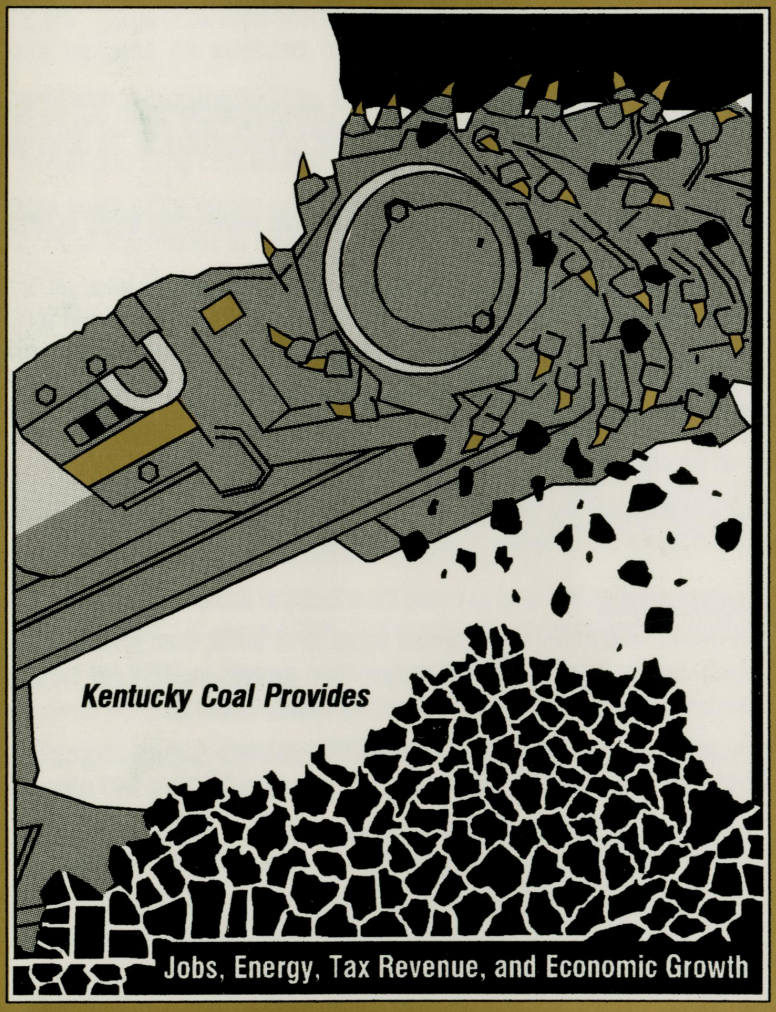
1997-1998 POCKET GUIDE

KENTUCKY COAL FACTS



Prepared by the

Kentucky Coal Marketing and Export Council

and the

Kentucky Coal Association

http://www.coaleducation.org Edition 5

Highlights

Electricity

Average electricity costs in Kentucky were 4.1 cents/kilowatt-hour in 1996, the second lowest in the United States behind a Northwestern hydro state.

Production

Kentucky produced 157.7 million tons of coal in 1996, compared to the record production of 179.4 million tons set in 1990. Kentucky has been one of the top three coal producers in the United States for the last 50 years.

Employment

The Kentucky coal industry paid $814.6 million in direct wages in 1996, directly employing 19,372 persons and indirectly providing an additional 59,686 jobs in 1996.

Economy

The Kentucky coal industry brought $3.1 billion into Kentucky from out-of-state during Fiscal Year 1996-1997 through coal sales to customers in 29 other states and 15 foreign countries.

Kentucky coal companies paid $163.2 million in coal severance taxes in Fiscal Year 1996-1997.

Coal Markets

A total of 59 electric utility companies purchased 117.4 million tons of Kentucky coal for 134 electric power plants located in 23 states during 1996, accounting for almost 80% of the Kentucky coal sold.

Over 83% of Kentucky's coal is sold out-of-state.

There are 20 major coal-burning electric utility plants in Kentucky, and almost all (95.7%) of Kentucky's electricity is generated from coal.

Environment

All surface-mined land today is reclaimed equal to or better than it was prior to mining. Kentucky received 4 national reclamation awards in 1996 for surface mining and received a total of 17 awards in the past 11 years.

Coal mining creates valuable lands such as wildlife habitats, flat mountaintops, wetlands, and industrial sites where only steep, unproductive hillsides had once existed.

Kentucky operators have paid over $659.1 million into the Federal Abandoned Mine Land Fund since 1978 to reclaim abandoned coal mines. Nationwide, operators have paid over $4.1 billion into this fund. However, $1.08 billion remains unallocated for AML reclamation.

Coal Resources

Kentucky has two distinct coal fields, one in Western Kentucky and one in Eastern Kentucky. Kentucky's 89.8 billion tons of coal resources remaining represent 85% of the original resource.

Teacher Resources

Coal education resource materials are now available to teachers and students on the Internet at the web site *www.coaleducation.org*. Additionally, a coal education multimedia library kit with interactive learning tools is now available in every public elementary, middle school, and county library in Kentucky.

December 1997. This publication is for informational use only. It includes some extrapolative second and third party data as well as some broad estimates, and should not necessarily be construed as official source data or be construed as advocating or reflecting any policy position of the Kentucky Coal Marketing and Export Council or the Kentucky Coal Association.

Changes and Trends

Three centuries after it was discovered in America, coal is still providing power for the nation. As we approach a new century, coal faces many challenges to its premier status, but its importance can never be questioned. The fuel that enabled the United States to become the wealthiest industrialized nation in the world is still responsible for over half the nation's electrical power.

Coal provides 56% of the electricity in this country, and in Kentucky 95.7% of our electricity comes from coal.

Average electricity costs in Kentucky were 4.1 cents per kilowatt-hour during 1996, the second lowest in the United States.

Most experts agree that demand for electricity will continue to grow as our economy grows. Rates of this growth each year have been estimated from a low of 1.3% to a high of 2.5%. Large coal-fired power plants, built in the 1950's and early 1960's, will need to be replaced, life extended, or repowered.

Utility deregulation is on the horizon. As in other parts of American business, low costs and customer service will be the hallmarks of a successful company. In 1995, 23 of the 25 lowest operating cost electric-generation units in America were fueled by coal.

Kentucky's share of the steam coal market to U.S. electric utilities has declined, down from 23.5% of the market in 1975 to 13.6% in 1996. *(see page 26)*

As Kentucky coal companies consolidated into a globally competitive industry, the number of mines in Kentucky declined from 2,063 in 1984 to 544 in 1996. *(page 8)*

What Changes are Occurring?

The number of direct mining employees in Kentucky has been reduced by 60% since 1981 while production has remained about the same. *(see pages 10 and 14)*

Productivity per hour is 2.6 times the 1979 level *(see page 11)*, thus maintaining production *(see page 7)* while mining costs have been contained to match coal prices that have fallen below 1979 price levels. *(see page 23)*

The amount of sulfur dioxide emitted from burning coal in Kentucky has been reduced by more than 1/2 since 1976, and the trend is continuing. *(see page 33)*

Post mining land use changes are providing long term economic, social, and environmental benefits to Kentucky, and the benefits are increasing. *(see page 31)*

Kentucky coal exports of 9.1 million tons in 1996 were less than the previous level of over 15 million tons per year. *(see page 27)*

Kentucky ships over 2.8 times as much coal to its neighboring states as it receives from them, but Kentucky's positive coal flow ratio has been cut in half since 1990. *(page 22)*

Natural gas costs to U.S. electric utilities in 1993 increased higher than petroleum while coal costs continued to steadily decrease. *(see page 19)*

Is there a Trend?

A larger percentage of the coal severance tax money is being returned to the coal counties for economic development each year. *(see page 16)*

Underground mining in Kentucky continues to show steady safety improvements. *(see page 12)*

$3.1 billion continues to be brought into Kentucky each year from coal sales to 29 other states and 15 foreign countries. *(see page 17)*

The number of successful mining reclamation-primacy bond releases in Kentucky continues to grow each year. *(see page 30)*

The AML reclamation accomplishments in Kentucky during the last 15 years are impressive and the future looks even brighter. *(see page 35)*

Source: See individual reference pages as listed.

References

Governor's Office
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Department of Mines and Minerals
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Kentucky Geological Survey
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Legislative Research Commission
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Department for Surface Mining Reclamation and Enforcement
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Division of Abandoned Lands
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Department for Environmental Protection
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UK - Center for Applied Energy Research
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United States Department of Energy
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Web site addresses: most reference sources have a web site address listed at the bottom of each page, and additional data can be obtained at these web sites. All addresses are world wide web (www), except as otherwise noted (i.e., ftp://ftp.), and the (http://) is implied on each address although not listed due to space limitations.

Example - [http://www.coaleducation.org]

Acknowledgment
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Table of Contents

History of Coal

1701	Coal discovered in Virginia.
1748	**First recorded U.S. coal production.**
1750	April 13th - Dr. Thomas Walker was the first recorded person to discover and use coal in Kentucky.
1755	Lewis Evan's map showing coal in what is now the Greenup County and Boyd County area of Kentucky.
1758	First commercial U.S. coal shipment.
1792	**Issac Shelby becomes the first Governor of Kentucky (1792-1796).**
1820	First commercial mine, known as the "McLean drift bank" opened in Kentucky, near the Green River and Paradise in Muhlenberg County. 328 short tons mined and sold in Kentucky.
1830	2,000 tons of Kentucky production.
1837	10,000 tons of Kentucky production.
1843	**100,000 tons of Kentucky production.**
1850	150,000 tons of Kentucky production. Lexington and Big Sandy Railroad proposed. Kentucky Geological Survey established.
1860	Pre-Civil War Kentucky production record of 285,760 tons.
1861	**Kentucky-born Abraham Lincoln becomes the 16th President of the United States (1861-65).**
1866	Surface mining begins near Danville, Illinois.
1870	Post-Civil War Kentucky production decline to 150,582 tons. St. Louis & Southern Railroad completed from Henderson to Earlington, Ky.
1872	First train off the Big Sandy Railroad.
1877	Coal mined with steam-powered shovel.
1879	**One million tons of Kentucky production.**
1880	Mechanical stokers introduced. First coke ovens in west Kentucky. Mine Ventilation Law. First train from Williamson, West Virginia to Pike County, Kentucky. Coal mining machines come into general use.
1890	N&W Railroad's first mine at Goody in Pike County. Hopkins County in west Kentucky leading coal producer in the state for 18 straight years. Miner Pay Law. United Mine Workers of America formed. Machines developed to undercut coalbeds. **5,000 kilowatt steam turbine generates electricity.**
1900	Child Labor Law. Edgewater Coal Company's first production in Pike County. First train off the Lexington and Eastern Railroad. Independent Geological Survey established.
1910	First train from the Cumberland Valley Railroad. Fordson Coal Company's first production at Pond Creek. Pike-Floyd Coal Company's first production at Betsy Layne.
1914	**World War I increases demand for coal; Kentucky production 20.3 million tons.** Short-flame or "permissible" explosives developed. Mine Safety Law.
1918	First pulverized coal firing in electric power plants.
1920	Federal Mineral Leasing Act. **42.1 million tons of Kentucky production.**
1923	All-time high U.S. employment of 704,793 bituminous coal and lignite miners. First dragline excavators built especially for surface mining.
1929	Stock market crashes beginning the Great Depression.
1932	Walking dragline excavators developed.
1936	47.7 million tons of Kentucky production .
1940	**World War II - coal production in Kentucky rises to 72.4 million tons for the war effort.**

History of Coal

1940	Auger surface mining introduced.
1942	Republic Steel Company's first production - Road Creek, Kentucky.
	Post-War Marshall Plan - production rises to 88.7 million tons in Kentucky.
	Continuous underground mining systems developed.
	Kentucky Water Contamination Legislation.
1947	**Kentucky Coal Association founded.**
1950	**82.2 million tons of Kentucky production.**
1956	Fish and Wildlife Coordination Act .
	Railroads converting from coal to diesel fuel.
	Roof bolting introduced in underground mines.
1960	Railroads began using unit coal trains.
	First longwall mining with powered roof supports.
	Kentucky Surface Mining Legislation.
1963	**Kentucky coal production exceeded 100 million tons.**
1966	National Historic Preservation Act.
	C&O Railroad to John's Creek constructed - Pike County.
1969	Federal Coal Mine Health and Safety Act.
1970	Federal Clean Air Act.
1972	Kentucky Coal Severance Tax established.
	Federal Water Pollution Control Act.
	Kentucky becomes the leading coal production state.
1973	Endangered Species Act.
	OPEC oil embargo: Coal production and prices rise.
1976	Federal Coal Leasing Amendments Act.
1977	Federal Surface Mine Control and Reclamation Act.
1980	Congress enacts the National Acid Precipitation Assessment Program (NAPAP) Study, a 10 year research program, which invested $550 million for the study of "acid rain." Industries spend over $1 billion on Air Pollution Control Equipment during 1980.
1983	**OPEC cuts oil prices for first time.**
	Martha Layne Collins becomes Kentucky's first woman Governor (1983-87).
	U.S. Clean Coal Technology Demonstration Program established $2.5 billion in Federal matching funds committed to assist the private sector to develop and demonstrate improved clean coal technologies.
	1988 Kentucky Supreme Court rules that the unmined minerals tax on coal is subject to the same state and local property tax rates as other real estate.
	TVA 160-MW Atmospheric Fluidized Bed Combustion Unit on line.
	Wyoming displaces Kentucky as the leading coal producing state.
1990	Federal Clean Air Act Amendments of 1990.
	Kentucky record production - 179.4 million tons (1990).
	U.S. coal production exceeds 1 billion tons.
1992	U.S. Energy Policy Act of 1992.
1993	CEDAR, Inc. (Coal Education Development and Resources) formed in Pike County.
1994	Western Kentucky CEDAR, Inc. was formed in Webster and Union Counties.
1996	Federal Energy Regulatory Commission (FERC) issues Order 888 addressing the issues of open access to encourage wholesale competition in the electric utility industry and FERC Order 889 requiring utilities to share information about available transmission capacity.
1996	Workers' Comp Reform Laws are passed in Kentucky.
1997	The Kentucky Fish and Wildlife Commission voted to re-introduce Elk into 14 East Kentucky Counties on post-mined lands, citing mountain-top removal areas and old mine benches as good elk habitat. This will be the only large free-ranging elk herd in the Eastern United States.
1997	**Kentucky Coal Association celebrates 50 years of service to the mining industry (1947-97).**

Sources: Energy Information Administration, Coal Data: A Reference, 1989, Kentucky Department of Mines and Minerals, Annual Reports, and Willard Rouse Jillson, Coal Industry in Kentucky, 1922.

Types of Mining

Kentucky has two distinct coal fields, each containing numerous deposits of bituminous coal of various characteristics and mines of every type and size. By the use of large draglines and shovels, the excavation of two or more coal seam deposits (multi-seam mining) is possible in the large area surface mines of the gently rolling **Western Kentucky** coal field and in the large mountain top removal mines in the steeper terrain of the **Eastern Kentucky** coal field. Both the Eastern and Western Kentucky coal fields have large, modern, and efficient underground mines (of various entry types) utilizing improved mining methods with increased mechanization including continuous miners, longwall mining panels, or both.

Of Kentucky's 152.4* million tons of 1996 coal production, 94.3 million tons were produced by underground mining methods and 58.1 million tons were produced by surface mining methods.

***NOTE:** This is the official U.S. DOE number for Kentucky. State and Federal numbers will differ, please see page 8 for details.

A breakdown of the different types of surface and underground mining methods used in Kentucky is as follows:

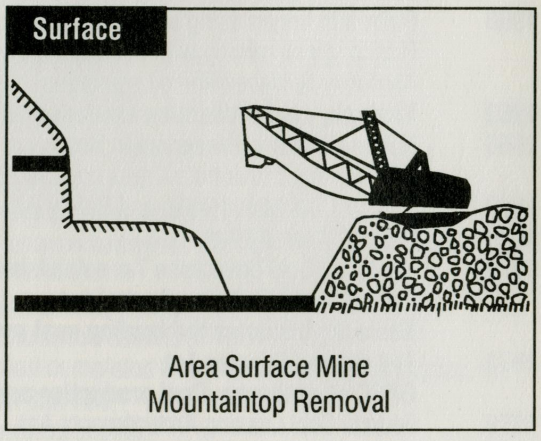
1996 Mining Type Estimates

Mine Type	No. of Mines	Production (million tons)
Surface	**237**	**58.1**
Surface Only*	-	15.0
Surface & Auger*	-	42.0
Auger Mining*	-	1.0
Underground	**307**	**94.3**
Continuous**	—	69.2
Conventional**	—	10.2
Longwall**	—	14.6
Other**	—	0.3
State Totals	**544**	**152.4**

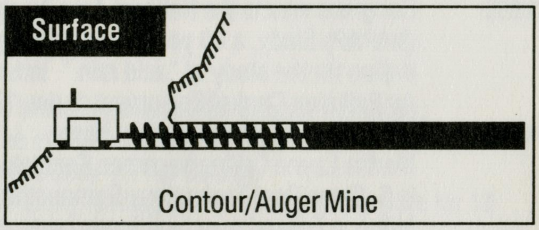
***NOTE:** Surface mining type estimates are based upon Kentucky Department of Mines and Minerals' License data.

****NOTE:** Underground mine type and production estimates are determined by the U.S.DOE-EIA when mines produce greater than 50 percent of their output by one of the underground mine types listed above.

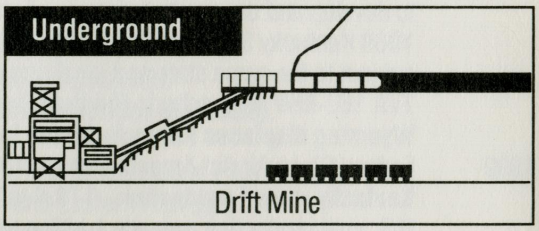
Sources: Kentucky Department of Mines and Minerals, Annual Report, 1996. U.S. DOE - EIA, Coal Industry Annual, 1996.



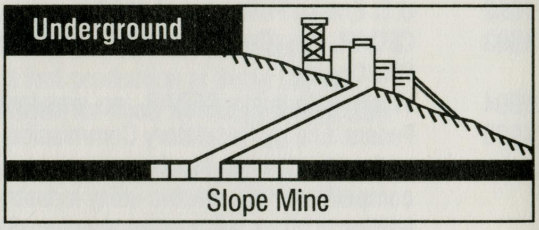
Area Surface Mine
Mountaintop Removal



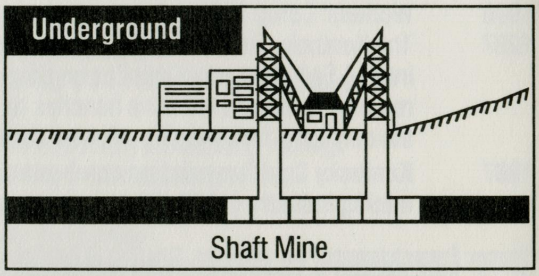
Contour/Auger Mine



Drift Mine



Slope Mine



Shaft Mine

Source: U.S. DOE - EIA Coal Data: A Reference, 1989.

[www.eia.doe.gov/fuelcoal.html] and [www.caer.uky.edu/kdmm/homepage.htm]

U.S. Coal Production

Kentucky and U.S. Coal Production,* 1970-96 (millions of tons)

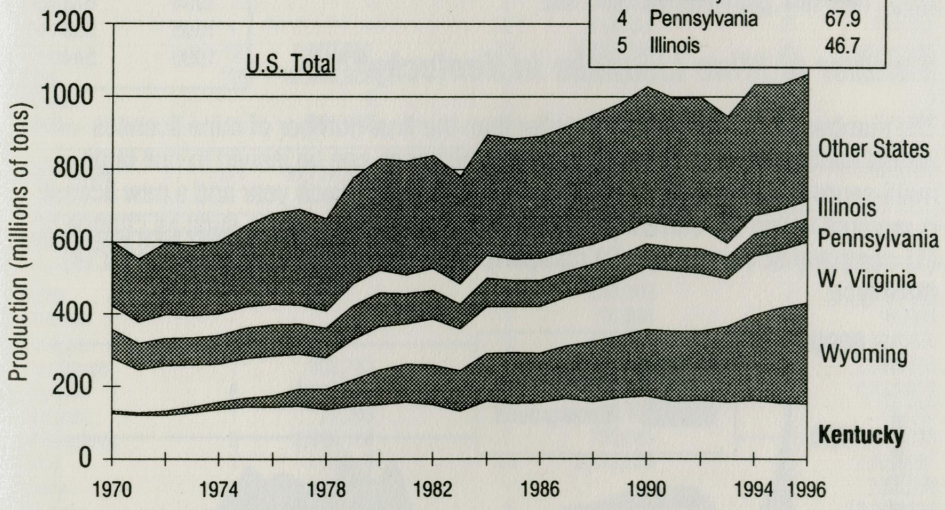
Year	Kentucky Eastern	Kentucky Western	Kentucky Total	United States	Kentucky as % of U.S.
1970	72.5	52.8	125.3	602.9	20.8
1971	71.6	47.8	119.4	552.2	21.6
1972	68.9	52.3	121.2	595.4	20.4
1973	74.0	53.7	127.6	591.7	21.6
1974	85.4	51.8	137.2	603.4	22.7
1975	87.3	56.4	143.6	648.4	22.1
1976	91.1	52.8	144.0	678.7	21.2
1977	94.0	52.3	146.3	691.3	21.2
1978	96.2	39.5	135.7	665.1	20.4
1979	104.1	42.5	146.5	777.9	18.8
1980	109.2	41.0	150.1	829.7	18.1
1981	117.9	39.7	157.6	823.8	19.1
1982	111.2	39.0	150.2	838.1	17.9
1983	95.6	35.6	131.2	782.1	16.8
1984	117.3	42.3	159.5	895.9	17.8
1985	113.3	39.0	152.3	883.6	17.2
1986	112.7	41.2	153.9	890.3	17.3
1987	119.9	45.3	165.2	918.8	18.0
1988	117.5	40.3	157.9	950.3	16.6
1989	125.7	41.6	167.4	980.7	17.1
1990	128.4	44.9	173.3	1,029.1	16.8
1991	117.2	41.8	159.0	996.0	16.0
1992	119.4	41.7	161.1	997.5	16.2
1993	120.2	36.1	156.3	945.4	16.5
1994	124.4	37.2	161.6	1,033.5	15.6
1995	118.5	35.2	153.7	1,033.0	14.9
1996	117.0	35.5	152.4	1,063.9	14.3

***NOTE:** This is the official U.S. DOE number for Kentucky. State and Federal numbers will differ; please see page 8 for details.

