



*Pennsylvania's*

# **COAL HARD FACTS**

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[www.pacoalalliance.com](http://www.pacoalalliance.com)

## Pennsylvania's Coal Hard Facts

### 2012

The Pennsylvania Coal Alliance was founded in 2012 as an initiative of Pennsylvania's bituminous coal mining operators, their employees, and industry suppliers to educate the public and policymakers about the benefits of the coal industry in Pennsylvania.

The Pennsylvania Coal Alliance is committed to promoting and advancing the Pennsylvania coal industry and the economic and social benefit to the employees, businesses, communities, and consumers who depend on affordable, reliable, and increasingly clean energy from coal.

Through aggressive advocacy and education, we seek to influence public policy, public opinion, and the marketplace in support of the coal economy. *Pennsylvania's Coal Hard Facts 2012* is based on 2011 data or the most recent available data as noted. This booklet assembles — in a concise and convenient format — all relevant information about the Commonwealth's coal industry from production and markets to employment and safety.

Feel free to contact us with your questions.

This booklet is also available in digital format at [www.pacoalalliance.com](http://www.pacoalalliance.com).



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## CEO's Message

On July 1, 2012, two Pennsylvania coal organizations, Pennsylvania Coal Association and Families Organized to Represent the Coal Economy (F.O.R.C.E) merged to form one voice representing the interests of workers, their families, industry suppliers, and manufacturers.

Our new organization, the Pennsylvania Coal Alliance, has been chartered to spread the message about the benefits of coal and to increase public awareness about the need to rely on coal as an affordable, reliable, and increasingly cleaner source of energy.

*Pennsylvania's Coal Hard Facts 2012* is one way to convey our message. It is the only publication that assembles all relevant information about the Commonwealth's bituminous coal industry from production and market to employment and safety in a concise and convenient format.

We encourage you to read this booklet and learn the facts:

- Pennsylvania is the fourth largest coal state.
- The Pennsylvania coal industry provides over 41,500 jobs across the state and annually contributes over \$7.5 billion to the Commonwealth's economy.
- In the U.S., the development and application of technology has enabled us to be enormously successful in reducing emissions of conventional pollutants by more than 85 percent since the 1970s while coal use has increased by 75 percent during that same period.

True energy security lies in a balanced energy policy that wisely utilizes all of our home-grown energy resources. As part of such a policy, prudence dictates that coal will continue to play a critical role in lighting our energy future as a reliable, baseload source of electricity.

John Pippy  
Chief Executive Officer



### John Pippy, CEO

Prior to joining the Pennsylvania Coal Alliance, John served in the state legislature for 16 years, serving in the Senate for nine and the State House for seven. Previously, he worked at U.S. Steel's Clairton Coke Works in Clairton, PA.

John earned a Masters in International Relations from the American University in Dublin, Ireland, and a Bachelor's in Environmental Science from the United States Military Academy at West Point.

He is a Lieutenant Colonel in the Pennsylvania National Guard and served on active duty in Iraq and Kuwait. John is active in the Pittsburgh community, serving on the advisory boards of numerous organizations.



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# *All about Coal*





AMERIKOHL MINING, INC.



*It takes about 3 to 7 feet of compacted plant matter to produce 1 foot of bituminous coal.*

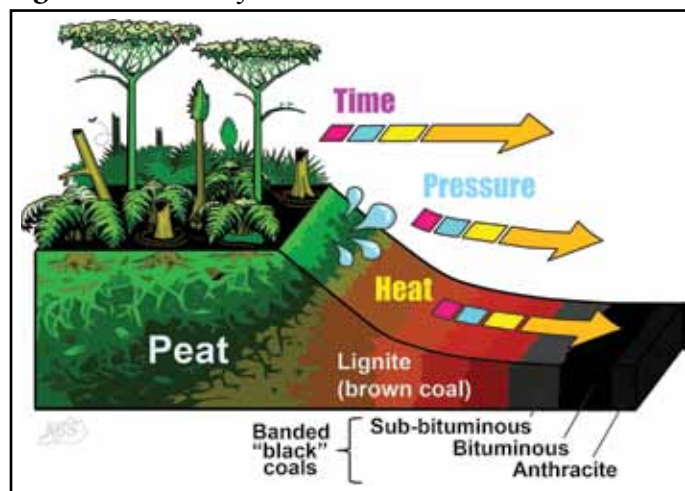
**Sediment** consists of solid fragments of inorganic or organic material that come from the weathering of rock and that settle to the bottom of a body of water, forming sedimentary rock.

## What is Coal?

Coal is considered a **fossil fuel** because it was formed from the remains of vegetation that grew almost 400 million years ago. Most of the coal that is used today was formed about 300 million years ago, when steamy swamps covered much of the earth. As these plants and trees died, their remains sank to the bottom of the swampy areas, accumulating layer upon layer and eventually forming a soggy, dense material called **peat**.

**Peat** deposits typically form in waterlogged environments where plant debris has accumulated.

*Fig. 1: How coal is formed.*



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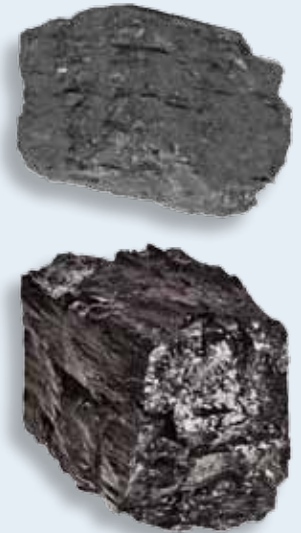
For peat to become coal, it must be buried by **sediment**. Being buried puts pressure on the peat and, consequently, much of the water is squeezed out. Continued burial, additional heat, and time cause the complex hydrocarbons in the peat to break down and become altered. These altered products produce gas (notably methane) that is expelled from the peat and becomes more and more carbon rich as the other elements disperse and coal deposits are formed. This process is called **coalification**.

## Bituminous vs. Anthracite

**Bituminous** coal is dark brown or black in color and contains a tar-like substance called **bitumen**. Bituminous coal has a relatively high heat value when burned — the higher the temperature produced when burned, the more energy is produced. Bituminous coal is the most widely available form of coal and has the broadest range of commercial uses.

**Anthracite** coal is hard, dense, and has a shiny quality compared to bituminous. Anthracite has the highest carbon content — the fewest impurities — and gives the highest energy output when burned. Anthracite accounts for only about one percent of all global coal reserves and typically costs two to three times more than bituminous.<sup>1</sup>

<sup>1</sup> *The Coal Resource: A Comprehensive Overview of Coal*, World Coal Institute, 25 May 2005.



Bituminous (top) and anthracite (bottom).

### The four classifications of coal

**Anthracite** is a dark, dense coal that has the highest carbon content of all coal — 86 to 98 percent. Anthracite burns slowly with very little smoke. It is formed by the transformation of bituminous coal in a process called **anthracitization**.

**Bituminous** is softer than anthracite. It contains less carbon — 69 to 86 percent — and burns faster, emitting more smoke. It is formed as a result of high pressure on lignite coal.

**Sub-Bituminous** is dull, black, has a relatively low carbon content, and gives off only marginally more energy (heat) than lignite.

**Lignite** is also known as brown coal. It is a very soft coal, contains approximately 70 percent water, and is high in impurities. Lignite makes up the largest portion of the world's coal reserves but gives the lowest energy output when burned.

**Bitumen**, also known as asphalt, is a sticky, black substance primarily used in road construction. It is the “glue” that holds all the other contents together.

CONSOL ENERGY



**Pennsylvania's  
Largest Producing  
Underground Mine**  
Bailey Deep Mine  
Greene County

CONSOL Energy  
142 Crabtree Road  
Wind Ridge, PA 15380

**2011 Statistics<sup>1</sup>**

Permit acres

Surface.....	652
Underground .....	26,620
Tons produced.....	10,833,141
Employees.....	897
Hours worked.....	2,226,126
Fatalities .....	0

## How Coal is Mined

There are two ways of removing coal from the ground—**underground mining** and **surface mining**. In Pennsylvania, underground coal mining accounted for 47 million tons of production in 2011, while surface mining accounted for only 14 million tons.<sup>2 3</sup> Technology in how coal is brought to the surface has improved dramatically in recent years, becoming far safer and more efficient.

### Underground Mining

To reach coal deposits that are underground, miners use one of three methods.

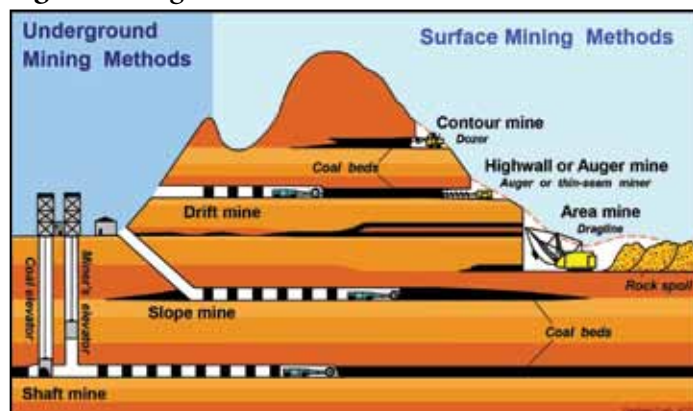
**Drift mines** enter the side of a hill horizontally at the level of the coal seam to be mined.

**Slope mines** involve digging a downward-sloping tunnel from the bottom of a hill (typically) to the coal seam.

**Shaft mines** access the deepest coal seams using an elevator installed in a vertical shaft dug from the surface.

Once the coal is reached, it is removed by one of two processes: **room and pillar** or **longwall**.

*Fig. 2: Mining Methods*



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**Room and Pillar** mining uses a **continuous mining machine** to cut a network of rooms into the seam while loading the coal onto a shuttle. The coal is then placed on a conveyor that takes it to the surface.

