



Current State of the Oil and Natural Gas Industry in West Virginia

A Special Presentation for:

**GOVERNOR'S ENERGY SUMMIT
STONEWALL RESORT**

October 7, 2016

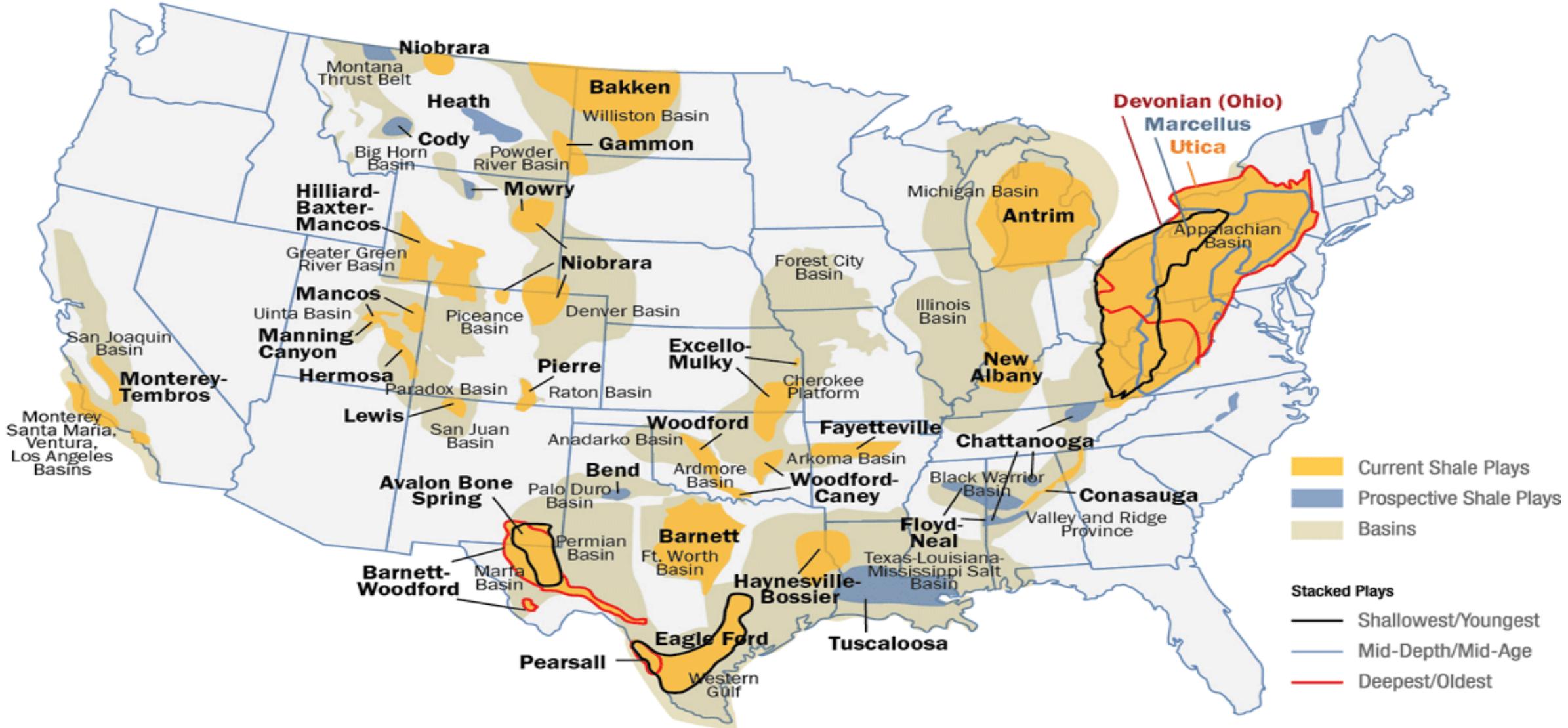
Charlie Burd, Executive Director



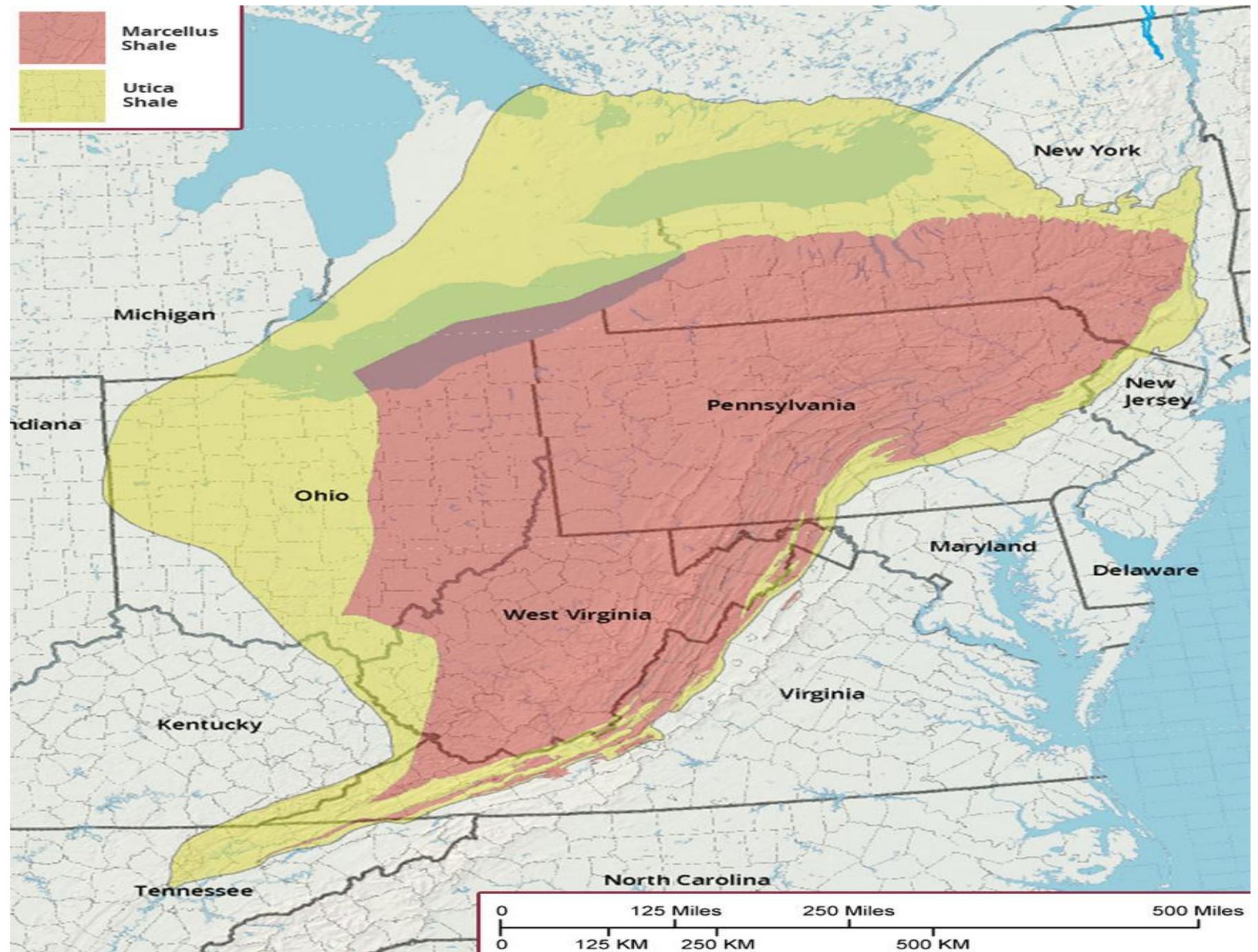
Independent Oil and Gas Association of West Virginia, Inc.

