

Pipeline Development & Opportunities for the Chemical Industry

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BRAVO GROUP

PA Natural Gas Key Statistics

- Gross natural gas production exceeded 4 trillion cubic feet in 2014,
 - doubling 2012 production,
 - PA the nation's 2nd-largest producer behind Texas
- What does the future hold?

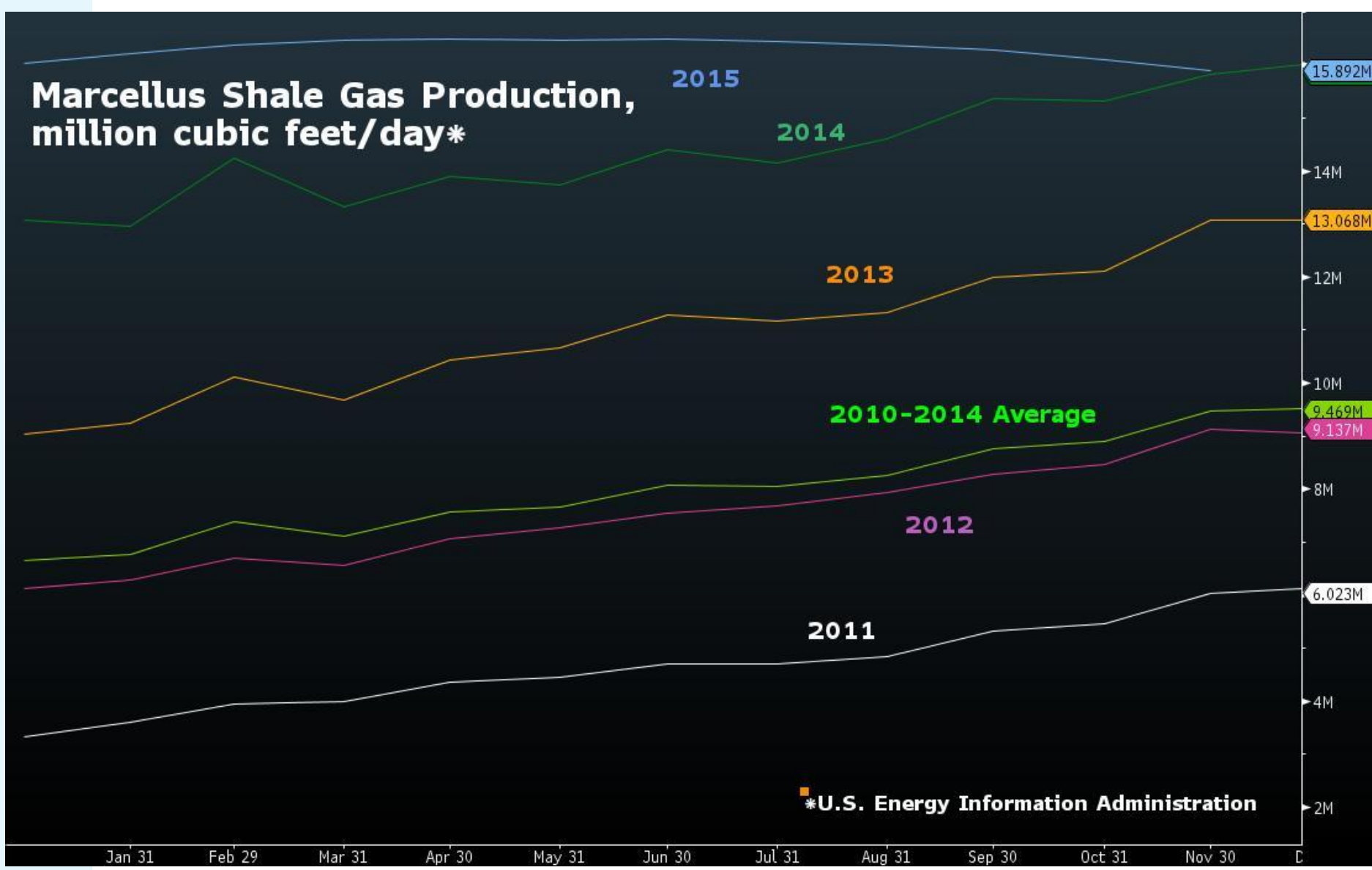
Impact to Downstream Markets

- Ongoing Natural Gas production
- Lack of pipeline capacity
- Competition with the Gulf Coast
- Long-term economic opportunity