<sup>1</sup> Pennsylvania Department of Environmental Protection (PADEP), Bureau of Mining Programs, Reports, "2011 Bituminous Underground Mines Reporting Production - Listed by County," 20 Sept. 2012. <[www.depweb/state/pa/us](http://www.depweb/state/pa/us)>

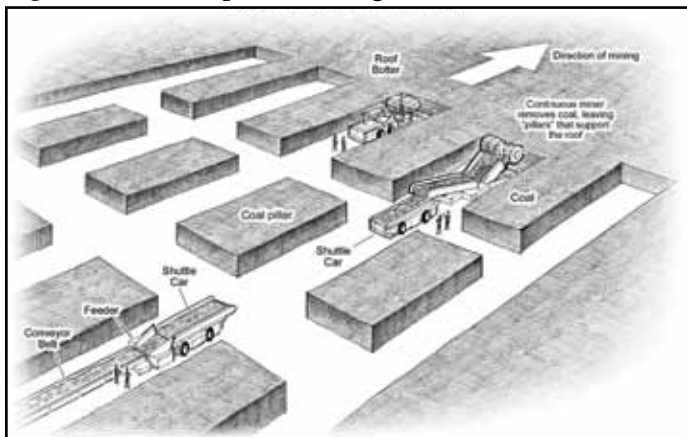
<sup>2</sup> Ibid., "2011 Bituminous Statewide Production Summary," 20 Sept. 2012

<sup>3</sup> Ibid., "2011 Anthracite Statewide Production Summary," 20 Dec. 2012



*Pillars of coal of increasingly greater width must be left behind to support the roof of the mine.*

**Fig. 3: Room and pillar mining**



**Longwall Mining** uses **mechanized shearers** to cut and remove coal at the face of the mine. It is then dropped onto a series of conveyors that take it to the surface.

*This method of mining is more efficient than room and pillar mining, with recovery rates of nearly 80 percent. However, the equipment is more expensive, and it cannot be used in all geographical circumstances. In Pennsylvania, longwall mining takes place only in Greene and Washington counties.*

## Surface Mining

Coal deposits located near the surface are usually mined using one of two surface mining techniques.

**Area mines** remove shallow coal over a broad area where the land is predominantly flat. Huge dragline shovels remove rocks that overlie the coal; these rocks are called **overburden**. After the coal has been removed, the overburden is placed back into the pit.

**Contour mines** extract coal in steep, hilly, or mountainous terrain. A wedge of **overburden** is removed along the coal seam in a pattern following the contours along a ridge or hillside. The coal is removed, and the overburden is returned to restore the hill to its natural slope.

PBS COALS, INC.



**Pennsylvania's  
Largest Producing  
Surface Mine**  
Schrock Run Mine  
Somerset County

PBS Coals, Inc.  
1576 Stoystown Road  
Friedens, PA 15541

### 2011 Statistics<sup>4</sup>

Surface permit acres .....	282
Tons produced .....	624,123
Employees .....	40
Hours worked .....	50,697
Fatalities .....	0

<sup>4</sup> Ibid., "2011 Bituminous Surface Mines Reporting Production - Listed by County," 20 Sept. 2012.



Coal generated over 100 million megawatt hours of electricity in Pennsylvania in 2011.<sup>1</sup>

**A 1% improvement in the efficiency of coal combustion results in a 3% reduction in carbon dioxide emissions.<sup>2</sup>**

<sup>1</sup> U.S. Energy Information Administration (US EIA), Electric Power Monthly, "Table 1.6.A Net Generation," 23 Jan. 2013. <[www.eia.gov/electricity/monthly](http://www.eia.gov/electricity/monthly)>

<sup>2</sup> World Coal Association (WCA), "Coal and the Environment," n.d. <[www.worldcoal.org](http://www.worldcoal.org)>

## Uses of Coal

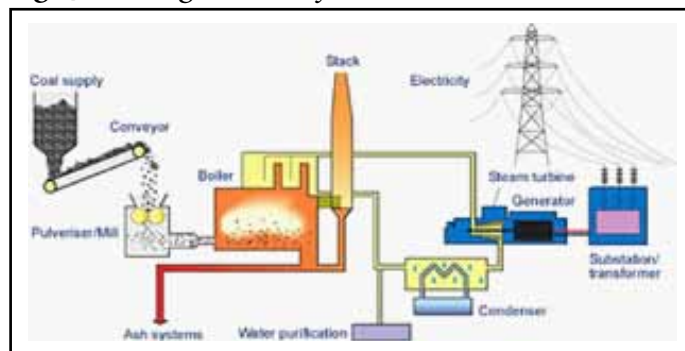
About 8.1 billion tons of coal was used worldwide in 2011.<sup>3</sup> Coal has many uses, but its most significant is electricity generation, closely followed by steel production.

Among the many lesser-known uses of coal are cement and paper manufacturing and aluminum refining. Coal also has widespread use in the chemical and pharmaceutical industries. Ammonia gas recovered from coke ovens is used to manufacture agricultural fertilizers. Thousands of everyday products use coal or its byproducts as components: soap, aspirin, solvents, dyes, plastics, and fibers such as rayon and nylon.

## Coal and Electricity

Modern life would be unimaginable without reliable, affordable electricity. It lights our houses and streets, and it powers the equipment in our offices and the machinery in our factories.

**Fig. 4: Power generation from coal**



**Converting to Electricity.** When coal arrives at a power plant, it is pulverized into a fine powder. The pulverized coal is blown into the combustion chamber of a boiler, where it is burned at an extremely high temperature. The boiler is lined with water-filled tubes, and the heat energy produced converts the water into steam.

The high-pressure steam is passed into a turbine containing thousands of propeller-like blades, causing the turbine shaft to rotate at high speed. A generator, consisting of

<sup>3</sup> US EIA, "International Energy Statistics," n.d. <[www.eia.gov](http://www.eia.gov)>

wound wire coils, is mounted at one end of the turbine shaft, and electricity is generated when the coils are rapidly rotated in a strong magnetic field.

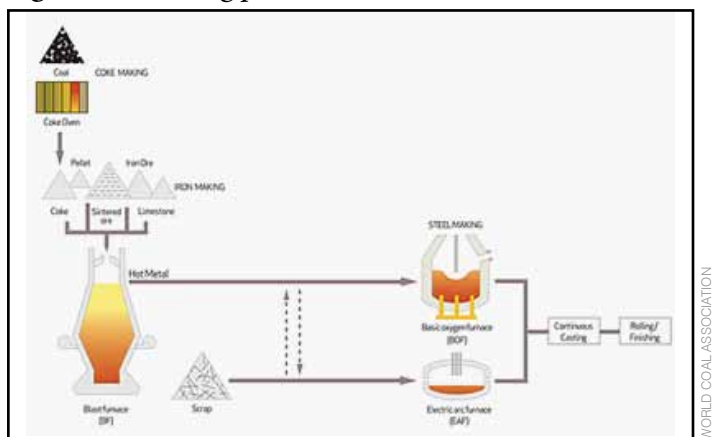
*Continuing improvements in power station design and the development of new combustion technologies allow more electricity to be produced from less coal. This is known as improving **thermal efficiency**.*

## The Making of Steel

Steel is the building block of modern life, and its production is dependent on coal. As much as 70 percent of the world's steel is produced using coal.<sup>4</sup>

**Coking.** It is the coking of coal that makes coal so vital to the steel making process.

*Fig. 5: Coal coking process*



Coke is produced by burning off coal's impurities, leaving almost pure carbon. The coking process involves heating coal to approximately 1,100°C in the absence of oxygen to drive off volatile, impure compounds, resulting in a hard, porous material called **coke**.

The coke is combined with iron ore and varying amounts of steel scrap in a furnace. A long, hollow tube forces pure oxygen into the furnace, causing the temperature to rise to 1,700°C. *The scrap melts, impurities are oxidized, and the carbon content is reduced, resulting in liquid steel.*

<sup>4</sup> WCA, "Coal & Steel," n.d. <[www.worldcoal.org/coal/uses-of-coal/coal-steel](http://www.worldcoal.org/coal/uses-of-coal/coal-steel)>

CONSOL ENERGY



Worldwide, 800 million tons of coking coal was used in the production of 1.6 billion tons of steel in 2010.<sup>5</sup>

*It takes about  
0.85 tons of coal  
to produce 1 ton  
of steel.<sup>6</sup>*

<sup>5</sup> Ibid.  
<sup>6</sup> Ibid.



*According to the EPA, nationally, from 1980 to 2010, ambient air quality levels of sulfur dioxide have decreased 83 percent; nitrogen dioxide, 52 percent; and carbon monoxide, 82 percent.*

## How Coal Is Cleaned

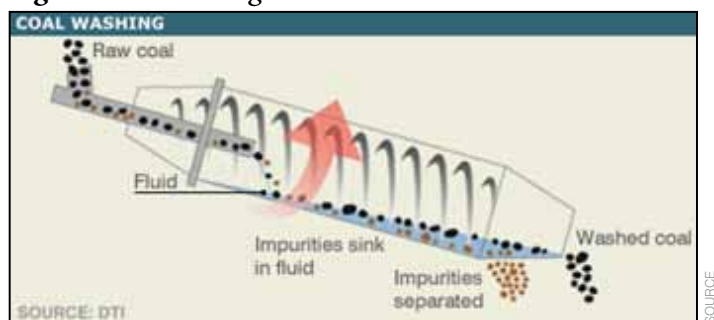
Clean coal technology has evolved over the years as scientists have developed efficient methods to capture pollutants in coal before they can escape into the atmosphere.

### Sulfur

Sulfur is a yellowish substance making up 3 to 10 percent of coal's weight. It is removed simply by crushing coal into small pieces and washing it. Typically, this is done by feeding the crushed pieces into a water-filled tank, where coal floats to the surface while the sulfur impurities sink to the bottom.

*But not all the sulfur is removed by washing.*

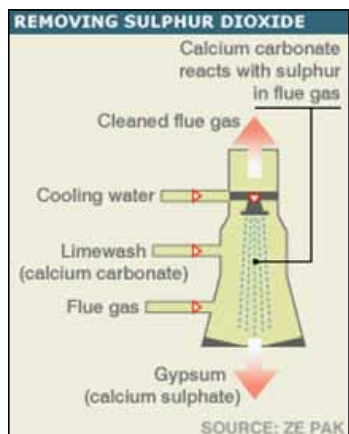
*Fig. 6: Coal washing*



All coal-burning power plants built since 1978 are required to have a special device installed that cleans the remaining sulfur from coal's combustion before it exits the smokestack. The technical name for this device is a **flue gas desulfurization unit**, but it is more commonly known as a **scrubber** because it “scrubs” the sulfur out of the smoke released by coal-burning boilers.

**How scrubbers work.** Most scrubbers rely on limestone. When crushed and processed, limestone will absorb sulfur gases similar to how a sponge absorbs water. The limestone is typically mixed with water and sprayed

**Fig. 7: Removing sulphur dioxide**



into the coal combustion gases, or flue gas. The limestone captures the sulfur in the gas and forms a wet paste, similar in consistency to toothpaste, that prevents the sulfur from escaping.

