

Research Brief: U.S. Coal Phase-Out, Blow by Blow

Plant Closings and the Likely Corresponding Effect on
Specific Companies and Mines



Institute for Energy Economics
and Financial Analysis
IEEFA.org

April 2017

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Introduction

At least 46 coal-fired generating units at 25 electricity plants in 16 states will likely close, convert to natural gas, or be intentionally curtailed in 2017 and 2018 as the U.S. electricity sector moves increasingly away from coal and toward other sources of power.

These changes will have an adverse impact on the coal-mining industry—and on certain mines and companies in particular—eliminating about 28.2 million tons of annual demand by the end of 2018, an amount of coal worth nearly \$1.1 billion, delivered, at 2016 prices.

This research brief presents plant-by-plant likelihoods and the corresponding effects on the companies and mines that supply those plants, which are in Colorado, Florida, Kentucky, Illinois, Massachusetts, Minnesota, Nevada, New Jersey, New Mexico, North Dakota, Ohio, Tennessee, Texas, Virginia, West Virginia and Wisconsin.

Producers in two major mining regions will be especially hard hit: those in the Powder River Basin of Wyoming and Montana and those in the Illinois Basin.

Coal-mining operations in the Four Corners region of the Southwest U.S. will also feel sharp effects from plant closings. Those with operations in Appalachia and the Uinta Basin of Utah, two regions already reeling from loss of demand, will be affected as well.

The two U.S. coal producers that stand to be the most affected by the plant closings are the two biggest: Peabody Energy and Cloud Peak Energy. Other affected companies include Westmoreland Coal, Alliance Resource Partners and Foresight Energy.

Overview

The U.S. electricity-generation sector continues to change rapidly as power producers continue to shift from coal to cheaper natural gas and renewables.

This research brief details the likely elimination through 2018 of coal-fired generation units with a combined net summer capacity in 2016 of 16 gigawatts or about 5.7 percent of the total coal-fired U.S. electricity generation capacity of 280 gigawatts in 2015. (Summer capacity is commonly used because it reflects output potential when demand is highest).

As coal generation is scaled back or eliminated at these 25 plants (which have a total of 46 separate coal-fired units slated to either close, convert to natural gas, or be purposely curtailed) specific coal-producing regions will feel varying impacts.

While generation at some coal-fired plants around the U.S. has increased during the first quarter of 2017, there is little reason to believe that this represents a long-term trend or anything resembling a recovery for coal.

Indeed, the transformative shift in electricity generation across the U.S. is likely to continue as intense cost competition from renewables and natural gas continues a trend toward more coal-fired plant closures and has even led to some nuclear plant retirements over the past few years.

To assess the specific impact of the closures expected by the end of 2018 in this rapidly changing marketplace, IEEFA has identified coal-fired units whose owners have announced retirement or conversion dates. From there, we used the amount of power generated at these units and each plant's overall generation to calculate the unit's share of coal used in 2016. That calculation shows the amount of coal demand likely to be lost at 28.2 million tons; that two-thirds of it came from the Powder River and Illinois Basins, and at 2016 contract prices, was worth at least \$1.1 billion, including the cost of delivery.

Our analysis is conservative in that it considers only those plants and units seem either certain or all but certain to close by the end of 2018.

We do not include some possible—perhaps probable—closures of plants like the Navajo Generating Station in Arizona. Nor have we included some plants in Texas, Ohio and Florida that have been shown to be uneconomical to run and highly likely to be retired in the near future but have not been formally designated for retirement.

Plants and Units to Be Closed

A total of 24 coal-fired units at 14 plants are set to be retired in 2017, and 22 more units at 11 plants in 2018 (for a total over 2017-18 of 46 units at 25 plants).

