennessee	6,367	26.98	-	-	-	-	-	-	6,367	26.98
Texas	287	w	-	-	53,562	w	-	-	53,849	10.91
Utah	20,099	21.46	-	-	-	-	-	-	20,099	21.46
Virginia	42,766	27.64	-	-	-	-	-	-	42,766	27.64
Washington	141	w	4,898	w	-	-	-	-	5,039	w
West Virginia	153,143	28.69	-	-	-	-	-	-	153,143	28.69
Wyoming	2,060	w	169,498	w	-	-	-	-	171,558	8.63
Appalachian Total³	458,580	\$28.65	-	-	-	-	2,889	\$42.93	461,469	\$28.74
Interior Total³	141,165	25.34	-	-	56,545	\$11.24	-	-	197,710	21.31
Western Total³	57,313	22.51	231,171	\$10.16	29,884	7.40	-	-	318,368	12.12
East of the Miss. River	593,033	27.88	-	-	-	-	2,889	42.93	595,922	27.95
West of the Miss. River	64,025	22.99	231,171	10.16	86,429	9.91	-	-	381,625	12.25
U.S. Total	657,059	27.40	231,171	10.16	86,429	9.91	2,889	42.93	977,547	21.82

¹ Excludes silt, culm, refuse bank, slurry dam, and dredge production except for Pennsylvania anthracite. Excludes mines producing less than 10,000 short tons of coal during the year.

² Average Mine Price is calculated by dividing the total free on board (f.o.b.) mine value of the coal produced by the total production.

³ For a definition of coal-producing regions, see Appendix C.

w Withheld to avoid disclosure of individual company data.

Note: Total may not equal sum of components because of independent rounding.

Source: Energy Information Administration, Form EIA-7A, "Coal Production Report."

Table 25. Average Mine Price¹ of U.S. Coal by State and Type of Mining, 1988, 1989
(Dollars Per Short Ton)

Coal-Producing State	1989						1988		
	Type of Mining				Total		Average Mine Price		
	Underground		Surface		Average Mine Price	Percent Change from Previous Year ²	Type of Mining		Total
	Average Mine Price	Percent Change from Previous Year ²	Average Mine Price	Percent Change from Previous Year ²			Underground	Surface	
Alabama	38.96	-2.33	44.31	3.26	41.18	-0.08	39.89	42.91	41.22
Alaska	-	-	w	w	w	w	-	w	w
Arizona	-	-	w	w	w	w	-	w	w
Arkansas	-	-	w	w	w	w	-	w	w
California	-	-	w	w	w	w	-	w	w
Colorado	26.02	-1.38	21.29	3.40	23.64	2.39	26.39	20.59	23.09
Illinois	28.66	-3.23	27.20	2.66	28.17	-1.32	29.62	26.50	28.55
Indiana	27.22	-8.99	23.26	-2.38	23.55	-3.05	29.90	23.83	24.29
Iowa	w	-	w	w	w	w	-	w	w
Kansas	-	-	27.00	-11.76	27.00	-11.76	-	30.59	30.59
Kentucky Total	25.06	-6.97	24.84	-1.00	24.97	-4.70	26.94	25.09	26.20
Kentucky, Eastern	25.69	-7.30	25.96	.13	25.80	-4.36	27.72	25.92	26.97
Kentucky, Western	23.03	-7.48	21.79	-2.39	22.48	-6.18	24.89	22.32	23.96
Louisiana	-	-	w	w	w	w	-	w	w
Maryland	w	w	w	w	24.73	-3.35	w	w	25.59
Missouri	-	-	w	w	w	w	-	27.06	27.06
Montana	-	-	10.27	2.10	10.27	2.10	-	10.06	10.06
New Mexico	w	w	w	w	23.42	2.80	w	w	22.78
North Dakota	-	-	7.36	-23	7.36	-23	-	7.38	7.38
Ohio	37.30	1.78	27.24	-.70	30.49	-.04	36.64	27.44	30.50
Oklahoma	w	-	w	w	28.46	-6.37	-	31.06	31.06
Pennsylvania Total	31.75	-2.94	26.19	-.45	29.33	-1.92	32.71	26.31	29.90
Anthracite	37.13	-5.30	43.50	-2.87	42.93	-2.80	39.21	44.78	44.16
Bituminous	31.71	-2.88	24.54	.28	28.74	-1.70	32.65	24.47	29.24
Tennessee	w	w	w	w	26.98	.75	w	w	26.78
Texas	-	-	10.91	-3.85	10.91	-3.85	-	11.34	11.34
Utah	21.46	-4.27	-	-	21.46	-4.27	22.42	-	22.42
Virginia	28.31	5.27	24.11	-2.02	27.64	4.32	26.89	24.60	26.49
Washington	-	-	w	w	w	w	-	w	w
West Virginia	29.49	1.58	26.42	3.09	28.69	1.67	29.03	25.63	28.22
Wyoming	w	w	w	w	8.63	-5.74	w	w	9.16
Appalachian Total³	\$29.45	w	\$27.45	w	\$28.74	-.50	w	w	\$28.88
Interior Total³	26.58	w	18.71	w	21.31	-3.27	w	w	22.03
Western Total³	22.55	-3.13	11.03	-1.50	12.12	-.87	\$23.27	\$11.19	12.23
East of the Miss. River	28.94	-1.55	26.43	-.05	27.95	-1.08	29.39	26.44	28.26
West of the Miss. River	22.54	-3.14	11.37	-2.27	12.25	-1.63	23.27	11.63	12.46
U.S. Total	28.44	-1.82	17.38	-.28	21.82	-1.12	28.97	17.43	22.07

¹ Average Mine Price is calculated by dividing the total free on board (f.o.b.) mine value of the coal produced by the total production. Production excludes silt, culm, refuse bank, slurry dam, and dredge production except for Pennsylvania anthracite. Excludes mines producing less than 10,000 short tons of coal during the year.

² Percent changes are calculated using unrounded data.

³ For a definition of coal-producing regions, see Appendix C.

w Withheld to avoid disclosure of individual company data

Source: Energy Information Administration, Form EIA-7A, "Coal Production Report."

Table 26. Average Mine Price¹ of U.S. Coal by District and Type of Mining, 1988, 1989
(Dollars Per Short Ton)

Coal-Producing District	1989						1988		
	Type of Mining				Total		Average Mine Price		
	Underground		Surface		Average Mine Price	Percent Change from Previous Year ²	Type of Mining		Total
	Average Mine Price	Percent Change from Previous Year ²	Average Mine Price	Percent Change from Previous Year ²			Underground	Surface	
District 1	w	w	w	w	27.66	-1.58	w	w	28.10
District 2	31.63	-2.08	26.51	1.56	30.56	-.73	32.30	26.11	30.79
District 3	27.44	-1.13	21.54	1.66	26.38	-1.24	27.76	21.19	26.71
District 4	37.30	1.78	27.24	-.70	30.49	-.04	36.64	27.44	30.50
District 6	w	w	w	w	w	w	w	w	w
District 7	30.06	6.20	29.96	-1.40	30.06	5.95	28.30	30.39	28.37
District 8	27.53	-1.64	26.37	1.39	27.13	-.66	27.99	26.01	27.31
District 9	23.03	-7.48	21.79	-2.39	22.48	-6.18	24.89	22.32	23.96
District 10	28.66	-3.23	27.20	2.66	28.17	-1.32	29.62	26.50	28.55
District 11	27.22	-8.99	23.26	-2.38	23.55	-3.05	29.90	23.83	24.29
District 12	w	-	w	w	w	w	-	w	w
District 13	38.22	-1.69	43.22	2.77	40.32	.12	38.88	42.06	40.27
District 14	-	-	w	w	w	w	-	24.38	24.38
District 15	w	-	w	w	12.80	-4.48	-	13.40	13.40
District 16	-	-	w	w	w	w	-	w	w
District 17	26.02	-1.97	21.59	.77	23.74	.61	26.55	21.43	23.60
District 18	-	-	21.82	6.32	21.82	6.32	-	20.53	20.53
District 19	w	w	w	w	8.63	-5.74	w	w	9.16
District 20	21.46	-4.27	-	-	21.46	-4.27	22.42	-	22.42
District 21	-	-	7.36	-.23	7.36	-.23	-	7.38	7.38
District 22	-	-	10.27	2.10	10.27	2.10	-	10.06	10.06
District 23	-	-	w	w	w	w	-	w	w
District 24 ³	37.13	-5.30	43.50	-2.87	42.93	-2.80	39.21	44.78	44.16
District 1-23³ Total	\$28.44	-1.81	\$17.27	-.19	\$21.76	-1.07	\$28.96	\$17.30	\$22.00
U.S. Total	28.44	-1.82	17.38	-.28	21.82	-1.12	28.97	17.43	22.07

¹ Average Mine Price is calculated by dividing the total free on board (f.o.b.) mine value of the coal produced by the total production. Production excludes silt, culm, refuse bank, slurry dam, and dredge production except for Pennsylvania anthracite. Excludes mines producing less than 10,000 short tons of coal during the year.

² Percent changes are calculated using unrounded data.

³ District 24 is the anthracite-producing district in Pennsylvania. Districts 1-23 represent the total U.S. production of bituminous, subbituminous coal, and lignite. See Appendix C.

⁴ Withheld to avoid disclosure of individual company data.

Source: Energy Information Administration, Form EIA-7A, "Coal Production Report."

Table 27. Average Mine Price¹ of U.S. Coal by Mine Production Range and Type of Mining, 1988, 1989
(Dollars Per Short Ton)

Mine Production Range (Thousand Short Tons)	1989						1988		
	Type of Mining				Total		Average Mine Price		
	Underground		Surface		Average Mine Price	Percent Change from Previous Year ²	Type of Mining		Total
	Average Mine Price	Percent Change from Previous Year ²	Average Mine Price	Percent Change from Previous Year ²			Underground	Surface	
Over 1000	30.26	-1.00	14.23	2.21	19.40	0.83	30.57	13.92	19.24
500 to 1000	29.14	-4.11	27.21	-.54	28.27	-2.32	30.38	27.36	28.94
200 to 500	25.81	-4.37	24.95	-1.85	25.39	-3.29	26.99	25.42	26.26
100 to 200	25.37	-2.39	23.80	-1.21	24.71	-1.83	25.99	24.09	25.17
50 to 100	25.02	.58	24.10	1.71	24.61	1.19	24.88	23.69	24.31
10 to 50	25.31	-2.20	24.34	-.40	24.77	-1.37	25.88	24.44	25.12
U.S. Total	\$28.44	-1.82	\$17.38	-.28	\$21.82	-1.12	\$28.97	\$17.43	\$22.07

¹ Average Mine Price is calculated by dividing the total free on board (f.o.b.) mine value of the coal produced by the total production. Production excludes silt, culm, refuse bank, slurry dam, and dredge production except for Pennsylvania anthracite. Excludes mines producing less than 10,000 short tons of coal during the year.

² Percent changes are calculated using unrounded data.

Source: Energy Information Administration, Form EIA-7A, "Coal Production Report."

Productivity and Employment

A dragline is in the process of removing overburden at Ashland Oil, Inc.'s Big John Mine.

Figure 6. U.S. Coal Mining Productivity by Type of Mining and by Region, 1980-1989

Note: Scale has been enlarged to show detail in the short tons produced per miner per hour by type of mining plot.

Source: Energy Information Administration, Form EIA-7A, "Coal Production Report."

Table 28. U.S. Coal Mining Productivity by State, 1989

Coal-Producing State	Number of Mining Operations ^{1 2}	Coal Production ² (thousand short tons)	Average Number of Miners Working Daily ³	Average Number of Days Worked During the Year	Average Production per Miner per Hour ⁴ (short tons)	Average Production per Miner per Shift ⁵ (short tons)
Alabama	86	27,888	6,505	207	2.25	19.44
Alaska	1	1,582	87	265	7.73	69.60
Arizona	2	11,935	780	205	6.25	75.00
Arkansas	1	39	8	300	1.75	15.73
California	1	41	5	124	8.21	65.69
Colorado	23	17,115	2,019	224	4.08	35.74
Illinois	54	59,246	10,003	238	2.77	22.98
Indiana	62	33,631	3,684	256	3.86	35.42
Iowa	3	427	149	210	1.51	14.37
Kansas	4	854	165	234	2.66	21.30
Kentucky Total	1,103	166,472	30,656	208	2.78	23.96
Kentucky, Eastern	1,004	124,895	24,620	208	2.58	22.19
Kentucky, Western	99	41,577	6,036	203	3.62	32.03
Louisiana	2	2,983	69	186	15.04	135.32
Maryland	25	3,343	554	221	3.00	25.97
Missouri	8	3,377	428	211	3.43	26.46
Montana	8	37,742	682	291	18.94	165.05
New Mexico	8	23,702	1,470	223	7.93	63.45
North Dakota	11	29,555	850	231	15.69	131.90
Ohio	170	33,525	7,374	226	2.33	21.14
Oklahoma	16	1,728	414	214	2.15	18.32
Pennsylvania Total	496	69,542	15,469	234	2.28	19.48
Anthracite	103	2,889	1,394	248	1.12	8.87
Bituminous	393	66,653	14,075	231	2.39	20.79
Tennessee	87	6,367	1,857	225	1.72	14.52
Texas	14	53,849	2,109	308	7.31	74.54
Utah	21	20,099	2,169	219	4.75	40.12
Virginia	403	42,766	10,371	212	2.21	18.30
Washington	3	5,039	787	200	3.34	28.94
West Virginia	871	153,143	29,482	198	2.77	23.62
Wyoming	28	171,558	3,351	271	20.28	184.65
Appalachian Total⁶	3,142	461,469	96,232	211	2.49	21.32
Interior Total⁶	263	197,710	23,065	230	3.84	33.84
Western Total⁶	106	318,368	12,200	240	11.63	101.69
East of the Miss. River	3,357	595,922	115,955	212	2.63	22.52
West of the Miss. River	154	381,625	15,542	241	10.21	89.91
U.S. Total	3,511	977,547	131,497	214	3.70	31.75

¹ Includes preparation plants.

² Excludes silt, culm, refuse bank, slurry dam, and dredge production except for Pennsylvania anthracite. Excludes mines producing less than 10,000 short tons of coal during the year.

³ Includes all employees engaged in production, preparation, processing, development, maintenance, repair, shop or yard work at mining operations. Excludes office workers. Includes mining operations management and all technical and engineering personnel.

⁴ Calculated by dividing total coal production by the total direct labor hours worked by all mine employees identified in footnote 3 above.

⁵ Calculated by multiplying average production per miner per hour by the average length of a miner shift.

⁶ For a definition of coal-producing regions, see Appendix C.

Note: Total may not equal sum of components because of independent rounding.

Source: Energy Information Administration, Form EIA-7A, "Coal Production Report."

Table 29. U.S. Underground Coal Mining Productivity by State, 1989

Coal-Producing State	Number of Mining Operations ^{1, 2}	Coal Production ² (thousand short tons)	Average Number of Miners Working Daily ³	Average Number of Days Worked During the Year	Average Production per Miner per Hour ⁴ (short tons)	Average Production per Miner per Shift ⁵ (short tons)
Alabama	13	16,307	4,371	212	2.00	16.04
Colorado	16	8,502	1,490	233	2.91	24.50
Illinois	35	39,328	8,084	238	2.41	20.35
Indiana	7	2,519	521	223	2.47	20.98
Iowa	1	36	15	121	2.06	19.58
Kentucky Total	673	98,591	20,752	208	2.54	21.10
Kentucky, Eastern	639	75,270	16,586	208	2.40	19.88
Kentucky, Western	34	23,321	4,166	218	3.13	27.15
Maryland	2	1,834	282	237	3.09	27.82
New Mexico	2	45	49	100	1.03	8.73
Ohio	20	10,824	2,953	228	2.00	17.76
Oklahoma	1	40	36	86	1.28	12.15
Pennsylvania Total	104	39,326	9,578	236	2.16	17.59
Anthracite	20	259	193	256	.71	5.56
Bituminous	84	39,067	9,385	231	2.19	18.02
Tennessee	58	4,597	1,471	220	1.58	13.17
Utah	21	20,099	2,169	219	4.75	40.12
Virginia	294	35,919	8,889	210	2.15	17.70
West Virginia	529	113,006	23,048	200	2.59	21.62
Wyoming	3	1,645	280	209	3.21	27.80
Appalachian Total⁶	1,659	297,082	67,178	208	2.34	19.40
Interior Total⁶	78	65,244	12,822	224	2.63	22.52
Western Total⁶	42	30,292	3,988	218	3.93	33.22
East of the Miss. River	1,735	362,251	79,949	209	2.39	19.82
West of the Miss. River	44	30,367	4,039	213	3.92	33.28
U.S. Total	1,779	392,618	83,988	209	2.46	20.45

¹ Includes preparation plants.

² Excludes silt, culm, refuse bank, slurry dam, and dredge production except for Pennsylvania anthracite. Excludes mines producing less than 10,000 short tons of coal during the year.

³ Includes all employees engaged in production, preparation, processing, development, maintenance, repair, shop or yard work at mining operations. Excludes office workers. Includes mining operations management and all technical and engineering personnel.

⁴ Calculated by dividing total coal production by the total direct labor hours worked by all mine employees identified in footnote 3 above.

⁵ Calculated by multiplying average production per miner per hour by the average length of a miner shift.

⁶ For a definition of coal-producing regions, see Appendix C.

Note: Total may not equal sum of components because of independent rounding.

Source: Energy Information Administration, Form EIA-7A, "Coal Production Report."

Table 30. U.S. Surface Coal Mining Productivity by State, 1989

Coal-Producing State	Number of Mining Operations ^{1 2}	Coal Production ² (thousand short tons)	Average Number of Miners Working Daily ³	Average Number of Days Worked During the Year	Average Production per Miner per Hour ⁴ (short tons)	Average Production per Miner per Shift ⁵ (short tons)
Alabama	73	11,581	2,134	206	2.72	23.82
Alaska	1	1,582	87	265	7.73	69.60
Arizona	2	11,935	780	205	6.25	75.00
Arkansas	1	39	8	300	1.75	15.73
California	1	41	5	124	8.21	65.69
Colorado	7	8,612	529	205	6.74	64.48
Illinois	19	19,917	1,919	236	3.96	31.60
Indiana	55	31,112	3,163	260	4.04	37.46
Iowa	2	391	134	255	1.48	14.03
Kansas	4	854	165	234	2.66	21.30
Kentucky Total	430	67,881	9,904	206	3.23	29.36
Kentucky, Eastern	365	49,625	8,034	208	2.92	26.64
Kentucky, Western	65	18,256	1,870	195	4.53	40.47
Louisiana	2	2,983	69	186	15.04	135.32
Maryland	23	1,509	272	220	2.90	25.01
Missouri	8	3,377	428	211	3.43	28.46
Montana	8	37,742	682	291	18.94	165.05
New Mexico	6	23,657	1,421	264	8.03	62.93
North Dakota	11	29,555	850	231	15.69	131.90
Ohio	150	22,701	4,421	226	2.52	22.99
Oklahoma	15	1,688	378	223	2.18	18.48
Pennsylvania Total	392	30,216	5,891	234	2.47	21.34
Anthracite	83	2,630	1,201	246	1.19	9.43
Bituminous	309	27,585	4,690	231	2.76	24.30
Tennessee	29	1,770	386	235	2.20	19.20
Texas	14	53,849	2,109	308	7.31	74.54
Virginia	109	6,847	1,482	219	2.59	21.77
Washington	3	5,039	787	200	3.34	28.94
West Virginia	342	40,137	6,434	195	3.49	30.55
Wyoming	25	169,913	3,071	279	21.38	195.81
Appalachian Total⁶	1,483	164,387	29,054	215	2.84	25.03
Interior Total⁶	185	132,466	10,243	232	4.97	44.31
Western Total⁶	64	288,076	8,212	254	14.64	130.90
East of the Miss. River	1,622	233,672	36,006	216	3.13	27.63
West of the Miss. River	110	351,257	11,503	252	11.86	105.88
U.S. Total	1,732	584,929	47,509	218	5.61	49.56

¹ Includes preparation plants.

² Excludes silt, culm, refuse bank, slurry dam, and dredge production except for Pennsylvania anthracite. Excludes mines producing less than 10,000 short tons of coal during the year.

³ Includes all employees engaged in production, preparation, processing, development, maintenance, repair, shop or yard work at mining operations. Excludes office workers. Includes mining operations management and all technical and engineering personnel.

⁴ Calculated by dividing total coal production by the total direct labor hours worked by all mine employees identified in footnote 3 above.

⁵ Calculated by multiplying average production per miner per hour by the average length of a miner shift.

⁶ For a definition of coal-producing regions, see Appendix C.

Note: Total may not equal sum of components because of independent rounding.

Source: Energy Information Administration, Form EIA-7A, "Coal Production Report."

Table 31. U.S. Coal Mining Productivity by District, 1989

Coal-Producing District	Number of Mining Operations ^{1 2}	Coal Production ² (thousand short tons)	Average Number of Miners Working Daily ³	Average Number of Days Worked During the Year	Average Production per Miner per Hour ⁴ (short tons)	Average Production per Miner per Shift ⁵ (short tons)
District 1	324	45,739	10,146	230	2.28	19.91
District 2	110	29,799	5,618	229	2.65	22.64
District 3	243	42,492	7,701	209	2.74	23.56
District 4	170	33,525	7,374	226	2.33	21.14
District 6	10	8,289	1,539	244	2.47	20.90
District 7	133	15,462	3,787	193	2.29	19.23
District 8	1,936	253,923	51,786	206	2.59	22.05
District 9	99	41,577	6,036	203	3.62	32.03
District 10	54	59,246	10,003	238	2.77	22.98
District 11	62	33,631	3,684	256	3.86	35.42
District 12	3	427	149	210	1.51	14.37
District 13	113	29,351	6,887	210	2.24	19.14
District 14	5	342	89	277	1.69	14.23
District 15	40	62,488	3,104	242	6.58	58.90
District 16	1	27	8	192	1.80	16.21
District 17	25	17,588	2,150	213	4.00	34.85
District 18	8	35,178	2,116	246	7.49	66.52
District 19	28	171,558	3,351	271	20.28	184.65
District 20	21	20,099	2,169	219	4.75	40.12
District 21	11	29,555	850	231	15.69	131.90
District 22	8	37,742	682	291	18.94	165.05
District 23	4	6,621	874	216	3.86	33.81
District 24 ⁶	103	2,889	1,394	248	1.12	8.87
District 1-23⁶ Total	3,408	974,658	130,103	213	3.73	32.05
U.S. Total	3,511	977,547	131,497	214	3.70	31.75

¹ Includes preparation plants.

² Excludes silt, culm, refuse bank, slurry dam, and dredge production except for Pennsylvania anthracite. Excludes mines producing less than 10,000 short tons of coal during the year.

³ Includes all employees engaged in production, preparation, processing, development, maintenance, repair, shop or yard work at mining operations. Excludes office workers. Includes mining operations management and all technical and engineering personnel.

⁴ Calculated by dividing total coal production by the total direct labor hours worked by all mine employees identified in footnote 3 above.

⁵ Calculated by multiplying average production per miner per hour by the average length of a miner shift.

⁶ District 24 is the anthracite-producing district in Pennsylvania. Districts 1-23 represent the total U.S. production of bituminous, subbituminous coal, and lignite. See Appendix C.

Note: Total may not equal sum of components because of independent rounding.

Source: Energy Information Administration, Form EIA-7A, "Coal Production Report."

Table 32. U.S. Underground Coal Mining Productivity by District, 1989

Coal-Producing District	Number of Mining Operations ^{1 2}	Coal Production ² (thousand short tons)	Average Number of Miners Working Daily ³	Average Number of Days Worked During the Year	Average Production per Miner per Hour ⁴ (short tons)	Average Production per Miner per Shift ⁵ (short tons)
District 1	60	21,612	5,907	233	1.91	16.08
District 2	33	23,576	4,700	223	2.59	20.82
District 3	107	34,859	6,275	220	2.71	22.57
District 4	20	10,824	2,953	228	2.00	17.76
District 6	4	7,921	1,452	253	2.49	21.56
District 7	112	14,938	3,567	195	2.32	19.25
District 8	1,271	166,042	37,506	205	2.38	19.75
District 9	34	23,321	4,166	218	3.13	27.15
District 10	35	39,328	8,084	238	2.41	20.35
District 11	7	2,519	521	223	2.47	20.98
District 12	1	36	15	121	2.06	19.58
District 13	32	17,051	4,625	212	1.98	16.18
District 15	1	40	36	86	1.28	12.15
District 17	18	8,547	1,539	218	2.88	24.30
District 19	3	1,645	280	209	3.21	27.80
District 20	21	20,099	2,169	219	4.75	40.12
District 24 ⁶	20	259	193	256	.71	5.56
District 1-23⁶ Total	1,759	392,359	83,795	209	2.46	20.50
U.S. Total	1,779	392,618	83,988	209	2.46	20.45

¹ Includes preparation plants.

² Excludes silt, culm, refuse bank, slurry dam, and dredge production except for Pennsylvania anthracite. Excludes mines producing less than 10,000 short tons of coal during the year.

³ Includes all employees engaged in production, preparation, processing, development, maintenance, repair, shop or yard work at mining operations. Excludes office workers. Includes mining operations management and all technical and engineering personnel.

⁴ Calculated by dividing total coal production by the total direct labor hours worked by all mine employees identified in footnote 3 above.

⁵ Calculated by multiplying average production per miner per hour by the average length of a miner shift.

⁶ District 24 is the anthracite-producing district in Pennsylvania. Districts 1-23 represent the total U.S. production of bituminous, subbituminous coal, and lignite. See Appendix C.

Note: Total may not equal sum of components because of independent rounding.

Source: Energy Information Administration, Form EIA-7A, "Coal Production Report."

Table 33. U.S. Surface Coal Mining Productivity by District, 1989

Coal-Producing District	Number of Mining Operations ^{1 2}	Coal Production ² (thousand short tons)	Average Number of Miners Working Daily ³	Average Number of Days Worked During the Year	Average Production per Miner per Hour ⁴ (short tons)	Average Production per Miner per Shift ⁵ (short tons)
District 1	264	24,127	4,239	230	2.75	24.26
District 2	77	6,223	918	231	2.91	25.48
District 3	136	7,633	1,426	201	2.91	25.60
District 4	150	22,701	4,421	226	2.52	22.99
District 6	6	368	87	238	2.02	16.92
District 7	21	524	220	183	1.69	15.04
District 8	665	87,880	14,280	206	3.11	27.72
District 9	65	18,256	1,870	195	4.53	40.47
District 10	19	19,917	1,919	236	3.96	31.60
District 11	55	31,112	3,163	260	4.04	37.46
District 12	2	391	134	255	1.48	14.03
District 13	81	12,299	2,262	208	2.73	23.76
District 14	5	342	89	277	1.69	14.23
District 15	39	62,448	3,068	246	6.60	58.96
District 16	1	27	8	192	1.80	16.21
District 17	7	9,040	611	199	6.32	59.63
District 18	8	35,178	2,116	246	7.49	66.52
District 19	25	169,913	3,071	279	21.38	195.81
District 21	11	29,555	850	231	15.69	131.90
District 22	8	37,742	682	291	18.94	165.05
District 23	4	6,621	874	216	3.86	33.81
District 24 ⁶	83	2,630	1,201	246	1.19	9.43
District 1-23⁶ Total	1,649	582,298	46,308	217	5.70	50.67
U.S. Total	1,732	584,929	47,509	218	5.81	49.56

¹ Includes preparation plants.

² Excludes silt, culm, refuse bank, slurry dam, and dredge production except for Pennsylvania anthracite. Excludes mines producing less than 10,000 short tons of coal during the year.

³ Includes all employees engaged in production, preparation, processing, development, maintenance, repair, shop or yard work at mining operations. Excludes office workers. Includes mining operations management and all technical and engineering personnel.

⁴ Calculated by dividing total coal production by the total direct labor hours worked by all mine employees identified in footnote 3 above.

⁵ Calculated by multiplying average production per miner per hour by the average length of a miner shift.

⁶ District 24 is the anthracite-producing district in Pennsylvania. Districts 1-23 represent the total U.S. production of bituminous, subbituminous coal, and lignite. See Appendix C.

Note: Total may not equal sum of components because of independent rounding.

Source: Energy Information Administration, Form EIA-7A, "Coal Production Report."