### Nitrogen (NOx)

Nitrogen is the most common part of the air we breathe; in fact, it makes up about 80 percent of it. Normally,

nitrogen atoms float in the air chemically joined to each other. But when air is heated — as when coal is burned — the nitrogen atoms break apart and join with oxygen, forming nitrogen oxides.

*Once in the air, nitrogen oxide becomes a regulated pollutant.*

The best way to prevent nitrogen oxide from getting into the air is by not allowing it to form in the first place. To accomplish this, coal is burned in burners where there is more fuel than air. Under these conditions, most of the oxygen in the air combines with the fuel rather than with the nitrogen. The burning mixture is then sent to another combustion chamber where the process is repeated until all the fuel is burned.

*This process is called **staged combustion**, since the coal is burned in stages. Approximately 75 percent of all large coal-burning boilers in the United States use these types of burners.*

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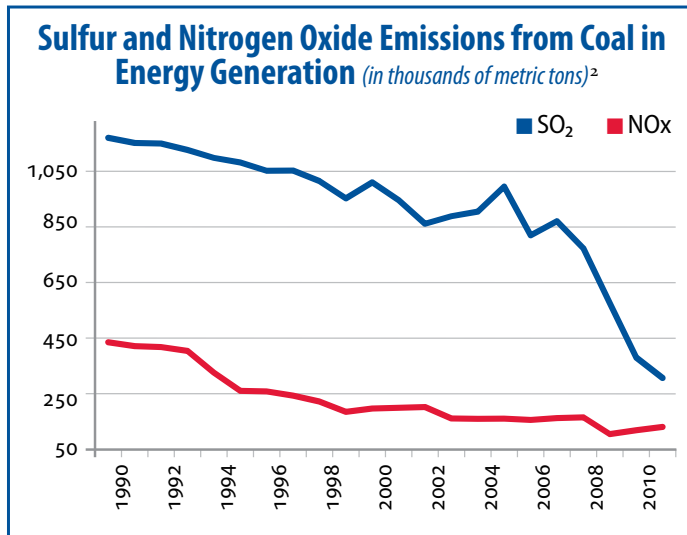
*Since 2000, Pennsylvania's electric power industry has cut sulfur dioxide (SO<sub>2</sub>) emissions by 67.4 percent and nitrogen oxide (NOx) emissions by 54 percent.<sup>1</sup>*

<sup>1</sup> US EIA, "Electric Power Industry Emissions," 1 Feb. 2013. <[www.eia.gov/beta/state/data](http://www.eia.gov/beta/state/data)>



## Coal is Clean

The application of clean coal technologies has worked. Emissions from burning coal are nearing negligible levels and improving every day. The chart below illustrates the steady decline of sulfur and nitrogen oxide released into the atmosphere from burning coal. Using techniques such as installing *scrubbers* in smokestacks and forcing nitrogen to combine with fuel, Pennsylvania's coal industry continues to go to great lengths to ensure that burning coal has a limited impact on the environment.



<sup>2</sup> Ibid.



# *Coal Hard Facts*





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Coal production in the United States increased only slightly during 2011, rising approximately 0.4 percent from its 2010 level. This represents the second year in a row of modest increases after falling sharply during 2009. Exports led the way for gains in production as U.S. coal shipments to other countries climbed to their highest level in two decades while domestic coal consumption for electricity generation fell.

## America's Coal Production

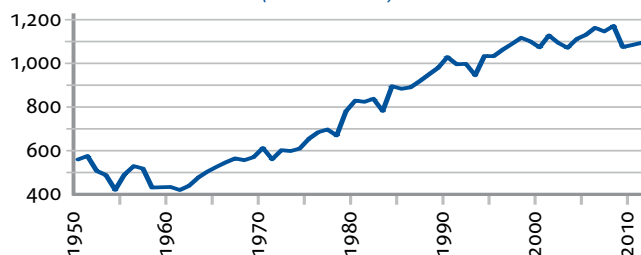
### U.S. Coal Production by State, 2007–2011<sup>1</sup>

(thousands of tons)

	2007	2008	2009	2010	2011
Wyoming	453,568	476,644	431,107	442,522	438,461
West Virginia	153,480	157,778	137,127	135,577	134,529
Kentucky	115,280	120,323	107,338	104,391	107,852
<b>Pennsylvania</b>	<b>65,048</b>	<b>76,024</b>	<b>60,030</b>	<b>59,397</b>	<b>59,756</b>
Texas	41,948	39,017	35,093	41,635	45,773
Montana	43,390	44,786	39,486	44,732	41,600
Illinois	32,445	32,918	33,748	33,159	37,441
North Dakota	29,606	29,627	29,945	28,949	28,214
Ohio	22,575	26,251	27,501	27,269	28,115
Colorado	36,384	32,028	28,267	25,170	27,204
Virginia	25,346	24,712	21,019	21,620	22,563
New Mexico	24,451	25,645	24,124	20,991	21,922
Utah	24,307	24,365	21,718	19,288	19,463
Alabama	19,327	20,611	18,796	20,223	19,060
Arizona	7,983	8,025	7,474	7,752	8,111
Louisiana	3,127	3,843	3,657	3,945	3,865
Mississippi	3,545	2,842	3,440	4,004	2,747
Maryland	2,301	2,860	2,305	2,479	2,555
Alaska	1,324	1,477	1,860	2,151	2,149
Tennessee	2,654	2,333	1,996	1,675	1,484
Oklahoma	1,648	1,463	956	1,010	1,143
Missouri	236	247	452	458	465
Arkansas	83	69	5	32	133
Kansas	420	229	185	133	37
<b>Totals</b>	<b>1,112,483</b>	<b>1,156,125</b>	<b>1,039,638</b>	<b>1,050,572</b>	<b>1,056,653</b>

### U.S. Coal Production, 1950 to 2011

(millions of tons)



<sup>1</sup> US EIA, "Annual Energy Review," Total Energy, 27 Sept. 2012. <[www.eia.gov/totalenergy/data/annual](http://www.eia.gov/totalenergy/data/annual)>

<sup>2</sup> US EIA, "Table 2. Coal Production and Number of Mines by State, County, and Mine Type, 2011," Annual Coal Report 2011, 11 Dec. 2012. <[www.eia.gov/coal/annual](http://www.eia.gov/coal/annual)>

# Pennsylvania's Coal Production

## Bituminous Production in Pennsylvania, 2010–2011<sup>1</sup>

		2010	2011	Change	% Change
Underground	Production (tons)	47,528,837	47,108,038	(420,799)	-0.89%
	Employees	4,836	5,232	396	8.19%
	Hours worked	11,447,304	12,819,474	1,372,170	11.99%
	Mines reporting	36	40	4	11.11%
	Companies reporting	15	13	(2)	-13.33%
Surface	Production (tons)	9,960,356	10,988,750	1,028,394	10.32%
	Employees	1,565	1,888	323	20.64%
	Hours worked	2,736,959	2,882,662	145,703	5.32%
	Mines reporting	284	291	7	2.46%
	Companies reporting	101	99	(2)	-1.98%
Refuse Sites	Production (tons)	1,716,463	1,640,343	(76,120)	-4.43%
	Employees	65	71	6	9.23%
	Hours worked	114,649	107,806	(6,843)	-5.97%
	Mines reporting	16	17	1	6.25%
	Companies reporting	12	13	1	8.33%
<b>Total Production</b>		<b>59,205,656</b>	<b>59,737,131</b>	<b>531,475</b>	<b>0.90%</b>

## Anthracite Production in Pennsylvania, 2010–2011<sup>2</sup>

		2010	2011	Change	% Change
Underground	Production (tons)	207,299	166,383	-40,916	-19.74%
	Employees	90	94	4	4.44%
	Hours worked	240,465	148,710	-91,755	-38.16%
	Mines reporting	10	11	1	10.00%
	Companies reporting	10	11	1	10.00%
Surface	Production (tons)	3,027,215	3,957,240	930,025	30.72%
	Employees	472	509	72	15.25%
	Hours worked	917,257	959,658	130,179	14.19%
	Mines reporting	63	55	-5	-7.94%
	Companies reporting	45	40	-3	-6.67%
Refuse Sites	Production (tons)	3,901,213	3,547,525	167,813	4.30%
	Employees	226	228	48	21.24%
	Hours worked	408,863	413,183	96,389	23.57%
	Mines reporting	46	45	0	0.00%
	Companies reporting	33	34	1	3.03%
<b>Total Production</b>		<b>7,135,727</b>	<b>8,192,649</b>	<b>1,056,922</b>	<b>14.81%</b>

<sup>1</sup> PADEP, "2011 Bituminous Statewide Production Summary," Bureau of Mining Programs, Reports, 20 Sept. 2012. <[www.depweb.state.pa.us](http://www.depweb.state.pa.us)>

<sup>2</sup> Ibid., "2011 Anthracite Statewide Production Summary," 20 Dec. 2012. <[www.depweb.state.pa.us](http://www.depweb.state.pa.us)>

AMERIKOHL MINING, INC.



Pennsylvania reached its all-time high for bituminous coal production in 1918, with 177 million tons. The Commonwealth's total 1918 output of 277 million tons of both anthracite and bituminous coal set a record for production by any state, which stood until 1996 when Wyoming eclipsed it with a total output of 278 million tons.<sup>3</sup>

<sup>3</sup> US EIA, "Annual Energy Review," Total Energy, 27 Sept. 2012. <[www.eia.gov/totalenergy/data/annual](http://www.eia.gov/totalenergy/data/annual)>

AMERIKOHL MINING, INC.



### Pennsylvania's Bituminous Coal Production Highlights

Pennsylvania's bituminous coal production slightly increased for the year, with the majority of the increase coming from surface mining. Underground mining still dominated production, accounting for almost 80 percent of total output, with Greene County accounting for 77 percent of total underground bituminous production.

The six coal producing counties — Somerset, Armstrong, Clearfield, Greene, Indiana, and Cambria — accounted for nearly 56 million tons of production, or 93 percent of the state's total.

Employment from Bituminous coal production grew by more than 11 percent in 2011, reaching employment levels not seen since 2001.

