MARCELLUS SHALE COALITION™

WATERWAYS COUNCIL, INC.

16^{th} Annual Waterways Symposium

David J. Spigelmyer

November 7 2019

About MSC

Our Membership

- 150+ diverse members
- Producers, midstream and suppliers

Our Focus

- Long-term development
- End use opportunities
- Addressing landowner and public issues
- Maximizing benefits to secure our region’s energy future

Associate Members are an integral part of the MSC and the industry's robust supply chain.

More than 95% of the natural gas in Pennsylvania is produced by MSC member companies.

The MSC Board of Directors consists of 34 major producer and midstream companies in the Appalachian Basin.

Drilling Activity in PA

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Drilling Activity in PA

- 11,208 unconventional wells*
  - 487 inactive
  - 603 shut in
  - 714 drilling not completed
- 9,340 unconventional wells producing natural gas
- 2nd largest natural gas producer in U.S.
- 3,820 unconventional well pads
- 18+ billion cubic feet/day
  - 6 trillion+ cubic feet/year
  - 32% of total U.S. shale gas production
- 20% of total U.S. natural gas demand

Drilling rig in Potter County, PA

* July 2019 (most recent data available)

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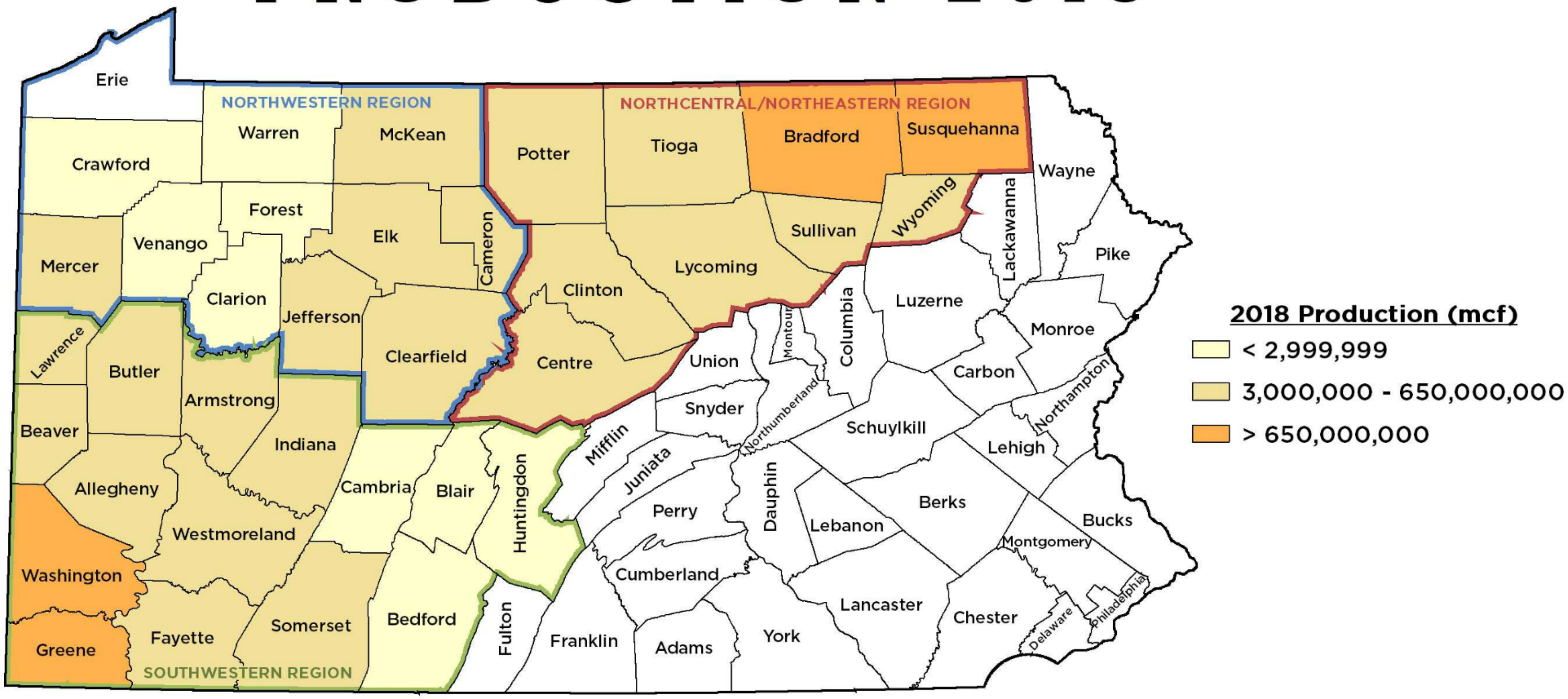
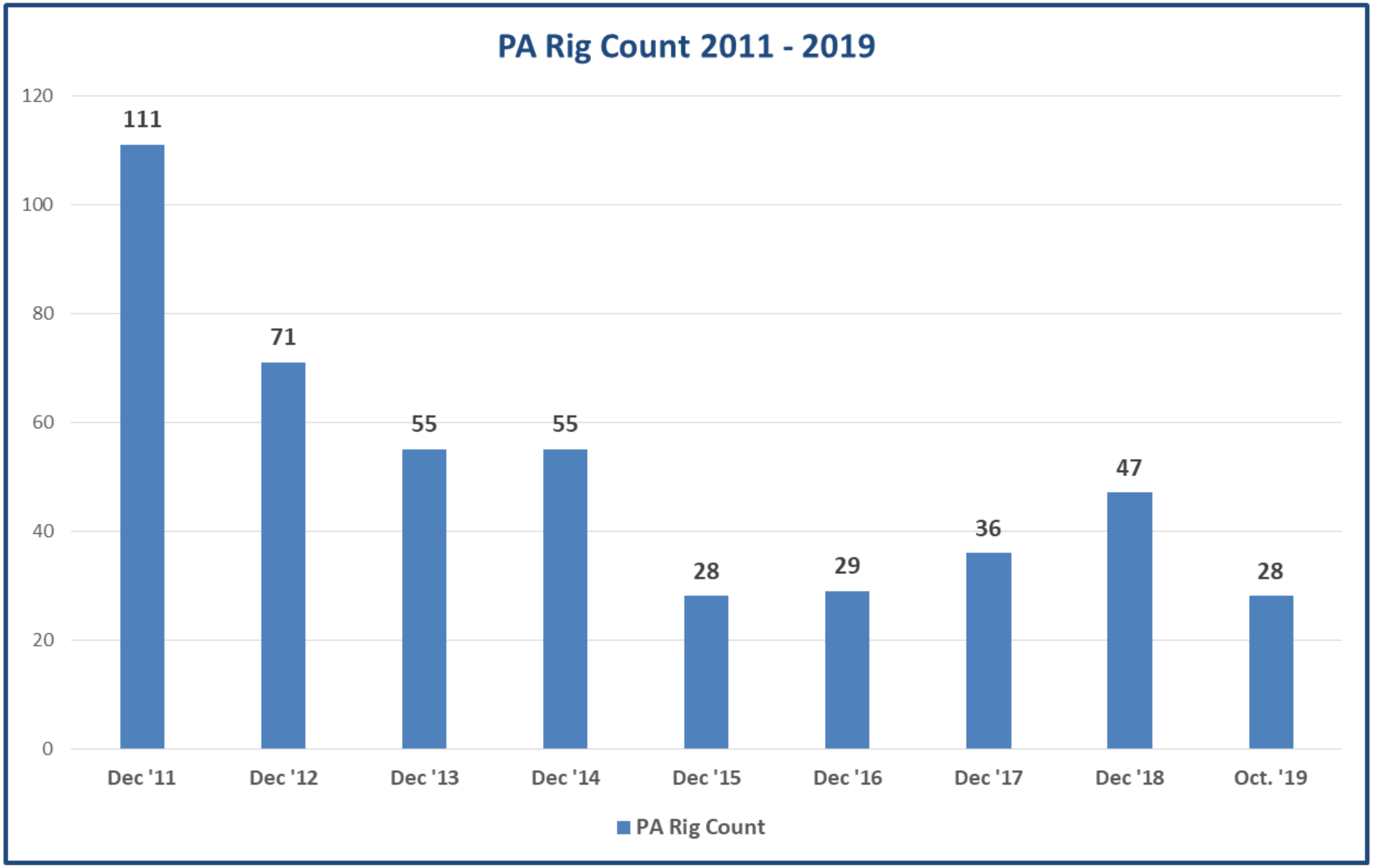
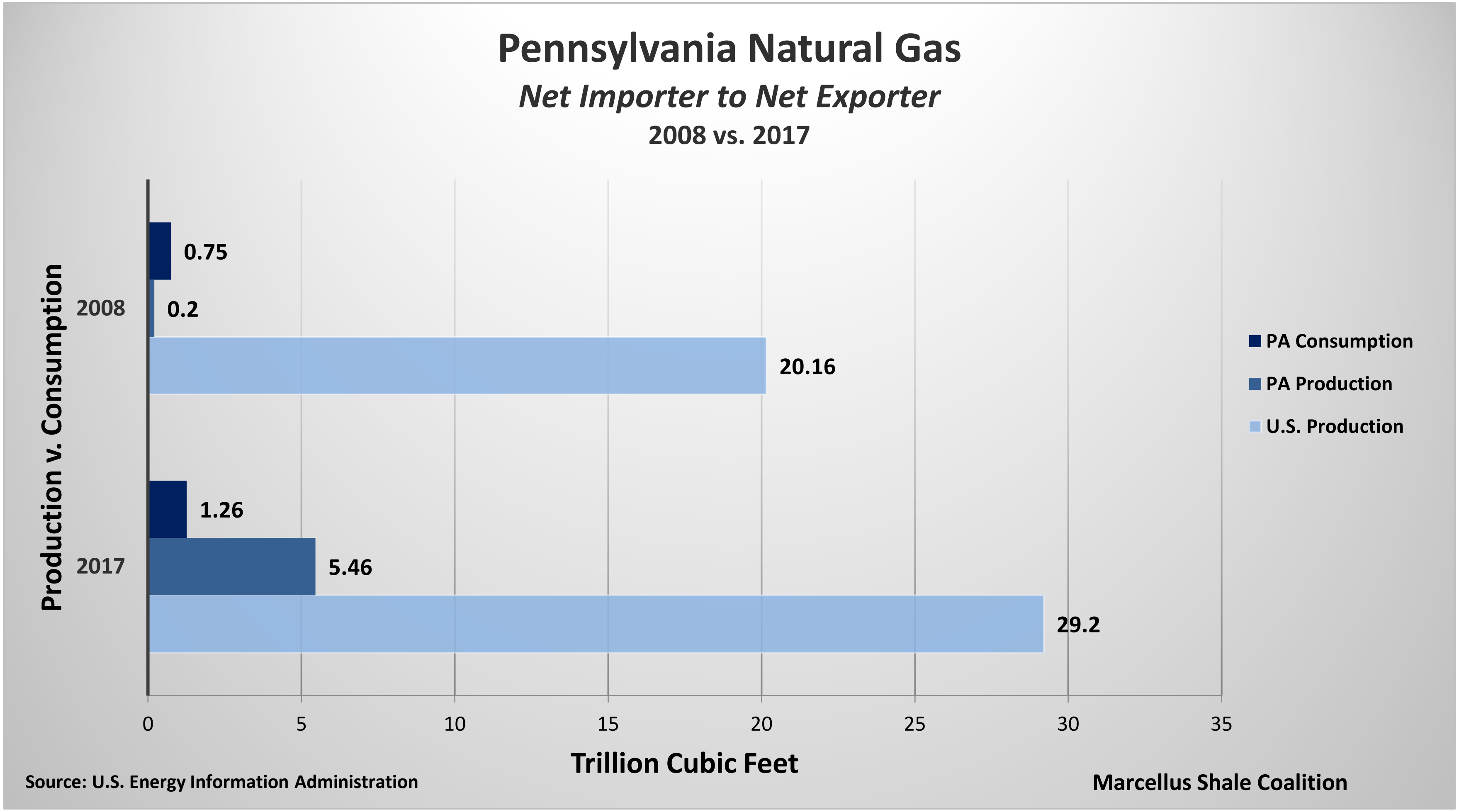
PENNSYLVANIA SHALE GAS PRODUCTION 2018



