

**Providing a Significant Opportunity for New and Expanding  
Natural Gas Demand Markets in the Northeast**



Prepared for:  
America's Natural Gas Alliance (ANGA)

Prepared by: Bentek Energy, a unit of Platts

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## Project Overview

Bentek Energy was asked to evaluate the future supply/demand dynamics in the Marcellus and Utica shale plays, also known as the Northeast Region, using Bentek's proprietary historical and forecast datasets. We investigated three primary categories:

- Supply growth potential of natural gas and natural gas liquids (NGLs)
- Availability of infrastructure to support supply growth
- Demand for natural gas and NGLs: power plants, industrial facilities, residential and commercial customers

## Key Findings

***Natural gas production in the US Northeast is expected to continue long-term, sustainable growth***

*US Northeast natural gas production:*

- Has grown over 550% since 2009 to an average of 12.3 Bcf/d today. The region now represents 17.5% of the total US supply.
- Exceeded Southeast/Gulf of Mexico supply for the first time in 2013, and will soon pass western Canada to become the second-largest natural gas producing region in North America, behind Texas.
- Is expected to nearly double over the next 10 years to an average of 20.9 Bcf/d. Based on current infrastructure development trends and efficiency / technology improvements increasing production per well, there is substantial opportunity for more upside to production growth.
- Currently, there are an estimated 800 wells in northern Pennsylvania that have been drilled but not completed. At an initial production rate of 4.2 MMcf/d, that represents 3.4 Bcf/d of natural gas supply, or 5% of total U.S. supply that is ready to be delivered to market and serve expanding and new demand markets.

***Producers and end users are making a massive investment in infrastructure to take advantage of the changing supply profile of the Northeast. The new infrastructure will provide enhanced opportunity for supply growth and provide new downstream options for intra- and inter-regional demand markets.***

- At least 40 gas pipeline expansion projects have been announced to either transport gas into the Northeast to serve high-demand areas or to send gas to other regions.
- The Northeast is currently the most active infrastructure development market in North America and accounts for more than 35% of all new U.S. processing additions projected from 2013-2018. Currently projects include more than 13.1 Bcf/d of pipeline takeaway capacity, 634 Mb/d of fractionation capacity, 660 Mb/d of NGL pipeline capacity and 5.0 Bcf/d of gas processing capacity.
- New opportunities in liquids-rich areas in Ohio, West Virginia and southwestern Pennsylvania have spurred proposals for more than 6.5 Bcf/d of pipeline expansions, with many targeting traditional upstream markets in the Midcontinent and Southeast.

*The Northeast is expected to achieve **natural gas self-sufficiency by 2020 and is providing competitive pricing for the region, producing more gas than demand is forecasted to consume.***

- Northeast demand is increasingly being met by local supply from the Marcellus and Utica shales, pushing out incoming supply from other regions. Net inflows of supply into the region from the Southeast, Rockies and Midcontinent have plummeted from more than 10.0 Bcf/d during 2011 to less than 3.0 Bcf/d recently.
- The local supply growth, along with infrastructure additions, has resulted in discounted pricing for supply in the region. Year-to-date, cash markets in Ohio averaged 17 cents lower than Henry Hub, the US benchmark. That is 38 cents lower than prices in 2010, providing consumers in the market an opportunity to source a portion of their supply portfolio at a lower cost. This represents a 25% drop in the spot market price of natural gas at Henry Hub in the Gulf but a 39% decrease in spot market prices for natural gas in Ohio.
- New infrastructure coming online in the next few years is expected to further open up other downstream markets in the Northeast, putting downward pressure on prices in end-use markets such as New York, Maryland and other coastal states.
- This ongoing trend will establish a new reality by 2020 in which the Northeast is expected to produce more than it consumes for the first time on an average annual basis.

*Without further substantial investment in demand-side projects, **Northeast supply will far outpace Northeast demand**, leaving the region oversupplied within 10 years and creating an unprecedented opportunity for local production to serve new demand markets, including additional power generation markets, transportation, industrial and/or global LNG markets.*

- While Northeast Region gas production is forecast to grow more than 9 Bcf/d from 2013 to 2023, announced demand-generation projects indicate Northeast demand will grow by only 3 Bcf/d over that same period, leading to large oversupplied conditions in the region.
- Currently, new sources of natural gas are supplanting coal- and oil-fired energy sources. Given the overhang of supply in the region and the expansion of pipeline infrastructure, substantial opportunity exists, particularly for the power sector, to further increase natural gas.
- Based on current project announcements, Bentek expects 3.0 Bcf/d of incremental demand in the Northeast Region over the next decade, including 1.6 Bcf/d in power generation demand, 0.4 Bcf/d of industrial demand, 0.3 Bcf/d of residential and commercial demand, and 0.7 Bcf/d in LNG exports via the Cove Point LNG facility. The increase in gas fired power demand is helping to allow for continued reliable and affordable electricity even with 13000MW of announced coal retirements.
- Growth in local supply presents a strategic opportunity to source demand market areas in Pennsylvania, Ohio and neighboring states, which are driving production growth in the region., About one third, or 1.0 Bcf/d, of the new demand being added to the region is expected to be in Pennsylvania and Ohio.
- Without additional demand growth in the Northeast, producers may need to pull back investment in supply development or look toward other markets to support development.

# Northeast Infrastructure Study: Leading the Market in a New Direction

Sept 10, 2013

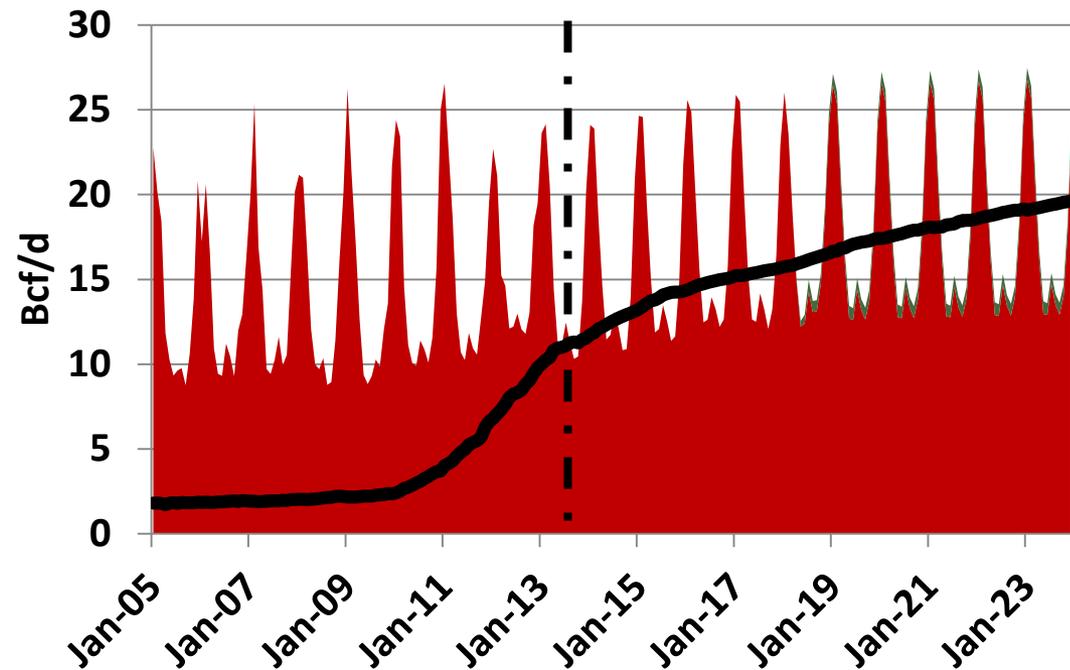
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- There is a significant amount of proposed midstream infrastructure being built in the Northeast to support continued production growth. Over 16 Bcf/d of planned or under construction pipeline infrastructure projects will link end users and producers.
- Substantial opportunity exists for local end use markets to benefit from supply growth in the Northeast region. Substantial opportunity also exists for other regional demand markets to benefit directly or indirectly from Northeast supply growth.
- There is significant potential for an even higher Marcellus/Utica production growth case in the short and long term given the potential productivity of the region.
- Short term opportunities may exist for economic dispatch of gas load as producers continue to test the limits of how much gas the demand markets can absorb.