## Pennsylvania Coal Production by County, 2011

### Bituminous Production by County, 2011<sup>1</sup>

County	Underground	Surface	Refuse Site	Total
Allegheny	-	69,688	-	69,688
Armstrong	2,138,918	1,142,582	-	3,281,500
Beaver	188,609	145,280	-	333,889
Bedford	-	83,721	-	83,721
Blair	-	59,990	-	59,990
Butler	-	633,308	-	633,308
Cambria	848,570	392,598	896,285	2,137,453
Cameron	-	7,790	-	7,790
Centre	-	197,955	-	197,955
Clarion	-	233,123	-	233,123
Clearfield	1,601,796	2,436,044	-	4,037,840
Elk	154,162	274,501	-	428,663
Fayette	-	269,473	6,157	275,630
Greene	36,488,732	61,896	-	36,550,628
Indiana	2,900,139	386,570	594,075	3,880,784
Jefferson	129,104	337,229	-	466,333
Lycoming	-	222,922	-	222,922
Mercer	-	31,126	-	31,126
Somerset	2,658,008	3,071,601	139,839	5,869,448
Tioga	-	-	-	-
Venango	-	57,736	-	57,736
Washington	-	576,984	3,987	580,971
Westmoreland	-	296,633	-	296,633
<b>Totals</b>	<b>47,108,038</b>	<b>10,988,750</b>	<b>1,640,343</b>	<b>59,737,131</b>

### Anthracite Production by County, 2011

County	Underground <sup>2</sup>	Surface <sup>3</sup>	Refuse Site <sup>4</sup>	Total
Carbon	-	150,489	44,757	195,246
Columbia	107,355	576,971	-	684,326
Dauphin	4,009	-	-	4,009
Lackawanna	-	14,522	-	14,522
Luzerne	-	1,939,676	103,288	2,042,964
Northumberland	8,160	67,654	616,675	692,489
Schuylkill	46,859	1,207,928	3,304,306	4,559,093
<b>Totals</b>	<b>166,383</b>	<b>3,957,240</b>	<b>4,069,026</b>	<b>8,192,649</b>

<sup>1</sup> PADEP, "2011 Bituminous Employees and Production Tonnage - Summary by County," Mining Programs, Reports, Bituminous, 20 Sept. 2012. <[www.depweb.state.pa.us](http://www.depweb.state.pa.us)>

<sup>2</sup> PADEP, "2011 Anthracite Underground Mines - Summary Production Information by County," Mining Programs, Reports, Anthracite, 20 Sept. 2012. <[www.depweb.state.pa.us](http://www.depweb.state.pa.us)>

<sup>3</sup> *Ibid.*, "2011 Anthracite Surface Mines - Summary Production Information by County," 20 Sept. 2012.

<sup>4</sup> *Ibid.*, "2011 Anthracite Coal Refuse Sites - Summary Production Information by County," 20 Sept. 2012.



# Pennsylvania's Coal Reserves

## Bituminous Coal Reserves

(millions of tons)

County	Reserves
Allegheny	790
Armstrong	1,000
Beaver	680
Bedford	68
Blair	8
Bradford	5
Butler	1,100
Cambria	1,200
Cameron	18
Centre	90
Clarion	530
Clearfield	810
Clinton	7
Elk	130
Fayette	2,500
Fulton	8
Greene	4,100
Huntingdon	21
Indiana	1,900
Jefferson	1,100
Lawrence	140
Lycoming	15
McKean	130
Mercer	110
Somerset	1,900
Sullivan	4
Tioga	10
Venango	110
Washington	4,000
Westmoreland	2,200
<b>Total</b>	<b>25,131</b>

AMERIKOHL MINING, INC.



Pennsylvania's abundant coal reserves assure decades of reliable, low-cost energy for all of the Commonwealth's residents. With more than 25 billion tons of bituminous coal and an additional 7 billion tons of anthracite coal, Pennsylvania is well positioned to meet energy needs well into the future.

*The U.S. has more coal than the rest of the world has oil.*

<sup>1</sup> Pennsylvania Bureau of Topographic and Geological Survey and Pennsylvania Department of Environmental Protection, 2003

MEPCO LLC



Coal mining, to many in Pennsylvania, is a family tradition, being passed down from generation to generation. With 41,500 family-sustaining jobs generated by the industry, these producers play a vital role in keeping Pennsylvania's economy healthy.

## Pennsylvania's Top Producers

### Pennsylvania's Top Producers, 2011

Rank	Company	Bituminous <sup>1</sup>	Anthracite <sup>2</sup>	Deep Mining	Surface Mining	Production	Employees
1	CONSOL PA Coal Company	•	•			21,023,396	1,567
2	Cumberland Coal Resources, LP	•	•			9,898,282	1,233
3	Rosebud Mining Company	•	•	•		7,114,864	811
4	Consolidated Coal Company	•	•			4,341,984	518
5	Emerald Coal Resources, LP	•	•			3,713,206	619
6	Amfire Mining Company, LLC	•	•	•		2,688,564	493
7	PBS Coals, Inc.	•		•		1,864,843	249
8	Reading Anthracite Company		•		•	1,593,065	54
9	Dana Mining Co. of PA, Inc.	•	•			1,225,070	214
10	Roxcoal, Inc.	•	•			1,059,414	301
11	Allegheny Mineral Corp.	•			•	1,038,450	49
12	Amerikohl Mining, Inc.	•			•	977,254	106
13	Susquehanna Coal Company		•		•	680,434	34
14	Northampton Fuel Supply Co.		•		•	636,533	24
15	Cambria Reclamation Corp.	•			•	587,659	7
16	Robindale Energy Svc., Inc.	•			•	470,613	15
17	Quecreek Mining, Inc.	•		•		456,318	131
18	RES Coal, LLC	•			•	453,683	89
19	Blaschak Coal Corp.		•		•	450,123	105
20	Glen O. Hawbaker Company		•		•	378,894	33
21	Pagnotti Enterprises, Inc.		•		•	372,053	80
22	Neiswonger Const., Inc.	•			•	337,252	78
23	Fuel Recovery, Inc.	•			•	332,200	10
24	Elk Lick Energy, Inc.	•		•		300,748	91
25	River Hill Coal Co., Inc.	•			•	286,975	48
26	Michael Coal Company		•		•	286,343	9
27	Waste Mgmt. & Proc., Inc.		•		•	256,728	4
28	Warren C. Hartman Contr.	•			•	248,679	31
29	Northeastern Power Company		•		•	245,098	15
30	Ebensburg Power Company	•			•	244,977	12
31	Maple Coal Company	•			•	242,741	11
32	McVillie Mining Company	•		•		234,614	40
33	P&N Coal Co., Inc.	•			•	225,657	37
34	EP Bender Coal Co., Inc.	•			•	223,095	16
35	Fisher Mining Company	•			•	222,922	39
<b>Totals</b>						<b>64,712,731</b>	<b>7,173</b>

<sup>1</sup> PADEP, "2011 Bituminous Underground Mines Reporting Production - Listed by County," 20 Sept. 2012. "2011 Bituminous Surface Mines Reporting Production - Listed by County," 20 Sept. 2012. <[www.depweb/state/pa/us](http://www.depweb/state/pa/us)>

<sup>2</sup> Ibid., "2011 Anthracite Underground Mines Reporting Production - Listed by County," 20 Sept. 2012. "2011 Anthracite Surface Mines Reporting Production - Listed by County," 20 Sept. 2012.

## Pennsylvania's Bituminous Coal Permitted Mining Acreage

### Bituminous Underground Permitted Mining Acres<sup>1</sup>

County	No. Permits	Surface Acres	Underground Acres
Armstrong	6	239.4	17,028.6
Beaver	1	16.8	1,624.3
Cambria	2	104.3	4,457.0
Clearfield	3	210.4	12,085.0
Elk	1	19.9	1,346.0
Greene	6	19,500.4	105,435.2
Indiana	11	433.0	23,690.1
Jefferson	1	23.7	2,614.0
Somerset	8	1,137.0	16,338.1
Washington	1	243.5	35,558.0
<b>Totals</b>	<b>40</b>	<b>21,928.4</b>	<b>220,176.3</b>

### Bituminous Surface Permitted Mining Acres<sup>2</sup>

County	No. Permits	Surface Acres
Allegheny	4	127.9
Armstrong	18	4,059.1
Beaver	5	572.0
Bedford	2	269.0
Blair	2	573.0
Butler	6	1,165.2
Cambria	8	1,612.4
Cameron	2	444.5
Centre	8	1,866.0
Clarion	7	642.7
Clearfield	105	18,352.2
Elk	10	1,860.5
Fayette	12	1,700.9
Greene	3	122.8
Indiana	16	3063.3
Jefferson	18	2459.5
Lycoming	2	894
Mercer	2	198.4
Somerset	46	12,375.1
Tioga	1	80.9
Venango	2	127.1
Washington	5	1,010.3
Westmoreland	7	181.9
<b>Totals</b>	<b>291</b>	<b>53,758.7</b>

### Bituminous Refuse Permitted Mining Acres<sup>3</sup>

County	No. Permits	Surface Acres
Cambria	8	483.5
Centre	1	6.5
Fayette	3	348.3
Indiana	2	268.0
Somerset	2	13.3
Washington	1	98.9
<b>Totals</b>	<b>17</b>	<b>1,218.5</b>

<sup>1</sup> PADEP, "2011 Bituminous Underground Mines Reporting Production - Listed by County," 20 Sept. 2012. <[www.depweb/state/pa/us](http://www.depweb/state/pa/us)>

<sup>2</sup> Ibid., "2011 Bituminous Surface Mines Reporting Production - Listed by County," 20 Sept. 2012.

<sup>3</sup> Ibid., "2011 Bituminous Coal Refuse Production - Listed by County, Pennsylvania Department of Environmental Protection, 20 Sept. 2012.

ROSEBUD MINING COMPANY



*Pennsylvania's top ten operators produce over 54 million tons of coal, accounting for nearly 83 percent of all production and employing 82 percent of the state's coal miners.*

AMERIKOHL MINING, INC.