Here is a breakdown:

Coal-Fired Unit Closures Planned for 2017

COMPANY	PLANT	STATE	UNIT	NET SUMMER CAPACITY MW	FIRST YEAR OPERATING	ESTIMATE OF COAL USED, 2016, TONS
FEBRUARY						
Nevada Power	Reid Gardner ¹	NV	4	257	1983	22,400
MARCH						
Public Service of Colorado	Valmont ²	CO	5	184	1964	437,378
APRIL						
Florida Power & Light	Indiantown ³	FL	1	330	1995	234,932
Tennessee Valley Authority	Paradise	KY	1	628	1963	1,051,734
	Paradise	KY	2	602	1963	1,112,976
Virginia Electric & Power	Yorktown	VA	1	159	1957	15,332
	Yorktown	VA	2	164	1958	91,050
JEMB Family; others	B.L. England ⁴	NJ	2	150	1964	40,642
JUNE						
Great River Energy	Stanton	ND	1	188	1967	612,216
Brayton Point Energy	Brayton Point	MA	1	225	1963	454,126
	Brayton Point	MA	2	238	1964	175,436
	Brayton Point	MA	3	575	1969	288,879
PSEG	Mercer	NJ	1	316	1960	0
	Mercer	NJ	2	316	1961	1,788
PSEG	Hudson	NJ	2	620	1968	4,746
DECEMBER						
Appalachian Power	Kanawha River	WV	1	200	1953	0
	Kanawha River	WV	2	200	1953	0
Public Service of New Mexico	San Juan	NM	2	340	1973	1,058,979
	San Juan	NM	3	497	1979	1,418,054
Tennessee Valley Authority	Johnsonville	TN	1	107	1951	361,965
	Johnsonville	TN	2	107	1951	367,866
	Johnsonville	TN	3	107	1952	335,621
	Johnsonville	TN	4	107	1952	333,329
Xcel	Cherokee ⁵	CO	4	352	1968	934,543
TOTALS:	14 plants		24 units	6,989		9,353,992

¹ Closed February 28.

² Stopped burning coal March 3; will remain on "reserve shutdown" as a natural gas fired unit through October 1.

³ FPL bought this plant in October, 2016, with the intention of shutting it down to save millions on an expensive power-purchase agreement, and said it would reduce the plant to 5 percent annual capacity factor immediately. The figure for coal used in 2016 reflects the amount that would not be used because of this reduction.

⁴ Was scheduled to close April 30, 2017, pending a coal-to-natural gas conversion. On April 17, however, the regional grid operator, PJM, announced the unit must stay available for longer for grid reliability needs, though it is expected to be used very little if at all.

⁵ Coal-to-natural-gas conversion.

Coal-Fired Unit Closures Planned for 2018

COMPANY	PLANT	STATE	UNIT	NET SUMMER CAPACITY MW	FIRST YEAR OPERATING	ESTIMATE OF COAL USED, 2016, TONS
APRIL						
Duke Energy Florida	Crystal River	FL	1	370	1966	268,261
	Crystal River	FL	2	499	1969	288,691
JEA; Florida Power & Light	St Johns River	FL	1	626	1987	1,128,494
	St Johns River	FL	2	626	1988	1,272,466
JUNE						
Dayton Power & Light; Dynegy; AEP	J.M. Stuart	OH	1	577	1971	1,121,413
	J.M. Stuart	OH	2	577	1970	1,149,981
	J.M. Stuart	OH	3	577	1972	1,035,753
	J.M. Stuart	OH	4	577	1974	1,189,575
Dayton Power & Light; Dynegy	Killen	OH	2	600	1982	1,553,113
Tennessee Valley Authority	Thomas H Allen	TN	1	247	1959	646,521
	Thomas H Allen	TN	2	247	1959	757,089
	Thomas H Allen	TN	3	247	1959	691,913
Northern Indiana Public Service/NiSource	Bailly	IN	7	160	1962	361,446
	Bailly	IN	8	320	1968	491,660
DECEMBER						
City of San Antonio	JT Deely	TX	1	420	1977	738,482
	JT Deely	TX	2	420	1988	823,488
Midwest Generations EME	Will County	IL	4	510	1963	1,281,054
Wisconsin Power & Light	Edgewater	WI	4	302	1969	652,862
ALLETE (Minnesota Power); WPPI Energy	Clay Boswell	MN	1	68	1958	269,742
	Clay Boswell	MN	2	68	1960	264,356
Oklahoma Gas & Electric	Muskogee ¹	OK	4	487	1977	1,545,543
	Muskogee ¹	OK	5	502	1978	1,296,912
TOTALS:	11 plants		22 units	9,027		18,828,816