Drilling Activity in PA

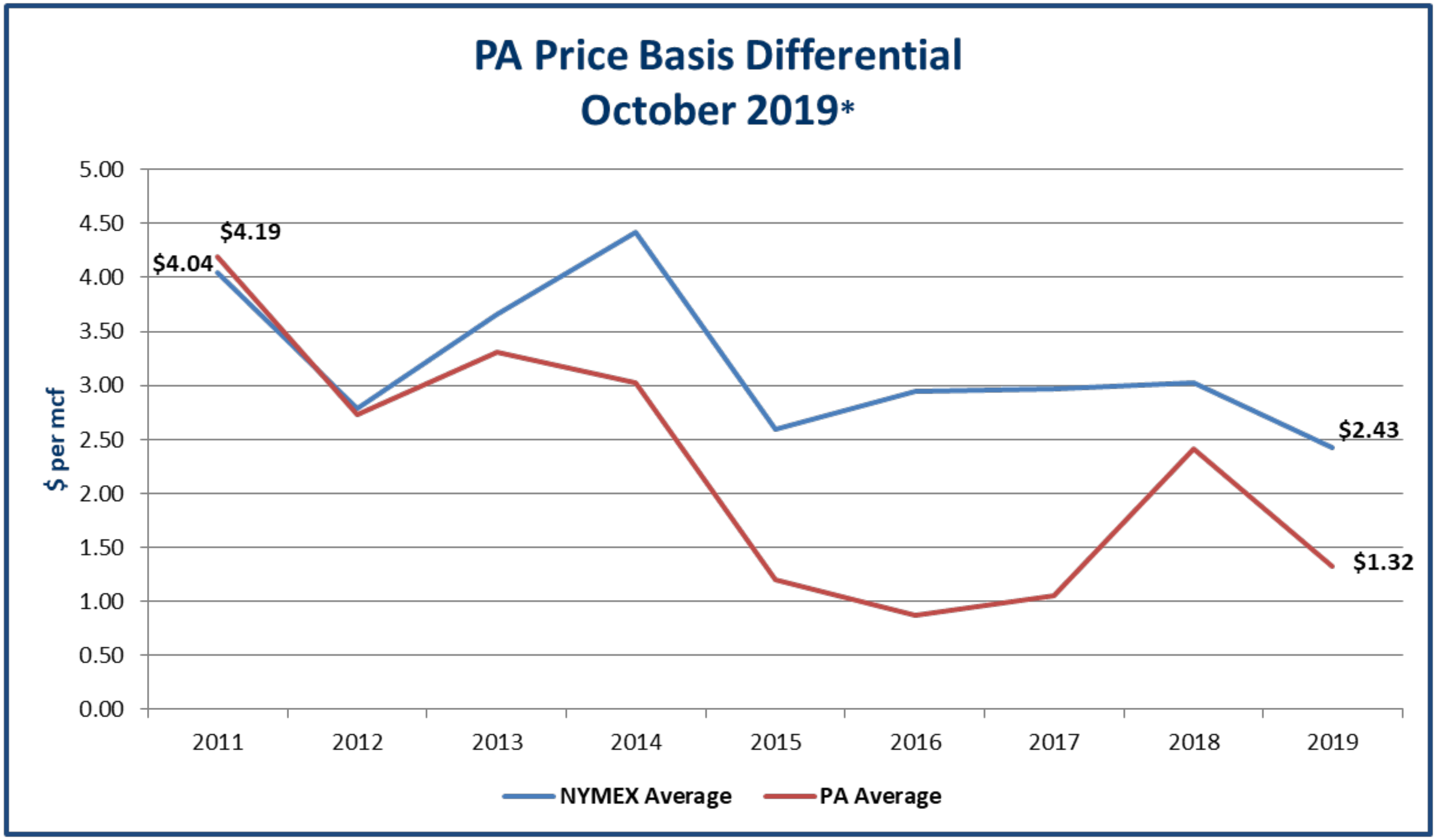


PA: World-Class Producer



Pricing

PA Price Differential



* October 2019 Monthly Bidweek Price – Platts Inside FERC

Consumer & Economic Benefits

Benefiting Consumers

Report: Pennsylvania Consumers Saved More Than $30 Billion Over 10 Years from Lower Natural Gas Prices