U.S. Leading Coal Producers**

Kentucky ranked third in the United States in coal production during 1996.

1996*** Rank	State	Millions of Tons
1	Wyoming	278.4
2	West Virginia	170.4
3	Kentucky	152.4
4	Pennsylvania	67.9
5	Illinois	46.7



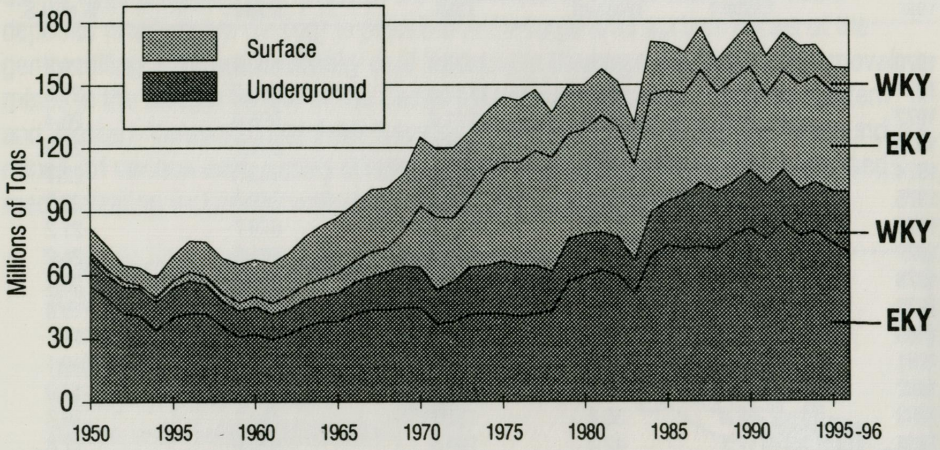
****NOTE:** Wyoming was not one of the top five coal producers until 1978, when it surpassed Virginia and Ohio, but is included before 1978 to show its rise to the leading coal-production state.

*****NOTE:** Does not include 55.2 million tons of Texas lignite, (see page 38).

Sources: U.S. DOE - Energy Information Administration; Coal Industry Annual, 1993-1996, Coal Production, 1977-1992. U.S. Bureau of Mines, Minerals Yearbook, 1970-1976.

Kentucky Production

Kentucky produced 157.7* million tons of bituminous coal in 1996, down from the record of 179.4 million tons set in 1990.



***NOTE:** State production numbers differ slightly from yearly federal U.S. DOE - Energy Information Administration (EIA) production numbers, due to minor differences in their methodology (i.e., clean coal versus raw). Please note whether Federal or State numbers are referenced when using a value in this publication.

Source: Kentucky Department of Mines and Minerals, Annual Reports, 1950-1996.

Number of Mines, 1996

There were 544 coal mines in Kentucky during 1996.

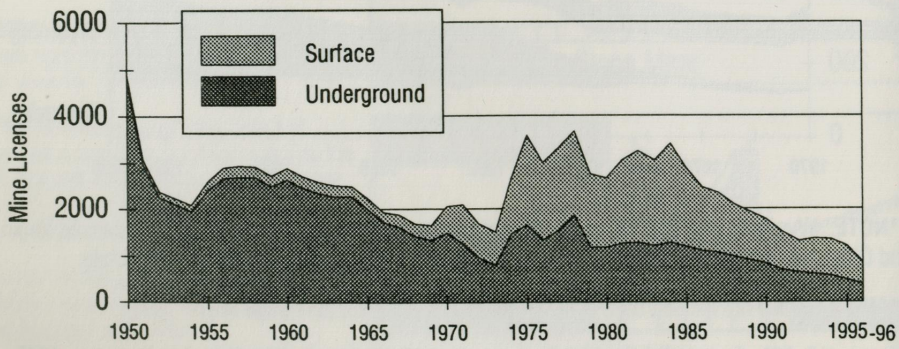
Region	Underground	Surface	Total
Eastern Kentucky	287	197	484
Western Kentucky	20	40	60
Kentucky Total	307	237	544

Source: U.S. DOE - Energy Information Administration, Coal Industry Annual, 1993-1996, Coal Production, 1984-1992.

Year	No. of KY Mines
1984	2,063
1985	1,155
1986	1,553
1987	1,428
1988	1,230
1989	1,099
1990	987
1991	838
1992	752
1993	696
1994	673
1995	598
1996	544

*Number of Mine Licenses in Kentucky***

The number of actual mines is smaller than the final number of mine licenses issued each year. This is because several licenses can be issued to one large multi-seam surface mine. A mine license is renewed each year and a new license is required within the current year when certain changes occur, such as change of: (1) company or ownership; (2) company name; (3) operator or principal; or (4) mine type.

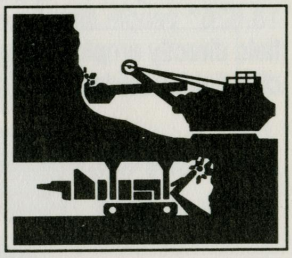


****NOTE:** Several licenses can be issued to one large multi-seam surface mine.

Source: Kentucky Department of Mines and Minerals, Annual Reports, 1950-1996.

County Production

There were 544 mines in Kentucky during 1996. These 544 mines were issued 845 Kentucky mine licenses and produced 157.7 million tons.



307 underground mines (392 licenses) accounted for 62.5% of Kentucky's production and 237 surface mines (453 licenses) accounted for 37.5% of Kentucky's production.

71% of Western Kentucky and 59% of Eastern Kentucky's coal production was from underground mines during 1996.

29 Kentucky counties produced coal in 1996; 10 Western Kentucky counties and 19 Eastern Kentucky counties.

*1996 Production by County and Type of Mine License**

County	Underground		Surface		Total	
	Licenses	Tonnage	Licenses	Tonnage	Licenses	Tonnage
EASTERN KENTUCKY						
Bell	17	2,666,853	16	2,453,890	33	5,120,743
Breathitt	-	-	16	5,615,615	16	5,615,615
Clay	-	-	8	142,030	8	142,030
Floyd	49	3,703,324	18	3,908,702	67	7,612,026
Harlan	52	9,730,638	19	1,372,266	71	11,102,904
Johnson	6	1,363,381	10	222,871	16	1,586,252
Knott	32	4,919,450	24	3,940,163	56	8,859,613
Knox	19	591,410	8	54,342	27	645,752
Laurel	-	-	1	52,437	1	52,437
Lawrence	-	-	3	68,260	3	68,260
Leslie	12	8,003,838	8	1,603,648	20	9,607,486
Letcher	27	5,691,952	26	2,694,106	53	8,386,058
McCreary	-	-	1	0	1	0
Magoffin	1	24,700	9	521,881	10	546,581
Martin	18	6,017,099	26	5,627,564	44	11,644,663
Morgan	-	-	2	7,321	2	7,321
Owsley	-	-	8	159,684	8	159,684
Perry	12	3,663,847	23	6,220,739	35	9,884,586
Pike	118	22,929,923	151	12,389,632	269	35,319,555
Pulaski	-	-	1	0	1	0
Whitley	8	407,942	15	321,252	23	729,194
EKY Total	371	69,714,357	393	47,376,403	764	117,090,760
WESTERN KENTUCKY						
Butler	-	-	3	233,289	3	233,289
Christian	-	-	1	90,848	1	90,848
Daviess	-	-	9	932,827	9	932,827
Henderson	1	903,743	3	1,682,275	4	2,586,018
Hopkins	6	4,626,073	17	5,199,546	23	9,825,619
McLean	1	71,200	3	23,922	4	95,122
Muhlenberg	3	2,615,188	7	730,045	10	3,345,233
Ohio	1	19,948	14	2,512,633	15	2,532,581
Union	3	7,335,310	-	-	3	7,335,310
Webster	6	13,193,466	3	413,532	9	13,606,998
WKY Total	21	28,764,928	60	11,818,917	81	40,583,845
KY Totals	392	98,479,285	453	59,195,320	845	157,674,605

***NOTE:** Several licenses can be issued to one large multi-seam surface mine.

Source: Kentucky Department of Mines and Minerals, Annual Report, 1996.

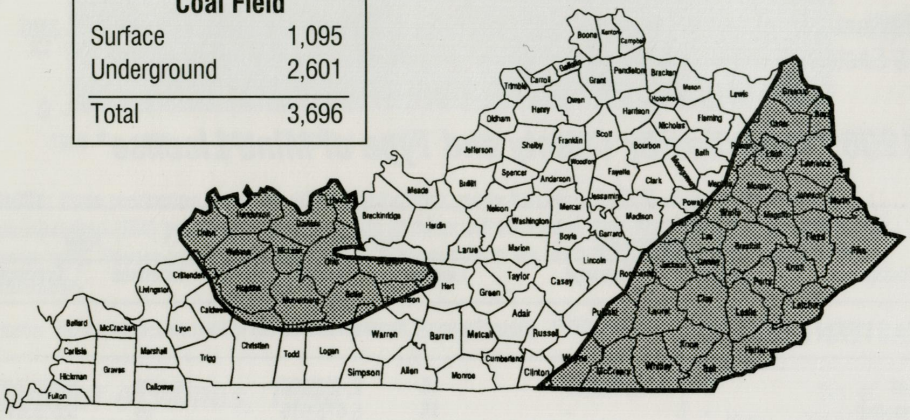
Employment

The Kentucky coal mining industry has a current work force of approximately 18,826* people directly employed in coal mining jobs. The Western Kentucky coal field directly employs approximately 3,696 persons, while the Eastern Kentucky coal field provides 15,130 direct mining jobs.

Kentucky's Coal Mining Work Force, 1996

Western Kentucky Coal Field	
Surface	1,095
Underground	2,601
Total	3,696

Eastern Kentucky Coal Field	
Surface	4,855
Underground	10,275
Total	15,130



Eastern Kentucky averaged 80% of Kentucky's coal mining work force and accounted for about 77% of Kentucky's total coal production in 1996.

Western Kentucky averaged 20% of Kentucky's coal mining work force and accounted for about 23% of Kentucky's total coal production in 1996.

Due to continued productivity gains, Kentucky produced 152.4 million tons during 1996 while direct mining employment continued to decline.

Kentucky Coal Mining Employment, 1979-1996

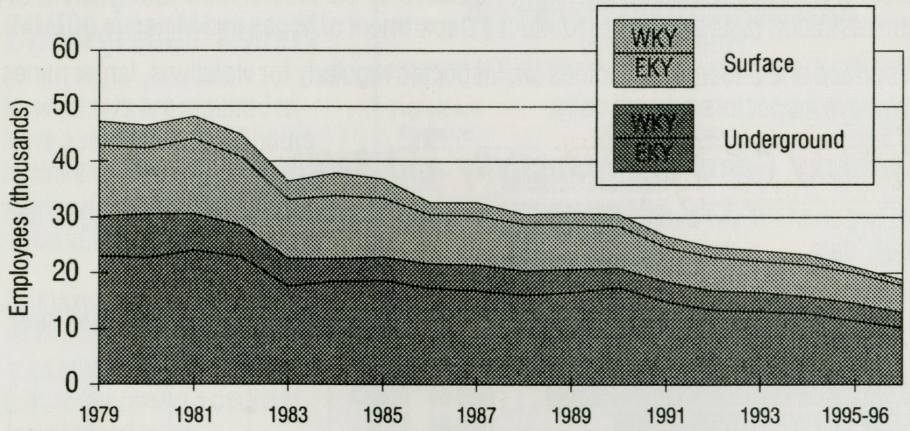
	Western Kentucky			Eastern Kentucky			Kentucky
Year	Surface	Underground	Total	Surface	Underground	Total	Totals
1979	4,343	6,945	11,288	12,838	23,064	35,902	47,190
1980	3,995	7,879	11,874	11.819	22,702	34,521	46,395
1981	4,056	6,489	10,545	13,473	24,032	37,505	48,050
1982	4,120	5,639	9,759	12,319	22,782	35,101	44,860
1983	3,415	4,918	8,333	10,485	17,615	28,100	36,433
1984	4,022	4,053	8,075	11,327	18,474	29,801	37,876
1985	3,421	4,294	7,715	10,516	18,583	29,099	36,814
1986	2,327	4,297	6,624	8,718	17,312	26,030	32,654
1987	2,345	4,605	6,950	8,740	16,900	25,640	32,590
1988	1,825	4,388	6,213	8,261	16,085	24,346	30,559
1989	1,870	4,166	6,036	8,034	16,586	24,620	30,656
1990	2,095	3,491	5,586	7,505	17,407	24,912	30,498
1991	1,910	3,603	5,513	6,251	14,878	21,129	26,642
1992	1,722	3,483	5,205	6,014	13,405	19,419	24,624
1993	1,887	3,465	5,352	5,683	13,028	18,711	24,063
1994	1,803	2,988	4,791	5,728	12,849	18,577	23,368
1995	1,109	3,176	4,285	5,474	11,366	16,840	21,125
1996	1,095	2,601	3,696	4,855	10,275	15,130	18,826

***NOTE:** State employment numbers (page 14) differ from federal EIA numbers.

Source: U.S. DOE - EIA; Coal Industry Annual, 1993-1996, Coal Production, 1979-1992.

Employment/Productivity

Kentucky Coal Mine Employment, 1979-1996*

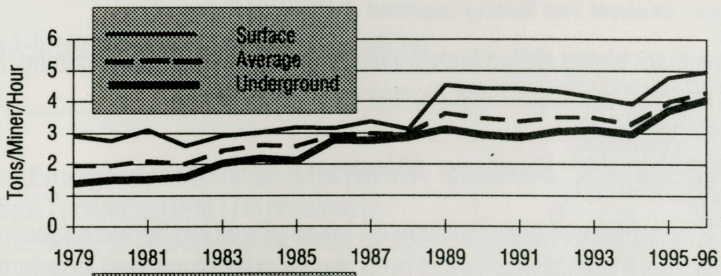


*State employment numbers (page 14) differ from federal EIA numbers.

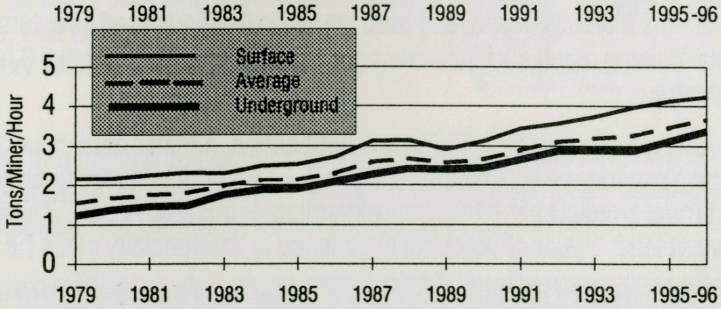
Mine Productivity, 1977-1996 (tons/miner/hour)

Year	Eastern Kentucky	Western Kentucky	Kentucky Average	Appalachian Coal Field	Interior Coal Field	Western U.S. Coal Field	U.S. Average
1977	1.71	2.22	1.86	1.36	2.42	5.85	1.82
1978	1.62	1.97	1.71	-	-	-	1.79
1979	1.54	1.94	1.64	1.33	2.21	5.47	1.81
1980	1.67	1.96	1.74	1.39	2.30	5.64	1.93
1981	1.76	2.12	1.84	1.51	2.35	6.15	2.10
1982	1.79	2.01	1.84	1.51	2.38	6.26	2.11
1983	1.98	2.43	2.08	1.75	2.69	7.60	2.50
1984	2.13	2.61	2.24	1.86	2.80	8.30	2.64
1985	2.13	2.57	2.23	1.90	2.81	8.55	2.74
1986	2.31	2.94	2.45	2.09	3.14	9.27	3.01
1987	2.59	2.98	2.69	2.30	3.33	10.42	3.30
1988	2.68	2.95	2.74	2.44	3.45	11.01	3.55
1989	2.58	3.62	2.78	2.49	3.84	11.63	3.70
1990	2.66	3.46	2.83	2.60	3.88	11.82	3.83
1991	2.90	3.37	3.01	2.74	3.98	12.42	4.09
1992	3.10	3.49	3.20	2.95	4.18	12.73	4.36
1993	3.18	3.49	3.25	3.00	4.43	13.53	4.70
1994	3.24	3.28	3.25	3.20	4.43	14.58	4.98
1995	3.47	3.97	3.57	3.32	4.97	15.68	5.38
1996	3.68	4.29	3.80	3.48	5.39	17.41	5.69

Western Kentucky Coal Mine Productivity 1979-1996



Eastern Kentucky Coal Mine Productivity 1979-1996



Source: U.S. Department of Energy - EIA; Coal Industry Annual, 1993-1996, Coal Production, 1977-1992.

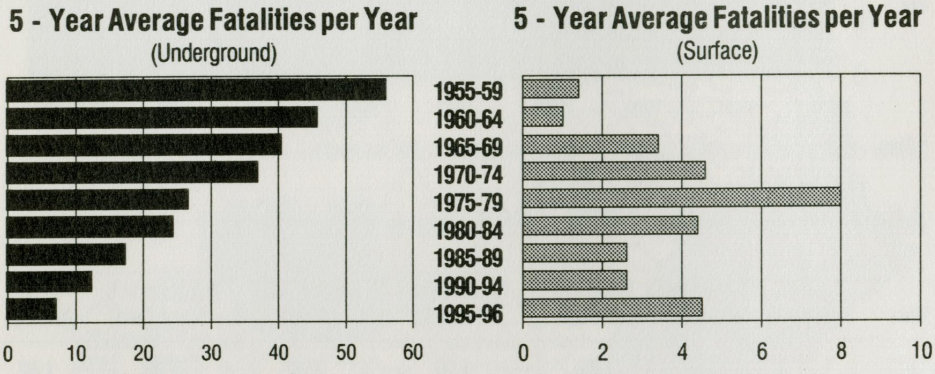
Safety and Training

Safety and health standards are highly regulated by the federal Mine Safety and Health Administration (MSHA) and the Kentucky Department of Mines and Minerals (KDMM).

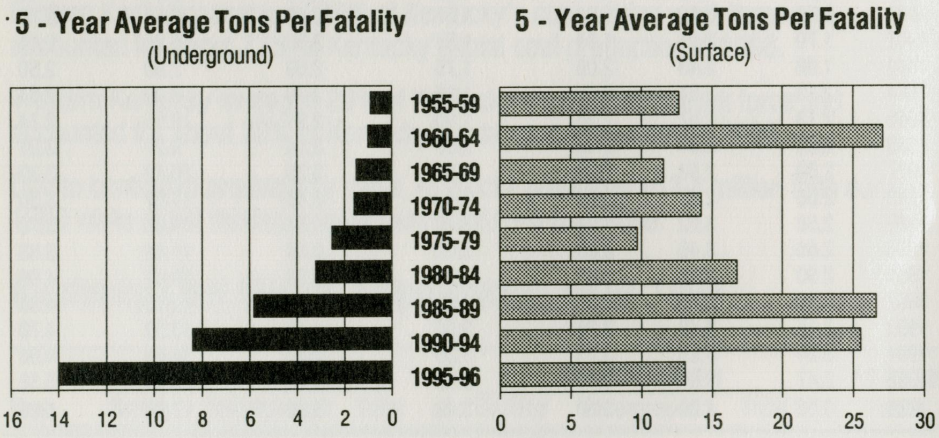
All surface and underground mines are inspected regularly for violations; larger mines may have inspectors present daily.

Kentucky Gains in Productivity and Safety

The bar charts show overall trends in mine safety improvements by averaging erratic yearly data.



The underground bar chart (below) indicates steady safety improvements in underground mines in Kentucky.



Source: Developed from Kentucky Department of Mines and Minerals data.

Miners are highly skilled technicians who receive extensive training, both general safety training and job-specific training.

Training for Surface Miners

New miners are required to have 24 hours of training before employment at a surface mine; this includes workers at prep plants, rail sidings, and river terminals. After initial training, each surface mine employee is required to receive 8 hours of annual retraining.

To obtain a Surface Mine Foreman Certification, a miner must have 3 years of surface mining experience achieved after age 18. A surface mine foreman obtaining certification must specialize in either coal extraction or post extraction. The applicant must have at least 1 year of practical experience in the specialty class he designates.

To obtain a surface blaster's license, a miner must have 2 years of work experience under an experienced blaster and pass a written examination.

Training for Underground Miners

New miners are required to have a minimum of 40 hours of training plus pass a written exam prior to starting work as an inexperienced miner.

An inexperienced miner must work a minimum of 45 days in an underground mine before becoming a certified experienced miner.

A minimum of 16 hours of annual retraining is required to maintain the miner certification and continue to work at an underground mine.

A newly hired miner (experienced or inexperienced) must receive 8 hours of mine site-specific training.

Underground Miner Classifications
(October, 1997)

Experience Required	Underground Mining Position	Miners Certified
5 Yrs.	Electrical Inspector*	13
	Mine Inspector/Mine Safety Analyst*	770
	Mine Foreman*	10,050
	Electrical Instructor*	95
3 Yrs.	Asst. Mine Foreman*	3,060
	Instructor	654
1 Yr.	Electrical Worker*	7,920
	Shot Firer/Solid Blasting*	4,402
	Drill Operator/Solid Blasting*	3,912
	Belt Examiner	2,826
	Hoisting Engineer*	1,184
45 days	Mine Rescue	262
	Conventional Shot Firer*	13,434
	Certified Miners	27,220
SPECIAL TRAINING		
EMT - Emergency Medical Technician		1,411
First Aid		1,985

***NOTE:** Tests are required in addition to years of experience.

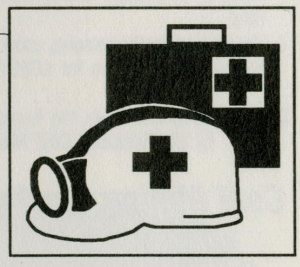
Source: Kentucky Department of Mines and Minerals (KDMM).