Marcellus Production

- Production levels decline for first time
 - 15.89 billion cubic feet (BCF) per day in November compared to 16.11 BCF per day in October
- Pipeline capacity constraints impacting production
- Producers “choking back” output

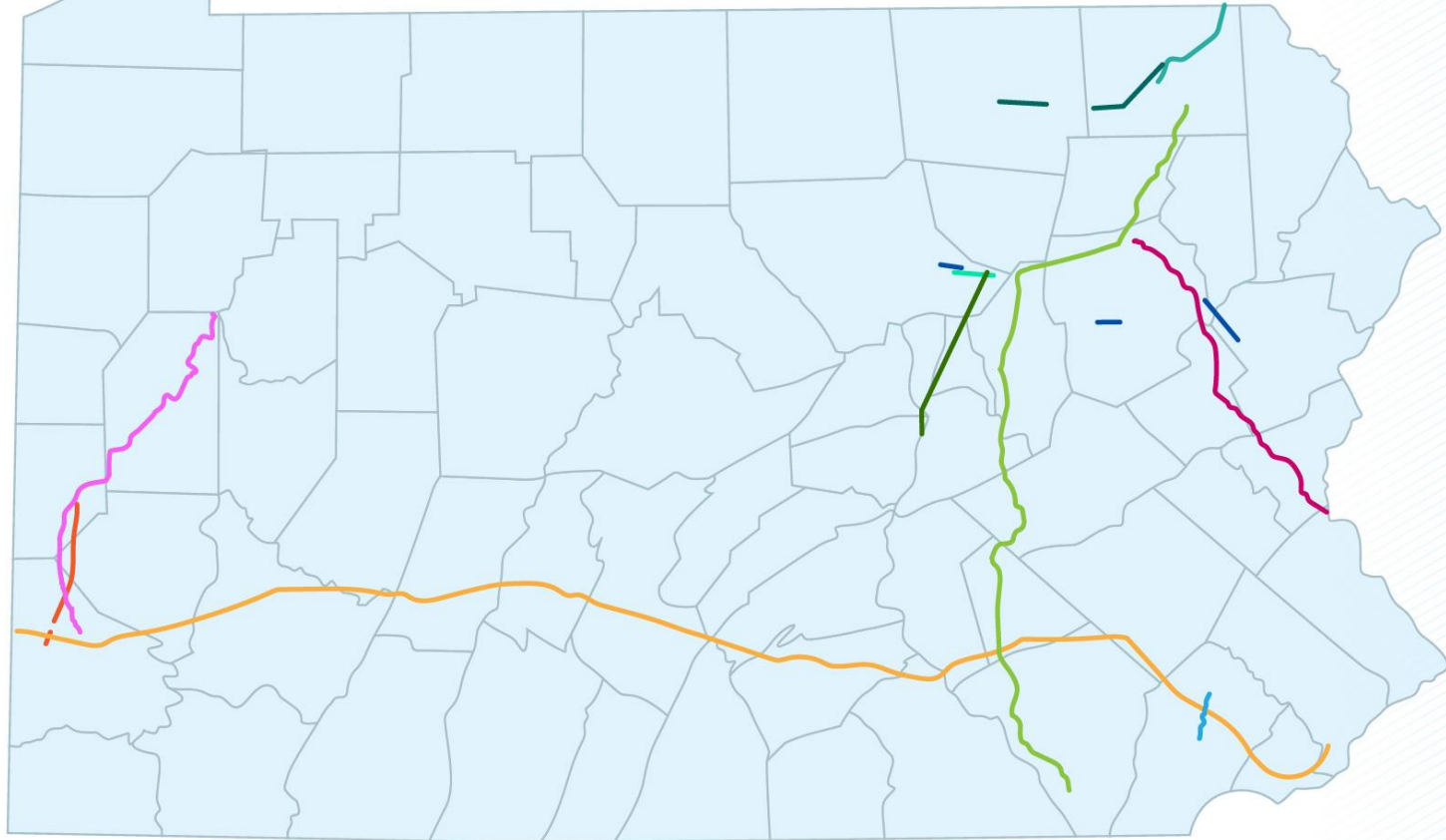
Marcellus Shale Gas Production, million cubic feet/day*