Consumer Energy Alliance Examines Benefits of Energy Production to Pennsylvania's Families, Small Businesses and Manufacturers in New Report
September 6, 2018

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Benefiting Consumers

Lower Prices = Customer Savings

- Wholesale electric prices down 41% since 2008
- Natural gas prices for end-use customers down 56% - 76% since 2008
- Average annual savings > $1,100 - $2,200 per household

Benefiting Consumers

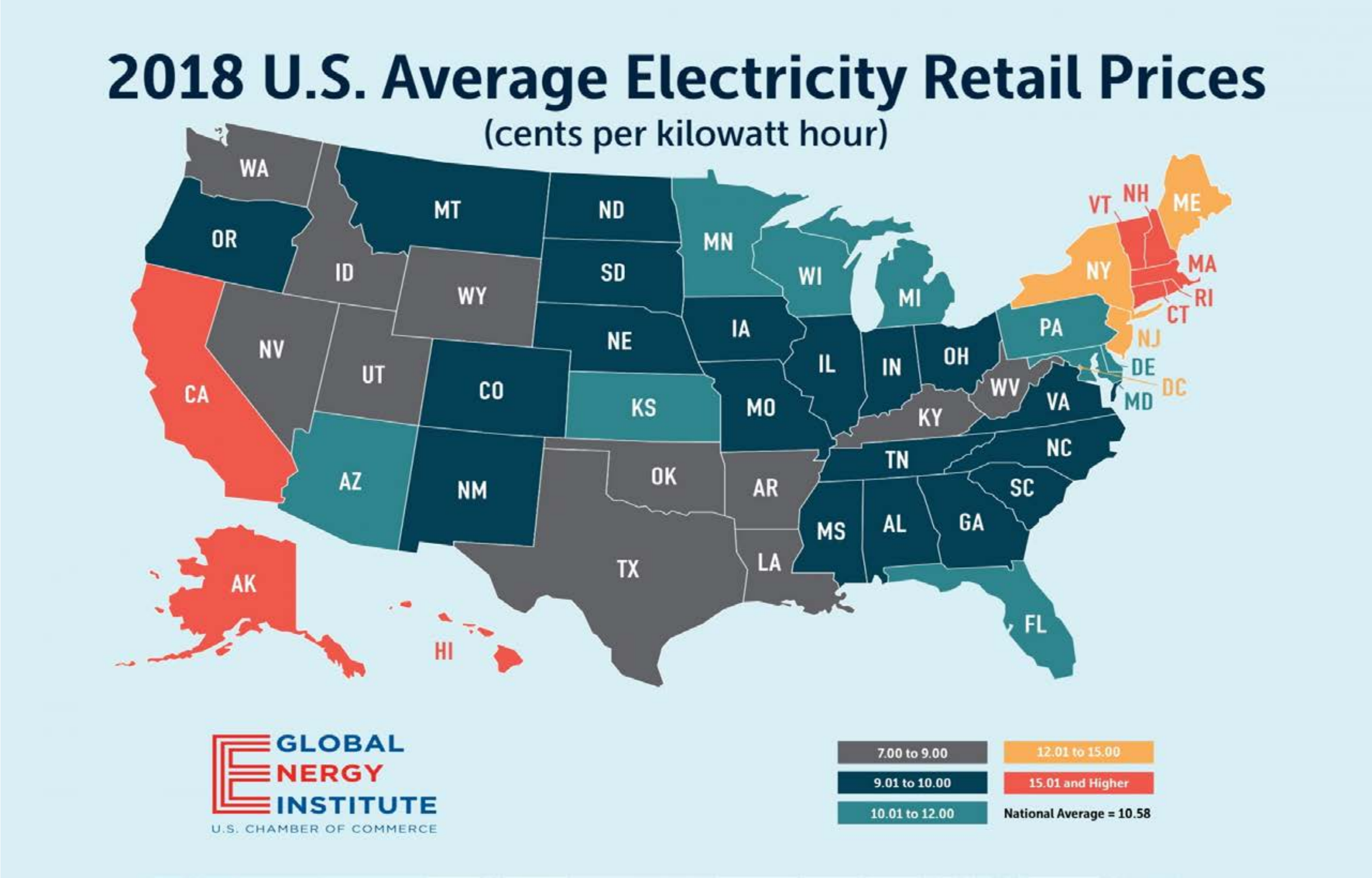
Lower Prices = Customer Savings
2008 - 2018

Utility	PGC Rate / mcf		% Change	Customer Savings**
	2008*	2018*	2008-2018	Annual
PECO	$13.16	$5.05	- 62%	$1,460
NFG	$10.86	$4.50	- 59%	$1,145
PGW	$13.02	$3.62	- 72%	$1,692
Columbia	$15.94	$3.84	- 76%	$2,178
UGI	$13.26	$5.89	- 56%	$1,327
UGI Penn	$11.68	$4.33	- 63%	$1,323
Peoples/Equitable	$15.89	$4.53	- 71%	$2,045

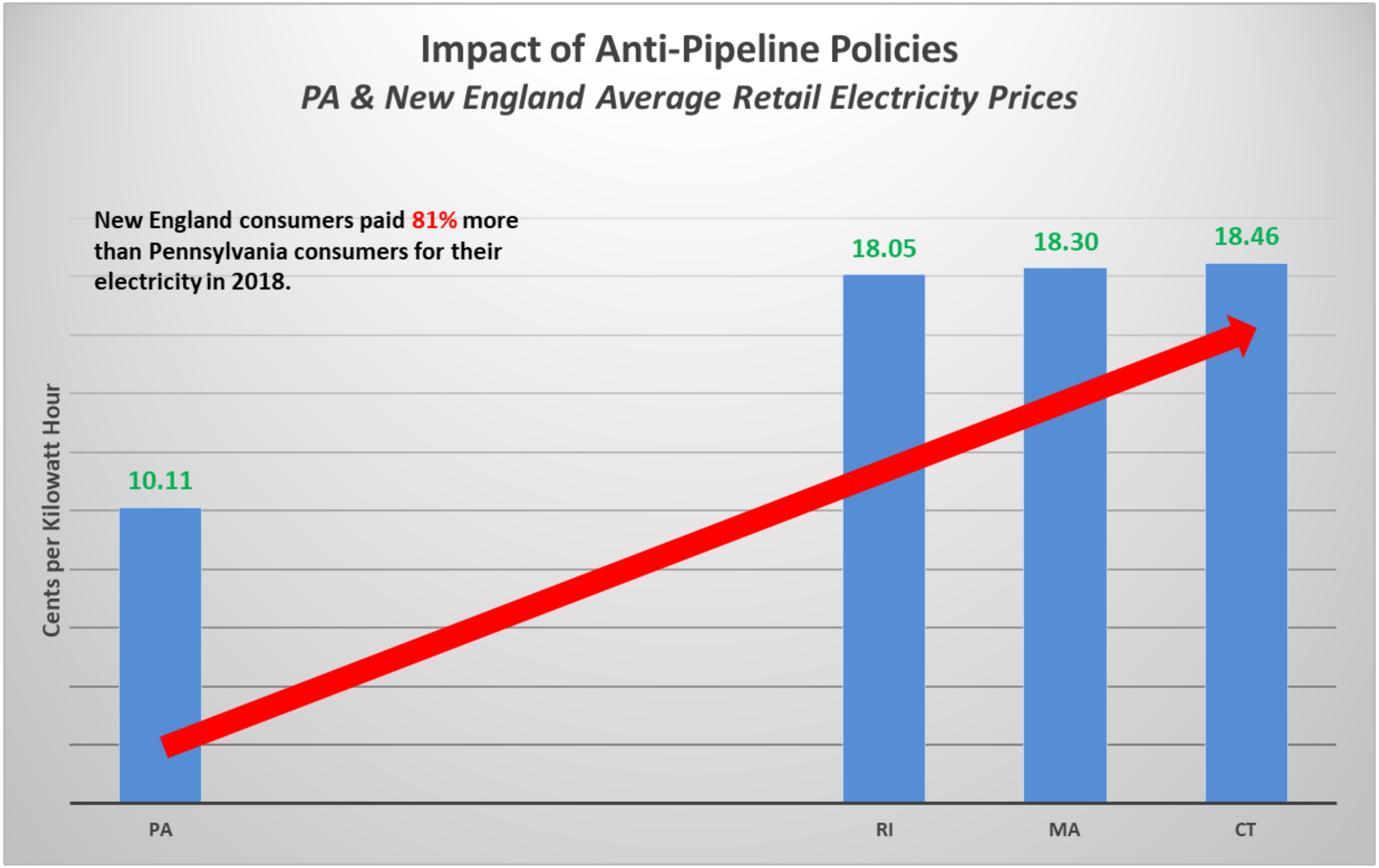
* PUC Purchased Gas Cost (PGC) Rate in Effect Prior to Annual Review: 2008 & 2017

** Residential heating customer using 15 MCF/month

Benefiting Consumers



Not…Benefiting New England Consumers



Source: *U.S. Chamber of Commerce – Global Energy Institute 2018 Average Retail Electricity Prices*

Look Familiar?

