



Marcellus Shale

A TALE OF TWO STATES: THE ECONOMIC
IMPACTS OF HYDRAULIC FRACTURING IN NEW
YORK AND PENNSYLVANIA

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Introduction

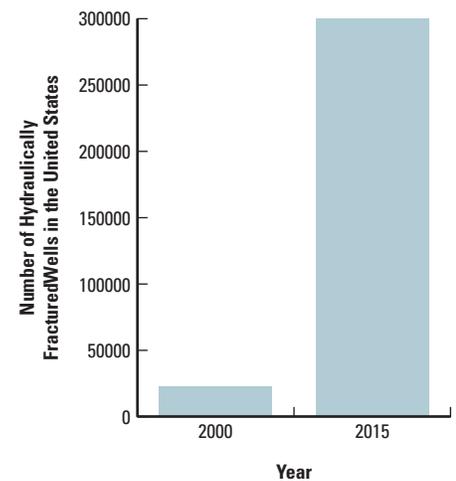
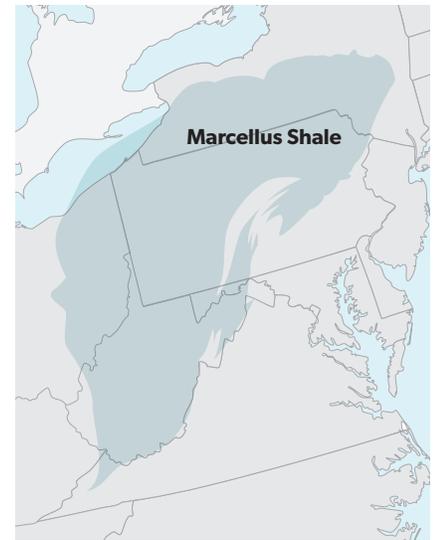
In the Northeastern United States, a geologic formation known as the Marcellus shale play runs from the southern border of West Virginia up into New York. Stored within this formation are vast deposits of carbon resources like oil and natural gas. Until the technological breakthroughs that led to the expansion of hydraulic fracturing--also known as fracking--in the early 2000's, accessing these stores of carbon resources was too costly to merit investment in extraction efforts.¹ With the rapid growth of hydraulic fracturing, however, the Marcellus shale play has become one of the most profitable sources of oil and natural gas in the world.

Two states with the largest claim to this shale play, Pennsylvania and New York, have taken drastically different approaches to crafting policy in regards to hydraulic fracturing. Policymakers in Pennsylvania have adopted policies that have been welcoming to the practice, while policymakers in New York have banned fracking outright. This case study examines the impact these two different approaches have had on local and state economies.

It is important to mention that this piece does not attempt to analyze the environmental impact fracking may have on an area. As with any technology used for natural resource extraction, fracking does affect environments where it is used. Concern over these environmental impacts have created much of the opposition fracking has faced over the past decade, and has had a major impact on the ways fracking is regulated. Environmental impacts are more difficult to quantify than economic ones, and there are varying opinions on how to best measure and evaluate these impacts. Other resources should be consulted for a complete understanding on the issue.

Hydraulic Fracturing Boom Rapid Expansion

The hydraulic fracturing boom began in Texas in the 1990's.² Hydraulic fracturing, paired with new advances in drilling techniques that allowed producers to drill horizontally along a shale formation rather than simply punching a vertical hole through it, created an economically viable method of extraction. That boom quickly spread outward from Texas, with fracking being utilized on shale play formations across the country. From 2000 to 2015, the number of hydraulically fractured wells in the United States grew from approximately 23,000 to approximately 300,000 wells.³



1 Ameri, S., Amenian, K., Miller, J.A., Dorich, D., Yost II, A.B. (1985). "A Systematic Approach for Economic Development of the Devonian Shale Gas Resources." *Society of Petroleum Engineers*. Retrieved from <https://www.onepetro.org/conference-paper/SPE-14504-MS>

2 U.S. Geological Survey. (2013). "Map of Assessed Shale Gas in the United States, 2012." Retrieved from https://pubs.usgs.gov/dds/dds-069/dds-069-z/DDS-69-Z_pamphlet.pdf

3 U.S. Energy Information Administration. (2016, March 15). "Hydraulic fracturing accounts for about half of current U.S. crude oil production." Retrieved from <https://www.eia.gov/todayinenergy/detail.php?id=25372>

"Policymakers have mitigated the negative effects of the fracking boom while still allowing individuals, communities, and cities to grow and benefit from the economic stimulus."