# The Shifting NE Balance Provides Significant Sourcing Opportunities



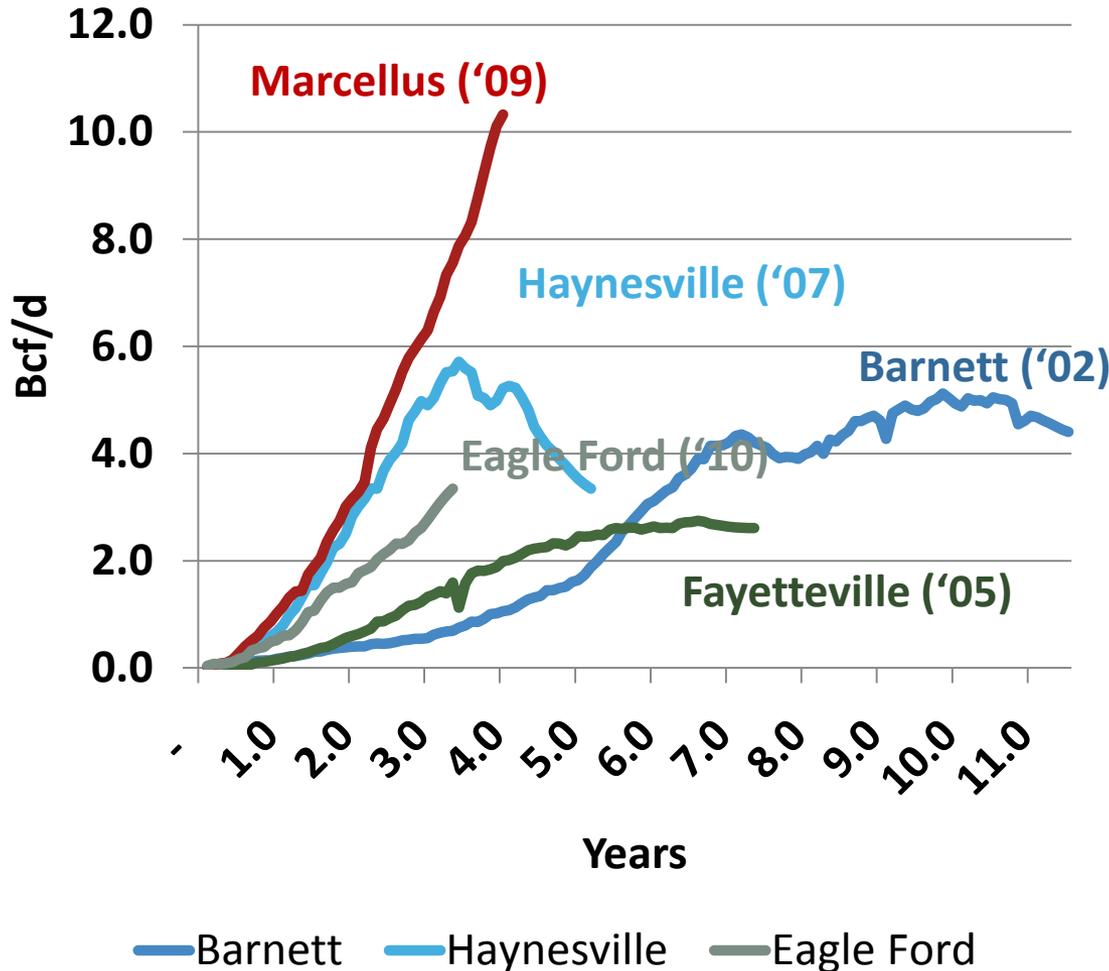
## NE Supply/Demand Balance



- Base case for Northeast supply growth calls for a 5.4 Bcf/d imbalance versus demand expectations (2013-2023).
- Seasonally, Storage injections can balance out some of the summer demand dips but winter withdraws add more supply to outlook.
- The Northeast will continue to displace inflows in the short term and will seek new demand markets in the long term to balance out supply growth.

# Shale Plays Transform How We Think About Production

## Production Growth Since Play's Inception



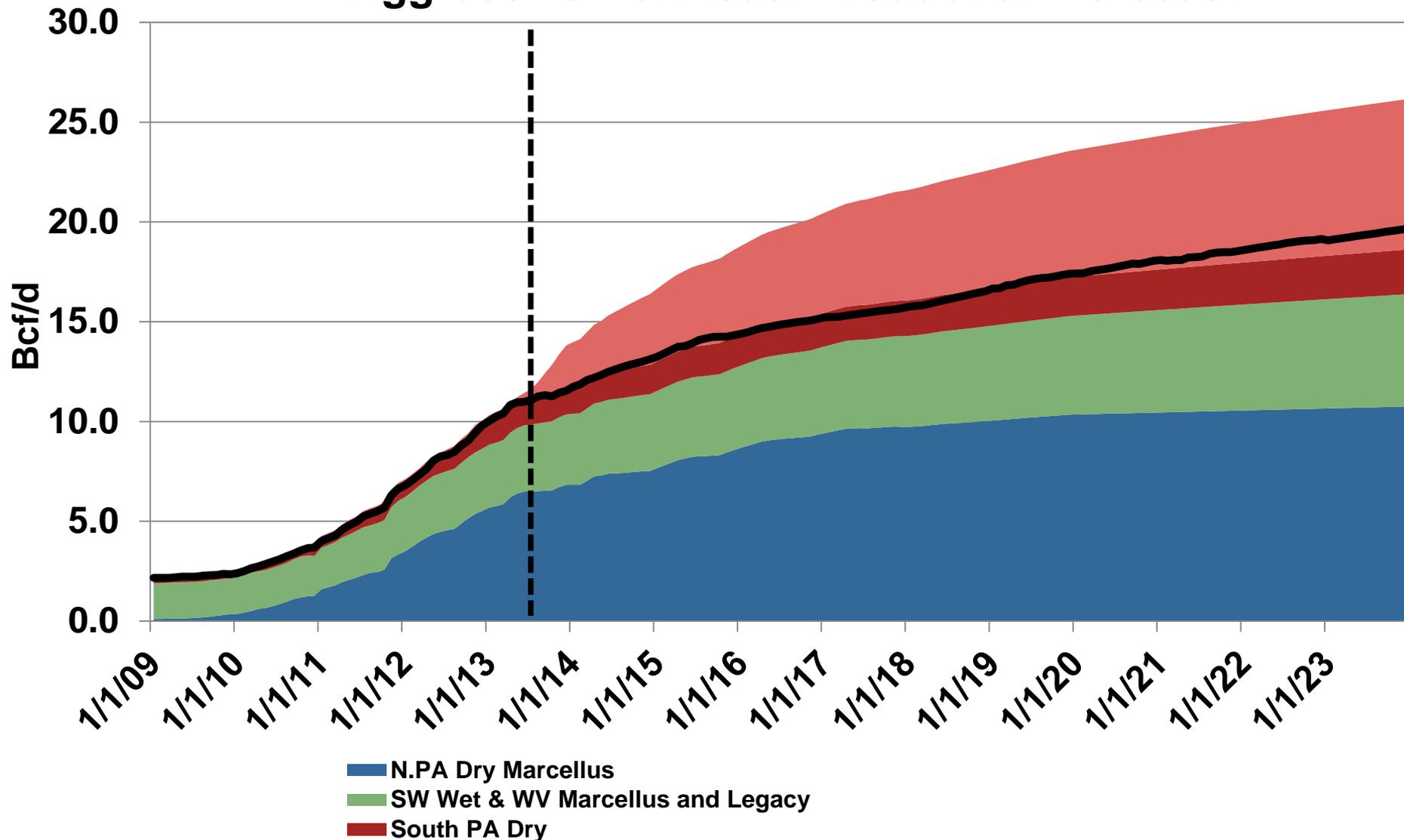
## Rig Count

	Peak Rig	July 2013
Marcellus	106	75
Hayneville	149	32
Eagle Ford	331	280
Barnett	240	65
Fayetteville	68	15

- US production continues to grow despite a pullback in many dry plays due to the Marcellus and associated gas production.
- A reinvestment in these plays could quickly boost production, should the market have the demand to consume it.

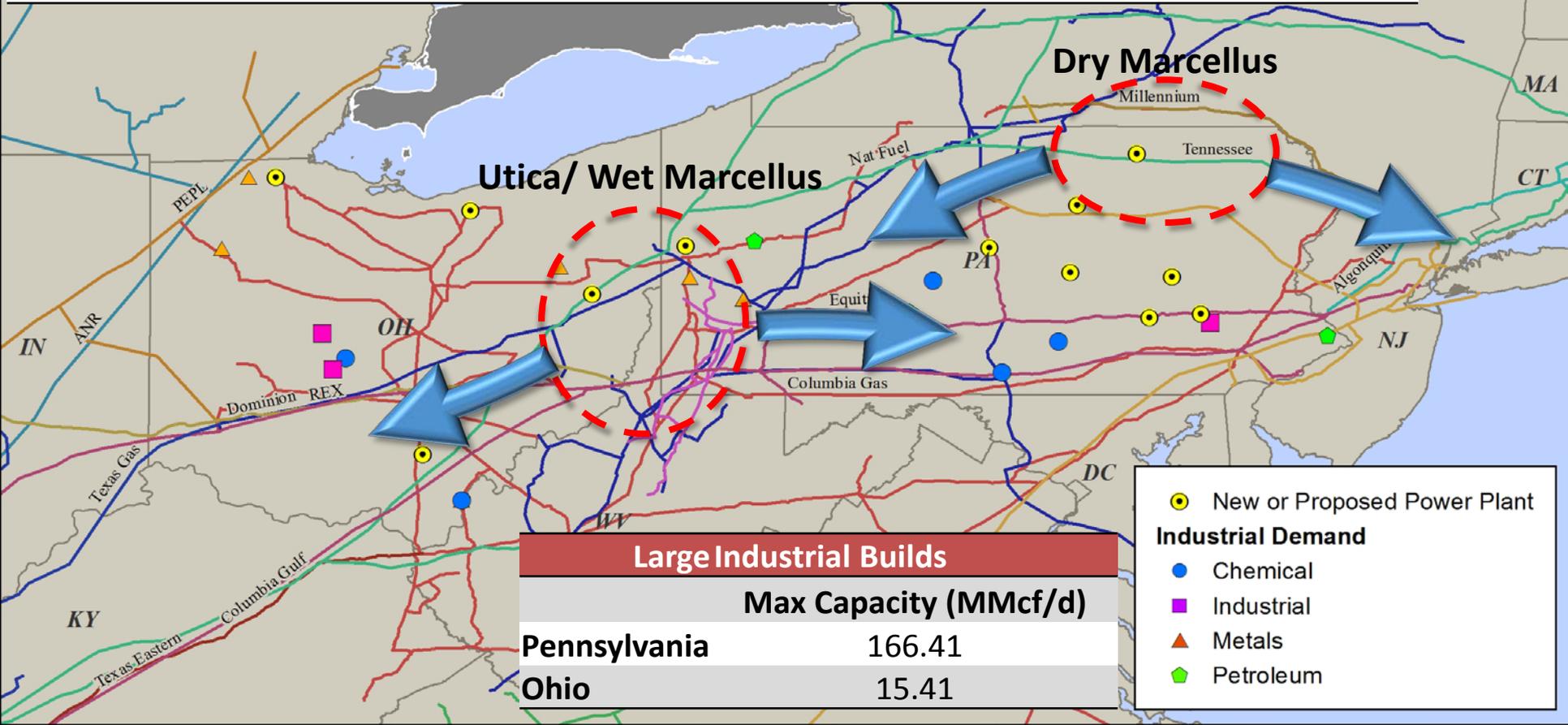
# Northeast to Exhibit Strong and Sustained Growth