- Formed in 1959
- Largest West Virginia based trade association of oil and gas producers and those that serve them, at over 600 members
- Serve conventional and horizontal oil and gas producers
- Serve EVERY ASPECT of the industry: Exploration, Drilling, Production, Transmission, Marketing, and Service Providers

Shale Plays, Lower 48 States



MARCELLUS & UTICA SHALE FORMATIONS

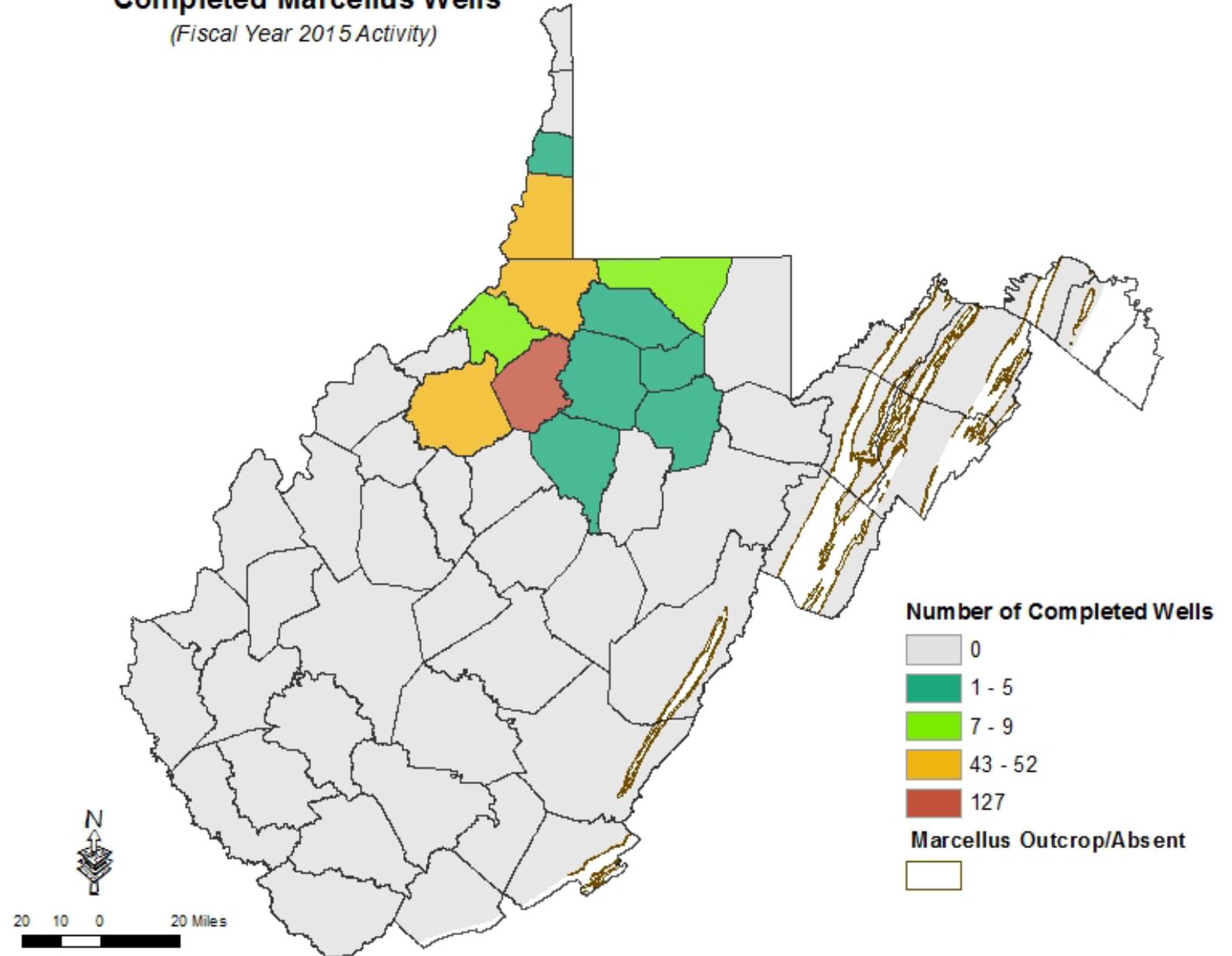


Marcellus Shale Impact in West Virginia

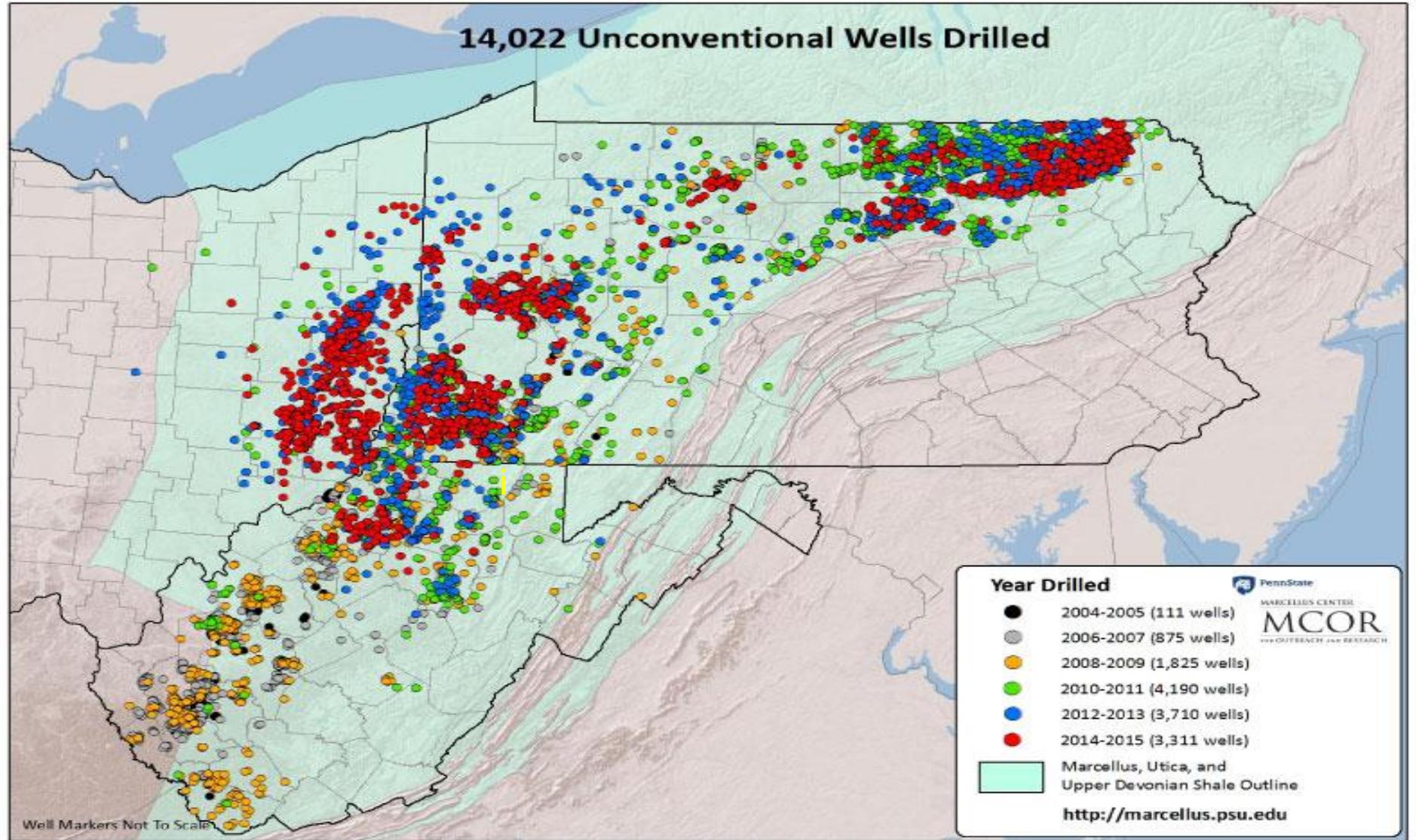
- **First Marcellus well: Marshall County by Chesapeake Energy in 2007;**
- **53 of 55 West Virginia counties have some type of oil or natural gas operation and all 55 counties benefit from state severance and property taxes paid by the industry;**
- **In the last three years, over \$728 million paid in severance and Ad Velorem property taxes;**
- **Beginning in 2006: over \$255 million in special severance paid to retire an unfunded Workers' Compensation Fund debt (Retired June 2016)**
- **Marcellus/Utica combined production peaked at 23.4Bcf/day in February, 2016. (RBN Energy, Inc.)**

