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connect

Gathering Momentum

Williams' Northeast Gathering and Processing Well-Positioned to Help Customers Capitalize on New Markets, Increased Demand

Inside this issue

Lathrop Towers, Susquehanna Supply Hub, Northeast Pennsylvania
Photo by Diane Francisco, Liaison Project Manager, Williams Northeast G&P

Northeast Gathering & Processing

Well-Positioned to Help Customers Capitalize on New Markets, Increased Demand

Through steady and efficient capital investment, Williams has purposefully built the leading network of midstream infrastructure in the northeast United States, resulting in best-in-class operational efficiency and speed-to-market advantages for our customers.

Since 2011, Williams has spent an average of about $1 billion in annual capital expenditures on our gathering and processing network to expand and upgrade our existing infrastructure; improve safety, reliability and operational performance; and help producers connect new wells. This doesn't even count our significant investment in transmission pipelines, such as Transco and our major Atlantic Sunrise expansion.

Through this investment, we have:

- More than quadrupled our gathering and processing pipeline mileage in the region, going from 1,000 to nearly 4,200 miles
- Increased gathering volume from slightly more than 110 million cubic feet per day (MMcf/d) to nearly 7 Bcf/d. All told, the natural gas volume Williams touches in the Northeast United States is enough to meet energy demand for the entire state of California or 17 other states and Washington, D.C., combined.
- Increased horsepower from 25,000 in 2010 to about 800,000 today

Foundational assets now in place

With this strategic investment, our world-class assets now span both the Marcellus and Utica basins, allowing us to gather, process and transmit wet gas, and gather and deliver dry gas.

In Northeast Pennsylvania, the heart of the highly productive and low-cost Marcellus, our large-scale supply hubs currently gather 5.7 Bcf/d and have extensive, reliable and robust delivery point capabilities to markets in the Northeast, Mid-Atlantic, Southeast and Gulf Coast U.S. markets, as well as Canada.

In the Utica and Southwest Marcellus, we have and/or are involved with a very powerful combination of premier assets. Our Utica Supply Hub — which includes Cardinal Gathering, Flint Gathering and Utica East Ohio — currently has about 1.2 Bcf/d between rich and lean systems. It also processes about 800 MMcf/d, and has a 135,000 bpd C2+ fractionation capacity.

Our Ohio River Supply Hub includes Ohio Valley Midstream, Laurel Mountain Midstream and Marcellus South. Together, these assets have a gathering capacity of 1.5 Bcf/d of rich/lean gas; up to 800 MMcf/d in processing capacity (with a nameplate capacity of 720 MMcf/d); and about 80,000 bpd of C2+ fractionation capacity.

Additionally, within this footprint, Williams has a more than 29-percent ownership stake in and operates Blue Racer Midstream. This includes 688 miles of gathering pipeline; 800 MMcf/d of nameplate processing capacity; residue connections to DTI, DEO, TETCO and REX; 123,000 bpd of C2+ fractionation; 153 miles of NGL and condensate transport; truck, rail and barge facilities; and several NGL connections (including WPZ, ATEX, Mariner West, Mariner East and TEPPCO).

Brown Compressor Station, Laurel Mountain Midstream, Greensboro, Pennsylvania. Photo by Brian Halchak, Engineer II, Northeast G&P

End result: best-in-class efficiency and speed-to-market advantages for companies like yours

While we've made solid, strategic investments to better serve customers, we've done much more than that. With a sharper focus on collaboration with customers earlier in planning stages, as well as improved responsiveness to customer schedules, we're consistently moving more than 98 percent of available gas.

Combining our operational excellence with transmission expansions like Atlantic Sunrise, Northeast Supply Enhancement, Dalton and other key projects, Williams is in a prime position to help customers capitalize on increased natural gas demand and new geographic markets. ■

TRANSCO PROJECT UPDATES

Gulf Trace
Placed in service Feb. 1, beating schedule and cost estimates

Dalton
Currently receiving early mainline service revenues

Garden State
Received necessary permits, began construction

Northeast Supply Enhancement
FERC certificate application filed for ~400 MMcf/d, ~$1 billion fully-contracted expansion project supplying New York City and Long Island

Southeastern Trail
Strong response to non-binding open season for new southward flowing firm service

Atlantic Sunrise
Began construction on Transco mainline facilities; received final PADEP 102 and 105 permits; FERC approved early partial mainline service ▼

Atlantic Sunrise project work, Station 190, Ellicott City, Maryland. Photo by Tim Rich, Manager Operations, Atlantic-Gulf

U.S. Natural Gas Abundance Creates Need for Pipeline Infrastructure

For decades, the U.S. depended on the rest of the world for much of its energy.