Fracking in Pennsylvania

The Marcellus region began experiencing its own fracking boom around 2007.⁴ In Pennsylvania, during the first year of the boom, producers drilled 116 new shale wells. Just three years later, in 2010, 1,956 new wells were drilled. As of May 2017, Pennsylvania had 10,097 active unconventional wells.⁵

The expansion of wells led to massive job growth in boom counties. Following the start of the boom, direct employment in the oil and gas industry in Pennsylvania grew by more than 300 percent.⁶ The Pennsylvania Department of Labor estimated that over that same period the total job growth resulting from the fracking boom was just under 90,000.⁷ The increased demand for workers put a strain on local communities. Housing demand grew as workers from outside of the area began to move in looking for work. The influx also put a strain on local law enforcement, with criminal caseloads increasing by anywhere from 20 to 40 percent in some counties.⁸ Fracking can also wear down roads due to the number of large, heavy trucks that move in and out of the area hauling water and drilling equipment.⁹

State legislators attempted to mediate these problems by implementing a state impact fee in 2012. An impact fee, which differs from the severance tax which most other fracking states have implemented, is intended to specifically target counties where fracking is occurring. Of the total revenue raised by the fee, \$25.5 million is earmarked each year by the state of Pennsylvania for use in offsetting statewide costs imposed by fracking. The rest of the money is distributed to individual counties, with the majority going to counties directly impacted by fracking operations.¹⁰ Impact fees have led to the construction of new housing, improved emergency response systems, and enabled improvements to government buildings in affected counties.¹¹

Economic Impacts in Pennsylvania

The economic effects of fracking within Pennsylvania have been overwhelmingly positive. A recent working paper authored by Tim Considine, a professor of Economics at the University of Wyoming, highlights the economic growth fracking has created

4 Perry, Mark J. (2014, August 5). "One of the most remarkable energy success stories in US history: The amazing Marcellus shale gas boom." *American Enterprise Institute*. Retrieved from <https://www.aei.org/publication/one-of-the-most-remarkable-energy-success-stories-in-us-history-the-amazing-marcellus-shale-gas-boom/>

5 Pennsylvania Department of Environmental Protection. (2017). "Oil and Gas Reports" Retrieved from <http://www.dep.pa.gov/DataandTools/Reports/Oil%20and%20Gas%20Reports/Pages/default.aspx>

6 Cusick, M. (2015, June 18). "New fracking jobs number likely more accurate, say economists." Retrieved from <https://stateimpact.npr.org/pennsylvania/2015/06/18/new-fracking-jobs-number-likely-more-accurate-say-economists/>

7 Wilber, T. (2017). "Promise of fracking." *Press & Sun-Bulletin*. Retrieved from <http://www.pressconnects.com/story/news/local/fracking/2015/11/22/promise-fracking-marcellus-part-neo/75479104/?from=global&sessionKey=&autologin=>

8 Wilber, T. (2015, November 22). "Impact fees buy goodwill in drilling communities." Retrieved from <http://www.pressconnects.com/story/news/local/fracking/2015/11/22/impact-fees-buy-goodwill-drilling-communities/75479980/>

9 Hansen, M., Simmons, R., & Yonk, R. (2016). "The Unseen Costs of Natural Gas-Generated Electricity." *The Institute of Political Economy*. Retrieved from https://www.strata.org/pdf/unseencosts/unseen_ng_full.pdf

10 Pennsylvania Public Utility Commission. (2012). "Act 13 of 2012 — The Unconventional Well Impact Fee Frequently Asked Questions." Retrieved from http://www.puc.state.pa.us/NaturalGas/pdf/MarcellusShale/Act13_FAQs.pdf