*Surface bituminous coal mining productivity has become extremely efficient in Pennsylvania, with each coal miner producing, on average, 4.45 tons of coal per hour.*

## Pennsylvania's Coal Mine Productivity

### Bituminous Surface Productivity (Annual)<sup>1</sup>

County	Total Production	Employees	Hours Worked	Tons per Labor Hour	Tons per Employee	Average Hours Worked per Week
Allegheny	69,688	21	35,679	1.95	3,318.48	32.67
Armstrong	1,142,582	82	145,194	7.87	13,933.93	34.05
Beaver	145,280	19	34,033	4.27	7,646.32	34.45
Bedford	83,721	22	39,691	2.11	3,805.50	34.69
Blair	59,990	15	16,291	3.68	3,999.33	20.89
Butler	633,308	54	82,475	7.68	11,727.93	29.37
Cambria	392,598	46	106,060	3.70	8,534.74	44.34
Cameron	7,790	15	4,753	1.64	519.33	6.09
Centre	197,955	35	72,383	2.73	5,655.86	39.77
Clarion	2,436,044	507	909,129	2.68	4,804.82	34.48
Clearfield	269,473	58	76,061	3.54	4,646.09	25.22
Elk	274,501	49	111,623	2.46	5,602.06	43.81
Fayette	269,473	58	76,061	3.54	4,646.09	25.22
Greene	61,896	12	15,631	3.96	5,158.00	25.05
Indiana	386,570	64	113,934	3.39	6,040.16	34.23
Jefferson	337,229	75	125,922	2.68	4,496.39	32.29
Lycoming	222,922	39	91,016	2.45	5,715.95	44.88
Mercer	31,126	34	58,618	0.53	915.47	33.15
Somerset	3,071,601	522	556,279	5.52	5,884.29	20.49
Tioga	-	2	568	-	-	5.46
Venango	57,736	9	14,400	4.01	6,415.11	30.77
Washington	576,984	91	124,281	4.64	6,340.48	26.26
Westmoreland	296,633	27	39,859	7.44	10,986.41	28.39
<b>Total</b>	<b>11,025,100</b>	<b>1,856</b>	<b>2,849,941</b>	<b>3.87</b>	<b>5,940.25</b>	<b>29.53</b>

<sup>1</sup> PADEP, "2011 Bituminous Surface Mines Reporting Production - Listed by County," 20 Sept. 2012, <[www.depweb.state.pa.us](http://www.depweb.state.pa.us)>

**Bituminous Underground Productivity** (Annual)<sup>2</sup>

County	Total Production	Employees	Hours Worked	Tons per Labor Hour	Tons per Employee	Average Hours Worked per Week
Armstrong	2,138,918	241	587,088	3.64	8,875.18	46.85
Beaver	188,609	19	46,900	4.02	9,926.79	47.47
Cambria	848,570	125	297,729	2.85	6,788.56	45.80
Clearfield	1,601,796	176	429,045	3.73	9,101.11	46.88
Elk	154,162	17	40,062	3.85	9,068.35	45.32
Greene	36,488,732	3,532	8,905,725	4.10	10,330.90	48.49
Indiana	2,900,139	458	1,073,809	2.70	6,332.18	45.09
Jefferson	129,104	41	100,851	1.28	3,148.88	47.30
Somerset	2,658,008	598	1,281,170	2.07	4,444.83	41.20
Washington	-	25	57,095	-	-	43.92
<b>Totals</b>	<b>47,108,038</b>	<b>5,232</b>	<b>12,819,474</b>	<b>3.67</b>	<b>9,003.83</b>	<b>47.12</b>

**Refuse Site Productivity** (Annual)<sup>3</sup>

County	Total Production	Employees	Hours Worked	Tons per Labor Hour	Tons per Employee	Average Hours Worked per Week
Cambria	896,285	41	65,897	13.60	21,860.61	30.91
Centre	-	1	128	-	-	2.46
Fayette	6,157	11	18,581	0.33	559.73	32.48
Indiana	594,075	9	17,091	34.76	66,008.33	36.52
Somerset	139,839	5	3,579	39.07	27,967.80	13.77
Washington	3,987	4	2,530	1.55	996.75	12.40
<b>Totals</b>	<b>1,640,343</b>	<b>71</b>	<b>107,806</b>	<b>15.21</b>	<b>23,103.42</b>	<b>29.21</b>

<sup>2</sup> Ibid., "2011 Bituminous Underground Mines Reporting Production - Listed by County," 20 Sept. 2012.

<sup>3</sup> Ibid., "2011 Bituminous Coal Refuse Production - Listed by County, 20 Sept. 2012.

AMERIKOHL MINING, INC.



*Last year, a typical underground bituminous coal miner produced over 9,000 tons of coal.*



MEPCO LLC



*Coal miners are the backbone of Pennsylvania industry. The coal produced from the 8,724 direct mining jobs and the 32,853 indirect mining jobs generates nearly half of the state's electricity.*

## Pennsylvania's Coal Employment

### Pennsylvania Coal Industry Employment, 2011

County	Number of Employees*			Total
	Underground Mining	Surface Mining	Coal Refuse	
Bituminous <sup>1</sup>				
Allegheny	-	21	-	21
Armstrong	241	82	-	323
Beaver	19	19	-	38
Bedford	-	22	-	22
Blair	-	15	-	15
Butler	-	54	-	54
Cambria	125	46	41	212
Cameron	-	15	-	15
Centre	-	35	1	36
Clarion	-	90	-	90
Clearfield	176	507	-	683
Elk	17	49	-	66
Fayette	-	58	11	69
Greene	3,532	12	-	3,544
Indiana	458	64	9	531
Jefferson	41	75	-	116
Lycoming	-	39	-	39
Mercer	-	34	-	34
Somerset	598	522	5	1,125
Tioga	-	2	-	2
Venango	-	9	-	9
Washington	25	91	4	120
Westmoreland	-	27	-	27
Total Bituminous	5,232	1,888	71	7,191
Anthracite <sup>2 3 4</sup>				
Carbon	0	17	18	35
Columbia	34	51	2	87
Dauphin	3	0	0	3
Lackawanna	0	4	1	5
Luzerne	0	245	49	294
Northumberland	14	6	39	59
Schuylkill	43	221	165	429
Total Anthracite	94	544	274	912

\*Does not include salary positions.

<sup>1</sup> PADEP, "2011 Bituminous Employees and Production Tonnage - Summary by County, 20 Sept. 2012. <[www.depweb.state.pa.us](http://www.depweb.state.pa.us)>

<sup>2</sup> Ibid., "2011 Anthracite Underground Mines - Summary Production Information by County, 20 Sept. 2012.

<sup>3</sup> Ibid., "2011 Anthracite Surface Mines - Summary Production Information by County, 20 Sept. 2012.

<sup>4</sup> Ibid., "2011 Anthracite Coal Refuse Sites - Summary Production Information by County, 20 Sept. 2012.

## Pennsylvania's Coal Distribution<sup>1</sup>

Coal is the most important commodity carried by America's railroads. It accounts for more than 43 percent of all tonnage shipped and over 24 percent of all gross rail revenues received. The efficiency of rail shipping is one of the leading reasons coal is the primary source of energy for electricity generation in the United States. With over 70 percent of all coal delivered to U.S. power plants delivered by rail, the businesses of coal, rail, and power generation are inextricably linked.

In 2011, Class I railroads originated 816 million tons and over 7 million carloads of coal, producing more revenue than any other commodity shipped by rail. Total revenue from coal shipments for Class I railroads was over \$16 billion; the second closest shipped commodity was chemicals, generating \$8.9 billion in revenue.

Because of productivity gains, railroads have dramatically increased their coal carrying capacity. In 2011, the average coal car carried 115.7 tons of coal, up almost 20 percent from 98.2 tons in 1990.

With increased efficiency came lower shipping costs. Using revenue per ton-mile (RPTM) as a measure for rates, in 2010, the cost of shipping coal was almost half that of any other commodity. The average RPTM for coal was \$0.025; for all other commodities excluding coal, the average RPTM was \$0.0533. Adjusting for inflation, coal's RPTM was 49 percent lower in 2010 than in 1981. This means that a typical producer can ship twice as much coal today for the same price it would have paid 30 years ago.

ROSEBUD MINING COMPANY



Class I railroads are classified by operating revenue. The U.S. Surface Transportation Board defines a Class I railroad as having annual carrier operating revenues of \$250 million or more after adjusting for inflation.

<sup>1</sup> Association of American Railroads, "Railroads and Coal," 20 June 2012. <[www.aar.org/keyissues/Documents/Background-Papers/Railroads-and-Coal.pdf](http://www.aar.org/keyissues/Documents/Background-Papers/Railroads-and-Coal.pdf)>

ALPHA NATURAL RESOURCES



*The coal industry accounts for one in five rail-road jobs.*

## Pennsylvania's Bituminous Coal Distribution, 2011<sup>\*1</sup>

(thousands of tons)

Destination State	Power Sector	Coke Plants	Industrial Plants	Commercial & Industrial	Total
<b>Via Railroad</b>					
Delaware	58	-	-	-	58
Florida	11	-	-	-	11
Georgia	26	-	-	-	26
Illinois	-	59	-	-	59
Indiana	361	-	-	-	361
Kentucky	-	21	-	-	21
Maryland	3,131	-	-	-	3,131
Michigan	129	-	-	-	129
New Hampshire	507	-	-	-	507
New Jersey	525	-	-	-	525
New York	456	-	254	-	710
North Carolina	309	-	-	-	309
Ohio	3,535	308	-	-	3,843
Pennsylvania	12,520	-	295	-	12,815
South Carolina	1,406	-	8	-	1,414
Tennessee	24	-	-	-	24
West Virginia	890	-	-	-	890
Wisconsin	1,764	-	5	-	1,769
<b>Total Via Rail</b>	<b>25,652</b>	<b>388</b>	<b>562</b>	<b>-</b>	<b>26,602</b>
<b>Via River</b>					
Florida	210	-	-	-	210
Illinois	-	148	-	-	148
Indiana	1,151	-	-	-	1,151
Kentucky	47	-	-	-	47
Ohio	709	-	-	-	709
Pennsylvania	3,317	455	-	4	3,776
West Virginia	1,424	403	-	-	1,827
<b>Total Via River</b>	<b>6,858</b>	<b>1,006</b>	<b>-</b>	<b>4</b>	<b>7,868</b>
<b>Via Truck</b>					
Kentucky	-	-	-	2	2
Maryland	39	-	186	-	225
Michigan	-	-	-	4	4
New York	85	-	55	-	140
Ohio	-	-	3	-	3
Pennsylvania	5,583	1	1,095	13	6,692
West Virginia	35	-	61	-	96
<b>Total Via Truck</b>	<b>5,742</b>	<b>1</b>	<b>1,400</b>	<b>19</b>	<b>7,162</b>

\*Data reflects the distribution of domestically-produced coal. Excluded are coal imports and exports, waste coal for the electricity power sector (which are significant for Pennsylvania), and all receipts for the commercial and industrial combined heat and power plants.