Table 34. Average Number of Miners Working Daily¹ at U.S. Coal Mines² by State and Type of Mining, 1988, 1989

Coal-Producing State	1989						1988		
	Type of Mining				Total		Average Number of Miners Working Daily		
	Underground		Surface		Average Number of Miners Working Daily	Percent Change from Previous Year ³	Type of Mining		Total
	Average Number of Miners Working Daily	Percent Change from Previous Year ³	Average Number of Miners Working Daily	Percent Change from Previous Year ³			Underground	Surface	
Alabama	4,371	-3.02	2,134	-9.23	6,505	-5.15	4,507	2,351	6,858
Alaska	-	-	87	-6.45	87	-6.45	-	93	93
Arizona	-	-	780	-20.73	780	-20.73	-	984	984
Arkansas	-	-	8	-63.64	8	-63.64	-	22	22
California	-	-	5	-37.50	5	-37.50	-	8	8
Colorado	1,490	4.63	529	-22.09	2,019	-3.99	1,424	679	2,103
Illinois	8,084	8.66	1,919	-25.68	10,003	-.19	7,440	2,582	10,022
Indiana	521	29.60	3,163	-14.65	3,684	-10.32	402	3,706	4,108
Iowa	15	-66.67	134	76.32	149	23.14	45	76	121
Kansas	-	-	165	-38.43	165	-38.43	-	268	268
Kentucky Total	20,752	1.36	9,904	-1.80	30,656	.32	20,473	10,086	30,559
Kentucky, Eastern	16,586	3.11	8,034	-2.75	24,620	1.13	16,085	8,261	24,346
Kentucky, Western	4,166	-5.06	1,870	2.47	6,036	-2.85	4,388	1,825	6,213
Louisiana	-	-	69	-11.54	69	-11.54	-	78	78
Maryland	282	-2.08	272	12.40	554	4.53	288	242	530
Missouri	-	-	428	-36.21	428	-36.21	-	671	671
Montana	-	-	682	-21.79	682	-21.79	-	872	872
New Mexico	49	-69.18	1,421	-.28	1,470	-7.20	159	1,425	1,584
North Dakota	-	-	850	-13.00	850	-13.00	-	977	977
Ohio	2,953	3.25	4,421	4.12	7,374	3.77	2,860	4,246	7,106
Oklahoma	36	-	378	-48.01	414	-43.05	-	727	727
Pennsylvania Total	9,578	-6.48	5,891	-6.95	15,469	-6.66	10,242	6,331	16,573
Anthracite	193	-18.57	1,201	-1.23	1,394	-4.06	237	1,216	1,453
Bituminous	9,385	-6.20	4,690	-8.31	14,075	-6.91	10,005	5,115	15,120
Tennessee	1,471	-12.23	386	-12.87	1,857	-12.36	1,676	443	2,119
Texas	-	-	2,109	-31.01	2,109	-31.01	-	3,057	3,057
Utah	2,169	-8.67	-	-	2,169	-8.67	2,375	-	2,375
Virginia	8,889	-1.74	1,482	-10.18	10,371	-3.04	9,046	1,650	10,696
Washington	-	-	787	9.92	787	9.92	-	716	716
West Virginia	23,048	-1.90	6,434	17.47	29,482	1.76	23,495	5,477	28,972
Wyoming	280	112.12	3,071	1.19	3,351	5.81	132	3,035	3,167
Appalachian Total⁴	67,178	-1.50	29,054	.18	96,232	-1.00	68,199	29,001	97,200
Interior Total⁴	12,822	4.46	10,243	-21.28	23,065	-8.79	12,275	13,012	25,287
Western Total⁴	3,988	-2.49	8,212	-6.57	12,200	-5.27	4,090	8,789	12,879
East of the Miss. River	79,949	-.60	36,006	-2.99	115,955	-1.35	80,429	37,114	117,543
West of the Miss. River	4,039	-2.32	11,503	-15.96	15,542	-12.80	4,135	13,688	17,823
U.S. Total	83,988	-.68	47,509	-6.48	131,497	-2.86	84,584	50,802	135,386

¹ Includes all employees engaged in production, preparation, processing, development, maintenance, repair, shop or yard work at mining operations. Excludes office workers. Includes mining operations management and all technical and engineering personnel.

² Excludes silt, culm, refuse bank, slurry dam, and dredge production except for Pennsylvania anthracite. Excludes mines producing less than 10,000 short tons of coal during the year.

³ Percent changes are calculated using unrounded data.

⁴ For a definition of coal-producing regions, see Appendix C.

Source: Energy Information Administration, Form EIA-7A, "Coal Production Report."

Table 35. Average Number of Miners Working Daily¹ at U.S. Coal Mines² by District and Type of Mining, 1988, 1989

Coal-Producing District	1989						1988		
	Type of Mining				Total		Average Number of Miners Working Daily		
	Underground		Surface		Average Number of Miners Working Daily	Percent Change from Previous Year ³	Type of Mining		Total
	Average Number of Miners Working Daily	Percent Change from Previous Year ³	Average Number of Miners Working Daily	Percent Change from Previous Year ³			Underground	Surface	
District 1	5,907	-4.63	4,239	-3.86	10,146	-4.31	6,194	4,409	10,603
District 2	4,700	-5.72	918	-23.50	5,618	-9.17	4,985	1,200	6,185
District 3	6,275	-.63	1,426	21.47	7,701	2.83	6,315	1,174	7,489
District 4	2,953	3.25	4,421	4.12	7,374	3.77	2,860	4,246	7,106
District 6	1,452	1.89	87	26.09	1,539	3.01	1,425	69	1,494
District 7	3,567	-8.28	220	17.02	3,787	-7.11	3,809	188	4,077
District 8	37,506	.09	14,280	1.80	51,786	.56	37,471	14,028	51,499
District 9	4,166	-5.06	1,870	2.47	6,036	-2.85	4,388	1,825	6,213
District 10	8,084	8.66	1,919	-25.68	10,003	-.19	7,440	2,582	10,022
District 11	521	29.60	3,163	-14.65	3,684	-10.32	402	3,706	4,108
District 12	15	-66.67	134	76.32	149	23.14	45	76	121
District 13	4,625	-4.11	2,262	-8.46	6,887	-5.58	4,823	2,471	7,294
District 14	-	-	89	-49.43	89	-49.43	-	176	176
District 15	36	-	3,068	-33.98	3,104	-33.20	-	4,647	4,647
District 16	-	-	8	-66.67	8	-66.67	-	24	24
District 17	1,539	-2.78	611	-22.66	2,150	-9.40	1,583	790	2,373
District 18	-	-	2,116	-7.27	2,116	-7.27	-	2,282	2,282
District 19	280	112.12	3,071	1.19	3,351	5.81	132	3,035	3,167
District 20	2,169	-8.67	-	-	2,169	-8.67	2,375	-	2,375
District 21	-	-	850	-13.00	850	-13.00	-	977	977
District 22	-	-	682	-21.79	682	-21.79	-	872	872
District 23	-	-	874	8.03	874	8.03	-	809	809
District 24 ⁴	193	-18.57	1,201	-1.23	1,394	-4.06	237	1,216	1,453
District 1-23⁴ Total	83,795	-.63	46,308	-6.61	130,103	-2.85	84,327	49,586	133,913
U.S. Total	83,988	-.68	47,509	-6.48	131,497	-2.86	84,564	50,802	135,366

¹ Includes all employees engaged in production, preparation, processing, development, maintenance, repair, shop or yard work at mining operations. Excludes office workers. Includes mining operations management and all technical and engineering personnel.

² Excludes silt, culm, refuse bank, slurry dam, and dredge production except for Pennsylvania anthracite. Excludes mines producing less than 10,000 short tons of coal during the year.

³ Percent changes are calculated using unrounded data.

⁴ District 24 is the anthracite-producing district in Pennsylvania. Districts 1-23 represent the total U.S. production of bituminous, subbituminous coal, and lignite. See Appendix C.

Source: Energy Information Administration, Form EIA-7A, "Coal Production Report."

Table 36. Average Number of Miners Working Daily¹ at U.S. Coal Mines² by Mine Production Range and Type of Mining, 1988, 1989

Mine Production Range (Thousand Short Tons)	1989						1988		
	Type of Mining				Total		Average Number of Miners Working Daily		
	Underground		Surface		Average Number of Miners Working Daily	Percent Change from Previous Year ³	Type of Mining		Total
	Average Number of Miners Working Daily	Percent Change from Previous Year ³	Average Number of Miners Working Daily	Percent Change from Previous Year ³			Underground	Surface	
Over 1000	34,895	6.97	16,973	-9.91	51,868	0.79	32,620	18,840	51,460
500 to 1000	11,393	-9.45	6,133	-9.11	17,526	-9.33	12,582	6,748	19,330
200 to 500	11,099	-4.25	8,046	3.54	19,145	-1.13	11,592	7,771	19,363
100 to 200	7,513	-9.61	4,447	-11.99	11,960	-10.51	8,312	5,053	13,365
50 to 100	5,832	-1.92	4,052	-3.91	9,884	-2.75	5,946	4,217	10,163
10 to 50	6,229	-7.83	4,610	-11.58	10,839	-9.46	6,758	5,214	11,972
Zero ⁴	7,027	4.04	3,248	9.77	10,275	5.79	6,754	2,959	9,713
U.S. Total	83,988	-6.68	47,509	-6.48	131,497	-2.86	84,564	50,802	135,366

¹ Includes all employees engaged in production, preparation, processing, development, maintenance, repair, shop or yard work at mining operations. Excludes office workers. Includes mining operations management and all technical and engineering personnel.

² Excludes silt, culm, refuse bank, slurry dam, and dredge production except for Pennsylvania anthracite. Excludes mines producing less than 10,000 short tons of coal during the year.

³ Percent changes are calculated using unrounded data.

⁴ Includes all employees at preparation plants and tipplers not co-located with a mine.

Source: Energy Information Administration, Form EIA-7A, "Coal Production Report."

**Table 37. U.S. Coal Mining¹ Productivity² by State
and Type of Mining, 1988, 1989**
(Short Tons of Coal Produced Per Miner Hour)

Coal-Producing State	1989						1988		
	Type of Mining				Total		Productivity		Total
	Underground		Surface		Productivity	Percent Change from Previous Year ³	Type of Mining		
	Productivity	Percent Change from Previous Year ³	Productivity	Percent Change from Previous Year ³			Underground	Surface	
Alabama	2.07	13.79	2.72	7.89	2.25	10.85	1.76	2.52	2.03
Alaska	-	-	7.73	-4.66	7.73	-4.66	-	8.11	8.11
Arizona	-	-	6.25	-3.10	6.25	-3.10	-	6.45	6.45
Arkansas	-	-	1.75	-77.22	1.75	-77.22	-	7.67	7.67
California	-	-	8.21	-45.02	8.21	-45.02	-	14.93	14.93
Colorado	2.91	12.39	6.74	3.53	4.08	3.48	2.59	6.51	3.94
Illinois	2.41	-81	3.96	19.30	2.77	3.73	2.43	3.32	2.67
Indiana	2.47	8.37	4.04	9.77	3.86	9.75	2.28	3.68	3.52
Iowa	2.06	-	1.48	-5.32	1.51	-2.73	0	1.56	1.55
Kansas	-	-	2.66	82.04	2.66	82.04	-	1.46	1.46
Kentucky Total	2.54	.48	3.23	2.79	2.78	1.47	2.53	3.14	2.74
Kentucky, Eastern	2.40	-.93	2.92	-7.09	2.58	-3.48	2.42	3.14	2.68
Kentucky, Western	3.13	9.57	4.53	44.59	3.62	22.75	2.86	3.13	2.95
Louisiana	-	-	15.04	-6.07	15.04	-6.07	-	16.01	16.01
Maryland	3.09	-9.89	2.90	13.51	3.00	-1.31	3.43	2.56	3.04
Missouri	-	-	3.43	28.06	3.43	28.06	-	2.68	2.68
Montana	-	-	18.94	-3.17	18.94	-3.17	-	19.56	19.56
New Mexico	1.03	-52.08	8.03	21.49	7.93	22.50	2.14	6.61	6.47
North Dakota	-	-	15.69	.35	15.69	.35	-	15.63	15.63
Ohio	2.00	2.38	2.52	-6.46	2.33	-2.82	1.95	2.70	2.39
Oklahoma	1.28	-	2.18	3.98	2.15	2.31	-	2.10	2.10
Pennsylvania Total	2.16	9.65	2.47	6.44	2.28	8.30	1.97	2.32	2.11
Anthracite	.71	-16.56	1.19	-6.89	1.12	-7.31	.86	1.28	1.21
Bituminous	2.19	9.86	2.76	8.98	2.39	9.46	1.99	2.53	2.18
Tennessee	1.58	8.94	2.20	9.52	1.72	9.00	1.45	2.00	1.57
Texas	-	-	7.31	12.18	7.31	12.18	-	6.52	6.52
Utah	4.75	14.20	-	-	4.75	14.20	4.16	-	4.16
Virginia	2.15	-5.71	2.59	3.88	2.21	-4.53	2.28	2.49	2.31
Washington	-	-	3.34	-6.58	3.34	-6.58	-	3.57	3.57
West Virginia	2.59	4.00	3.49	-1.17	2.77	3.66	2.49	3.53	2.68
Wyoming	3.21	-13.78	21.38	10.50	20.28	7.86	3.72	19.34	18.80
Appalachian Total ⁴	2.34	3.02	2.84	-.08	2.49	2.07	2.27	2.84	2.44
Interior Total ⁴	2.63	2.12	4.97	18.11	3.84	11.32	2.57	4.20	3.45
Western Total ⁴	3.93	10.58	14.64	6.89	11.63	5.63	3.55	13.70	11.01
East of the Miss. River	2.39	2.78	3.13	4.77	2.63	3.62	2.32	2.99	2.54
West of the Miss. River	3.92	10.17	11.86	10.53	10.21	8.84	3.55	10.73	9.38
U.S. Total	2.46	3.43	5.61	5.35	3.70	4.23	2.38	5.32	3.55

¹ Excludes silt, culm, refuse bank, slurry dam, and dredge production except for Pennsylvania anthracite. Excludes mines producing less than 10,000 short tons of coal during the year.

² Calculated by dividing total coal production by the total direct labor hours worked by all employees engaged in production, preparation, processing, development, maintenance, repair, and shop or yard work at mining operations. Excludes office workers. Includes mining operations management and all technical and engineering personnel.

³ Percent changes are calculated using unrounded data.

⁴ For a definition of coal-producing regions, see Appendix C.

Source: Energy Information Administration, Form EIA-7A, "Coal Production Report."

Table 38. U.S. Coal Mining¹ Productivity² by District and Type of Mining, 1988, 1989
(Short Tons of Coal Produced Per Miner Hour)

Coal-Producing District	1989						1988		
	Type of Mining				Total		Productivity		
	Underground		Surface		Productivity	Percent Change from Previous Year ³	Type of Mining		Total
	Productivity	Percent Change from Previous Year ³	Productivity	Percent Change from Previous Year ³			Underground	Surface	
District 1	1.91	11.18	2.75	10.74	2.28	11.41	1.72	2.48	2.04
District 2	2.59	9.09	2.91	7.90	2.65	8.38	2.37	2.70	2.44
District 3	2.71	.56	2.91	-19.82	2.74	-2.34	2.69	3.63	2.81
District 4	2.00	2.38	2.52	-6.46	2.33	-2.82	1.95	2.70	2.39
District 6	2.49	1.53	2.02	-12.09	2.47	.73	2.45	2.30	2.45
District 7	2.32	1.11	1.69	-11.07	2.29	.48	2.30	1.90	2.28
District 8	2.38	.47	3.11	-1.62	2.59	-.06	2.37	3.16	2.59
District 9	3.13	9.57	4.53	44.59	3.62	22.75	2.86	3.13	2.95
District 10	2.41	-.81	3.96	19.30	2.77	3.73	2.43	3.32	2.67
District 11	2.47	8.37	4.04	9.77	3.86	9.75	2.28	3.68	3.52
District 12	2.06	-	1.48	-5.32	1.51	-2.73	0	1.56	1.55
District 13	1.98	12.66	2.73	8.07	2.24	10.36	1.76	2.53	2.03
District 14	-	-	1.69	-30.00	1.69	-30.00	-	2.42	2.42
District 15	1.28	-	6.60	17.68	6.58	17.37	-	5.61	5.61
District 16	-	-	1.80	-4.73	1.80	-4.73	-	1.89	1.89
District 17	2.88	12.05	6.32	5.97	4.00	4.66	2.57	5.97	3.83
District 18	-	-	7.49	10.60	7.49	10.60	-	6.78	6.78
District 19	3.21	-13.78	21.38	10.50	20.28	7.86	3.72	19.34	18.80
District 20	4.75	14.20	-	-	4.75	14.20	4.16	-	4.16
District 21	-	-	15.69	.35	15.69	.35	-	15.63	15.63
District 22	-	-	18.94	-3.17	18.94	-3.17	-	19.56	19.56
District 23	-	-	3.86	-7.16	3.86	-7.16	-	4.16	4.16
District 24 ⁴	.71	-16.56	1.19	-6.89	1.12	-7.31	.86	1.28	1.21
District 1-23⁴ Total	2.46	3.43	5.70	5.49	3.73	4.28	2.38	5.41	3.58
U.S. Total	2.46	3.43	5.61	5.35	3.70	4.23	2.38	5.32	3.55

¹ Excludes silt, culm, refuse bank, slurry dam, and dredge production except for Pennsylvania anthracite. Excludes mines producing less than 10,000 short tons of coal during the year.

² Calculated by dividing total coal production by the total direct labor hours worked by all employees engaged in production, preparation, processing, development, maintenance, repair, and shop or yard work at mining operations. Excludes office workers. Includes mining operations management and all technical and engineering personnel.

³ Percent changes are calculated using unrounded data.

⁴ District 24 is the anthracite-producing district in Pennsylvania. Districts 1-23 represent the total U.S. production of bituminous, subbituminous coal, and lignite. See Appendix C.

Source: Energy Information Administration, Form EIA-7A, "Coal Production Report."

Recoverable Reserves

Large capacity off-road trucks are being used to haul Texas lignite.

Figure 7. Recoverable Coal Reserves at U.S. Mines by Type of Mining and by Region, 1980-1989

Source: Energy Information Administration, Form EIA-7A, "Coal Production Report."

**Table 39. Recoverable Coal Reserves¹ and Average Recovery Percentage²
at U.S. Mines³ by State and Type of Mining, 1989**
(Million Short Tons)

Coal-Producing State	Type of Mining				Total	
	Underground		Surface		Recoverable Coal Reserves	Average Recovery Percentage
	Recoverable Coal Reserves	Average Recovery Percentage	Recoverable Coal Reserves	Average Recovery Percentage		
Alabama	359.2	56.18	148.6	86.46	507.7	81.00
Alaska	-	-	w	w	w	w
Arizona	-	-	w	w	w	w
Arkansas	-	-	w	w	w	w
California	-	-	w	w	w	w
Colorado	476.9	61.57	185.1	88.00	662.1	69.50
Illinois	1,225.4	46.97	155.3	78.13	1,380.7	57.59
Indiana	78.0	53.00	396.9	82.56	474.9	79.48
Iowa	-	-	w	w	w	w
Kansas	-	-	27.6	78.25	27.6	78.25
Kentucky Total ⁴	1,012.0	62.75	501.2	82.98	1,513.2	70.49
Kentucky, Eastern	615.3	64.00	317.8	81.95	933.1	70.26
Kentucky, Western	396.7	48.33	183.3	87.03	580.1	72.05
Louisiana	-	-	w	w	w	w
Maryland	w	w	w	w	86.7	82.76
Missouri	-	-	w	w	w	w
Montana	-	-	1,513.7	91.00	1,513.7	91.00
New Mexico	w	w	w	w	1,410.7	86.71
North Dakota	-	-	1,360.6	89.30	1,360.6	89.30
Ohio	460.4	60.25	354.2	86.69	814.6	84.30
Oklahoma	w	w	w	w	23.7	84.60
Pennsylvania Total	824.5	65.50	359.6	80.73	1,184.1	77.25
Anthracite	34.1	71.25	26.0	61.38	60.1	63.51
Bituminous	790.4	64.73	333.6	83.54	1,124.0	79.20
Tennessee	w	w	w	w	71.6	69.54
Texas	-	-	1,135.3	83.43	1,135.3	83.43
Utah	518.6	56.16	-	-	518.6	56.16
Virginia	353.5	64.07	66.2	84.66	419.7	68.38
Washington	-	-	w	w	w	w
West Virginia	1,889.7	62.61	423.7	80.88	2,313.4	68.84
Wyoming	w	w	w	w	6,287.7	87.18
Appalachian Total⁴	w	63.48	w	82.67	6,330.9	72.63
Interior Total⁴	w	48.36	w	83.58	3,906.6	73.14
Western Total⁴	1,092.1	58.86	11,350.2	89.31	12,442.3	77.93
East of the Miss. River	6,300.2	62.48	2,466.4	82.77	8,766.6	72.42
West of the Miss. River	1,092.3	59.05	12,820.9	86.88	13,913.2	79.53
U.S. Total	7,392.5	62.34	15,287.3	83.22	22,679.8	72.96

¹ Represents the quantity of coal that can be recovered (i.e. mined) from existing coal reserves at reporting mines.

² Represents the percentage of coal that can be recovered from coal reserves at reporting mines, averaged for all mines in the reported geographic area.

³ Excludes silt, culm, refuse bank, slurry dam, and dredge operations. Excludes mines producing less than 10,000 short tons of coal during the year.

⁴ For a definition of coal-producing regions, see Appendix C.

⁵ Withheld to avoid disclosure of individual company data.

Note: Total may not equal sum of components because of independent rounding.

Source: Energy Information Administration, Form EIA-7A, "Coal Production Report."

**Table 40. Recoverable Coal Reserves¹ and Average Recovery Percentage²
at U.S. Mines³ by District and Type of Mining, 1989**
(Million Short Tons)

Coal-Producing District	Type of Mining				Total	
	Underground		Surface		Recoverable Coal Reserves	Average Recovery Percentage
	Recoverable Coal Reserves	Average Recovery Percentage	Recoverable Coal Reserves	Average Recovery Percentage		
District 1	w	w	w	w	811.1	79.78
District 2	468.2	67.91	36.9	81.87	505.1	77.64
District 3	567.2	66.00	22.9	82.46	590.1	74.30
District 4	460.4	60.25	354.2	86.69	814.6	84.30
District 6	w	w	w	w	w	w
District 7	194.5	63.57	2.6	75.86	197.2	64.98
District 8	1,560.8	63.36	782.5	81.59	2,343.3	68.88
District 9	396.7	48.33	183.3	87.03	580.1	72.05
District 10	1,225.4	46.97	155.3	78.13	1,380.7	57.59
District 11	78.0	53.00	396.9	82.56	474.9	79.48
District 12	-	-	w	w	w	w
District 13	364.1	60.31	155.8	86.68	519.9	78.32
District 14	-	-	w	w	w	w
District 15	w	w	w	w	1,448.7	83.24
District 16	-	-	w	w	w	w
District 17	492.9	62.40	184.0	87.17	676.9	69.48
District 18	-	-	1,889.4	91.00	1,889.4	91.00
District 19	w	w	w	w	6,287.7	87.18
District 20	518.6	56.16	-	-	518.6	56.16
District 21	-	-	1,360.6	89.30	1,360.6	89.30
District 22	-	-	1,513.7	91.00	1,513.7	91.00
District 23	-	-	w	w	w	w
District 24 ⁴	34.1	71.25	26.0	61.38	60.1	63.51
District 1-23⁴ Total	7,358.4	62.27	15,261.3	83.90	22,619.7	73.15
U.S. Total	7,392.5	62.34	15,287.3	83.22	22,679.8	72.96

¹ Represents the quantity of coal that can be recovered (i.e. mined) from existing coal reserves at reporting mines.

² Represents the percentage of coal that can be recovered from coal reserves at reporting mines, averaged for all mines in the reported geographic area.

³ Excludes silt, culm, refuse bank, slurry dam, and dredge operations. Excludes mines producing less than 10,000 short tons of coal during the year.

⁴ District 24 is the anthracite-producing district in Pennsylvania. Districts 1-23 represent the total U.S. production of bituminous, subbituminous coal, and lignite. See Appendix C.

w Withheld to avoid disclosure of individual company data.

Note: Total may not equal sum of components because of independent rounding.

Source: Energy Information Administration, Form EIA-7A, "Coal Production Report."

Table 41. Recoverable Coal Reserves¹ at U.S. Mines² by State and Type of Mining, 1988, 1989
(Million Short Tons)

Coal-Producing State	1989						1988		
	Type of Mining				Total		Recoverable Reserves		
	Underground	Percent Change from Previous Year ³	Surface	Percent Change from Previous Year ³	Recoverable Reserves	Percent Change from Previous Year ³	Underground	Surface	Total
Alabama	359.2	4.51	148.6	-11.01	507.7	-0.56	343.6	166.9	510.6
Alaska	-	-	w	w	w	w	-	w	w
Arizona	-	-	w	w	w	w	-	w	w
Arkansas	-	-	w	w	w	w	-	w	w
California	-	-	w	w	w	w	-	w	w
Colorado	476.9	6.36	185.1	-9.12	662.1	1.52	448.4	203.7	652.1
Illinois	1,225.4	.81	155.3	15.07	1,380.7	2.24	1,215.5	135.0	1,350.5
Indiana	78.0	25.35	396.9	.98	474.9	4.31	62.2	393.1	455.3
Iowa	-	-	w	w	w	w	-	w	w
Kansas	-	-	27.6	w	27.6	w	-	w	w
Kentucky Total	1,012.0	-10.62	501.2	-16.01	1,513.2	-12.48	1,132.2	596.8	1,729.0
Kentucky, Eastern	615.3	-17.63	317.8	-15.27	933.1	-16.84	747.0	375.2	1,122.1
Kentucky, Western	396.7	2.97	183.3	-17.27	580.1	-4.42	385.3	221.6	606.9
Louisiana	-	-	w	w	w	w	-	w	w
Maryland	w	w	w	w	86.7	-2.61	w	w	89.0
Missouri	-	-	w	w	w	w	-	131.1	131.1
Montana	-	-	1,513.7	-3.76	1,513.7	-3.76	-	1,572.9	1,572.9
New Mexico	w	w	w	w	1,410.7	-11.29	w	w	1,590.2
North Dakota	-	-	1,360.6	-2.33	1,360.6	-2.33	-	1,393.1	1,393.1
Ohio	460.4	11.01	354.2	-11.10	814.6	.17	414.7	398.4	813.2
Oklahoma	w	-	w	w	23.7	-33.17	-	35.5	35.5
Pennsylvania Total	824.5	-17.15	359.6	25.91	1,184.1	-7.55	995.2	285.6	1,280.8
Anthracite	34.1	10.39	26.0	-3.44	60.1	3.96	30.9	26.9	57.8
Bituminous	790.4	-18.03	333.6	28.96	1,124.0	-8.09	964.3	258.7	1,223.0
Tennessee	w	w	w	w	71.6	-35.96	w	w	111.8
Texas	-	-	1,135.3	-2.73	1,135.3	-2.73	-	1,167.2	1,167.2
Utah	518.6	-3.49	-	-	518.6	-3.49	537.4	-	537.4
Virginia	353.5	2.54	66.2	-5.57	419.7	2.03	344.7	66.6	411.3
Washington	-	-	w	w	w	w	-	w	w
West Virginia	1,889.7	-4.95	423.7	11.58	2,313.4	-2.30	1,988.1	379.7	2,367.8
Wyoming	w	w	w	w	6,287.7	-2.45	w	w	6,445.9
Appalachian Total⁴	w	w	w	w	6,330.9	-5.60	w	w	6,706.6
Interior Total⁴	w	w	w	w	3,906.6	-1.81	w	w	3,978.6
Western Total⁴	1,092.1	5.14	11,350.2	-4.27	12,442.3	-3.51	1,038.7	11,856.7	12,895.4
East of the Miss. River	6,300.2	-5.00	2,486.4	-8.6	8,786.6	-3.87	6,631.5	2,487.7	9,119.3
West of the Miss. River	1,092.3	5.17	12,820.9	-4.48	13,913.2	-3.79	1,038.7	13,422.6	14,461.3
U.S. Total	7,392.5	-3.62	15,287.3	-3.92	22,679.8	-3.82	7,670.2	15,910.3	23,580.6

¹ Represents the quantity of coal that can be recovered (i.e. mined) from existing coal reserves at reporting mines.

² Excludes silt, culm, refuse bank, slurry dam, and dredge operations. Excludes mines producing less than 10,000 short tons of coal during the year.

³ Percent changes are calculated using unrounded data.

⁴ For a definition of coal-producing regions, see Appendix C.

⁵ Withheld to avoid disclosure of individual company data.

Note: Total may not equal sum of components because of independent rounding.

Source: Energy Information Administration, Form EIA-7A, "Coal Production Report."

Table 42. Recoverable Coal Reserves¹ at U.S. Mines² by District and Type of Mining, 1988, 1989
(Million Short Tons)

Coal-Producing District	1989						1988		
	Type of Mining				Total		Recoverable Reserves		
	Underground	Percent Change from Previous Year ³	Surface	Percent Change from Previous Year ³	Recoverable Reserves	Percent Change from Previous Year ³	Underground	Surface	Total
District 1	w	w	w	w	811.1	4.55	w	w	775.8
District 2	468.2	-17.16	36.9	-14.55	505.1	-16.98	565.2	43.1	608.4
District 3	567.2	-8.98	22.9	-20.11	590.1	-9.79	623.2	31.0	654.2
District 4	460.4	11.01	354.2	11.10	814.6	.17	414.7	398.4	813.2
District 6	w	w	w	w	w	w	w	w	w
District 7	194.5	3.47	2.6	-19.60	197.2	3.07	188.0	3.3	191.3
District 8	1,560.8	-12.53	782.5	-1.69	2,343.3	-9.19	1,784.5	795.9	2,580.4
District 9	396.7	2.97	183.3	-17.27	580.1	-4.42	385.3	221.6	606.9
District 10	1,225.4	.81	155.3	15.07	1,380.7	2.24	1,215.5	135.0	1,350.5
District 11	78.0	25.35	396.9	.98	474.9	4.31	62.2	393.1	455.3
District 12	-	-	w	w	w	w	-	w	w
District 13	364.1	4.50	155.8	-11.63	519.9	-.92	348.4	176.3	524.7
District 14	-	-	w	w	w	w	-	5.6	5.6
District 15	w	-	w	w	1,448.7	-4.01	-	1,509.3	1,509.3
District 16	-	-	w	w	w	w	-	w	w
District 17	492.9	4.79	184.0	-5.01	676.9	1.93	470.4	193.7	664.1
District 18	-	-	1,889.4	-8.87	1,889.4	-8.87	-	2,073.3	2,073.3
District 19	w	w	w	w	6,287.7	-2.45	w	w	6,445.9
District 20	518.6	-3.49	-	-	518.6	-3.49	537.4	-	537.4
District 21	-	-	1,360.6	-2.33	1,360.6	-2.33	-	1,393.1	1,393.1
District 22	-	-	1,513.7	-3.76	1,513.7	-3.76	-	1,572.9	1,572.9
District 23	-	-	w	w	w	w	-	w	w
District 24 ⁴	34.1	10.39	26.0	-3.44	60.1	3.96	30.9	26.9	57.8
District 1-23⁴ Total	7,358.4	-3.68	15,261.3	-3.92	22,619.7	-3.84	7,639.3	15,883.4	23,522.7
U.S. Total	7,392.5	-3.62	15,267.3	-3.92	22,679.8	-3.82	7,670.2	15,910.3	23,580.6

¹ Represents the quantity of coal that can be recovered (i.e. mined) from existing coal reserves at reporting mines.

² Excludes silt, culm, refuse bank, slurry dam, and dredge operations. Excludes mines producing less than 10,000 short tons of coal during the year.