COMPLETED MARCELLUS WELLS 2015

Completed Marcellus Wells
(Fiscal Year 2015 Activity)

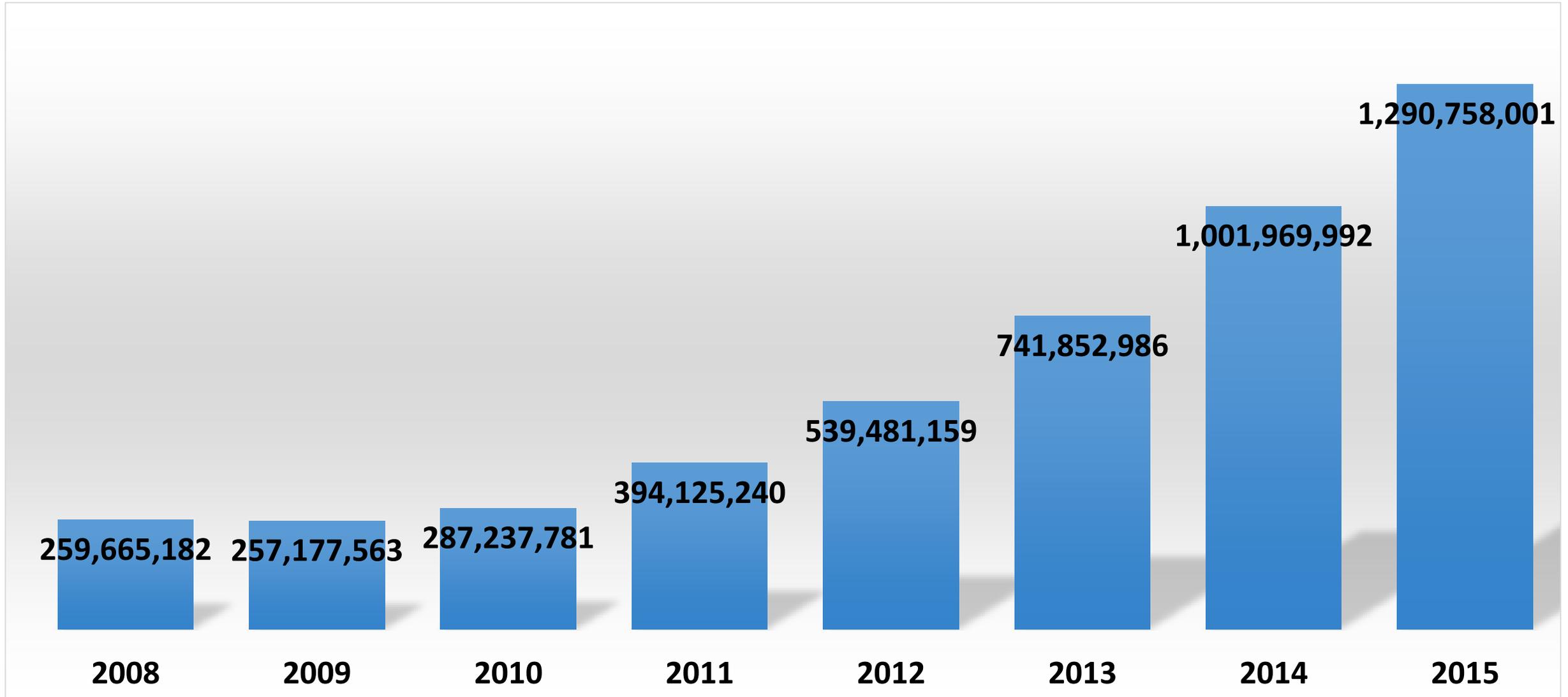


Source: WVGES



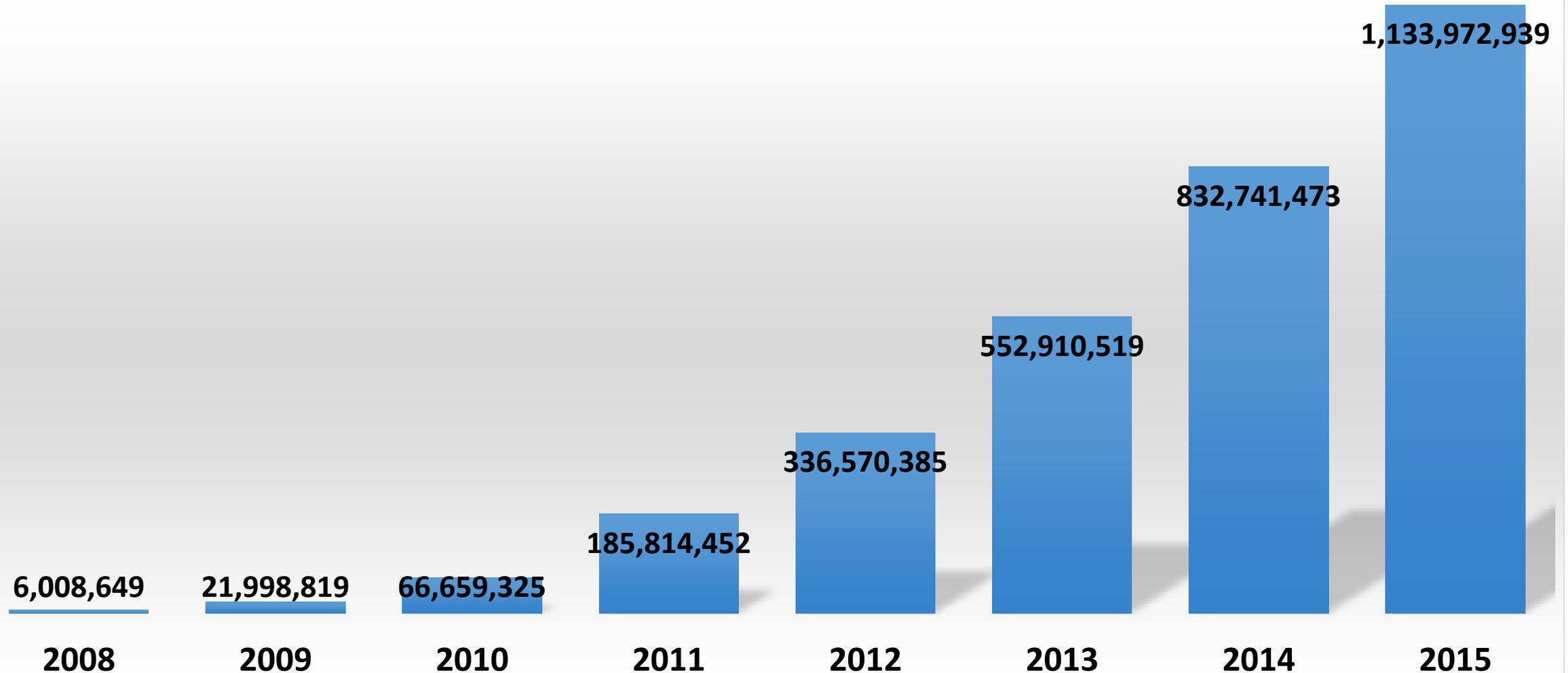
Total Natural Gas Production (MCF)