<sup>1</sup> US EIA, "By Coal Destination State," *Annual Coal Distribution Report 2011*, 6 Nov. 2012. <www.eia.gov>

## PA's Bituminous Coal Distribution Summary, 2011<sup>2</sup>

(thousands of tons)

Transported Via	Power Sector	Coke Plants	Industrial Plants	Commercial & Industrial	Total
Great Lakes	-	-	40	-	40
Railroad	25,652	388	562	-	26,602
River	6,858	1,006	-	4	7,868
Tramway, Conveyor & Slurry Pipeline	915	-	-	-	915
Truck	5,742	1	1,400	119	7,162
<b>Totals</b>	<b>39,167</b>	<b>1,395</b>	<b>2,002</b>	<b>23</b>	<b>42,587</b>

## Pennsylvania's Coal Originations by Rail<sup>3</sup> (tons)

	2006	2007	2008	2009	2010	2011
Bituminous	36,361	40,378	27,690	29,192	30,144	26,599
Anthracite	182	475	-	9	27	8
<b>Total Rail Originations</b>	<b>36,543</b>	<b>40,853</b>	<b>27,690</b>	<b>29,201</b>	<b>30,171</b>	<b>26,607</b>

<sup>2</sup> Ibid., "By Coal Origin State."

<sup>3</sup> Ibid.

<sup>4</sup> Ibid.

<sup>5</sup> Ibid., "By Coal Destination State."

AMERIKOHL MINING, INC.



*Sixty-two percent of Pennsylvania's coal is distributed by rail.*

ROSEBUD MINING COMPANY



CONSOL ENERGY

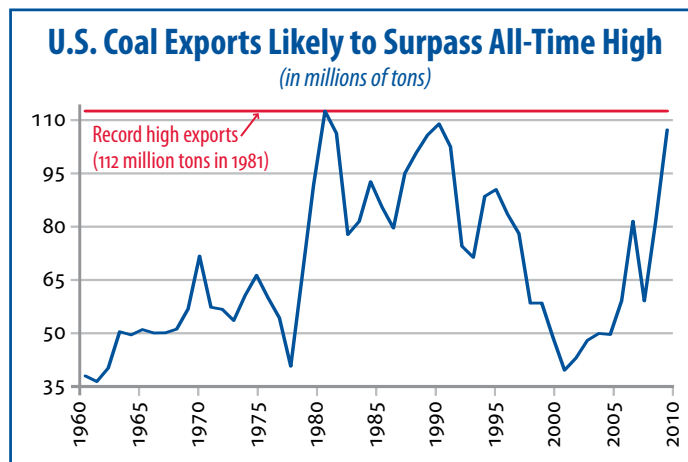


Coal exports are described in two forms: **metallurgical coal**, which is used for steel production, and **steam coal**, which is used for electricity generation. Metallurgical coal dominated U.S. coal exports in 2011, totaling approximately 70 million tons compared to about 38 million tons for steam coal.

## America's Coal Exports

The United States exported 107.2 million tons of coal in 2011, just short of the record high of 113.0 million tons set in 1981. Coal exports in 2011 marked a significant reversal from the downward trajectory of U.S. coal exports that began in the early 1990s and bottomed in 2002 when only 40 million tons were exported. If exports continue at their current pace, they are expected to approach a record-breaking 133 million tons in 2012.

Europe and Asia purchased the vast majority of America's coal, totaling 76 percent of all coal exports in 2011. Even though Europe has traditionally received a significant portion of U.S. coal exports, coal exports to Asia have steadily grown since 2009 because of that region's unprecedented economic growth, particularly in China, India, and South Korea. In 2011, total coal exports were up 31 percent compared to 2010, due mostly to these two regions.<sup>1</sup>

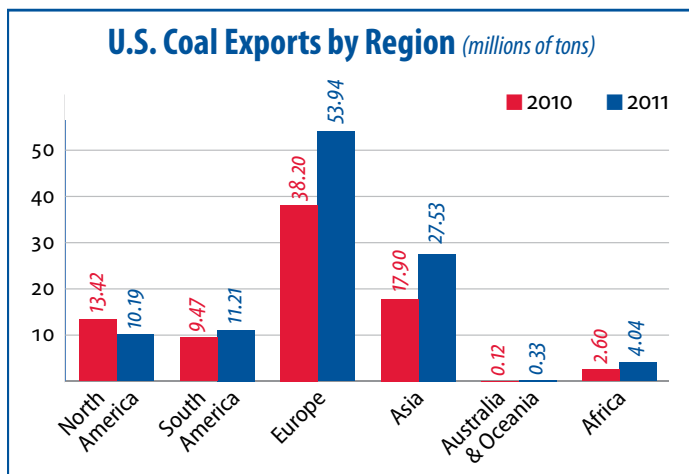


Several factors played a role in the rise of U.S. coal exports, but the most significant is economic growth in Asia. Even though China is the largest producer of coal, it is still the largest importer of coal to fuel its rapid economic growth.

The U.S. was able to meet China's and the rest of the world's demand because of falling domestic consumption (down 4.6 percent in 2011, mostly due to an unseasonably warm winter) as well as a slight increase in production.

<sup>1</sup> US EIA, "Table 7.5 Coal Exports by Country of Destination, 1960-2011," 27 Sept. 2012. <<http://www.eia.gov/totalenergy/data/annual/showtext.cfm?t=ptbo705>>





**Coal Exports by Destination Country\***<sup>3</sup> (millions of tons)

Year	Canada	United Kingdom	Netherlands	Brazil	Japan	Exports Total
1990	15,511	5,177	8,369	5,847	13,338	105,804
1991	11,178	6,171	9,625	7,052	12,269	108,969
1992	15,140	5,595	9,148	6,370	12,304	102,516
1993	8,889	4,111	5,562	5,197	11,878	74,519
1994	9,193	3,363	4,874	5,482	10,158	71,359
1995	9,427	4,726	7,301	6,351	11,787	88,547
1996	12,029	6,196	7,058	6,540	10,529	90,473
1997	14,975	7,185	4,825	7,455	7,974	83,545
1998	20,654	5,947	4,516	6,475	7,734	78,048
1999	19,826	3,162	3,432	4,442	4,953	58,476
2000	18,769	3,294	2,623	4,536	4,446	58,489
2001	17,633	2,471	2,123	4,574	2,070	48,666
2002	16,686	1,902	1,650	3,538	1,253	39,601
2003	20,760	1,480	1,993	3,514	6	43,014
2004	17,760	1,986	2,471	4,361	4,426	47,998
2005	19,466	1,777	2,623	4,199	2,081	49,942
2006	19,889	2,565	2,091	4,534	332	49,647
2007	18,389	3,361	4,553	6,512	5	59,163
2008	22,979	5,763	7,004	6,380	1,733	81,519
2009	10,599	4,589	5,878	7,416	907	59,097
2010	11,400	4,391	7,306	7,925	3,164	81,716
2011	6,845	6,927	10,785	8,680	6,923	107,259

\*Data for China and India not separately available.

<sup>2</sup> US EIA, "Most U.S. coal exports went to European and Asian markets in 2011," *Today in Energy*, 19 June, 2012. <[www.eia.gov/todayinenergy/detail.cfm?id=6750](http://www.eia.gov/todayinenergy/detail.cfm?id=6750)>

<sup>3</sup> US EIA, "Table 7.5 Coal Exports by Country of Destination, 1960-2011," 27 Sept. 2012. <[www.eia.gov/totalenergy/data/annual/showtext.cfm?t=ptb0705](http://www.eia.gov/totalenergy/data/annual/showtext.cfm?t=ptb0705)>

ALPHA NATURAL RESOURCES



*Pennsylvania exported 14,497,000 tons of coal in 2011. Of that total, 14,100,000 tons were bituminous.*

AMERIKOHL MINING, INC.



*The Pennsylvania coal industry contributes over \$7 billion annually to the Pennsylvania economy and is responsible for the existence of 41,500 mine-related jobs across the state.*

## Economic Impact of Coal in Pennsylvania<sup>1</sup>

Coal production is vital to Pennsylvania's economy. In 2011, the industry directly contributed \$3.2 billion in economic output to the Commonwealth, supplied well-paying jobs for nearly 41,500 Pennsylvania residents, and provided more than \$750 million in federal, state, and local personal income and payroll tax revenue.

### Coal Output

The coal industry's \$3.2 billion in direct output stimulated an additional output of \$4.2 billion across the state from companies that supply products and services directly to the coal industry and their respective supply chains. In total, approximately \$7.5 billion in output resulted from coal activity in Pennsylvania.

### Coal Industry's Economic Impact in Pennsylvania, 2011

Coal Industry	*Direct Mining Jobs	*Indirect Mining Jobs	Total
Employment Impact	8,724	32,853	41,577
Output Impact	\$3,247,978,670	\$4,229,193,026	\$7,477,171,696

\*Does not include salaried positions.

### Average Wages

The 41,500 full- and part-time jobs supported by the coal industry pay family sustaining wages. Moreover, the 8,500 direct coal mining jobs pay well above the private sector norm, particularly of those in manufacturing.

<sup>1</sup> *The Economic Impact of the Coal Industry in Pennsylvania*, Pennsylvania Economy League of Southwestern Pennsylvania, LLC, April 2010. <[www.allegheny-conference.org/PennsylvaniaEconomyLeague/PDFs/EconomicImpactAnalyses/EconomicImpactOfCoalIndustryInPa0410.pdf](http://www.allegheny-conference.org/PennsylvaniaEconomyLeague/PDFs/EconomicImpactAnalyses/EconomicImpactOfCoalIndustryInPa0410.pdf)>

## Pennsylvania Occupational Wages for Mining, 2011

Occupation	Entry Annual Wage	Experienced Annual Wage	Average Annual Wage	Average Hourly Wage
Mining & Geological Engineers	\$49,290	\$85,820	\$73,640	\$35.41
Explosive Workers & Blasters	\$37,490	\$54,140	\$48,590	\$23.36
Continuous Mining Operators	\$36,440	\$51,780	\$46,670	\$22.44
Mine Cutting Operators	\$29,670	\$48,250	\$42,050	\$20.22
Mining Machine Operators	\$36,000	\$45,780	\$42,520	\$20.44
Roof Blasters, Mining	\$45,730	\$55,500	\$52,240	\$25.12
Loading Machine Operators	\$41,700	\$48,290	\$46,090	\$22.16

## Mining Machinery

Pennsylvania also has a strong manufacturing base that produces machinery and equipment used by the coal industry. The number of people employed in the manufacturing of mining machinery and equipment in Pennsylvania is six times the average of all other states combined and amounts to 27% of the nationwide employment in that sector.

