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# *Fueling the grid: natural gas becoming choice for generating electricity*

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**IMG Midstream's Beaver Dam natural gas-fueled power plant, which is similar to what its planned plants in Greene and Washington counties will look like.**

It was the Marcellus Shale that initially drew IMG Midstream to southwestern Pennsylvania, but it's the infrastructure that's being built up around the shale that's enabling the company to continue growing here.

IMG, a builder of small-scale, natural gas-fueled power plants that generate electricity, moved its corporate offices to the North Shore last year and today has two projects in the works in southwestern Pennsylvania: Amity in Amwell Township, Washington County, and Bayles in Greene Township, Greene County.

The company's business model revolves around building $20 million, 20-megawatt distributed generation facilities – all with a similar design – near existing natural gas pipelines and electric substations where the electricity will flow into PJM Interconnection's grid, which provides electricity for Washington, D.C., and 13 states including Pennsylvania.

"One of the founding principles of our business model was to be at the intersection of Marcellus gas and PJM grid territory," said John Tingue, manager of development at IMG Midstream.

Historically, natural gas power plants were built as backups to coal plants, and used only for small areas or when demand was at its highest.

But, that's changed dramatically over the past decade, as natural gas is rapidly replacing coal in this region as the fuel source of preference for electricity generating facilities. Many of the plants currently under construction are using natural gas, which is cleaner burning and cheaper than coal.

According to data from the Energy Information Administration, 54.27 percent of the electricity generated in Pennsylvania a decade ago came from coal plants, while only 8.49 percent was from natural gas. Today, natural gas accounts for 31.59 percent, while coal is down to 25.35 percent. Nuclear, which has remained steady over the past decade, is the source of 38.60 percent, more than any other fuel type.

At PJM, one-third of the capacity in 2016 came from coal, one-third from natural gas, 18 percent nuclear and 6 percent renewables.

Mike Bryson, vice president of operations for PJM, said low natural gas prices coupled with more stringent EPA rules regarding coal plants had led to 21,000 megawatts of coal and oil retiring. About 95 percent of that has since been replaced by natural gas, much of it in the more heavily populated middle and eastern part of PJM's service area.

"Over the past couple of years, you've seen a decline in the makeup of coal," Bryson said. "The lower price of natural gas has nudged coal out of the market in terms of economics. … [Natural gas has] none of the emissions issues as coal or oil, and natural gas is available. When you sit right on top of the shale wells, that makes availability even higher."

PJM also expects an increasing number of natural gas plants will provide electricity to the system in the years to come.

"To the extent that [the price of] natural

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## ► CLOSER LOOK

**In the works**
Here's a look at some of the natural gas power projects currently being planned, according to the Pennsylvania Department of Environmental Protection.

**Tenaska Westmoreland Generation Station**
**Developer:** Tenaska Pennsylvania Partners LLC
**Location:** South Huntingdon, Westmoreland County
**Approximate capacity:** 925 megawatts
**Cost to build:**$500 million
**Status:** Under construction, expected to be operational by late 2018

**Beech Hollow Power Plant**
**Developer:** Robinson Power Co. LLC
**Location:** Robinson Township, Washington County
**Approximate capacity:** 950 megawatts
**Cost to build:** N/A
**Status:** Under technical review by the DEP; still under study

**Shell power plant at cracker site**
**Developer:** Shell Chemical Appalachia LLC
**Location:** Potter Township, Beaver County
**Approximate capacity:** 250 megawatts
**Cost to build:** N/A
**Status:** Under construction

**Bayles Energy Plant**
**Developer:** IMG Midstream
**Location:** Greene Township, Greene County
**Approximate capacity:** 20 megawatts
**Cost to build:** $20 million
**Status:** Construction expected to begin early in 2018

**Amity Energy Plant**
**Developer:** IMG Midstream
**Location:** Amwell Township, Washington County
**Approximate capacity:** 20 megawatts
**Cost to build:** $20 million
**Status:** Construction expected to begin near the end of this year

gas stays low, we will continue to see natural gas developers proposing projects," Bryson said. "You will continue to see natural gas chip away at some of the other megawatts."

In southwestern Pennsylvania, at least five new natural gas-powered plants are in the works, according to the Pennsylvania Department of Environmental Protection, including IMG's two.

One large project is Robinson Power Co. LLC's Beech Hollow Power Plant in Robinson Township, Washington County. The 950-megawatt plant is undergoing a completeness review, according to the DEP, and is still under study, said PJM. The developers were unavailable for comment.

Another project is Shell Chemical Appalachia LLC's plans to construct a 250 megawatt natural gas-fueled power plant in Potter Township, Beaver County, at the site where it is building an ethane cracker plant.

While most of the electricity generated at this plant will be used to run the cracker site, "any unused electricity generated by the Shell power plant on site will go into the grid," said Ray Fisher, a spokesman for Shell, via email.

Like IMG Midstream, Shell chose natural gas, "because of the availability and abundance of natural gas in the area as well as it being a cleaner burning fuel compared to other options," Fisher said.

Meanwhile, Tenaska Pennsylvania Partners LLC's plans to build a $500 million, 925-megawatt natural gas-fueled electric generating facility in South Huntingdon Township in Westmoreland County. The Tenaska Westmoreland Generation Station is under construction and expected to be operational by late 2018.

Brad Heisey, a senior vice president at Tenaska, said location played a key role in the company's decision to build the plant in Westmoreland County.

"The best way to describe it really is its locational proximity to the Marcellus Shale, and the shale play that has developed in the state of Pennsylvania has afforded us the opportunity to take advantage of that," he said. "We are looking for long-term availability of supply and price stability."

Expect the trend to continue. Heisey noted there continues to be a need for new plants, and with natural gas prices anticipated to remain low for a long time to come, it makes sense for them to be powered by natural gas.

"We currently don't have another active development site within southwestern Pennsylvania, but we know of other parties that are continuing to look for development opportunities in the southwest region and across the state," he said.

IMG Midstream is one such company. It's already on the lookout for a third location in southwestern Pennsylvania to build another plant. And if it gets enough plants in this region, it may also build an operations center here.

"We'd like to continue to build out a cluster of projects so we have economies of scale for the operations center and support that goes along with it," Tingue said.

IMG's two existing projects, Amity and Bayles, have most of their permits in place, and construction is expected to begin at Amity near the end of this year and by early 2018 for Bayles. Once construction begins, each plant will be online roughly nine months later.

IMG's smaller plants will give it an opportunity to quickly provide electricity when PJM needs it, a far cry from the days when natural gas plants were primarily used to generate electricity to fill in only during peak times.

"We can certainly come on when dispatched by PJM within five minutes of a start time," Tingue said. "We can respond to peak events if necessary, but the plants also run 60 to 70 percent of the time."

Yet, with all this extra natural gas coming online, how will it impact the reliability of the grid? PJM on March 30 released a report that studied what will happen as coal and nuclear plants retire and more natural gas and renewables are used to generate electricity for the grid.

"Fuel diversity is not directly an indication of reliability," Bryson said. "We didn't see any operating issues with a high penetration of natural gas, ... [but] we did see a renewable limit at 20 percent of operational capacity. That's still significantly more than what we have now."