## Aggressive Northeast Production Forecast



## Nat Gas Power Plant Builds

	Max Cap (MW)	Avg MW/ Hour	MW Avg/ Day	MMcf/d
<b>Ohio</b>	4,274	3,206	76,932	258.6
<b>Pennsylvania</b>	6,771	5,078	121,869	409.7
<b>Total</b>	11,045	8,284	198,801	668.3

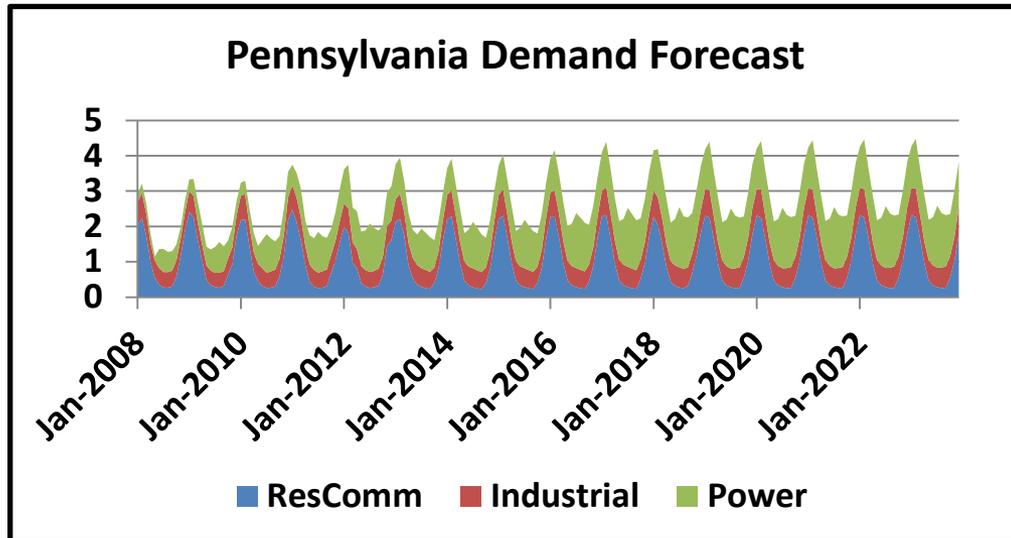
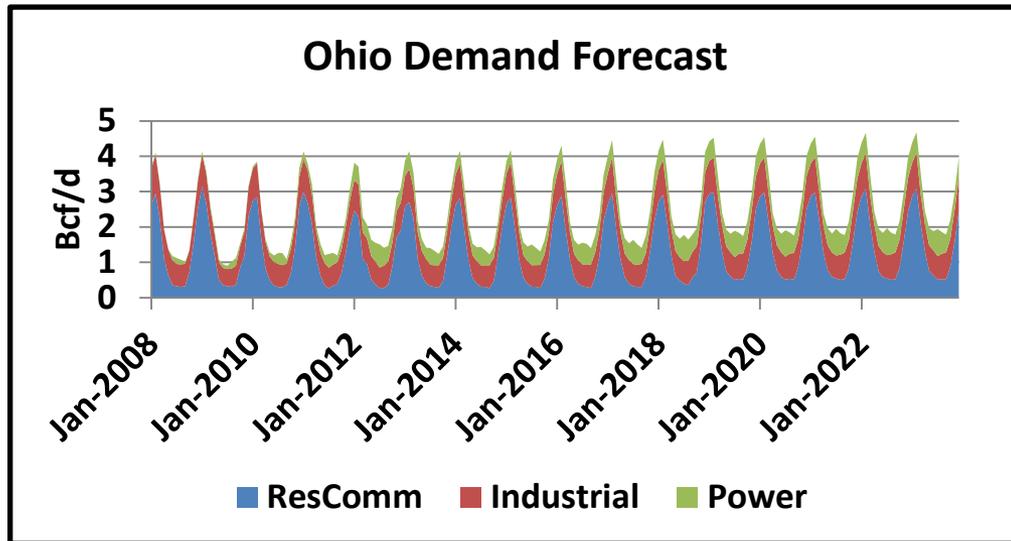


### Large Industrial Builds

	Max Capacity (MMcf/d)
<b>Pennsylvania</b>	166.41
<b>Ohio</b>	15.41

**Legend**

- New or Proposed Power Plant
- Industrial Demand**
  - Chemical
  - Industrial
  - ▲ Metals
  - ◆ Petroleum



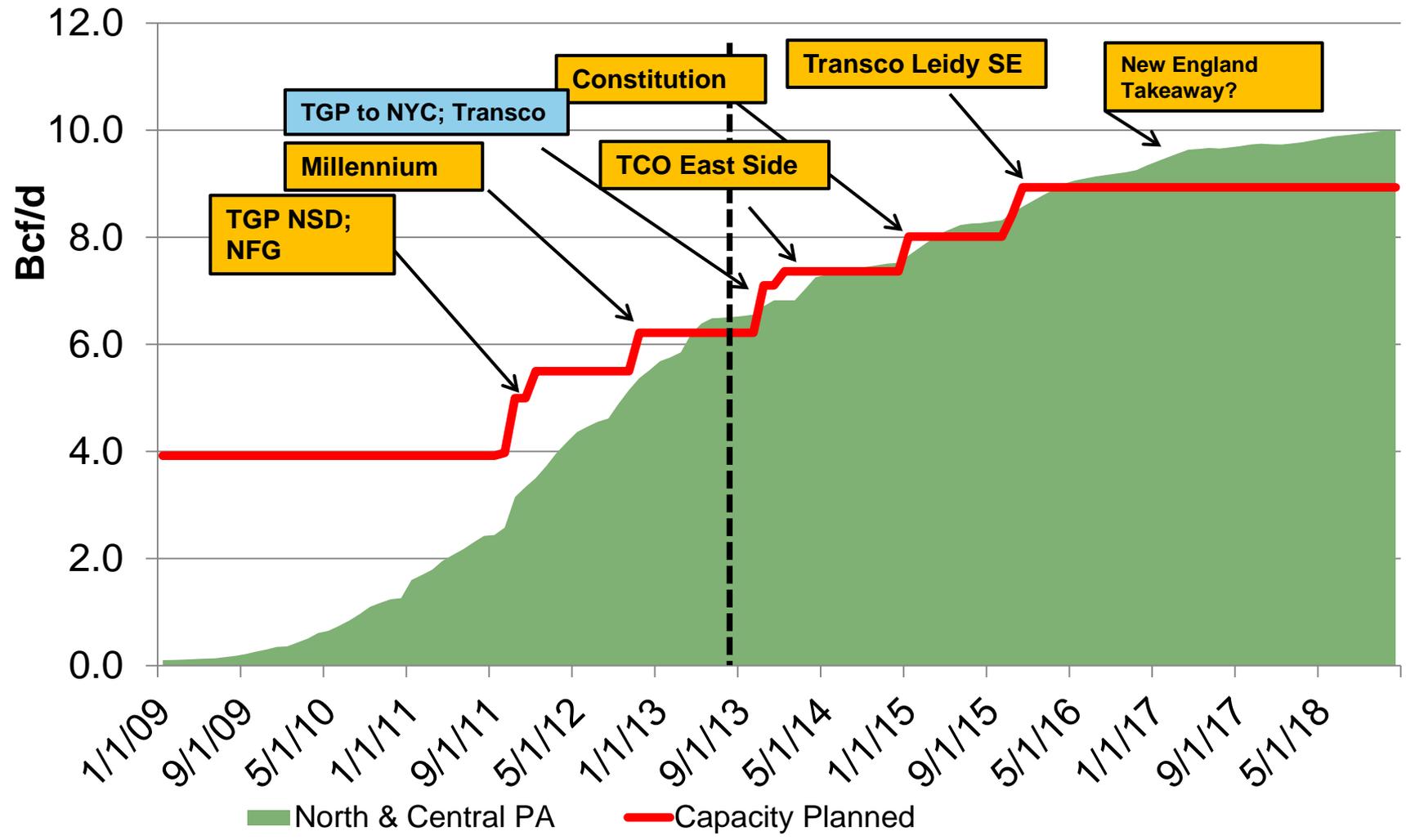
## Assumptions/ Takeaways

- Peak Demand in Ohio is expected to increase nearly 400 MMcf/d in the next ten years
- Peak Demand in Pennsylvania is expected to increase nearly 500 MMcf/d in the next ten years.