Pennsylvania's mining machinery and equipment industry serves the coal industry nationally, and, conversely, these Pennsylvania jobs are supported by national and international coal demand.

R. G. JOHNSON COMPANY



*For each direct coal industry job, an additional 3.77 jobs are generated throughout the Commonwealth.*

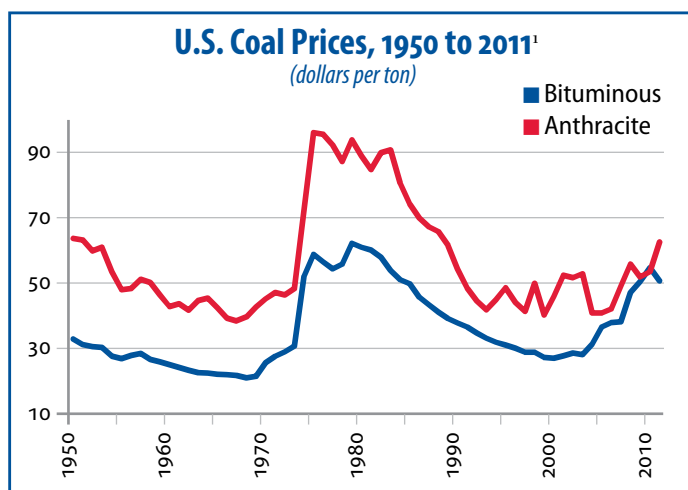
CONSOL ENERGY



*U.S. bituminous coal prices increased in 2011 primarily because of international demand, with exports nearing record levels.*

## Coal Prices

In 2011 coal prices in the United States were mixed; the average price for bituminous (adjusted for inflation) was \$50.85 per ton and for anthracite, \$62.62 per ton. Prices for anthracite increased by 17 percent while prices for bituminous fell by 7 percent during the year. Overall, coal prices have dramatically risen since 2000, in inflation adjusted terms, increasing by 87 percent for bituminous and 36 percent for anthracite.



Coal prices are well above their all-time lows of the 1960s, when anthracite sold for \$38.41 per ton and bituminous for \$21.33 per ton, but they still have not reached the record highs of the 1970s when anthracite sold for \$96.04 per ton and bituminous for \$62.35.

The upward trend in coal prices can be attributed to both supply and demand. Slightly lower production in 2011, combined with increased demand from Asia and Europe, pushed prices higher.

Increased demand came from countries such as China and India that have experienced uncommonly high economic growth rates. These countries are unable to mine enough coal domestically to support their growing economies' needs.

<sup>1</sup> US EIA, "Table 7.9 Coal Prices, 1949-2011," Annual Energy Review, 27 Sept. 2012. <<http://www.eia.gov/totalenergy/data/annual/showtext.cfm?t=ptbo709>>

Coal prices have historically been more stable than oil and gas prices; that is why coal has been — and will remain — the most affordable and efficient fuel source for power generation and steel production.

Coal prices in Pennsylvania did not follow the national trend; both anthracite and bituminous rose approximately 26 percent for the year, outperforming U.S. averages. The primary reason for Pennsylvania's price increases were local demand and proximity to eastern seaports.

Local demand for Pennsylvania's coal primarily came from electricity generators in the region, accounting for the majority of the state's coal. However, the increased demand from Europe and Asia put additional upward pressure on prices — more so than other coal-producing regions of the U.S. — because of Pennsylvania's close proximity to major coal exporting seaports, allowing for Pennsylvania coal to export coal more economically than other regions of the U.S.

AMERIKOHL MINING, INC.



## Pennsylvania's Mine Safety

ROSEBUD MINING COMPANY



Miner safety is the top priority of Pennsylvania's coal producers, and overwhelming progress has been made in keeping miners safe. Investments in training and technology improvements, coupled with government oversight, have contributed to reduced injuries and the near elimination of fatalities in the industry.

Mine safety standards are highly regulated by the Federal Mine Safety and Health Administration

(MSHA) and the Pennsylvania Department of Environmental Protection's Bureau of Mine Safety. Together, these agencies ensure that all mines and their operations are regularly and thoroughly inspected and operating safely at all times.

The year 2011 marked the second straight year without a work-related fatality in a Pennsylvania-permitted coal mine. Through technological advancements, improved safety equipment, and dedication to safety by miners and coal companies, the potential for serious injury and fatalities has been reduced and almost nullified.

**Training for Surface Miners.** All of Pennsylvania's new miners must have 24 hours of training and pass a written exam before being eligible for employment at a surface mine. After the initial training, each surface mine employee is required to receive eight hours of continuing education annually.

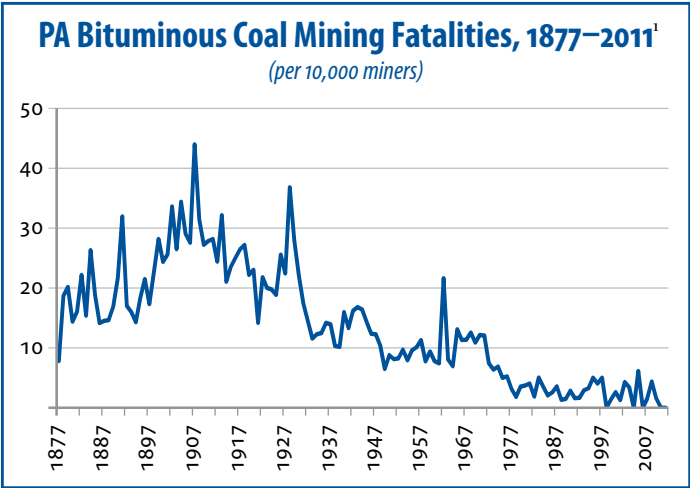
*A safe mine is a productive mine, and a productive mine is a safe mine.*



**Training for Underground Miners.** Pennsylvania’s underground miners are required to have a minimum of 40 hours of training plus a written exam prior to beginning work as a miner. An additional eight hours of continuing education is required every year.

To become an Underground Mine Foreman, a miner must have at least five years’ work experience in an underground coal mine, with two years in a working section. An Assistant Mine Foreman must have at least four years’ work experience, with two of those years in a working section.

Pennsylvania’s Bureau of Mine Safety uses both federal and state funds to train miners. In a pre-employment orientation, all miners are taught mine rescue and emergency medical techniques. The Bureau also holds educational programs for miners addressing critical matters they will be exposed to on a daily basis, such as gas detection awareness, ventilation, self-contained breathing apparatus, and blasting awareness. Pennsylvania’s Bituminous Mining Fatalities, 2001–2011



<sup>1</sup> PADEP, “Bituminous Coal Mining Activities 1877 to 2011 - Historical Summary,” Mining Programs, Reports, Bituminous, 20 Sept. 2012. <[www.depweb/state/pa/us](http://www.depweb/state/pa/us)>

**Pennsylvania’s Bituminous Mining Fatalities, 2001 – 2011<sup>2</sup>**

Year	Employees	Fatalities
2001	7,720	1
2002	6,995	3
2003	5,860	2
2004	6,515	0
2005	6,537	4
2006	6,288	0
2007	6,381	1
2008	6,895	3
2009	6,597	1
2010	6,466	0
2011	7,191	0

<sup>2</sup> Ibid.



Electricity is sold in **kilowatt hours** (1,000 watt hours). A **kilowatt hour** is a unit of energy equivalent to one kilowatt of power expended for one hour of time. For example, a heater rated at 1,000 watts (1 kilowatt), operating for one hour, uses one kilowatt hour of energy. A 60-watt light bulb consumes 0.6 kilowatt hours of energy per hour.

The cost of running electrical appliances in a home is the product of the power in kilowatts multiplied by the running time of the appliance and the price per kilowatt hour.

A **megawatt hour** is a thousand kilowatt hours. It is approximately the amount of electricity used by 330 homes in one hour.

## Pennsylvania's Coal Power Plants and Electricity Costs

### Pennsylvania Net Electricity Generation, by Source<sup>1</sup> (in megawatt hours)

Year	Coal <sup>1</sup>	Natural Gas <sup>2</sup>	Nuclear <sup>3</sup>	Total
1990	106,677,155	2,833,882	57,787,051	175,623,311
1991	106,028,875	2,108,889	57,475,671	172,762,709
1992	109,124,697	2,707,834	60,132,729	179,405,645
1993	108,131,818	3,869,669	59,330,534	181,214,132
1994	101,867,590	4,079,764	67,206,815	184,078,701
1995	106,334,647	4,926,183	66,461,535	185,451,311
1996	111,199,706	3,093,102	68,672,038	191,872,623
1997	115,504,502	2,654,904	67,654,588	193,463,198
1998	116,387,155	3,890,017	61,149,224	191,191,518
1999	111,214,374	3,802,013	71,127,449	194,528,045
2000	116,212,561	2,699,072	73,771,347	201,687,980
2001	111,900,448	3,036,297	73,730,797	196,576,591
2002	113,906,440	6,715,537	76,088,930	204,322,878
2003	116,009,874	5,518,536	74,360,862	206,349,513
2004	117,175,783	9,813,647	77,458,632	214,658,501
2005	120,933,254	10,807,750	76,289,432	218,091,125
2006	122,557,903	13,541,728	75,297,632	218,811,595
2007	122,693,094	19,197,600	77,376,316	226,088,340
2008	117,583,412	18,730,607	78,658,093	222,350,925
2009	105,474,534	29,214,955	77,327,686	219,496,144
2010	110,369,292	33,717,608	77,828,348	229,752,306
2011	100,602,082	41,792,165	76,146,617	227,636,139

### Five Largest Coal Power Plants by Generation Capacity, 2010<sup>2</sup>

Plant	Operating Company	Net Summer Capacity (Megawatt hours)
Bruce Mansfield	FirstEnergy Generation, Corp	2,510
Homer City Station	Midwest Generation EME LLC	1,884
Conemaugh	RRI Energy NE Management Co	1,712
Keystone	RRI Energy NE Management Co	1,711
Hatfield's Ferry	Allegheny Energy Supply Co LLC	1,590

<sup>1</sup> US EIA, "1990-2011 Net Generation by State by Type of Producer by Energy Source (EIA-906, EIA-920, and EIA-923)" 17 Jan. 2013 <[www.eia.gov/electricity/data/state/](http://www.eia.gov/electricity/data/state/)>

<sup>2</sup> US EIA, "Table 2. Ten Largest Plants by Generation Capacity, 2010," Form EIA-860, Annual Electric Generator Report, 5 Jan. 2013. <[www.eia.gov/electricity/state/pennsylvania/pdf/Pennsylvania.pdf](http://www.eia.gov/electricity/state/pennsylvania/pdf/Pennsylvania.pdf)>

## Coal Consumption in Pennsylvania for Electricity Generation

Year	Coal (in tons) Consumption for Electricity
1990	45,497,182
1991	45,248,585
1992	46,518,367
1993	47,161,055
1994	45,434,368
1995	47,348,693
1996	49,562,430
1997	50,730,191
1998	50,906,994
1999	48,849,311
2000	52,064,279
2001	49,415,494
2002	50,331,922
2003	51,299,946
2004	51,608,474
2005	54,291,946
2006	55,814,230
2007	55,490,146
2008	53,917,459
2009	48,805,298
2010	50,993,378
2011	47,324,852

## Average Price and Quality for Electric Power Delivered in Pennsylvania

Year	Price		Heat Value	
	Coal (cents per Btu)	Natural Gas (cents per Btu)	Coal (Btu/pound)	Natural Gas (Btu/cubic foot)
2004	137	723	11,615	1,033
2005	159	990	11,741	1,033
2006	172	772	11,459	1,033
2007	175	780	11,400	1,035
2008	210	1,016	11,079	1,031
2009	230	461	10,940	1,027
2010	241	519	11,063	1,025



The **British thermal unit**, or **Btu**, is a unit of energy that is the approximate amount of energy needed to heat one pound of water by one degree Fahrenheit.