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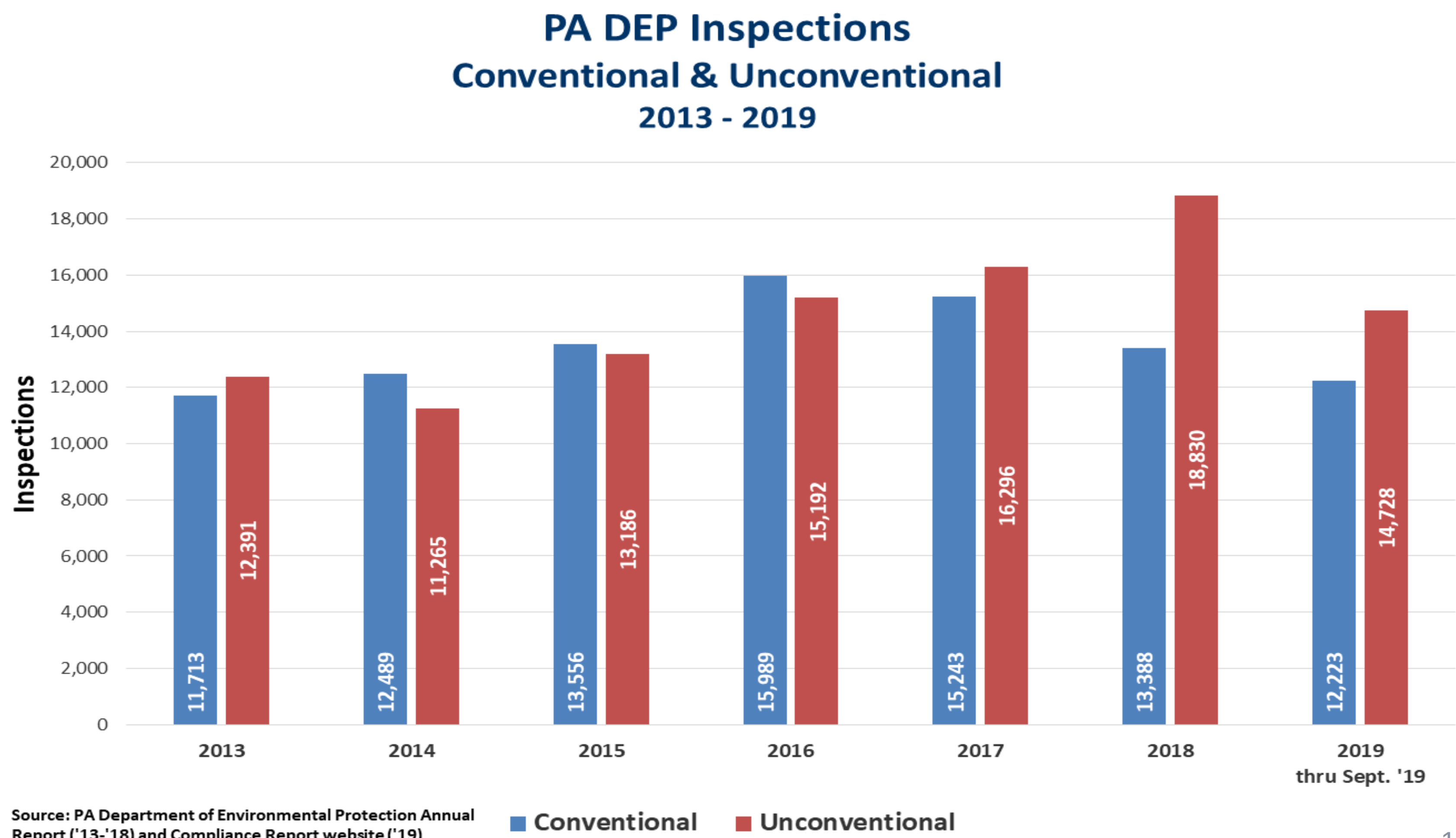
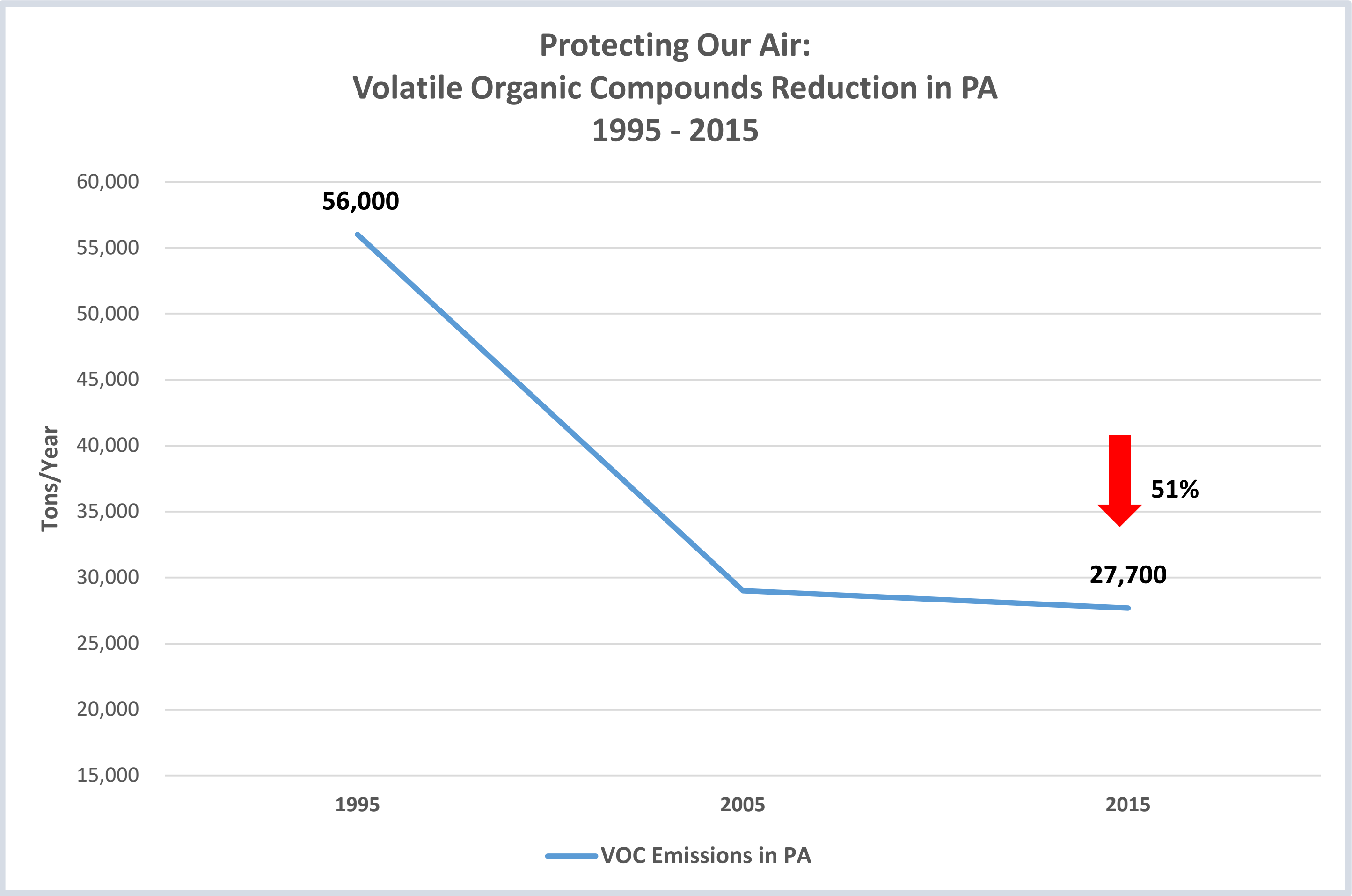
Protecting Our Environment

