

A Shrinking Coal Backstop in PJM

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Data Sources Used in This Publication
Intercontinental Exchange
PJM
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Coal Competes at the Margin

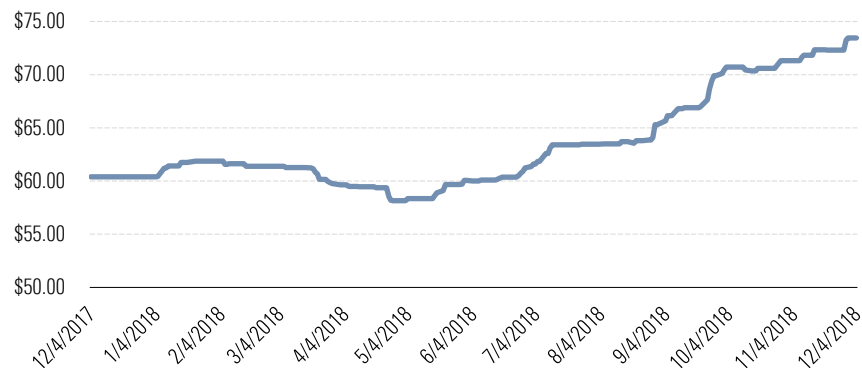
Since the natural gas rally began in November, analysts have raised the potential for increased coal generation as the latter begins to compete at the margins. Winter strip natural gas futures at Henry Hub sit at \$4.25/mmBtu, with Northeast gas basis Tetco-M3 trading virtually at par with the benchmark. This note explores the potential for gas to coal switching in PJM this winter in light of higher gas prices.

Coal Priced to Burn

Over the past year, winter CSX coal prices have moved up significantly, with the January 2019-March 2019 strip trading from a summer low of \$58.15/short ton to \$74.45/short ton this month (Exhibit 1). Assuming the OTC CSX coal specification of 12,500 Btu/pound with 1% sulfur, the recent coal price translates to \$3.10/mmBtu. Assuming \$17/short ton cost to transport Eastern coal to a power plant, PJM generators are looking at a \$3.81/mmBtu equivalent delivered price or about \$0.44/mmBtu under Tetco-M3. On paper, the cheaper coal price should be encouraging gas to coal switching.

Yet we believe rising coal prices this year are more closely tied to increased exports (see [Trump Declares That the War on Coal Is Over](#)) rather than to any uptick in switching demand to domestic power generation. In part this is a consequence of the last decade of coal retirements that have decimated domestic markets, with the result being several producers exiting the space. That has left little capacity for domestic mines to rally production to service an unexpected reversal in coal generation economics.

Exhibit 1 CSX 1% Coal Futures, January-March 2019



Source: ICE.

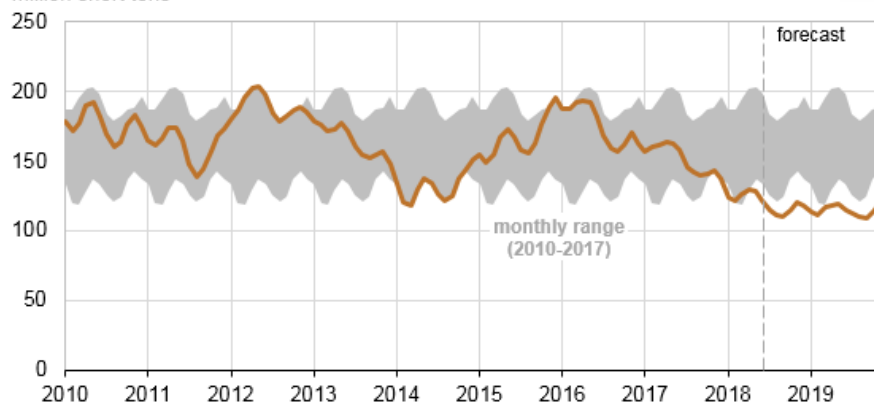
According to the latest Energy Information Administration Short-Term Energy Outlook, coal demand (98% of which comes from the electric utility sector) is expected to continue to decline by 4% from 2017 levels. As coal plant retirements continue, the need for new production wanes. On the supply side, according to weekly EIA coal numbers, Appalachian production is up about 2.3% over this point last year at 182 million tons year to date. But although the stronger prices and slight increase in production this year are welcome news to the industry, the "recovery" is primarily export driven and will be short-lived. Central Appalachian exports ticked up on supply disruptions overseas, but as those markets return to normal, higher-priced Eastern U.S. coal exports will be unable to compete with lower-cost rivals.

On the domestic front, we expect coal stocks to remain low, with EIA's quarterly forecast from May 2018 showing a continued reduction in power plant inventories through 2019. The most recent Electricity Monthly Update from EIA shows total bituminous coal stocks with 84 days of burn, which is 8 days fewer than the same point in 2017. This trend will continue over the next few years, with the electricity sector having 60-75 days of burn inventory available for both bituminous and subbituminous coal (Exhibit 2). Although production is up slightly this year, it has fallen so much over the last decade that the increase is negligible. The downward trend will continue as additional coal generators retire and demand for Eastern coal from the electricity sector goes away.