³ Percent changes are calculated using unrounded data.

⁴ District 24 is the anthracite-producing district in Pennsylvania. Districts 1-23 represent the total U.S. production of bituminous, subbituminous coal, and lignite. See Appendix C.

w Withheld to avoid disclosure of individual company data.

Note: Total may not equal sum of components because of independent rounding.

Source: Energy Information Administration, Form EIA-7A, "Coal Production Report."

Table 43. Recoverable Coal Reserves¹ at U.S. Mines² by Mine Production Range and Type of Mining, 1988, 1989
(Million Short Tons)

Mine Production Range (Thousand Short Tons)	1989						1988		
	Type of Mining				Total		Recoverable Reserves		
	Underground		Surface		Recoverable Reserves	Percent Change from Previous Year ³	Type of Mining		Total
	Recoverable Reserves	Percent Change from Previous Year ³	Recoverable Reserves	Percent Change from Previous Year ³			Underground	Surface	
Over 1000	4,512.0	2.33	12,899.8	-2.70	17,411.8	-1.44	4,409.3	13,257.2	17,666.5
500 to 1000	1,313.4	-1.40	563.9	-52.34	1,877.3	-25.36	1,332.1	1,183.1	2,515.2
200 to 500	639.8	-28.04	568.6	-15.73	1,208.3	-22.73	889.1	674.7	1,563.8
100 to 200	434.4	-29.14	503.9	86.10	938.3	6.16	613.0	270.8	883.8
50 to 100	188.5	-16.03	200.7	-36.59	389.2	-28.06	224.5	316.5	541.0
10 to 50	304.5	50.59	550.5	164.60	855.0	108.40	202.2	208.0	410.2
U.S. Total	7,392.5	-3.62	15,287.3	-3.02	22,679.8	-3.82	7,670.2	15,910.3	23,580.6

¹ Represents the quantity of coal that can be recovered (i.e. mined) from existing coal reserves at reporting mines.

² Excludes silt, culm, refuse bank, slurry dam, and dredge operations. Excludes mines producing less than 10,000 short tons of coal during the year.

³ Percent changes are calculated using unrounded data.

Note: Total may not equal sum of components because of independent rounding.

Source: Energy Information Administration, Form EIA-7A, "Coal Production Report."

Appendix A

Demonstrated Reserve Base

Auger mining is used when the overburden is too costly to excavate. These large-diameter drills are being driven into a coalbed in the side of a stripped pit.

Appendix A

Demonstrated Reserve Base

EIA has calculated a demonstrated reserve base (DRB) of coal in the United States as of January 1, 1990, that contains an estimated 472 billion short tons. At least 50 percent of the DRB total is considered to be recoverable with today's technologies. However, neither the DRB nor the recoverable portion of the DRB is meant to represent the precise amount of coal that can be profitably mined, given current laws, regulations, economics, and usages. Depletion adjustments for the calendar year were made using 1989 production data.

Widely distributed geographically, over half of the 1990 DRB occurs in States West of the Mississippi River (Table A1). Almost a third of the total DRB is presently considered attainable by surface mining, and nearly three-quarters of that surface-minable coal is located West of the Mississippi. Conversely, over half of the DRB coal currently requiring underground mining is located in States East of the Mississippi.

Coal ranks are also distributed differently among coal regions. About half of the DRB is bituminous coal, which is concentrated primarily in the States East of

the Mississippi. Subbituminous coal accounts for 38 percent of the DRB and is all located West of the Mississippi, primarily in the Rocky Mountain and Pacific Northwest States. Nearly 10 percent of the DRB is lignite, almost all of which is located in the West. Only 1.6 percent of the DRB is anthracite, which is concentrated almost entirely in northeastern Pennsylvania.

Detailed data by State, coal rank, and potential method of mining are presented in Tables A1 through A4. All tables include the previous DRB estimates (as of January 1, 1989) for comparison. No new data sources or adjustments based on changes in DRB criteria or data analysis were used in the 1990 DRB. The differences between 1989 and 1990 data are based on depletion adjustments using production in 1989.

The Explanatory Notes section (Appendix D) includes a summary of all adjustments, except for normal annual depletion adjustments, performed on DRB data since EIA took over DRB responsibilities in 1977. Also described there are plans for a new program to develop improved DRB and reserves data.

Table A1. Demonstrated Reserve Base of Coal by Rank
(Million Short Tons)

Coal Producing Region and State	Anthracite		Bituminous		Subbituminous		Lignite		Total	
	1989	1990	1989	1990	1989	1990	1989	1990	1989	1990
Alabama	-	-	3,822.0	3,774.8	-	-	1,083.0	1,083.0	4,905.0	4,857.8
Alaska	-	-	697.5	697.5	5,430.2	5,428.2	14.0	14.0	6,141.7	6,139.7
Arizona	-	-	281.6	286.6	-	-	-	-	281.6	286.6
Arkansas	104.1	104.1	287.7	287.6	-	-	25.4	25.4	417.1	417.0
Colorado	25.5	25.5	8,923.0	8,903.4	3,906.8	3,898.7	4,189.9	4,189.9	17,045.2	17,017.4
Georgia	-	-	3.2	3.2	-	-	-	-	3.2	3.2
Idaho	-	-	4.4	4.4	-	-	-	-	4.4	4.4
Illinois	-	-	78,434.9	78,331.3	-	-	-	-	78,434.9	78,331.3
Indiana	-	-	10,243.1	10,199.2	-	-	-	-	10,243.1	10,199.2
Iowa	-	-	2,191.6	2,191.0	-	-	-	-	2,191.6	2,191.0
Kansas	-	-	979.3	978.3	-	-	-	-	979.3	978.3
Kentucky Total	-	-	29,926.5	29,643.0	-	-	-	-	29,926.5	29,643.0
Kentucky, Eastern	-	-	9,439.1	9,225.1	-	-	-	-	9,439.1	9,225.1
Kentucky, Western	-	-	20,487.4	20,417.9	-	-	-	-	20,487.4	20,417.9
Louisiana	-	-	-	-	-	-	495.3	491.6	495.3	491.6
Maryland	-	-	768.0	762.4	-	-	-	-	768.0	762.4
Michigan	-	-	127.7	127.7	-	-	-	-	127.7	127.7
Missouri	-	-	6,011.5	6,007.3	-	-	-	-	6,011.5	6,007.3
Montana	-	-	1,385.4	1,385.4	102,912.7	102,865.9	15,762.6	15,762.2	120,060.7	120,013.5
New Mexico	2.3	2.3	1,977.4	1,961.8	2,537.2	2,523.2	-	-	4,516.9	4,487.2
North Carolina	-	-	10.7	10.7	-	-	-	-	10.7	10.7
North Dakota	-	-	-	-	-	-	9,700.4	9,663.4	9,700.4	9,663.4
Ohio	-	-	18,565.5	18,515.3	-	-	-	-	18,565.5	18,515.3
Oklahoma	-	-	1,593.3	1,591.1	-	-	-	-	1,593.3	1,591.1
Oregon	-	-	-	-	17.5	17.5	-	-	17.5	17.5
Pennsylvania Total	7,061.0	7,057.7	22,290.5	22,177.1	-	-	-	-	29,351.4	29,234.8
Anthracite	7,061.0	7,057.7	-	-	-	-	-	-	7,061.0	7,057.7
Bituminous	-	-	22,290.5	22,177.1	-	-	-	-	22,290.5	22,177.1
South Dakota	-	-	-	-	-	-	366.1	366.1	366.1	366.1
Tennessee	-	-	867.5	855.9	-	-	-	-	867.5	855.9
Texas	-	-	-	-	-	-	13,469.0	13,402.1	13,469.0	13,402.1
Utah	-	-	6,216.9	6,176.7	1.1	1.1	-	-	6,218.0	6,177.8
Virginia	125.5	125.5	2,667.2	2,586.4	-	-	-	-	2,792.6	2,711.9
Washington	-	-	303.7	303.7	1,119.2	1,113.1	8.1	8.1	1,431.0	1,424.8
West Virginia	-	-	37,666.1	37,389.2	-	-	-	-	37,666.1	37,389.2
Wyoming	-	-	4,412.6	4,408.8	64,041.0	63,829.1	-	-	68,453.6	68,237.8
Appalachian Total¹	7,186.5	7,183.2	96,099.8	95,300.1	-	-	1,083.0	1,083.0	104,369.3	103,566.4
Interior Total¹	104.1	104.1	120,356.5	120,131.3	-	-	13,989.7	13,919.0	134,450.2	134,154.3
Western Total^{1,2}	27.8	27.8	24,202.5	24,108.3	179,965.5	179,676.5	30,041.0	30,003.7	234,236.8	233,816.3
East of the Miss. River	7,186.5	7,183.2	205,392.9	204,376.2	-	-	1,083.0	1,083.0	213,662.4	212,642.4
West of the Miss. River	131.9	131.9	35,265.9	35,183.6	179,965.5	179,676.5	44,030.7	43,922.6	259,394.0	258,894.6
U.S. Total	7,318.3	7,315.1	240,658.9	239,539.7	179,965.5	179,676.5	45,113.7	45,005.6	473,056.3	471,537.0

¹ For a definition of coal-producing regions, see Appendix C.

² The 1989 Western Region totals, as published in *Coal Production 1988*, did not include the subbituminous data for Oregon or the lignite data for South Dakota.

Note: Total may not equal sum of components because of independent rounding. Data are reported as of the first day of the year.

Source: State geological and mineral resource surveys, and other geological reports.

Table A2. Demonstrated Reserve Base of Coal by Potential Method of Mining
(Million Short Tons)

Coal Producing Region and State	Underground		Surface		Total	
	1989	1990	1989	1990	1989	1990
Alabama	1,555.7	1,523.0	3,349.4	3,334.8	4,905.0	4,857.8
Alaska	5,423.0	5,423.0	718.7	716.7	6,141.7	6,139.7
Arizona	101.6	101.6	180.0	165.1	281.6	266.6
Arkansas	272.5	272.5	144.6	144.5	417.1	417.0
Colorado	12,185.4	12,168.4	4,859.8	4,849.0	17,045.2	17,017.4
Georgia	1.9	1.9	1.3	1.3	3.2	3.2
Idaho	4.4	4.4	-	-	4.4	4.4
Illinois	62,979.7	62,901.1	15,455.2	15,430.2	78,434.9	78,331.3
Indiana	8,906.7	8,901.7	1,336.4	1,297.5	10,243.1	10,199.2
Iowa	1,732.6	1,732.5	459.0	458.5	2,191.6	2,191.0
Kansas	-	-	979.3	978.3	979.3	978.3
Kentucky Total	24,311.2	24,113.1	5,615.3	5,529.9	29,926.5	29,643.0
Kentucky, Eastern	7,675.3	7,523.8	1,763.8	1,701.3	9,439.1	9,225.1
Kentucky, Western	16,635.9	16,589.3	3,851.5	3,828.6	20,487.4	20,417.9
Louisiana	-	-	495.3	491.6	495.3	491.6
Maryland	677.3	673.7	90.7	88.8	768.0	762.4
Michigan	123.1	123.1	4.6	4.6	127.7	127.7
Missouri	1,479.1	1,479.1	4,532.4	4,528.2	6,011.5	6,007.3
Montana	70,958.7	70,958.7	49,102.0	49,054.8	120,060.7	120,013.5
New Mexico	2,121.9	2,121.8	2,395.0	2,365.5	4,516.9	4,487.2
North Carolina	10.7	10.7	-	-	10.7	10.7
North Dakota	-	-	9,700.4	9,663.4	9,700.4	9,663.4
Ohio	12,841.6	12,819.9	5,724.0	5,695.4	18,565.5	18,515.3
Oklahoma	1,238.3	1,238.2	355.0	352.9	1,593.3	1,591.1
Oregon	14.5	14.5	2.9	2.9	17.5	17.5
Pennsylvania Total	27,993.9	27,914.7	1,357.5	1,320.1	29,351.4	29,234.8
Anthracite	6,954.8	6,953.8	106.1	103.9	7,061.0	7,057.7
Bituminous	21,039.1	20,960.9	1,251.4	1,216.2	22,290.5	22,177.1
South Dakota	-	-	366.1	366.1	366.1	366.1
Tennessee	568.9	559.5	298.6	296.3	867.5	855.9
Texas	-	-	13,469.0	13,402.1	13,469.0	13,402.1
Utah	5,950.1	5,909.9	267.9	267.9	6,218.0	6,177.8
Virginia	2,034.2	1,987.1	758.5	749.8	2,792.6	2,711.9
Washington	1,332.3	1,332.3	98.7	92.6	1,431.0	1,424.8
West Virginia	32,761.4	32,535.0	4,904.7	4,854.3	37,666.1	37,389.2
Wyoming	42,550.0	42,546.7	25,903.6	25,891.2	68,453.6	68,237.8
Appalachian Total¹	86,120.8	85,524.2	18,248.5	18,042.2	104,369.3	103,566.4
Interior Total¹	93,368.0	93,237.5	41,082.3	40,916.9	134,450.2	134,154.3
Western Total^{1,2}	140,641.8	140,581.2	93,595.0	93,235.1	234,236.8	233,816.3
East of the Miss. River	174,766.3	174,039.3	38,896.1	38,603.0	213,662.4	212,642.4
West of the Miss. River	145,364.3	145,303.5	114,029.7	113,591.1	259,394.0	258,894.6
U.S. Total	320,130.5	319,342.8	152,925.8	152,194.1	473,056.3	471,537.0

¹ For a definition of coal-producing regions, see Appendix C.

² The 1989 Western Region totals, as published in *Coal Production 1988*, did not include the subbituminous data for Oregon or the lignite data for South Dakota.

Note: Total may not equal sum of components because of independent rounding. Data are reported as of the first day of the year.

Source: State geological and mineral resource surveys, and other geological reports.

Table A3. Demonstrated Reserve Base of Coal by Rank, Potentially Movable by Underground Methods
(Million Short Tons)

Coal Producing Region and State	Anthracite		Bituminous		Subbituminous		Lignite		Total	
	1989	1990	1989	1990	1989	1990	1989	1990	1989	1990
Alabama	-	-	1,555.7	1,523.0	-	-	-	-	1,555.7	1,523.0
Alaska	-	-	617.0	617.0	4,805.9	4,805.9	-	-	5,423.0	5,423.0
Arizona	-	-	101.6	101.6	-	-	-	-	101.6	101.6
Arkansas	88.6	88.6	183.9	183.9	-	-	-	-	272.5	272.5
Colorado	25.5	25.5	8,322.9	8,305.9	3,837.0	3,837.0	-	-	12,185.4	12,168.4
Georgia	-	-	1.9	1.9	-	-	-	-	1.9	1.9
Idaho	-	-	4.4	4.4	-	-	-	-	4.4	4.4
Illinois	-	-	32,979.7	62,901.1	-	-	-	-	62,979.7	62,901.1
Indiana	-	-	8,906.7	8,901.7	-	-	-	-	8,906.7	8,901.7
Iowa	-	-	1,732.6	1,732.5	-	-	-	-	1,732.6	1,732.5
Kentucky Total	-	-	24,311.2	24,113.1	-	-	-	-	24,311.2	24,113.1
Kentucky, Eastern	-	-	7,675.3	7,523.8	-	-	-	-	7,675.3	7,523.8
Kentucky, Western	-	-	16,635.9	16,589.3	-	-	-	-	16,635.9	16,589.3
Maryland	-	-	677.3	673.7	-	-	-	-	677.3	673.7
Michigan	-	-	123.1	123.1	-	-	-	-	123.1	123.1
Missouri	-	-	1,479.1	1,479.1	-	-	-	-	1,479.1	1,479.1
Montana	-	-	1,385.4	1,385.4	69,573.3	69,573.3	-	-	70,958.7	70,958.7
New Mexico	2.3	2.3	1,230.6	1,230.5	889.0	889.0	-	-	2,121.9	2,121.8
North Carolina	-	-	10.7	10.7	-	-	-	-	10.7	10.7
Ohio	-	-	12,841.6	12,819.9	-	-	-	-	12,841.6	12,819.9
Oklahoma	-	-	1,238.3	1,238.2	-	-	-	-	1,238.3	1,238.2
Oregon	-	-	-	-	14.5	14.5	-	-	14.5	14.5
Pennsylvania Total	6,954.8	6,953.8	21,039.1	20,960.9	-	-	-	-	27,993.9	27,914.7
Anthracite	6,954.8	6,953.8	-	-	-	-	-	-	6,954.8	6,953.8
Bituminous	-	-	21,039.1	20,960.9	-	-	-	-	21,039.1	20,960.9
Tennessee	-	-	568.9	559.5	-	-	-	-	568.9	559.5
Utah	-	-	5,949.0	5,908.8	1.1	1.1	-	-	5,950.1	5,909.9
Virginia	125.5	125.5	1,908.7	1,836.6	-	-	-	-	2,034.2	1,962.1
Washington	-	-	303.7	303.7	1,028.6	1,028.6	-	-	1,332.3	1,332.3
West Virginia	-	-	32,761.4	32,535.0	-	-	-	-	32,761.4	32,535.0
Wyoming	-	-	3,887.0	3,883.7	38,663.0	38,663.0	-	-	42,550.0	42,546.7
Appalachian Total¹	7,080.3	7,079.3	79,040.5	79,144.9	-	-	-	-	86,120.8	85,524.2
Interior Total¹	88.6	88.6	93,279.4	93,148.9	-	-	-	-	93,368.0	93,237.5
Western Total^{1,2}	27.3	27.8	21,801.6	21,741.0	118,812.4	118,812.4	-	-	140,641.8	140,581.2
East of the Miss. River	7,080.3	7,079.3	167,685.9	166,960.1	-	-	-	-	174,766.3	174,039.3
West of the Miss. River	116.4	116.4	26,435.5	26,374.7	118,812.4	118,812.4	-	-	145,364.3	145,303.5
U.S. Total	7,196.7	7,195.7	194,121.4	193,144.8	118,812.4	118,812.4	-	-	320,130.5	319,342.8

¹ For a definition of coal-producing regions, see Appendix C.

² The 1989 Western Region totals, as published in *Coal Production 1988*, did not include the subbituminous data for Oregon or the lignite data for South Dakota.

Note: Total may not equal sum of components because of independent rounding. Data are reported as of the first day of the year.

Source: State geological and mineral resource surveys, and other geological reports.

Table A4. Demonstrated Reserve Base of Coal by Rank, Potentially Mined by Surface Methods
(Million Short Tons)

Coal Producing Region and State	Anthracite		Bituminous		Subbituminous		Lignite		Total	
	1989	1990	1989	1990	1989	1990	1989	1990	1989	1990
Alabama	-	-	2,266.4	2,251.8	-	-	1,083.0	1,083.0	3,349.4	3,334.8
Alaska	-	-	80.5	80.5	624.2	622.2	14.0	14.0	718.7	716.7
Arizona	-	-	180.0	165.1	-	-	-	-	180.0	165.1
Arkansas	15.5	15.5	103.8	103.7	-	-	25.4	25.4	144.6	144.5
Colorado	-	-	600.1	597.5	69.8	61.7	4,189.9	4,189.9	4,859.8	4,849.0
Georgia	-	-	1.3	1.3	-	-	-	-	1.3	1.3
Illinois	-	-	15,455.2	15,430.2	-	-	-	-	15,455.2	15,430.2
Indiana	-	-	1,336.4	1,297.5	-	-	-	-	1,336.4	1,297.5
Iowa	-	-	459.0	458.5	-	-	-	-	459.0	458.5
Kansas	-	-	979.3	978.3	-	-	-	-	979.3	978.3
Kentucky Total	-	-	5,615.3	5,529.9	-	-	-	-	5,615.3	5,529.9
Kentucky, Eastern	-	-	1,763.8	1,701.3	-	-	-	-	1,763.8	1,701.3
Kentucky, Western	-	-	3,851.5	3,828.6	-	-	-	-	3,851.5	3,828.6
Louisiana	-	-	-	-	-	-	495.3	491.6	495.3	491.6
Maryland	-	-	90.7	88.8	-	-	-	-	90.7	88.8
Michigan	-	-	4.6	4.6	-	-	-	-	4.6	4.6
Missouri	-	-	4,532.4	4,528.2	-	-	-	-	4,532.4	4,528.2
Montana	-	-	-	-	33,339.4	33,292.6	15,762.6	15,762.2	49,102.0	49,054.8
New Mexico	-	-	746.9	731.3	1,648.2	1,634.2	-	-	2,395.0	2,365.5
North Dakota	-	-	-	-	-	-	9,700.4	9,663.4	9,700.4	9,663.4
Ohio	-	-	5,724.0	5,695.4	-	-	-	-	5,724.0	5,695.4
Oklahoma	-	-	355.0	352.9	-	-	-	-	355.0	352.9
Oregon	-	-	-	-	2.9	2.9	-	-	2.9	2.9
Pennsylvania Total	106.1	103.9	1,251.4	1,216.2	-	-	-	-	1,357.5	1,320.1
Anthracite	106.1	103.9	-	-	-	-	-	-	106.1	103.9
Bituminous	-	-	1,251.4	1,216.2	-	-	-	-	1,251.4	1,216.2
South Dakota	-	-	-	-	-	-	366.1	366.1	366.1	366.1
Tennessee	-	-	298.6	296.3	-	-	-	-	298.6	296.3
Texas	-	-	-	-	-	-	13,469.0	13,402.1	13,469.0	13,402.1
Utah	-	-	267.9	267.9	-	-	-	-	267.9	267.9
Virginia	-	-	758.5	749.8	-	-	-	-	758.5	749.8
Washington	-	-	-	-	90.6	84.5	8.1	8.1	98.7	92.6
West Virginia	-	-	4,904.7	4,854.3	-	-	-	-	4,904.7	4,854.3
Wyoming	-	-	525.6	525.1	25,378.0	25,166.1	-	-	25,903.6	25,691.2
Appalachian Total¹	106.1	103.9	17,059.4	16,855.2	-	-	1,083.0	1,083.0	18,248.5	18,042.2
Interior Total¹	15.5	15.5	27,077.1	26,982.4	-	-	13,989.7	13,919.0	41,082.3	40,916.9
Western Total^{1,2}	-	-	2,400.0	2,367.3	61,153.1	60,864.2	30,041.0	30,003.7	93,595.0	93,235.1
East of the Miss. River	106.1	103.9	37,707.0	37,416.1	-	-	1,083.0	1,083.0	38,896.1	38,603.0
West of the Miss. River	15.5	15.5	8,830.5	8,788.9	61,153.1	60,864.2	44,030.7	43,922.6	114,029.7	113,591.1
U.S. Total	121.6	119.4	46,537.5	46,205.0	61,153.1	60,864.2	45,113.7	45,005.6	152,925.8	152,194.1

¹ For a definition of coal-producing regions, see Appendix C.

² The 1989 Western Region totals, as published in *Coal Production 1988*, did not include the subbituminous data for Oregon or the lignite data for South Dakota.

Note: Total may not equal sum of components because of independent rounding. Data are reported as of the first day of the year.

Source: State geological and mineral resource surveys, and other geological reports.

Appendix B

State Coal Facts

Appendix B

State Coal Facts

This appendix provides a ready reference of basic coal-related information for each coal-producing State, including detailed statistics for production, mining method, price, number of mines and miners, and consumption. Covering the period 1970 through 1989, the data show changes that have occurred since the oil embargo and the enactment of clean air standards in the early 1970's. Data on coal-fired electric generating units and coal deposits are shown for 1989. A map appears for each State, with the coal-producing counties shaded and coal-fired electric generating plants indicated if coal is the primary fuel used at the plant.

Since 1970, coal has gained importance as a source of energy in the United States, its share of total energy consumption rising from almost 19 percent in 1970 to 23 percent in 1989. Reflecting this growth, coal production rose from 613 million short tons in 1970 to 981 million short tons in 1989. Although States East of the Mississippi River have been the mainstay of U.S. coal production during the period, States West of the Mississippi River have gained importance as a source of

coal. Coal production West of the Mississippi River rose from 45 million short tons in 1970 to 382 million short tons in 1989. The magnitude of Western coal production is further emphasized in that Wyoming is now the leading producer for the second consecutive year. Of the seven States that reached record levels of production in 1989, five (Louisiana, New Mexico, Texas, Utah and Wyoming) are West of the Mississippi.

Coal consumption increased from 523 million short tons in 1970 to 889 million short tons in 1989. Virtually all of the increase was due to the greater use of coal to generate electricity. This is illustrated by the fact that in 1989, 86 percent of the total coal consumed was consumed by the electric utility industry, in contrast to 61 percent in 1970. As a source of the total electricity generated, the share represented by coal increased from 46 percent in 1970 to 56 percent in 1989. Texas is still the top coal-consuming State (91 million short tons), primarily for electric power generation, followed by Ohio (61 million short tons) and Pennsylvania (59 million short tons).

Table B1. Coal Production Trends by State
(Thousand Short Tons)

Coal-Producing Region and State	1982	1983	1984	1985	1986	1987	1988	1989
Alabama	26,556	23,812	27,088	27,797	25,826	25,540	26,518	27,992
Alaska	833	786	859	1,433	1,570	1,492	1,745	1,582
Arizona	12,364	11,404	11,522	9,625	11,556	11,379	12,398	11,935
Arkansas	161	88	82	80	167	84	276	70
California	-	-	-	71	-	46	54	41
Colorado	18,318	16,732	17,967	17,243	15,237	14,420	15,913	17,123
Georgia	14	187	125	-	-	-	-	-
Illinois	60,275	56,846	63,769	59,201	61,866	59,155	58,594	59,267
Indiana	31,783	31,835	37,555	33,316	32,852	34,208	31,271	33,641
Iowa	566	385	527	591	484	468	341	430
Kansas	1,412	1,271	1,328	994	1,486	2,021	737	856
Kentucky Total	150,215	131,217	159,541	152,272	153,933	165,192	157,852	167,389
Eastern	111,195	95,613	117,274	113,251	112,732	119,906	117,524	125,739
Western	39,020	35,602	42,267	39,021	41,201	45,285	40,328	41,649
Louisiana	-	-	-	207	2,254	2,751	2,889	2,983
Maryland	3,817	3,184	4,103	2,985	3,906	3,962	3,242	3,376
Missouri	5,341	4,982	6,733	5,571	4,687	4,292	4,169	3,378
Montana	27,890	28,930	33,000	33,290	33,978	34,399	38,881	37,742
New Mexico	19,944	20,415	21,279	22,203	21,496	19,131	21,803	23,702
North Dakota	17,855	19,190	22,112	26,873	25,640	25,142	29,731	29,566
Ohio	36,490	33,770	39,256	35,602	36,441	35,788	34,043	33,689
Oklahoma	4,797	3,694	4,640	3,337	3,048	2,870	2,136	1,753
Pennsylvania Total	79,359	69,828	77,494	71,408	71,648	70,423	70,645	70,596
Anthracite	4,588	4,089	4,162	4,708	4,292	3,560	3,555	3,348
Bituminous	74,771	65,739	73,332	66,699	67,356	66,863	67,091	67,248
Tennessee	7,450	6,640	7,313	7,446	6,870	6,442	6,510	6,480
Texas	34,818	38,947	41,145	45,459	48,590	50,529	52,281	53,854
Utah	17,029	11,768	12,323	12,780	14,269	16,508	18,163	20,102
Virginia	39,778	35,027	40,368	40,940	41,178	44,543	45,886	43,006
Washington	4,164	3,891	3,872	4,438	4,601	4,449	5,170	5,039
West Virginia	128,540	115,049	131,008	127,764	129,907	136,676	145,005	153,580
Wyoming	108,361	112,214	130,914	140,714	136,826	146,850	164,014	171,558
Appalachian Total¹	433,199	383,111	444,029	427,193	428,508	443,281	449,373	464,457
Interior Total¹	178,153	173,651	198,045	187,778	196,634	201,663	193,022	197,880
Western Total¹	226,758	225,329	253,846	268,669	265,172	273,818	307,871	318,391
East of the Miss. River	564,257	507,395	587,820	558,730	584,427	581,929	579,565	599,015
West of the Miss. River	273,853	274,897	308,301	324,908	325,887	336,833	370,700	381,714
U.S. Total	838,110	782,091	895,821	883,638	890,315	918,762	950,265	980,729

¹ For a definition of coal-producing regions, see Appendix C.

Note: Excludes silt, culm, refuse bank, slurry dam, and dredge production except for Pennsylvania anthracite. Total may not equal sum of components because of independent rounding. Coal data for 1989 have been revised and finalized.

Source: Energy Information Administration, Form EIA-6, "Coal Distribution Report"; and State mining agency coal production reports.

Table B2. Rankings for Coal Consumption, Reserves, and Production by Coal-Producing State

State	1989 Consumption					Demonstrated Reserve Base on January 1 1990	1989 Production		
	Electric Utilities	Coke Plants	Other Industrial	Residential and Commercial	Total		Underground	Surface	Total
Alabama	10	-	12	16	9	15	7	13	12
Alaska	26	-	-	-	27	13	-	21	23
Arizona	13	-	17	25	14	26	-	12	16
Arkansas	21	-	22	23	22	25	-	25	26
California	-	-	10	20	26	27	-	26	27
Colorado	14	-	21	15	15	8	9	14	15
Illinois	7	5	7	4	7	2	4	11	5
Indiana	4	1	2	3	4	10	11	6	10
Iowa	17	-	11	10	13	18	16	24	25
Kansas	16	-	25	22	19	21	-	23	24
Kentucky	6	8	13	7	6	5	2	2	2
Louisiana	20	-	16	26	21	24	-	18	21
Maryland	24	7	19	17	23	23	12	22	20
Missouri	8	-	15	5	10	14	-	17	19
Montana	22	-	24	18	24	1	-	5	8
New Mexico	15	-	26	21	16	16	14	9	13
North Dakota	11	-	1	11	8	11	-	8	11
Ohio	2	3	3	2	2	7	8	10	9
Oklahoma	18	-	20	24	17	19	15	20	22
Pennsylvania	3	2	5	1	3	6	3	7	4
Tennessee	12	11	6	8	12	22	10	19	17
Texas	1	-	4	19	1	9	-	3	6
Utah	19	9	18	6	18	12	6	-	14
Virginia	23	10	8	9	20	17	5	15	7
Washington	25	-	23	14	25	20	-	16	18
West Virginia	5	6	9	12	5	4	1	4	3
Wyoming	9	-	14	13	11	3	13	1	1

Sources: Energy Information Administration, *Coal Production*; *Quarterly Coal Report*; *Weekly Coal Production*; and *Coal Data: A Reference*.