Protecting Our Environment



Source: PA Department of Environmental Protection Annual Report ('13-'18) and Compliance Report website ('19)

Enhancing Air Quality



Source: PA Department of Environmental Protection – Stationary Source Emission Inventory 2012-2015

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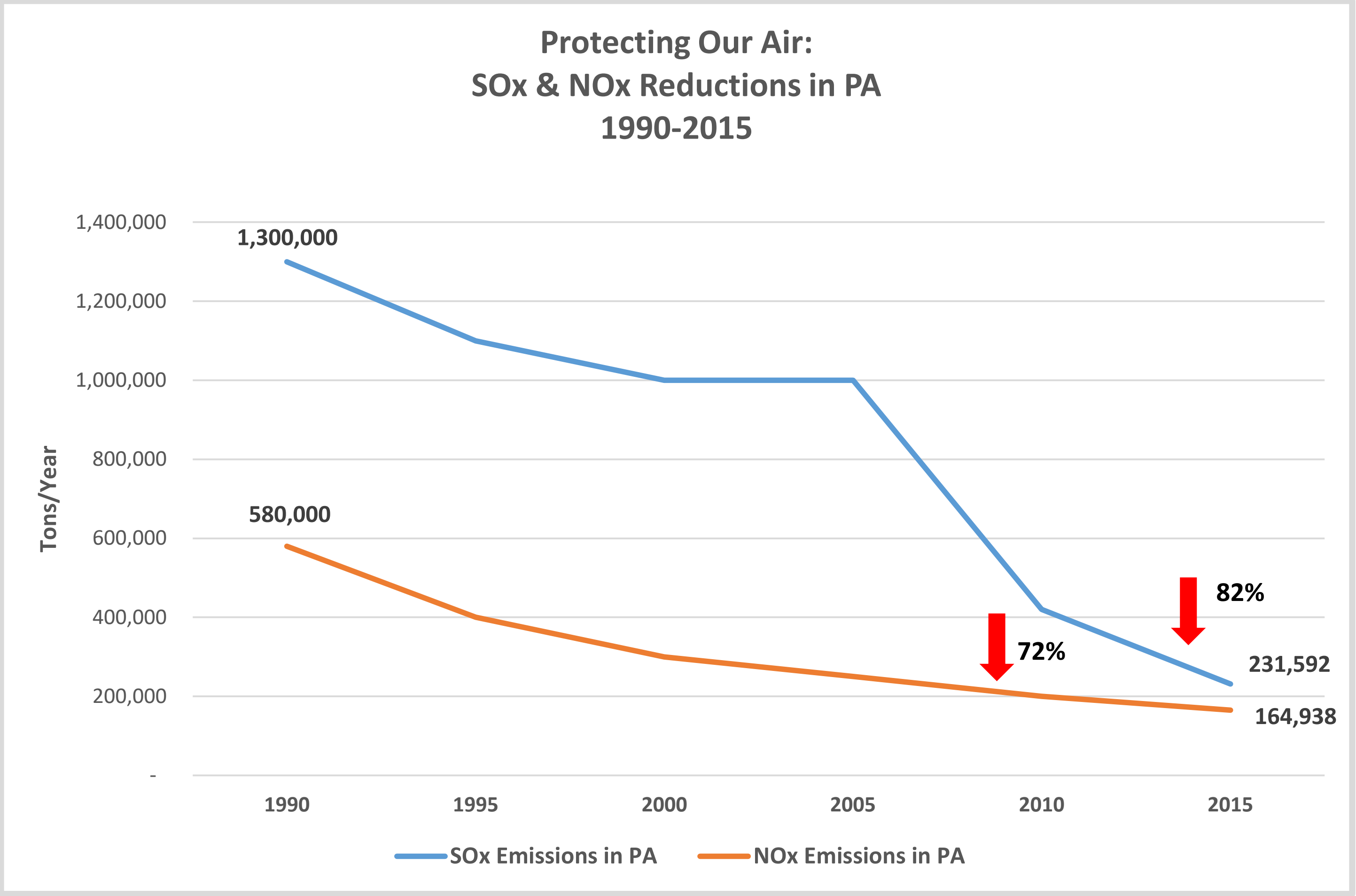
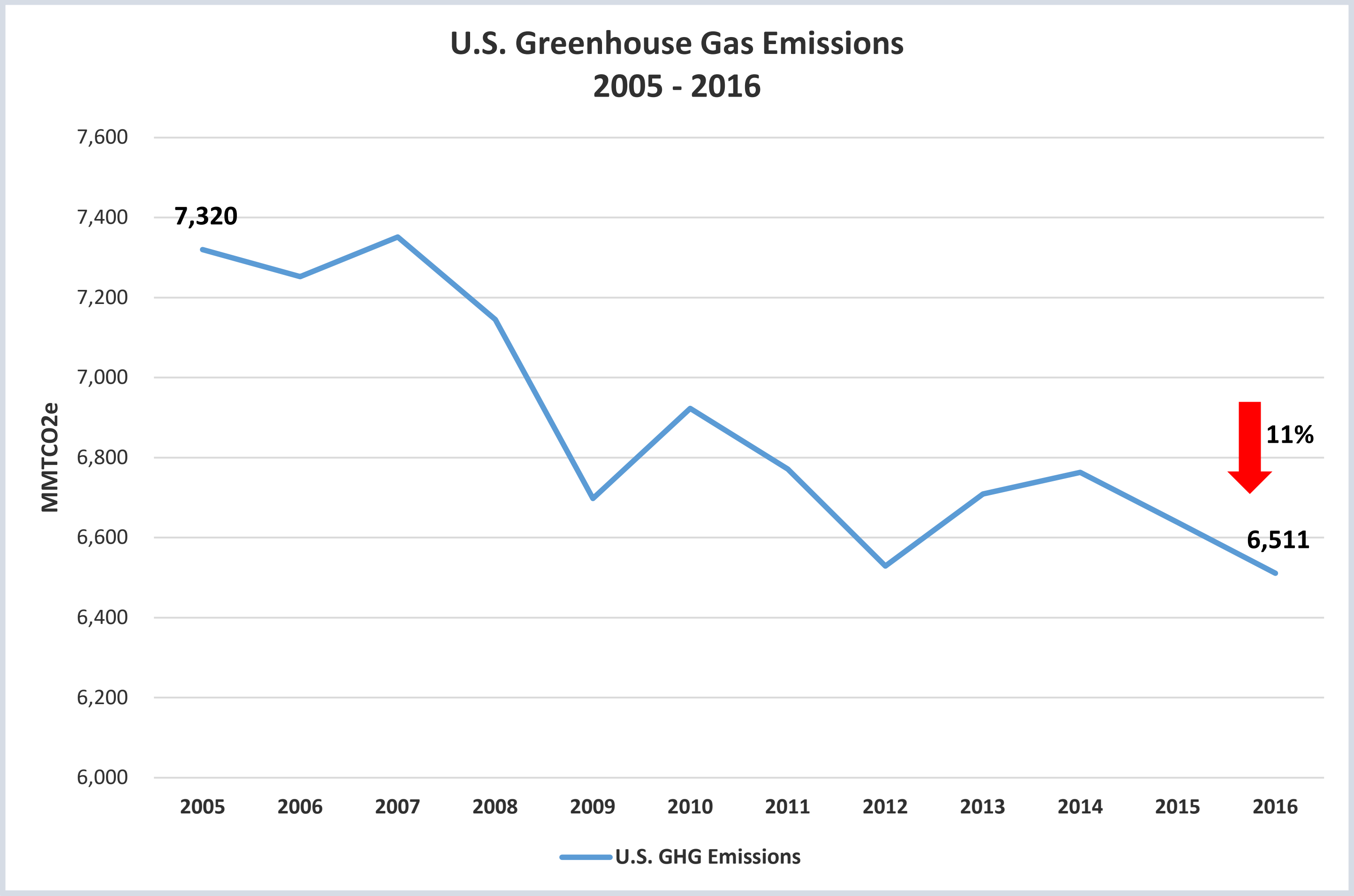
Enhancing Air Quality