To receive an Underground Mine Foreman Certification, a miner must have 5 years practical underground coal mining experience gained after age 18, with at least 1 year on an active working section of a coal mine. An Assistant Mine Foreman Certification requires 3 years practical experience.

Each miner receives new work assignment training of 20 hours minimum to become certified for each new job classification.

To maintain certification and qualifications, satisfactory completion of an electrical retraining class for certified electrical workers is required annually.

Only certified shot-firers can detonate explosives within a mine.



MET/EMT - A Mine Emergency Technician (MET) or Emergency Medical Technician (EMT) is required at every coal mine on every shift with a work force of up to 50 employees, with an additional MET or EMT employed for every additional 50 employees, or any portion thereof.

METs are certified thru training and examination as administered by KDMM under regulations as established by the KDMM. The MET certification requires 40 hours of initial training, plus a current CPR certification and 8 hours of annual retraining.

All certifications and mining specialities, as established by the Kentucky Mining Board, must be signed by the Commissioner (KDMM) verifying the holder has passed.

Employment/Wages by County

Coal County Employment and Wages, 1996[4]

County[1]	Direct Mining Employment	% of Labor Force	Miners as % of Total Employed	Mining Wages	% of Total County Wages	Average Weekly Mining Earnings[3]
EASTERN KENTUCKY						
Bell	907	9.0%	9.8%	$32,815,994	17.1%	$695.78
Boyd	429	1.9%	2.1%	$11,013,176	1.5%	$493.69
Breathitt	218	4.9%	5.5%	$10,192,970	15.2%	$899.17
Carter	16	0.1%	0.2%	$331,627	0.4%	$398.59
Clay	82	1.1%	1.2%	$2,638,277	3.4%	$618.73
Floyd	786	5.5%	6.2%	$27,340,675	10.8%	$668.93
Harlan	1,373	14.7%	17.0%	$60,992,387	32.1%	$854.28
Johnson	232	2.3%	2.6%	$8,040,994	6.3%	$666.53
Knott	1,339	22.9%	25.7%	$51,402,782	55.9%	$738.25
Knox	142	1.3%	1.4%	$3,606,946	2.8%	$488.48
Laurel	197	0.9%	1.0%	$6,644,781	1.8%	$648.65
Leslie	1,307	30.7%	33.1%	$58,261,390	59.6%	$857.24
Letcher	981	12.7%	14.3%	$34,333,781	28.3%	$673.05
Magoffin	133	2.8%	3.2%	$5,589,521	12.6%	$808.20
Martin	1,049	31.3%	36.6%	$51,928,113	61.8%	$951.97
Perry	938	8.3%	9.1%	$38,104,161	15.5%	$781.21
Pike	4,649	17.0%	18.8%	$190,033,343	33.9%	$786.08
Whitley	322	2.3%	2.5%	$10,130,746	4.9%	$605.04
Subtotal	15,100	-	-	$603,401,664	-	$768.47
EKY Total[2]	15,248	-	-	$610,178,092	-	$769.56
Fayette	**Note:** The direct mining employment classification does not include most of the administrative/professional employees of the coal companies located in (2) Kentucky metropolitan areas and does not include any private services or indirect employment.					$1,680.77
Jefferson						$1,621.29
WESTERN KENTUCKY						
Daviess	147	0.3%	0.3%	$6,013,157	0.7%	$786.65
Henderson	321	1.4%	1.5%	$13,629,431	2.9%	$816.52
Hopkins	930	4.5%	4.9%	$42,432,129	10.5%	$877.42
Muhlenberg	213	1.8%	1.9%	$11,097,610	6.8%	$1,001.95
Ohio	317	3.3%	3.6%	$13,122,521	12.2%	$796.08
Union	1,008	15.5%	16.8%	$55,782,214	36.0%	$1,064.22
Webster	971	17.3%	18.7%	$51,534,045	44.0%	$1,020.64
Subtotal	3,907	-	-	$193,611,107	-	$952.98
WKY Total[2]	4,057	-	-	$199,039,760	-	$943.48
State Total[2]	19,372	-	-	$814,658,596	-	$808.72

1 Counties with less than three employers or one employer with 80% of the total county miner work force were withheld to avoid disclosure of individual company data. The counties are as follows: Boone, Butler, Christian, Elliott, Estill, Lawrence, Lee, Marshall, McCreary, McLean, Nelson, Owsley, Pulaski, Wolfe. It is suspected that multi-county mining employment attributes to some counties being "under reported" and others being over reported.

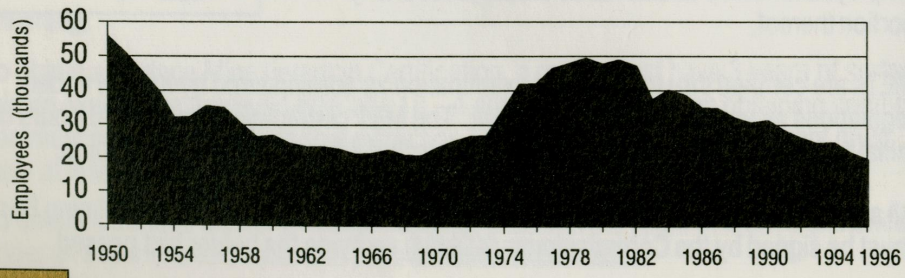
2 Columns do not add to the totals due to withheld data.

3 Variation in average weekly mining income affected greatly by hours worked per week as well as hourly wage rate.

4 Values and methodologies used in this table may not be consistent with LGEDF regulations (see page 16). Do not use these values for LGEDF estimates.

Source: Developed from the Kentucky Workforce Development Cabinet. Employment and Wages Section Data by the Kentucky Coal Marketing and Export Council.

Coal Mining Employees in Kentucky, 1950-1996



[www.state.ky.us/agencies/wforce/des.htm]

Severance Tax by County

Coal Severance Tax Revenue by County, FY 1996-97

County	Gross Value of Severed Coal	Tax on Severed Coal	Gross Value of Processing	Total Tax Receipts
EASTERN KENTUCKY				
Bell	$119,227,660	$5,357,433	$14,539,440	$6,011,703
Boyd	---	---	$8,834,514	$392,066
Breathitt	$57,268,527	$2,498,450	$10,647,454	$2,977,586
Clay	$1,018,601	$48,876	$758,384	$82,964
Floyd	$123,759,612	$5,302,476	$8,921,900	$5,709,318
Harlan	$323,381,274	$14,220,784	$19,057,657	$15,089,021
Johnson	$11,583,109	$522,121	$2,075,999	$615,938
Knott	$259,835,810	$11,684,507	$30,989,391	$13,078,936
Knox	$14,154,530	$643,332	$3,427,925	$800,630
Laurel	$1,431,400	$64,058	$488,744	$86,225
Lawrence	$2,277,062	$100,274	$29,006	$101,578
Leslie	$211,355,532	$9,632,579	$18,223,409	$10,452,634
Letcher	$186,083,065	$8,319,316	$22,141,582	9,288,916
Magoffin	$19,351,696	$905,416	$315,662	$919,620
Martin	$298,211,521	$12,992,233	$44,194,638	$14,985,972
Owsley	$3,154,730	$141,964	$54,832	$144,432
Perry	$172,879,952	$7,783,709	$67,704,768	$10,806,907
Pike	$805,724,092	$35,303,095	$115,741,334	$40,362,844
Pulaski	---	---	$189,595	$9,119
Whitley	$10,736,652	$460,454	$10,414,492	$929,107
EASTERN KY Total*	$2,623,457,655	$116,103,264	$382,189,728	$133,116,805
WESTERN KENTUCKY				
Daviess	$12,573,599	$583,313	$1,374,798	$652,965
Henderson	$42,078,582	$1,755,374	$4,620,211	$1,947,705
Hopkins	$148,330,714	$6,379,481	$11,464,788	$6,908,759
McLean	$6,924,918	$311,629	$433	$311,648
Muhlenberg	$54,488,909	$2,413,121	$2,640,106	$2,529,061
Ohio	$31,861,394	$1,435,689	$4,902,598	$1,656,643
Webster	$187,261,706	$7,804,795	$20,902,042	$8,691,111
WESTERN KY Total*	$632,508,728	$27,423,323	$58,684,100	$30,046,074
STATE TOTALS*	$3,255,966,383	$143,526,587	$440,873,828	$163,162,879

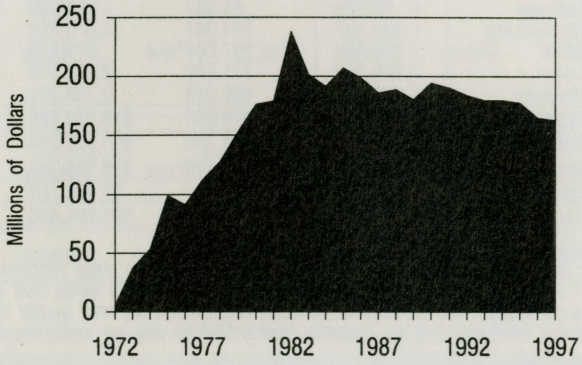
* Columns do not add to State Totals because of Butler, Christian, Estill, Lee, McCreary, Morgan, and Union Counties' information being withheld to avoid disclosure of individual company data.

Source: Kentucky Revenue Cabinet

Severance Tax Revenues (millions of dollars)

The gross value of coal mined and processed in Kentucky during Fiscal Year 1996-1997 was $3.7 billion.

The Kentucky coal industry paid $163.2 million in coal severance taxes in Fiscal Year 1996-1997.



Coal Taxes Returned

Coal Severance Taxes Returned to Counties, FY 1992-97

Fiscal Year	Local Government Economic Assistance Fund (LGEAF)*		Local Government Economic Development Fund (LGEDF)**		Total Percent Returned
1991-92	$22,120,783	12%	$0	—	12%
1992-93	$21,559,445	12%	$4,105,100	3%	15%
1993-94	$19,403,593	12%	$9,236,600	6%	18%
1994-95	$18,981,314	12%	$15,052,300	9%	21%
1995-96	$17,826,998	12%	$20,383,293	13%	25%
1996-97	$17,625,559	12%	$24,806,340	16%	28%
1997-98	$ —	13%	$ —	18%	31%

***NOTE:** Established by the 1980 General Assembly; however, this column only includes fiscal years 1992 through 1997, and includes coal severance taxes only.

****NOTE:** Totals $82 million with interest.

Coal Taxes Returned to Coal Producing Counties

	TABLE 1	TABLE 2		TABLE 3	
PRODUCING COUNTIES	**LGEAF*** (FY 97)	**LGEDF** Single County (FY 97)	**LGEDF** Total to County (FY 93-97)	**Unmined Minerals Tax** (FY96) County Share*** (83.7%)	Total Tax
EASTERN KY					
Bell	$622,270	$531,475	$1,566,447	$184,050	$219,893
Boyd	—	90,127	262,514	2,190	2,616
Breathitt	324,038	556,635	1,656,106	82,858	98,994
Carter	—	91,158	287,491	358	428
Clay	162,278	173,361	839,555	3,917	4,680
Clinton	—	—	130,961	—	—
Elliott	—	90,232	331,892	898	1,073
Floyd	840,523	629,736	2,004,253	672,178	803,080
Greenup	—	66,095	237,636	—	—
Harlan	1,376,681	1,255,245	3,792,062	577,731	690,240
Jackson	—	84,250	287,852	576	688
Johnson	297,386	202,861	602,055	Not Filed	Not Filed
Knott	1,111,906	1,051,628	2,930,135	731,202	873,599
Knox	204,507	186,868	613,713	48,999	58,541
Laurel	192,341	72,272	228,033	554	662
Lawrence	424,772	148,949	465,643	8,585	10,257
Lee	—	198,740	620,181	254	303
Leslie	940,105	1,160,563	3,106,387	Not Filed	Not Filed
Letcher	879,508	790,591	2,438,728	488,792	583,981
McCreary	135,348	72,352	233,479	622	743
Magoffin	263,903	186,132	693,022	69,370	82,879
Martin	1,203,144	1,510,204	4,566,204	502,982	600,934
Menifee	—	50,155	127,168	—	—
Morgan	28,005	106,415	311,825	471	563
Owsley	114,785	137,110	414,865	157	188
Perry	915,459	1,025,023	3,276,439	685,860	819,427
Pike	3,461,823	2,331,755	6,875,712	2,185,042	2,610,564
Pulaski	—	—	99,327	8	10
Rockcastle	—	67,932	185,216	—	—
Wayne	—	—	109,465	—	—
Whitley	224,678	231,884	758,189	28,557	34,118
Wolfe	—	58,153	252,669	42	50
EKY Total	$13,723,460	$13,157,902	$40,305,222	$6,276,252	$7,498,510
WESTERN KY					
Butler	$120,209	$62,704	$203,349	2,620	$3,130
Caldwell	—	34,336	131,330	255	305
Christian	172,454	61,165	223,384	1,183	1,413
Daviess	333,240	86,865	294,690	Not Filed	Not Filed
Edmonson	—	—	116,765	—	—
Hancock	—	55,181	172,389	—	—
Henderson	307,391	203,183	666,454	101,492	121,257
Hopkins	786,706	541,171	1,730,817	210,556	251,560
McLean	99,068	65,367	207,389	4,279	5,112
Muhlenberg	351,322	294,387	1,073,258	127,953	152,871
Ohio	266,530	287,066	877,523	68,464	81,797
Union	639,019	721,820	2,293,646	64,460	77,013
Webster	826,160	966,413	2,748,291	346,109	413,511
WKY Total	$3,902,099	$3,379,658	$10,739,285	$927,371	$1,107,969
Multi-County**		$8,268,780	$25,522,254		
State Total	**$17,625,559**	**$24,806,340**	**$76,566,761**	**$7,203,623**	**$8,606,479**
Interest			$5,431,705		
Tax & Interest			**$81,998,466**		

* County and municipal totals for FY 1996-97.

** Counties may jointly apply for multi-county LGEDF Funds. State Allocation Total is only partially authorized.

*** Revenue generated from the Unmined Minerals Tax for some coal counties was unavailable at the time of this publication. The *ad valorem* tax rates on real property vary greatly from county to county. The Revenue Cabinet estimates that the counties receive 83.7%, with the remainder being the state share.

Note: Table doesn't include non-producing counties impacted by coal transportation, referred to as "Impacted Counties." These 44 counties received **$1.95 million** in coal severance taxes during FY 97. Columns do not add due to individual rounding.

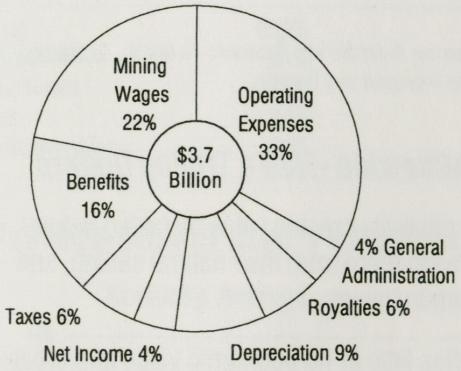
Economic Impact

The Kentucky coal industry in 1996:

- employed 19,372 miners earning over $814.6 million in wages.
- created a total of 79,058 jobs statewide.
- paid over $163 million in severance taxes and generated total state tax revenues of about $494 million.
- was a $3.7 billion industry which brought into Kentucky receipts totaling about $3.1 billion from 29 states and 15 countries. The five leading states were: Florida ($418 million), North Carolina ($417 million), Tennessee ($416 million), Georgia ($355 million), and South Carolina ($276 million).*
- created economic activity throughout Kentucky totaling $8.338 billion.

***NOTE:** Estimated values of coal sold in each state are based upon average per ton gross value of coal produced and processed.

1996 Estimated Distribution of $3.7 Billion



Of the $3.7 billion in receipts from coal produced and processed, the largest part, 38 percent, went to miners' wages and benefits. Another 33 percent went to operating costs, including fuel, materials, maintenance, etc., and the remaining 29 percent went to depreciation (9%), taxes (6%), royalties (6%), net income (4%), and general administration (4%).

1996 Estimated Impact of $3.7 Billion

The $3.7 billion in receipts from coal produced and processed in Kentucky in 1996 generated additional economic activity totaling $4.64 billion and 59,686 jobs. This additional economic activity plus coal production and processing yielded total economic activity in Kentucky of $8.338 billion and 79,058 jobs.

	Coal Industry		Indirect		Coal Industry and Indirect	
	Output (billion $)	Jobs	Output (billion $)	Jobs	Output (billion $)	Jobs
Mining Wages and Benefits (38%)	$1.405	19,372	$1.563	21,944	$2.968	41,316
Operating Costs (33%)	$1.220	N/A*	$1.840	19,960	$3.060	19,960
Other** (29%)	$1.072	N/A*	$1.238	17,782	$2.310	17,782
Total	$3.697	19,372	$4.641	59,686	$8.338	79,058

***NOTE:** Not Applicable.
****NOTE:** Royalties, net income, depreciation, general administration, taxes.
Source: Updated from the University of Kentucky Center for Business and Economic Research, Economic Impact Analysis of Coal in Kentucky, (1995) for 1996 by Haywood and Baldwin.

Economic Impact

Benefits Throughout the Kentucky Economy

Due to the economic impact of the coal industry throughout Kentucky in 1996, in addition to 19,372 persons working at the mines, 7,787 persons worked in factories making everything from mining equipment to home appliances; 3,383 persons drove coal trucks and cargo trucks, worked at rail yards, etc.; 16,433 persons worked in warehouses, sold clothing, appliances, furniture, in retail stores, etc.; 16,134 persons worked in banks, law offices, engineering firms, accounting firms, and other service businesses; 5,647 persons built homes, offices, factories, and highways; and 10,302 others were teachers, government officials, and a wide variety of other professions and occupations.

Industry	Employment	Product Value
Coal mining, processing	19,372 jobs	$3.697 billion
Manufacturing	7,787 jobs	1.232 billion
Transportation	3,383 jobs	.295 billion
Wholesale/retail trade	16,433 jobs	.696 billion
Services	16,134 jobs	.717 billion
Construction	5,647 jobs	.398 billion
Other	10,302 jobs	1.304 billion
Total	**79,058 jobs**	**$8.338 billion***

***NOTE:** Does not total to $8.338 due to rounding.

Source: Updated from the University of Kentucky Center for Business and Economic Research, Economic Impact Analysis of Coal in Kentucky, (1995) to 1996 by Haywood and Baldwin.

Economic Impacts of All Mining Nationwide - Half a Trillion Dollars

The mining of coal, metals, and industrial minerals creates value by taking natural resources found in the Earth's crust, removing them from their natural setting, and converting them into products useful to human beings.

Mining literally takes a part of nature that has little or no economic value and creates something of value from it. The output of mining, therefore, constitutes *created value*. The payments made by others, by which the mining industry disburses that created value, form a net addition to the stream of income in the economy.

A recently completed study for the National Mining Association found that in 1995, the American mining industries (coal mining, metal mining, and industrial minerals mining) had a combined direct and indirect impact on the economy of the United States of $523.6 billion. That sum included combined direct and indirect contributions of $143.7 billion in personal income, $295.7 billion in business income, $56.9 billion in federal government revenues and $27.2 billion in state and local government revenues.

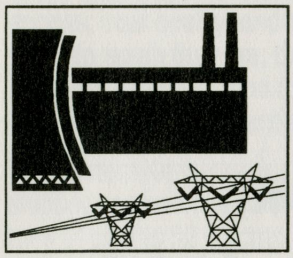
The total benefit to the nation's economy was nearly nine times the value of the solid minerals that were mined in the United States that year. The total number of American jobs created both directly and indirectly by the domestic mining industry was more than 15 times the number of workers directly involved in mining. And the total personal income generated from mining was enough to pay the wages of nearly five million American workers, only six percent of whom were actually employed in mining.

A major finding of the study was that people don't have to live in an obvious mining state or work directly in the mining industry to benefit from mining. All 50 states benefit from mining. In 1995, mining employed 320,400 people who produced coal and minerals with a total value of over $60 billion.

Source: National Mining Association, Mining and the American Economy - Everything Begins with Mining, July, 1997

Coal - Low Cost Energy

Coal is the lowest cost fossil fuel and its price is the most stable.



95.7% of Kentucky's electricity was generated from coal in 1996. (Hydro provided 4.0%; oil and gas together provided 0.3%.)

Utilities in Kentucky generated about 88.4 billion kilowatt-hours of electricity in 1996. After accounting for line losses and net state-line flows of electricity, 75.9 billion kilowatt-hours of electricity were sold within Kentucky during 1996 compared to 88.4 kilowatt-hours of net generation.

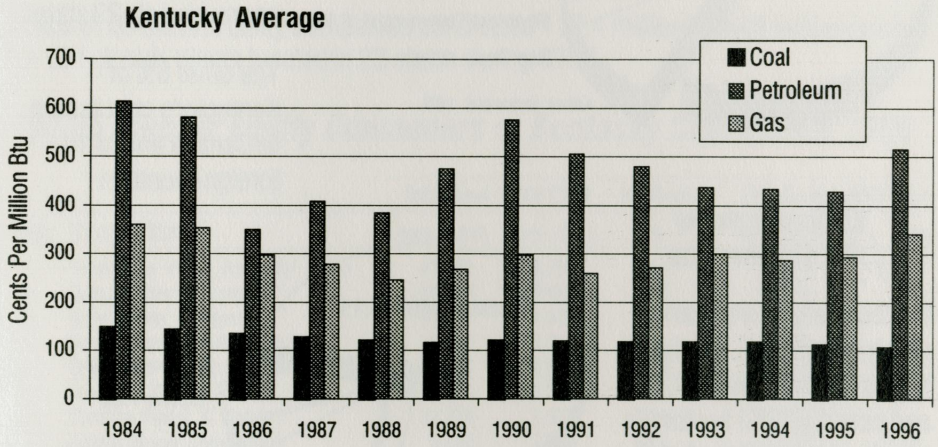
Source: U.S. DOE-EIA, Electric Power Annual, 1996, Volume I.