Table B3. U.S. Coal Production Ranked by State, 1987-1989
(Thousand Short Tons)

Rank	1987		1988		1989	
	State	Tonnage	State	Tonnage	State	Tonnage
1.	Kentucky	165,192	Wyoming	164,014	Wyoming	171,558
2.	Wyoming	146,850	Kentucky	157,852	Kentucky	167,389
3.	West Virginia	136,676	West Virginia	145,005	West Virginia	153,580
4.	Pennsylvania	70,423	Pennsylvania	70,645	Pennsylvania	70,596
5.	Illinois	59,155	Illinois	58,594	Illinois	59,267
6.	Texas	50,529	Texas	52,281	Texas	53,854
7.	Virginia	44,543	Virginia	45,886	Virginia	43,006
8.	Ohio	35,788	Montana	38,881	Montana	37,742
9.	Montana	34,399	Ohio	34,043	Ohio	33,689
10.	Indiana	34,208	Indiana	31,271	Indiana	33,641
11.	Alabama	25,540	North Dakota	29,731	North Dakota	29,566
12.	North Dakota	25,142	Alabama	26,518	Alabama	27,992
13.	New Mexico	21,131	New Mexico	21,803	New Mexico	23,702
14.	Utah	16,508	Utah	18,163	Utah	20,102
15.	Colorado	14,420	Colorado	15,912	Colorado	17,123
16.	Arizona	11,379	Arizona	12,398	Arizona	11,935
17.	Tennessee	6,442	Tennessee	6,510	Tennessee	6,480
18.	Washington	4,449	Washington	5,170	Washington	5,039
19.	Missouri	4,292	Missouri	4,169	Missouri	3,378
20.	Maryland	3,962	Maryland	3,242	Maryland	3,376
21.	Oklahoma	2,870	Louisiana	2,889	Louisiana	2,983
22.	Louisiana	2,751	Oklahoma	2,136	Oklahoma	1,753
23.	Kansas	2,021	Alaska	1,745	Alaska	1,582
24.	Alaska	1,492	Kansas	737	Kansas	856
25.	Iowa	468	Iowa	341	Iowa	430
26.	Arkansas	84	Arkansas	276	Arkansas	70
27.	California	46	California	54	California	41
	U.S. Total	918,762	U.S. Total	950,265	U.S. Total	980,729

Source: Energy Information Administration, *Coal Production*, DOE/EIA-0118, various issues.

Table B4. U.S. Coal Consumption Ranked by State, 1987-1989
(Thousand Short Tons)

Rank	1987		1988		1989	
	State	Tonnage	State	Tonnage	State	Tonnage
1.	Texas	82,915	Texas	86,689	Texas	90,989
2.	Ohio	59,350	Ohio	61,086	Ohio	61,016
3.	Pennsylvania	55,305	Pennsylvania	58,639	Pennsylvania	58,526
4.	Indiana	52,335	Indiana	56,762	Indiana	58,203
5.	Michigan	35,865	West Virginia	36,435	West Virginia	37,186
6.	West Virginia	34,815	Michigan	35,355	Michigan	34,932
7.	Illinois	34,632	Kentucky	35,176	Kentucky	32,792
8.	Kentucky	32,023	Illinois	32,979	Illinois	32,374
9.	Georgia	29,126	Georgia	28,654	Georgia	27,918
10.	Alabama	26,632	North Dakota	28,028	North Dakota	27,401
11.	Tennessee	24,782	Alabama	26,365	Alabama	27,261
12.	Missouri	24,764	Missouri	26,119	Missouri	26,297
13.	Wyoming	24,399	Wyoming	25,424	Florida	25,447
14.	North Dakota	24,101	Tennessee	25,152	Wyoming	23,952
15.	Florida	23,644	Florida	24,595	Tennessee	23,496
16.	North Carolina	19,965	North Carolina	20,506	North Carolina	22,239
17.	Wisconsin	19,652	Wisconsin	20,038	Wisconsin	19,922
18.	Kansas	15,194	Minnesota	17,231	Minnesota	17,584
19.	Iowa	15,191	Iowa	16,114	Iowa	17,103
20.	Colorado	15,007	Colorado	15,860	Arizona	16,871
21.	Minnesota	14,504	Oklahoma	15,006	Colorado	16,393
22.	New Mexico	14,395	Kansas	14,951	New Mexico	15,295
23.	Oklahoma	13,476	New Mexico	14,715	Oklahoma	15,086
24.	Arizona	13,375	Arizona	14,525	Utah	15,044
25.	Virginia	13,227	Utah	14,513	Kansas	14,963
26.	Arkansas	12,066	Virginia	13,430	Virginia	14,279
27.	Utah	11,807	New York	12,955	New York	14,105
28.	South Carolina	11,701	Louisiana	12,848	Louisiana	12,471
29.	New York	11,471	Arkansas	12,555	South Carolina	11,981
30.	Maryland	11,311	South Carolina	11,937	Arkansas	11,547
31.	Louisiana	10,391	Maryland	11,757	Maryland	11,541
32.	Montana	7,730	Montana	10,634	Montana	10,458
33.	Nevada	6,920	Nevada	8,276	Nevada	7,667
34.	Nebraska	6,744	Nebraska	8,057	Nebraska	7,587
35.	Washington	5,819	Washington	5,929	Washington	5,843
36.	Mississippi	4,846	Mississippi	5,136	Massachusetts	4,841
37.	Massachusetts	4,487	Massachusetts	4,463	Mississippi	3,831
38.	New Jersey	3,434	New Jersey	3,295	New Jersey	3,545
39.	Delaware	2,710	Delaware	2,886	California	2,551
40.	California	1,934	South Dakota	2,591	South Dakota	2,541
41.	New Hampshire	1,176	California	2,209	Delaware	2,357
42.	South Dakota	1,101	New Hampshire	1,229	New Hampshire	1,183
43.	Connecticut	815	Connecticut	881	Connecticut	866
44.	Idaho	494	Alaska	727	Idaho	533
45.	Alaska	274	Idaho	527	Oregon	386
46.	Maine	273	Maine	277	Alaska	299
47.	Oregon	205	Oregon	176	Maine	271
48.	Dist Columbia	70	Rhode Island	175	Dist Columbia	60
49.	Hawaii	63	Hawaii	50	Hawaii	32
50.	Vermont	12	Dist Columbia	31	Rhode Island	27
51.	Rhode Island	5	Vermont	11	Vermont	9
	Unknown	411	Unknown	124	Unknown	581
	U.S. Total	836,941	U.S. Total	883,664	U.S. Total	889,491

Sources: Energy Information Administration, *Quarterly Coal Report*, DOE/EIA-0121, various issues.

Table B5. U.S. Demonstrated Reserve Base on January 1, 1990, by Mining Method and Ranked by State Total
(Million Short Tons)

	Underground	Surface	Total
1 Montana	70,958.7	49,054.8	120,013.5
2 Illinois	62,901.1	15,430.2	78,331.3
3 Wyoming	42,546.7	25,691.2	68,237.8
4 West Virginia	32,535.0	4,854.3	37,389.2
5 Kentucky	24,113.1	5,529.9	29,643.0
6 Pennsylvania	27,914.7	1,320.1	29,234.8
7 Ohio	12,819.9	5,695.4	18,515.3
8 Colorado	12,168.4	4,849.0	17,017.4
9 Texas	.0	13,402.1	13,402.1
10 Indiana	8,901.7	1,297.5	10,199.2
11 North Dakota	.0	9,663.4	9,663.4
12 Utah	5,909.9	267.9	6,177.8
13 Alaska	5,423.0	716.7	6,139.7
14 Missouri	1,479.1	4,528.2	6,007.3
15 Alabama	1,523.0	3,334.8	4,857.8
16 New Mexico	2,121.8	2,365.5	4,487.2
17 Virginia	1,962.1	749.8	2,711.9
18 Iowa	1,732.5	458.5	2,191.0
19 Oklahoma	1,238.2	352.9	1,591.1
20 Washington	1,332.3	92.6	1,424.8
21 Kansas	.0	978.3	978.3
22 Tennessee	559.5	296.3	855.9
23 Maryland	673.7	88.8	762.4
24 Louisiana	.0	491.6	491.6
25 Arkansas	272.5	144.5	417.0
26 South Dakota	.0	366.1	366.1
27 Arizona	101.6	165.1	266.6
28 Michigan	123.1	4.6	127.7
29 Oregon	14.5	2.9	17.5
30 North Carolina	10.7	.0	10.7
31 Idaho	4.4	.0	4.4
32 Georgia	1.9	1.3	3.2
U.S. Total	319,342.8	152,194.1	471,537.0

Sources: State geological and mineral resource surveys, and other geological reports.

Alabama

1989 Coal Highlights

Production	
(thousand short tons)	27,992
Value	
(million dollars)	1,153
Number of Employees	6,505
Consumption	
(thousand short tons)	27,261
Coal-Fired Electric Generating Units	
Number	41
Summer Capability (megawatts)	11,171
% of Total Summer Capability	57.5
Generation (gigawatthours)	52,601
Coal Deposits	
Area (square miles)	9,700
Percent of State Land	19

Table B6. Alabama Coal Facts

	1970	1975	1980	1985	1987	1988	1989
Production (Thousand Short Tons)	20,560	22,644	26,403	27,797	25,540	26,518	27,992
Underground	9,078	7,614	9,504	14,440	14,342	14,833	16,327
Surface	11,482	15,029	16,899	13,357	11,198	11,685	11,665
Average Mine Price (Dollars per Short Ton) ..	8.09	26.53	37.01	42.84	41.42	41.22	41.18
Total Value of Production (Million Dollars) ...	166	601	977	1,191	1,058	1,093	1,153
Percentage of U.S. Coal Production ..	3.4	3.5	3.2	3.1	2.8	2.8	2.9
National Rank (Production)	8	9	11	11	11	12	12
Total U.S. Coal Production							
(Thousand Short Tons)	612,661	654,641	829,700	883,638	918,762	950,265	980,729
Number of Mines¹	129	236	176	131	99	104	105
Underground	35	20	18	20	16	15	15
Surface	94	216	158	111	83	89	90
Employment²	5,126	8,400	11,688	8,616	6,718	6,858	6,505
Underground	3,675	4,420	7,160	5,832	4,461	4,507	4,371
Surface	1,451	3,980	4,528	2,784	2,257	2,351	2,134
Consumption (Thousand Short Tons)	w	28,205	26,853	27,069	26,632	26,365	27,261
Electric Utilities	w	19,236	19,593	21,515	20,746	20,002	21,609
Coke Plants	w	6,769	4,849	2,883	3,150	3,383	3,314
Other Industrial Plants	w	³ 2,200	2,202	2,541	2,614	2,843	2,275
Residential and Commercial	w	(³)	209	99	121	137	63

¹ For 1980, includes only mines that produced 10,000 or more tons.

² Beginning in 1980, includes only mines that produced 10,000 or more tons.

³ Consumption data at Other Industrial Plants and in Residential and Commercial Sector are combined to avoid disclosure of individual company data.

w Withheld to avoid disclosure of individual company data.

Note: Total may not equal sum of components because of independent rounding.

Sources: Energy Information Administration, *Coal Production; Quarterly Coal Report; Weekly Coal Production; Coal Data: A Reference; Electric Power Monthly 1989; and Inventory of Power Plants in the United States 1989*; Bureau of Mines, U.S. Department of Interior, *Minerals Yearbook; Information Circular 8705: Historical Fuels and Energy Consumption Data, 1960-72, United States by States and Census Districts West of the Mississippi*; and *Geological Survey Bulletin 1412: Coal Resources of the United States, January 1, 1974*.

Alaska

1989 Coal Highlights

Production (thousand short tons)	1,582
Value (million dollars)	w
Number of Employees	87
Consumption (thousand short tons)	299
Coal-Fired Electric Generating Units	
Number	5
Summer Capability (megawatts)	56
% of Total Summer Capability	3.6
Generation (gigawatthours)	302
Coal Deposits	
Area (square miles)	35,000
Percent of State Land	6

Table B7. Alaska Coal Facts

	1970	1975	1980	1985	1987	1988	1989
Production (Thousand Short Tons)	549	766	791	1,433	1,492	1,745	1,582
Underground	0	0	0	0	0	0	0
Surface	549	766	791	1,433	1,492	1,745	1,582
Average Mine Price (Dollars per Short Ton) ..	w	w	w	w	w	w	w
Total Value of Production (Million Dollars) ...	w	w	w	w	w	w	w
Percentage of U.S. Coal Production	.1	.1	.1	.2	.2	.2	.2
National Rank (Production)	21	22	23	22	24	23	23
Total U.S. Coal Production (Thousand Short Tons)	612,661	654,641	829,700	883,638	918,762	950,265	980,729
Number of Mines¹	3	1	1	1	1	1	1
Underground	0	0	0	0	0	0	0
Surface	3	1	1	1	1	1	1
Employment²	66	80	33	96	93	93	87
Underground	0	0	0	0	0	0	0
Surface	66	80	33	96	93	93	87
Consumption (Thousand Short Tons)	612	768	272	733	274	727	299
Electric Utilities	151	257	272	296	274	727	299
Coke Plants	0	0	0	0	0	0	0
Other Industrial Plants	461	511	0	437	40	0	0
Residential and Commercial	(4)	(4)	0	(4)	(4)	(3)	(3)

¹ For 1980, includes only mines that produced 10,000 or more tons.

² Beginning in 1980, includes only mines that produced 10,000 or more tons.

³ Consumption data at Electric Utilities and in Residential and Commercial Sector are combined to avoid disclosure of individual company data.

⁴ Consumption data at Other Industrial Plants and in Residential and Commercial Sector are combined to avoid disclosure of individual company data.

W Withheld to avoid disclosure of individual company data.

Note: Total may not equal sum of components because of independent rounding.

Sources: Energy Information Administration, *Coal Production: Quarterly Coal Report*; *Weekly Coal Production*; *Coal Data: A Reference*; *Electric Power Monthly 1989*; and *Inventory of Power Plants in the United States 1989*; Bureau of Mines, U.S. Department of Interior, *Minerals Yearbook*; *Information Circular 8705: Historical Fuels and Energy Consumption Data, 1960-72, United States by States and Census Districts West of the Mississippi*; and *Geological Survey Bulletin 1412: Coal Resources of the United States, January 1, 1974*.

Arizona

1989 Coal Highlights

Production (thousand short tons)	11,935
Value (million dollars)	w
Number of Employees	780
Consumption (thousand short tons)	16,871
Coal-Fired Electric Generating Units	
Number	13
Summer Capability (megawatts)	4,756
% of Total Summer Capability	32.6
Generation (gigawatthours)	32,364
Coal Deposits	
Area (square miles)	3,040
Percent of State Land	3

Table B8. Arizona Coal Facts

	1970	1975	1980	1985	1987	1988 ⁷	1989
Production (Thousand Short Tons)	132	6,986	10,905	9,625	11,379	12,398	11,935
Underground	0	0	0	0	0	0	0
Surface	132	6,986	10,905	9,625	11,379	12,398	11,935
Average Mine Price (Dollars per Short Ton) .	w	w	w	w	w	w	w
Total Value of Production (Million Dollars) ...	w	w	w	w	w	w	w
Percentage of U.S. Coal Production	(¹)	1.1	1.3	1.1	1.2	1.3	1.2
National Rank (Production)	23	16	16	16	16	16	16
Total U.S. Coal Production (Thousand Short Tons) ..	612,661	654,641	829,700	883,838	918,762	950,265	980,729
Number of Mines ²	1	2	2	2	2	2	2
Underground	0	0	0	0	0	0	0
Surface	1	2	2	2	2	2	2
Employment ³	75	450	897	885	900	984	780
Underground	0	0	0	0	0	0	0
Surface	75	450	897	885	900	984	780
Consumption (Thousand Short Tons)	w	3,985	11,558	16,364	13,375	14,525	16,871
Electric Utilities	w	3,873	10,915	14,448	12,706	13,932	16,182
Coke Plants	w	0	0	0	0	0	0
Other Industrial Plants	w	⁴ 112	⁴ 643	⁴ 1,916	⁴ 669	⁴ 593	⁴ 689
Residential and Commercial	w	(⁴)	(⁴)	(⁴)	(⁴)	(⁴)	(⁴)

¹ Less than 0.05 percent.

² For 1980, includes only mines that produced 10,000 or more tons.

³ Beginning in 1980, includes only mines that produced 10,000 or more tons.

⁴ Consumption data at Other Industrial Plants and in Residential and Commercial Sector are combined to avoid disclosure of individual company data.

w Withheld to avoid disclosure of individual company data.

Note: Total may not equal sum of components because of independent rounding.

Sources: Energy Information Administration, *Coal Production; Quarterly Coal Report; Weekly Coal Production; Coal Data: A Reference; Electric Power Monthly 1989; and Inventory of Power Plants in the United States 1989*; Bureau of Mines, U.S. Department of Interior, *Minerals Yearbook; Information Circular 8705: Historical Fuels and Energy Consumption Data, 1960-72. United States by States and Census Districts West of the Mississippi*; and *Geological Survey Bulletin 1-112: Coal Resources of the United States, January 1, 1974*.

Arkansas

1989 Coal Highlights

Production	
(thousand short tons)	70
Value	
(million dollars)	w
Number of Employees	8
Consumption	
(thousand short tons)	11,547
Coal-Fired Electric Generating Units	
Number	5
Summer Capability (megawatts)	3,817
% of Total Summer Capability	39.7
Generation (gigawatthours)	18,604
Coal Deposits	
Area (square miles)	1,700
Percent of State Land	3

Table B9. Arkansas Coal Facts

	1970	1975	1980	1985	1987	1988	1989
Production (Thousand Short Tons)	268	488	319	80	84	276	70
Underground	51	0	0	0	0	0	0
Surface	217	488	319	80	84	276	70
Average Mine Price (Dollars per Short Ton) ..	8.30	32.76	41.83	w	w	w	w
Total Value of Production (Million Dollars) ...	2	16	13	w	w	w	w
Percentage of U.S. Coal Production	(¹)	.1	(¹)	(¹)	(¹)	(¹)	(¹)
National Rank (Production)	22	23	25	26	26	26	26
Total U.S. Coal Production							
(Thousand Short Tons)	612,661	654,641	829,700	883,638	918,762	950,265	980,729
Number of Mines²	8	8	4	7	8	7	7
Underground	2	0	0	0	0	0	0
Surface	6	8	4	7	8	7	7
Employment³	137	180	75	26	19	22	8
Underground	42	0	0	0	0	0	0
Surface	95	180	75	26	19	22	8
Consumption (Thousand Short Tons)	w	34	2,076	12,682	12,066	12,555	11,547
Electric Utilities	w	0	1,774	12,302	11,764	12,295	11,278
Coke Plants	w	0	0	0	0	0	0
Other Industrial Plants	w	⁴ 34	296	379	302	260	267
Residential and Commercial	w	(⁴)	6	1	(⁴)	(⁴)	3

¹ Less than 0.05 percent.

² For 1980, includes only mines that produced 10,000 or more tons.

³ Beginning in 1980, includes only mines that produced 10,000 or more tons.

⁴ Consumption data at Other Industrial Plants and in Residential and Commercial Sector are combined to avoid disclosure of individual company data.

(*) Less than 500 short tons.

w Withheld to avoid disclosure of individual company data.

Note: Total may not equal sum of components because of independent rounding.

Sources: Energy Information Administration, *Coal Production: Quarterly Coal Report; Weekly Coal Production; Coal Data: A Reference; Electric Power Monthly 1989; and Inventory of Power Plants in the United States 1989*; Bureau of Mines, U.S. Department of Interior, *Minerals Yearbook; Information Circular 8705: Historical Fuels and Energy Consumption Data, 1960-72, United States by States and Census Districts West of the Mississippi*; and Geological Survey Bulletin 1412: *Coal Resources of the United States, January 1, 1974*.

California

1989 Coal Highlights

Production (thousand short tons)	41
Value (million dollars)	w
Number of Employees	5
Consumption (thousand short tons)	2,551
Coal-Fired Electric Generating Units	
Number	0
Summer Capability (megawatts)	0
% of Total Summer Capability	0
Generation (gigawatthours)	0
Coal Deposits	
Area (square miles)	230
Percent of State Land	0.1

Table B10. California Coal Facts

	1970	1975	1980	1985	1987	1988	1989
Production (Thousand Short Tons)	0	0	0	71	46	54	41
Underground	0	0	0	0	0	0	0
Surface	0	0	0	71	46	54	41
Average Mine Price (Dollars per Short Ton) ..	.00	.00	.00	6.05	w	w	w
Total Value of Production (Million Dollars) ...	0	0	0	0	w	w	w
Percentage of U.S. Coal Production	.0	.0	.0	(1)	.0	(1)	(1)
National Rank (Production)	0	0	0	27	27	27	27
Total U.S. Coal Production (Thousand Short Tons)	612,661	654,641	829,700	883,638	918,762	950,265	980,729
Number of Mines ²	0	0	0	1	1	1	1
Underground	0	0	0	0	0	0	0
Surface	0	0	0	1	1	1	1
Employment ³	0	0	0	9	37	8	5
Underground	0	0	0	0	0	0	0
Surface	0	0	0	9	37	8	5
Consumption (Thousand Short Tons)	2,317	2,151	2,669	1,942	1,934	2,209	2,551
Electric Utilities	0	0	0	0	0	0	0
Coke Plants	0	0	1,510	0	0	0	0
Other Industrial Plants	2,189	2,151	1,155	1,889	1,934	⁴ 2,203	⁴ 2,551
Residential and Commercial	128	0	4	53	0	(⁴)	(⁴)

¹ Less than 0.05 percent.

² For 1980, includes only mines that produced 10,000 or more tons.

³ Beginning in 1980, includes only mines that produced 10,000 or more tons.

⁴ Consumption data at Other Industrial Plants and in Residential and Commercial Sector are combined to avoid disclosure of individual company data.

^w Withheld to avoid disclosure of individual company data.

Note: Total may not equal sum of components because of independent rounding.

Sources: Energy Information Administration, *Coal Production/Quarterly Coal Report; Weekly Coal Production; Coal Data: A Reference; Electric Power Monthly 1989; and Inventory of Power Plants in the United States 1989*; Bureau of Mines, U.S. Department of Interior, *Minerals Yearbook; Information Circular 8705: Historical Fuels and Energy Consumption Data, 1960-72, United States by States and Census Districts West of the Mississippi*; and Geological Survey Bulletin 1412: *Coal Resources of the United States, January 1, 1974*.

Colorado

1989 Coal Highlights

Production	
(thousand short tons)	17,123
Value	
(million dollars)	405
Number of Employees	2,019
Consumption	
(thousand short tons)	16,393
Coal-Fired Electric Generating Units	
Number	31
Summer Capability (megawatts)	4,942
% of Total Summer Capability	74.4
Generation (gigawatthours)	29,406
Coal Deposits	
Area (square miles)	29,600
Percent of State Land	28

Table B11. Colorado Coal Facts

	1970	1975	1980	1985	1987	1988	1989
Production (Thousand Short Tons)	6,025	8,219	18,846	17,243	14,420	15,912	17,123
Underground	3,858	3,446	5,721	6,377	5,645	6,870	8,511
Surface	2,167	4,773	13,125	10,865	8,775	9,042	8,612
Average Mine Price (Dollars per Short Ton) ..	5.85	16.53	19.89	24.65	23.58	23.09	23.84
Total Value of Production (Million Dollars) ...	35	136	375	425	340	367	405
Percentage of U.S. Coal Production	1.0	1.3	2.3	2.0	1.6	1.7	1.7
National Rank (Production)	12	14	12	14	15	15	15
Total U.S. Coal Production (Thousand Short Tons)	612,661	634,641	829,700	883,638	918,762	950,265	980,729
Number of Mines¹	48	33	43	35	22	23	23
Underground	40	18	26	23	9	15	16
Surface	8	15	17	12	13	8	7
Employment²	1,273	1,850	3,911	2,551	1,795	2,103	2,019
Underground	1,152	1,360	2,408	1,464	1,094	1,424	1,490
Surface	121	490	1,503	1,087	701	679	529
Consumption (Thousand Short Tons)	5,136	8,210	11,981	15,242	15,007	15,860	16,393
Electric Utilities	3,266	6,428	10,124	14,295	14,178	15,087	15,686
Coke Plants	1,022	1,084	(³)	0	0	0	0
Other Industrial Plants	(⁴)	(⁴)	(³)	(⁴)	(⁴)	(⁴)	(⁴)
Residential and Commercial	⁴ 848	⁴ 698	³ 1,857	⁴ 948	⁴ 748	⁴ 773	⁴ 707

¹ For 1980, includes only mines that produced 10,000 or more tons.

² Beginning in 1980, includes only mines that produced 10,000 or more tons.

³ Consumption data at Coke Plants, Other Industrial Plants and in Residential and Commercial Sector are combined to avoid disclosure of individual company data.

⁴ Consumption data at Other Industrial Plants and in Residential and Commercial Sector are combined to avoid disclosure of individual company data.

⁵ Withheld to avoid disclosure of individual company data.

Sources: Energy Information Administration, *Coal Production; Quarterly Coal Report; Weekly Coal Production; Coal Data: A Reference; Electric Power Monthly 1989; and Inventory of Power Plants in the United States 1989*; Bureau of Mines, U.S. Department of Interior, *Minerals Yearbook; Information Circular 8705: Historical Fuels and Energy Consumption Data, 1960-72, United States by States and Census Districts West of the Mississippi*; and *Geological Survey Bulletin 1412: Coal Resources of the United States, January 1, 1974*.

Illinois

1989 Coal Highlights

Production	
(thousand short tons)	59,267
Value	
(million dollars)	1,670
Number of Employees	10,003
Consumption	
(thousand short tons)	32,374
Coal-Fired Electric Generating Units	
Number	61
Summer Capability (megawatts)	14,934
% of Total Summer Capability	45.8
Generation (gigawatthours)	51,125
Coal Deposits	
Area (square miles)	37,700
Percent of State Land	67

Table B12. Illinois Coal Facts

	1970	1975	1980	1985	1987	1988	1989
Production (Thousand Short Tons)	65,119	59,537	62,543	59,201	59,155	58,594	59,267
Underground	32,093	31,875	34,969	37,343	37,521	38,522	39,337
Surface	33,026	27,661	27,574	21,858	21,634	20,072	19,930
Average Mine Price (Dollars per Short Ton) ..	4.92	14.64	24.39	30.80	29.56	26.55	28.17
Total Value of Production (Million Dollars) ...	320	872	1,525	1,823	1,749	1,673	1,670
Percentage of U.S. Coal Production	10.6	9.1	7.5	6.7	6.4	6.2	6.0
National Rank (Production)	4	4	5	5	5	5	5
Total U.S. Coal Production (Thousand Short Tons)	612,661	654,641	829,703	883,638	918,762	950,285	980,729
Number of Mines ¹	59	58	59	54	51	49	48
Underground	28	21	31	34	23	28	30
Surface	31	37	28	20	22	20	18
Employment ²	9,277	12,850	17,735	13,858	12,171	10,022	10,003
Underground	6,057	9,010	12,610	10,349	8,932	7,440	8,084
Surface	3,220	3,840	5,125	3,509	3,239	2,582	1,919
Consumption (Thousand Short Tons)	42,310	41,948	39,840	37,601	34,632	32,971	32,374
Electric Utilities	29,448	34,859	34,610	31,608	28,894	26,681	25,758
Coke Plants	3,081	3,104	1,810	2,358	1,565	1,678	2,546
Other Industrial Plants	³ 9,181	³ 3,985	3,265	3,399	3,900	4,364	3,770
Residential and Commercial	(³)	(³)	155	236	273	256	297

¹ For 1980, includes only mines that produced 10,000 or more tons.

² Beginning in 1980, includes only mines that produced 10,000 or more tons.

³ Consumption data at Other Industrial Plants and in Residential and Commercial Sector are combined to avoid disclosure of individual company data. Note: Total may not equal sum of components because of independent rounding.

Sources: Energy Information Administration, *Coal Production; Quarterly Coal Report; Weekly Coal Production; Coal Data: A Reference; Electric Power Monthly 1989*; and *Inventory of Power Plants in the United States 1989*; Bureau of Mines, U.S. Department of Interior, *Minerals Yearbook; Information Circular 8705: Historical Fuels and Energy Consumption Data, 1960-72, United States by States and Census Districts West of the Mississippi*; and *Geological Survey Bulletin 1412: Coal Resources of the United States, January 1, 1974*.

Indiana

1989 Coal Highlights

Production	
(thousand short tons)	33,641
Value	
(million dollars)	792
Number of Employees	3,684
Consumption	
(thousand short tons)	58,203
Coal-Fired Electric Generating Units	
Number	80
Summer Capability (megawatts)	19,579
% of Total Summer Capability	94.8
Generation (gigawatthours)	87,330
Coal Deposits	
Area (square miles)	6,500
Percent of State Land	18

Table B13. Indiana Coal Facts

	1970	1975	1980	1985	1987	1988	1989
Production (Thousand Short Tons)	22,263	25,124	30,873	33,316	34,208	31,271	33,641
Underground	2,094	188	688	2,053	2,447	2,409	2,519
Surface	20,169	24,935	30,185	31,262	31,761	28,862	31,122
Average Mine Price (Dollars per Short Ton) ..	4.60	11.15	20.72	26.54	24.57	24.29	23.55
Total Value of Production (Million Dollars) ...	102	280	640	884	840	760	792
Percentage of U.S. Coal Production	3.6	3.8	3.7	3.8	3.7	3.3	3.4
National Rank (Production)	7	7	8	9	10	10	10
Total U.S. Coal Production (Thousand Short Tons)	612,661	654,641	829,700	883,638	918,762	950,265	980,729
Number of Mines¹	38	62	87	70	67	73	60
Underground	6	2	4	4	5	5	6
Surface	32	60	83	66	62	68	54
Employment²	2,275	3,040	5,315	5,187	3,992	4,108	3,684
Underground	487	80	133	455	489	402	521
Surface	1,788	2,960	5,182	4,732	3,503	3,706	3,163
Consumption (Thousand Short Tons)	42,385	46,928	50,485	53,291	52,335	56,762	58,203
Electric Utilities	22,760	28,720	33,664	38,310	36,987	40,060	42,378
Coke Plants	12,673	14,078	11,989	9,338	9,791	11,287	10,568
Other Industrial Plants	³ 6,952	³ 4,130	4,610	5,119	5,016	4,784	4,738
Residential and Commercial	(³)	(³)	222	524	541	631	518

¹ For 1980, includes only mines that produced 10,000 or more tons.