Source: WVDEP



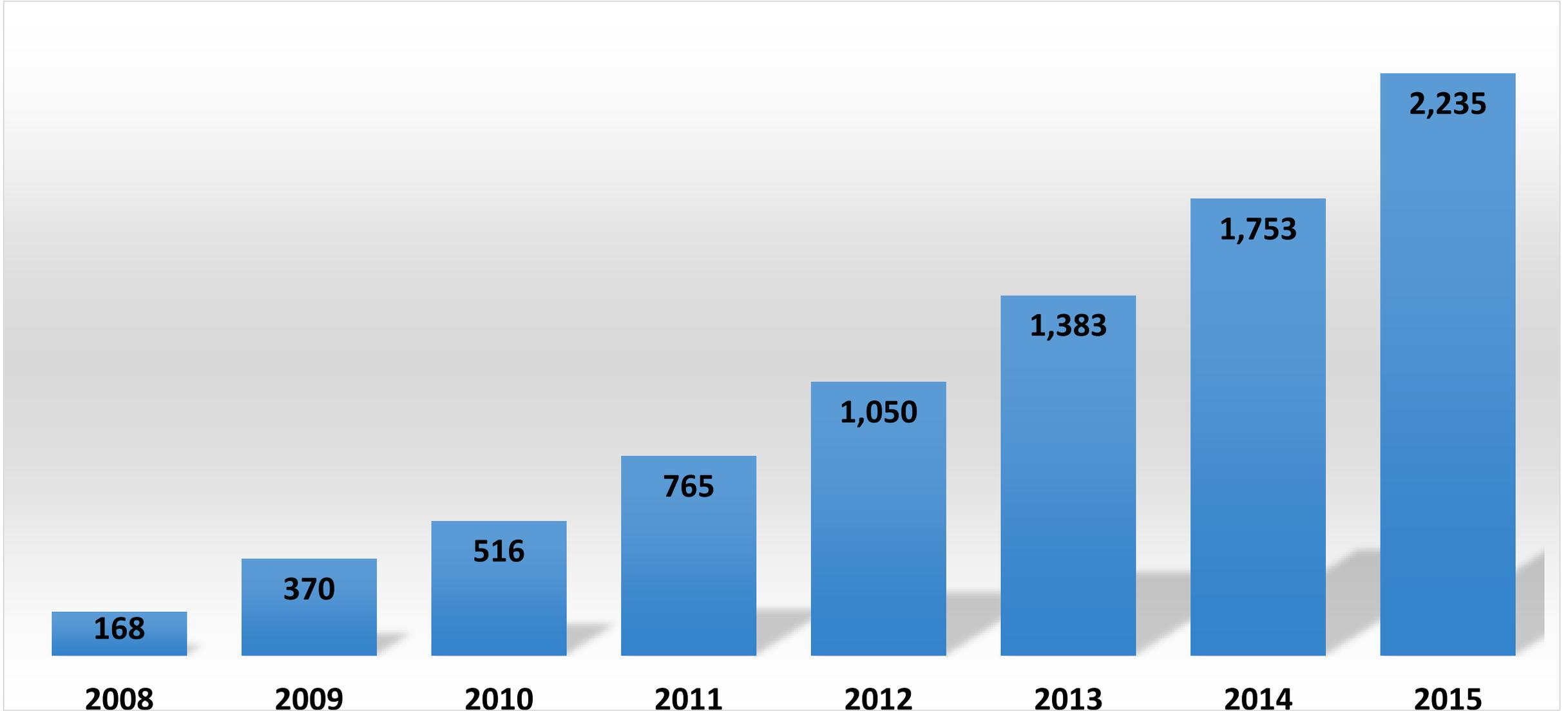
Total Horizontal Natural Gas Production (MCF)

Source: WVDEP



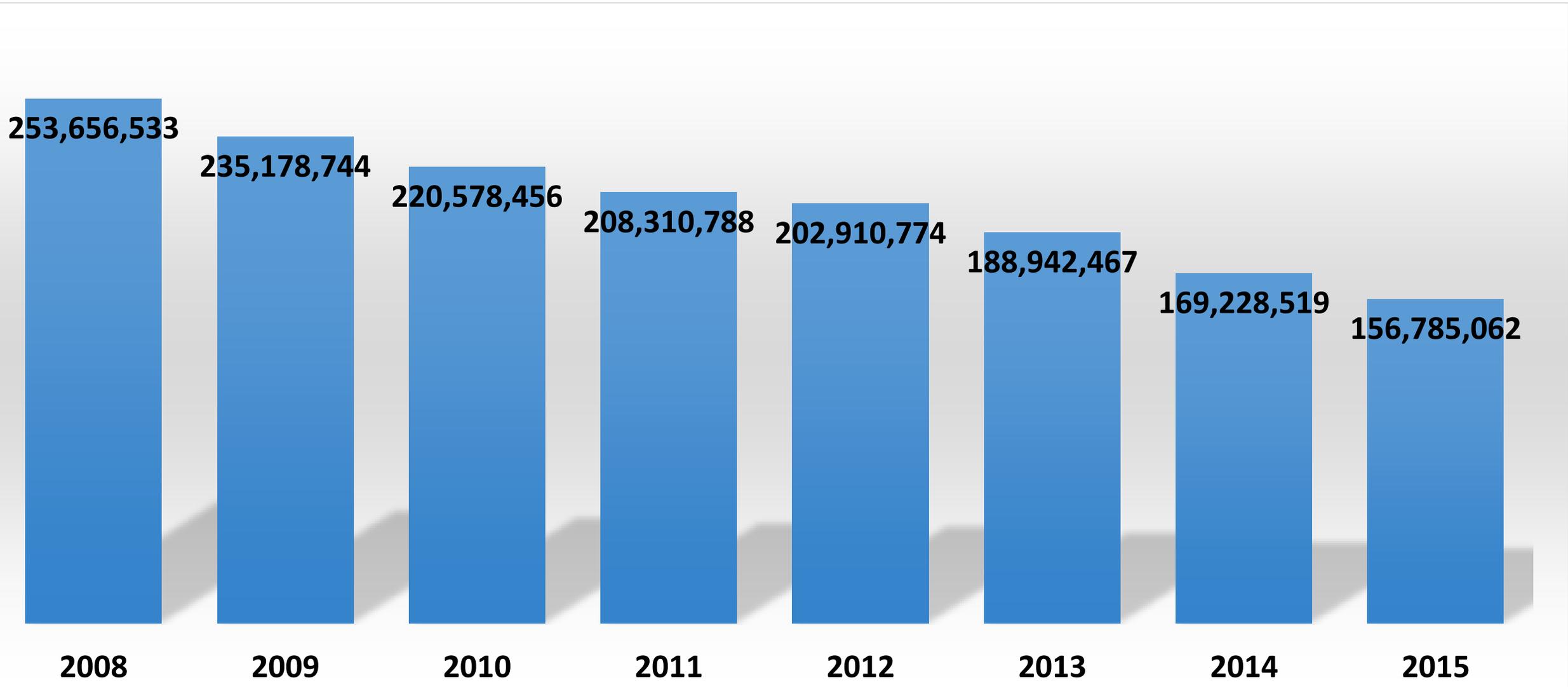
Number of Horizontal Wells Reporting Production