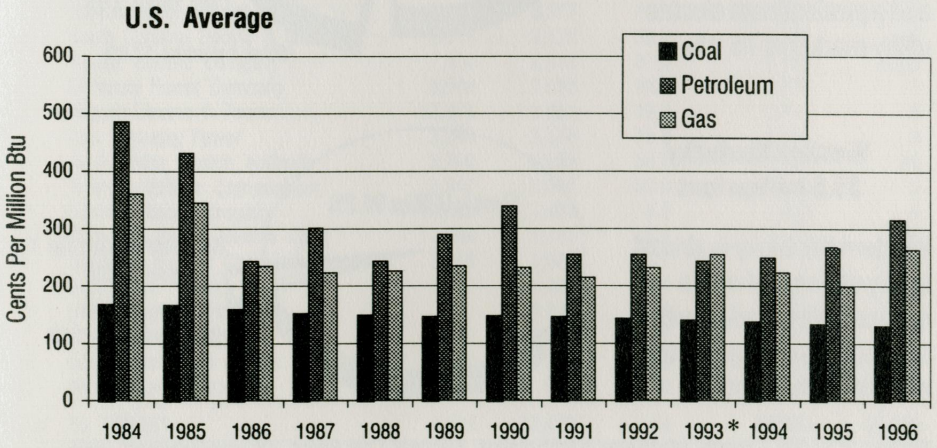
Generating Capability- Net Generation in Kentucky during 1996 by Fuel Type

Fuel Type	Generating Capability	Net Generation
Coal	90.2%	95.7%
Hydro	5.1%	4.0%
Petroleum	0.9%	< 0.2%
Gas	3.5%	< 0.2%
Petroleum/Gas	0.3%	--

Kentucky's electric utility generating capability for 1996 was 15,535 mega-watts from 113 generators.

Average Cost of Coal, Petroleum, and Gas as Electric Utility Fuel





***NOTE:** In 1993 gas cost rose above petroleum for the first time while coal cost continued to decrease.
Source: U.S. DOE - EIA, Cost and Quality of Fuels for Electric Utility Plants, 1996.

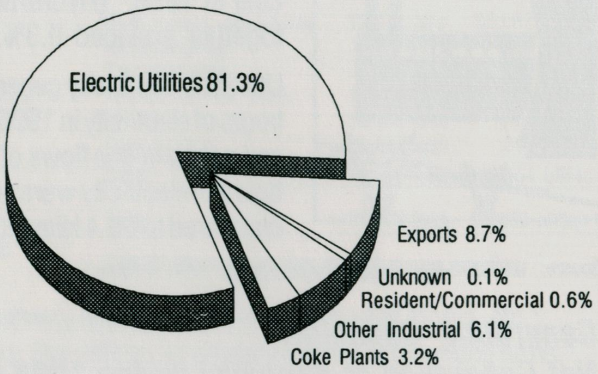
Uses of Coal

Distribution of Coal by Consuming Sector, 1996

U.S. TOTAL
1,059.9 million tons

Electric utilities represent the largest market for U.S. and Kentucky coal.

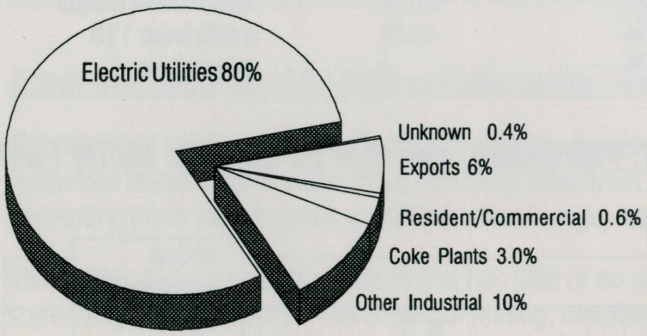
The three major markets for coal are electric utilities, industry, and the export market.



KENTUCKY TOTAL
152.9 million tons*

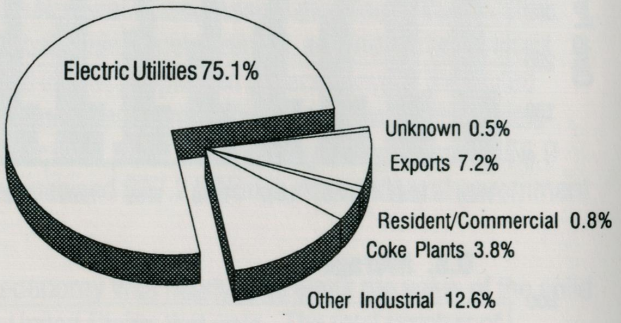
Combining market sectors shows that 94% of Kentucky's coal goes to the domestic market in approximately 29 states.

The other 6% of Kentucky's coal is sold to Canada and to 14 foreign countries.



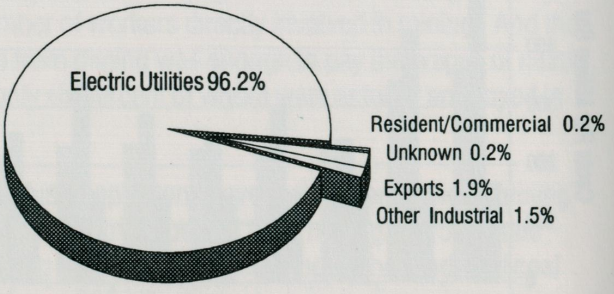
Eastern Kentucky
117.4 million tons

Eastern Kentucky's market, much like the U.S. market, has strong industrial (12.6%) and export (7.2%) sectors, a small coking coal market, and a predominate electric utility market at 75.1%.



Western Kentucky
35.5 million tons

Western Kentucky is almost totally dependent on the electric utility market with 96.2% of its coal going to electric utility plants.



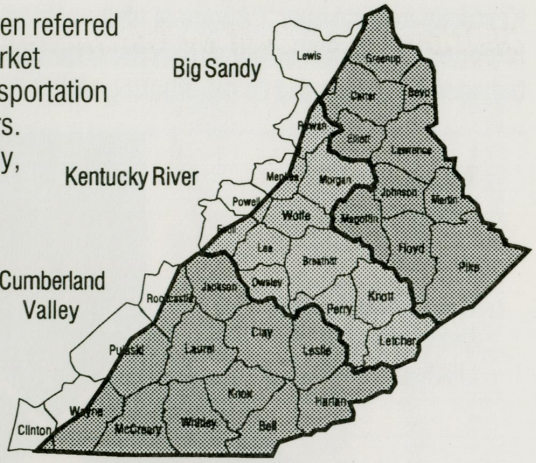
Source: U.S. DOE - Energy Information Administration, Quarterly Coal Report, October-December, 1996. Cost and Quality of Fuels for Electric Utility Plants, 1996 tables, Coal Industry Annual, 1996.

*Includes stockpiled coal.

[www.eia.doe.gov/cneaf/coal/tables/tables33.txt]

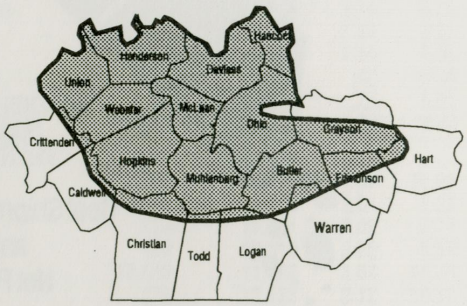
Top Utility Consumers

The Eastern Kentucky coal field is often referred to by three different sub-areas or market sheds based upon coal markets, transportation access, coal quality, and other factors. North to south they are; the Big Sandy, the Kentucky River, and the Cumberland Valley Counties.



The Eastern Kentucky coal field shipped approximately 83.9 million tons of coal to 52 electric utility companies for use at 118 electric power plants located in 22 states during 1996.

The Western Kentucky coal field sold approximately 33.5 million tons of coal to 17 electric utility companies for use at 35 power plants in 8 states during 1996. Utility companies purchased almost all of Western Kentucky's coal, including the Tennessee Valley Authority which purchased over half of the coal mined in Western Kentucky during 1996.



Source: Analysis from U.S. DOE - Energy Information Administration, Form 423 Data, 1996, with computer assistance from Kenneth McCleevy, EIA.

A total of 59 electric utility companies purchased 117.4 million tons of Kentucky coal for 134 electric plants located in 23 states during 1996.

Top 25 Electric Utility Consumers of Kentucky Coal during 1996

Rank	Electric Utility*	Total Coal tons (000)	KY Coal tons (000)	KY Coal %	EKY Coal tons (000)	WKY Coal tons (000)
1	Tennessee Valley Authority (TVA)	41,251	24,296	58.9	5,299	18,997
2	Georgia Power Company	28,364	13,764	48.5	13,764	0
3	Duke Power Company	14,691	11,535	78.5	11,535	0
4	South Carolina Public Service	5,616	5,616	100.0	5,616	0
5	Big Rivers Electric	4,904	4,600	93.8	191	4,409
6	Louisville Gas & Electric	6,684	4,250	63.6	11	4,239
7	Carolina Power & Light	10,776	3,978	36.9	3,978	0
8	Florida Power Corporation	5,783	3,956	68.4	3,956	0
9	Kentucky Utilities Company	6,995	3,568	51.0	2,865	703
10	Dayton Power & Light	7,546	3,377	44.8	3,377	0
11	South Carolina Electric & Gas	4,514	3,122	69.2	3,122	0
12	Tampa Electric Company	7,534	2,846	37.8	1,186	1,660
13	Kentucky Power Company	2,648	2,638	99.6	2,638	0
14	Virginia Electric & Power	12,914	2,554	19.8	2,544	0
15	East Kentucky Power	3,265	2,378	72.8	2,378	0
16	Jacksonville Electric Authority	3,790	2,239	59.1	2,199	40
17	Orlando Utilities Commission	2,047	2,047	100.0	2,047	0
18	Detroit Edison Company	19,962	1,900	9.5	1,900	0
19	Cincinnati Gas & Electric Co.	11,066	1,781	16.1	1740	41
20	Seminole Electric Cooperative	3,553	1,624	45.7	0	1,624
21	Consumers Power	7,302	1,320	18.1	1,320	0
22	Ohio Valley Electric Corp.	3,070	1,232	40.1	1,232	0
23	Ohio Edison Company	7,536	1,183	15.7	1,183	0
24	South Mississippi Electric Power	925	925	100.0	925	0
25	United Illuminating Co.	931	903	97.0	903	0
Total	59 Utilities*	n/a	117,412	n/a	83,900	33,500

*__NOTE:__ Receiving Kentucky Coal (columns do not add to totals due to 34 utilities not being listed).

Distribution - Utility Coal

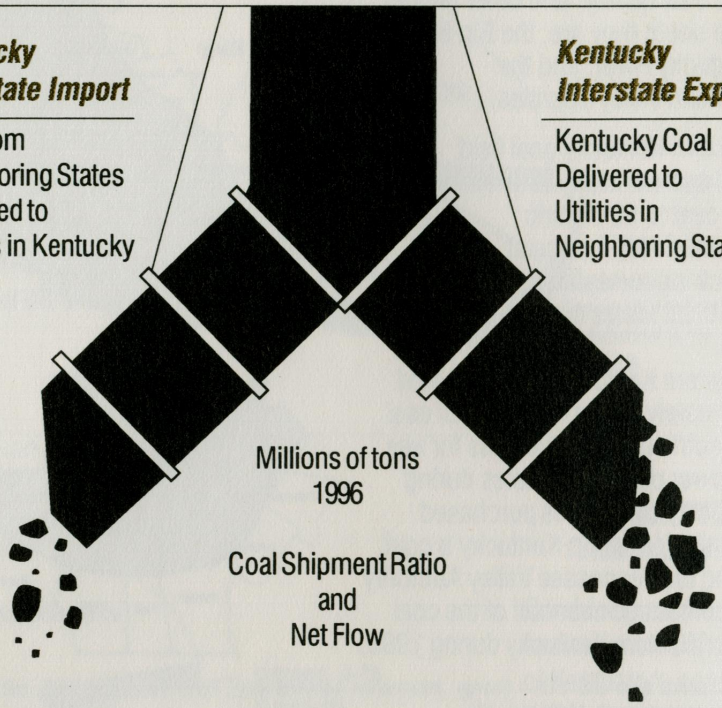
Kentucky exports over 2.8 tons of utility coal to neighboring states for every ton imported. The chart below shows the ***Interstate Imports and Exports*** of utility coal between Kentucky and its neighboring states.*

Kentucky Interstate Import

Coal from Neighboring States Delivered to Utilities in Kentucky

Kentucky Interstate Export

Kentucky Coal Delivered to Utilities in Neighboring States



Millions of tons
1996

Coal Shipment Ratio
and
Net Flow

Kentucky receives from Illinois 0.08	KY : IL 5.2 : 1 →	Illinois receives from Kentucky 0.39
Kentucky receives from Indiana 2.95	← KY : IN 1 : 3.9	Indiana receives from Kentucky 0.75
Kentucky receives from Missouri 0.0	KY : MO N/A →	Missouri receives from Kentucky 0.05
Kentucky receives from Ohio 0.37	KY : OH 23.2 : 1 →	Ohio receives from Kentucky 8.50
Kentucky receives from Tennessee 0.0	KY : TN N/A →	Tennessee receives from Kentucky 12.92
Kentucky receives from Virginia 0.0	KY : VA N/A →	Virginia receives from Kentucky 2.79
Kentucky receives from West Virginia 5.63	← KY : WV 1 : 35	West Virginia receives from Kentucky 0.16

Kentucky's Utilities Import from Neighboring States 9.0 Million Tons of Coal*

2.8 : 1 →

Kentucky Exports to Utilities in Neighboring States 25.6 Million Tons of Coal

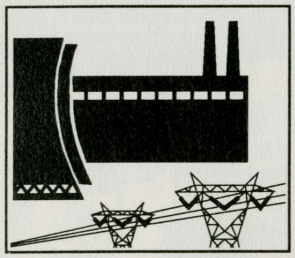
*Does not include metallurgical or industrial coal shipments, or Kentucky's imports of coal from Colorado (2.43 million tons), Pennsylvania (0.40 million tons), Utah (0.04 million tons), and Wyoming (0.12 million tons).

Source: U.S. Department of Energy - Energy Information Administration, Quarterly Coal Report, May, 1997.

[www.eia.doe.gov/cneaf/coal/quarterly/qcr_sum]

Distribution/Coal Prices

Kentucky coal was shipped to electric utility plants in 23 states in 1996.



Eastern Kentucky coal shipped to electric utility plants during 1996 averaged 1.03% sulfur.

Western Kentucky electric utility coal shipments averaged 3.2% sulfur.

Coal Field Destination (State)	Receipts (000) Tons	Average Btu/lb	Average % Sulfur	 Ash
EASTERN KENTUCKY				
Alabama	1,375	12,224	1.07	10.89
Connecticut	903	13,098	.54	7.24
Florida	10,743	12,758	1.07	8.48
Georgia	14,059	12,523	1.00	9.90
Illinois	391	13,236	.60	6.09
Indiana	423	13,175	1.49	5.88
Kentucky	8,430	12,219	1.03	10.35
Maryland	717	13,029	.74	7.35
Massachusetts	457	12,760	.65	7.97
Michigan	4,011	12,690	.94	8.53
Mississippi	925	12,372	.88	8.22
Missouri	52	13,289	.90	7.95
New Hampshire	15	12,830	.90	8.40
New Jersey	173	13,008	.67	7.51
New York	1,191	12,872	.63	8.59
North Carolina	14,692	12,397	.94	9.73
Ohio	8,483	12,121	.97	11.23
South Carolina	9,561	12,734	1.16	8.73
Tennessee	4,299	12,674	1.48	8.91
Virginia	2,792	12,642	1.10	9.86
West Virginia	161	12,662	.97	8.55
Wisconsin	34	13,100	.77	8.05
Eastern Ky. Subtotal	**83,887**	**12,522**	**1.03**	**9.49**
WESTERN KENTUCKY				
Alabama	2,667	11,860	2.67	10.81
Florida	3,688	11,950	2.84	8.27
Indiana	328	11,951	2.09	8.74
Iowa	159	12,015	2.75	5.99
Kentucky	17,939	11,026	3.64	14.36
Mississippi	105	12,123	2.12	10.31
Ohio	19	11,432	2.66	9.86
Tennessee	8,620	11,735	2.69	9.12
Western Ky. Subtotal	**33,525**	**11,394**	**3.20**	**11.95**
Total	**117,412**	**12,200**	**1.65**	**10.19**

Coal Prices

There are as many coal price averages as there are coal qualities (i.e., sulfur, Btu), market types (i.e., steam coal, metallurgical or coking, industrial, export), sales conditions (i.e., spot market, extended spot market, short-term contract, long-term contract), sales location and included costs (i.e., FOB - Free on Board the mine, railcar, river terminal, export terminal, FAS - Free Along Side, CIF - Cargo Cost/ Insurance Freight, total delivered cost). Within each of these ways to sell coal, there are wide ranges of price.

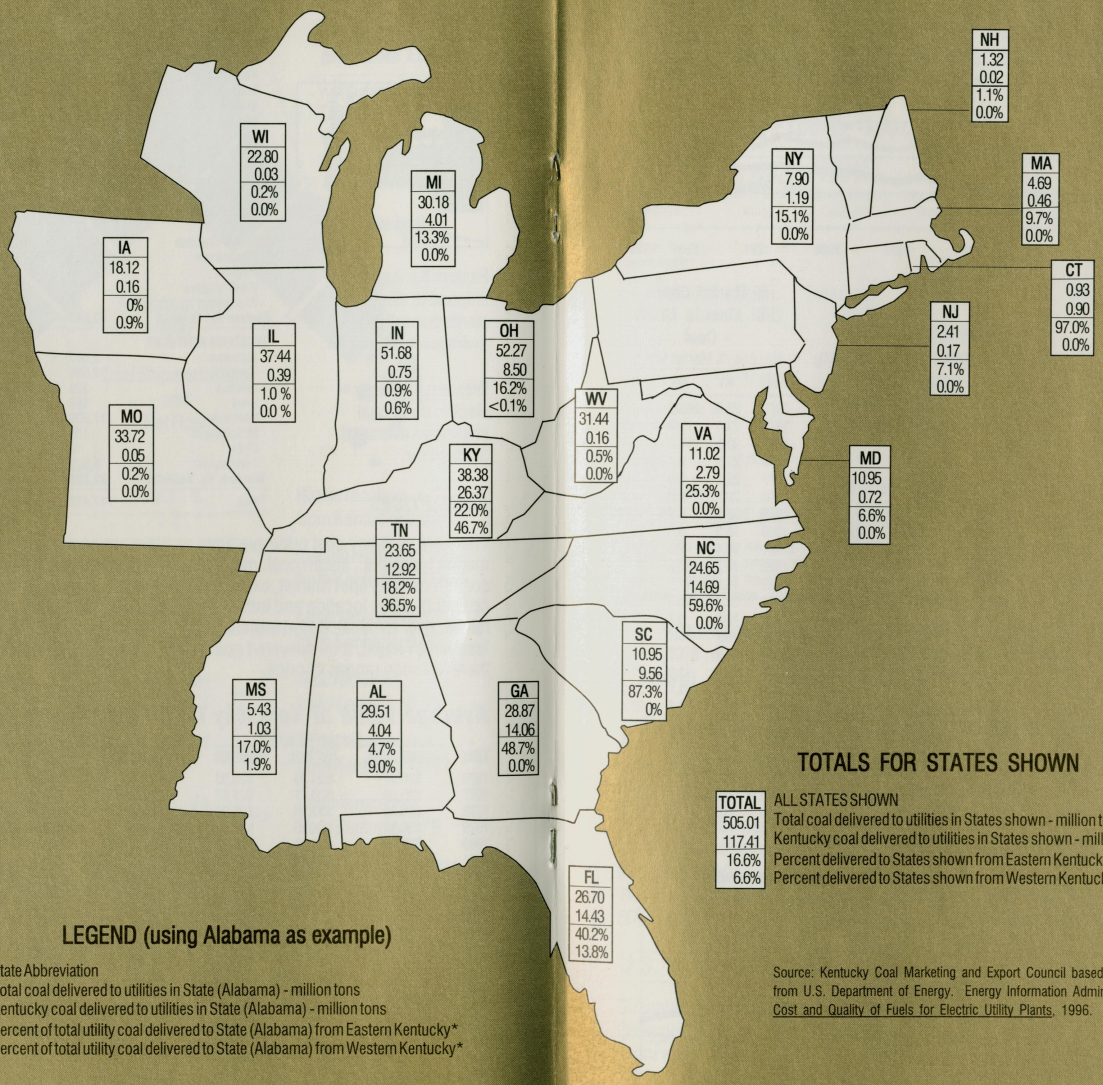
Average Value of Kentucky Coal FOB Mine (dollars per ton)

	Eastern Kentucky			Western Kentucky			KY
Year	Underground	Surface	Average	Underground	Surface	Average	Average
1976	$26.37	$20.36	$23.03	$15.12	$13.41	$14.18	$19.79
1977	$25.98	$18.71	$21.67	$19.88	$14.80	$17.07	$20.02
1978	$28.86	$22.58	$25.30	$22.78	$18.35	$20.36	$23.86
1979	$30.18	$24.85	$27.62	$26.26	$18.79	$22.17	$26.04
1980	$30.98	$26.23	$28.73	$27.40	$22.28	$24.72	$27.62
1981	$32.47	$28.86	$30.72	$30.92	$25.03	$27.66	$29.95
1982	$32.71	$28.85	$30.87	$32.50	$26.53	$29.25	$30.44
1983	$30.71	$28.43	$29.63	$30.72	$25.97	$28.09	$29.20
1984	$29.29	$27.84	$28.61	$28.68	$25.50	$26.81	$28.13
1985	$29.83	$27.41	$28.77	$26.79	$26.68	$26.73	$28.24
1986	$26.89	$25.67	$26.38	$24.25	$26.56	$25.31	$26.09
1987	$27.48	$25.74	$26.71	$25.06	$24.16	$24.68	$26.15
1988	$27.72	$25.92	$26.97	$24.89	$22.32	$23.96	$26.20
1989	$25.69	$25.96	$25.80	$23.03	$21.79	$22.48	$24.97
1990	$25.49	$26.44	$25.84	$24.42	$22.01	$23.32	$25.19
1991	$26.29	$26.51	$26.37	$24.83	$20.26	$22.88	$25.45
1992	$25.32	$24.49	$25.00	$24.75	$20.94	$23.10	$24.50
1993	$25.42	$25.63	$25.50	$23.84	$20.45	$22.36	$24.77
1994	$26.19	$23.92	$25.25	$25.95	$20.07	$23.63	$24.88
1995	$26.52	$25.24	$26.00	$21.33	$19.46	$20.75	$24.79
1996	$25.98	$23.53	$24.98	$21.04	$18.79	$20.38	$23.91

Sources: U.S. Bureau of Mines, Minerals Yearbook, 1976, U.S. DOE, Bituminous Coal and Lignite Production and Mine Operations, 1977-1978, and Coal Production, 1979-1992, DOE-EIA, Coal Data: A Reference, May, 1989, and Coal Industry Annual, 1993-1996.