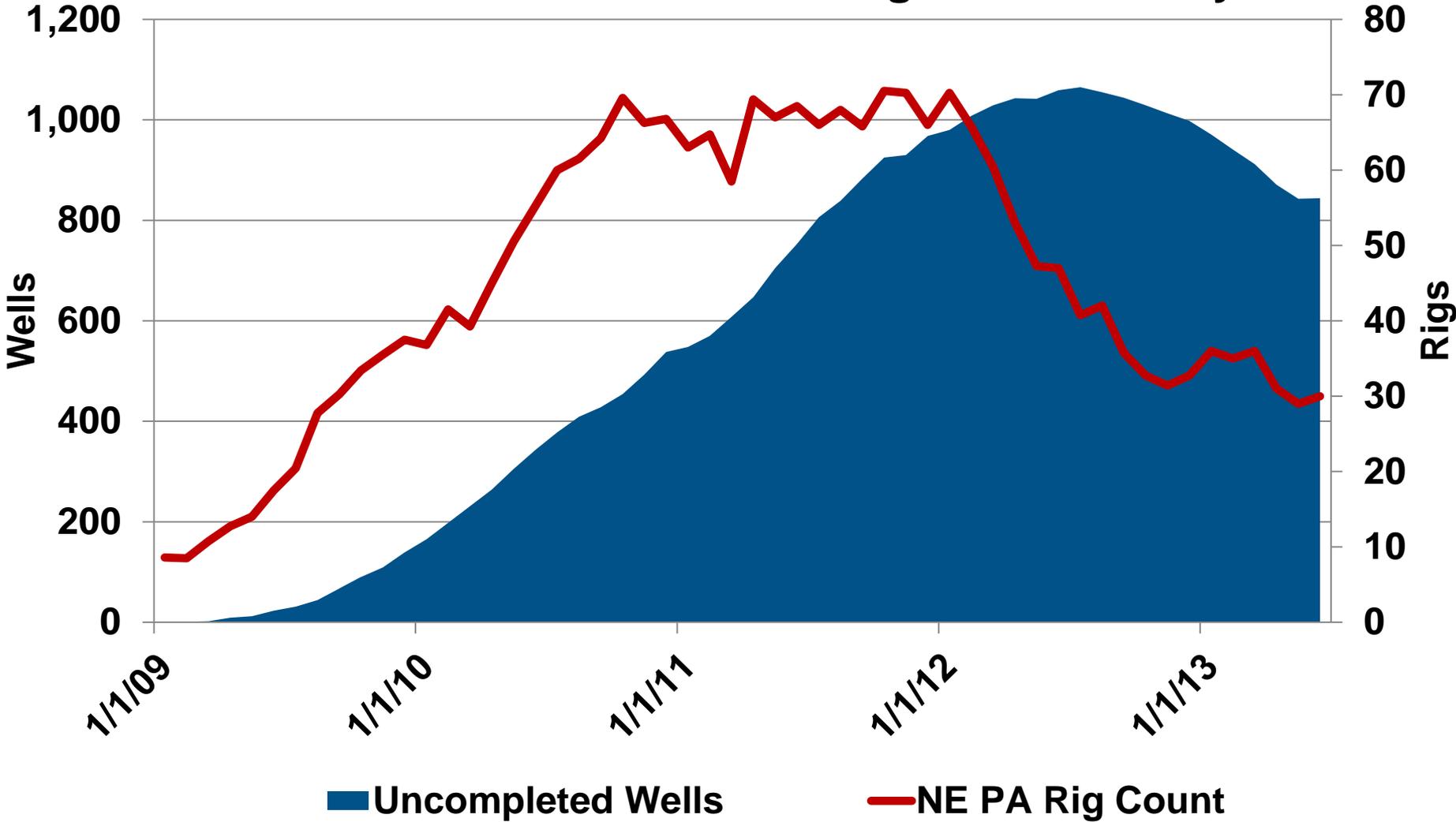
**There is Substantial Opportunity for Demand Growth**

