

Marcellus Shale Fact Sheet

Background

The Marcellus Shale Formation is one of the largest shale formations in the United States and underlies parts of New York, Pennsylvania, Ohio, West Virginia, and small portions of Maryland and Virginia. The Marcellus contains an estimated 84 trillion cubic feet of natural gas.

The first natural gas well was drilled in the Marcellus in 2003, but it wasn't until the 2008 that production rapidly increased with the use of hydraulic fracturing and directional drilling.

In 2002, the United States Geological Survey (USGS) estimated the area held about two trillion cubic feet of natural gas and .01 billion barrels of natural gas liquids.¹ By 2011, however, the USGS estimated the area held 84 trillion cubic feet of natural gas and 3.4 billion barrels of liquids. Within a span of 9 years, technology increased estimated natural gas supplies in the Marcellus 42-fold, and liquids 340-fold.²

According to geologists at Penn State University, the Marcellus could hold up to 500 trillion cubic feet of natural gas, making it potentially the second largest natural gas field in the entire world.

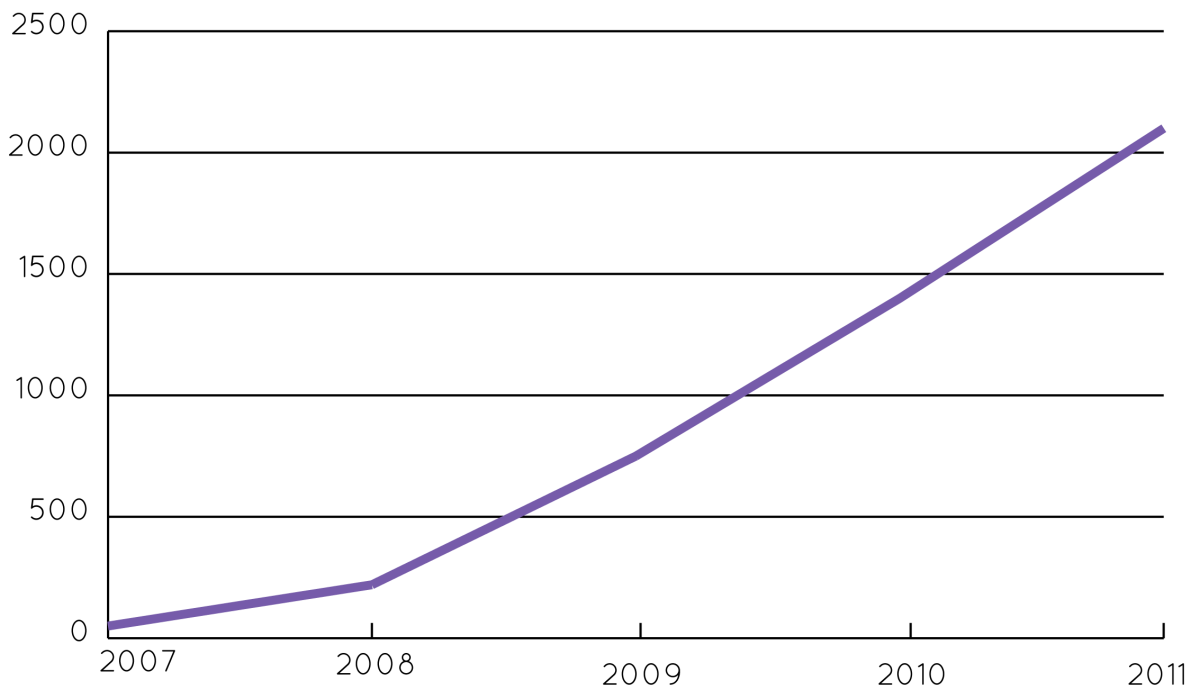
Converted on a British thermal unit (Btu) basis to oil, 500 trillion cubic feet equates to more than 85 billion barrels of oil, which is more than the proved oil reserves of Russia, and over 4 times as much energy as our own proved reserves.³

Production Growth

Much of the recent development in the Marcellus has been in Pennsylvania, where production has grown significantly in the past three years.