Kentucky Coal Shipments to Electric Utility Plants by State in 1996

Kentucky Coal was shipped to electric plants in 23 states in 1996.



TOTALS FOR STATES SHOWN

TOTAL	ALL STATES SHOWN
505.01	Total coal delivered to utilities in States shown - million tons
117.41	Kentucky coal delivered to utilities in States shown - million tons
16.6%	Percent delivered to States shown from Eastern Kentucky*
6.6%	Percent delivered to States shown from Western Kentucky*

LEGEND (using Alabama as example)

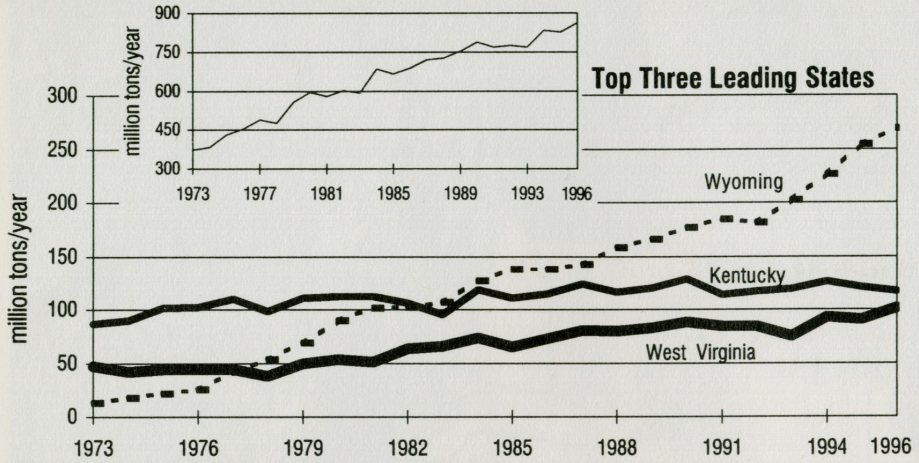
AL	State Abbreviation
29.51	Total coal delivered to utilities in State (Alabama) - million tons
4.04	Kentucky coal delivered to utilities in State (Alabama) - million tons
4.7%	Percent of total utility coal delivered to State (Alabama) from Eastern Kentucky*
9.0%	Percent of total utility coal delivered to State (Alabama) from Western Kentucky*

*Percentages are rounded to the nearest tenth

Source: Kentucky Coal Marketing and Export Council based on data from U.S. Department of Energy. Energy Information Administration, Cost and Quality of Fuels for Electric Utility Plants, 1996.

U.S. Electric Utility-Coal

U.S. Electric Utility Market Coal Shipments



Tons of Coal Shipped to U.S. Electric Utility Market

Million Tons

Year	KY	WV	WY	U.S.
1973	87	47	13	375
1974	90	42	18	385
1975	101	44	22	432
1976	102	45	26	455
1977	110	44	42	490
1978	99	38	53	476
1979	111	50	69	557
1980	112	53	90	594
1981	112	51	101	579
1982	106	64	102	601
1983	95	66	107	593
1984	119	74	127	684
1985	111	65	138	667
1986	115	73	138	687
1987	124	81	142	721
1988	116	80	158	728
1989	120	83	166	753
1990	129	89	176	787
1991	114	85	184	770
1992	117	85	182	776
1993	120	75	202	769
1994	127	93	226	832
1995	121	91	254	827
1996	117	102	269	863

Kentucky shipped 117 million tons of steam coal to the U.S. electric utility market in 1996, down from the 1990 high of 129 million tons.

The U.S. steam coal market has increased from 375 million tons in 1973 to 863 million tons in 1996.

Wyoming, West Virginia, and Kentucky supply over half of the U.S. Steam Coal to the electric utility market.

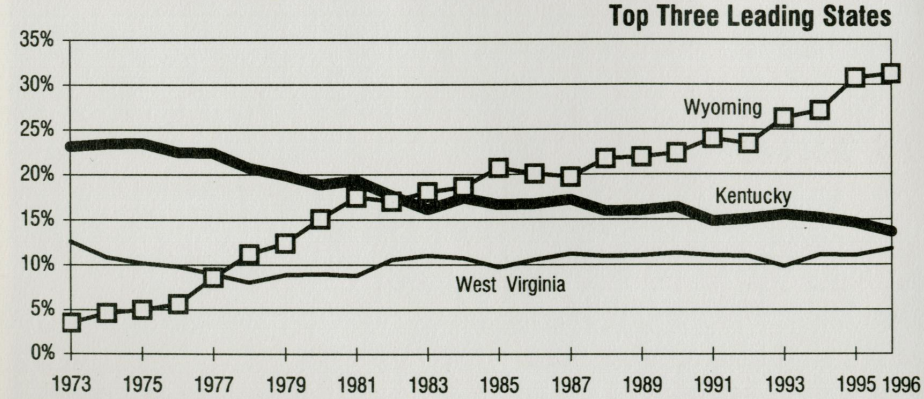
Kentucky's share of the U.S. steam coal market has declined, down to 13.6% in 1996.

% Market Share U.S. Electric Utility - Coal

% Market Share

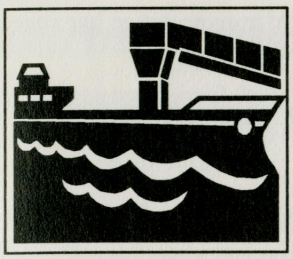
Year	KY	WV	WY
1973	23.2	12.6	3.5
1974	23.4	10.8	4.7
1975	23.5	10.2	5.0
1976	22.5	9.8	5.7
1977	22.4	9.0	8.6
1978	20.7	8.0	11.2
1979	19.9	8.9	12.4
1980	18.9	8.9	15.1
1981	19.4	8.8	17.5
1982	17.7	10.6	17.0
1983	16.1	11.1	18.1
1984	17.4	10.8	18.6
1985	16.6	9.7	20.7
1986	16.7	10.6	20.1
1987	17.2	11.2	19.8
1988	15.9	11.0	21.7
1989	16.0	11.1	22.0
1990	16.4	11.3	22.4
1991	14.8	11.0	24.0
1992	15.1	10.9	23.4
1993	15.6	9.8	26.3
1994	15.2	11.1	27.2
1995	14.6	11.0	30.7
1996	13.6	11.8	31.2

U.S. Electric Utility Market Share - Coal



Source: U.S. DOE/EIA - Cost and Quality of Fuels for Electric Utility Plants, 1973-1996

Coal Exports/Imports



The U.S. exported 92.2 million tons of coal in 1996, up by almost 20 million tons from 1994. Imports totaled 7.1 million tons.

Kentucky's 1996 exports of 9.1 million tons were 10% of total U.S. exports. Kentucky exported coal to 15 foreign countries during 1996 at an estimated value of $382 million.

Kentucky Coal Exports, 1996

Country of Destination	KY Steam Export Coal (tons)	Estimated* Value KY Steam Export Coal ($)	KY Metallurgical Export Coal (tons)	Estimated* Value KY Metallurgical Export Coal ($)	Total KY Export Coal (tons)	Estimated* Value KY Export Coal ($)
Belgium & Luxembourg	--	--	67,000	3,261,560	67,000	3,261,560
Canada	--	--	1,178,000	42,396,220	1,178,000	42,396,220
China (Taiwan)	1,978,000	69,882,740	--	--	1,978,000	69,882,740
Finland	4,000	140,920	--	--	4,000	140,920
France	--	--	548,000	25,827,240	548,000	25,827,240
Iceland	--	--	119,000	5,260,990	119,000	5,260,990
Italy	1,613,000	66,455,600	132,000	6,322,800	1,745,000	72,778,400
Jamaica	17,000	591,260	--	--	17,000	591,260
Japan	--	--	93,000	3,923,670	93,000	3,923,670
Korea, Republic of	--	--	1,876,000	86,446,080	1,876,000	86,446,080
Netherlands	--	--	581,000	27,475,490	581,000	27,475,490
Norway	--	--	140,000	7,987,000	140,000	7,987,000
Portugal	229,000	8,152,400	--	--	229,000	8,152,400
Saudi Arabia	--	--	22,000	1,174,360	22,000	1,174,360
United Kingdom	--	--	548,000	26,895,840	548,000	26,895,840
KENTUCKY	3,841,000	$145,222,920	5,303,000	$236,971,250	9,143,000	$382,194,170

***NOTE:** The value of Kentucky export coal (in current dollars) is estimated by using published U.S. free alongside ship (FAS) average values/ton/coal type/country of destination.
Source: Estimated by the Kentucky Coal Marketing and Export Council using data from the Energy Information Administration, Coal Industry Annual, 1996.

Kentucky ranked fourth in the U.S. in 1996 for exports behind West Virginia (42.0 million tons), Virginia (13.4 million tons), and Pennsylvania (9.2 million tons).

U.S. Bituminous Coal Exports, Steam and Metallurgical

Metallurgical coal has historically dominated U.S. bituminous exports and is expected to continue to do so through the remainder of the century.

In 1996 the U.S. exported 92.2 million tons of coal (36.0 million steam coal and 56.2 million metallurgical coal). Metallurgical coal remained the majority of U.S. exports, with its share at 60.9% in 1996.

U.S. Imports*

Columbia, Indonesia, Venezuela, and Canada were the largest suppliers of imported coal in 1996. Their share was 2.5 million, 1.5 million, 1.5 million, and 1.4 million short tons, respectively.

***NOTE:** Includes Puerto Rico and Virgin Islands

Source: U.S. DOE Energy Information Administration, Coal Industry Annual, 1996.

U.S. Import Totals*

Year	Quantity (millions)	Average Price/Ton
1981	1.043	$28.47
1982	0.742	30.40
1983	1.271	33.59
1984	1.286	35.37
1985	1.952	36.04
1986	2.212	36.02
1987	1.747	32.04
1988	2.134	29.96
1989	2.851	34.14
1990	2.699	34.45
1991	3.390	33.12
1992	3.803	34.46
1993	7.309	29.89
1994	7.584	30.21
1995	7.201	34.13
1996	7.127	33.45

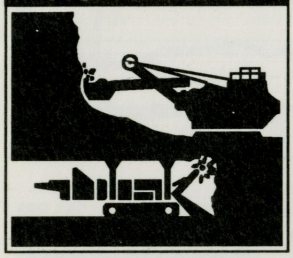
Transportation

Most Kentucky coal is transported by more than one mode of transportation because of cost considerations, the location of the minesite, and/or the customer.

Kentucky coal is transported by rail, truck, and/or barge, and transportation is often more than one third of the cost of delivered coal.

Kentucky Coal Transportation System Distribution Estimates

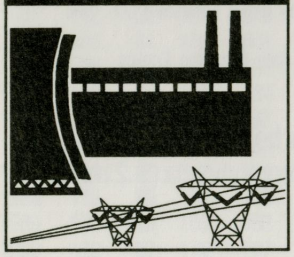
From Minesite



Kentucky's 1996 Coal Production was 157.7 Million Tons

Initial Distribution Modes (% Production)	
59%	**Minesite To State-Maintained Highway (93 Million Tons)**
5%	Kentucky power plants and other Ky. consumers
8%	Coal river terminals
4%	State line
3%	Truck Sites
39%	Rail loading facilities
36%	**Other Known Direct Minesite Distribution Modes (57 Million Tons)**
<1%	Minesite to barge facility
5%	Minesite to barge facility via conveyor
31%	Loaded directly to rail at the minesite
5%	**Unknown, Unreported, or Unclassified**
	(7.6 Million Tons - i.e., refuse, raw coal losses, other differences in reporting methods, etc.)

To Consumer



In multimodal coal transportation the "initial" transportation mode from the minesite is not always the "primary" mode of coal transportation due to the following:

Shipments of coal moved to consumers primarily by rail can include coal hauled to or away from a railroad siding by truck.

Shipments of coal moved to consumers via river by barge include coal hauled to or away from coal river terminals by truck, rail, or conveyor.

Primary Distribution Modes to Kentucky Coal Consumers, 1996

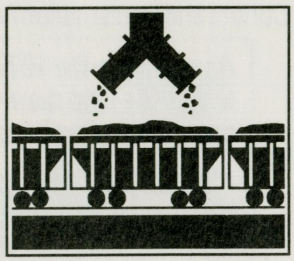
	Domestic Distribution (million of tons)			Foreign Distribution* (million of tons)		
MODE	EKY	WKY	KY	EKY	WKY	KY
Railroad	87.2	8.3	95.5	0.1	—	0.1
River	11.1	21.3	32.4	—	—	—
Great Lakes	1.2	—	1.2	1.0	—	1.0
Tidewater	2.1	—	2.1	7.3	0.7	8.0
Truck	6.7	5.3	11.9	—	—	—
Unknown	0.6	0.1	0.6	—	—	—
Total	108.9	34.8	143.7	8.4	0.7	9.1

***NOTE:** Primary Modes of Foreign Distribution include secondary coal transportation modes being moved by rail and barge to tidewater ports and ports on the Great Lakes for export.

Sources: Kentucky Coal Marketing and Export Council estimates based on data from: Kentucky Transportation Cabinet's Coal Haul Highway System; U.S. DOE-EIA, Quarterly Coal Report October-December, 1996; Coal Industry Annual, 1996; Kentucky Department of Mines and Minerals, Annual Report, 1996.

Transportation

Coal Transportation by Rail in Kentucky



Kentucky has over 2,700 miles of railroad lines, over which 110.3 million tons of Kentucky coal were transported in 1996.

There are 2 Class I railroads, 1 Regional railroad, and 2 short line railroads that operate totally in Kentucky or originate coal in Kentucky.

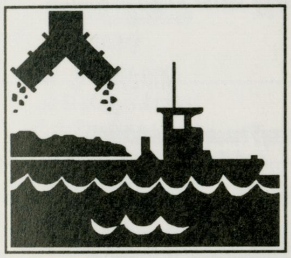
These railroads have in excess of 76,000 hopper cars dedicated to the transport of coal.

Kentucky has approximately 185 coal rail loading facilities.

93% of rail shipments of Kentucky coal move by unit train service.

Coal Transportation by Barge in Kentucky

Kentucky has more than 1,000 miles of navigable rivers over which approximately 33 million tons of Kentucky coal were shipped in 1996.



Statewide, 55 coal river terminals on the Ohio River and its tributaries serve Kentucky coal shippers (42 within Kentucky).

In total, 22 coal river terminals are located near Eastern Kentucky, 6 in Central Kentucky, and 27 near Western Kentucky.

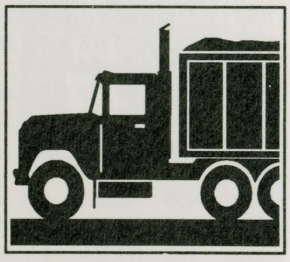
Of these, 22 of the coal river terminals have rail access, 47 have truck access, 18 have barge off-loading access, and 3 have conveyor access. Automated blending is found in 34 of the coal river terminals with 35 having automatic sampling, 29 having some coal crushing equipment, and 11 having stoker preparation equipment.

Source: Kentucky Coal Marketing and Export Council, Kentucky Coal Marketing Updates - Coal River Terminals, 1995.

Coal Transportation by Truck in Kentucky

Approximately 5,000 miles of state-maintained highways are used for transporting coal.

Truck shipments are a very important mode of coal transportation in Kentucky. In 1996, approximately 93 million tons or 59% of Kentucky's coal used trucks in at least one leg of the many different types of multimodal coal transportation market routes.



2.5 billion ton-miles of coal transportation by truck were reported during 1995.

Over 3,200 coal trucks were registered during 1996 in Kentucky, indicating that over 3,200 coal truck drivers were employed in Kentucky. The sale of extended weight coal decals generated $846,000 in 1996.

Sources: Kentucky Transportation Cabinet, Official Coal Haul Highway System; Department of Vehicle Regulation - Division of Motor Vehicle Licensing.

Reclamation

Mined land must be returned to its approximate original contour, with the exception of mountaintop removal operations, in accordance with the federal Surface Mining Control and Reclamation Act of 1977.

According to the 1977 law, mountaintops may be reclaimed as flat land, which leaves the land more valuable for development. Reclaimed land must be as useful as the land was before mining; often it is more useful.

Stringent regulations govern the design, operations, and environmental impact of every mine. Mining and reclamation sites are inspected on a regular basis by state inspectors with random oversight inspections by federal inspectors.

Kentucky coal operators have paid over $659.1 million to date into a federal program to reclaim land that was mined prior to August 3, 1977.

Before surface mining begins Kentucky coal operators must post bonds to ensure proper reclamation.

Under Kentucky's 1984 Permanent Program or "Primacy Program," bonds are not fully released until a coal operator has demonstrated five years of consecutive successful reclamation. (see chart below.)

The Kentucky coal mining industry currently has $737.4 million of reclamation bonds outstanding to assure timely and successful reclamation.

Bond Release Phase	Reclamation Release Type	% of Bond Released	Time/Phase Requirement
Phase I	Backfilling, Grading, Seeding, and Drainage	60%	Complete Landscaping
Phase II	Vegetation	25%	Approximately 2 Years of Successful Reclamation
Phase III	Final	15%	5 Years of Consecutive Successful Reclamation

Successful Mining Reclamation/Primacy Bond Releases, 1984-96

	Phase I			Phase II			Phase III		
Year	# of Releases	Acres* Released	Bond	# of Releases	Acres* Released	Bond	# of Releases	Acres* Released	Bond
1984	4	123	$277,886	-	-	-	-	-	-
1985	40	767	$1,946,323	2	84	$79,841	1	8	$11,600
1986	248	6,361	$16,781,470	-	-	-	1	14	$16,800
1987	332	8,379	$21,390,109	11	253	$289,767	4	155	$284,300
1988	561	15,583	$38,194,394	57	1,303	$1,261,810	-	-	-
1989	446	16,777	$32,058,350	60	1,632	$1,967,811	3	21	$38,500
1990	533	15,383	$28,108,146	260	7,298	$6,221,870	51	1,697	$1,569,147
1991	626	14,642	$28,373,662	428	12,667	$11,200,897	130	2,958	$6,890,877
1992	670	18,278	$33,822,612	477	13,338	$11,489,035	255	8,101	$6,811,872
1993	498	13,893	$25,386,134	416	12,661	$11,242,965	448	15,986	$8,629,089
1994	452	15,933	$27,423,038	319	10,828	$9,768,647	406	14,098	$8,709,946
1995	525	16,650	$32,343,224	427	13,141	$12,399,017	517	18,419	$16,338,524
1996	619	23,968	$47,602,996	419	14,784	$17,378,599	784	27,018	$22,365,232
Total	5,554	166,737	$333,708,344	2,876	87,989	$83,300,259	2,600	88,475	$71,665,887

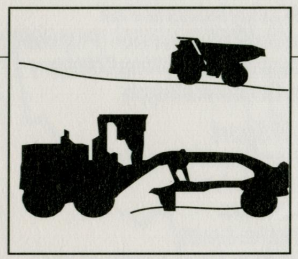
***NOTE:** Includes surface acreage over underground mines.

Source: Kentucky Natural Resources and Environmental Protection Cabinet, Department for Surface Mining, Reclamation and Enforcement.

Post-Mining Land Uses

Post-mining land use changes go hand-in-hand with economic development in Kentucky, especially in many parts of Eastern Kentucky where much needed level land for development is still at a premium.

Post-Mining Land Use and County



Regional Airports

Big Sandy Regional Airport	Martin
Hatcher Field Airport	Pike
Carroll Field Airport	Breathitt
Ford Airport	Perry
Ohio County Airport	Ohio
Manchester Airport	Clay

Correctional Facilities

Federal Correctional Institute	Clay, Martin (Proposed)
East Kentucky Correctional Complex	Morgan
Medium Security Prison	Muhlenberg
Otter Creek Correctional Center	Floyd
Juvenile Boot Camp	Martin (Proposed)

Government Facilities

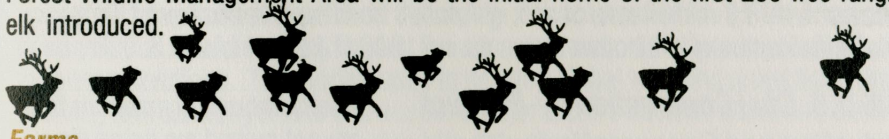
Earle C. Clements Job Corps Ctr.	Muhlenberg
Army National Guard Training Ctr.	Muhlenberg
U.S. Postal Service	Laurel
County Park	Ohio
Madisonville South By-Pass	Hopkins
Solid Waste Landfills	Daviess, Greenup, Ohio, Hopkins, Perry
Hazard Armory	Perry

Fish & Wildlife

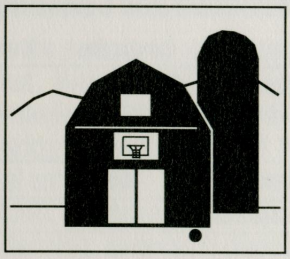
Duck Refuge Areas	Ohio, Perry, Breathitt, Knott, Martin, Muhlenberg
Catfish Farming	McLean
Wildlife Management Area	Muhlenberg
Wetland Development	Muhlenberg

Elk in the Mountains of East Kentucky Again

Free-ranging elk return to the mountains of East Kentucky, with reclaimed mountain-top removal areas, old reclaimed mine benches, and hardwood forests serving as their home once again. Of the 14 East Kentucky counties selected for the elk reintroduction, the combined 475,000 acres of the Cyprus-Amax Wildlife Management Area on an active mountain-top removal coal mine, and the adjacent Robinson Forest Wildlife Management Area will be the initial home of the first 200 free-ranging elk introduced.