**8-13 Bcf/d of Production Growth  
VS  
~1.0 Bcf/d of Demand Growth**

### NE PA Forecast and Takeaway Capacity- Low Case

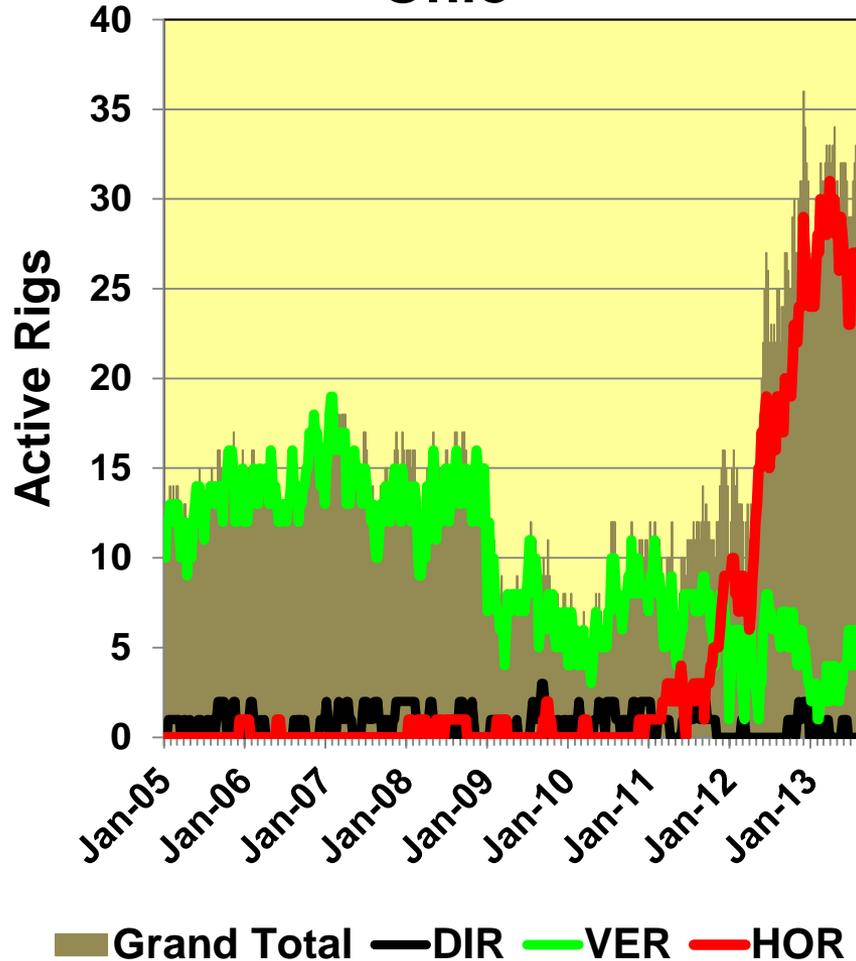


### NE PA Forecast Non-Producing Well Inventory

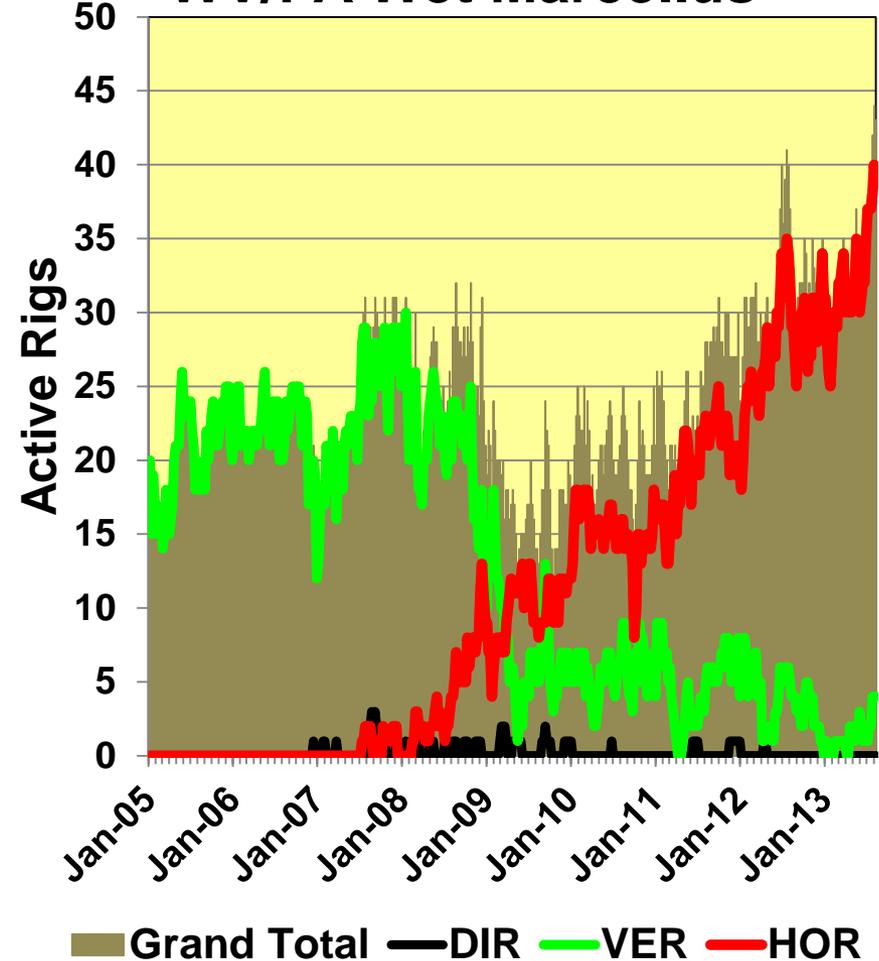


# Investment in Ohio and WV and PA Continues to Ramp Up

## Ohio

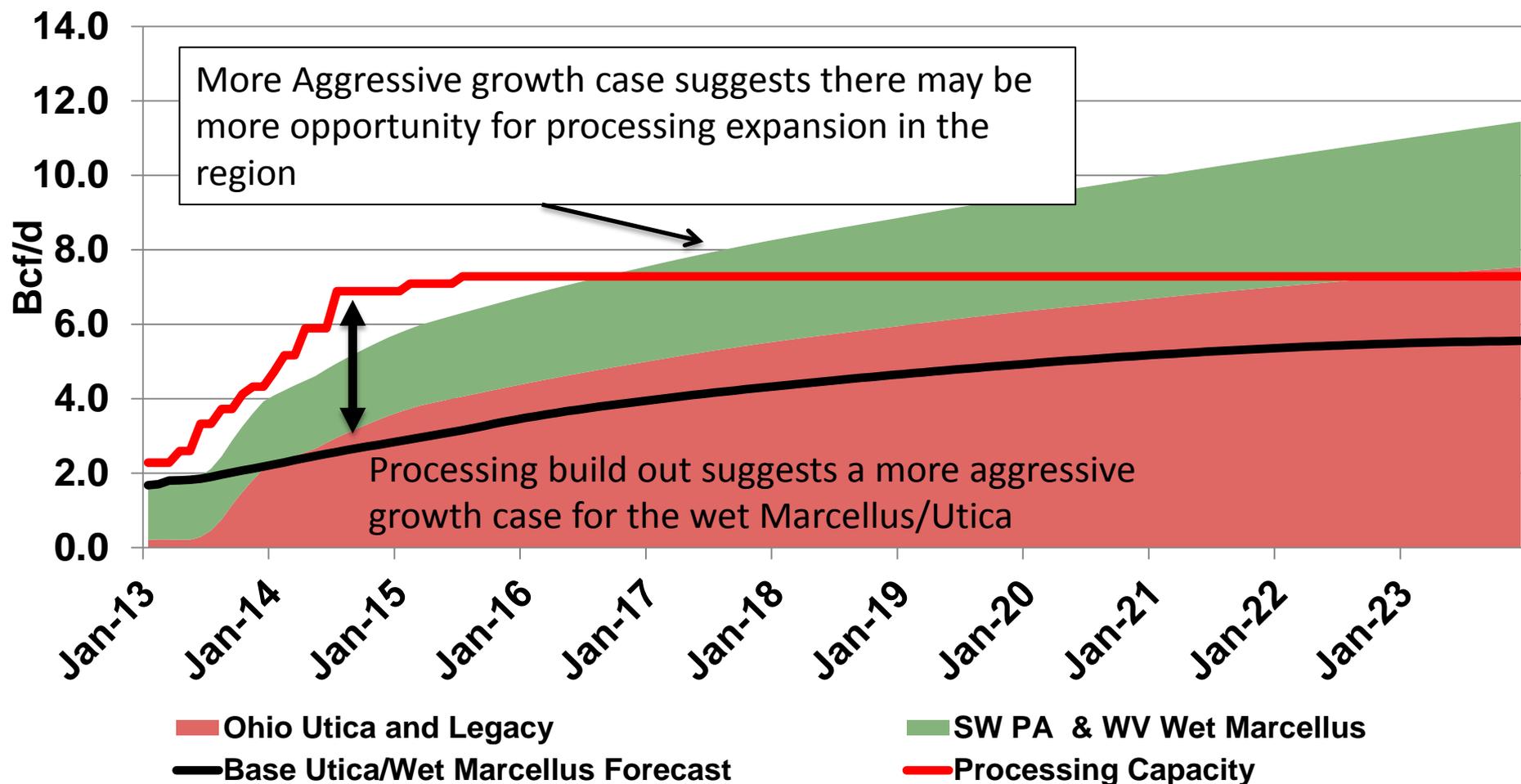


## WV/PA Wet Marcellus



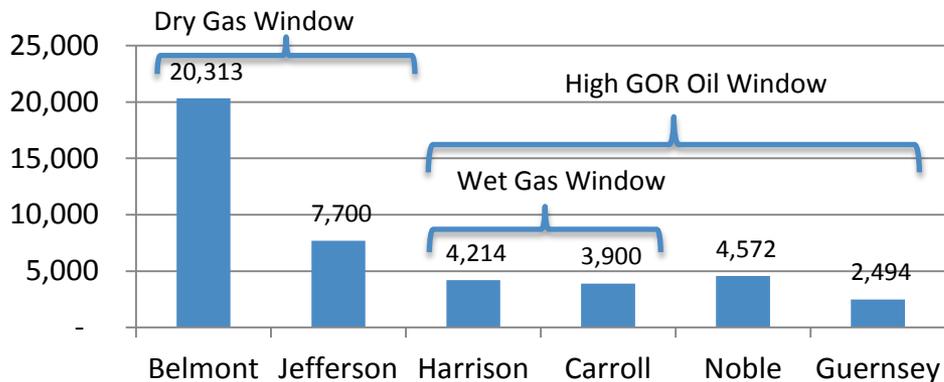
# Northeast Production Could be Bigger!

## Aggressive Marcellus/Utica Production Forecast

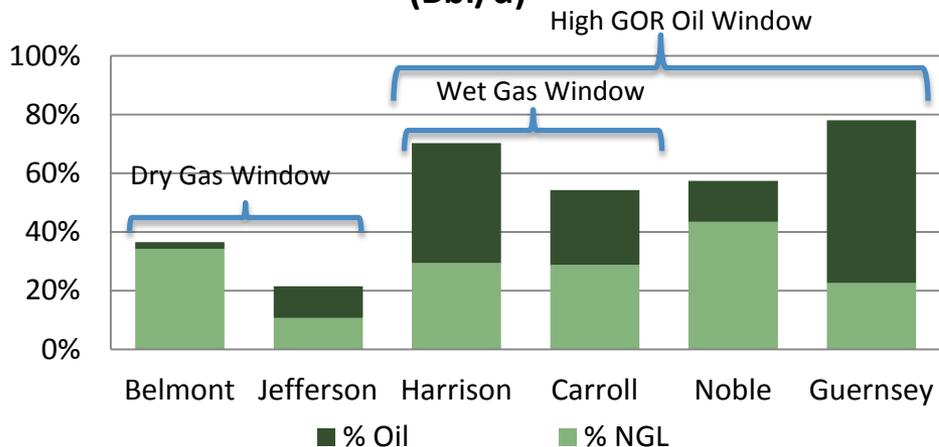


# Utica Production Window Showcases its Diversity

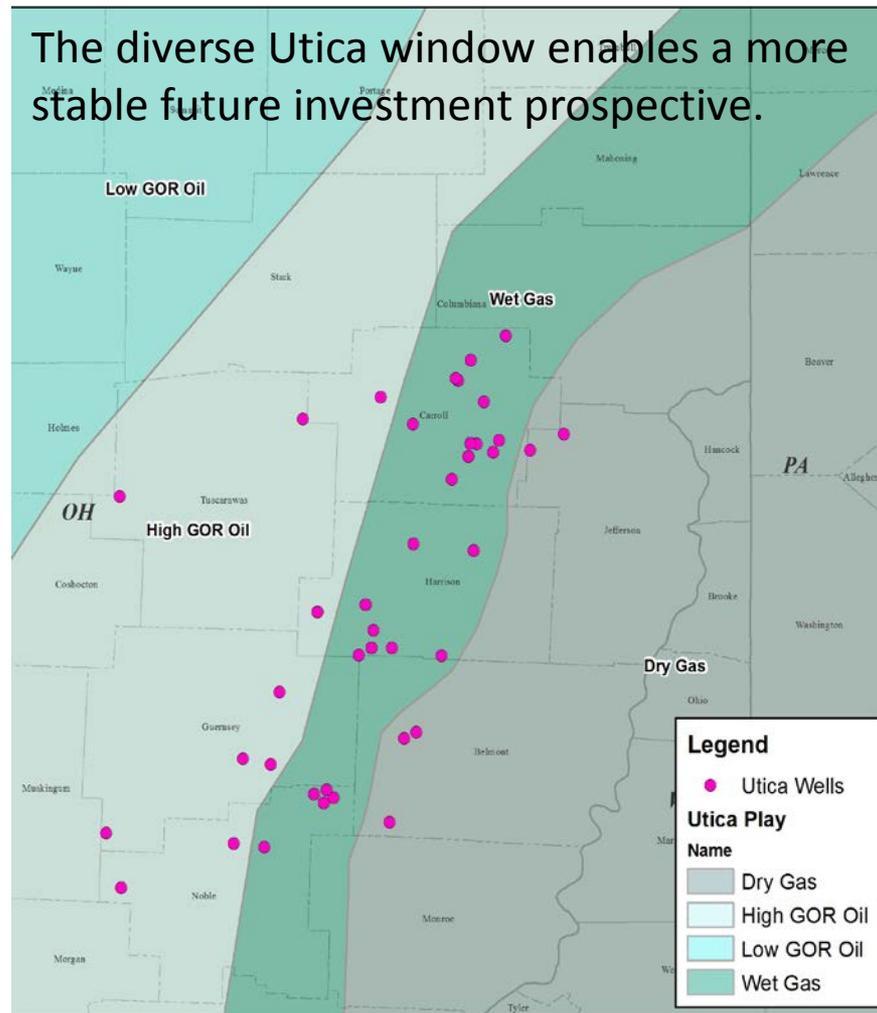
### Utica Peak Gas IP Rates by Window and County ( Mcf/d)