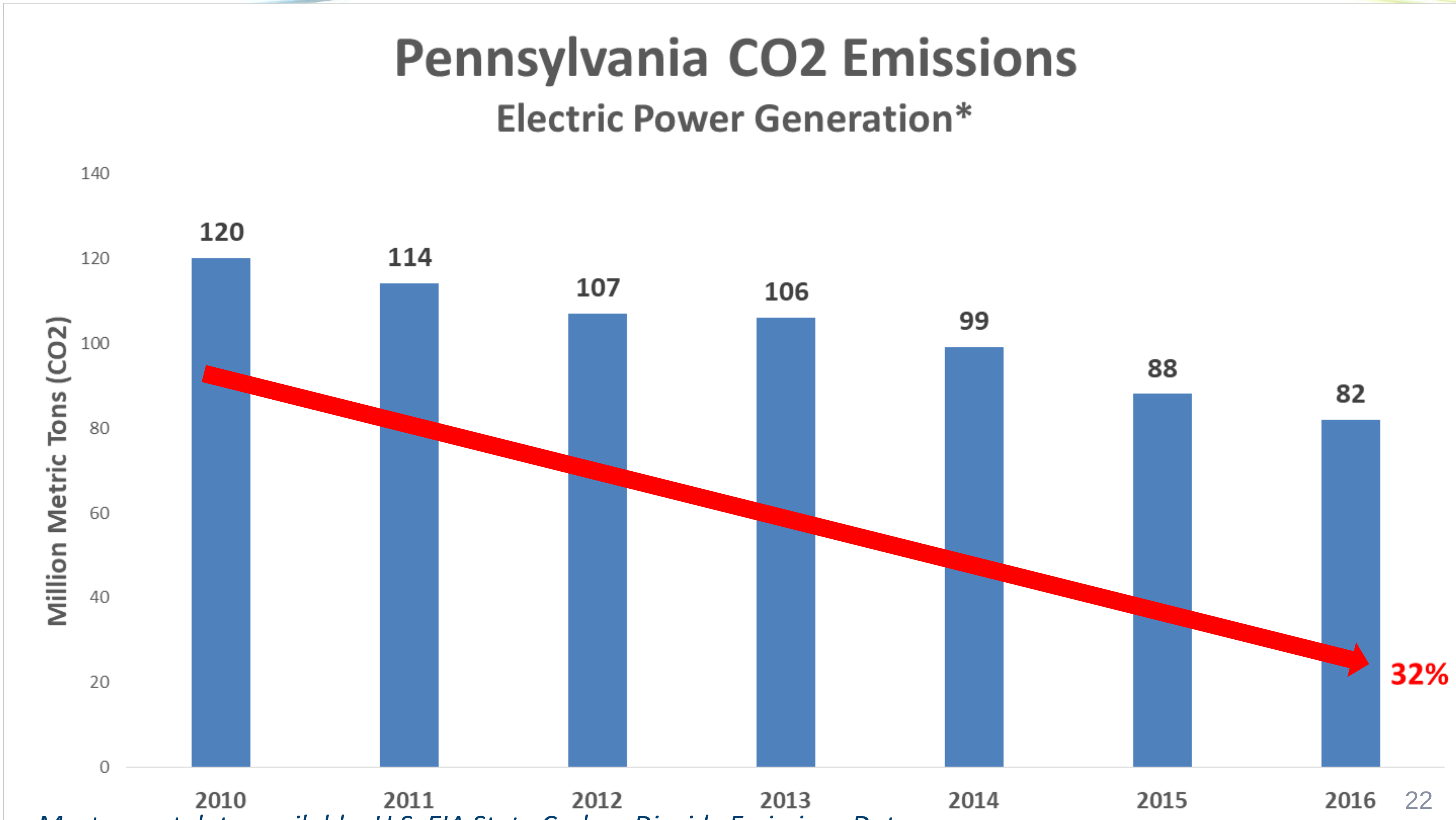


Source: PA Department of Environmental Protection – Stationary Source Emission Inventory 2012-2015

Leading on Climate Change



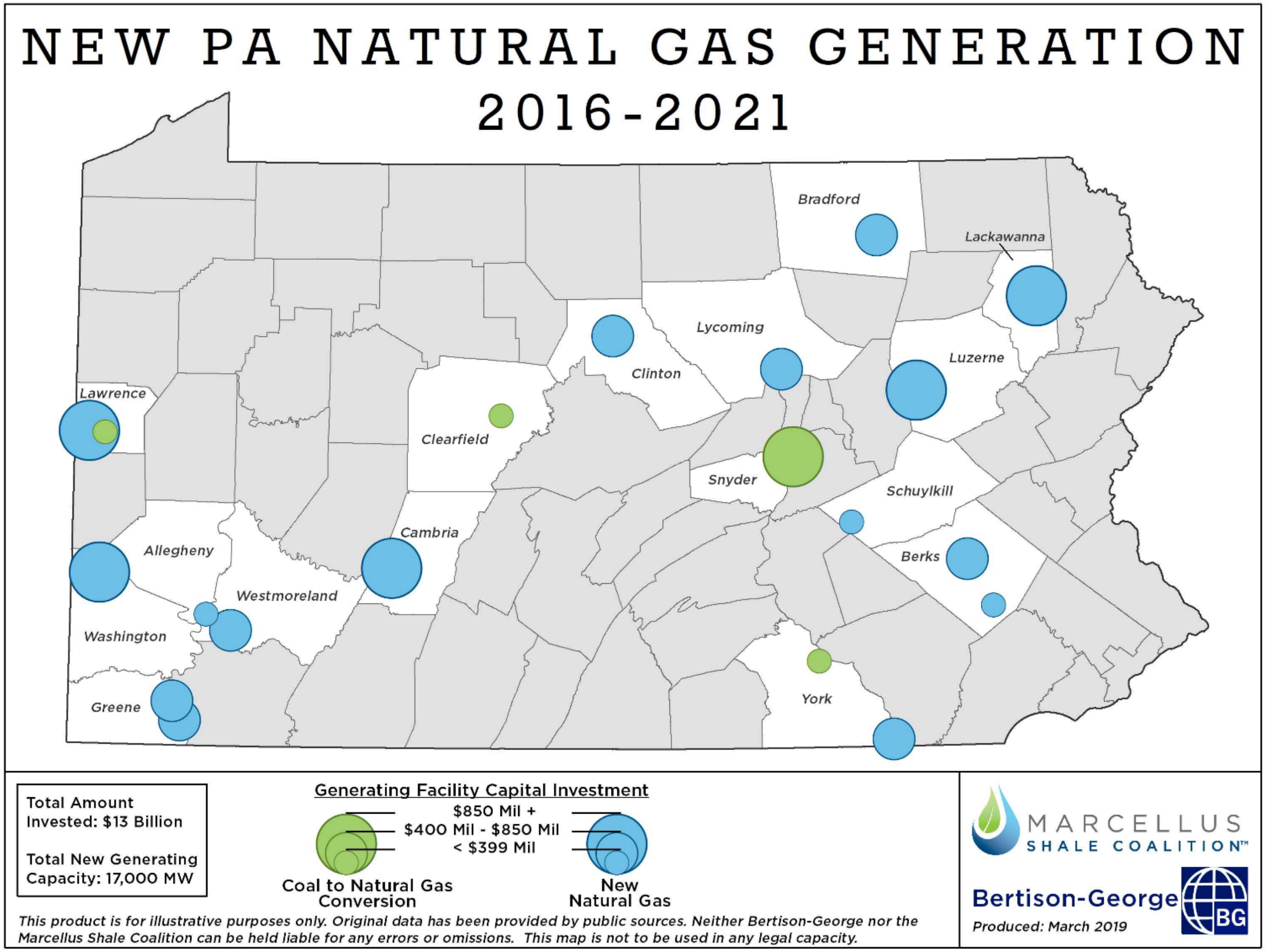
Source: U.S. Environmental Protection Agency – Inventory of U.S. Greenhouse Gas Emissions & Sinks