In 2005, the U.S. imported approximately 60 percent of its petroleum and was on the cusp of becoming a global importer of liquefied natural gas (LNG). Major energy companies such as Exxon Mobil Corp., BP and Chevron Corp. were planning to spend billions on natural gas import terminals to offset the decline in U.S. production, which had fallen below 50 billion cubic feet per day.

Fast forward to 2017 and America's energy landscape has been turned upside down. Today, the country is the world's top producer of both petroleum and natural gas for the fifth straight year, making a dramatic shift from energy dependence to energy dominance.

For the sudden abundance of energy, Americans can thank hydraulic fracturing, or fracking, an innovative drilling technique for unlocking gas and oil deposits in hard-to-access rock formations.

In 2016, fracking produced more than half of America's crude oil. And thanks to fracking, U.S. natural gas production has surged by more than 50 percent since 2005 to approximately 90 billion cubic feet per day.

The U.S. has such a surplus of natural gas that this year, for the first time ever, the country started turning its natural gas into LNG and sending it overseas. In fact, in 2017 the country expects to export more of the heating fuel than it imports for the first time since the 1950s.

Growth in U.S. Natural Gas Consumption

The combination of plentiful production, low commodity pricing and more stringent environmental regulations have fueled a resurgence in the popularity of natural gas.

In addition to heating more than half of U.S. homes, in 2015 natural gas overtook coal as the top source of U.S. electric power generation. Today, approximately 35 percent of U.S. electric power generation comes from natural gas.

In its 2017 Annual Energy Outlook, the U.S. Energy Information Administration (EIA) forecasts that by 2040 natural gas will account for 40 percent of all U.S. energy production. It also suggests that natural gas use will increase more than other fuel sources, thanks to significant demand from the industrial and electric power sectors.

Low natural gas prices have helped the U.S. industrial sector enjoy a renaissance in domestic manufacturing, particularly in the petrochemical industry, creating significant new markets for gas and related natural gas liquids. According to

EIA, this industrial resurgence is expected to continue for at least the next two decades.

Creating the need for pipelines

The rapid growth in U.S. natural gas production has yielded an immediate need for additional pipeline infrastructure to connect emerging production basins with consuming markets.

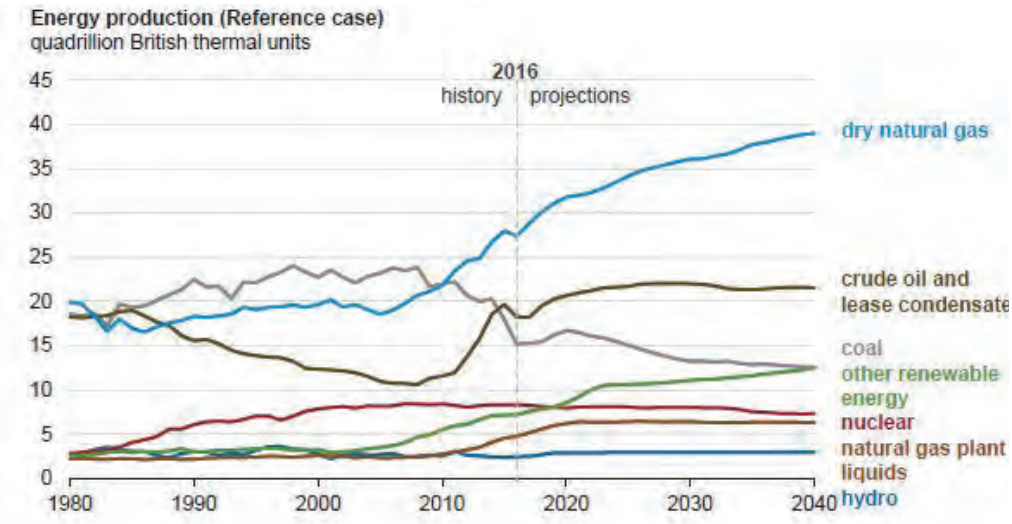
In a 2016 study by energy analyst ICF International, it was estimated that at least 850 miles of new gas transmission lines would be needed in North America each year from 2011 through 2035 to meet the demands of rising shale production.

The jewel of America's natural gas production is a shale formation in the eastern U.S. known as the Marcellus, one of the richest natural gas deposits in the world. The basin currently produces about 18 billion cubic feet of natural gas per day. By 2020, the Marcellus is expected to produce about 25 billion cubic feet of natural gas per day, according to ICF.

The Commonwealth of Pennsylvania hosts much of this new production activity. It now accounts for about 20 percent of U.S. gas production, making it bigger than any state other than Texas. It has seen its gas output rocket from 0.5 billion cubic feet per day in 2006 to 14.5 billion cubic feet per day in 2016.

Unfortunately, during that same time period, the amount of new pipeline capacity has been unable to keep up with the production boom.