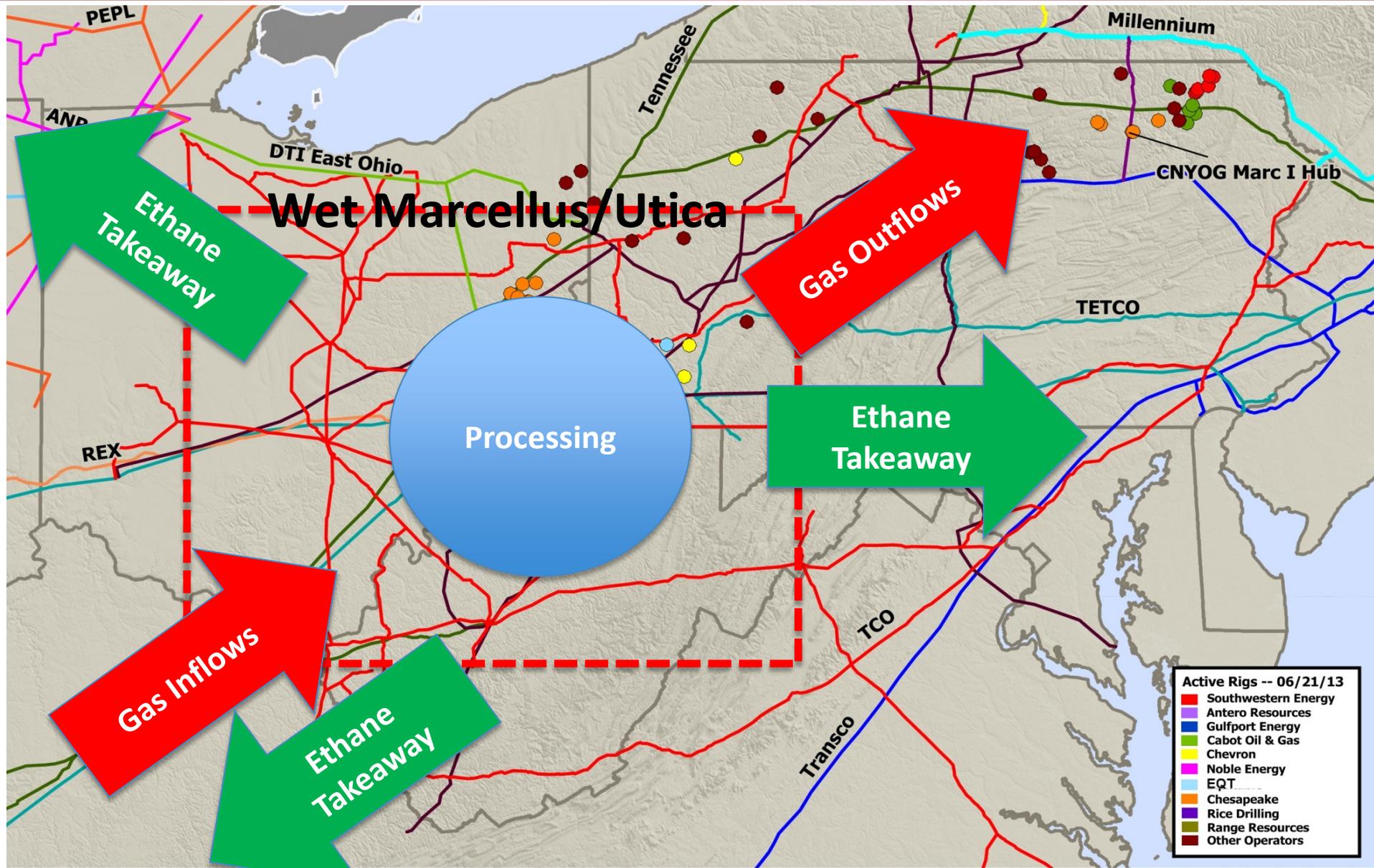
### Utica NGL's & Oil by Window and County (Bbl/d)



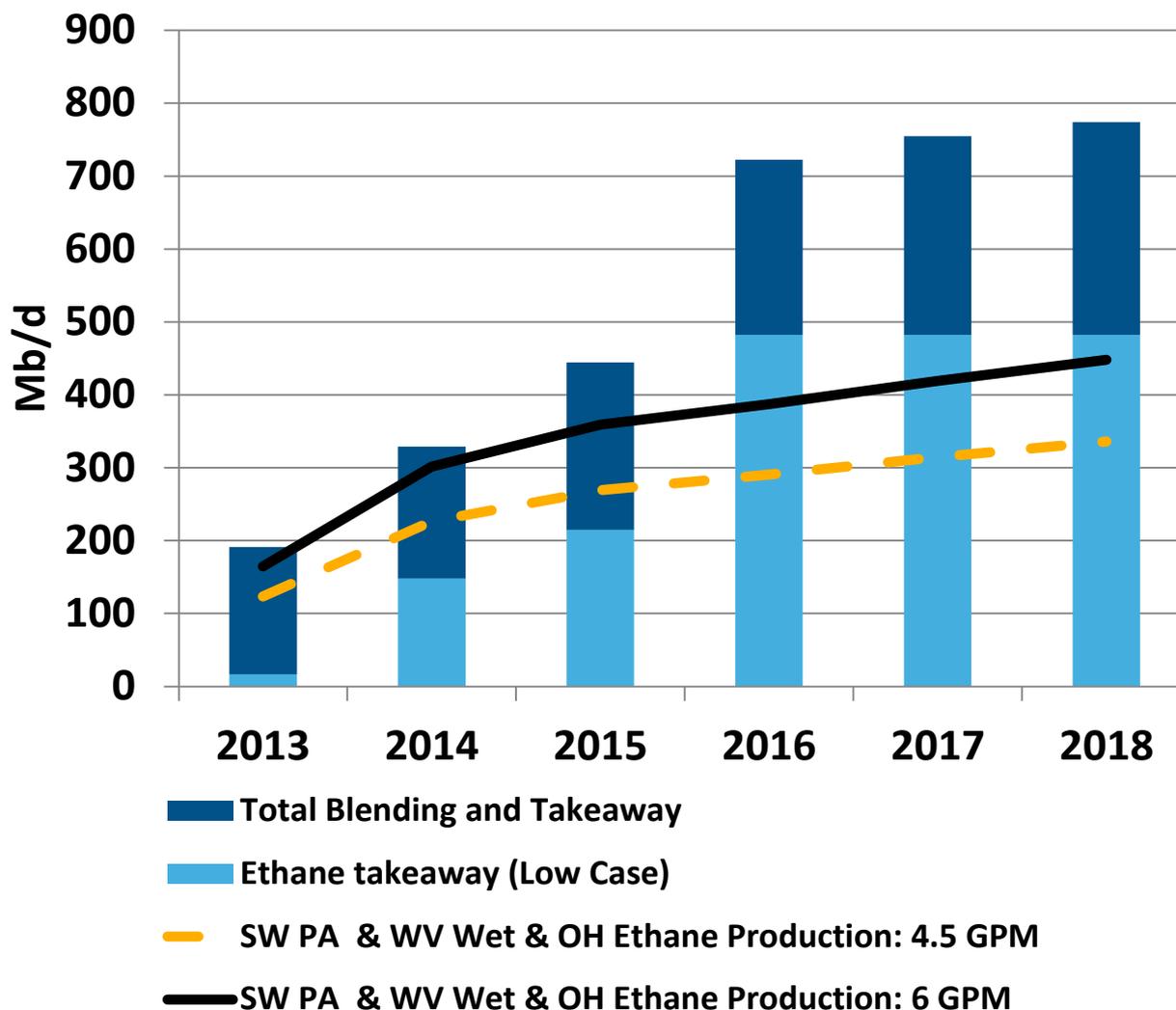
The diverse Utica window enables a more stable future investment prospective.