² Beginning in 1980, includes only mines that produced 10,000 or more tons.

³ Consumption data at Other Industrial Plants and in Residential and Commercial Sector are combined to avoid disclosure of individual company data.

Note: Total may not equal sum of components because of independent rounding.

Sources: Energy Information Administration, *Coal Production; Quarterly Coal Report; Weekly Coal Production; Coal Data: A Reference; Electric Power Monthly 1989; and Inventory of Power Plants in the United States 1989*; Bureau of Mines, U.S. Department of Interior, *Minerals Yearbook; Information Circular 8705: Historical Fuels and Energy Consumption Data, 1960-72, United States by States and Census Districts West of the Mississippi*; and Geological Survey Bulletin 1412: *Coal Resources of the United States, January 1, 1974*.

Iowa

1989 Coal Highlights

Production	
(thousand short tons)	430
Value	
(million dollars)	w
Number of Employees	149
Consumption	
(thousand short tons)	17,103
Coal-Fired Electric Generating Units	
Number	53
Summer Capability (megawatts)	5,855
% of Total Summer Capability	75.1
Generation (gigawatthours)	23,724
Coal Deposits	
Area (square miles)	20,000
Percent of State Land	36

Table B14. Iowa Coal Facts

	1970	1975	1980	1985	1987	1988	1989
Production (Thousand Short Tons)	987	622	559	591	468	341	430
Underground	423	363	166	172	63	9	36
Surface	565	259	393	419	405	332	394
Average Mine Price (Dollars per Short Ton) ..	4.11	11.08	21.33	26.13	25.89	w	w
Total Value of Production (Million Dollars) ...	4	7	12	15	12	w	w
Percentage of U.S. Coal Production	.2	.1	.1	(¹)	.0	(¹)	(¹)
National Rank (Production)	20	23	24	24	25	25	25
Total U.S. Coal Production (Thousand Short Tons)	612,661	654,641	829,700	883,638	918,762	950,265	980,729
Number of Mines ²	13	10	6	5	4	4	5
Underground	3	2	1	1	1	1	1
Surface	10	8	5	4	3	3	4
Employment ³	166	120	143	142	166	121	149
Underground	62	60	31	42	87	45	15
Surface	104	60	112	100	79	76	134
Consumption (Thousand Short Tons)	6,159	6,741	12,340	14,342	15,191	16,114	17,103
Electric Utilities	4,188	5,561	10,745	12,491	12,997	13,921	14,575
Coke Plants	0	0	0	0	0	0	0
Other Industrial Plants	⁴ 1,971	⁴ 1,180	1,505	1,572	1,857	1,808	2,351
Residential and Commercial	(⁴)	(⁴)	90	278	337	385	176

¹ Less than 0.05 percent.

² For 1980, includes only mines that produced 10,000 or more tons.

³ Beginning in 1980, includes only mines that produced 10,000 or more tons.

⁴ Consumption data at Other Industrial Plants and in Residential and Commercial Sector are combined to avoid disclosure of individual company data. Note: Total may not equal sum of components because of independent rounding.

Sources: Energy Information Administration, *Coal Production; Quarterly Coal Report; Weekly Coal Production; Coal Data: A Reference; Electric Power Monthly 1989; and Inventory of Power Plants in the United States 1989*; Bureau of Mines, U.S. Department of Interior, *Minerals Yearbook; Information Circular 8705: Historical Fuels and Energy Consumption Data, 1960-72, United States by States and Census Districts West of the Mississippi*; and Geological Survey Bulletin 1412: *Coal Resources of the United States, January 1, 1974*.

Kansas

1989 Coal Highlights

Production	
(thousand short tons)	856
Value	
(million dollars)	23
Number of Employees	165
Consumption	
(thousand short tons)	14,963
Coal-Fired Electric Generating Units	
Number	20
Summer Capability (megawatts)	5,064
% of Total Summer Capability	52.9
Generation (gigawatthours)	22,907
Coal Deposits	
Area (square miles)	18,800
Percent of State Land	23

Table B15. Kansas Coal Facts

	1970	1975	1980	1985	1987	1988	1989
Production (Thousand Short Tons)	1,627	479	342	994	2,021	737	856
Underground	0	0	0	0	0	0	0
Surface	1,627	479	342	994	2,021	737	856
Average Mine Price (Dollars per Short Ton) ..	5.59	19.78	26.54	26.00	24.54	30.59	27.00
Total Value of Production (Million Dollars) ...	9	9	22	26	50	22	23
Percentage of U.S. Coal Production	.3	.1	.1	.1	.2	.1	.1
National Rank (Production)	18	25	22	23	23	24	24
Total U.S. Coal Production (Thousand Short Tons)	612,661	654,641	829,700	883,638	918,762	950,265	990,729
Number of Mines¹	5	4	8	5	5	6	5
Underground	0	0	0	0	0	0	0
Surface	5	4	8	5	5	6	5
Employment²	235	130	274	228	247	268	165
Underground	0	0	0	0	0	0	0
Surface	235	130	274	228	247	268	165
Consumption (Thousand Short Tons)	1,974	3,333	10,371	14,715	15,194	14,951	14,963
Electric Utilities	1,599	3,220	10,035	14,351	14,942	14,742	14,575
Coke Plants	0	0	0	0	0	0	0
Other Industrial Plants	320	³ 113	331	363	252	208	183
Residential and Commercial	55	(³)	5	1	1	1	6

¹ For 1980, includes only mines that produced 10,000 or more tons.

² Beginning in 1980, includes only mines that produced 10,000 or more tons.

³ Consumption data at Other Industrial Plants and in Residential and Commercial Sector are combined to avoid disclosure of individual company data.

Note: Total may not equal sum of components because of independent rounding.

Sources: Energy Information Administration, *Coal Production; Quarterly Coal Report; Weekly Coal Production, Coal Data. A Reference; Electric Power Monthly 1989*, and *Inventory of Power Plants in the United States 1989*; Bureau of Mines, U.S. Department of Interior, *Minerals Yearbook; Information Circular 8705: Historical Fuels and Energy Consumption Data, 1960-72, United States by States and Census Districts West of the Mississippi*; and Geological Survey Bulletin 1412: *Coal Resources of the United States, January 1, 1974*.

Kentucky

1989 Coal Highlights

Production (thousand short tons)	167,389
Value (million dollars)	4,180
Number of Employees	30,658
Consumption (thousand short tons)	32,792
Coal-Fired Electric Generating Units	
Number	57
Summer Capability (megawatts)	13,818
% of Total Summer Capability	92.0
Generation (gigawatthours)	66,214
Coal Deposits	
Area (square miles)	14,600
Percent of State Land	36

Table B16. Kentucky Coal Facts

	1970	1975	1980	1985	1987	1988	1989
Production (Thousand Short Tons)	125,305	143,613	150,144	152,272	165,192	157,852	167,389
Underground	62,610	65,632	79,162	81,236	92,882	63,131	99,067
Surface	62,695	77,981	70,982	71,036	72,310	94,720	68,322
Average Mine Price (Dollars per Short Ton) ..	5.68	17.40	27.62	28.24	26.15	26.20	24.97
Total Value of Production (Million Dollars) ...	712	2,499	4,147	4,300	4,320	4,136	4,180
Percentage of U.S. Coal Production	20.5	21.9	18.1	17.2	18.0	18.6	17.1
National Rank (Production)	2	1	1	1	1	2	2
Total U.S. Coal Production (Thousand Short Tons)	612,661	654,841	829,700	883,638	918,762	950,265	980,729
Number of Mines ¹	1,721	2,401	1,150	1,858	1,428	1,230	1,099
Underground	1,104	896	647	921	816	738	670
Surface	617	1,505	503	937	612	492	429
Employment ²	25,691	36,070	46,395	36,814	32,590	30,559	30,658
Underground	18,843	22,200	30,581	22,877	21,505	20,473	20,752
Surface	6,848	13,870	15,814	13,937	11,085	10,086	9,904
Consumption (Thousand Short Tons)	23,672	28,480	27,524	30,990	32,023	35,176	32,792
Electric Utilities	19,103	25,717	24,383	27,085	28,569	31,818	29,109
Coke Plants	1,586	1,253	905	(³)	(³)	(³)	(³)
Other Industrial Plants	⁴ 2,983	⁴ 1,510	1,969	2,510	1,896	1,702	2,168
Residential and Commercial	(⁴)	(⁴)	267	³ 1,396	³ 1,584	³ 1,656	³ 1,515

¹ For 1980, includes only mines that produced 10,000 or more tons.

² Beginning in 1980, includes only mines that produced 10,000 or more tons.

³ Consumption data at Coke Plants and in Residential and Commercial Sector are combined to avoid disclosure of individual company data.

⁴ Consumption data at Other Industrial Plants and in Residential and Commercial Sector are combined to avoid disclosure of individual company data.
Note: Total may not equal sum of components because of independent rounding.

Sources: Energy Information Administration, *Coal Production; Quarterly Coal Report; Weekly Coal Production; Coal Data: A Reference; Electric Power Monthly 1989; and Inventory of Power Plants in the United States 1989*; Bureau of Mines, U.S. Department of Interior, *Minerals Yearbook; Information Circular 8705. Historical Fuels and Energy Consumption Data, 1960-72, United States by States and Census Districts West of the Mississippi*; and *Geological Survey Bulletin 1412: Coal Resources of the United States, January 1, 1974*.

Louisiana

1989 Coal Highlights

Production (thousand short tons)	2,983
Value (million dollars)	w
Number of Employees	69
Consumption (thousand short tons)	12,471
Coal-Fired Electric Generating Units	
Number	6
Summer Capability (megawatts)	3,343
% of Total Summer Capability	19.9
Generation (gigawatthours)	18,081
Coal Deposits	
Area (square miles)	1,360
Percent of State Land	3

Table B17. Louisiana Coal Facts

	1970	1975	1980	1985	1987	1988	1989
Production (Thousand Short Tons)	0	0	0	207	2,751	2,889	2,983
Underground	0	0	0	0	0	0	0
Surface	0	0	0	207	2,751	2,889	2,983
Average Mine Price (Dollars per Short Ton) ..	.00	.00	.00	6.05	w	w	w
Total Value of Production (Million Dollars) ...	0	0	0	1	w	w	w
Percentage of U.S. Coal Production	.0	.0	.0	(¹)	.3	.3	.3
National Rank (Production)	0	0	0	25	22	21	21
Total U.S. Coal Production (Thousand Short Tons)	612,661	654,641	829,700	883,638	918,762	950,265	980,729
Number of Mines²	0	0	0	1	1	1	2
Underground	0	0	0	0	0	0	0
Surface	0	0	0	1	1	1	2
Employment³	0	0	0	72	81	78	69
Underground	0	0	0	0	0	0	0
Surface	0	0	0	72	81	78	69
Consumption (Thousand Short Tons)	2,317	0	111	9,217	10,391	12,848	12,471
Electric Utilities	w	0	0	8,760	10,029	12,301	11,770
Coke Plants	w	0	0	0	0	0	0
Other Industrial Plants	w	0	107	4,457	4,362	4,547	4,701
Residential and Commercial	w	0	4	(⁴)	(⁴)	(⁴)	(⁴)

¹ Less than 0.05 percent.

² For 1980, includes only mines that produced 10,000 or more tons.

³ Includes only mines that produced 10,000 or more tons.

⁴ Consumption data at Other Industrial Plants and in Residential and Commercial Sector are combined to avoid disclosure of individual company data.

w Withheld to avoid disclosure of individual company data.

Note: Total may not equal sum of components because of independent rounding.

Sources: Energy Information Administration, *Coal Production; Quarterly Coal Report; Weekly Coal Production; Coal Data: A Reference; Electric Power Monthly 1989; and Inventory of Power Plants in the United States 1989*; Bureau of Mines, U.S. Department of Interior, *Minerals Yearbook; Information Circular 8705: Historical Fuels and Energy Consumption Data, 1960-72, United States by States and Census Districts West of the Mississippi*; and Geological Survey Bulletin 1412: *Coal Resources of the United States, January 1, 1974*.

Maryland

1989 Coal Highlights

Production (thousand short tons)	3,376
Value (million dollars)	83
Number of Employees	554
Consumption (thousand short tons)	11,541
Coal-Fired Electric Generating Units	
Number	14
Summer Capability (megawatts)	3,972
% of Total Summer Capability	41.2
Generation (gigawatthours)	23,627
Coal Deposits	
Area (square miles)	440
Percent of State Land	4

Table B18. Maryland Coal Facts

	1970	1975	1980	1985	1987	1988	1989
Production (Thousand Short Tons)	1,615	2,606	3,760	2,985	3,962	3,242	3,376
Underground	238	104	1,494	1,785	2,400	2,024	1,842
Surface	1,377	2,502	2,266	1,200	1,563	1,218	1,533
Average Mine Price (Dollars per Short Ton) ..	5.01	19.38	28.47	27.40	24.31	25.59	24.73
Total Value of Production (Million Dollars) ...	8	51	107	82	96	83	83
Percentage of U.S. Coal Production	.3	.4	.5	.3	.4	.3	.3
National Rank (Production)	19	21	21	21	20	20	20
Total U.S. Coal Production (Thousand Short Tons)	612,661	654,641	829,700	883,638	918,762	950,265	990,729
Number of Mines¹	50	69	32	45	35	29	31
Underground	16	2	4	6	2	2	2
Surface	34	67	28	39	33	27	29
Employment²	357	580	1,087	678	555	533	554
Underground	117	50	561	375	286	288	282
Surface	240	530	526	303	269	242	272
Consumption (Thousand Short Tons)	NA	7,861	9,312	10,013	11,311	11,757	11,541
Electric Utilities	NA	3,978	5,908	7,046	8,228	9,020	9,074
Coke Plants	NA	3,576	2,645	³ 2,249	³ 2,112	³ 2,043	³ 0
Other Industrial Plants	NA	307	723	718	972	694	685
Residential and Commercial	NA	0	36	(³)	(³)	(³)	(³)

¹ For 1980, includes only mines that produced 10,000 or more tons.

² Beginning in 1980, includes only mines that produced 10,000 or more tons.

³ Consumption data at Coke Plants and in Residential and Commercial Sector are combined to avoid disclosure of individual company data.

NA Not Available.

Note: Total may not equal sum of components because of independent rounding.

Sources: Energy Information Administration, *Coal Production; Quarterly Coal Report; Weekly Coal Production; Coal Data: A Reference; Electric Power Monthly 1989; and Inventory of Power Plants in the United States 1989*; Bureau of Mines, U.S. Department of Interior, *Minerals Yearbook; Information Circular 8705: Historical Fuels and Energy Consumption Data, 1960-72, United States by States and Census Districts West of the Mississippi*; and Geological Survey Bulletin 1412: *Coal Resources of the United States, January 1, 1974*.

Missouri

1989 Coal Highlights

Production (thousand short tons)	3,378
Value (million dollars)	w
Number of Employees	428
Consumption (thousand short tons)	26,297
Coal-Fired Electric Generating Units	
Number	47
Summer Capability (megawatts)	10,649
% of Total Summer Capability	70.5
Generation (gigawatthours)	49,754
Coal Deposits	
Area (square miles)	24,700
Percent of State Land	35

Table B19. Missouri Coal Facts

	1970	1975	1980	1985	1987	1988	1989
Production (Thousand Short Tons)	4,447	5,638	5,503	5,571	4,292	4,169	3,378
Underground	0	0	0	5	0	0	0
Surface	4,447	5,638	5,503	5,566	4,292	4,169	3,378
Average Mine Price (Dollars per Short Ton) .	4.39	8.52	20.50	27.08	28.92	27.06	w
Total Value of Production (Million Dollars) ...	20	48	113	151	124	113	w
Percentage of U.S. Coal Production	.7	.9	.7	.6	.5	.4	.3
National Rank (Production)	15	18	18	18	19	19	19
Total U.S. Coal Production (Thousand Short Tons)	612,661	654,641	829,700	883,638	918,762	950,265	980,729
Number of Mines¹	9	13	13	15	12	10	9
Underground	0	0	0	1	0	0	0
Surface	9	13	13	14	12	10	9
Employment²	480	890	1,093	1,108	814	671	428
Underground	0	0	0	0	0	0	0
Surface	480	890	1,093	1,108	814	671	428
Consumption (Thousand Short Tons)	13,397	19,741	24,846	24,733	24,764	26,119	26,297
Electric Utilities	12,009	17,866	23,169	22,779	23,012	24,356	24,612
Coke Plants	308	276	⁽³⁾	⁽³⁾	⁽³⁾	⁽³⁾	⁽³⁾
Other Industrial Plants	⁴ 1,080	⁴ 1,599	1,396	1,565	1,427	1,539	1,436
Residential and Commercial	⁽⁴⁾	⁽⁴⁾	³ 281	³ 390	³ 324	³ 223	³ 249

¹ For 1980, includes only mines that produced 10,000 or more tons.

² Beginning in 1980, includes only mines that produced 10,000 or more tons.

³ Consumption data at Coke Plants and in Residential and Commercial Sector are combined to avoid disclosure of individual company data.

⁴ Consumption data at Other Industrial Plants and in Residential and Commercial Sector are combined to avoid disclosure of individual company data.

Note: Total may not equal sum of components because of independent rounding.

Sources: Energy Information Administration, *Coal Production; Quarterly Coal Report; Weekly Coal Production; Coal Data: A Reference; Electric Power Monthly 1989; and Inventory of Power Plants in the United States 1989*; Bureau of Mines, U.S. Department of Interior, *Minerals Yearbook; Information Circular 8705: Historical Fuels and Energy Consumption Data, 1960-72, United States by States and Census Districts; West of the Mississippi*; and *Geological Survey Bulletin 1412: Coal Resources of the United States, January 1, 1974*.

Montana

1989 Coal Highlights

Production (thousand short tons)	37,742
Value (million dollars)	388
Number of Employees	682
Consumption (thousand short tons)	10,458
Coal-Fired Electric Generating Units	
Number	6
Summer Capability (megawatts)	2,260
% of Total Summer Capability	46.1
Generation (gigawatthours)	16,129
Coal Deposits	
Area (square miles)	51,300
Percent of State Land	35

Table B20. Montana Coal Facts

	1970	1975	1980	1985	1987	1988	1989
Production (Thousand Short Tons)	3,447	22,054	29,872	33,290	34,399	38,881	37,742
Underground	28	0	0	0	0	0	0
Surface	3,419	22,054	29,872	33,290	34,399	38,881	37,742
Average Mine Price (Dollars per Short Ton) ..	1.85	5.06	10.50	13.18	12.43	10.06	10.27
Total Value of Production (Million Dollars) ...	6	112	314	439	428	391	388
Percentage of U.S. Coal Production	.6	3.4	3.6	3.8	3.7	4.1	3.8
National Rank (Production)	18	10	9	10	9	8	8
Total U.S. Coal Production (Thousand Short Tons)	612,661	654,641	829,700	883,638	918,762	950,265	980,729
Number of Mines ¹	8	8	9	9	8	9	9
Underground	4	0	0	0	0	0	0
Surface	4	8	9	9	8	9	9
Employment ²	109	640	1,131	1,173	847	872	682
Underground	28	0	0	0	0	0	0
Surface	81	640	1,131	1,173	847	872	682
Consumption (Thousand Short Tons)	1,065	1,252	3,519	5,713	7,730	10,634	10,458
Electric Utilities	652	1,203	3,351	5,480	7,530	10,410	10,208
Coke Plants	0	0	0	0	0	0	0
Other Industrial Plants	185	³ 49	154	³ 233	³ 200	³ 215	³ 250
Residential and Commercial	228	⁽³⁾	14	⁽³⁾	⁽³⁾	⁽³⁾	⁽³⁾

¹ For 1980, includes only mines that produced 10,000 or more tons.

² Beginning in 1980, includes only mines that produced 10,000 or more tons.

³ Consumption data at Other Industrial Plants and in Residential and Commercial Sector are combined to avoid disclosure of individual company data.

Note: Total may not equal sum of components because of independent rounding.

Sources: Energy Information Administration, *Coal Production; Quarterly Coal Report; Weekly Coal Production; Coal Data: A Reference; Electric Power Monthly 1989; and Inventory of Power Plants in the United States 1989*; Bureau of Mines, U.S. Department of Interior, *Minerals Yearbook; Information Circular 8705: Historical Fuels and Energy Consumption Data, 1960-72, United States by States and Census Districts West of the Mississippi*; and *Geological Survey Bulletin 1412: Coal Resources of the United States, January 1, 1974*.

New Mexico

1989 Coal Highlights

Production (thousand short tons)	23,702
Value (million dollars)	555
Number of Employees	1,470
Consumption (thousand short tons)	15,295
Coal-Fired Electric Generating Units	
Number	13
Summer Capability (megawatts)	3,894
% of Total Summer Capability	76.2
Generation (gigawatthours)	25,446
Coal Deposits	
Area (square miles)	14,650
Percent of State Land	12

Table B21. New Mexico Coal Facts

	1970	1975	1980	1985	1987	1988	1989
Production (Thousand Short Tons)	7,381	8,785	18,425	22,203	19,131	21,803	23,702
Underground	938	764	950	803	620	224	45
Surface	6,423	8,022	17,475	21,399	18,512	21,579	23,657
Average Mine Price (Dollars per Short Ton) .	2.89	w	14.01	23.41	21.78	22.78	23.42
Total Value of Production (Million Dollars) ...	21	w	258	520	417	497	555
Percentage of U.S. Coal Production	1.2	1.3	2.2	2.5	2.1	2.3	2.4
National Rank (Production)	10	12	13	13	13	13	13
Total U.S. Coal Production (Thousand Short Tons)	612,661	654,641	829,700	883,638	918,762	950,265	980,729
Number of Mines¹	4	5	10	12	10	10	8
Underground	1	1	1	2	1	1	1
Surface	3	4	9	10	9	9	7
Employment²	428	930	1,603	1,929	1,658	1,584	1,470
Underground	165	340	390	249	192	159	49
Surface	261	590	1,213	1,680	1,466	1,425	1,421
Consumption (Thousand Short Tons)	6,032	7,422	11,458	14,589	14,395	14,715	15,295
Electric Utilities	6,020	7,422	11,406	14,498	14,340	14,661	15,250
Coke Plants	0	0	0	0	0	0	0
Other Industrial Plants	12	0	52	90	55	51	44
Residential and Commercial	0	0	(³)	(³)	(³)	(³)	(³)

¹ For 1980, includes only mines that produced 10,000 or more tons.

² Beginning in 1980, includes only mines that produced 10,000 or more tons.

³ Consumption data at Other Industrial Plants and in Residential and Commercial Sector are combined to avoid disclosure of individual company data.

^w Withheld to avoid disclosure of individual company data.

Note: Total may not equal sum of components because of independent rounding.

Sources: Energy Information Administration, *Coal Production; Quarterly Coal Report; Weekly Coal Production; Coal Data: A Reference; Electric Power Monthly 1989*; and *Inventory of Power Plants in the United States 1989*; Bureau of Mines, U.S. Department of Interior, *Minerals Yearbook; Information Circular 8705: Historical Fuels and Energy Consumption Data, 1960-72, United States by States and Census Districts West of the Mississippi*; and *Geological Survey Bulletin 1412: Coal Resources of the United States, January 1, 1974*.

North Dakota

1989 Coal Highlights

Production	
(thousand short tons)	29,566
Value	
(million dollars)	218
Number of Employees	850
Consumption	
(thousand short tons)	27,401
Coal-Fired Electric Generating Units	
Number	14
Summer Capability (megawatts)	3,876
% of Total Summer Capability	85.7
Generation (gigawatthours)	23,774
Coal Deposits	
Area (square miles)	32,000
Percent of State Land	45

Table B22. North Dakota Coal Facts

	1970	1975	1980	1985	1987	1988	1989
Production (Thousand Short Tons)	5,639	8,515	16,975	26,873	25,142	29,731	29,566
Underground	0	0	0	0	0	0	0
Surface	5,639	8,515	16,975	26,873	25,142	29,731	29,566
Average Mine Price (Dollars per Short Ton) ..	1.95	3.17	7.48	9.30	7.91	7.38	7.36
Total Value of Production (Million Dollars) ...	11	27	127	250	199	219	218
Percentage of U.S. Coal Production	.9	1.3	2.0	3.0	2.7	3.1	3.0
National Rank (Production)	13	13	14	12	12	11	11
Total U.S. Coal Production (Thousand Short Tons)	612,661	654,641	829,700	983,638	918,762	950,265	980,729
Number of Mines¹	20	10	13	14	11	12	13
Underground	0	0	0	0	0	0	0
Surface	20	10	13	14	11	12	13
Employment²	306	380	1,711	1,132	961	977	850
Underground	0	0	0	0	0	0	0
Surface	306	380	1,711	1,132	961	977	850
Consumption (Thousand Short Tons)	4,799	5,650	12,347	22,958	24,101	28,028	27,401
Electric Utilities	4,103	5,068	11,619	17,354	17,434	21,686	20,536
Coke Plants	0	0	0	0	0	0	0
Other Industrial Plants	489	³ 582	³ 728	³ 5,604	³ 6,667	³ 6,242	³ 6,863
Residential and Commercial	207	(³)	(³)	(³)	(³)	(³)	(³)

¹ For 1980, includes only mines that produced 10,000 or more tons.

² Beginning in 1980, includes only mines that produced 10,000 or more tons.

³ Consumption data at Other Industrial Plants and in Residential and Commercial Sector are combined to avoid disclosure of individual company data. Note: Total may not equal sum of components because of independent rounding.

Sources: Energy Information Administration, *Coal Production; Quarterly Coal Report; Weekly Coal Production; Coal Data: A Reference; Electric Power Monthly 1989*; and *Inventory of Power Plants in the United States 1989*; Bureau of Mines, U.S. Department of Interior, *Minerals Yearbook; Information Circular 8705: Historical Fuels and Energy Consumption Data, 1960-72, United States by States and Census Districts West of the Mississippi*; and *Geological Survey Bulletin 1412: Coal Resources of the United States, January 1, 1974*

Ohio

1989 Coal Highlights

Production (thousand short tons)	33,689
Value (million dollars)	1,027
Number of Employees	7,374
Consumption (thousand short tons)	61,016
Coal-Fired Electric Generating Units	
Number	120
Summer Capability (megawatts)	21,961
% of Total Summer Capability	85.2
Generation (gigawatthours)	117,677
Coal Deposits	
Area (square miles)	10,000
Percent of State Land	24

Table B23. Ohio Coal Facts

	1970	1975	1980	1985	1987	1988	1989
Production (Thousand Short Tons)	55,351	46,770	39,394	35,602	35,788	34,043	33,689
Underground	18,111	15,455	12,994	13,646	12,317	11,264	10,824
Surface	37,240	31,315	26,400	21,956	23,171	22,779	22,865
Average Mine Price (Dollars per Short Ton) ..	4.74	16.40	27.82	33.97	30.80	30.50	30.49
Total Value of Production (Million Dollars) ...	262	767	1,096	1,209	1,102	1,038	1,027
Percentage of U.S. Coal Production	9.0	7.1	4.7	4.0	3.9	3.6	3.4
National Rank (Production)	5	5	7	8	8	9	9
Total U.S. Coal Production (Thousand Short Tons)	612,661	654,641	829,700	883,638	918,672	950,265	980,729
Number of Mines ¹	306	348	199	204	210	215	184
Underground	44	33	19	14	16	16	14
Surface	262	315	180	190	194	199	170
Employment ²	9,251	13,430	14,638	8,954	7,827	7,106	7,374
Underground	5,044	8,730	7,843	4,166	3,552	2,860	2,953
Surface	4,207	4,700	6,795	4,788	4,275	4,246	4,421
Consumption (Thousand Short Tons)	67,375	68,019	64,914	57,979	59,350	61,096	61,016
Electric Utilities	37,124	46,389	48,537	46,700	47,520	48,893	50,479
Coke Plants	12,734	12,515	10,268	5,242	5,361	5,448	5,265
Other Industrial Plants	³ 17,517	³ 9,115	5,553	5,178	5,657	6,030	4,727
Residential and Commercial	(³)	(³)	556	859	812	726	545

¹ For 1980, includes only mines that produced 10,000 or more tons.

² Beginning in 1980, includes only mines that produced 10,000 or more tons.

³ Consumption data at Other Industrial Plants and in Residential and Commercial Sector are combined to avoid disclosure of individual company data. Note: Total may not equal sum of components because of independent rounding.

Sources: Energy Information Administration, *Coal Production; Quarterly Coal Report; Weekly Coal Production; Coal Data: A Reference; Electric Power Monthly 1989*; and *Inventory of Power Plants in the United States 1989*; Bureau of Mines, U.S. Department of Interior, *Minerals Yearbook; Information Circular 6705; Historical Fuels and Energy Consumption Data, 1960-72, United States by States and Census Districts West of the Mississippi*; and *Geological Survey Bulletin 1412: Coal Resources of the United States, January 1, 1974*.