- Currently, operators are producing more than 3.2 billion cubic feet of natural gas each day—a staggering sum.⁴ In 2009, the Marcellus produced 194 billion cubic feet. But by 2010 production had increased 180 percent to 540 billion cubic feet on an annual basis.⁵
- By 2020, geologists at Penn State predict that Pennsylvania alone will produce as much as 13.5 billion cubic feet of natural gas a day, or near five trillion cubic feet per year.⁸⁰
- Under that scenario, Pennsylvania would rank only behind Texas as the most prolific gas-producing state in the nation.⁶

Number of Marcellus Shale Wells Drilled in Pennsylvania by Calendar Year



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Source: Energy Information Administration, Monthly Energy Review 2012

Economic Impacts

The increased drilling activity and production has had extraordinary economic impacts:

- According to the Marcellus Shale Coalition, in 2010 drilling in the Marcellus contributed \$11.2 billion to Pennsylvania's economy, and was projected to add more than \$12.8 billion in 2011.^{vii}
- Marcellus production supported nearly 140,000 jobs in Pennsylvania in 2010, and was projected to support nearly 157,000 in 2011.^{viii}
- Pennsylvania's state and local governments received \$1.1 billion in tax revenues from Marcellus natural gas development in 2010, and were projected to collect more than \$1.2 billion in 2011.^{ix}
- By contrast, in New York—where a moratorium has been imposed on the use of hydraulic fracturing in much of the state's portion of the Marcellus—the ban is estimated to cause \$11-15 billion in lost economic impact between 2011 and 2020.^x

Geography

- The depth of the Marcellus Shale varies greatly—from the surface in central Pennsylvania to over 9,000 feet in southwestern and northeastern Pennsylvania.¹¹
- It has a thickness between 20 feet in northwestern Pennsylvania up to several hundred feet in central and northeastern Pennsylvania.¹²
- Marcellus drilling has affected 15,400 acres of land in Pennsylvania, which is only 0.5% of the total land in the state.¹³

Marcellus Formation



¹ US Geological Survey, USGS Releases New Assessment of Gas Resources in the Marcellus Shale, Appalachian Basin, <http://www.usgs.gov/newsroom/article.asp?ID=28>

² *Id.*

³ U.S. Energy Information, International Energy Outlook, September 2011, <http://www.eia.gov/forecasts/ieo/index.cfm>

⁴ Pennsylvania Department of Environmental Protection, <https://www.paoilandgasreporting.state.pa.us/publicreports/Modules/DataExports/DataExports.aspx>

⁵ *Id.*

⁶ Calculated from EIA, <http://www.eia.gov/state/state-energy-rankings.cfm?keyid=29&orderid=1>

^{vii} The Economic Impacts of the Marcellus Shale in Pennsylvania: 2011 Update, <http://marcelluscoalition.org/wp-content/uploads/2011/07/Final-2011-PA-Marcellus-Economic-Impacts.pdf>.

^{viii} *Id.*

^{ix} *Id.*

^x The Economic Impacts of the Marcellus Shale: Implications for New York, Pennsylvania, and West Virginia: <http://www.api.org/~media/files/policy/exploration/api-economic-impacts-marcellus-shale.ashx>

¹¹ Pennsylvania Department of Conservation and Natural Resources, Marcellus Shale, http://www.dcnr.state.pa.us/topogeo/econresource/oilandgas/marcellus/marcellus_faq/marcellus_shale/index.htm

¹² *Id.*

¹³ Explore Shale, www.exploreshale.org: "As of August 2011, about 3,860 Marcellus wells have been drilled in Pennsylvania. On average there are two wells per pad, or about 1,930 pads in the state. Each pad (plus associated water impoundments, new roads, and other necessities) consumes between five and eight acres of land. This means that Marcellus Shale drilling has affected approximately 15,440 acres of land, which is .05% of the total land in the state."