Source: WVDEP



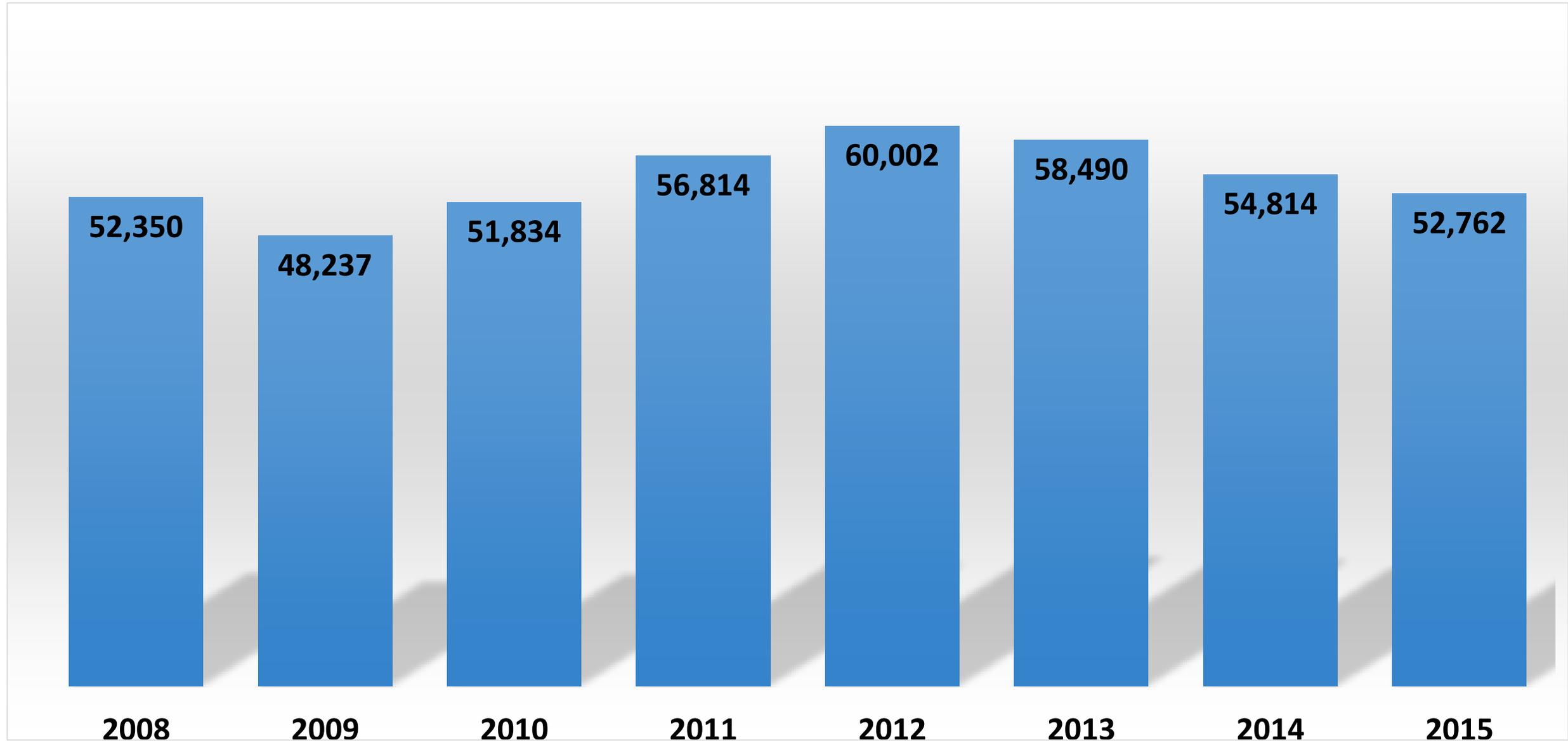
Total Conventional Gas Well Production (MCF)

Source: WVDEP



Number of Conventional Wells Reporting production

Source: WVDEP



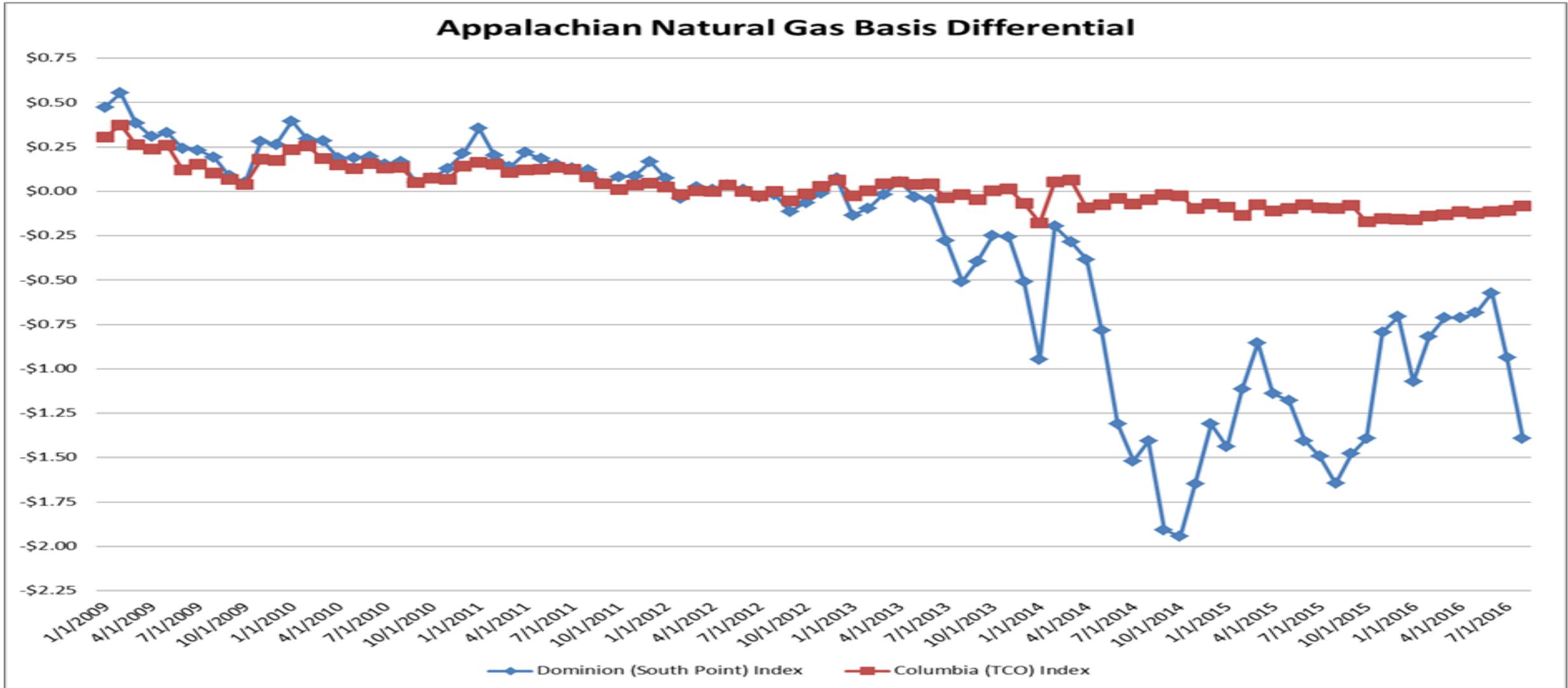
HENRY HUB SPOT

Natural gas spot prices (Henry Hub)