Most recent data available; U.S. EIA State Carbon Dioxide Emissions Data Release Date October 31, 2018

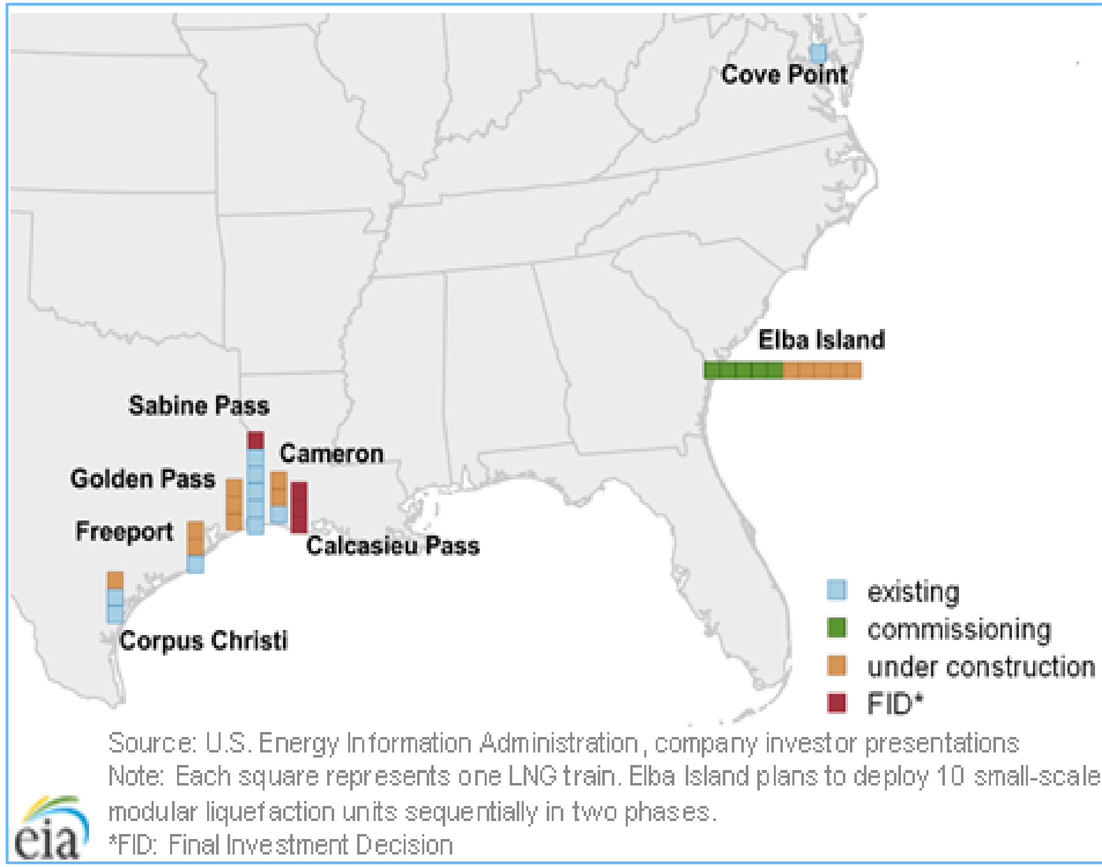
Market Opportunities

Historic Economic Investment



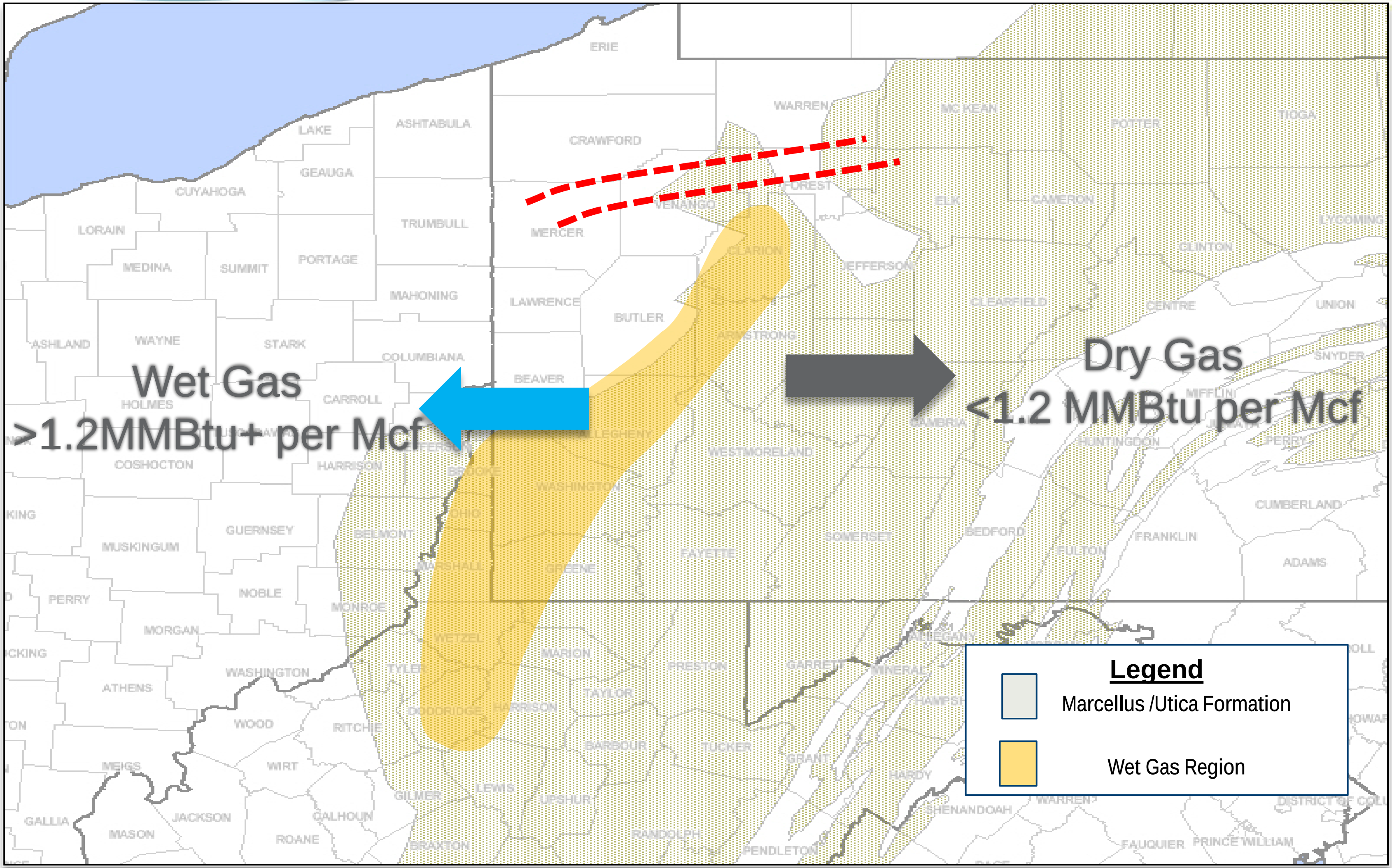
LNG Exports

- 8 planned LNG terminals in Lower 48 states
  - 5 operational
  - 3 planned/under construction
- 6.1 BCF/day capacity (2019)
- 9.5 BCF/day capacity (2021)
- 500 cargo shipments (2018)
- Top destinations
  - South Korea
  - Mexico
  - Japan