<sup>1</sup> US EIA, "Fossil Fuel Consumption for Electricity Generation by Year, Industry Type and State (EIA-906, EIA-920, and EIA-923)," 15 Nov. 2011. <[www.eia.gov/electricity/data/state/consumption\\_annual.xls](http://www.eia.gov/electricity/data/state/consumption_annual.xls)>

<sup>2</sup> US EIA, "Table 6. Electric Power Delivered Fuel Prices and Quality for Coal, Petroleum, and Natural Gas, 2000 and 2004 Through 2010," 5 Jan. 2012 <[www.eia.gov/electricity/state/pennsylvania/pdf/Pennsylvania.pdf](http://www.eia.gov/electricity/state/pennsylvania/pdf/Pennsylvania.pdf)>

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**Mine Reclamation** is the process of restoring mined land back to its natural or economically-usable purpose. Although the process of mine reclamation occurs when mining is complete, preparation and planning for the reclamation begins before mine permits are even issued.

**Coal Remining** is the mining of abandoned surface or underground mines and coal refuse piles in which the site is reclaimed to its original state.

## Reclaiming Pennsylvania's Abandoned Mines

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Until the Surface Mining Control and Reclamation Act (SMCRA) was passed in 1977, there were no comprehensive federal laws regulating surface mining. SMCRA established guidelines for the states for permitted existing and future mines as well as a fund to finance the reclamation of abandoned mines.

### The Process

Before a mining permit is issued, SMCRA requires operators to present a comprehensive plan for reclaiming the land after mining activity has been completed. Operators are also required to post a performance bond to ensure that funds will be available to complete the reclamation if the operator goes out of business before it can complete the reclamation.

**Funding Mine Reclamation.** To fund the reclamation of abandoned mines closed prior to 1977, SMCRA created a trust funded by a production tax on coal. Mine operators must now pay a tax of \$0.12 a ton for underground mined coal and \$0.28 a ton for surface mined coal (these rates were reduced from \$0.135 and \$0.315 per ton, respectively, on October 1, 2012).

The Abandoned Mine Reclamation Fund distributes the proceeds from the tax to states that have an approved reclamation program and to the federal Office of Surface Mining to purchase and reclaim abandoned mines.

**Reclaiming Pennsylvania's Mines.** Pennsylvania began mining coal in the 1880s, producing the coal that fueled the industrial growth of America as well as providing the energy to fight two world wars. But this legacy left Pennsylvania's landscape with more than 250,000 acres of abandoned surface mines.

Pennsylvania has always been a leader in reclaiming abandoned mines. Most notably, in the mid-1960s, a decade before SMCRA, Pennsylvania enacted **Operation Scarlift**. This program has invested \$200 million to address Pennsylvania's abandoned mines, with significant results:

- Completed more than 500 stream pollution abatement projects \$75 million
- Extinguished 75 underground mine fires \$24 million
- Stabilized more than 150 areas subjected to mine subsidence \$26 million
- Controlled air pollution at 30 refuse banks \$16 million

**Re-mining**

Re-mining is an extremely effective tool in the reclamation of abandoned mine lands in Pennsylvania. During the last five years, coal mine operators have provided over \$8.7 million to return mined land back to its original state without using any state or federal government funds.

**2011 Reclamation Award Winners**

**Amerikohl Mining, Inc.  
Butler, PA**

**142 acres, Dunbar Twp., Fayette County:**  
Transformed 5.5 acres into the perfect habitat for many wildlife species.

**143 acres, Sandy Twp., Clearfield County:**  
Reclaimed 8 acres of sinkholes associated with extensive deep mining; abated two post-mining discharge points, reducing constituent loadings to the receiving stream; and returned the land to pasture land and forests.

**32 acres, Young Twp., Jefferson County:**  
Reclaimed 1,000 feet of open highwall along with 3 acres of sinkholes; abated post-mining discharge, reducing acid loading to the receiving stream; and returned the land to forest.

**Original Fuels, Inc.  
Punxsutawney, PA**

**12 acres, Perry Twp., Jefferson County:**  
Reclaimed 3 acres of land; eliminated a section of abandoned highwall; and returned the acreage to unmanaged natural habitat.

## 2011 Reclamation Award Winners, *cont.*

### **P&N Coal Company, Inc.** **Punxsutawney, PA**

#### **21-acre site, Winslow**

#### **Twp., Jefferson County:**

Subsidence had created accessibility challenges. Turned half of the acreage into land for hunting and recreation and the other half into wildlife food plots.

### **PBS Coals, Inc.** **Friedens, PA**

#### **102-acre site, Somerset**

#### **Twp., Somerset County:**

Reclaimed 28 acres of abandoned mine lands; eliminated 1,700 feet of unreclaimed highwalls; and returned the land to woodlands and crop land.

### **Waroquier Coal Company** **Clearfield, PA**

#### **Knox Twp., Clearfield**

**County:** Reclaimed 41 acres of previously mined land including an existing 5,300 foot highwall; converted it to a wildlife habitat; and increased site pH from 2.1 to 6.6 through special handling of mining material and addition of alkaline material.

## Remining and Reclamation in Pennsylvania<sup>1</sup>

	2004*	2005*	2006	2007	2009	2010	2011
Acres reclaimed by industry remining and no-cost contracts	179	266	912	537	376	587	478
Acres reclaimed by government	1,139	788	620	755	1,046	554	407
Remining/government reclamation ratio	1:6	1:3	1.5:1	1:1.4	1:3	1:1	1.2:1
Estimated dollar value of industry remining/reclamation (\$ million)	\$0.54	\$0.80	\$2.70	\$1.60	\$1.20	\$1.80	\$1.40

\*Because of the change to conventional bonding in 2001, and changes in the way DEP tracks lands reclaimed by remining, representative data on reclamation by industry is not tracked exactly. However, DEP believes that industry numbers for 2004 and 2005 may have been underestimated.

The Pennsylvania Coal Alliance strongly supports and applauds all remining and mine reclamation efforts by its members and coal operators nationwide. That is why the Pennsylvania Coal Alliance, along with the Department of Environmental Protection, sponsors the Annual Reclamation Awards for outstanding reclamation projects.

This award recognizes the great lengths to which operators go to meet and, in many instances, surpass the government's strict environmental standards.

<sup>1</sup> PADEP, "Draft Surface Mining Conservation and Reclamation Act 2011 Reclamation and Remining Incentives Report," 26 Jun. 2012. <[http://files.dep.state.pa.us/Mining/BureauOfMiningPrograms/BMPPortalFiles/MRAB/Agendas\\_and\\_Handouts/2012/July\\_12/DRAFT\\_incentive\\_report.pdf](http://files.dep.state.pa.us/Mining/BureauOfMiningPrograms/BMPPortalFiles/MRAB/Agendas_and_Handouts/2012/July_12/DRAFT_incentive_report.pdf)>



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## Non-Producers

- 18 Karat Inc  
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Matheson Valley Gas  
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Pillar Industrial Products Company  
Pillar Innovations, LLC  
Piney Creek L.P.  
Pittsburgh Wire & Cable  
PM Supply Inc  
PPL EnergyPlus, LLC  
PrepTech, Inc.  
Promark Industries, Inc.  
Pumpaction Corporation
- Q** Quality Aggregates, Inc.  
The Quikrete Companies
- R** R & E Electric Company, Inc.  
R. G. Johnson Company, Inc.  
R. K. Stein & Company  
R.M. Manufacturing Sales & Service, Inc.  
R & S Machine Co. Inc.  
Regal Industrial Corporation
- The Reschini Group  
RFI Energy, LP  
RICHWOOD  
River Hill Coal Company, Inc.  
Robindale Energy Services, Inc.  
Rockwood Casualty Insurance  
Rosscares, Inc.  
Royal Hydraulic Services & Mfg., Inc.  
Rudd Equipment Co.
- S** S & T—Evergreen Ins. LLC  
Safety Products Inc.  
A. Sebulsky Steel Company  
SENEX Explosives, Inc.  
Shaffer's Fabricating, Inc.  
Shaft Drillers International Limited  
Sherpa Mining Contractors Inc.  
Sherwin—Williams (Mining Div.)  
Shuck Construction Company, LLC  
Shumar's Welding & Machine Service, Inc.  
Skelly and Loy, Inc.  
Stash Mining Company  
Steel Nation / Steel Building  
Steptoe & Johnson PLLC  
Strata Worldwide  
Swanson Industries, Inc.  
Szalankiewicz Engineering, P.C.
- T** Taggart Global  
Target Drilling, Inc.  
Tensor International  
Three Rivers Marine & Rail Terminals LP  
Traval Contractors Supply, Inc.
- V** Valley Tire Company, Inc.  
Victaulic Corporation of America  
Voto Sales Company
- W** W. K. Merriman Inc.  
Wallace & Pancher, Inc.  
Wampum Hardware Co.  
West View—Cunningham Co., Inc.
- X** Xcoal Energy & Resources



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