In its 2016 Pipeline Infrastructure Task Force Report, the Pennsylvania Department of Environmental Protection estimated that 25-30 percent of wells drilled to date do not have access to pipeline takeaway capacity.



Source: EIA

"Drilling for natural gas in Pennsylvania has far outpaced the development of the infrastructure needed to get that gas to markets," the report notes. "Almost a third of the wells that have been drilled in Pennsylvania since 2004 are shut in because the pipelines to move that gas from the well to end users have not caught up with the pace of drilling. So, the primary challenge the industry faces now is to get the gas around or out of Pennsylvania to connect it to customers."

Williams operates more than 4,000 miles of natural gas gathering and transmission lines in Pennsylvania, including the Transco pipeline, the largest-volume transmission pipeline in the country. This massive 10,200-mile pipeline network features a mainline which extends nearly 1,800 miles along the East Coast linking South Texas and New York City, transporting about 12 percent of the natural gas consumed in the U.S.

Fortunately, Transco also operates more than 1,000 miles of transmission pipe in Pennsylvania, extending into the heart of the Marcellus.

"When this segment of the Transco pipeline was constructed in Pennsylvania in the 1960s, its primary purpose was to provide our customers with access to underground storage in the western part of the state," said Rich Truxell, manager of Transco pipeline control. "It was extremely fortuitous for us that one day, this segment of pipeline would become the focal point of this new, surging gas supply area."

Atlantic Sunrise

In 2014, Williams announced plans to significantly loosen the Pennsylvania pipeline bottleneck by expanding the Transco pipeline system through its $3 billion Atlantic Sunrise expansion project.

Approved by the Federal Energy Regulatory Commission (FERC) in February 2017, Atlantic Sunrise is the largest expansion project in Transco's history, extending and expanding the capacity of the existing pipeline network by approximately 1.7 billion cubic feet per day (enough natural gas to provide service to approximately seven million homes).

The project has been designed to extend the reach of Transco to northeast Pennsylvania to tap some of the most abundant supply areas in the state.

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It requires adding approximately 180 miles of greenfield pipe, 12 miles of pipe looping, 2.5 miles of pipe replacement, two new compressor stations and making various facility modifications in five states that will allow natural gas to flow bi-directionally.

"This project is historic in a lot of ways," said Frank Ferazzi, senior vice president of Williams' Atlantic-Gulf Operating Area. "Atlantic Sunrise redefines the Transco supply area, and in the process, provides Williams customers in the Mid-Atlantic and southeastern states with access to the most prolific natural gas supply area in the world."

Bi-Directional Flow

Until 1999, the Gulf of Mexico supplied about one-third of all U.S. natural gas production.

When the Transco pipeline was initially designed in the 1940s, it was intended to transport gas from south to north, moving gas from production areas located in Texas, Louisiana and the Gulf of Mexico to cities in the Northeast — as far north as New York City.

"It is really amazing when you stop and consider just how far our country has come."

Frank Ferazzi
Vice President, Atlantic-Gulf

However, as the U.S. natural gas supply landscape changed, pipelines like Transco are being modified to allow consumers in southern markets to take advantage of new northeastern gas supplies.

Since July 2011, Transco has seen its Pennsylvania gas receipts skyrocket from approximately 250 million cubic feet per day to approximately 3.5 billion cubic feet per day. Today, Transco is capable of transporting about 12 billion cubic feet of gas per day, but receives less than 1 billion cubic feet of its supply from the Gulf of Mexico.

"We are turning the system around to accommodate the supply shift and create opportunities for bi-directional flow," says Hector Alatorre, Transco Customer Services director. "Our customers value the flexibility and supply access that the Transco pipeline is able to provide. By making the system bi-directional, we are delivering maximum value to our customers and providing access to some of the most attractive gas supply sources in the country."

Williams' Atlantic Sunrise project is on schedule to be placed into full service in mid-2018. Once that happens, natural gas molecules originating in Pennsylvania will have the ability to flow about 1,000 miles south, fueling natural gas consumers as far away as Alabama.

And when that happens, the U.S. will take another giant step forward on its track toward energy independence.

"It is really amazing when you stop and consider just how far our country has come," added Ferazzi.

"I remember it wasn't that long ago that our industry was on the cusp of spending billions of dollars on gas import terminals because of the perceived shortage of gas. Then suddenly today we are at a point where we have more supply than demand and desperately need to build new infrastructure to keep up with all of the shale production. It's a good problem to have, and as pipeline builders, it's something we will continue to work hard to resolve."

Williams Welcomes New Member of Executive Team

Chad Zamarin
Senior VP of Corporate Strategic Development

Chad Zamarin recently joined Williams as Senior Vice President of Corporate Strategic Development (CSD).