Exhibit 2 U.S. Power Sector Coal Inventories

U.S. electric power sector coal inventories (2010-2019)

million short tons



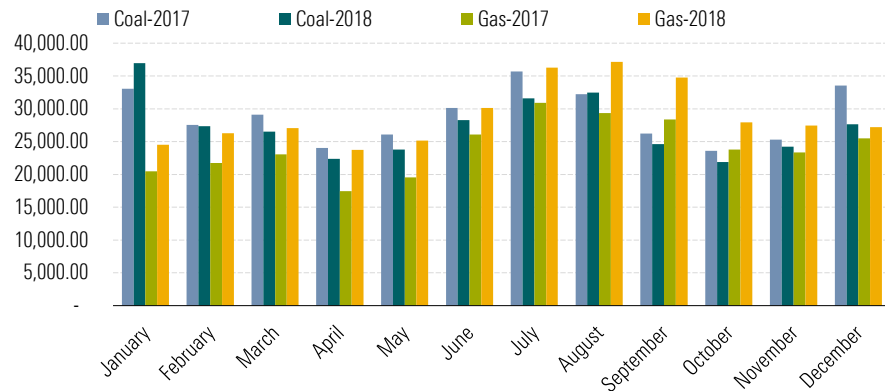
Source: EIA.

Coal Uncertainty This Winter

The strong start to the 2018-19 winter comes at a time when natural gas storage is at historic lows and prices are at levels not seen at this time of year since 2012. Heavy natural gas withdrawals early this winter are reflected in PJM monthly average generation data for natural gas and coal (Exhibit 3). During November and early December, coal generation fell year over year, with natural gas generation filling the void. The data offers no evidence of gas to coal switching even as coal economics have become competitive. We believe that this reality reflects generators' uncertainty around short- and long-term forecasts that have yet to converge on a consistent theme for the rest of winter. That uncertainty challenges the need for generators to order additional coal as the ISO moves into the peak winter

months unless unforeseen operational or weather events require them to act. This reluctance to restock even when economics are good suggests coal will play a shrinking role in meeting system load.

Exhibit 3 Monthly Average Coal and Natural Gas Generation PJM 2017-18 (MW)

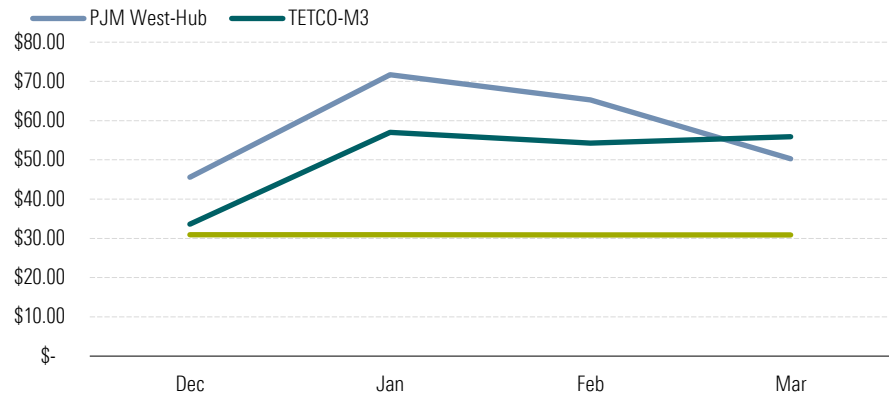


Source: PJM.

Added to tepid demand from the declining coal generation fleet is the reluctance of producers to crank up output in the absence of long-term prospects. The high capital cost to develop additional mines forces producers to weigh opportunity costs associated with increased production. Although Central Appalachian coal prices are at levels that support additional production, the long-term domestic forecasts do not support the investment. As a result, we enter the peak winter months when coal generation typically ramps up with fewer coal generators and constrained supplies of physical coal.

Winter Dark and Spark Spreads

Comparing gas and coal fuel costs with PJM Western Hub electricity prices for the remaining winter months shows coal margins are higher (Exhibit 4). Assuming a 7.0 heat rate for natural gas and a 10.5 heat rate for coal, the megawatt equivalent price for coal generators is flat at around \$31.00/megawatt-hour. That compares favorably with the winter strip average of \$50.19/MW for gas at Tetco-M3. Generating margins close to \$30/MW should encourage coal generators to run their assets, but as we noted above, operating data from PJM shows only a marginal uptick in the use of coal month over month, with declines year over year. Between Nov. 26 and 28, PJM ramped up natural gas generation from 25,000 MW to around 36,000 MW, while coal only increased from 26,000 MW to 30,000 MW over the same period.

Exhibit 4 PJM West Hub, TETCO-M3, Eastern Coal (\$/MW)

Source: EOX, ICE, Morningstar.

Convention Is No Longer Conventional

Conventional wisdom in PJM was that at times of high demand during the winter, coal generation would provide a backstop against more volatile natural gas prices. However, a decade of retirements in coal generation and mine shut-ins in Central Appalachia have shrunk the safety net coal plants used to provide. Even where plants have capacity available to generate, the bottlenecks may come in their ability to purchase and receive coal when it is needed. Coal producers need more than high prices to invest in expanding production. This winter and going forward, historically low inventories of coal and natural gas coupled with a greater reliance on natural gas generation will strengthen the relationship between gas price and power demand and decouple signals generated by the coal stack. ■■■

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