Oklahoma

1989 Coal Highlights

Production	
(thousand short tons)	1,753
Value	
(million dollars)	50
Number of Employees	414
Consumption	
(thousand short tons)	15,086
Coal-Fired Electric Generating Units	
Number	10
Summer Capability (megawatts)	4,828
% of Total Summer Capability	37.8
Generation (gigawatthours)	24,122
Coal Deposits	
Area (square miles)	14,550
Percent of State Land	21

Table B24. Oklahoma Coal Facts

	1970	1975	1980	1985	1987	1988	1989
Production (Thousand Short Tons)	2,427	2,872	5,358	3,337	2,870	2,136	1,753
Underground	219	0	0	5	1	0	40
Surface	2,208	2,872	5,358	3,332	2,869	2,136	1,713
Average Mine Price (Dollars per Short Ton) ..	6.27	16.69	27.78	31.72	31.83	31.06	28.46
Total Value of Production (Million Dollars) ...	15	48	149	106	91	66	50
Percentage of U.S. Coal Production	.4	.4	.6	.4	.3	.2	.2
National Rank (Production)	17	20	19	20	21	22	22
Total U.S. Coal Production (Thousand Short Tons)	612,661	654,641	829,700	883,638	918,762	950,265	980,729
Number of Mines ¹	11	31	37	28	19	24	21
Underground	2	0	0	1	1	0	1
Surface	9	31	37	27	18	24	20
Employment ²	603	870	1,340	1,024	653	727	414
Underground	286	0	0	0	0	0	36
Surface	317	870	1,340	1,024	653	727	378
Consumption (Thousand Short Tons)	w	19	6,046	13,602	13,476	15,006	15,086
Electric Utilities	w	0	5,752	12,747	12,861	14,435	14,423
Coke Plants	w	0	0	0	0	0	0
Other Industrial Plants	w	19	264	852	613	563	663
Residential and Commercial	w	0	30	32	8	0	(*)

¹ For 1980, includes only mines that produced 10,000 or more tons.

² Beginning in 1980, includes only mines that produced 10,000 or more tons.

(*) Rounded to zero.

w Withheld to avoid disclosure of individual company data.

Note: Total may not equal sum of components because of independent rounding.

Sources: Energy Information Administration, *Coal Production, Quarterly Coal Report, Weekly Coal Production, Coal Data: A Reference, Electric Power Monthly 1989*; and *Inventory of Power Plants in the United States 1989*, Bureau of Mines, U.S. Department of Interior, *Minerals Yearbook, Information Circular 8705, Historical Fuels and Energy Consumption Data, 1960-72, United States by States and Census Districts West of the Mississippi*, and *Geological Survey Bulletin 1412, Coal Resources of the United States, January 1, 1974*.

Pennsylvania

1989 Coal Highlights

Production (thousand short tons)	70,596
Value (million dollars)	2,071
Number of Employees	15,469
Consumption (thousand short tons)	58,526
Coal-Fired Electric Generating Units	
Number	65
Summer Capability (megawatts)	17,508
% of Total Summer Capability	52.3
Generation (gigawatthours)	105,913
Coal Deposits	
Area (square miles)	15,000
Percent of State Land	33

Table B25. Pennsylvania Coal Facts

	1970	1975	1980	1985	1987	1988	1989
Production (Thousand Short Tons)	90,220	90,340	93,125	71,408	70,423	70,645	70,596
Underground	57,124	45,272	43,474	36,590	38,450	39,407	39,607
Surface	33,095	45,069	49,651	34,818	31,974	31,238	30,989
Average Mine Price (Dollars per Short Ton) ..	7.68	25.56	31.12	32.91	29.81	29.90	29.33
Total Value of Production (Million Dollars) ...	692	2,309	2,898	2,350	2,099	2,112	2,071
Percentage of U.S. Coal Production	14.7	13.8	11.2	8.1	7.7	7.4	7.2
National Rank (Production)	3	3	4	4	4	4	4
Total U.S. Coal Production (Thousand Short Tons)	612,661	654,641	829,700	883,638	918,762	950,265	980,729
Number of Mines ¹	1,297	1,185	673	774	683	716	681
Underground	407	241	124	196	173	163	156
Surface	890	944	549	578	510	553	525
Employment ²	28,439	33,867	35,918	22,207	17,287	16,573	15,469
Underground	19,480	22,713	23,442	14,185	10,402	10,242	9,578
Surface	8,959	11,154	12,476	8,022	6,885	6,331	5,891
Consumption (Thousand Short Tons)	71,257	68,498	65,442	56,553	55,305	58,639	58,526
Electric Utilities	30,284	37,263	42,465	41,713	41,263	43,166	43,241
Coke Plants	27,006	23,152	17,065	9,762	8,395	10,146	9,877
Other Industrial Plants	³ 13,9C7	³ 8,083	4,391	3,852	4,112	3,942	3,995
Residential and Commercial	(³)	(³)	1,521	1,226	1,535	1,385	1,413

¹ For 1980, includes only mines that produced 10,000 or more tons.

² Beginning in 1980, includes only mines that produced 10,000 or more tons.

³ Consumption data at Other Industrial Plants and in Residential and Commercial Sector are combined to avoid disclosure of individual company data.

Note: Total may not equal sum of components because of independent rounding.

Sources: Energy Information Administration, *Coal Production, Quarterly Coal Report, Weekly Coal Production, Coal Data: A Reference, Electric Power Monthly 1989*; and *Inventory of Power Plants in the United States 1989*; Bureau of Mines, U.S. Department of Interior, *Minerals Yearbook, Information Circular 8705, Historical Fuels and Energy Consumption Data, 1960-72, United States by States and Census Districts West of the Mississippi*; and *Geological Survey Bulletin 1412, Coal Resources of the United States, January 1, 1974*.

Tennessee

1989 Coal Highlights

Production	
(thousand short tons)	6,480
Value	
(million dollars)	175
Number of Employees	1,857
Consumption	
(thousand short tons)	23,496
Coal-Fired Electric Generating Units	
Number	37
Summer Capability (megawatts)	9,289
% of Total Summer Capability	54.7
Generation (gigawatthours)	46,324
Coal Deposits	
Area (square miles)	4,600
Percent of State Land	11

Table B26. Tennessee Coal Facts

	1970	1975	1980	1985	1987	1988	1989
Production (Thousand Short Tons)	8,237	8,206	9,850	7,446	6,442	6,510	6,480
Underground	4,350	3,806	4,750	5,204	4,865	4,689	4,688
Surface	3,886	4,400	5,100	2,242	1,577	1,821	1,792
Average Mine Price (Dollars per Short Ton) .	4.90	17.10	27.54	28.54	27.65	26.78	26.98
Total Value of Production (Million Dollars) ...	40	140	271	213	178	190	175
Percentage of U.S. Coal Production	1.3	1.3	1.2	.8	.7	.7	.7
National Rank (Production)	9	15	17	17	17	17	17
Total U.S. Coal Production (Thousand Short Tons)	612,661	654,641	829,700	883,638	918,762	950,265	980,729
Number of Mines ¹	203	186	117	118	93	105	98
Underground	116	62	54	70	60	74	68
Surface	87	104	63	48	33	31	30
Employment ²	1,999	3,140	3,615	2,622	1,998	2,119	1,857
Underground	1,344	1,890	2,076	1,871	1,552	1,676	1,471
Surface	655	1,250	1,539	751	446	443	386
Consumption (Thousand Short Tons)	18,315	26,633	24,496	25,105	24,782	25,152	23,496
Electric Utilities	15,494	24,662	21,679	20,853	20,697	21,010	19,283
Coke Plants	183	160	(3)	(3)	(3)	(3)	(3)
Other Industrial Plants	(4)	(4)	(3)	(3)	(3)	(3)	(3)
Residential and Commercial	⁴ 2,638	⁴ 1,811	³ 2,817	³ 4,253	³ 4,186	³ 4,141	³ 4,213

¹ For 1980, includes only mines that produced 10,000 or more tons.

² Beginning in 1980, includes only mines that produced 10,000 or more tons.

³ Consumption data at Coke Plants, Other Industrial Plants and in Residential and Commercial Sector are combined to avoid disclosure of individual company data.

⁴ Consumption data at Other Industrial Plants and in Residential and Commercial Sector are combined to avoid disclosure of individual company data.

Note: Total may not equal sum of components because of independent rounding.

Sources: Energy Information Administration, *Coal Production; Quarterly Coal Report; Weekly Coal Production; Coal Data: A Reference; Electric Power Monthly 1989; and Inventory of Power Plants in the United States 1989*; Bureau of Mines, U.S. Department of Interior, *Minerals Yearbook; Information Circular 8705: Historical Fuels and Energy Consumption Data, 1960-72, United States by States and Census Districts West of the Mississippi*; and *Geological Survey Bulletin 1412: Coal Resources of the United States, January 1, 1974*.

Texas

1989 Coal Highlights

Production (thousand short tons)	53,854
Value (million dollars)	588
Number of Employees	2,109
Consumption (thousand short tons)	90,989
Coal-Fired Electric Generating Units	
Number	33
Summer Capability (megawatts)	18,433
% of Total Summer Capability	30.3
Generation (gigawatthours)	118,566
Coal Deposits	
Area (square miles)	16,100
Percent of State Land	6

Table B27. Texas Coal Facts

	1970	1975	1980	1985	1987	1988	1989
Production (Thousand Short Tons)	0	11,002	29,354	45,459	50,529	52,281	53,854
Underground	0	0	0	0	0	0	0
Surface	0	11,002	29,354	45,459	50,529	52,281	53,854
Average Mine Price (Dollars per Short Ton) ..	.00	w	7.67	11.60	12.10	11.34	10.91
Total Value of Production (Million Dollars) ...	0	w	225	527	611	593	588
Percentage of U.S. Coal Production	.0	1.7	3.5	5.1	5.5	5.5	5.5
National Rank (Production)	0	11	10	6	6	6	6
Total U.S. Coal Production (Thousand Short Tons)	612,661	654,641	829,700	883,638	918,762	950,265	980,729
Number of Mines ¹	0	4	10	14	15	14	15
Underground	0	0	0	0	0	0	0
Surface	0	4	10	14	15	14	15
Employment ²	0	440	1,780	2,360	3,319	3,057	2,109
Underground	0	0	0	0	0	0	0
Surface	0	440	1,780	2,360	3,319	3,057	2,109
Consumption (Thousand Short Tons)	w	12,370	48,602	77,017	82,915	86,644	90,989
Electric Utilities	w	9,067	45,351	71,818	78,802	82,889	86,701
Coke Plants	w	977	(3)	(3)	(3)	0	0
Other Industrial Plants	w	2,326	3,251	5,199	4,113	3,755	4,288
Residential and Commercial	w	(4)	(3)	(3)	(3)	(4)	(4)

¹ For 1980 includes only mines that produced 10,000 or more tons.

² Beginning in 1980, includes only mines that produced 10,000 or more tons.

³ Consumption data at Coke Plants, Other Industrial Plants and in Residential and Commercial Sector are combined to avoid disclosure of individual company data.

⁴ Consumption data at Other Industrial Plants and in Residential and Commercial Sector are combined to avoid disclosure of individual company data.

w Withheld to avoid disclosure of individual company data.

Note: Total may not equal sum of components because of independent rounding.

Sources: Energy Information Administration, *Coal Production; Quarterly Coal Report; Weekly Coal Production; Coal Data: A Reference; Electric Power Monthly 1989; and Inventory of Power Plants in the United States 1989*; Bureau of Mines, U.S. Department of Interior, *Minerals Yearbook; Information Circular 8705: Historical Fuels and Energy Consumption Data, 1960-72, United States by States and Census Districts West of the Mississippi*; and *Geological Survey Bulletin 1412: Coal Resources of the United States, January 1, 1974*.

Utah

1989 Coal Highlights

Production (thousand short tons)	20,102
Value (million dollars)	431
Number of Employees	2,169
Consumption (thousand short tons)	15,044
Coal-Fired Electric Generating Units	
Number	14
Summer Capability (megawatts)	4,424
% of Total Summer Capability	93.4
Generation (gigawatthours)	29,676
Coal Deposits	
Area (square miles)	15,000
Percent of State Land	8

Table B28. Utah Coal Facts

	1970	1975	1980	1985	1987	1988	1989
Production (Thousand Short Tons)	4,733	6,961	13,236	12,780	16,508	18,163	20,102
Underground	4,733	6,961	13,236	12,780	16,508	18,163	20,102
Surface	0	0	0	0	0	0	0
Average Mine Price (Dollars per Short Ton) ..	7.28	19.84	25.63	27.69	25.70	22.42	21.46
Total Value of Production (Million Dollars) ...	34	138	339	354	424	407	431
Percentage of U.S. Coal Production	.8	1.1	1.6	1.4	1.8	1.9	2.0
National Rank (Production)	14	17	15	15	14	14	14
Total U.S. Coal Production (Thousand Short Tons)	612,661	654,641	829,700	883,638	918,762	950,265	980,729
Number of Mines ¹	20	20	29	22	21	20	21
Underground	20	20	29	22	21	20	21
Surface	0	0	0	0	0	0	0
Employment ²	1,469	2,550	3,512	2,563	2,544	2,375	2,169
Underground	1,469	2,550	3,512	2,563	2,544	2,375	2,169
Surface	0	0	0	0	0	0	0
Consumption (Thousand Short Tons)	3,010	4,514	7,106	8,303	11,807	14,513	15,044
Electric Utilities	464	1,995	4,895	6,325	11,175	12,544	12,949
Coke Plants	1,938	1,973	³ 1,710	³ 1,506	³ 0	³ 1,586	³ 1,409
Other Industrial Plants	⁴ 608	⁴ 546	501	472	631	⁴ 597	686
Residential and Commercial	(⁴)	(⁴)	(³)	(³)	(³)	(³)	(³)

¹ For 1980, includes only mines that produced 10,000 or more tons.

² Beginning in 1980, includes only mines that produced 10,000 or more tons.

³ Consumption data at Coke Plants and in Residential and Commercial Sector are combined to avoid disclosure of individual company data.

⁴ Consumption data at Other Industrial Plants and in Residential and Commercial Sector are combined to avoid disclosure of individual company data.
Note: Total may not equal sum of components because of independent rounding.

Sources: Energy Information Administration, *Coal Production; Quarterly Coal Report; Weekly Coal Production; Coal Data: A Reference; Electric Power Monthly 1989*; and *Inventory of Power Plants in the United States 1989*; Bureau of Mines, U.S. Department of Interior, *Minerals Yearbook; Information Circular 8705: Historical Fuels and Energy Consumption Data, 1960-72, United States by States and Census Districts West of the Mississippi*; and *Geological Survey Bulletin 1412: Coal Resources of the United States, January 1, 1974*.

Virginia

1989 Coal Highlights

Production	
(thousand short tons)	43,006
Value	
(million dollars)	1,189
Number of Employees	10,371
Consumption	
(thousand short tons)	14,279
Coal-Fired Electric Generating Units	
Number	24
Summer Capability (megawatts)	4,225
% of Total Summer Capability	32.0
Generation (gigawatthours)	24,059
Coal Deposits	
Area (square miles)	1,940
Percent of State Land	5

Table B29. Virginia Coal Facts

	1970	1975	1980	1985	1987	1988	1989
Production (Thousand Short Tons)	35,016	35,510	41,009	40,940	44,543	45,886	43,006
Underground	28,018	23,181	32,358	33,550	36,943	37,809	36,044
Surface	6,998	12,329	8,651	7,390	7,599	8,076	6,962
Average Mine Price (Dollars per Short Ton) ..	7.03	30.46	34.58	30.16	27.42	26.49	27.64
Total Value of Production (Million Dollars) ...	246	1,082	1,418	1,235	1,221	1,215	1,189
Percentage of U.S. Coal Production	5.7	5.4	4.9	4.6	4.8	4.8	4.4
National Rank (Production)	6	6	6	7	7	7	7
Total U.S. Coal Production (Thousand Short Tons)	612,661	654,641	829,700	883,638	918,762	950,265	980,729
Number of Mines¹	803	745	502	509	477	413	365
Underground	566	374	387	390	343	304	271
Surface	237	371	115	11	134	109	94
Employment²	10,630	16,510	15,876	13,268	12,047	10,696	10,371
Underground	9,567	13,360	13,569	11,553	10,228	9,046	8,889
Surface	1,063	3,150	2,307	1,715	1,819	1,650	1,482
Consumption (Thousand Short Tons)	11,065	6,561	9,291	11,656	13,227	13,430	14,279
Electric Utilities	6,661	3,989	5,560	7,166	8,297	8,469	9,573
Coke Plants	22	0	³ 856	³ 1,155	³ 1,267	³ 1,216	³ 1,130
Other Industrial Plants	⁴ 4,382	⁴ 2,572	2,875	3,334	3,662	3,745	3,576
Residential and Commercial	(⁴)	(⁴)	(³)	(³)	(³)	(³)	(³)

¹ For 1980, includes only mines that produced 10,000 or more tons.

² Beginning in 1980, includes only mines that produced 10,000 or more tons.

³ Consumption data at Coke Plants and in Residential and Commercial Sector are combined to avoid disclosure of individual company data.

⁴ Consumption data at Other Industrial Plants and in Residential and Commercial Sector are combined to avoid disclosure of individual company data.
Note: Total may not equal sum of components because of independent rounding.

Sources: Energy Information Administration, *Coal Production; Quarterly Coal Report; Weekly Coal Production; Coal Data: A Reference; Electric Power Monthly 1989; and Inventory of Power Plants in the United States 1989*; Bureau of Mines, U.S. Department of Interior, *Minerals Yearbook; Information Circular 8705: Historical Fuels and Energy Consumption Data, 1960-72, United States by States and Census Districts West of the Mississippi*; and *Geological Survey Bulletin 1412: Coal Resources of the United States, January 1, 1974*.

Washington

1989 Coal Highlights

Production (thousand short tons)	5,039
Value (million dollars)	w
Number of Employees	787
Consumption (thousand short tons)	5,843
Coal-Fired Electric Generating Units	
Number	2
Summer Capability (megawatts)	1,276
% of Total Summer Capability	5.3
Generation (gigawatthours)	8,519
Coal Deposits	
Area (square miles)	1,150
Percent of State Land	2

Table B30. Washington Coal Facts

	1970	1975	1980	1985	1987	1988	1989
Production (Thousand Short Tons)	37	3,743	5,140	4,438	4,449	5,170	5,039
Underground	32	13	0	0	0	0	0
Surface	5	3,730	5,140	4,438	4,449	5,170	5,039
Average Mine Price (Dollars per Short Ton) .	12.81	w	w	w	w	w	w
Total Value of Production (Million Dollars) ...	.5	w	w	w	w	w	w
Percentage of U.S. Coal Production	(¹)	.6	.6	.5	.5	.5	.5
National Rank (Production)	24	19	20	19	18	18	18
Total U.S. Coal Production (Thousand Short Tons)	612,661	654,641	829,700	883,638	918,762	950,265	980,729
Number of Mines ²	3	4	2	3	4	4	4
Underground	2	1	0	0	0	0	0
Surface	1	3	2	3	4	4	4
Employment ³	30	520	597	677	699	716	787
Underground	28	10	0	0	0	0	0
Surface	2	510	597	677	699	716	787
Consumption (Thousand Short Tons)	374	4,121	5,443	5,616	5,819	5,929	5,843
Electric Utilities	0	3,717	4,950	5,192	5,468	5,561	5,514
Coke Plants	0	0	0	0	0	0	0
Other Industrial Plants	296	4,404	332	208	298	252	238
Residential and Commercial	78	(⁴)	161	216	52	116	90

¹ Less than 0.05 percent.

² For 1980, includes only mines that produced 10,000 or more tons.

³ Beginning in 1980, includes only mines that produced 10,000 or more tons.

⁴ Consumption data at Other Industrial Plants and in Residential and Commercial Sector are combined to avoid disclosure of individual company data.

w Withheld to avoid disclosure of individual company data.

Note: Total may not equal sum of components because of independent rounding.

Sources: Energy Information Administration, *Coal Production; Quarterly Coal Report; Weekly Coal Production; Coal Data: A Reference; Electric Power Monthly 1989; and Inventory of Power Plants in the United States 1989*; Bureau of Mines, U.S. Department of Interior, *Minerals Yearbook; Information Circular 8705: Historical Fuels and Energy Consumption Data, 1960-72, United States by States and Census Districts West of the Mississippi*; and *Geological Survey Bulletin 1412: Coal Resources of the United States, January 1, 1974*.

West Virginia

1989 Coal Highlights

Production	
(thousand short tons)	153,580
Value	
(million dollars)	4,406
Number of Employees	29,482
Consumption	
(thousand short tons)	37,186
Coal-Fired Electric Generating Units	
Number	33
Summer Capability (megawatts)	14,315
% of Total Summer Capability	99.2
Generation (gigawatthours)	82,105
Coal Deposits	
Area (square miles)	16,800
Percent of State Land	69

Table B31. West Virginia Coal Facts

	1970	1975	1980	1985	1987	1988	1989
Production (Thousand Short Tons)	144,072	109,283	121,584	127,764	136,676	145,005	153,580
Underground	116,414	88,357	96,409	103,753	107,463	110,076	113,202
Surface	27,657	20,926	25,175	24,011	29,213	34,929	40,378
Average Mine Price (Dollars per Short Ton) ..	7.93	29.35	34.88	33.47	29.15	28.22	28.89
Total Value of Production (Million Dollars) ...	1,142	3,207	4,241	4,276	3,984	4,092	4,406
Percentage of U.S. Coal Production	23.5	16.7	14.7	14.5	14.9	15.3	15.7
National Rank (Production)	1	2	2	3	3	3	3
Total U.S. Coal Production (Thousand Short Tons)	612,861	654,641	829,700	883,638	918,762	950,265	980,729
Number of Mines¹	1,319	1,072	762	797	778	747	773
Underground	748	703	539	502	478	477	461
Surface	571	369	223	295	300	270	312
Employment²	47,144	54,210	53,403	36,658	29,458	28,972	29,482
Underground	41,323	48,400	45,904	31,106	24,513	23,495	23,048
Surface	5,821	5,810	7,499	5,552	4,945	5,477	6,434
Consumption (Thousand Short Tons)	24,395	34,360	34,673	34,907	34,815	36,435	37,186
Electric Utilities	14,320	26,320	28,499	31,367	30,605	31,703	32,391
Coke Plants	5,074	4,467	³ 3,951	³ 1,454	³ 1,884	³ 2,135	³ 2,084
Other Industrial Plants	⁴ 5,001	⁴ 3,573	2,223	2,086	2,326	2,597	2,712
Residential and Commercial	(⁴)	(⁴)	(³)	(³)	(³)	(³)	(³)

¹ For 1980, includes only mines that produced 10,000 or more tons.

² Beginning in 1980, includes only mines that produced 10,000 or more tons.

³ Consumption data at Coke Plants and in Residential and Commercial Sector are combined to avoid disclosure of individual company data.

⁴ Consumption data at Other Industrial Plants and in Residential and Commercial Sector are combined to avoid disclosure of individual company data.
Note: Total may not equal sum of components because of independent rounding.

Sources: Energy Information Administration, *Coal Production; Quarterly Coal Report; Weekly Coal Production; Coal Data: A Reference; Electric Power Monthly 1989*; and *Inventory of Power Plants in the United States 1989*; Bureau of Mines, U.S. Department of Interior, *Minerals Yearbook; Information Circular 8705: Historical Fuels and Energy Consumption Data, 1960-72, United States by States and Census Districts West of the Mississippi*; and *Geological Survey Bulletin 1412: Coal Resources of the United States, January 1, 1974*.

Wyoming

1989 Coal Highlights

Production (thousand short tons)	171,558
Value (million dollars)	1,481
Number of Employees	3,351
Consumption (thousand short tons)	23,952
Coal-Fired Electric Generating Units	
Number	19
Summer Capability (megawatts)	5,410
% of Total Summer Capability	95.1
Generation (gigawatthours)	36,003
Coal Deposits	
Area (square miles)	40,055
Percent of State Land	41

Table B32. Wyoming Coal Facts

	1970	1975	1980	1985	1987	1988	1989
Production (Thousand Short Tons)	7,222	23,804	94,887	140,714	146,850	164,014	171,558
Underground	118	436	1,633	1,058	107	1,138	1,645
Surface	7,105	23,369	93,254	139,656	146,743	162,876	169,913
Average Mine Price (Dollars per Short Ton) ..	3.38	6.74	10.54	11.36	9.80	9.16	8.83
Total Value of Production (Million Dollars) ...	24	160	1,000	1,599	1,439	1,502	1,481
Percentage of U.S. Coal Production	1.2	3.6	11.4	15.9	16.0	17.3	17.5
National Rank (Production)	11	8	3	2	2	1	1
Total U.S. Coal Production (Thousand Short Tons)	612,661	654,641	829,700	883,638	918,762	950,265	980,729
Number of Mines ¹	13	20	25	30	29	32	30
Underground	4	5	3	1	2	4	4
Surface	9	15	22	29	27	28	26
Employment ²	514	1,630	4,799	4,444	3,191	3,167	3,351
Underground	62	270	465	270	20	132	280
Surface	452	1,360	4,334	4,174	3,171	3,035	3,071
Consumption (Thousand Short Tons)	3,809	7,855	15,209	23,155	24,399	25,424	23,952
Electric Utilities	3,588	7,282	13,499	21,173	22,408	23,563	21,908
Coke Plants	0	0	0	0	0	0	0
Other Industrial Plants	³ 221	³ 573	³ 1,710	³ 1,981	³ 1,990	³ 1,722	³ 2,044
Residential and Commercial	(³)	(²)	(³)	(³)	(³)	(³)	(³)

¹ For 1980, includes only mines that produced 10,000 or more tons.

² Beginning in 1980, includes only mines that produced 10,000 or more tons.

³ Consumption data at Other Industrial Plants and in Residential and Commercial Sector are combined to avoid disclosure of individual company data. Note: Total may not equal sum of components because of independent rounding.

Sources: Energy Information Administration, *Coal Production; Quarterly Coal Report; Weekly Coal Production; Coal Data: A Reference; Electric Power Monthly 1989; and Inventory of Power Plants in the United States 1989*; Bureau of Mines, U.S. Department of Interior, *Minerals Yearbook; Information Circular 8705: Historical Fuels and Energy Consumption Data, 1960-72, United States by States and Census Districts West of the Mississippi*; and *Geological Survey Bulletin 1412: Coal Resources of the United States, January 1, 1974*.

Appendix C

Reference Tables and Maps

At an Ohio surface mine, a giant, shovel-type earth mover (GEM) removes overburden.

Figure C1. Coal-Bearing Areas of the United States

1 Symbolic representation; these small areas or data points cannot be shown to scale.

2 Principal anthracite deposits are in Pennsylvania. Small deposits occur in Alaska, Arkansas, Colorado, Massachusetts-Rhode Island, New Mexico, Utah, Virginia, Washington, and West Virginia.

Figure C2. Coal-Producing Districts

Bituminous Coal Producing Districts as Defined in the Bituminous Coal Act of 1937 and Amendments
 The districts were originally established to aid in formulating minimum prices of bituminous coal and lignite. Because much statistical information was compiled in terms of these districts, their use for statistical purposes has continued since the abandonment of that legislation in 1943.
 District 24 is the anthracite producing district in Pennsylvania.

Coal-Producing Districts

District 1

Maryland - All mines in the State.

Pennsylvania - All mines in the following counties: Bedford, Blair, Bradford, Cambria, Cameron, Centre, Clarion, Clearfield, Clinton, Elk, Forest, Fulton, Huntingdon, Jefferson, Lycoming, McKean, Mifflin, Potter, Somerset, and Tioga. Selected mines in the following counties: Armstrong County (part), all mines east of the Allegheny River, and those mines served by the Pittsburgh and Shawmut Railroad located on the west bank of the river; Fayette County (part), all mines located on and east of the line of Indian Creek Valley branch of the Baltimore & Ohio Railroad (CSX Transportation); Indiana County (part), all mines not served by the Saltsburg branch of the Consolidated Rail Corporation; and Westmoreland County (part), all mines served by the Consolidated Rail Corporation from Torrance, east.

West Virginia - All mines in the following counties: Grant, Mineral, and Tucker.

District 2

Pennsylvania - All mines in the following counties: Allegheny, Beaver, Butler, Greene, Lawrence, Mercer, Venango, and Washington. Selected mines in the following counties: Armstrong County (part), all mines west of the Allegheny River except those mines served by the Pittsburgh & Shawmut Railroad; Fayette County (part), all mines except those on and east of the line of Indian Creek Valley branch of the Baltimore & Ohio Railroad (CSX Transportation); Indiana County (part), all mines served by the Saltsburg branch of the Consolidated Rail Corporation; and Westmoreland County (part), all mines except those served by the Consolidated Rail Corporation from Torrance, east.

District 3

West Virginia - All mines in the following counties: Barbour, Braxton, Calhoun, Doddridge, Gilmer, Harrison, Jackson, Lewis, Marion, Monongalia, Pleasants, Preston, Randolph, Ritchie, Roane, Taylor, Tyler, Upshur, Webster, Wetzel, Wirt, and Wood. Selected mines in the following county: Nicholas County (part), all mines served by or north of the Baltimore & Ohio Railroad (CSX Transportation).

District 4

Ohio - All mines in the State.

District 5

Michigan - All mines in the State.

District 6

West Virginia - All mines in the following counties: Brooke, Hancock, Marshall, and Ohio.

District 7

Virginia - All mines in the following counties: Craig, Giles, Montgomery, Pulaski, and Wythe. Selected mines in the following counties: Buchanan County (part), all mines in that portion of the county served by the Richlands-Jewell Ridge branch of the Norfolk & Western Railroad (Norfolk Southern Corporation) and in that portion on the headwaters of Dismal Creek east of Lynn Camp Creek (a tributary of Dismal Creek); and Tazewell County (part), all mines in those portions of the county served by the Dry Fork branch to Cedar Bluff and from Bluestone Junction to Boissevain branch of the Norfolk & Western Railroad (Norfolk Southern Corporation) and Richlands-Jewell Ridge branch of the Norfolk & Western Railroad (Norfolk Southern Corporation).