Chad succeeds Frank Billings, who announced his intent to retire from Williams early in 2017.

Chad has significant experience in delivering strategic growth across diverse segments of the energy industry and the development of growing liquid natural gas exports.

Most recently, he served as SVP and president, Pipeline and Midstream at Cheniere Energy, a position he held since 2014.

Prior to joining Cheniere, Chad served in a variety of executive roles at NiSource/Columbia Pipeline Group, including chief operating officer at NiSource Midstream, LLC and NiSource Energy Ventures, LLC, as well as president of Pennant Midstream, LLC, a joint venture with Hilcorp Energy. Previously, Chad held technical services and asset integrity leadership roles at Colonial Pipeline Company, and served in product, engineering and project management roles at both GE Energy and Panhandle Energy.

Q&A: Micheal Dunn

Chief Operating Officer, Williams

Micheal Dunn
COO

You began your career at Williams after serving in various roles for more than a decade early in your career. Why did you decide to return?

Williams is a great company, composed of great assets with a great customer base, but the real draw to me was the caliber of people who work here. Our employees truly love this company — its culture is unique in today's energy industry. The reason I left was the fact that Williams sold the company I was working for at the time back in 2002; otherwise, I'm sure I wouldn't have had a break in service. I have admired Williams since I was hired originally back in 1988, and I have continued to follow the company as a shareholder even after I left Williams.

"Williams is a great company, composed of great assets with a great customer base, but the real draw to me was the caliber of people who work here."

But my years away from Williams provided valuable experience as well. For example, I served in a leadership position for a regulated multi-state power generation company, which gave me an up-close-and-personal perspective on the pressures and challenges of many of Williams' customers. At Berkshire Hathaway Energy, I came to appreciate extreme capital discipline, a focus on continuous improvement and the value of a lean organization.

What are your priorities as Williams' first chief operating officer?

My main priority in any role is keeping our employees safe, protecting the assets we operate, and keeping the public out of harm's way as we construct and operate our facilities. Safety is simply non-negotiable in our business. I also will constantly seek ways to improve our efficiency, finding opportunities where we can improve operations to the benefit of our customers and shareholders.

What can customers expect under your leadership of Williams' operations?

Customers can expect to see us improve on our project execution. While there are many factors involved in meeting a project in-service date, some outside our control, the bottom line is we are responsible for our projects. Accountability for meeting those commitments rests with each and every Williams employee.

In addition, customers will see us continue to find ways to make their business interests successful. I have been reaching out to meet as many customers as possible, to learn about their needs and business objectives first hand. Those who haven't heard from me yet can expect to.

Williams consistently ranks high in customer surveys. How do you plan to build on that track record?

Under Alan's leadership, we've demonstrated our commitment to connecting the best supplies to the best markets. We will continue to listen to our customers and invest in facilities that help them grow their businesses. And, we'll invest in existing facilities, employing maintenance capital to provide our customers even greater assurance of system reliability.

In your view, what's the biggest challenge our industry is facing, and how is Williams addressing it?

Our industry is facing a number of challenges, one of which is the increasing difficulty in building new projects. The opposition groups are much better organized than in the past, and the regulatory permitting processes are getting much longer without any real benefits to the overall project compliance. We're making great efforts to increase our outreach programs and ensure we are reaching all stakeholders in the process. Our intent is not to amplify the noise, but to engage in constructive, civil discussion. It's more important than ever for us to continue to be transparent to the public regarding our projects. Once we reach the construction phase, we must be diligent with our contractors such that they fully understand Williams' commitments to protecting the environment and meeting and exceeding our permit requirements.

We make energy happen.®

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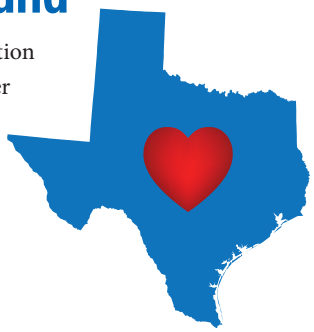
Williams Donates $500K to Harvey Relief Fund

Williams on Aug. 30 announced a donation of $500,000 to the United Way of Greater Houston's flood relief fund. The company is also matching employee donations to relief funds through its charitable giving program.



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Ranked With the Best

Forbes recently ranked Williams as #22 on its America's Best Large Employers list for 2017. This is a significant jump from just one year ago, when we were ranked #116.

America's Best Employers are based on an independent survey from a sample of nearly 30,000 U.S. employees working for companies that employ at least 1,000 people in their U.S. operations. Williams ranked first in its category of Construction, Oil & Gas Operations, Mining and Chemicals.

"This award is a true reflection of our company's culture and an energized workforce that is proud to be a part of our success story," said President & CEO Alan Armstrong. "It's a solid example of our core value and belief that people are the company's best resource."