# Will Takeaway Issues Limit Growth From the Wet Marcellus/Utica



# Ethane Takeaway Will Be a Problem of the Past



## New Ethane Takeaway

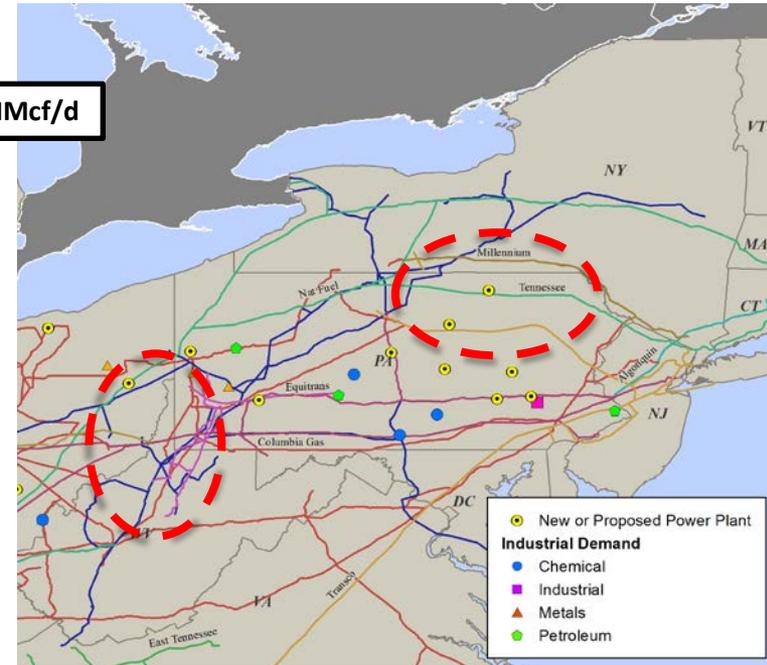
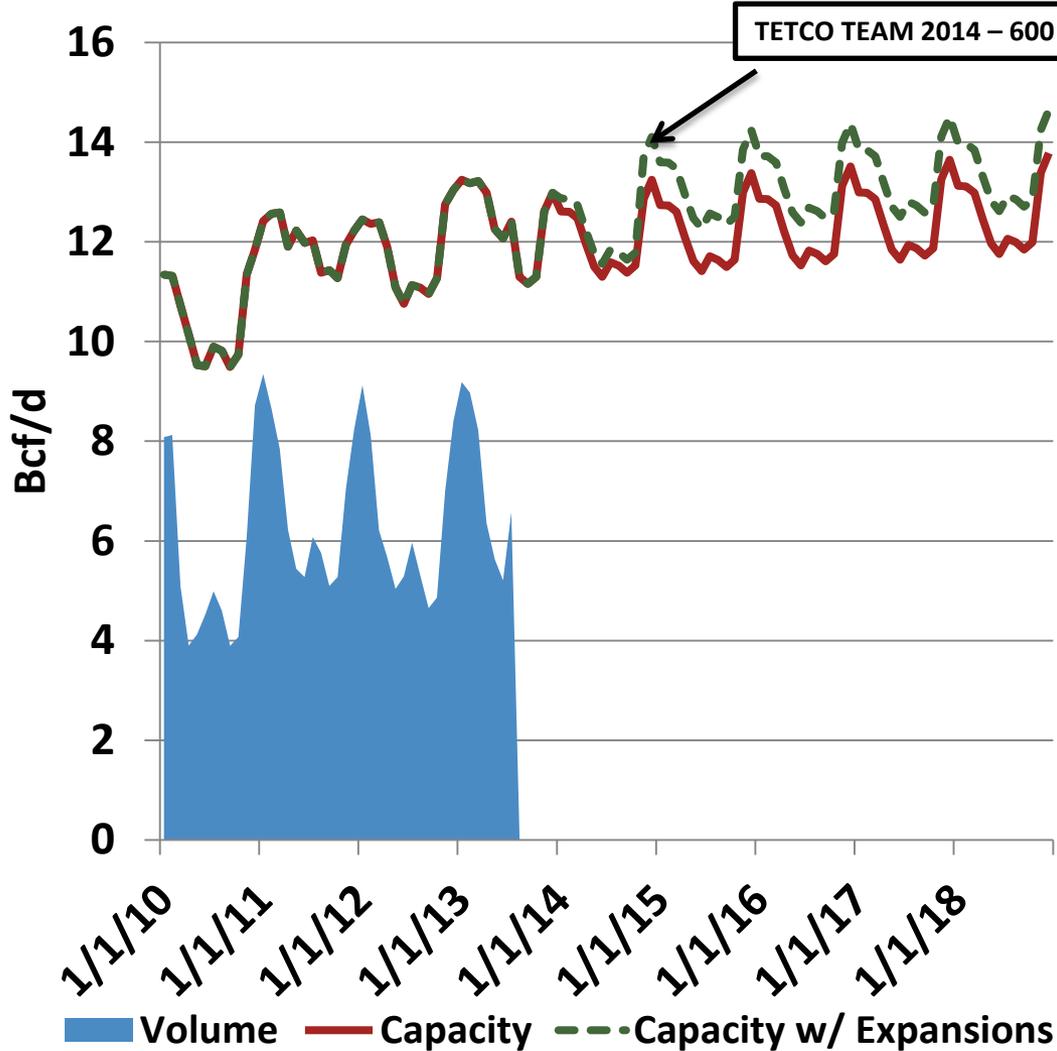
Pipeline	Cap (Mb/d)
Mariner West	50-65
Atex	125-190
Mariner East	18
Bluegrass	90-180
Tenn Conversion	200-400

## Ethane Blending Options

- Bidirectional Flow From the Region Provides Additional Blending Options
- Producers Can Blend Down Volumes With Dry Production from the Region.

# Eastward Expansions from Utica/ Wet Marcellus Compete With NE PA

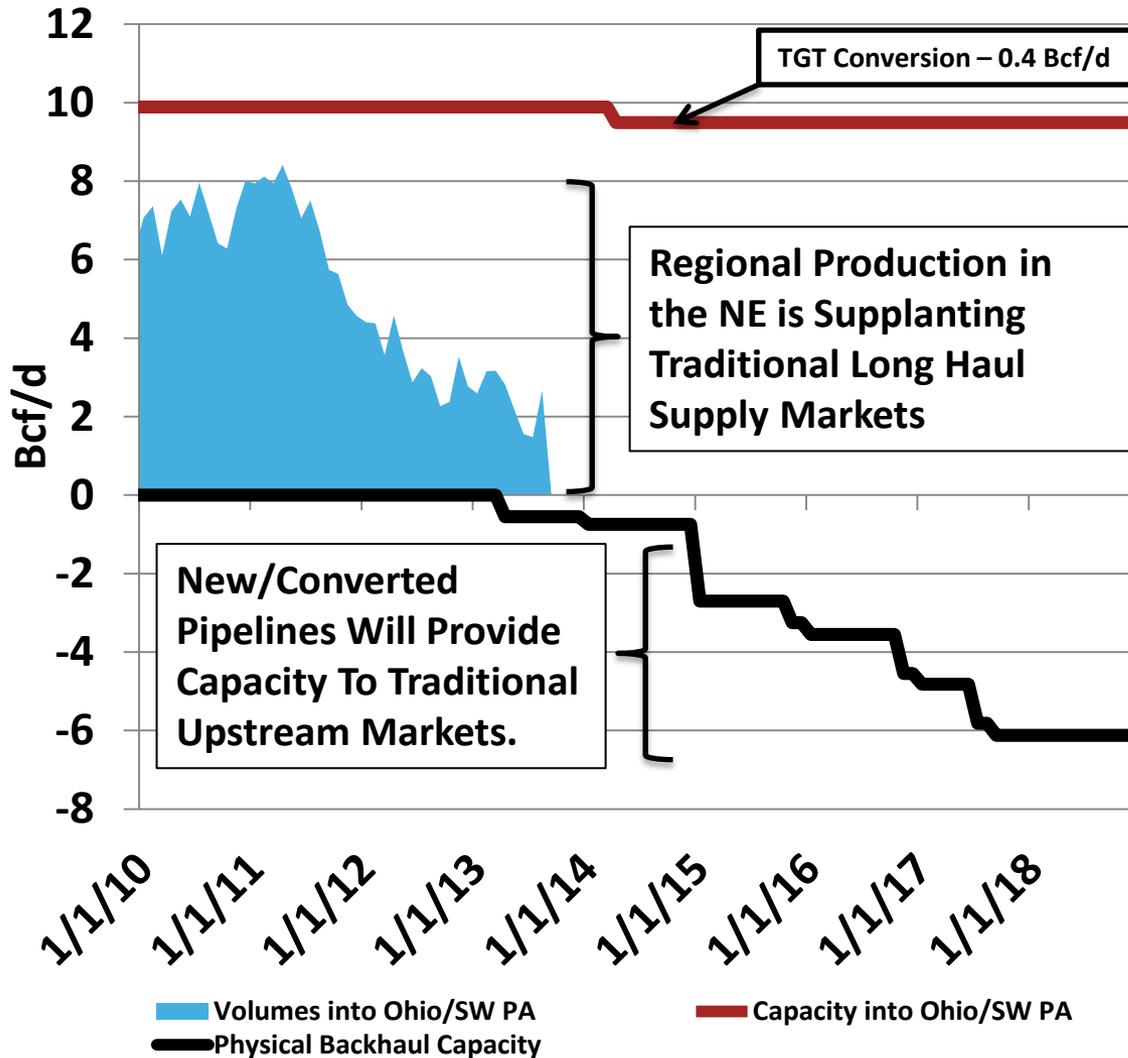
## Gas Outflows – North/East



- Close proximity of the Wet Marcellus/Utica and the Dry Marcellus leaves suppliers competing for some of the same market share.
- Utica/SW PA Expansion opportunities East are limited given the substantial available supply coming from NE PA.