West Virginia - All mines in the following counties: Greenbrier, Mercer, Monroe, Pocahontas, and Summers. Selected mines in the following counties: Fayette County (part), all mines east of Gauley River and all mines served by the Gauley River branch of the Chesapeake & Ohio Railroad (CSX Transportation) and mines served by the Norfolk & Western Railroad (Norfolk Southern Corporation); McDowell County (part), all mines in that portion of the county served by the Dry Fork branch of the Norfolk & Western Railroad (Norfolk Southern Corporation) and east thereof; Raleigh County (part), all mines except those on the Coal River branch of the Chesapeake & Ohio Railroad (CSX Transportation) and north thereof; and Wyoming County (part), all mines in that portion served by the Guyandot branch of the Norfolk & Western Railroad (Norfolk Southern Corporation) lying east of the mouth of Skin Fork of Guyandot River and in that portion served by the Virginia division main line of the Norfolk & Western Railroad (Norfolk Southern Corporation).

District 8

Kentucky - All mines in the following counties in eastern Kentucky: Bell, Boyd, Breathitt, Carter, Clay, Clinton, Elliott, Estill, Floyd, Greenup, Harlan, Jackson, Johnson, Knott, Knox, Laurel, Lawrence, Lee, Leslie, Letcher, McCreary, Magoffin, Martin, Morgan, Owsley, Perry, Pike, Powell, Pulaski, Rockcastle, Wayne, Whitley, and Wolfe.

North Carolina - All mines in the State.

Tennessee - All mines in the following counties: Anderson, Campbell, Claiborne, Cumberland, Fentress, Morgan, Overton, Roane, and Scott.

Virginia - All mines in the following counties: Dickinson, Lee, Russell, Scott, and Wise. Selected mines in the following counties: Buchanan County (part), all mines in the county, except in that portion on the headwaters of Dismal Creek, east of Lynn Camp Creek (a tributary of Dismal Creek) and in that portion served by the Richlands-Jewell Ridge branch of the Norfolk & Western Railroad (Norfolk Southern Corporation); and Tazewell County (part), all mines in the county except in those portions served by the Dry Fork branch of the Norfolk & Western Railroad (Norfolk Southern Corporation) and branch from Bluestone Junction to Boissevain of Norfolk & Western Railroad (Norfolk Southern Corporation) and Richlands-Jewell Ridge branch of the Norfolk & Western Railroad (Norfolk Southern Corporation).

West Virginia - All mines in the following counties: Boone, Cabell, Clay, Kanawha, Lincoln, Logan, Mingo, Putnam, and Wayne. Selected mines in the following counties: Fayette County (part), all mines west of the Gauley River except mines served by the Gauley River branch of the Chesapeake & Ohio Railroad (CSX Transportation); McDowell County (part), all mines west of and not served by the Dry Fork branch of the Norfolk & Western Railroad (Norfolk Southern Corporation); Nicholas County (part), all mines in that part of the county south of and not served by the Baltimore & Ohio Railroad (CSX Transportation); Raleigh County (part), all mines on the Coal River branch of the Chesapeake & Ohio Railroad (CSX Transportation) and north thereof; and Wyoming County (part), all mines in that portion served by the Guyandot branch of the Norfolk & Western Railroad (Norfolk Southern Corporation) and lying west of the mouth of Skin Fork of Guyandot River.

District 9

Kentucky - All mines in the following counties in western Kentucky: Butler, Caldwell, Christian, Crittenden, Daviess, Edmonson, Grayson, Hancock, Henderson,

Hopkins, Logan, McLean, Muhlenberg, Ohio, Simpson, Todd, Union, Warren, and Webster.

District 10

Illinois - All mines in the State.

District 11

Indiana - All mines in the State.

District 12

Iowa - All mines in the State.

District 13

Alabama - All mines in the State.

Georgia - All mines in the State.

Tennessee - All mines in the following counties: Bledsoe, Grundy, Hamilton, Marion, McMinn, Rhea, Sequatchie, Van Buren, Warren, and White.

District 14

Arkansas - All mines in the State.

Oklahoma - All mines in the following counties: Haskell, Le Flore, and Sequoyah.

District 15

Kansas - All mines in the State.

Louisiana - All mines in the State.

Missouri - All mines in the State.

Oklahoma - All mines in the following counties: Coal, Craig, Latimer, McIntosh, Muskogee, Nowata, Okmulgee, Pittsburgh, Rogers, Tulsa, and Wagoner.

Texas - All mines in the State.

District 16

Colorado - All mines in the following counties: Adams, Arapahoe, Boulder, Douglas, Elbert, El Paso, Jackson, Jefferson, Larimer, and Weld.

District 17

Colorado - All mines except those included in District 16.

New Mexico - All mines except those included in District 18.

District 18

Arizona - All mines in the State.

California - All mines in the State.

New Mexico - All mines in the following counties: Catron, Grant, Lincoln, McKinley, Rio Arriba, Sandoval, San Juan, San Miguel, Santa Fe, and Socorro.

District 19

Idaho - All mines in the State.

Wyoming - All mines in the State.

District 20

Utah - All mines in the State.

District 21

North Dakota - All mines in the State.

South Dakota - All mines in the State.

District 22

Montana - All mines in the State.

District 23

Alaska - All mines in the State.

Oregon - All mines in the State.

Washington - All mines in the State.

District 24 (Pennsylvania Anthracite)

Pennsylvania - All mines in the following counties: Carbon, Columbia, Dauphin, Lackawanna, Lebanon, Luzerne, Northumberland, Schuylkill, Snyder, Sullivan, and Susquehanna. All anthracite mines in Bradford County.

Coal-Producing Regions

Appalachian

Alabama, Georgia, Eastern Kentucky, Maryland, Ohio, Pennsylvania, Tennessee, Virginia, West Virginia.

Interior

Arkansas, Illinois, Indiana, Iowa, Kansas, Western Kentucky, Louisiana, Missouri, Oklahoma, Texas.

Western

Alaska, Arizona, California, Colorado, Montana, New Mexico, North Dakota, Utah, Washington, Wyoming.

Table C1. Classification of Coals by Rank
Principles

The lower rank coals can be classified based on heat content. The heat content of the higher rank coals is generally above 14,000 Btu per pound for each coal rank group (except for meta-anthracite, which trends slightly lower), and heat content ranges vary within a relatively narrow range. Since heat content is not a dependable criterion for these higher rank coals, their rank categories are instead described by degree of metamorphism, or "coalification," a property that is measured by fixed carbon content. Finally, the agglomerating character of bituminous coals is a critical attribute for certain coal consumers, and thus agglomerating character has come to define the distinctions between certain adjacent coal groups. Some high-volatile C bituminous and subbituminous A coals can be distinguished only on the basis of agglomerating character.

Coal Rank	Coal Group	Basis of Classification		
Coals Classified by Fixed Carbon		Fixed Carbon Percentage ¹		Agglomerating Character
		Equal to or Greater than	Less than	
I. Anthracitic	1. Meta-anthracite	98	--	Non-agglomerating
	2. Anthracite	92	98	Non-agglomerating
	3. Semianthracite ²	86	92	Non-agglomerating
II. Bituminous	1. Low-volatile bituminous	78	86	Commonly agglomerating ³
	2. Medium-volatile bituminous	4 69	78	Commonly agglomerating ³
	3. High-volatile A bituminous	--	4 69	Commonly agglomerating ³
Coals Classified by Heat Content		Heat Content in Btu per Pound ⁵		Agglomerating Character
		Equal to or Greater than	Less than	
II. Bituminous	4. High-volatile B bituminous	13,000	14,000	Commonly agglomerating ³
	5. High-volatile C bituminous	11,500	13,000	Commonly agglomerating ³
	6. High-volatile C bituminous	10,500	11,500	Agglomerating
III. Subbituminous	1. Subbituminous A	10,500	11,500	Non-agglomerating
	2. Subbituminous B	9,500	10,500	Non-agglomerating
	3. Subbituminous C	8,300	9,500	Non-agglomerating
IV. Lignitic	1. Lignite A	6,300	8,300	Non-agglomerating
	2. Lignite B	--	6,300	Non-agglomerating

¹ Percentages are based on dry mineral-matter-free coal. Volatile matter (not shown) is the complement of fixed carbon; that is, the percentages of fixed carbon and volatile matter sum to 100 percent. As fixed carbon percentage decreases, therefore, volatile matter percentage increases by the same amount.

² If agglomerating, classify in low-volatile group of the bituminous class.

³ There may be nonagglomerating varieties in the bituminous class, most notably in the high-volatile C bituminous group.

⁴ Coals having 69 percent or more fixed carbon are classified according to fixed carbon, regardless of Btu value. Coals with less than 69 percent fixed carbon, but with 14,000 or more Btu per pound, are classified as high-volatile A bituminous.

⁵ Calorific values in Btu per pound, on a moist mineral-matter-free basis.

Note: Terms in this table are defined in the Glossary.

Source: Adapted from American Society for Testing and Materials 1988, Standard Classification of Coal by Rank, ASTM Designation D 388-84.

Appendix D

Explanatory Notes

Miners are protected during longwall operations by hydraulically-operated, canopied roof supports.

Explanatory Notes

Coal Production

Sources of Data

As early as the 1880's, the U.S. Geological Survey began collecting coal data under a voluntary reporting system. The responsibility for gathering this information was transferred to the Bureau of Mines in the 1920's, initially under the U.S. Department of Commerce and later under the U.S. Department of the Interior, which published the data in its *Minerals Yearbook*. Except for a brief period from 1937 to 1943, when bituminous coal data were collected under the mandatory authority of the Bituminous Coal Act, the Bureau of Mines continued to conduct voluntary coal surveys until the Department of Energy was created.

The Energy Information Administration (EIA) began collecting annual coal production data on October 1, 1977. The 1989 coal production and related data in this report were collected on Form EIA-7A, "Coal Production Report," from companies that produced, processed, or prepared coal in 1989. So that the EIA may fulfill its data collection functions as specified in the Federal Energy Administration Act of 1974 (Public Law 93-275), response to this survey is mandatory. The respondents to this survey are compared with lists of mining operations maintained by various State coal mining/licensing agencies and the Mine Safety and Health Administration (MSHA), U.S. Department of Labor, to identify new respondents. No sampling procedures are used. In 1989, there were 3,511 mining operations that produced, processed, or prepared 10,000 or more short tons of coal. Of these mining operations, 76.1 percent (2,673) responded to the EIA-7A survey. In 1989, there were 2,821 mines that produced 10,000 or more short tons of coal. Of these mines, 73.1 percent (2,063) responded to the EIA-7A survey and they accounted for 909.3 million short tons, or 93 percent of the 1989 production total. All of the data were collected by mail and were edited to ensure that they were complete and accurate.

The total number of U.S. mining operations and total U.S. coal production were taken from the 1989 EIA-7A data base, which included production by mines producing less than 10,000 short tons of coal during 1989. State mining agency reports on coal production for 1989 and Form 7000-2, "Quarterly Mine Employment and Coal Production Report," collected by the Mine Safety and Health Administration, were used to determine production figures for EIA-7A nonrespondents.

As in all surveys, data from Form EIA-7A, "Coal Production Report," are subject to various sources of error: (1) coverage (the list of respondents may not be complete or, on the other hand, there may be double counting), (2) nonresponse (all units that are surveyed may not respond or may not provide all the information requested), (3) respondents (respondents may commit errors in reporting the data), (4) processing (the data collection agency may lose or incorrectly transcribe the submissions), (5) concept (the data collection elements may not measure the items they were intended to measure), and (6) adjustment (errors may be made in estimating values for missing data).

Because the annual coal production survey (Form EIA-7A) is not a sample survey, the estimates shown in this report are not subject to sampling error.¹ It is not possible to present estimates of nonsampling error, but precautionary steps were taken at each stage of the survey design to minimize the possible occurrence of these errors. These steps are described below.

Data Editing, Analysis and Processing

The forms are logged within 24 hours of receipt and assigned to a team of editors consisting of Coal Data Systems Branch personnel and contractors. The editors screen the forms for legibility, completeness, and consistency. Names and address changes are updated in the files. The reported data are compared to data from previous years and with secondary sources such as

¹Sampling error is a measure of the variation that occurs by chance because a sample rather than a complete enumeration of units is surveyed.

Mine Safety and Health Administration and State mining agency reports. Inconsistencies are identified and the respondent^a contacted for clarification.

Computer edits are generated to identify keypunch errors, errors made by coders, out-of-range codes, and unlikely data combinations. Errors are corrected to conform to the data on the submissions or revised after telephone conversations with company representatives. All changes to reported data are documented.

Data from Form EIA-7A are maintained on an automated database at the EIA computing facility in Washington, D.C. The survey forms are filed by EIA identification number organized by State and county.

Missing Data

The survey forms were sent via regular mail in January with a due date of March 1, 1990. A nonresponse letter was mailed March 15 to those mining operations that had not submitted their forms. Subsequent to the letter, attempts were made to contact by telephone those nonrespondents whose reported 1988 production was 200,000 short tons or more.

Some forms could not be delivered. Where possible, address corrections were obtained. In some instances, mining operations that had reported in earlier surveys or operated only in 1989 were no longer in business. Unobtainable data were derived from three secondary sources: State mining agency coal production reports; the Form EIA-6 "Coal Distribution Report"; and Form 7000-2, "Quarterly Mine Employment and Coal Production Report," collected by the Mine Safety and Health Administration.

Missing production quantity data were derived from secondary sources for 1,187 mines, which produced 69.8 million short tons, or 7.1 percent of total production. The received and generated data sources for total U.S. coal production are shown in Table D1. Of the mines whose production exceeded 10,000 or more short tons, missing production quantity data were derived from secondary sources for 758 mines, representing 7 percent (68.2 million short tons).

Missing *coalbed classification*, *coalbed thickness*, and *coal rank/group* data were estimated using State mining agency production reports, geological data, and previous years' reports for these mines.

When a mine had a missing *production value*, its production was multiplied by the county-level average mine price to estimate the value. County-level average mine prices were calculated by dividing the total value for the appropriate disposition (open/captive) and type

of mining (underground or surface) by the corresponding total production. All missing production was classified as open market unless information was available to classify it as captive. Of those mines whose production was 10,000 or more short tons, data were estimated for 864 mines, representing 8.8 percent (86.1 million short tons) of their production total.

Employment data include *direct labor hours*, *number of production days worked*, *average length of a production shift*, *average number of miners per shift*, and *average number of shifts per day*. Of those mines whose production exceeded 10,000 or more short tons, one or more of these data elements were derived from secondary sources or estimated for 783 mines representing 7.2 percent (70.1 million short tons) of their production total. Of the mining operations that produced, processed or prepared 10,000 or more short tons, one or more of these data elements were derived from secondary sources or estimated for 877 mining operations, or 25 percent of the total.

Missing *direct labor hours* were estimated using county- or State-level productivity-per-hour averages. The averages were calculated by dividing the total production at the county or State level by total direct labor hours at the same level for the appropriate type of mining (underground or surface). The quantity of production for the mine with missing data was divided by this productivity average to derive direct labor hours.

Missing *average number of production days worked* and *length of a production shift* were derived by using the corresponding county- or State-level average for the appropriate type of mining (underground or surface).

Missing *average number of miners per shift* was estimated as the average number of miners working daily. The average number of miners working daily was calculated by multiplying the average length of a production shift by the number of production days worked, and then dividing this number into the total direct labor hours. Missing *average number of shifts per day* was estimated as one shift per day.

Missing *recoverable coal reserves* data were estimated by using the mine's 1988 recoverable reserves minus the mine's 1989 production. If this calculation could not be made, the mine's projected production for 1989 was used. If recoverable coal reserves for 1988 and 1989 and projected production for 1990 were all missing, no estimate was made. In 1989, recoverable reserves were reported by or estimated for 1,904 mines, representing 906.1 million short tons, or 92.7 percent whose production exceeded 10,000 or more short tons.

Missing *recovery percentage* data were estimated by using 1988 recovery percentage averages at the State level for the appropriate type of mining (underground or surface).

**Table D1. Sources of Data for Total U.S. Coal Production¹
and Number of Mining Operations²**
(Thousand Short Tons)

Coal-Producing State	Received		Generated Data Sources				Total	
	Form EIA-7A		Derived From State Mining Agency Coal Production Reports		Derived From Mine Safety and Health Administration Data		Number of Operations	Production
	Number of Operations	Production	Number of Operations	Production	Number of Operations	Production		
Alabama	99	27,785	12	184	3	22	114	27,992
Alaska	1	1,582	-	-	-	-	1	1,582
Arizona	2	11,935	-	-	-	-	2	11,935
Arkansas	8	70	-	-	-	-	8	70
California	1	41	-	-	-	-	1	41
Colorado	26	17,123	-	-	-	-	26	17,123
Illinois	54	59,267	-	-	-	-	54	59,267
Indiana	63	33,546	-	-	1	95	64	33,641
Iowa	4	394	-	-	1	36	5	430
Kansas	5	856	-	-	-	-	5	856
Kentucky Total	773	133,547	545	33,842	33	-	1,351	167,389
Eastern Kentucky	691	93,398	520	32,341	31	-	1,242	125,739
Western Kentucky	82	40,149	25	1,500	2	-	109	41,649
Louisiana	2	2,983	-	-	-	-	2	2,983
Maryland	32	3,365	1	10	-	-	33	3,376
Missouri	9	3,378	-	-	-	-	9	3,378
Montana	8	37,742	1	(*)	-	-	9	37,742
New Mexico	9	23,702	-	-	-	-	9	23,702
North Dakota	13	29,566	-	-	-	-	13	29,566
Ohio	194	33,608	-	-	11	81	205	33,689
Oklahoma	21	1,753	-	-	-	-	21	1,753
Pennsylvania Total	621	66,221	110	3,876	35	500	766	70,596
Anthracite	181	2,910	45	362	17	76	243	3,348
Bituminous	440	63,311	65	3,514	18	424	523	67,248
Tennessee	94	6,342	-	-	23	138	117	6,480
Texas	15	53,854	-	-	-	-	15	53,854
Utah	22	20,102	-	-	-	-	22	20,102
Virginia	313	36,140	131	6,851	15	14	459	43,006
Washington	4	5,039	-	-	-	-	4	5,039
West Virginia	620	129,421	313	24,159	32	-	965	153,580
Wyoming	30	171,558	-	-	-	-	30	171,558
U.S. Total	3,043	910,920	1,113	68,923	154	896	4,310	980,729

¹ Excludes silt, culm, refuse bank, slurry dam, and dredge production except for Pennsylvania anthracite.

² Includes preparation plants.

(*) Less than 500 short tons.

Note: Totals may not equal sum of components because of independent rounding.

Sources: Energy Information Administration, Form EIA-7A, "Coal Production Report"; State Mining Agency Coal Production Reports; U.S. Department of Labor, Mine Safety and Health Administration, Form 7000-2, "Quarterly Mine Employment and Coal Production Report."

In 1989, there were 47 mines that produced 1.3 million short tons of refuse bituminous and subbituminous coal. These operations are not included in this report.

Nondisclosure of Data

In order to protect the confidentiality of individual respondent's data, a policy was implemented to ensure that the reporting of survey data on mine prices and recoverable reserves in this publication would not associate those data with a particular company. The final phase in the data quality assurance and control procedures is determining which data must be suppressed (withheld) during publication to provide the necessary confidentiality for mines or companies that operate in small reporting areas. All withholding analysis is done

based upon production volumes. These procedures are performed as follows:

1. Primary Withholding Based on the Number of Respondents in a Cell -- All cells with three or fewer active coal mining operations are suppressed.
2. Residual Withholding Dominance Rule Phase 1 -- All cells containing between four and ten active coal mining operations are examined. A cell is suppressed if any single respondent accounts for 75 or more percent of the volume for all respondents included in that cell.
3. Residual Withholding Dominance Rule Phase 2 -- All cells in which two active coal mining operations represent 90 or more percent of the volume for all respondents included in that cell are suppressed.

4. Complementary Suppression -- All tables are reviewed to identify cells which should have data withheld to prevent disclosure of already suppressed cells. An example of cells to be withheld during complementary suppression is underground price if the surface price is withheld during primary or residual suppression. Since the total price is published, if the underground price is not withheld, the surface price could be calculated using the total price, the underground price, and the underground, surface, and total volumes.

Most complementary suppression involves type of mining considerations. Other complementary suppression is based on regional level data. A State or Region must be withheld during complementary suppression because an already withheld state could be calculated using other States and the regional total. Cells are also selected for complementary suppression that represent the smallest volumes or that were withheld in prior years.

Inter-table effects are also examined regarding complementary suppression. For example, Districts and States that are withheld in one District or one State table can influence the complementary suppression of an associated State or District table. This occurs because some Districts equal some States or aggregates of States. This analysis is very similar to that done at the regional level except that two tables are involved rather than one. Finally, similar tables are reviewed to ensure that all like suppressed cells are consistently withheld (suppressed) in all tables in which they appear.

The withholding/suppression of data is performed as an adjunct to the Quality Assurance (QA) procedures. The work is performed by survey editors, and the QA staff and is reviewed by the survey manager before being submitted to division level QA review.

All sensitive cells identified in withholding analysis are denoted with the symbol/letter "W." The use of the symbol/letter applies to primary, complementary and inter-table suppressions as well as all withheld data. The symbol/letter "W" is footnoted as follows: "W Withheld to avoid disclosure of individual company data."

Data Revision and Correction Policy

Published data are not revised. There is no new information that would become available, as the data have already been subjected to extensive quality assurance procedures and compared with secondary sources.

Demonstrated Reserve Base

Sources of Data

The demonstrated reserve base (DRB) has been derived over the past 20 years mostly from published sources such as U.S. and State geological survey and mining agency reports and reliable mineral assessments from various sources. The derivation of the coal resource data for each State DRB was documented in the EIA's 1979 DRB publication, along with comprehensive treatment of definitions and DRB background information.² Subsequent revisions were documented in the EIA's 1980 DRB publication³ and in the DRB portions of *Coal Production* starting with the 1982 report.

Annual updates have involved one or more of three methods. The methods are: (1) depletion due to mining since the previous update; (2) revisions based on new data sources determined to be suitable under DRB criteria; and (3) adjustments using existing data sources as they relate to changes in DRB criteria or basic data analysis. The current update does not include any revisions due to new data sources or changes in DRB criteria or data analyses (methods 2 and 3). The various revisions the EIA has made to DRB data, from the 1979 through the 1989 updates, are listed in summary form in Table D2.

In recent years, new data on coal reserves have not been forthcoming in forms and aggregation levels appropriate for DRB revisions. In addition, the growing demands on DRB data for use in complex analyses have emphasized the need for better information on the characteristics and availability of DRB coal resources. Consequently, the EIA is currently initiating a new program to support the development and enhancement of coal resource data, with the cooperation of State and other coal resource authorities. This pro-

²Energy Information Administration, *Demonstrated Reserve Base of Coal in the United States on January 1, 1979*, DOE/EIA-0280(79) (Washington, DC, 1981).

³Energy Information Administration, *Demonstrated Reserve Base of Coal in the United States on January 1, 1980*, DOE/EIA-0280(80) (Washington, DC, 1982).

gram is described more fully below (see "New Data Sources and Data Adjustments").

Appendix A presents data for the DRB on January 1, 1990. These data update the prior DRB estimate as of January 1, 1989.

Depletion of Prior DRB Estimates

Depletion adjustments are based on annual coal production data collected or estimated by the EIA on Form EIA-7A for 1989. Each State DRB on January 1, 1990, was derived by adjusting the State DRB on January 1, 1989 (as shown in the publication *Coal Production 1988*), for depletion due to 1989 mining activity. No production from silt, culm, refuse bank, slurry dam, or dredge operations is included in annual depletion adjustments to the DRB because such sources represent portions of previous years' depletion. Reported production with no corresponding State level DRB (e.g., Texas bituminous coal production) is excluded from depletion adjustments.

New Data Sources and Data Adjustments

No new data sources are included in the 1989 DRB. All changes in data are the result of depletion adjustments based solely on recorded 1988 production. New resource data will be included in future updates.

In February 1990, the EIA held a Coal Reserves Assessment Conference in Arlington, Virginia, as a forum to discuss data needs and formulate a plan to improve national coal reserve estimates. The EIA is using information gained from the conference to plan a new program to develop updated, more detailed coal reserve estimates. The program would support States and alternative sources to process and compile available data that is needed for improved reserve base and recoverable reserve estimates. The program is being initiated with two pilot studies in Ohio and Wyoming, in cooperation with the Ohio Division of Geological Survey and the Geological Survey of Wyoming. These studies were underway in October, 1990, to run for 1 year each.

Table D2. Summary of EIA Revisions to Demonstrated Reserve Base of Coal

Year of Update	Action Taken ¹	State or Producing Area
1979 DRB	a, b, c a, b, c c a, c a, e c, e c, e, f a, b c, e a, b, d a, c a, b, c, d, e a, b, c, d, e a, b c a, c, d, e	Alabama Arizona Arkansas Georgia W. Kentucky Maryland Michigan Missouri North Carolina Oklahoma South Dakota Tennessee Texas Virginia West Virginia Wyoming
1980 DRB	e a, c a, e c, f, g	Alabama Colorado Ohio Washington
1982 DRB (2-year update)	b b, c a, e a, c a, b, c	Alabama Arkansas Illinois New Mexico Texas
1983 DRB	a, f a, c, d c a, b, e, f, g	Illinois E. Kentucky Pennsylvania (Bit.) Texas
1984 DRB	g f	Pennsylvania (Anth.) South Dakota
1985 DRB	f d, g	E. Kentucky Pennsylvania (Anth.)
1986-87 DRB (2-year update)	a, e	Louisiana
1988 DRB	h	
1989 DRB	h	
1990 DRB	h	

¹ Interpretations of "Action Taken" codes are as follows:

- a. Incorporate new resource data
- b. Reallocate resource data due to update of DRB criteria
- c. Analysis of resource data
- d. Adjust using revised depletion estimates
- e. Analysis of depletion data
- f. Corrections to resource data derivations
- g. Corrections to depletion data adjustments
- h. No new revisions, resource data adjustments, or corrections.

Note: Actions listed refer to revisions and adjustments due to new data or analyses, or corrections to existing data. Adjustments for depletion due to annual production are not listed.

Technical Notes

1. Resource Data and Minability Criteria

The demonstrated reserve base, or DRB, of coal represents a level of coal resource classification (geologic assurance), with definitive physical measurements applied, that can supply a uniform and consistent data base for estimating minable in-place coal on a national basis. "Demonstrated" is a collective term for the sum of resource data in both the "measured" and "indicated" categories of geologic reliability (see the Glossary) and represents 100 percent of known measured and indicated coal in place as of a certain date. DRB coal occurs within depth and thickness ranges which are judged to be economically minable at the time of the estimate.

In applying uniform standards nationwide, many site-specific minability criteria must necessarily be passed over in order to maintain objectivity and compatibility of data. Some coalbeds that do not meet the "national" criteria for depth and thickness are included, however, because those or analogous beds are presently being mined.

The DRB is not a fixed quantity but one that will increase with discovery and new development, decrease with mining, and may change either upward or downward if the criteria for its calculation are modified. Additionally, both known and indeterminable factors such as natural and manmade obstructions, environmental and other legal restrictions, technology, and economics could limit or prevent (or encourage) the mining of certain coalbeds. These factors not only affect the availability of DRB coal for mining, but also influence recoverability in the actual mining process.

2. Coal Rank and Coalbed Characteristics

The rank of coal is one of the more important physical criteria influencing its use and, hence, its commercial minability. The standard specifications for classifying coal by rank are presented in Appendix C.

In addition to rank of coal, quantitative data pertaining to thickness and depth of coalbeds are maintained for the DRB and identified resource data on file at the EIA. The DRB includes data for beds of bituminous coal and anthracite 28 or more inches thick and beds of subbituminous coal 60 or more inches thick that occur at depths having 1,000 feet or less of overlying material. Lignite beds 60 or more inches thick having 200 feet or less of overlying material are included. In addition, certain thinner and/or deeper resources are included that presently are being mined or for which there is evidence that they could be mined commercially at present. These criteria are defined in the 1979

publication and in the discussions in the "Explanatory Notes" section of the publication *Coal Production*, for each year from 1982 through the present.

3. Depletion

Depletion of DRB data is calculated by subtracting tonnages of coal mined and lost to mining since the previous update, or for another time period if prior depletion adjustments require re-evaluation. Depletion is computed from production statistics collected on Form EIA-7A and from certain generated data sources by applying depletion factors (multipliers), usually 2.00 and 1.25, respectively, to underground and surface-mined production. Any coal that remains in the ground following termination of a mining operation has, in effect, been depleted from the DRB along with the recovered coal by use of these depletion factors. Some of the remaining coal, however, may be recovered later, and in instances where such "secondary" or even "tertiary" recovery is known, the depletion adjustments are revised to reflect the subsequent production.

Depletion factors are the reciprocal functions of recoverability estimates, expressed as percentages of the DRB or other quantified portions of a resource. The determination of recoverability percentages, referred to as "recovery factors," takes into consideration the fact that the quantity of coal recovered from the DRB varies from mine to mine because of a variety of factors that impede complete extraction, as discussed above. Also, an undetermined portion of coal, nationwide, is lost in cleaning processes following extraction, and is not included in production data.

For the purpose of calculating depletion rates only, standard recovery factors of 50 percent for underground mining and 80 percent for surface mining are selected by the EIA as reasonable estimates of "average" recovery rates for all ranks of coal mined in the United States. This is based on past, present, and projected near-future mining practices, including regional recoverability studies by individuals with extensive coal industry experience, and on recoverability estimates submitted to the EIA from producers.

These standard rates will be used by the EIA until other rates become well established and documented. The only exceptional recovery rate being used for current production is a 90 percent factor for surface-mined Pennsylvania anthracite, where recovery reflects a combination of higher value coal and unusual geologic conditions.

The proportion of coal that can be recovered ("reserves") ranges from less than 40 percent in some underground mines to over 90 percent at some surface mines. The EIA believes that on a national basis at least one-half of the demonstrated in-place coal is recoverable at the present time.

4. Distinction Between Demonstrated Reserve Base Data and Recoverable Reserves as Reported on Form EIA-7A

The demonstrated reserve base (as explained in Technical Note 1) provides a definitive and uniform basis for estimating minable in-place coal within the United States. At least one-half of this estimated tonnage is considered by the EIA to be recoverable nationwide at the present time. By contrast, "recoverable reserves," as reported on Form EIA-7A, are confined to producing mines and, as such, represent only a fraction of the DRB. (See the Glossary for relevant terms.)