¹ Coal-to-natural gas conversion.

Mining Regions Affected

Nearly 46 percent of the coal no longer required at these units, or 10.6 million tons, came from the Powder River Basin, and further 23.6 percent came from the Illinois Basin, making these the two hardest-hit regions.

Imports from Colombia could also be seriously affected; nearly 9 percent, or 2.5 million tons, burned in 2016 at the Brayton Point, Massachusetts, and St. Johns River, Florida, plants came from Colombia.

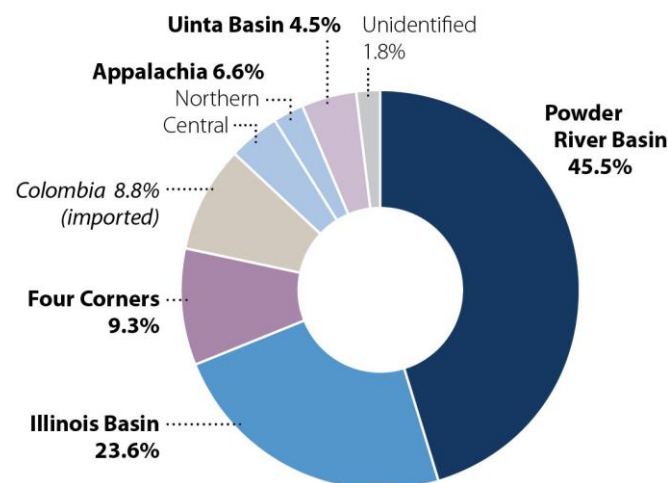
Using 2016 coal delivery contract information from the database developed by SNL (part of S&P Global Market Intelligence), we were able to track about 28.1 million tons at risk from the likely closure of plants in 2017 and 2018. This figure is based on total plant deliveries and adjusted to reflect only the share of actual generation by the units to be closed. This adjusted total includes 8.8 million tons of 2016 deliveries to plants that are expected to close in 2017, and 19.3 million tons of 2016 deliveries to plants expected to close in 2018.

As highlighted above, coal from the Powder River and Illinois basins delivered to plants that will be closing units made up nearly 70 percent of what was purchased in 2016. While some plants may have flexibility in which mine they purchase from, significant regional shifts in coal sourcing are unlikely, both because of economic reasons such as shipping costs and limits on changing the physical properties of the coal each plant uses. This means that the coal shipments cited here are likely to represent permanent losses in demand for each mining region.

By way of example, the coal deliveries produced in the Four Corners area shown as at risk here actually all comes from the San Juan Mine 1 in New Mexico owned by Westmoreland Coal and goes to the Public Service Company of New Mexico's San Juan Plant. The San Juan plant is the only one that mine serves, and it is unlikely that the two remaining coal-fired units will make up for the losses: in March, the Public Service Company of New Mexico said it is considering shutting down those remaining units by 2022.

The chart here shows how the regional effects are dispersed:

Regional Impact of Coal Retirements in 2017-18



Impact on Individual Coal Companies

By the end of 2018, Peabody Energy is set to lose nearly 4.9 million tons of coal sales to nine different plants that are closing power units, the most of any company. Cloud Peak Energy, facing the second-largest impact by volume, is expected to lose 4.1 million tons in 2016 sales to five plants.