# Utica and SW PA Target Markets to the South and West

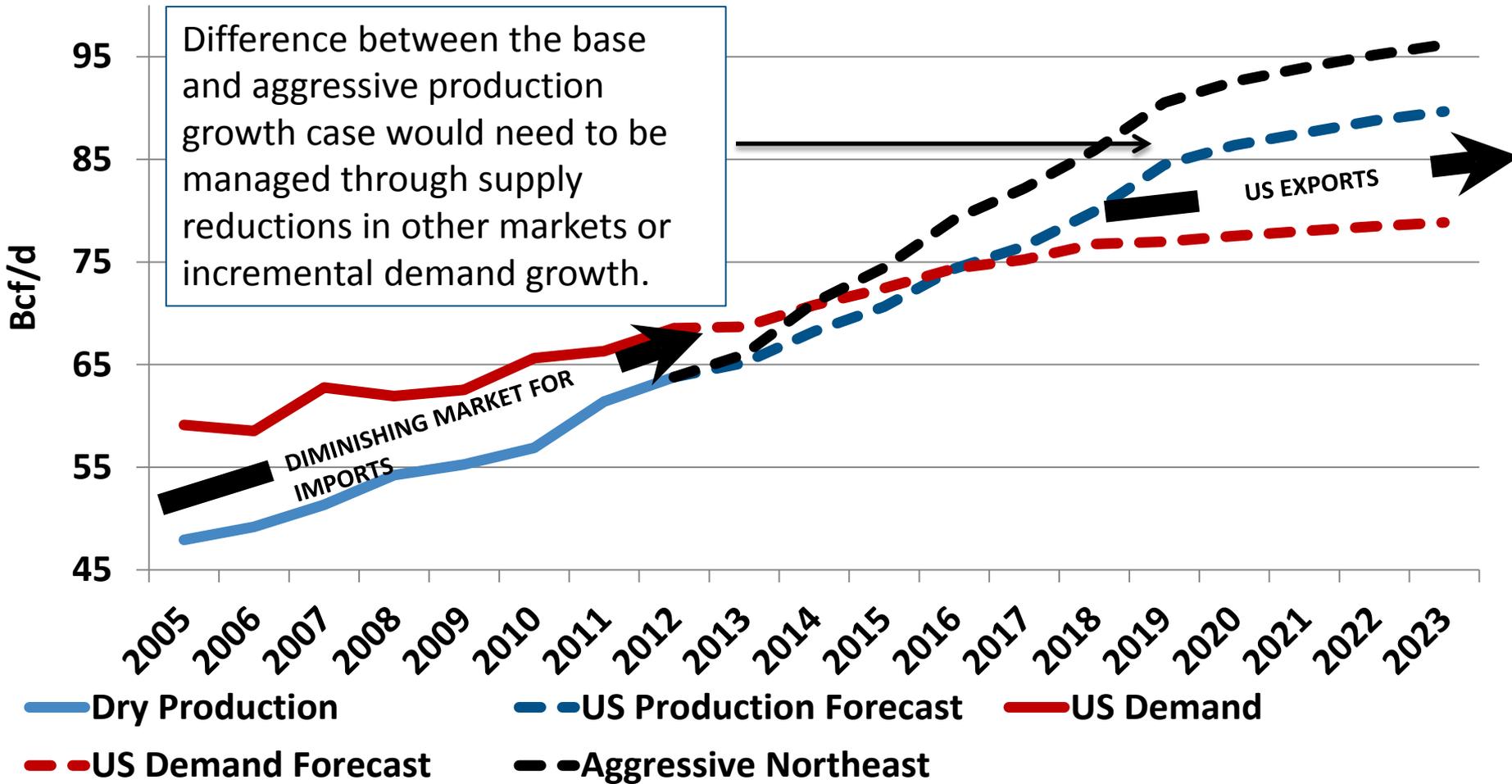
## Gas Inflows – West/South



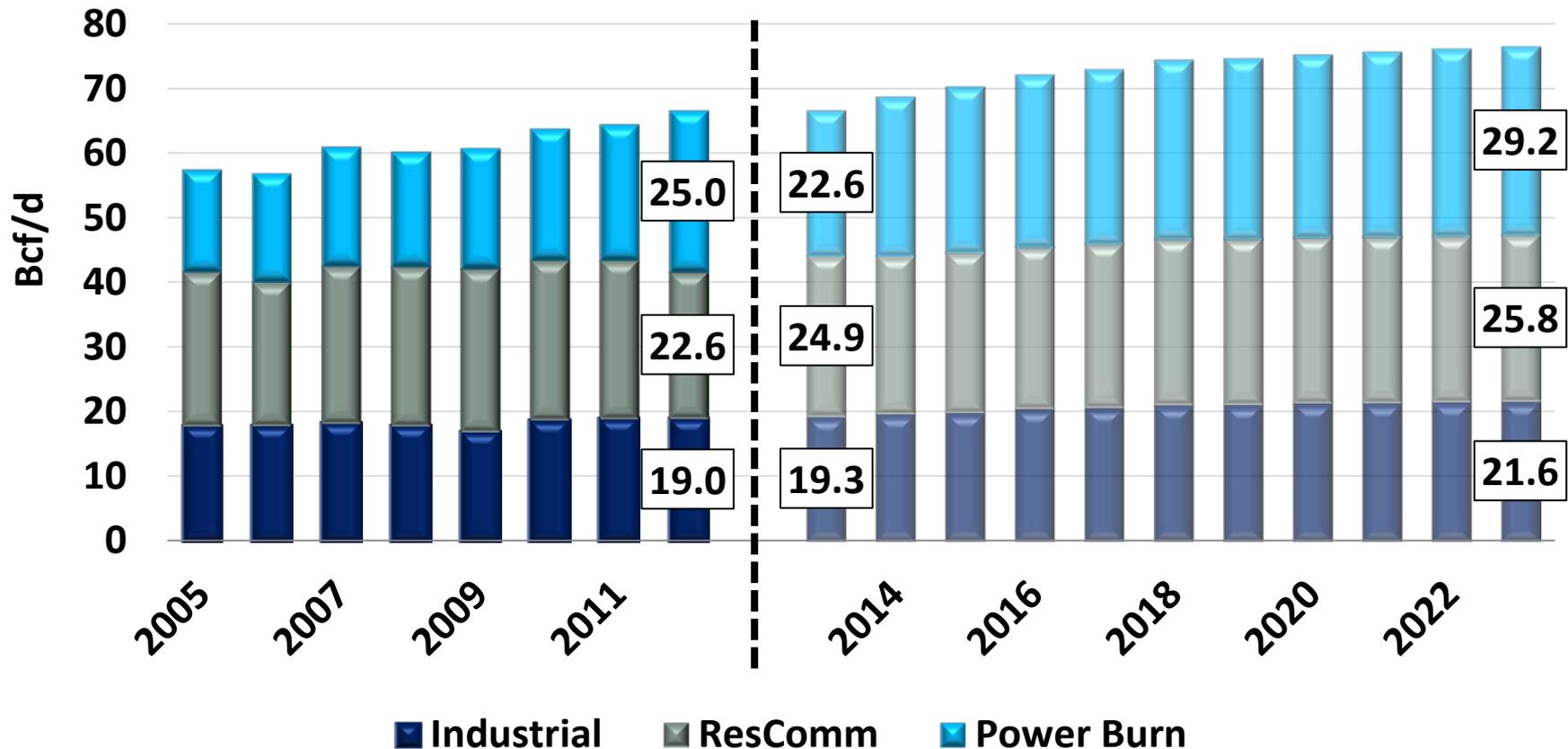
## New Gas Takeaway

Pipeline	Cap (MMcf/d)
West Side Exp	550
REX Backhaul	1,800
ANR Lebanon Lat	350
TETCO Open	550
Spectra Gas City	300
TETCO Renaissance	1,000
TGP SW LA Project	300
Spectra Nexus Project	1,000
ANR Lebanon Exp	270

## U.S. Supply/Demand Balance

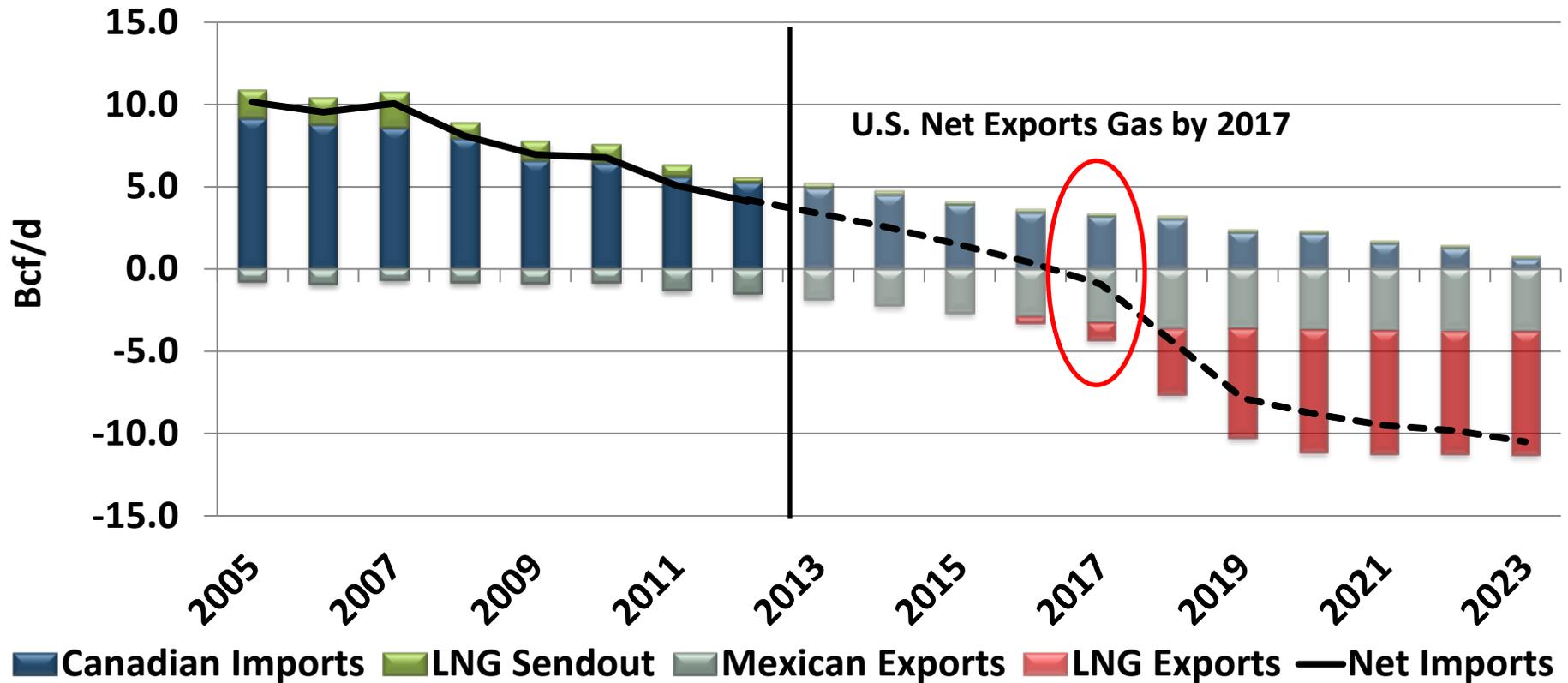


# U.S. Power Burn Drives Current Demand Growth Trend



- Industrial demand markets present one substantial opportunity for additional demand to consume supply.

# U.S. To Become Nat Gas Independent By 2017. Other LNG projects on the Table



- ❑ US LNG Exports will average 7.38 Bcf/d by 2023. Over 30 Bcf/d of LNG export projects from the U.S. Have been proposed.
- ❑ Mexican demand is expected to grow by 2.2 Bcf/d. Over 4.0 Bcf/d of pipeline expansion projects into Mexico have been proposed.

- There is a significant amount of proposed midstream infrastructure being built in the Northeast to support continued production growth. Over 16 Bcf/d of planned or under construction pipeline infrastructure projects will link end users and producers.
- Substantial opportunity exists for local end use markets to benefit from supply growth in the Northeast region. Substantial opportunity also exists for other regional demand markets to benefit directly or indirectly from Northeast supply growth.
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# Q&A

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