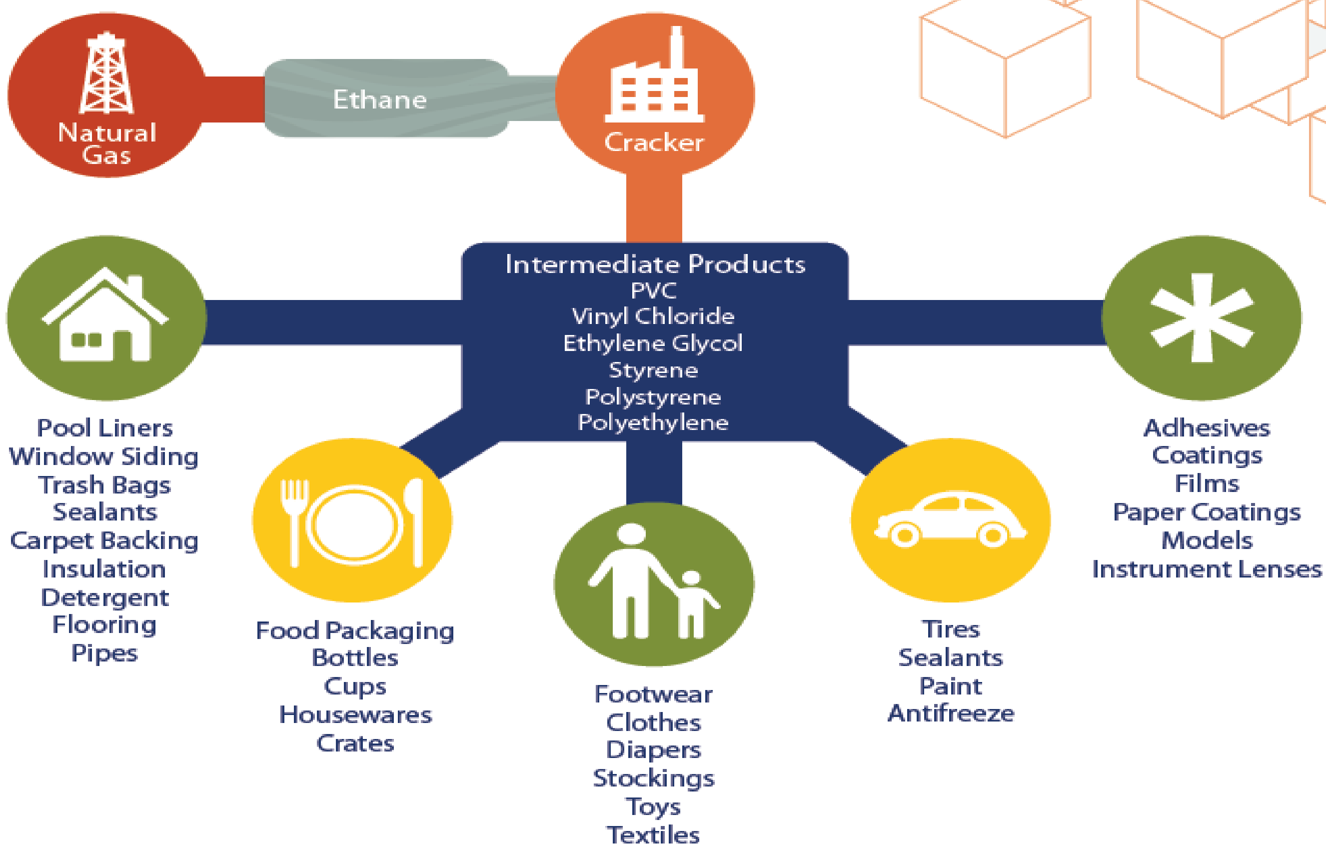
Source: EIA Natural Gas Weekly – September 11, 2019

Feedstock: "Wet Gas" Region



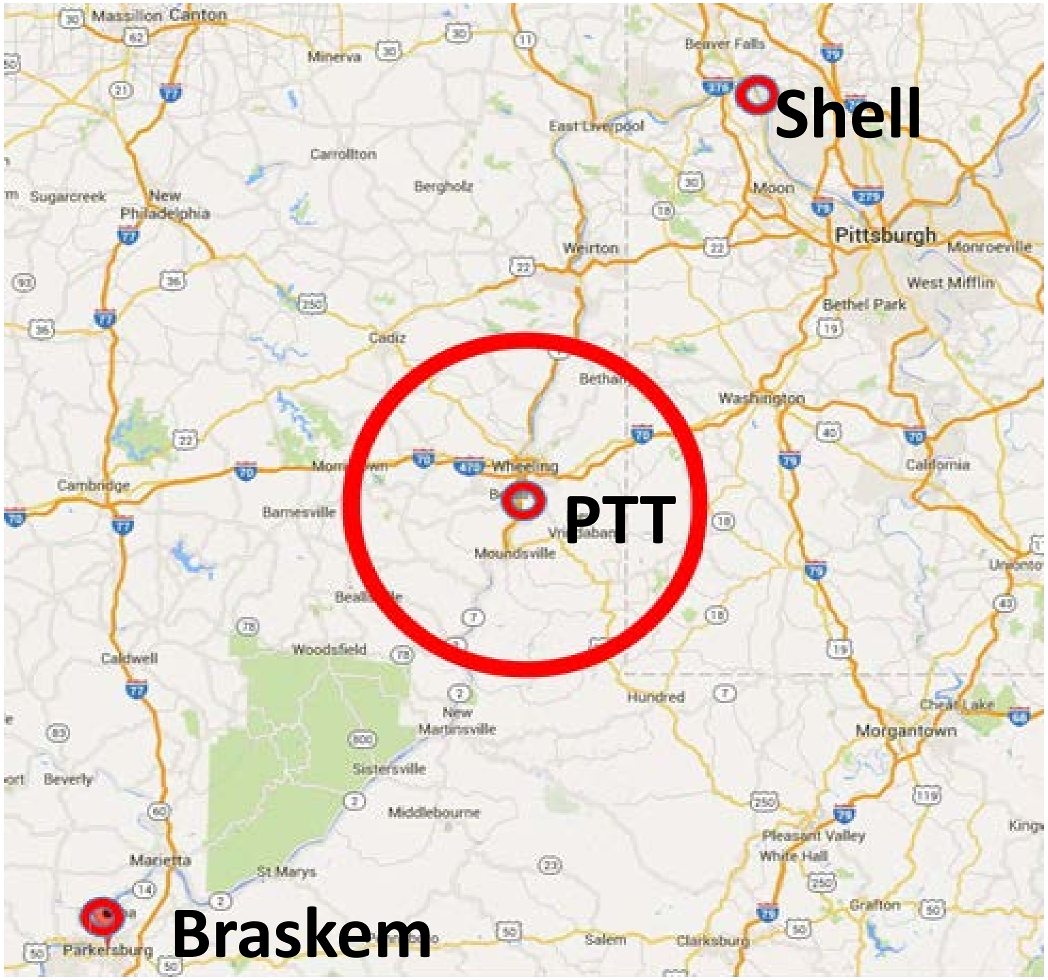
The Ethane Factor

ETHYLENE CHAIN



American Chemistry Council

Active Cracker Projects



Shell Petrochemical Facility

Shell Petrochemical Facility

- $6B+ Capital Investment
- ~3.5B Pounds of Polyethylene / Year
- 600 Full-time Employees
- 6000 During Construction Phase

Polyethylene Grades

High Density

Low Density

Linear Low Density

Forge the Future

Forge the Future

WHAT IF..

Hydraulic Fracturing Was Banned??

What If…….

Hydraulic Fracturing Was Banned?

- The United States would Lose 14.8 Million Jobs

U.S. Chamber of Commerce Institute for 21st Century Energy

What If…….

Hydraulic Fracturing Was Banned?

- Gasoline Prices Would Increase by 53%

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What If…….

Hydraulic Fracturing Was Banned?

- Natural Gas Prices would be 400% Higher

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What If…….

Hydraulic Fracturing Was Banned?

- U.S. Households Would Pay Almost 100% More For Their Electricity in 2022

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What If…….

Hydraulic Fracturing Was Banned?

- Average Out-of-Pocket, Cost-of-Living Increase for U.S. Families Would Approach $4,000 by 2022

U.S. Chamber of Commerce Institute for 21st Century Energy

What If…….

Hydraulic Fracturing Was Banned?

- U.S. GDP Would Be Reduced by $1.6 Trillion by 2022

U.S. Chamber of Commerce Institute for 21st Century Energy

Thank you!

Marcelluscoalition.org