There is no direct relationship between the DRB and the recoverable reserves reported on Form EIA-7A because the data come from different sources. The DRB, based on broad coal resource studies, is a compilation of regional coal resource estimates, with certain adjustments. The recoverable reserves from Form EIA-7A represent the summation of site-specific recoverable reserves within the boundaries or mining permit areas of active mines which report.

Conceptually, the relationship resembles a simple, broad-patterned quilt (the DRB) with scattered de-

tailed patchwork areas sewn on (the mine-site reserves). In some instances, the locations of mine-site reserves and DRB source studies may coincide only in part, or not at all. Further, the coalbeds covered in mine-site data and DRB source studies may be different. The DRB estimates represent coal still in the ground, whereas the recoverable reserves at active mines represent the tonnage that producers expect to extract from the mine sites. In terms of areas of coverage and typical detail of data, however, the quilt analogy is a useful description of how the two types of coal data relate to each other.

A key point regarding the two types of data is that the recoverable reserves at mines should not be expected to add up to the DRB. The recoverable reserves could be adjusted by the mines' various recovery factors and would describe coal reserves in the ground, but only for a limited sampling -- the mines active in the reporting year. Even if all the in-place reserves data from all past and future mines could theoretically be compiled, they would not equate to the DRB. In most cases they would, instead, supersede the DRB. The process of developing a mine in effect redefines (or in some cases defines for the first time) the actual DRB using ideally detailed data. The DRB published by the EIA is only an estimate.

Appendix E

Form and Instructions

A belt-conveyor system stores clean coal at a West Kentucky preparation plant.

Appendix E

U.S. Department of Energy
Energy Information Administration
Form EIA-7A (October 1988)

Coal Production Report

Form Approved
OMB No. 1901-0167
Expires 03/1/92
Burden: 1.21 hours

This report is mandatory under Public Law 93-275. Failure to comply may result in criminal fines, civil penalties and other sanctions as provided by law. For the provisions concerning the confidentiality of information submitted on this form, see Part II of the instructions. Public reporting burden for this collection of information is estimated to average 1.21 hours per response, including the time of reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Energy Information Administration, Office of Statistical Standards, E-173, Mail Station 1H-023 Forrestal, 1000 Independence Ave. SW, Washington, DC 20585, and to the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, DC 20503.

Please read the instructions provided before completing this form.

100

(Please make any corrections to the mailing label in the area provided at the right and return the completed form in the business reply envelope provided)

GENERAL REPORTING INSTRUCTIONS: Form EIA-7A must be submitted by all coal mining companies that owned a mining operation that produced, processed, or prepared coal during the reporting year. A separate Form EIA-7A must be submitted for each mining operation, i.e., mine and/or preparation plant, and/or tipple.

Mining operations that produced, processed, or prepared 10,000 or more short tons of coal should report as follows: (i) For mines only or mines with preparation plants or tipples, complete all parts of the form, (ii) For preparation plants and tipples only, complete Parts I, II.C.3 and III through V of the form.

If this mining operation produced, processed, or prepared under 10,000 short tons during the year, check this box, complete Sections I (Identification), II.C.6 column (1) (Total Production Quantity), and V (Certification) and return this form in the enclosed envelope. ☐

110

Operating subsidiaries and contractors who are unable to provide the data requested should forward Form EIA-7A to the parent company or contractee for completion prior to submission to the Energy Information Administration.

I. Identification The shaded areas in this section are reserved for preprinted information. Please make any corrections to the information in these areas by drawing a line through the incorrect information and entering the changes in the space provided at the right.

A. Name and Location of Mining Operation

Mining Operation Name:
Location(County):
Location(State):

111

B. Name and Address of Operating Company

Company Name:
Address:
City, State, Zip:

112

C. Operating Company Point of Contact

The operating company representative who can answer questions regarding the information provided on this form.

Name, Title:
Address:
City, State, Zip:
Phone No.(Area code):

113

D. Type of Company Operating this Mining Operation

Check one. (See instructions for definitions of company types.)

☐ 1. Independent Producer Operator ☐ 2. Operating Subsidiary ☐ 3. Contractor

115

If you checked box 2 or 3 in section I.D above, fill in Sections I.E and I.F below. If there is more than one Parent Company or Contractee, provide the additional information for these sections on a separate sheet of paper.

E. Parent Company or Contractee

Provide the following information about your Parent Company or Contractee.

Name of Parent/Contractee:
Address:
City, State, Zip:

117

F. Parent Company/Contractee Point of Contact

Provide the following information about your Parent Company or Contractee contact person.

Name, Title:
Address:
City, State, Zip:
Phone No.(Area Code):

118

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	-----

(3) Preparation Plant or Tipple ☐

120

☐ (d) Silt, Culm, Refuse Bank or Slurry Dam

122

123

125

(State) (Zip Code)

129

130

135

215

221

222

II. Production (continued)

Id Number

C. Production Quantity and Value by Disposition (Exclude coal produced in prior years but shipped this year.)

The company owning the coal produced at this mining operation should report, by disposition (as of the end of the reporting year), the quantity and f.o.b. value of all coal produced at this mining operation during the reporting year. The quantity and value figures reported here must reflect the condition of the coal as of its disposition. Report open market disposition on a first sale basis, i.e., as of its first sale or first change of ownership. Report captive market disposition based on use, i.e., as consumed at this mining operation, sold or transferred to and for use by the parent company or any subsidiaries of the parent company, or stockpiled. Calculate open market values using actual sales prices. Calculate captive market values and stock values using the actual accounting values recorded by your company for this coal. Exclude purchased coal.

Disposition of Coal Produced During the Year	(1) Quantity (short tons)	(2) Value (dollars) (f.o.b. Mining Operation)	
Open Market Sales			
1. Total coal produced at this mining operation during the year which was sold to other mining companies and coal dealers/brokers (wholesale and retail).			231
2. Total coal produced at this mining operation during the year which was sold to all customers other than coal mining companies and coal dealers. Include sales to employees.			232
Captive Market Uses/Sales			
3. Total coal produced during the year which was used / consumed in this mining operation.			233
4. Total coal produced at this mining operation during the year which was sold to or transferred for use by the parent company or any other subsidiaries of the parent company.			234
Stocks			
5. Total coal produced at this mining operation during the year which was remaining in stocks at the end of the year.			235
Total Production			
6. Total production at this mining operation during the year. (Sum of 1-5)			236
FOR EIA USE ONLY			240

III. Productivity

A. Employment

For EIA Use Only:

1. Total Direct Labor Hours Worked at this Mining Operation During the Year (hours).

Report direct labor hours for all employees at this mining operation who were engaged in production, preparation, processing, development, maintenance, repair, shop or yard work at the mining operation including on site mining operations management and technical/engineering personnel. Exclude office workers. For hourly employees, report hours actually worked and do not report vacation or leave hours. For salaried employees, report actual or best estimate of hours worked. Exclude reclamation hours.

2. Total Number of Production Days Worked at this Mining Operation During the Year (days).

A production day is any day in which coal was mined, and/or loaded for shipment, and/or stockpiled.

3. Average Number of Employees per Shift. Compute by adding the total number of employees working each shift, whether it is a production or a maintenance shift, and dividing this total by the total number of shifts worked per day. Average over the total number of days worked. Round to the nearest whole number.

4. Average Number of Shifts per Day. Average over the total number of days worked. Include maintenance as well as production shifts. Report to the nearest tenth of a shift (i.e., 1.0, 2.2, 3.5).

5. Average Length of Production Shift (hours). Report to the nearest hundredth of an hour. (For example, 7 1/4 = 07.25, 8 1/2 = 08.50). Include overtime if usually worked during the year.

Employment data check: If the data entered for lines 420, 430, 440, and 450 are multiplied together, the result should be approximately equal to line 410. If this answer is not within 15 percent of the data on line 410, please explain in the remarks.

B. Daily Productive Capacity and Projected Production

For EIA Use Only:

1. Daily productive capacity of this mining operation (short tons/day).

Report the maximum amount of coal that realistically could be/was produced (or prepared if this mining operation is a preparation plant/tripple only) on any day during the year.

2. Projected Production for this Mining Operation During Next Year (short tons)

Id Number

Complete statements 1 and 2 only if the mining operation includes a preparation plant or a tipple which crushes, screens, or mechanically cleans coal.

- 3 Total direct labor hours worked at the preparation plant and/or tipple only.

Complete this section only if you prepared or processed coal for **both** underground and surface mines **and** this report includes an underground or surface mine.

Preparation Plant Direct Labor Hours

Total	100
-------	-----

490

I certify that the information provided herein and appended hereto (if any) is true and accurate to the best of my knowledge.

600

Date _____

I, the undersigned, declare under penalty of perjury that I am a citizen of the United States; that I am not a member of, nor affiliated with, nor agent or employee of, nor in any way connected with, nor in receipt of funds from, nor in any way financially interested in, any foreign principal, nor in any way financially interested in, any foreign or domestic organization, any of which is an enemy of the United States; that I am not a member of, nor affiliated with, nor agent or employee of, nor in any way connected with, nor in receipt of funds from, nor in any way financially interested in, any such organization which has been or may hereafter be so designated by the Executive Order of the President of the United States on the basis of being an enemy of the United States; and that I have not rendered substantial assistance and have not acted in concert with, nor have I been an agent or employee of, nor have I been in receipt of funds from, nor have I been in any way financially interested in, any person or organization which has been or may hereafter be so designated by the Executive Order of the President of the United States on the basis of being an enemy of the United States.

Instructions for completing Form EIA-7A, "Coal Production Report"

- A. PURPOSE** This survey collects coal production data from U.S. coal mining companies. Information on coal production and value of production, coal beds mined, employment, recoverable reserves, productive capacity, and stocks is collected to provide Congress with basic statistics concerning coal supply, as required by the Federal Energy Administration Act of 1974 (P.L. 93-275) as amended.

These data appear in the annual report *Coal Production*, the *Quarterly Coal Report*, the *Monthly Energy Review*, the *Annual Energy Review*, and the *Weekly Coal Production Report*. In addition, the Energy Information Administration uses the data for coal production related analysis and in short term and mid-term models (i.e., the Short-Term Coal Analysis System (SCOAL), the Short-Term Integrated Forecasting System (STIFS), the Resource Allocation and Mine Costing Model (RAMC), and the Coal Supply and Transportation Model (CSTM)). The forecast data appear quarterly in the *Short-Term Energy Outlook* and the *Annual Energy Outlook* publications.

- B. WHO MUST SUBMIT** Form EIA-7A must be submitted by all coal mining companies that owned a mining operation that produced, processed or prepared coal in the U.S. during the reporting year. A separate Form EIA-7A must be submitted for each mining operation, i.e., mine and/or preparation plant and/or tipple.

- C. WHERE TO SUBMIT** Form EIA-7A should be returned in the business reply envelope provided to:

Energy Information Administration, EI-521
Mail Station: BG-084, FORSTL
U.S. Department of Energy
Washington, D.C. 20585
Attn: EIA-7A

Requests for further information, additional forms, or business reply envelopes should be directed to the address above or by telephone on (202) 254-5400.

- D. WHEN TO SUBMIT** Form EIA-7A must be submitted by March 1 to report data for the previous year.

- E. SANCTIONS** The timely submission of Form EIA-7A by a company required to report is a mandatory requirement. Late filing, failure to file, or failure otherwise to make information available to EIA in accordance with these instructions may result in criminal fines, civil penalties and other sanctions as provided by Section 13(i) of the FEA Act (P.L. 93-275).

F. DEFINITIONS

Auger Mine: A surface mine in which the coal bed is removed by means of a large diameter drill. Usually operated only when the overburden becomes too thick for economical strip mining.

Captive Coal: All coal produced and consumed by the independent producer/operator or operating subsidiary or produced for consumption by a parent company.

Coal Bed: A bed or stratum of coal. Also called a coal seam.

Drift Mine: A mine that opens horizontally into the coal bed or coal outcrop.

f.o.b. (Free on Board) Mining Operation Value: The price of coal at the mining operation. Does not include insurance and freight or shipping costs.

Independent Producer/Operator: A company which operates a coal mining operation and has no subsidiaries or parent companies and is not a contractor.

Latitude and Longitude: The distance on the earth's surface measured, respectively, north or south of the equator and east or west of the standard meridian, expressed in angular degrees, minutes, and seconds.

Mining Operation: One mine and/or tipple at a single physical location.

MSHA ID Number: Seven (7) digit code assigned to a mining operation by the Mine Safety and Health Administration.

Open Market Coal: Coal sold in the open market (i.e., coal sold to companies other than the reporting company's parent company or an operating subsidiary of the parent company).

Operating Subsidiary: Company which operates a coal mining operation and is owned by another company (i.e., the parent company).

Parent Company: A company which solely or jointly owns a subsidiary which operates a coal mining operation and is not owned itself by another company.

Report Year: The calendar year beginning at 12:00 a.m. January 1 and ending at 11:59 p.m. December 31.

Shaft Mine: A mine that reaches the coal bed by means of a vertical shaft.

Slope Mine: A mine that reaches the coal bed by means of an inclined opening.

State Permit/License/Mine Number: Code assigned to a mining operation by the state in which the operation is located.

Strip Mine: An open cut in which the overburden is removed from a coal bed prior to the removal of coal.

- G. GENERAL INSTRUCTIONS** Mining operations that produced, processed or prepared less than 10,000 short tons of coal during the year should check the first box (Line Code 110) on the form and complete Sections I (Identification), II.C.6 column (1) (Total Production Quantity), and V (Certification). Mines only or mines with preparation plants or tipples that produced 10,000 or more short tons during the year should complete all parts of the form. Preparation plants or tipples only that prepared or processed 10,000 or more short tons of coal during the year should complete Parts I, II.C.3 and III through V of the form. Report coal quantities in short tons (2,000 pounds) to the nearest whole ton. Report value in dollars to the nearest dollar. Report coal bed thickness in inches, to the nearest whole inch. Report percentages to the nearest whole percent. Operating subsidiaries and contractors who are unable to provide the data requested should forward Form EIA-7A immediately to the parent company or contractee for completion prior to submission to the Energy Information Administration.

- H. DISCLOSURE OF INFORMATION** The following data elements will not be treated as confidential by EIA:

- a. Total production quantity.
- b. Coal beds mined.

The name and address of the responding company, the mine or plant type (i.e., underground, surface, preparation plant) and location (state, county, and/or coal-producing district) will be released upon request in the form of a full or partial list of respondents for this coal data collection survey. All other information, other than that described above, will be kept confidential to the extent that it satisfies the criteria for exemption in the Freedom of Information Act (FOIA), the DOE regulations implementing the FOIA, and the Trade Secrets Act, 18 U.S.C. §1905.

Upon receipt of a request for this information under the FOIA, the DOE shall, in accordance with the procedures and criteria provided in 10 C.F.R. §1004.11, make a final determination whether the information is exempt from disclosure. To assist in this determination, respondents should demonstrate to the DOE that, for example, their information contains trade secrets or commercial or financial information whose release would be likely to cause substantial harm to their company's competitive position. A letter accompanying the submission that explains (on an element-by-element basis) the reasons why the information would be likely to cause the respondent substantial competitive harm if released to the public would aid in this determination. A new justification does not need to be provided each time information is submitted on the form if the company has previously submitted a justification for that information and the justification has not been changed.

Except as otherwise provided by law, the information may be made available in response to an order of a Court of competent jurisdiction, or, upon request, to other components of the Department of Energy, to any Committee of Congress, the General Accounting Office, or other congressional agencies authorized by law to receive such information. Detailed provisions of the restrictions on the disclosure of the information can be found in the Policy on the Disclosure of Individually Identifiable Energy Information in the Possession of the Energy Information Administration (45 Federal Register §59812 (1980)).

Glossary

Agglomerating Character: Agglomeration describes the caking properties of coal. Agglomerating character is determined by examination and testing of the residue when a small powdered sample is heated to 950 degrees centigrade under specified conditions. If the sample is "agglomerating," the residue will be coherent, show swelling or cell structure, and be capable of supporting a 500-gram weight without pulverizing.

Anthracite: Anthracite, or hard coal, is the highest rank of economically usable coal. It is jet black with a high luster. The moisture content generally is less than 15 percent. Anthracite contains approximately 22 to 28 million Btu per ton as received and averages about 25 million Btu per ton. Its ignition temperature is approximately 925 to 970 degrees Fahrenheit. Virtually all of the anthracite mined in the United States is from northeastern Pennsylvania. It is used mostly for space heating and generating electricity.

Auger Mine: A mine in which coal is recovered through the use of a large-diameter drill driven into a coalbed in a hillside. It usually follows contour surface mining, particularly when the overburden is too costly to excavate.

Average Daily Production: The ratio of the total production at a mining operation to the total number of production days worked at the operation.

Average Length of a Shift: The arithmetic mean number of hours worked during a production shift. Overtime is included if usually worked during the year.

Average Mine Price: The ratio of the total value of the coal produced at the mine to the total production tonnage. (See f.o.b. mine price.)

Average Number of Employees per Shift: The arithmetic mean number of employees working during a production shift. Includes all employees except office workers. (See direct labor hours.)

Average Number of Shifts per Day: The arithmetic mean number of shifts each day at a mining operation. Includes maintenance as well as production shifts.

Average Production per Miner per Day: The product of the average production per miner per hour at a min-

ing operation and the average length of a production shift at the operation.

Average Production per Miner per Hour: The ratio of the total production at a mining operation to the total direct labor hours worked at the operation.

Bituminous Coal: Bituminous coal, or soft coal, is the most common coal. It is dense, black, often with well-defined bands of bright and dull material. Its moisture content usually is less than 20 percent. The heating value ranges from 19 to 30 million Btu per ton as received and averages about 24 million Btu per ton. The ignition temperature ranges from about 700 to almost 900 degrees Fahrenheit. Bituminous coal is mined chiefly in the Appalachian and Interior coal fields. It is used for generating electricity, making coke, and space heating.

Btu (British thermal unit): The amount of heat needed to raise the temperature of 1 pound of water by 1 degree Fahrenheit. The Btu is a convenient measure by which to compare the energy content of various fuels.

Captive Coal: Coal produced and consumed by the mine operator, a subsidiary, or parent company (for example, steel companies and electric utilities).

Coal Preparation: The process of sizing and cleaning coal to meet market specifications by removing impurities such as rock, sulfur, etc. May include crushing, screening, or mechanical cleaning.

Coal-Producing Districts: A classification of coalfields defined in the Bituminous Coal Act of 1937. The districts were originally established to aid in formulating minimum prices of bituminous and subbituminous coal and lignite. Because much statistical information was compiled in terms of these districts, their use for statistical purposes has continued since the abandonment of that legislation in 1943. District 24 was added for the anthracite-producing district in Pennsylvania.

Coal-Producing Regions: A geographic classification of coal-producing States. The States in the Appalachian Region are Alabama, Georgia, Eastern Kentucky, Maryland, Ohio, Pennsylvania, Tennessee, Virginia, and West Virginia. The States in the Interior Region are Arkansas, Illinois, Indiana, Iowa, Kansas, Western Kentucky, Louisiana, Missouri, Oklahoma, and Texas. The States in the Western Region are Alaska, Arizona,

California, Colorado, Montana, New Mexico, North Dakota, Utah, Washington, and Wyoming.

The three regional groupings by district are as follows:

Appalachian: Coal-Producing Districts 1-4, 6-8, 13, 24

Interior: Coal-Producing Districts 5, 9-12, 14-15

Western: Coal-Producing Districts 16-23.

Coal Rank: A classification of coal based on fixed carbon, volatile matter, heating value, and agglomerating character. It is an indication of the progressive alteration, or coalification, from lignite to anthracite. The rank of coal can also be determined by measuring the reflectance of vitrinite, one of the several organic components (macerals) of coal.

Coal Stocks: The supply of coal remaining at the mine, preparation plant, or tippie at the end of the reporting period.

Coalbed: A bed or stratum of coal. Also called a coal seam.

Continuous Mining: A form of room-and-pillar mining in which a continuous mining machine extracts and removes coal from the working face in one operation; no blasting is required.

Conventional Mining: The oldest form of room-and-pillar mining which consists of a series of operations that involve cutting the coalbed so it breaks easily when blasted with explosives or high-pressure air, and then loading the broken coal.

Culm: A mixture of very fine coal and refuse. Synonymous with silt.

Demonstrated Reserve Base: A collective term for the sum of coal in both measured and indicated resource categories of reliability which represents 100 percent of the coal in these categories in-place as of a certain date. Includes beds of bituminous coal and anthracite 28 or more inches thick and beds of subbituminous coal 60 or more inches thick that occur at depths to 1,000 feet. Includes beds of lignite 60 or more inches thick that can be surface mined. Includes also thinner and/or deeper beds that presently are being mined or for which there is evidence that they could be mined commercially at this time. Represents that portion of the identified coal resource from which reserves are calculated.

Depletion: The subtraction of both the tonnage produced and the tonnage lost to mining from identified resources to determine the remaining tonnage as of a certain time.

Depletion Factor: The multiplier applied to the tonnage produced to compute depletion. This multiplier takes into account both the tonnage recovered and the ton-

nage lost due to mining. The depletion factor is the reciprocal of the recovery factor in relation to a given quantity of production.

Direct Labor Hours: Direct labor hours worked by all mining employees at a mining operation during the year. Includes hours worked by those employees engaged in production, preparation, development, maintenance, repair, shop or yard work, management, and technical or engineering work. Excludes office workers. Excludes vacation and leave hours.

Dredge Mining: A method of recovering fine coal from rivers or streams.

Drift Mine: An underground mine that has a horizontal entry dug to a coalbed in a hillside.

Dry (Coal) Basis: Coal quality data calculated to a theoretical basis in which no moisture is associated with the sample. This basis is determined by measuring the weight loss of a sample when its inherent moisture is driven off under controlled conditions of low temperature air-drying followed by heating to just above the boiling point of water (104 to 110 degrees centigrade).

Fixed Carbon: The nonvolatile matter in coal minus the ash. Fixed carbon is the solid residue other than ash obtained by prescribed methods of destructive distillation of a coal. Fixed carbon is the part of the total carbon that remains when coal is heated in a closed vessel until all volatile matter is driven off.

f.o.b. Mine Price: The free on board mine price. This is the price paid for coal measured in dollars per short ton at the mining operation site and therefore does not include freight or shipping and insurance costs.

Identified Resources: Coal deposits whose location, rank, quality, and quantity are known from geologic evidence supported by engineering measurements. Included are beds of bituminous coal and anthracite 14 or more inches thick and beds of subbituminous coal and lignite 30 or more inches thick that occur at depths to 6,000 feet. The existence and quantity of these beds have been delineated within specified degrees of geologic assurance as measured, indicated, or inferred. Also included are thinner and/or deeper beds that presently are being mined or for which there is evidence that they could be mined commercially.

Indicated Resources: Coal for which estimates of the rank, quality, and quantity have been computed partly from sample analyses and measurements and partly from reasonable geologic projections. Indicated resources are computed partly from specified measurements and partly from projection of visible data for a reasonable distance on the basis of geologic evidence. The points of observation are 1/2 to 1-1/2 miles apart. Indicated coal is projected to extend as a 1/2-mile wide belt that lies more than 1/4 mile from the outcrop or points of observation or measurement.

Inferred Resources: Coal in unexplored extensions of demonstrated resources for which estimates of the quality and size are based on geologic evidence and projection. Qualitative estimates are based largely on broad knowledge of the geologic character of the bed or region and where few measurements of bed thickness are available. The estimates are based primarily on an assumed continuation from demonstrated coal for which there is geologic evidence. The points of observation are 1-1/2 to 6 miles apart. Inferred coal is projected to extend as a 2-1/4-mile wide belt that lies more than 3/4 mile from the outcrop or points of observation or measurement.

Lignite: Lignite, the lowest rank of coal, is brownish black and has a high moisture content, sometimes as high as 45 percent. It tends to disintegrate when exposed to the weather. The heat content of lignite ranges from 9 to 17 million Btu per ton as received and averages about 14 million Btu per ton. The ignition temperature is approximately 600 degrees Fahrenheit. Lignite is mined in California, Louisiana, Montana, North Dakota, and Texas, and is used mainly to generate electricity in power plants that are relatively close to the mines.

Longwall Mining: A form of underground coal mining which is gaining in importance in the United States and can be used at greater depths than room-and-pillar mining. In longwall mining, a cutting machine is pulled back and forth across a panel of coal 300 to 600 feet wide and as much as a mile long, with the broken coal moved by conveyor. Longwall mining is done under movable roof supports that are advanced as the bed is cut. The roof in the mined-out area is allowed to fall as the mining advances.

Measured Resources: Coal for which estimates of the rank, quality, and quantity have been computed, within a margin of error of less than 20 percent, from sample analyses and measurements from closely spaced and geologically well-known sample sites. Measured resources are computed from dimensions revealed in outcrops, trenches, mine workings, and drill holes. The points of observation and measurement are so closely spaced and the thickness and extent of coals are so well defined that the tonnage is judged to be accurate within 20 percent. Although the spacing of the points of observation necessary to demonstrate continuity of the coal differs from region to region according to the character of the coalbeds, the points of observation are no greater than 1/2 mile apart. Measured coal is projected to extend as a 1/4-mile wide belt from the outcrop or points of observation or measurement.

Mine Count: The number of mines, or mines collocated with preparation plants or tipples, located in a particular geographic area (State, region, or coal-producing district). If a mine is mining coal across two counties within a State or across two States, then it is counted as two operations. This is done so that EIA can separate production by State and county.

Mineral-Matter-Free Basis: The parent material in coal from which ash is derived, and which comes from minerals present in the original plant materials that formed the coal, or from extraneous sources such as sediments and precipitates from mineralized water is called the mineral matter. Mineral matter in coal cannot be analytically determined and is commonly calculated using data on ash and ash-forming constituents. Coal analyses are calculated to the mineral-matter-free basis by adjusting formulas used in calculations in order to deduct the weight of mineral matter from the total coal.

Moist (Coal) Basis: "Moist" coal contains its natural inherent or bed moisture, but does not include water adhering to the surface. Coal analyses expressed on a moist basis are performed or adjusted so as to describe the data when the coal contains only that moisture which exists in the bed in its natural state of deposition, and when the coal has not lost any moisture due to drying.

Open Market Coal: Coal production that is sold on the open market to other coal companies or directly to consumers.

Overburden: Any material, consolidated or unconsolidated, that overlies a coal deposit.

Percent Utilization: The ratio of the average daily production to the daily productive capacity.

Preparation Plant: A mining facility at which coal is crushed, screened, and mechanically cleaned.

Recoverable Reserves: The amount of coal that can be recovered (mined) from the coal deposits at active, producing mines as of the end of the year, as reported on Form EIA-7A.

Recovery Factor: The percentage of total tons of coal estimated to be recoverable from a given area in relation to the total tonnage estimated to be in the demonstrated reserve base. The estimated recovery factors for the demonstrated reserve base generally are 50 percent for underground mining methods and 80 percent for surface mining methods. More precise recovery factors can be computed by determining the total coal in place and the total recoverable in any specific locale.

Recovery Percentage: The percentage of coal that can be recovered from the coal deposits at existing mines.

Refuse Bank: A repository for waste material generated by the coal cleaning process.

Refuse Mine: A surface mine where coal is recovered from previously mined coal. It may also be known as a silt bank, culm bank, refuse bank, slurry dam, or dredge operation.

Reserve: That portion of the demonstrated reserve base that is estimated to be recoverable at the time of de-

termination. The reserve is derived by applying a recovery factor to that component of the identified coal resource designated as the demonstrated reserve base.

Room-and-Pillar Mining: The most common method of underground mining in which the mine roof is supported mainly by coal pillars left at regular intervals. Rooms are places where the coal is mined; pillars are areas of coal left between the rooms. Room-and-pillar mining is done either by conventional or continuous mining.

Shaft Mine: An underground mine equipped with elevators that provide vertical access to a coalbed that is generally deeper than one reached by a slope mine. In addition to the passages providing entry to the coalbed, a network of other passages are also dug, some to provide access to various parts of the mine and some for ventilation.

Shortwall Mining: A form of underground mining that involves the use of a continuous mining machine and movable roof supports to shear coal panels 150 to 200 feet wide and more than half a mile long. Although similar to longwall mining, shortwall mining is generally more flexible because of the smaller working area. Productivity is lower than with longwall mining because the coal is hauled to the mine face by shuttle cars as opposed to conveyors.

Silt: A mixture of very fine coal and refuse. Synonymous with culm.

Slope Mine: An underground mine in which the entry is driven at an angle to reach the coal deposit.

Slurry Dam: A repository for the silt or culm from a preparation plant.

Strip (Surface) Mining: A method used on flat terrain to recover coal by mining long strips successively. The material excavated from the strip being mined is deposited in the strip previously mined.

Subbituminous Coal: Subbituminous coal, or black lignite, is dull black and generally contains 20 to 30 percent moisture. The heat content of subbituminous coal ranges from 16 to 24 million Btu per ton as received and averages about 18 million Btu per ton. Subbituminous coal, mined in the western coal fields, is used for generating electricity and space heating.

Surface Mine: A coal-producing mine that is usually within a few hundred feet of the surface. Earth and rock above or around the coal (overburden) is removed to expose the coalbed, which is then mined with surface excavation equipment such as draglines, power shovels, bulldozers, loaders, and augers. It may also be known as an area, contour, open-pit, strip, or auger mine.

Tipple: A loading facility at the mine where coal is crushed or screened prior to cleaning.

Underground Mine: A mine where coal is produced by tunneling into the earth to the coalbed, which is then mined with underground mining equipment such as cutting machines and continuous, longwall, and shortwall mining machines. Underground mines are classified according to the type of opening used to reach the coal, i.e., drift (level tunnel), slope (inclined tunnel), or shaft (vertical tunnel).

Volatile Matter: Those products, exclusive of moisture, given off by a material as gas or vapor. Volatile matter is determined by heating the coal to 950 degrees centigrade under carefully controlled conditions and measuring the weight loss, excluding weight of moisture driven off at 105 degrees centigrade.

END

DATE FILMED

01 / 04 / 91