\$/MMBtu

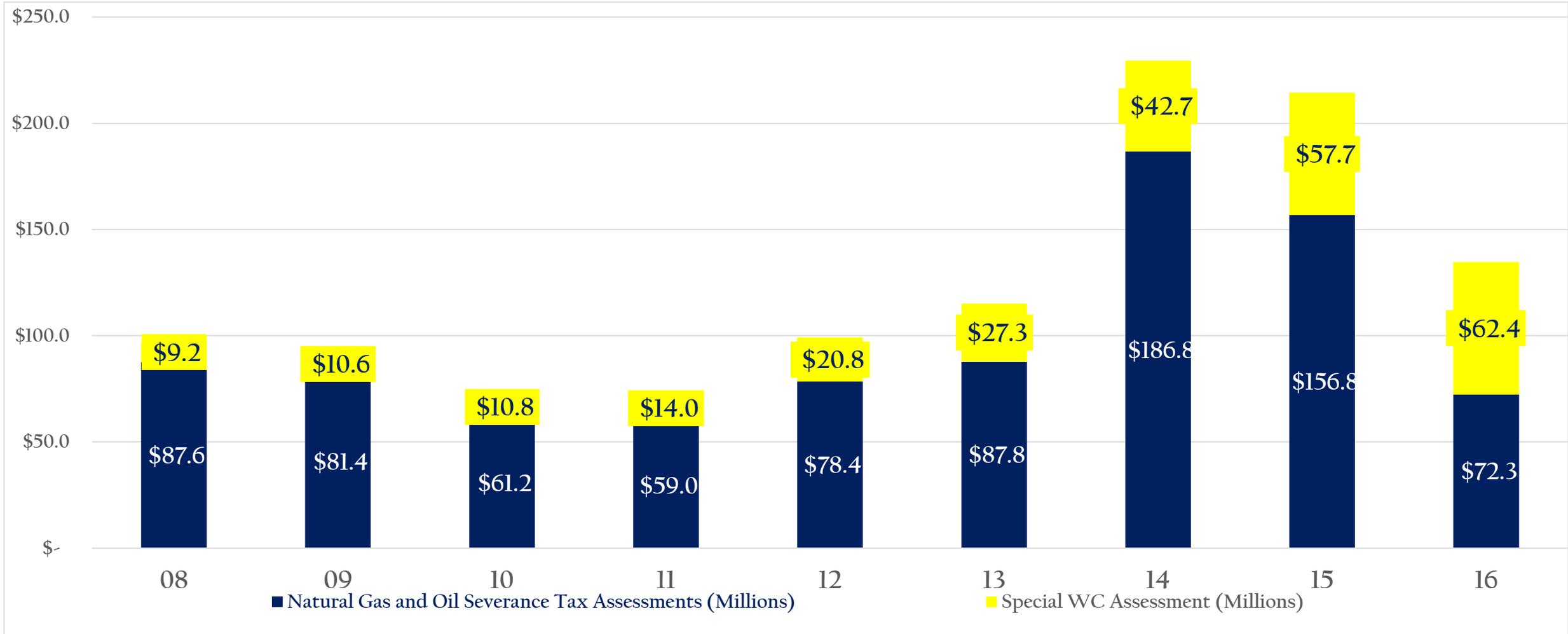


Negative Basis Differential



WV Oil and Natural Gas Severance Tax Contributions (Millions)

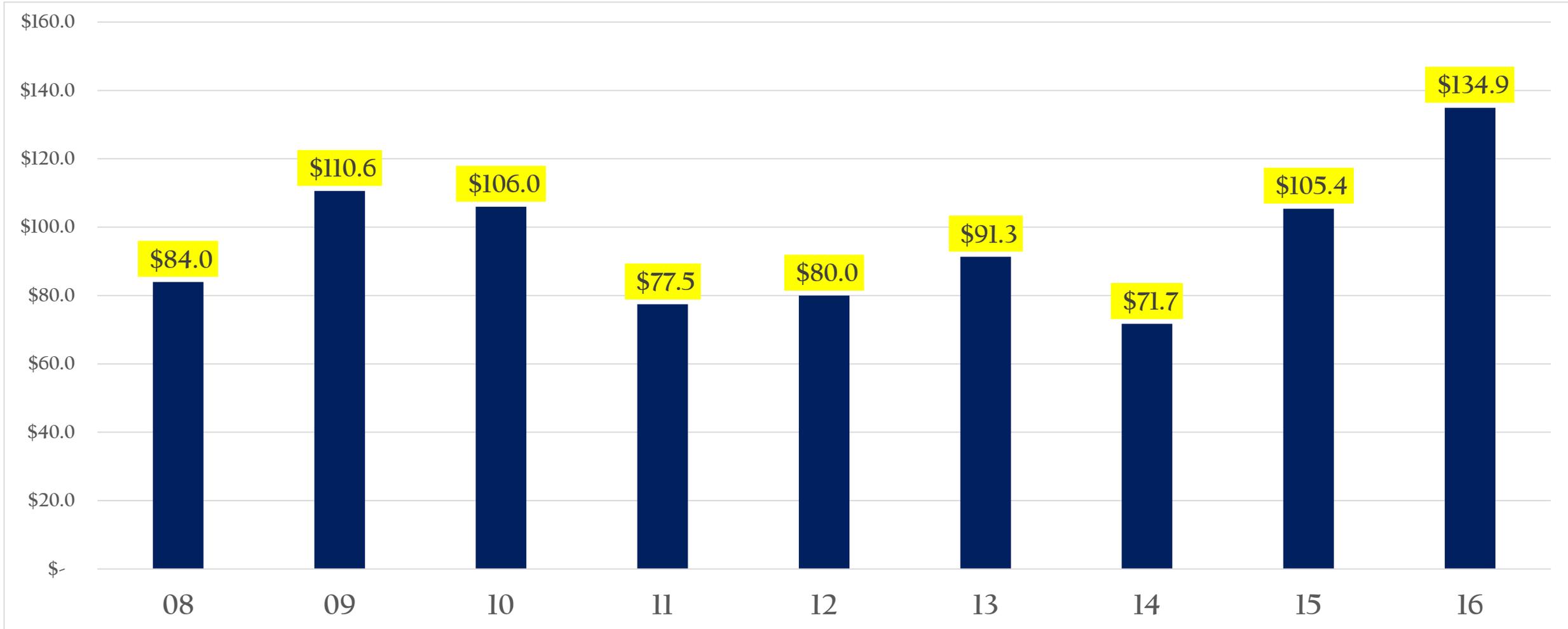
Source: WV Department of Revenue





Oil and Natural Gas Property Tax Contributions (Millions)

Source: WV Department of Revenue





2015 Top Natural Gas Producing Counties

Source: WVDEP (Through May)

1. Doddridge (364.0 Bcf)
2. Wetzel (200.4 Bcf)
3. Harrison (143.5 Bcf)
4. Marshall (138.1Bcf)
5. Ritchie (84.3 Bcf)
6. Tyler (62.1 Bcf)
7. Ohio (39.1 Bcf)
8. Taylor (29.8 Bcf)
9. Barbour (29.7 Bcf)
10. Marion (25.7 Bcf)

- 2014: Doddridge (225.0 Bcf)*
2014: Harrison (173.6 Bcf)
2014: Wetzel (151.7 Bcf)
2014: Marshall (90.2 Bcf)
2014: Tyler (40.0 Bcf)
2014: Ritchie (33.0 Bcf)
2014: Ohio (32.1 Bcf)
2014: Taylor (23.9 Bcf)
2014: Marion (19.9 Bcf)
2014: Barbour (17.4 Bcf)