Farms



Starfire Project	Perry
MAPCO/Morehead Agriculture Ctr.	Martin
Martin County Coal Corp. Farm	Martin
D&R Brangus Farm	Perry
Hog Farm	Hopkins, Knox
Livestock Feed	Lee
Chicken/Broiler Houses	Hopkins, Muhlenberg
Avian Farms	Wayne

Industrial/Commercial

Electric Utility Operations Center	Hopkins
Industrial Scrubber Sludge Disposal	Ohio, Daviess, Webster
Explosive Manufacturing	Muhlenberg
Wood Fabrication Plant	Breathitt, Perry
Apparel Manufacturing	Perry
Mine Shops/Welding/Machine/Equip.	Johnson, Hopkins, Knox, Muhlenberg, Ohio, Union, Whitley
Trucking Company	Muhlenberg
Explosive Company	Perry, Hopkins
Farm Equipment	Hopkins
Sawmill/Logs/Lumber	Bell, Butler, Clay, Jackson, Laurel, Pike, Whitley, Wolfe
Recycling Facility	Letcher
Blacktop/Concrete Facilities	Laurel, Perry
Oil/Gas Facilities	Clay, Lee, Elliott

(continued on page 32)

Land Uses/By-Products

Industrial/Commercial (continued)	
Industrial Parkway	Greenup
Industrial Park	McCreary (Complete), Greenup-Boyd-Carter, Martin, Letcher-Perry-Knott, and Whitley (All Proposed)
Paul Coffey Industrial Park	Boyd
Industrial Park Expansion (Proposed)	Leslie-Clay
Plastic Injection Molding Company	Perry
Mine/Electronics Supply	Martin
R&R/Sport	
Red Fox Resort (Proposed)	Knott
Recreation Areas	Greenup
Golf Courses	Clay (Proposed), Laurel, Letcher, Floyd (Proposed), McLean
Golf (drive & putt)	Webster
Recreational Area & Fishing Lake	Pike
Athletic Facilities	Letcher
Fairgrounds	Morgan
Structural Building Sites	
High Schools	Bell, Harlan, Pike
Middle School	Bell
Athletic Complexes	Bell, Letcher, Perry, Pike
Appalachian Regional Hospital	Perry
Housing Project - Happy Top	Lee
Housing Developments	Clay, Letcher, Perry, Pike, Knox, Laurel, Bell, Harlan, Martin
Church, Daycare	Laurel
Mobile Home Sales	Laurel
Shopping Centers	Breathitt, Clay, Knox, Laurel, Leslie, Letcher, Pike, Perry
Car/Truck/Equipment Sales	Perry
Motel/Hotel	Laurel, Perry
Office Complex	Morgan, Martin
Numerous small businesses in EKy	

Sources: Natural Resources and Environmental Protection Cabinet - DSMRE, Area Development Districts, Kentucky Coal Marketing and Export Council.

Coal Combustion By-Products

Coal combustion in Kentucky produced almost 4 million tons of ash and 2 to 4 million tons of flue gas desulfurization (FGD) materials during 1994. According to a 1992 University of Kentucky Center for Applied Energy Research survey, 7% of coal combustion by-products produced within Kentucky were reused. Combustion materials generated within Kentucky do not include the coal combustion material, estimated to be 8.5 million tons of ash, generated from the combustion of Kentucky coal outside Kentucky in 22 other states during 1996 (13.6% of total U.S. utility coal).

1996 U.S. Coal Combustion By-Product Production and Consumption (million tons)

	Production	Consumption	% Used
Fly Ash	59.4	16.2	27.4
Bottom Ash	16.1	4.9	30.3
Boiler Slag	2.6	2.4	93.3
Subtotal	78.0	23.5	30.1
FGD Material	23.8	1.7	6.9
Total	101.8	25.2	24.7

Sources: American Coal Ash Association, Inc.

Coal combustion materials that are not reused are being disposed of in Kentucky as high volume - low hazard special waste. Electric utility plants use existing ash ponds (lagoons) and stabilized landfills for onsite disposal. For off-site disposal, special waste landfills such as monofills or co-disposal (minesite haulback) are used.

Existing Consumption

Cement and concrete products
Road base/subbase
Snow and ice control
Grouting/wallboard
Coal mining applications/other
Structural fill/flowable fill
Mineral filler in asphalt
Blasting grit/roofing granules
Waste stabilization

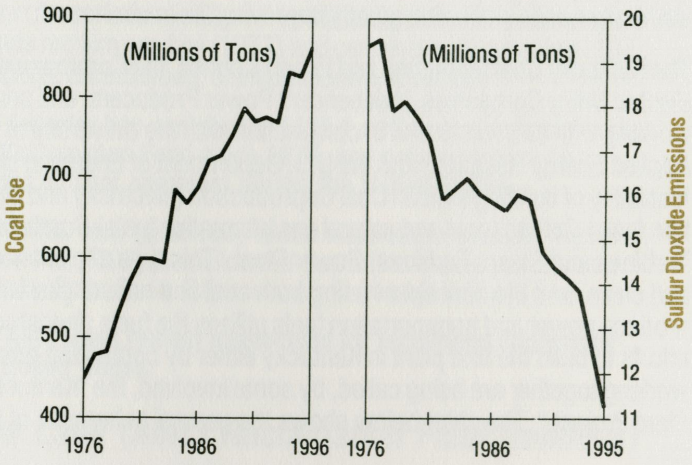
Source: American Coal Ash Association, Inc., University of Kentucky - Center for Applied Energy Research.

Air Quality/Global Climate

Coal Use and Sulfur Dioxide Emissions from Electric Utility Plants

Coal is being burned more cleanly today than ever before. Air pollution from coal is decreasing, while coal use is increasing.

Coal-fired power plants in the U.S. have reduced their sulfur dioxide emission rate (the amount of pollution produced for each ton of coal burned) by 66.7% from 1977 to 1995.



U.S. sulfur dioxide emissions have decreased by 42% from 1977 to 1995, even though power plants increased their 1977 to 1995 coal use level by 80%.

Kentucky's 1995 sulfur dioxide emissions of 608,150 tons have been reduced by 59% from the 1976 sulfur dioxide emissions level of 1,495,622 tons.

These achievements are the result of using lower-sulfur coal and using pollution control equipment such as scrubbers. The use of flue gas desulfurization equipment (FGD or scrubbers) has increased dramatically. Kentucky is second in the nation in installed scrubber capacity. Utilities in Kentucky during 1995 had scrubbers on 48% of their coal-fired generating capacity, compared to the national average of 26%.

Sources: Environmental Quality Commission, The State of Kentucky's Environment: 1996 Air Quality; U.S. DOE - EIA, Coal Industry Annual, 1996; Electric Power Annual, 1989-95; Cost and Quality of Fuels for Electric Utility Plants, 1996 tables.

Global Climate Change -Scientific Concerns

While potential global climate change is an issue of concern, it is crucial that public policy is based on taking the right actions at the right time. The science and economics say there is time to do this right - it is not prudent to rush to short-term solutions that would severely impact the economy and preclude more cost-effective long-term solutions. The models used to develop global warming projections are still evolving and cannot yet take into account major factors such as cloud and ocean processes, sunspots, and natural variations in climate.

The "greenhouse effect" is a natural process that allows the earth to be warm enough to sustain life. Gases in the atmosphere act as a blanket. Water vapor makes up about 97% of all greenhouse gases (ghgs), while the remaining 3% is composed primarily of carbon dioxide (CO_2), methane and nitrous oxide. Man-made global emissions of carbon dioxide are less than 4% of the total emissions. Man-made CO_2 comes primarily from deforestation and burning fossil fuels. Methane and nitrous oxide come from a variety of sources including mining, farming, and waste disposal. There are conflicting scientific data over whether there is a warming trend but National Aeronautic and Space Administration (NASA) satellite measurements show no net warming over the past 18 years.

Economic Concerns

Recent analyses by three of the nation's best known economic forecasting firms - WEFA, Inc., DRI/McGraw Hill, Inc., and Charles River Associates - assert that restricting carbon dioxide to 1990 levels by 2012 could depress annual U.S. economic output as much as 3%, or roughly $250 billion a year; add tens of billions of dollars to the nation's trade deficit; increase gasoline prices by as much as 50 cents a gallon; double average electricity rates; and cost more than a million U.S. jobs.

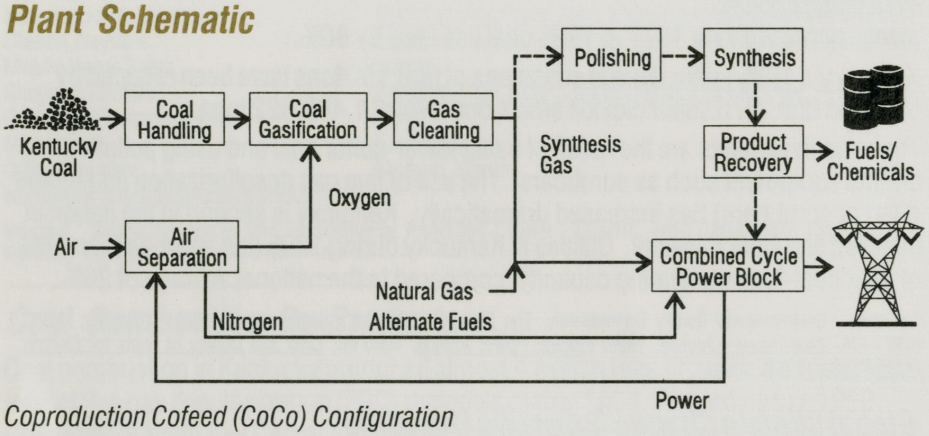
Clean Coal Technology

Clean Coal Technology and the Future Role of Coal

Clean Coal Technologies are ensuring that America can rely increasingly on coal, the nation's most abundant and lowest-cost energy resource, to meet its growing electricity needs while also greatly improving the environment.

The Kentucky Coal Marketing and Export Council, the Commonwealth of Kentucky, Electric Utility Companies, Independent Power Producers, and private companies are working with each other and in conjunction with the University of Kentucky - Center for Applied Energy Research and the U.S. Department of Energy to determine the feasibility of building a Clean Coal Coproduction (electricity and high quality transportation fuels) Cofeed (coal and natural gas/alternative fuels) Combined Cycle (Gas Turbines and Steam Turbines) Power Plant. This type of plant is extremely efficient and clean, and the concept of using both coal and natural gas/alternative fuels to co-produce power and transportation fuels utilizes the fuels (feedstocks) optimally. These efforts to build the first plant in Kentucky either by competing groups or by groups working together are being called, by some involved, the "Kentucky Pioneer Power Plant Project." The chart below shows the general schematic of such a plant:

Plant Schematic



Coproduction Cofeed (CoCo) Configuration

In addition to producing clean, efficient, cost competitive electric power, this plant can also co-produce valuable chemicals and clean transportation fuels with up to 1/3 less carbon emissions.

Source: Developed from the University of Kentucky Center for Applied Energy Research Energia, Vol. 8, #4, 1997.

Electric Utility Deregulation - Impact on Coal

Traditionally made up of regulated monopolies serving prescribed state service areas, the U.S. electric utility industry may ultimately become a nationwide competitive electricity market. The expanded authority (Energy Policy Act, 1992) of the federal government to order utilities to wheel power from generators to wholesale buyers (municipalities and other utilities), has opened the U.S. electricity grid to competitive wholesale transactions. In 1996 the Federal Energy Regulatory Commission (FERC) issued Order 888 addressing the issues of open access to encourage wholesale competition to the electric utility industry and FERC Order 889 requiring utilities to share information about available transmission capacity.

A competitive market will greatly intensify pressures to keep generating costs low. Coal-fired generating plants close to major power markets will be well positioned to compete with low-cost power. As new generating plants are needed in the coming decade or so, coal's ability to capture this new market will be aided by its low and stable cost, by expected increases in the cost of natural gas, and by increasingly efficient and environmentally beneficial Clean Coal Technologies.

AML Reclamation

Abandoned Mine Land (AML) Reclamation

The federal Surface Mining Control and Reclamation Act of 1977 established authority for the AML Fund. Contributions to this fund are made by each mining company at the rate of $0.35 per ton for surface mined coal and $0.15 per ton for underground-mined coal. These funds reclaim pre-law (1977) and certain interim program (1977-1982) sites left abandoned, unreclaimed, or insufficiently reclaimed.

The Kentucky coal industry has contributed $659.1 million to the Abandoned Mine Land (AML) Reclamation Fund since 1978, and nationally over $4.1 billion has been paid by coal operators across the United States.

50% of the total KY AML fees go directly to the state share account. However, $83.6 million (September, 1996) is unallocated due to the federal appropriation process (see Kentucky State Share Balance column in table below).

$1,082,350,082 of AML taxes remain unallocated for reclaiming abandoned mines across the United States.

Abandoned Mine Land (AML) Reclamation Fund (millions)

Fiscal Year	Kentucky Collection	Kentucky State Share*	KY AML Grant Disbursement	KY State Share Balance**
1978	$29.97	$14.98	$ 0	$15.0
1979	33.70	16.85	0.6	31.8
1980	35.03	17.51	0	49.3
1981	35.82	17.91	1.4	67.2
1982	36.58	18.29	16.4	69.6
1983	31.13	15.56	28.9	56.7
1984	37.75	18.87	36.8	44.8
1985	34.60	17.30	32.3	31.4
1986	34.50	17.25	19.7	31.6
1987	35.22	17.61	16.4	36.7
1988	26.34	13.17	15.3	37.5
1989	35.39	17.69	27.6	38.5
1990	38.44	19.41	6.4	43.3
1991	37.04	18.45	11.0	47.8
1992	35.60	17.82	28.2	54.9
1993	36.18	18.04	11.5	62.8
1994	36.82	18.24	18.7	70.7
1995	35.22	17.61	15.5	77.1
1996	33.79	16.90	16.0	83.6
Totals	$659.10	$329.47	$245.8	

*NOTE: Includes reclamation fees, interest, and audit adjustments and will not equal exactly 50%.
**NOTE: Adding across table will not equal balance due to all adjustments not being included in table.

AML Reclamation Accomplishments in Kentucky (through 1996)

Kentucky AML Projects

484 Multi-site State AML Projects
$300 million in expenditures
13,800 acres reclaimed
(plus various projects currently under construction)

Federal AML Projects

700 Multi-site AML Projects
$84.2 million in expenditures
5,300 acres reclaimed
Rural Abandoned Mine Program, Emergency and Non-Emergency

1,184 multi-site AML projects have been undertaken in Kentucky by both the state and federal programs from 1978-1994 reclaiming over 19,100 acres and expending $384.2 million in AML reclamation funds.

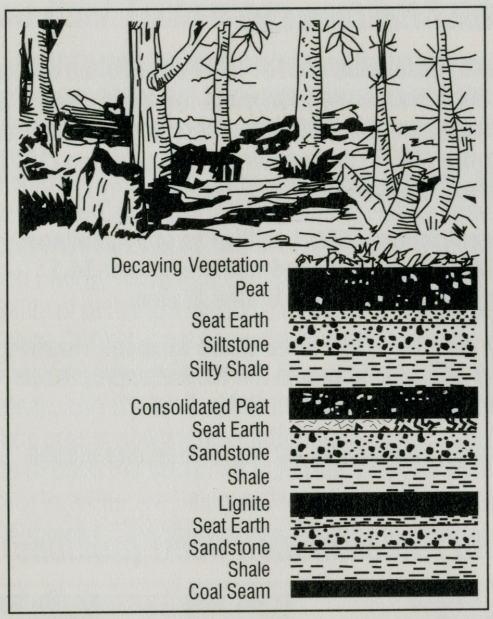
Some accomplishments to date of the state's AML Projects in Kentucky are:

25 water line projects - $29.3 million.
Over 23,000 feet of highwall eliminated.
Over 130 hazardous structures removed.
Over 1,720 acres of landslide projects stabilized.
1,335 mine portal closures.
65 vertical shafts sealed.
34 miles of stream restoration.
292 acres of mine fires controlled.

Today's coal industry in Kentucky is reclaiming the land to uses as good or better than before mining, and through contributions to the AML fund, is helping to restore lands mined prior to today's reclamation standards.

Sources: Natural Resources and Environmental Protection Cabinet, Division of Abandoned Lands; U.S. Office of Surface Mining (OSM); U.S. Department of Agriculture, RAMP.

Coal Origin and Properties



It is generally accepted that coal originated from plant debris including ferns, trees, bark, leaves, and seeds some of which accumulated and settled in swamps.

This unconsolidated accumulation of plant remains is called peat. Peat is being formed today in marshes and bogs.

Layers of peat, covered by sediment receiving heat and pressure from the subsidence of the swamps, went through a metamorphic process called coalification to form coal.

The metamorphic process is thought to have occurred in several stages. The conditions of the metamorphic process and the swamps and bogs greatly affected the formation of the coal.

Several factors which greatly affected the content, makeup, quality, and rank of the coal were:

Temperature	Fresh water/sea water
Pressure	Swamp acidity
Time	Types of plant debris
Layering process	Types of sediment cover

Coal first formed from peat has a high moisture content and a relatively low heating value.

Coal Rank

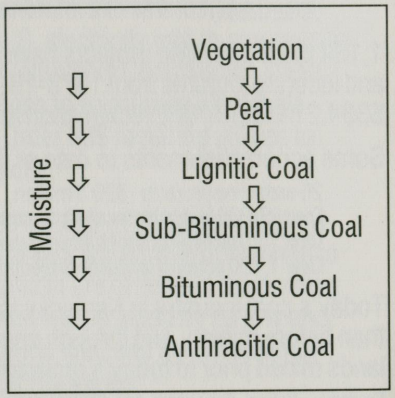
Coal usually is divided into two main classes - anthracite (hard coal) and bituminous (soft coal). When anthracite was formed, it was squeezed under greater pressure than was bituminous. As a result, anthracite contains the highest percentage of carbon and the lowest percentage of moisture. Anthracite makes up only a small part of the world's supply of coal. About half of the world's coal reserve is bituminous coal. (See U.S. Coal Reserves map.) Remaining coal reserves are even softer (lignite and sub-bituminous).

Moisture decreases, rank increases.

Rank increases, fixed carbon increases.

Rank increases, volatile matter decreases.

Rank increases, heating value increases (optimum Btu at low-volatile bituminous).

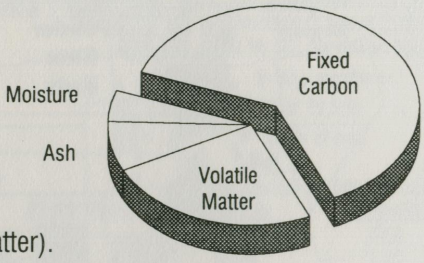


Coal Properties/Improvements

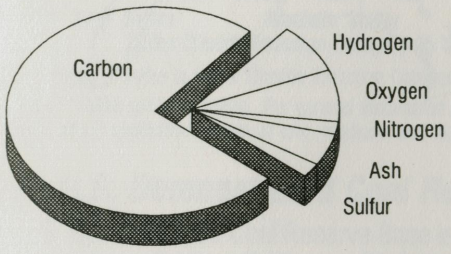
There are two different types of analyses used to determine the nature of bituminous coal: proximate and ultimate analysis. Proximate analysis determines (on an as-received basis):

- **Moisture content**
- **Volatile matter** (gases released when coal is heated).
- **Fixed carbon** (solid fuel left after the volatile matter is driven off).
- **Ash** (impurities consisting of silica, iron, alumina, and other incombustible matter).

Proximate Analysis



Ultimate Analysis

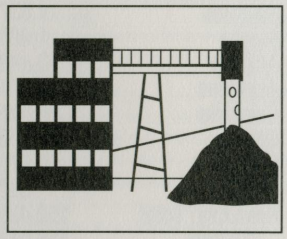


Ultimate analysis determines the amount of carbon, hydrogen, oxygen, nitrogen, and sulfur.

Btu - Heating value is determined in terms of Btu both on an as-received basis (including moisture) and on a dry basis.

Source: U.S. DOE - EIA, Coal Data: A Reference, 1989.

Improving the Properties of Mined Coal



Kentucky coal is improved by the partial removal of the impurities - sulfur and ash. The cleaning process to remove impurities from the coal is often called *beneficiation*, *coal preparation*, or *coal washing.*

In general, coal cleaning is accomplished by separating and removing inorganic impurities from organic coal particles. The inorganic ash impurities are predominantly more dense than the coal particles. This property is generally the basis for separating the coal particles from the ash impurities.

Western Kentucky had 18,385 tons per hour of coal preparation design capacity at approximately 29 coal preparation plants during 1997. Eastern Kentucky had 50,000 tons per hour of coal preparation design capacity at approximately 100 sites during 1993.

Each coal seam has a different washability characteristic. The range of improvement to a particular seam by mechanical washing varies from plant to plant and location to location.