*U.S. Energy Information Administration

PROPOSED PA PIPELINE PROJECTS

Proposed Pipelines



- Line N West Side Expansion (East Coast Markets)
- Mariner East II (Marcus Hook)
- Atlantic Sunrise (East Coast Markets)
- Sunbury (East Coast Markets)
- Northeast Energy Direct (New England Markets)
- Constitution (New England Markets)
- Leidy Southeast (East Coast Markets)
- PennEast (East Coast Markets)
- ETP Revolution
- Unnamed

Note: The lines are approximations and generalizations.

Downstream Markets & Opportunities

GULF COAST VS. PENNSYLVANIA FOR CHEMICAL INVESTMENTS

CHEMICAL INVESTMENT IN SHALE GAS REACHES \$145 BILLION

By 2023, 637,000 permanent new jobs will be created.
By 2016, 222,000 temporary jobs will be created during
the capital investment phase, which peaks in 2016.



637,000 PERMANENT
NEW JOBS

222,000
TEMPORARY JOBS

As of June 2015, more than 200 projects valued at

\$145 BILLION

with more than half the investment
coming from outside the US.



New factories, expansions and
process changes could lead to

\$81 BILLION

per year in new chemical
industry output.



Pennsylvania chemistry...



At **\$22.2B**, is the
4th largest
manufacturing
industry in the state



Makes Pennsylvania the
10th largest
chemistry producing
state



Provides
41,300 direct jobs
and another
50,000 related jobs



Generates
\$3.7B
in payroll



Has an average wage of
\$88,660,
57% higher than
the average
manufacturing wage



Generates **\$237M**
in state & local taxes,
and **\$807M** in
federal taxes



Invests \$943M
to build & update
equipment and
facilities



Ships \$7.8B
in products to
customers around
the world



Generates an
additional
35,100 jobs
in plastics
& rubber products



Powered by Natural Gas

The chemical industry uses 1.7 trillion cubic feet of natural gas each year (largely for fuel and power purposes) to create products that touch every part of consumer's lives from the cars they drive to the clothes they wear to the food they eat.

Air mattresses

Antifreeze

Aspirin

Balloons

Ballpoint pens

Bandages

Baseballs

Basketballs

Beach umbrellas

Boats

Cameras

Candles

Candy

Cellphones

Clothing

Computer keyboards

Computer monitors

Crayons

Credit cards

Curtains

Deodorant

Detergent

Eyeglasses

Fertilizers

Fishing rods

Food preservatives

Footballs

Glass

Glue

Golf bags

Gum

Hand lotion

House paint

Hula hoops

Ink

Life jackets

Lipstick

Luggage

Movie film

Paint

Perfumes

Plastics

Propane

Refrigerants

Roofing

Shampoo

Shaving cream

Shoes/sandals

Soap dishes

Sunglasses

Surf boards

Telephones

Tennis rackets

Tents

Tires

Toothbrushes

Toothpaste

Trash bags

Umbrellas



Impacts to PA Chemical Growth

- Increased pipeline infrastructure-primarily Sunoco Logistics' Mariner East, Atlantic Sunrise and Constitution
- Potential Cracker facilities in SWPA & SEPA
- Pro-growth business and regulatory climate
- Skilled workforce

Only the Beginning

- Patience & Perseverance - Gulf Coast has a 50+ year head start
- Encouraging Pipeline Infrastructure Development
- Regulatory and Tax Climate to encourage growth

Long-term Growth Strategy

- Regional Economic Development Planning
- Building Relationships with producers and with logistics companies
- If Pennsylvania gets it right, natural gas will be a game changer for the next century