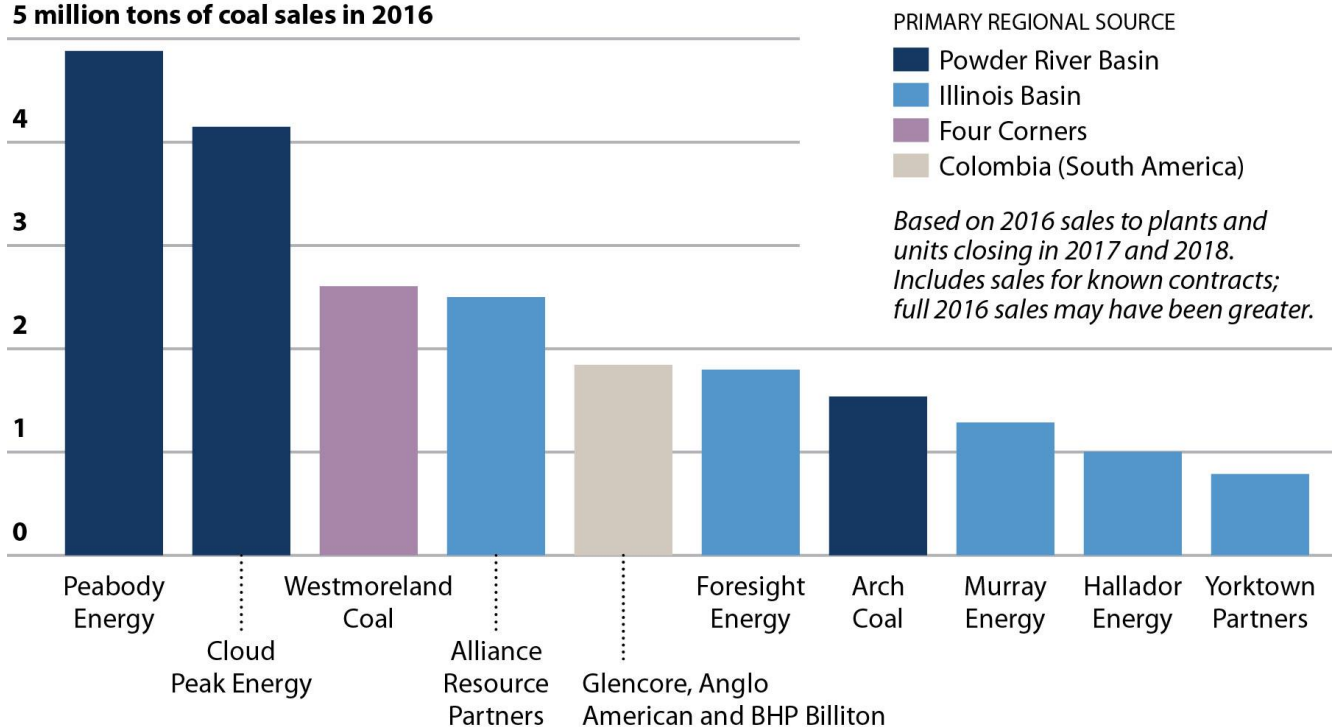
Other companies are confronting large losses in volume from curtailments or closures at a single plant. Westmoreland Coal sold and estimated 2.6 million tons to the San Juan plant in 2016 for the two units that are closing. Similarly, the closure of Florida Power & Light's St. Johns River plant in Florida may affect Glencore, Anglo American and BHP Billiton, which jointly sold that plant 1.8 million tons from its jointly-owned mine in Colombia.

In the Powder River Basin, where nearly 13 million tons of 2016 demand will be lost by the end of 2018, competition will likely intensify among the numerous large coal producers that operate there. Several of them, including Peabody Energy, Cloud Peak Energy and Arch Coal, will be losing more than a million and a half tons each in 2016 sales.

This chart ranks, left to right, the impact by company:

Biggest Company Impacts of Coal Retirements in 2017-18

5 million tons of coal sales in 2016



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