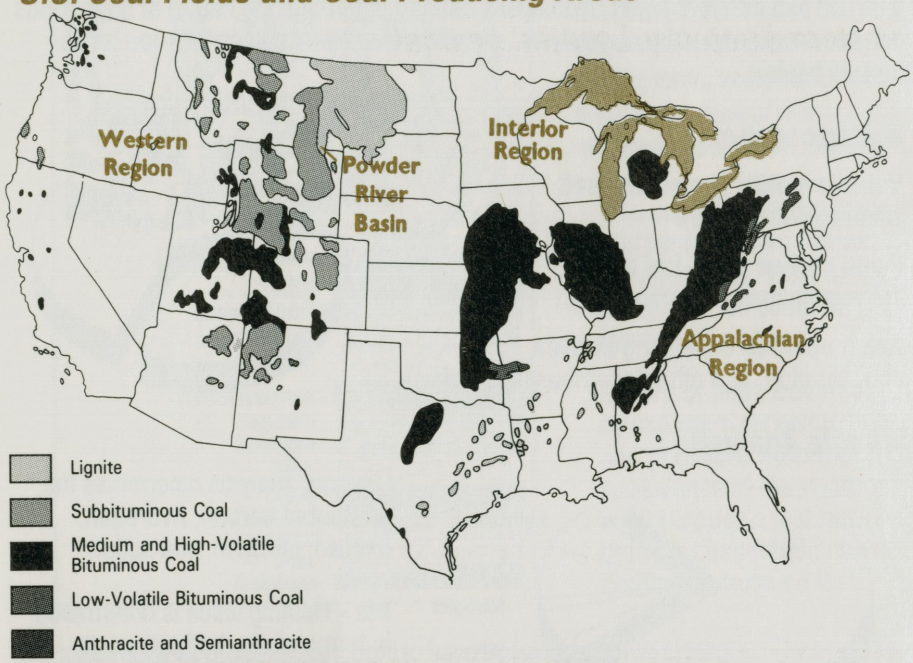
In Western Kentucky, sulfur (inorganic sulfur) and ash are the two main impurities removed. Considering the 7 principal mined seams in this area, 0.5% to 2.5% can be subtracted from the average sulfur content and 9% to 13% can be subtracted from the ash content after the coal washing process.

In Eastern Kentucky, coals with very high ash contents are washed. High ash content results from seam impurities, splits or partings in the seam, or ash accumulating mining methods. In these seams the ash is the main impurity removed; 10% to 15% can be subtracted from the ash content after the coal washing process and with only a slight reduction in the sulfur content.

Source: Kentucky Coal Marketing and Export Council's Kentucky Coal Marketing Information System.

U.S. Comparisons-Production

U.S. Coal Fields and Coal Producing Areas



Source: Developed from the U.S. Geological Survey

Coal Production by State, 1996 (thousand tons)

State and Region	Total	Anthracite	Bituminous	Sub-Bituminous	Lignite
Alabama	24,637	--	24,637	--	--
Alaska	1,481	--	--	1,481	--
Arizona	10,442	--	10,442	--	--
Arkansas	21	16	5	--	--
Colorado	24,886	--	15,942	8,944	--
Illinois	46,656	--	46,656	--	--
Indiana	29,670	--	29,670	--	--
Kansas	232		232	--	--
Kentucky, Total	152,425	--	152,425	--	--
Eastern	116,951	--	116,951	--	--
Western	35,474	--	35,474	--	--
Louisiana	3,221	--	--	--	3,221
Maryland	4,093	--	4,093	--	--
Missouri	710		710	--	--
Montana	37,891	--	--	37,635	256
New Mexico	24,067	--	12,837	11,230	--
North Dakota	29,861	--	--	--	29,861
Ohio	28,572	--	28,572	--	--
Oklahoma	1,701	--	1,701	--	--
Pennsylvania	67,942	4,751	63,190	--	--
Tennessee	3,651	--	3,651	--	--
Texas	55,164	--	446	--	54,718
Utah	27,507	--	27,507	--	--
Virginia	35,590	--	35,590	--	--
Washington	4,565	--	173	4,393	--
West Virginia, Total	170,433	--	170,433	--	--
Northern	45,910	--	45,910	--	--
Southern	124,523	--	124,523	--	--
Wyoming	278,440	--	1,832	276,608	--
Appalachian Total	451,868	4,751	447,116	--	--
Interior Total	172,848	16	114,893	--	57,939
Western Total	439,140	--	68,732	340,291	30,117
East of Miss. River	563,668	4,751	558,916	--	--
West of Miss. River	500,188	16	71,825	340,291	88,056
U.S. Total	**1,063,856**	**4,768**	**630,741**	**340,291**	**88,056**

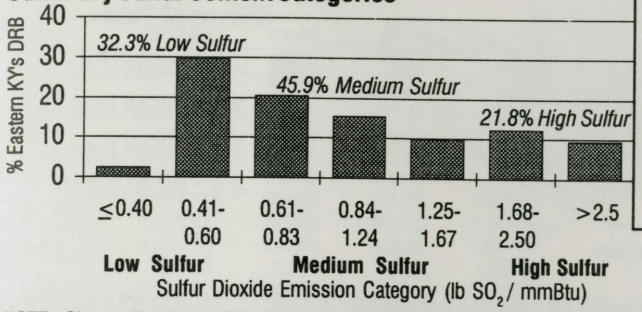
Source: U.S. DOE - Energy Information Administration, Coal Industry Annual, 1996.

U.S. Coal Reserves

Eastern Kentucky Low-Sulfur Coal

The U.S. DOE estimates that over 32.3% of Eastern Kentucky's Demonstrated Reserve Base (DRB) would meet a 0.6 pounds of sulfur dioxide per million Btu emissions limit (low sulfur), and that 45.9% would meet a 1.67 lb/mm Btu emissions limit (medium sulfur).

Summary Sulfur Content Categories*



Converting "Percent Sulfur" to "lb SO_2 per million Btu"

$$\text{lb } SO_2/\text{mmBtu} = \frac{\%S \times 19{,}500}{\text{Btu/lb of coal}}$$

Examples for 12,500 Btu coal:

% Sulfur	lb/mm Btu
1.0%	1.56
0.9%	1.40
0.8%	1.25
0.7%	1.09

NOTE: Change % sulfur to Sulfur Dioxide Emission Category (lb SO_2 / mmBtu) comparisons.

*EIA uses 7 sulfur content ranges. For general discussion and summary data, however, those 7 ranges are combined into 3 qualitative ratings of low, medium, and high-sulfur content.

1995 U.S. Demonstrated Coal Reserve Base (millions of tons)

The U.S. Demonstrated Coal Reserve Base is an estimate of the tonnage of economically available coal.**

Coal Producing Region and State	Anthracite	Bituminous	Sub-Bituminous	Lignite	Total** (millions of tons)
Appalachian Total	**6.7%**	**92.3%**		**1.0%**	**109,624.8**
Alabama		76.6%		23.4%	4,635.0
Georgia		100.0%			3.6
Kentucky, Eastern		100.0%			12,484.8**
Maryland		100.0%			731.4
North Carolina		100.0%			10.7
Ohio		100.0%			23,754.0
Pennsylvania	25.0%	75.0%			28,867.8
Tennessee		100.0%			827.1
Virginia	5.4%	94.6%			2,327.3
West Virginia		100.0%			35,983.1
Interior Total	**<0.1%**	**90.6%**		**9.4%**	**144,848.0**
Arkansas	25.0%	68.9%		6.1%	417.1
Illinois		100.0%			89,956.0,
Indiana		100.0%			9,991.0
Iowa		100.0%			2,189.5
Kansas		100.0%			975.6
Kentucky, Western		100.0%			20,079.8
Louisiana				100.0%	471.3
Michigan		100.0%			127.7
Missouri		100.0%			5,995.7
Oklahoma		100.0%			1,579.6
Texas				100.0%	13,064.9
Western Total	**<0.1%**	**10.5%**	**77.1%**	**12.4%**	**241,193.0**
Alaska		11.4%	88.4%	0.2%	6,129.9
Arizona		100.0%			188.8
Colorado	0.1%	52.1%	22.9%	24.9%	16,843.8
Idaho		100.0%			4.4
Montana		1.2%	85.7%	13.1%	119,773.3
New Mexico	<0.1%	29.8%	70.2%		12,546.8
North Dakota				100.0%	9,470.0
Oregon			100.0%		17.5
South Dakota				100.0%	366.1
Utah		>99.9%	<0.1%		5,955.7
Washington		21.7%	77.7%	0.6%	1,400.9
Wyoming		6.4%	93.6%		68,495.8
U.S. Total	**1.5%**	**52.0%**	**37.5%**	**9.0%**	**495,665.6**

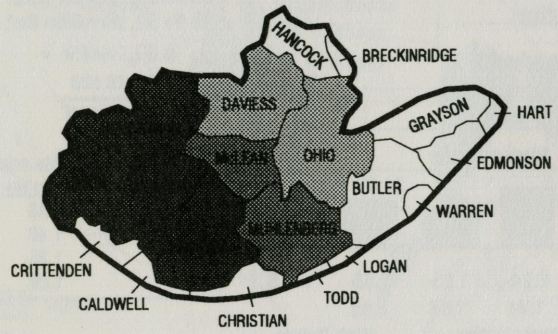
**Kentucky coal resource values are considered by some to be too high of a value, while the Eastern Kentucky "Demonstrated Coal Reserve Base" value being increased by 4 billion tons is still openly rejected by many others as being too low.

Source: U.S. DOE - EIA, U.S. Coal Reserves: A Review and Update, August, 1996.

Kentucky Coal Resources

Western Kentucky Coal Field

The Western Kentucky coal field covers 6,400 square miles and contains over 36 billion tons of remaining resources. (Part of this cannot be mined economically using today's technology.) The remaining resources and their locations are illustrated below.



Remaining Resources Billions of Tons

- > 5 Billion Tons
- 3-5 Billion Tons
- 1-3 Billion Tons
- < 1 Billion Tons

There are 35 named coal beds, of which 7 principal coal beds contain about 94% of the resources in Western Kentucky.

Over 4.8 billion tons of coal have been mined or lost due to mining, amounting to only about 11.8% of total Western Kentucky coal resources.

How To Calculate Tons of Coal

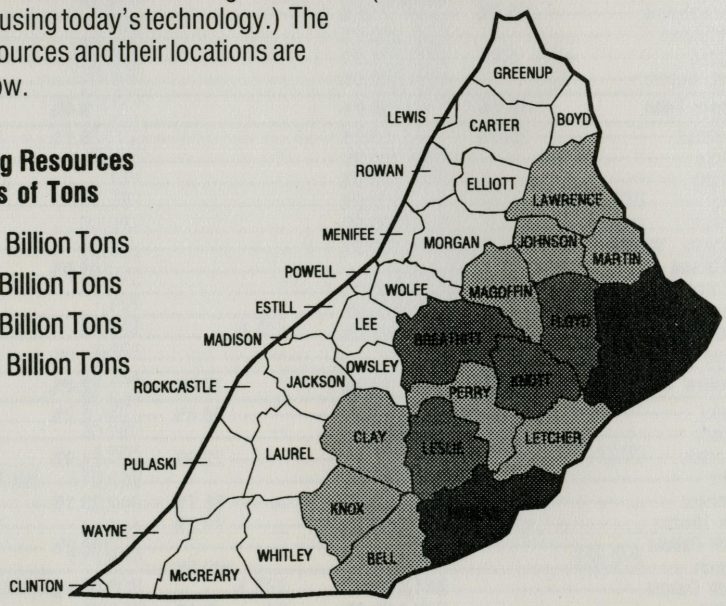
Total Tons = _____ Acres **x** _____ Inches **x** 135 tons per acre - inch
(acres of coal) **x** (height of coal) **x** (density of coal)

Eastern Kentucky Coal Field

The Eastern Kentucky coal field covers 10,500 square miles and contains approximately 53.6 billion tons of remaining resources. (Part of this cannot be mined economically using today's technology.) The remaining resources and their locations are illustrated below.

Remaining Resources Billions of Tons

- > 5 Billion Tons
- 3-5 Billion Tons
- 1-3 Billion Tons
- < 1 Billion Tons



There are more than 80 named coal beds in the Eastern Kentucky coal field which covers parts of 37 counties.

Approximately 10.4 billion tons of coal have been mined or lost due to mining, amounting to only about 16.3% of total Eastern Kentucky coal resources.

Source: Updated from Brant and Other, Coal Resource Series, 1980-1983.

Kentucky Coal Resources

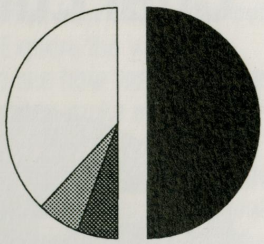
Original resource estimates for Western and Eastern Kentucky were 41 and 64 billion tons respectively. The resources currently remaining after 200 years of mining are estimated to be 36.1 billion tons in Western Kentucky and 53.6 billion tons in Eastern Kentucky. As shown in the Demonstrated Reserve Base (DRB) tables on page 39, assumptions on the percentage available for development reduce those values even further.

Western Kentucky Coal Resources

County	Original	Mined	Lost	Remaining
Butler	413.69	30.05	30.05	353.59
Daviess	1,330.32	58.61	58.61	1,213.10
Henderson	6,852.78	57.24	57.24	6,738.30
Hopkins	8,814.80	720.90	720.90	7,373.00
McLean	3,576.41	15.05	15.05	3,546.31
Muhlenberg	4,723.84	716.91	716.91	3,290.02
Ohio	1,824.55	261.28	261.28	1,301.99
Union	6,506.98	289.38	289.38	5,928.22
Webster	6,322.95	248.94	248.94	5,825.07
Other*	623.08	23.58	23.58	575.92
WKY Total	**40,989.40**	**2,421.94**	**2,421.94**	**36,145.52**

***NOTE:** "Other" includes Breckinridge, Caldwell, Christian, Crittenden, Edmonson, Grayson, Hancock and Warren Counties.

Original Coal Resources Estimate (41 Billion Tons)



20.1 Billion Tons in DRB**

2.4 Billion Tons Lost Due to Mining 1790-1996

2.4 Billion Tons Mined 1790-1996

15.3 Billion Tons Remaining but not in DRB**

Kentucky coal resource values are considered by some to be too high of a value, while the Eastern Kentucky "DRB" value is rejected by many others as being too low.

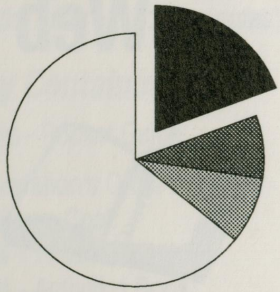
Three-fourths of the remaining coal resources in EKY are not considered to be part of the "DRB".

NOTE: Caution: coal reserve estimates affected by static terms like "today's technology" and "economically recoverable" may not continue to apply tomorrow.

Eastern Kentucky Coal Resources

County	Original	Mined	Lost	Remaining
Bell	3,194.70	272.03	272.03	2,650.64
Boyd	630.68	19.93	19.93	590.82
Breathitt	4,112.20	185.79	185.79	3,740.62
Carter	501.96	18.60	18.60	464.76
Clay	1,536.11	60.23	60.23	1,415.65
Elliott	316.32	9.83	9.83	296.66
Floyd	4,168.08	427.15	427.15	3,313.78
Greenup	204.87	10.41	10.41	184.05
Harlan	7,881.12	833.12	833.12	6,214.88
Jackson	375.87	11.20	11.20	353.47
Johnson	1,419.44	89.00	89.00	1,241.44
Knott	4,385.10	237.30	237.30	3,910.50
Knox	1,381.93	71.14	71.14	1,239.65
Laurel	408.04	35.64	35.64	336.76
Lawrence	2,024.68	19.93	19.93	1,984.82
Lee	363.98	8.40	8.40	347.18
Leslie	3,554.65	203.68	203.68	3,147.29
Letcher	3,692.80	481.62	481.62	2,729.56
McCreary	444.97	55.34	55.34	334.29
Magoffin	1,969.10	52.70	52.70	1,863.70
Martin	3,319.97	312.28	312.28	2,695.41
Morgan	849.40	15.07	15.07	819.26
Owsley	574.14	9.45	9.45	555.24
Perry	3,596.70	494.50	494.50	2,607.70
Pike	11,391.70	1,155.97	1,155.97	9,079.76
Whitley	987.44	89.76	89.76	807.92
Wolfe	443.92	7.16	7.16	429.60
Other***	334.89	33.11	33.11	268.67
EKY Total	**64,064.76**	**5,220.34**	**5,220.34**	**53,624.08**

Original Coal Resources Estimate (64.1 Billion Tons)



12.5 Billion Tons in DRB**

5.2 Billion Tons Lost Due to Mining 1790-1996

5.2 Billion Tons Mined 1790-1996

41.2 Billion Tons Remaining, but not in DRB**

Source for DRB: U.S. DOE-EIA, U.S. Coal Reserves, August, 1996.

****NOTE:** Kentucky coal resource values are considered by some to be too high of a value while the Eastern Kentucky "DRB" value was increased from 8.6 to 12.5 billion tons but is still rejected by some as being too low (see page 39).

*****NOTE:** "Other" includes Clinton, Pulaski, Rockcastle, and Wayne Counties.

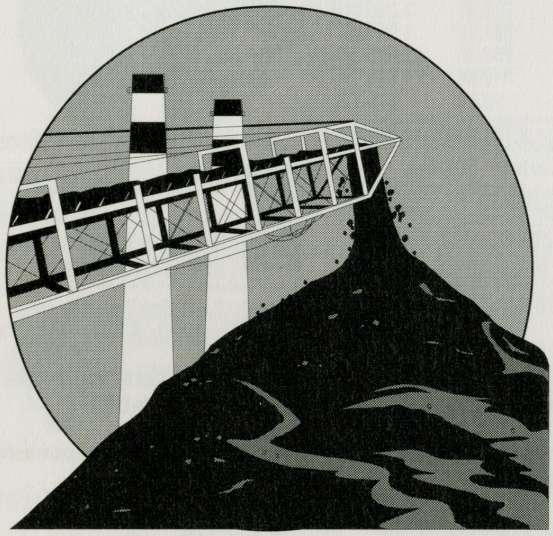
Sources: Smith and Brant (1980), Mined and Lost and Remaining Resources updated by the Kentucky Coal Marketing and Export Council from Kentucky Department of Mines and Minerals Annual reports.

www.coaleducation.org

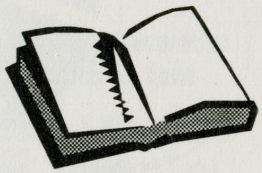
Visit Our Coal Education Web Site at http://www.coaleducation.org

Welcome to the Kentucky Coal Marketing and Export Council

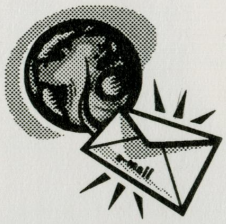
Coal Education



Web Site



Sign Guestbook



E-mail for comments or suggestions

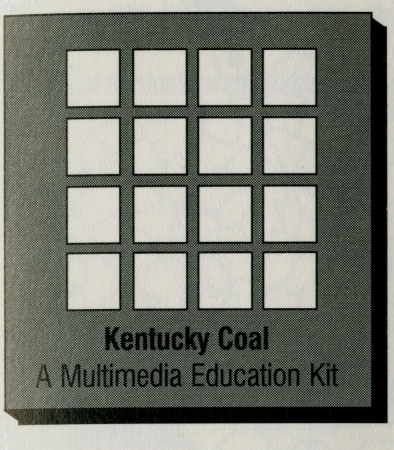
- Classroom Lesson Plans
- Coal Education Resources
- Glossary of Terms
- Kentucky Coal Facts Book
- Coal Related Issues Info
- Technical Abstracts of Coal Related Topics
- Kentucky Coal and the Regulatory Authority Agencies of the Coal Industry
- Other Kentucky Coal Marketing and Export Council Grant Recipients
- Where We've Been and Where We're Going
- On-Line Education Web Conference
- Coal Mining History

Majority funding for the Coal Education Web Site is provided by the **Kentucky Coal Marketing and Export Council**. It is dedicated to the men and women in the coal industry who provide heat, light, and power to our nation. Their efforts sustain our world every day.

In an effort to educate the public, the contents of this page are directed to students, to teachers, to employees of the coal industry, and to the general public to increase their knowledge of coal and the coal industry. It is a dynamic, growing portrait of one of America's most essential industries. Education comes in many forms, and this page provides a wide selection of choices. Its purpose is to present factual, useful information about coal. But the ultimate purpose is to prove that coal is the very backbone of the computer age. Knowledge is power, and power IS coal.

Multimedia Library Kit

Coal Education Interactive Multimedia Library Kit



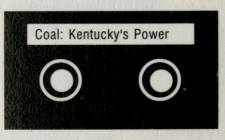
Kentucky Coal - A Multimedia Education Kit with interactive learning tools is now available in every public elementary, middle school, and county library in Kentucky.

Coal is a fossil fuel used to make electricity to power our schools, homes, and industries. Kentucky coal is a natural resource used around the world. But, how do we use coal to make electricity? Explore the world of Kentucky coal and see how we get coal out of the ground and use it to make electricity.

The interactive multimedia CD-ROM and three coal education classroom videos are a production of Western Kentucky University in cooperation with the Kentucky Authority for Educational Television with partial funding from the Commonwealth of Kentucky's Coal Marketing and Export Council.

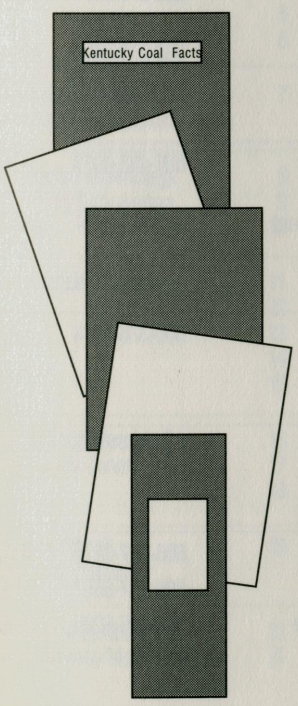
Interactive Multimedia CD-ROM

A role-playing computer game for 4th and 5th grade students and up.