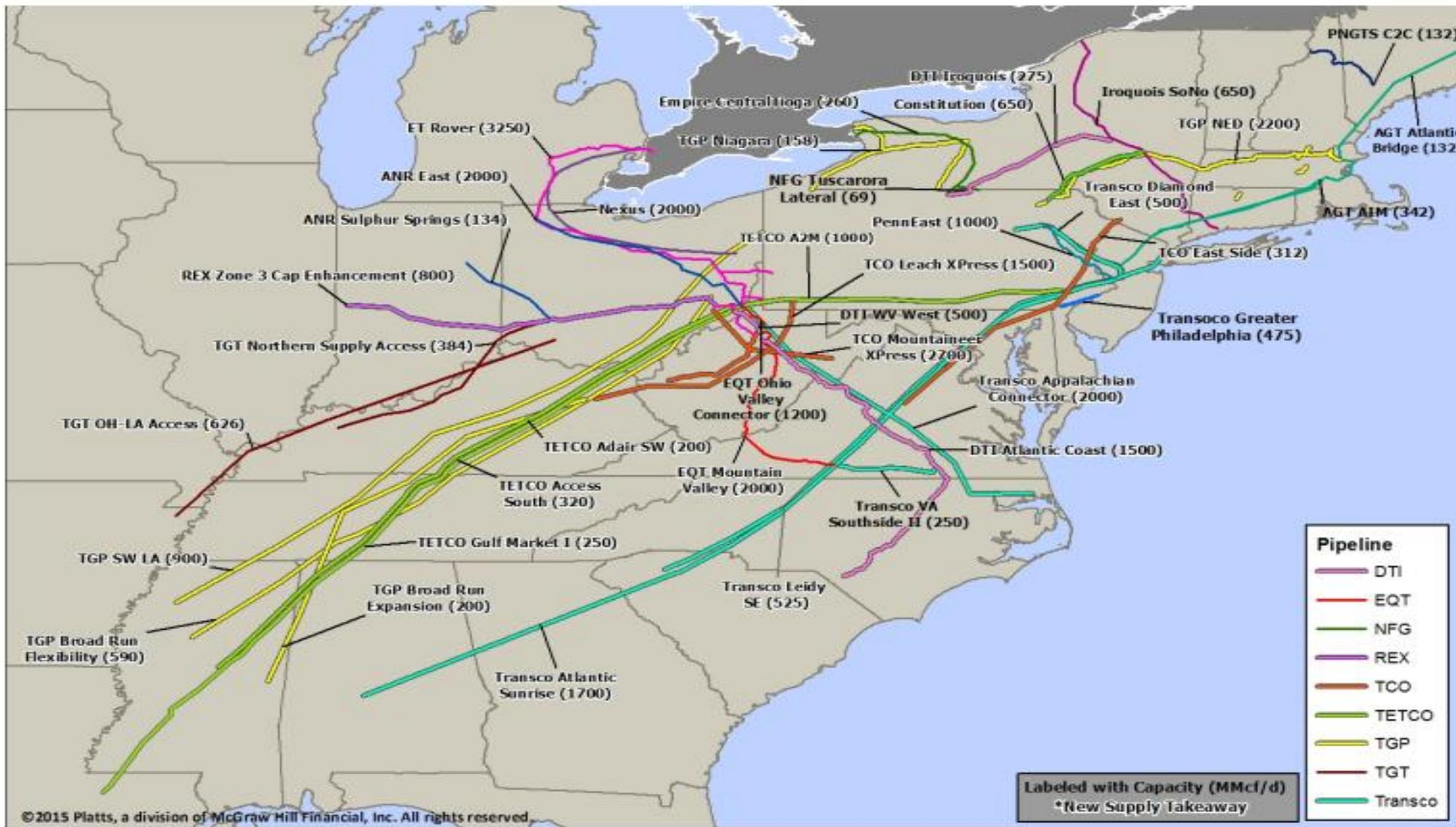
2015 Top Natural Gas Producers

Source: WVDEP (Through May)

1. Antero Resources Corp (440.9 Bcf)
2. EQT Production (211.6 Bcf)
3. Southwestern Production (119.2 Bcf)
4. Noble Energy Inc. (100.3 Bcf)
5. Ascent resources (42.5 BCF)
6. Stone Energy (41.0 Bcf)
7. CNX Gas/Consol Gas (35.3 Bcf)
8. Jay-Bee Oil & Gas (34.4 Bcf)
9. Gastar Exploration (24.5 Bcf)
10. Trans-Energy (23.6 Bcf)

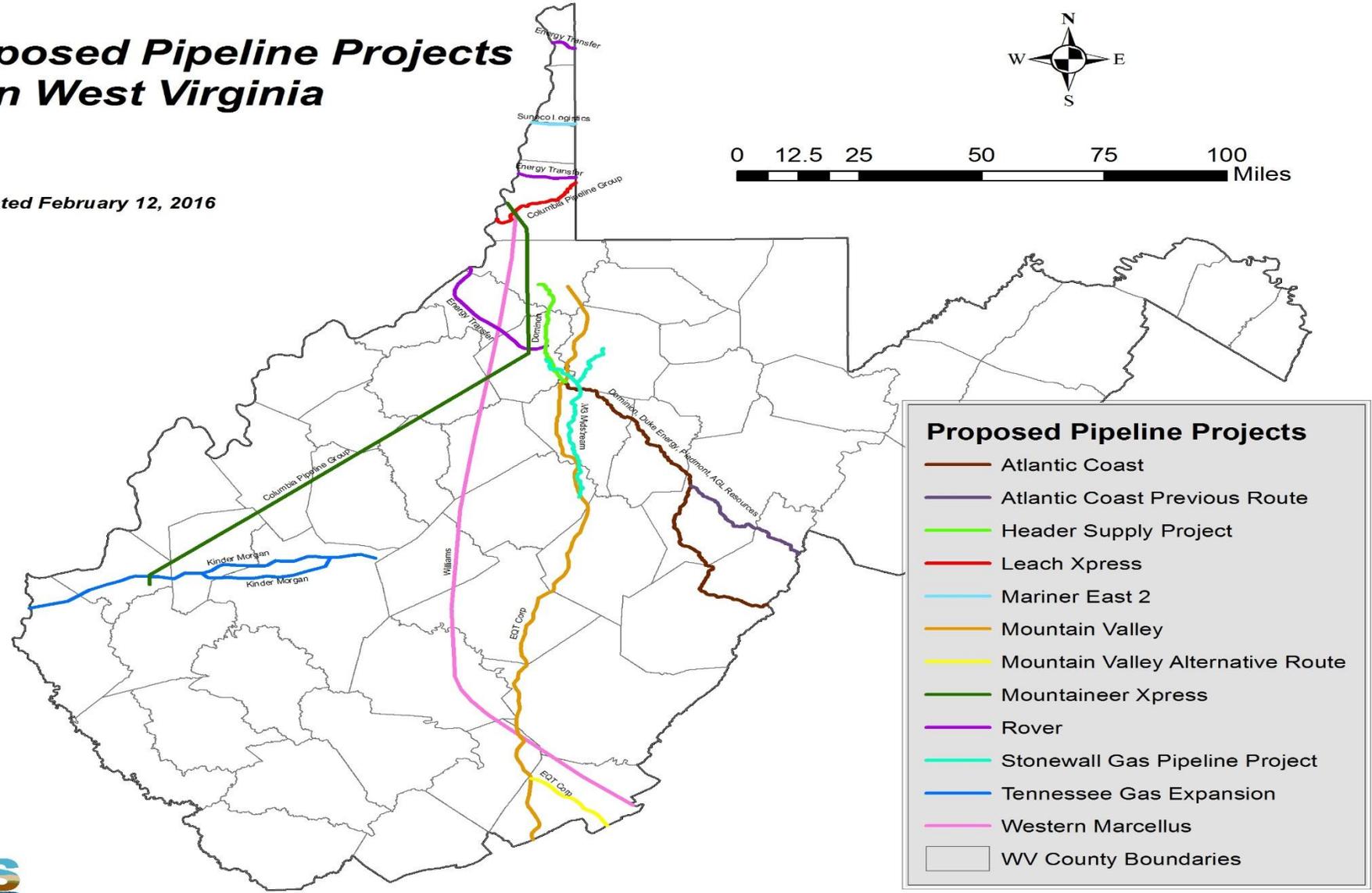
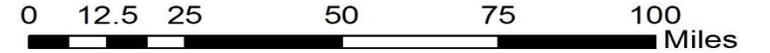
- 2014: Antero Resources Corp (344.2 Bcf)*
- 2014: EQT Production (128.6 Bcf)*
- 2014: Chesapeake Appalachia (112.7 Bcf)*
- 2014: Noble Energy Inc (43.4 Bcf)*
- 2014: Stone Energy (41.0 Bcf)*
- 2014: CNX Gas/Consol Gas (30.5 Bcf)*
- 2014: Jay-Bee Oil & Gas (27.9 Bcf)*
- 2014: HG Energy LLC (27.2 Bcf)*
- 2014: PDC Mountaineer (19.0 Bcf)*
- 2014: Gastar Exploration (18.6 Bcf)*