Coal Education Classroom Videos
Coal: Kentucky's Power Source

The Rock That Burns (27 minutes)
Everyday Uses of Coal (14:53 minutes)
Coal - Now and In the Future (24:16 minutes)



Literature Tray Containing

Kentucky Coal Facts - Pocket Guide

American Coal Foundation's Order Form For Classroom Materials on Coal:
- Power from Coal - Teacher's Guide
- Power from Coal - Activities Book
- Coal: Ancient Gift
- Let's Learn About Coal

Physiographic Diagram of Kentucky

Coal Education Web Site Information

Sample of Kentucky Coal

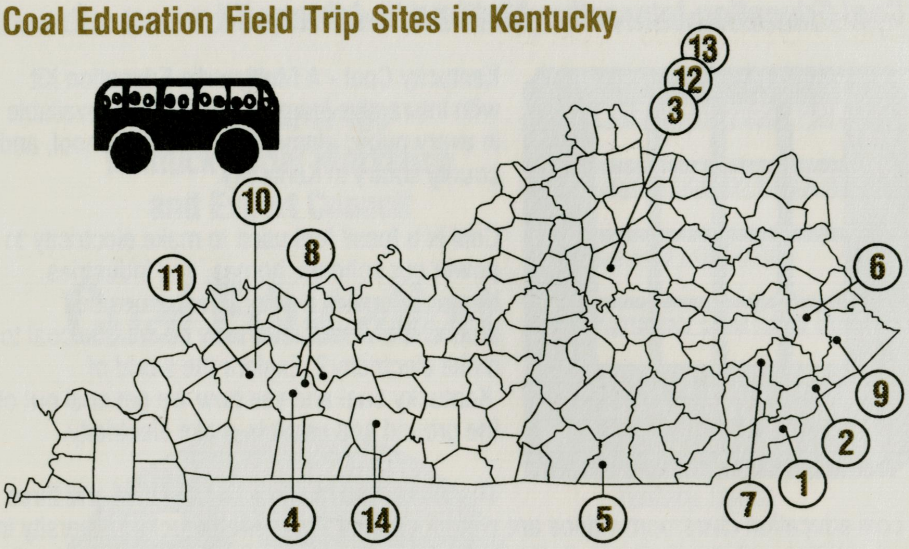
Videos and CD-ROM Order Form

KET's Electronic Field Trip to a Coal Mine

Additional Copies of the Kentucky Coal CD-ROM and Videos

Coal Education Field Trip Sites

Coal Education Field Trip Sites in Kentucky



	Field Trip Site	City/County	Phone	Age Group
	Museums			
1	*Kentucky Coal Museum*	Benham/Harlan	606-848-1530	all ages
2	*Coal & Rail Museum*	Jenkins/Letcher	606-832-4676	all ages
3	*Lexington Children's Museum*	Lexington/Fayette	606-258-3253	all ages
	Parks			
4	*Paradise Park Complex* *Duncan Cultural Center*	Greenville/Muhlenberg Greenville/Muhlenberg	502-338-5422 502-338-2605	all ages all ages
5	*Big South Fork Scenic Railway*	Stearns/McCreary	800-GO-ALONG	all ages
	Interpretive Center			
6	*Jenny Wiley State Resort Park* Contact: Ron Vanover	Prestonsburg/Floyd	606-886-2711	all ages
	Wildlife Reclamation			
7	*Cyprus-Amax WMA (Elk)* Contact: David Schindler, KDFWR	Ary/Perry	606-378-3474	all ages
8	*Peabody Wildlife Mgmt. Area* Contact: Mike Henshaw, KDFWR	Muhlenberg & Ohio	502-273-3569	4th grade & up
	Annual Events			
9	*CEDAR's Regional Coal Fair* Contact: John Justice	Pikeville/Pike	606-433-4053	all ages
10	*West Kentucky CEDAR's Coal Fair* Contact: Phil Edmondson	West Kentucky Coal Field	502-333-9807	all ages
	Surface Coal Mine			
7	*Cyprus-Amax Starfire Mine* Contact: David Schindler	Ary/Perry	606-378-3474	all ages
	Simulated Underground Mine			
11	*Madisonville Regional Ky. Tech Ctr.* Contact: Tommy Caskey	Madisonville/Hopkins	502-824-7009	3rd grade & up
	Coal Research Labs*			
12	*Center for Applied Energy Research*	Lexington/Fayette	606-257-0224	all ages
13	*Kentucky Geological Survey*	Lexington/Fayette	606-257-5500	all ages
14	*Western Kentucky University*	Bowling Green/Warren	502-745-6020	all ages

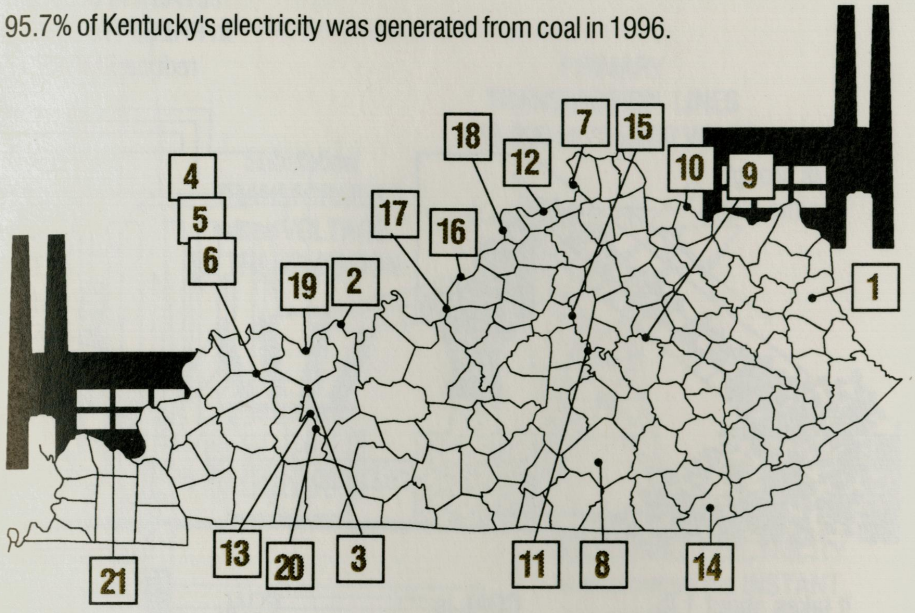
*All labs are limited to tours for special projects only.

Coal-Fired Power Plants

Coal-into-Kilowatts Plant Sites

(see pages 46 & 47 for Coal-into-Kilowatts schematic)

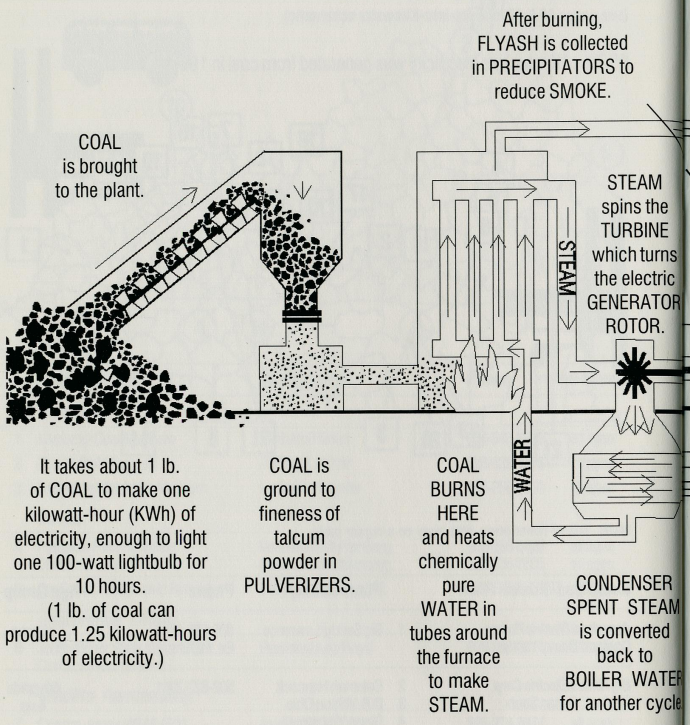
95.7% of Kentucky's electricity was generated from coal in 1996.

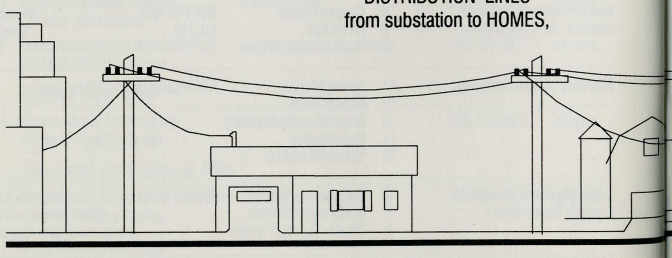


NOTE: Not all power plants offer tours on a regular basis.

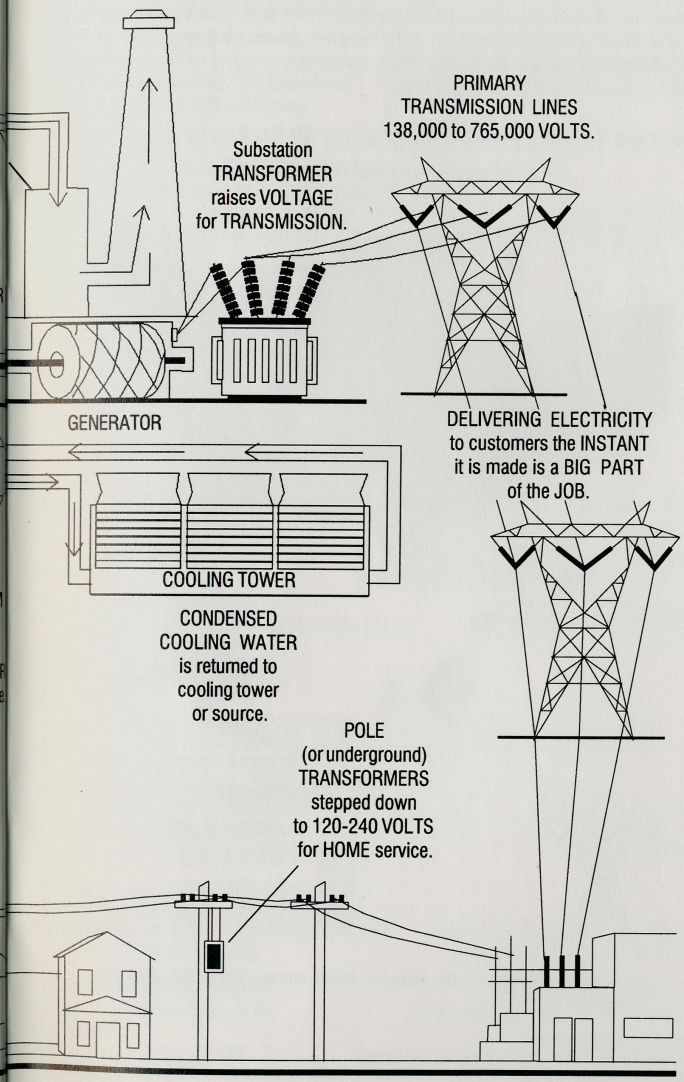
Coal-Fired Power Plant		Plant/County	Phone	Age Group
American Electric Power Contact: Diana Frasher	1	Big Sandy/Lawrence	606-686-2415, Ext. 1133	all ages
Big Rivers Electric Corp. Contact: Susan Sauls	2 3 4 5 6	Coleman/Hancock D.B. Wilson/Ohio Green/Webster Henderson/Webster Reid/Webster	502-827-2561	6th grade & up
Cincinnati Gas & Electric Co. Contact: Cindy Blake/Cindy Wells	7	East Bend/Boone	513-287-4700	3rd grade & up
East Kentucky Power Corp. Contact: Jerry Schureman	8 9 10	Cooper/Pulaski Dale/Clark H.L. Spurlock/Mason	606-744-4812, Ext. 385	5th grade & up
Kentucky Utilities Company	11 12 13 14 15	Brown/Mercer Ghent/Carroll Green River/Muhlenberg Pineville/Bell Tyrone/Woodford	No regular tours at this time.	
Louisville Gas & Electric Co. Contact: Sandy Gentry	16 17 18	Cane Run/Jefferson Mill Creek/Jefferson Trimble County/Trimble	502-627-2713	5th grade & up (other grades will be considered upon request)
Owensboro, City of Contact: Jody Wassmer	19	Elmer Smith/Daviess	502-926-3200, Ext. 336	5th grade & up
Tennessee Valley Authority *Contact: Beverly Morehead	20 21	Paradise*/Muhlenberg Shawnee/McCracken	502-476-3301 502-575-8001	all ages No tours at this time.

Coal-into-Kilowatts





Coal-into-Kilowatts



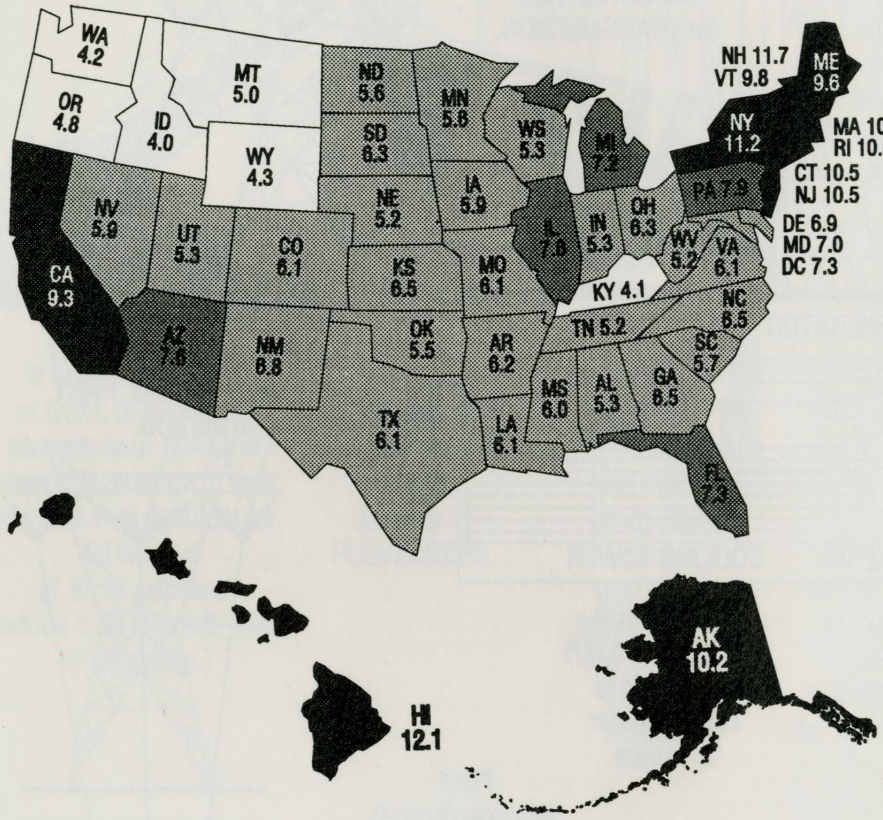
Source: American Electric Power

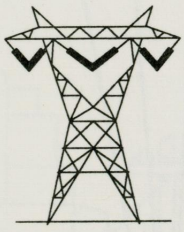
Electricity Costs

Average electricity costs in Kentucky were 4.1 cents per kilowatt-hour during 1996, **the second lowest** in the United States. Kentucky's average electricity costs are lower than all other states except a Northwestern *hydro* state. Some states such as California and several New England states have average electricity costs that are 2 to 2.5 times the average electricity costs in Kentucky.

Average Revenue per Kilowatt-hour for All Sectors by State, 1996

U.S. Average Revenue per KWh is 6.87 Cents





Cents per KWh

- 4.0 - 5.0 cents
- >5.0 - 7.0 cents
- >7.0 - 9.0 cents
- >9.0-12.1 cents

Only one Northwestern hydro state has lower average electricity costs than Kentucky.

KWh = Kilowatt-hour

Note: The average revenue per kilowatt-hour of electricity sold is calculated by dividing revenue* by sales.

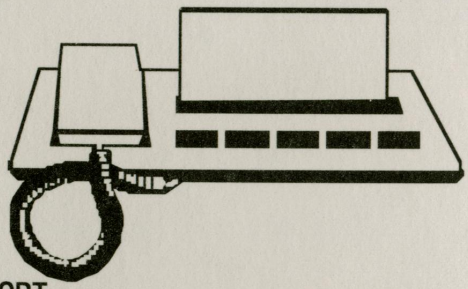
*Includes energy charges, demand charges, consumer service charges, environmental surcharges, fuel adjustments, and other miscellaneous charges. Taxes assessed on the consumer, "pass through" taxes, are not recorded in the operating revenues of the utility and are not included; however, taxes assessed on the utility are included in the electric utility's operating revenue.

Source: U.S. DOE - Energy Information Administration, Electric Power Annual, 1996, Volume I, August, 1997.

[ftp://ftp.eia.doe.gov/pub/electricity@pov196.pdf]

Information Assistance

Kentucky Coal Information



Kentucky coal data, information, and referral assistance to government, private organizations, and individuals are available from the following:

OFFICE OF COAL MARKETING AND EXPORT
Reseach Park Drive - 110 Administration Building
P.O. Box 11578, Lexington, Kentucky 40576-1578 **606/246-2500**
[www.coaleducation.org/kcmec] E-mail: kcmec@mis.net FAX 606/246-2497

William J. Grable, Executive Director
J. Dan Guffey, P.E., P.L.S., Coal Development Projects
Tears Francis, Executive Secretary

Karen L. Smith, Eastern Kentucky Coal Representative
Mines and Minerals Building, 2nd Floor
P.O. Box 2974, Lower Chloe Rd., Pikeville, Kentucky 41502 **606/433-7510**
E-mail: ekkcmec@eastky.net

Dennis McCully, Western Kentucky Coal Representative
State Office Building
625 Hospital Drive, Madisonville, Kentucky 42431 **502/824-7543**
E-mail: wkkcmec@vci.net

KENTUCKY COAL ASSOCIATION
1947 - 1997
Celebrating Our 50th Anniversary
340 South Broadway
Lexington, Kentucky 40508 **606/233-4743**
[www.miningusa.com/associat/kca/kca.htm] FAX 606/233-4745

Mike Musulin II, President
Bill K. Caylor, Vice-President

1997-1998 KENTUCKY COAL FACTS Ordering Information

Kentucky Geological Survey (KGS)
University of Kentucky - Publication Section
228 Mining and Minerals Resources Building
Lexington, Kentucky 40506
[www.uky.edu/kgs/home.htm] **606/257-3896**

Coal Teaching Materials

Kentucky Coal Marketing and Export Council
[www.coaleducation.org]

Kentucky Geological Survey (KGS)
[www.uky.edu/kgs/home.htm]

American Coal Foundation
1130 Seventeenth St., N.W.
Suite 220
Washington, DC 20036
202/466-8630
[www.nma.org/infosorc.html]

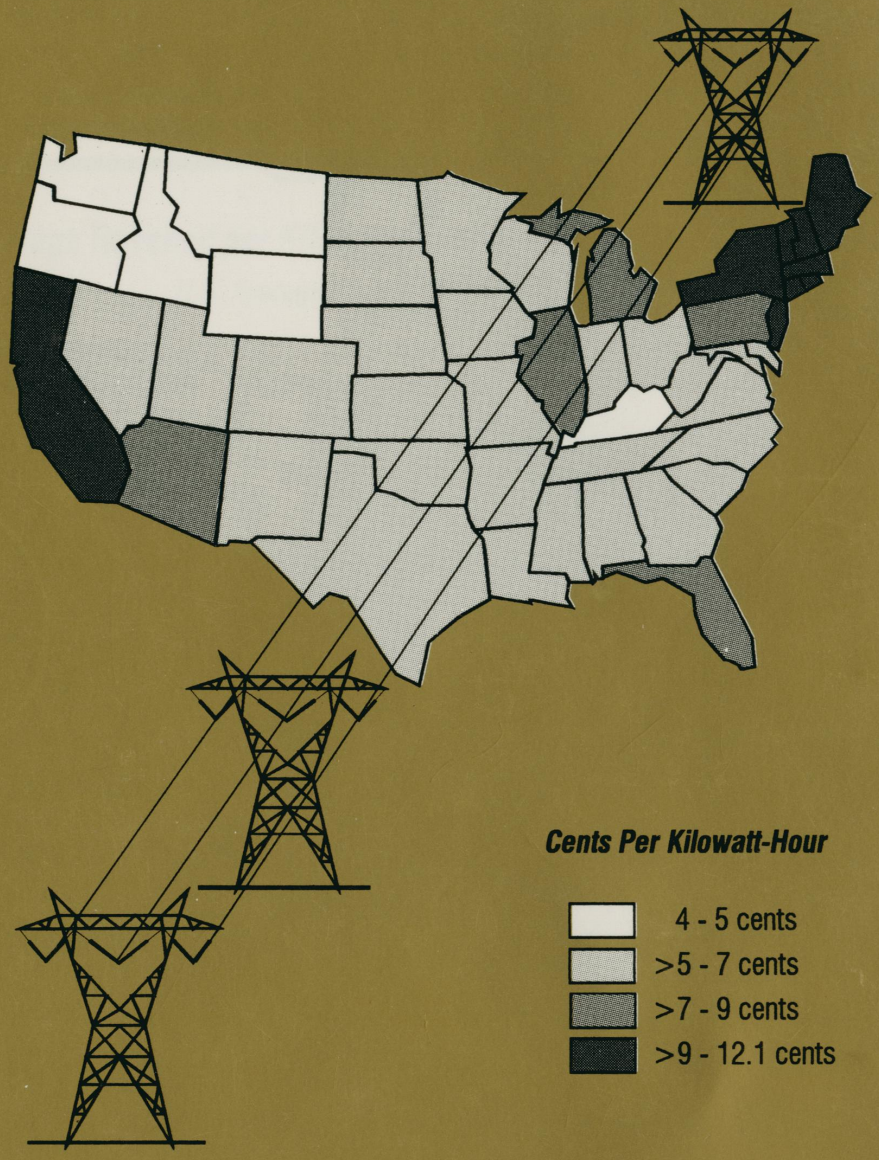
KET, The Kentucky Network
[www.ket.org/Trips/Coal/Index.htm]

Center for Energy and Economic Development
[www.conx.com/ceed]

University of Kentucky Center for Applied Energy Research (CAER)
[www.caer.uky.edu]

Help the teachers at your school obtain coal education classroom materials.

Average Electricity Costs per Kilowatt-Hour, 1996



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Paul E. Patton, Governor