2015-2018 Pipeline Expansion Projects Map



Major Proposed Pipeline Projects in West Virginia

Updated February 12, 2016



Proposed Pipeline Projects

- Atlantic Coast
- Atlantic Coast Previous Route
- Header Supply Project
- Leach Xpress
- Mariner East 2
- Mountain Valley
- Mountain Valley Alternative Route
- Mountaineer Xpress
- Rover
- Stonewall Gas Pipeline Project
- Tennessee Gas Expansion
- Western Marcellus
- WV County Boundaries



Pipeline Projects / Impact

<u>Project Name</u>	<u>Operator</u>	<u>Miles</u>	<u>Cost</u>	<u>Bcf/d</u>	<u>In Service</u>
Atlantic Coast PL	Dominion	600	\$5 B	2.0	Fall 2018

- Spring Ridge Constructors, LLC (Contracted 9/21/16)
- 17,000+ Projected Construction Jobs; 2,200 Projected Jobs After Completion
- \$2.7B Total Economic Activity and \$4.2M Average Annual LOCAL Tax Revenue
- \$65M Total Economic Activity; \$28M Average Annual LOCAL Tax Revenue
- Pending FERC approval; first draft of the EIS expected to be released December 2016

Mountain Valley	EQT / JV	300	\$3 B	2.0	4 th Q 2018
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- In WV, 2015-18 Planned Spending is \$811M
- That Level of Spending Equates to \$594 Cumulative Gross Regional Product
- Over 4,500 Jobs At peak Construction in 2017-18 (Of which 2,800+ Would be Direct Jobs)
- 65 Permanent Jobs Once Completed With An Annual Salary Estimated at \$65K
- Generate over \$47M in Severance, Property, Sales, Income and other taxes



Pipeline Projects / Impact

<u>Project Name</u>	<u>Operator</u>	<u>Miles</u>	<u>Cost</u>	<u>Bcf/d</u>	<u>In Service</u>
ROVER PL	Energy Transfer	713	\$4.2 B	3.25	Mid to Later 2017
<ul style="list-style-type: none"> ➤ DUAL 42-inch diameter underground pipelines (with Various 24-inch, 30- inch, 36-inch take-offs) delivering Westward from WV to Defiance, Ohio, and on north to the Vector/Dawn Hub in Canada ➤ 10,000 Temporary Employees ➤ Estimated \$147 M in Property Tax Revenue 					
MXP (MOUNTAINEER EXPRESS)	Columbia	165	\$1.5 B	2.7	Fall 2018
<ul style="list-style-type: none"> ➤ 165 miles of various diameter pipeline, three new compressor stations, modifications to three existing compressor stations and one regulating station (Marshall County to Wayne County West Virginia) ➤ 9,000 jobs will be created during the length of this project ➤ Initiating construction in the fall of 2017 					



Pipeline Projects / Impact

<u>Project Name</u>	<u>Operator</u>	<u>Miles</u>	<u>Cost</u>	<u>Bcf/d</u>	<u>In Service</u>
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LEACH EXPRESS	Columbia	160	\$1.4 B	1.5	Fall 2017
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- 160 Miles of 30 and 36 inch Running From Majorville, WV to Oak Hill, (Vinton County) Ohio
- Estimated to Create 5,700 Jobs through 2016-17
- \$2.3B Total Economic Impact

WB EXPRESS	Columbia	26	\$1.0 B	1.3	Summer 2018
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- Replacement of approximately 26 miles of 26 inch diameter pipeline in Randolph and Pendleton Counties
- New pipeline installations of approximately 1,500 feet of 36-inch pipeline from Panther Mountain Regulator Station to the new Kanawha County compressor station, and 3,300 feet of 36-inch pipeline from the new Kanawha County compressor station to Point of Delivery
- Modifications to the existing: Frametown Compressor Station, Cleveland Compressor Station, Files Creek Compressor Station, Seneca Compressor Station, and Lost River Compressor Station

Recent Industry Investments

- **MarkWest Energy Partners Processing Facilities**
 - **Sherwood (Doddridge County)—1,200MMCF/d; plus 40,000BBL/d De-ethanization;**
 - **Majorsville (Marshall County)—1,170MMCF/d plus 40,000BBL/d De-ethanization;**
 - **Mobley (Wetzel County)—920MMCF/d plus 41,000BBL/d De-ethanization;**
- **Williams Ohio Valley Midstream:**
 - **\$4.5B Investment**
 - **Oak Grove Gas Processing Plant**
 - **Fort Beeler Processing Plant**
 - **Moundsville Fractionation Plant**
 - **Provides 2.5 Bcf/d natural gas gathering, processing, fractionation and natural gas liquid (NGL) processing capacity;**
 - **The Ohio Valley Ethane Pipeline runs from Oak Grove Gas Plant to the ethane hub in Houston, Pa., via a 50-mile, 12-inch pipeline;**

Recent Industry Investments

- ANTERO RESOURCES

- Doddridge County Water Treatment Facility

- \$275 million state-of-the-art, 60,000 barrel per day water treatment complex;
- Designed to treat and reuse flowback and produced water rather than permanently dispose of the water in injection wells thus saving approximately \$150,000 per well on future completion costs;
- Will be used in combination with Antero's existing freshwater pipeline distribution system, to place Antero at the forefront of environmentally conscious water management in U.S. shale plays;

- Ohio River Water Pipeline Project

- 80-mile, \$525M pipeline from the Ohio River to supply water to Tyler and Ritchie Counties;
- Estimated to draw about 4.8 million gallons a day; Expected to lessen water-handling costs and decrease water truck traffic on local roadways and reduce completion costs by up to \$600,000 per horizontal well

Face Of Future Natural Gas Usage

- **NATURAL GAS POWER GENERATION**
 - **IN WEST VIRGINIA:** Quantum Utility Generation and Energy Solutions Consortium (ESC) to invest at total of over \$2 Billion.
 - **Quantum Utility Generation's: MOUNDSVILLE POWER, LLC (Marshall County, WV)**
 - \$615M, 549 MW Natural Gas/Ethane fired Base-load Plant, On-line: Summer 2019
 - 400 Skilled construction jobs, up to 60 Full time jobs once operational, \$8B total economic impact;
 - **ESC**
 - **HARRISON COUNTY POWER: \$600M investment; 650 MW**
 - **BROOKE COUNTY POWER: \$800M investment, 700 MW**

All await approval from the PJM Interconnection. PJM Interconnection is a regional transmission organization (RTO) that coordinates the movement of wholesale electricity in all or parts of Delaware, Illinois, Indiana, Kentucky, Maryland, Michigan, New Jersey, North Carolina, Ohio, Pennsylvania, Tennessee, Virginia, West Virginia and the District of Columbia.

Face Of Future Natural Gas Usage

- **NATURAL GAS FUELED VEHICLES**
 - IGS Energy/CNG Services has built 3 new NG fueling stations in Charleston, Jane Lew, Bridgeport
- **LNG EXPORTS—Dominion Cove Point**
 - October 2014—Construction of the \$3.4-\$3.8B project began. It will create thousands of skilled construction jobs, 75 permanent jobs;
 - Operations are projected to begin in late 2017 and will produce about 5.25 million metric tons of liquefied natural gas annually, and LNG shipments from Cove Point are projected to reduce the U.S. trade imbalance by at least \$2.8 billion, and possibly as much as \$7.1 billion, annually.
- **INDUSTRIAL EXPANSION**
 - Plastics manufacturing, chemical manufacturing, glass, fertilizer, auto parts, etc.;
 - Ethane crackers,
 - \$4B, Appalachian Shale Cracker Enterprise (ASCENT may be developed by Odebrecht subsidiary Braskem, near Parkersburg, WV. A site location that once housed SABIC and previous to that, GE Plastics;
 - Other crackers: Royal Dutch Shell, in Beaver County, PA and PTT Global Chemical, Belmont County, Ohio.

**That's All I Have To
Say About That**

Forrest Gump, 1994