11 Wilber, T. (2015, November 22). "Impact fees buy goodwill in drilling communities." Retrieved from <http://www.pressconnects.com/story/news/local/fracking/2015/11/22/impact-fees-buy-goodwill-drilling-communities/75479980/>

in Pennsylvania. According to Dr. Considine's econometric analysis, "\$1 million...in shale industry spending generates 16 jobs, \$1.75 million value added and \$3 million in personal income after 18 months."¹² Much of this economic growth primarily benefits landowners in rural areas. Employment opportunities in those areas are often more limited than in urban areas, and fracking has provided a welcome opportunity for individuals in those areas. The Marcellus Shale Coalition published a report stating that Pennsylvania landowners received more than \$1.6 billion in lease and bonus payments from drilling companies in 2010, around the peak of the boom.¹³

Pennsylvania's natural gas production totals have skyrocketed, growing from almost 200 billion cubic feet (Bcf) in 2008 to 5,313 Bcf in 2016.¹⁴ This growth in production has helped fuel Pennsylvania's own natural gas economy. Pennsylvania was the 5th largest consumer of natural gas in 2016.¹⁵ The state's increasing production of natural gas has also created a significant opportunity for natural gas exports, including exporting to neighboring New York. The growth has also spurred investments like a \$6 billion ethane cracker plant which Shell Chemical recently began construction on in Potter Township, Pennsylvania.¹⁶ There will also be an expected \$20 billion investment in new gas plants in coming years.¹⁷

This growth in natural gas production has not only benefited residents of Pennsylvania, but has helped to make the United States the leading producer of natural gas in the world.¹⁸ It has boosted economies in rural areas of Pennsylvania, decreased unemployment, and spurred investment across the state. Through the use of impact fees, policymakers have mitigated the negative effects of the fracking boom while still allowing individuals, communities, and cities to grow and benefit from the economic stimulus.

Fracking in New York

Despite its proximity to Pennsylvania and its location atop the Marcellus shale plays, New York legislators have chosen to take an entirely different approach to regulating fracking within the state. Landowners in New York, like their neighbors in Pennsylvania, were caught up in the initial fracking rush in the area. Initial lease payments to New York

\$1 million
in shale industry
spending leads to



\$1.75
million
value
added

16
jobs

\$3
million
in personal
income
after 18 months

12 Considine, T. J. (2017). "Revisiting the Economic Impacts of Fracking in Pennsylvania." Retrieved from <https://www.strata.org/archive/revisiting-the-economic-impacts-of-fracking-in-pennsylvania/>

13 Urbina, I., and McGinty, J. C. (2011, December 1). "Learning Too Late of the Perils in Gas Well Leases." *New York Times*. Retrieved from <http://www.nytimes.com/2011/12/02/us/drilling-down-fighting-over-oil-and-gas-well-leases.html>

14 US Energy Information Administration. (2017). "Natural Gas Gross Withdrawals and Production." Retrieved from https://www.eia.gov/dnav/ng/ng_prod_sum_a_EPG0_FGW_mmc_f_a.htm

15 US Energy Information Administration. (2017). "Natural Gas Consumption by End Use." Retrieved from https://www.eia.gov/dnav/ng/ng_cons_sum_a_EPG0_VC0_mmc_f_a.htm

16 Stonesifer, J. (2017, November 8). "Shell officially starts construction on \$6 billion ethane cracker plant." *Beaver County Times*. Retrieved from <http://www.timesonline.com/news/20171108/shell-officially-starts-construction-on-6-billion-ethane-cracker-plant>

17 Clemente, J. (2017, April 23). "Pennsylvania's Natural Gas To The Rescue." *Forbes*. Retrieved from <https://www.forbes.com/sites/judeclemente/2017/04/23/pennsylvanias-natural-gas-to-the-rescue/#149edb5c4ec3>

18 US Energy Information Administration. (2017, June 7). "United States remains the world's top producer of petroleum and natural gas hydrocarbons." Retrieved from <https://www.eia.gov/todayinenergy/detail.php?id=31532>

"In 2016, New York was the 6th highest consumer of natural gas in the nation, just below neighboring Pennsylvania."

landowners by gas companies totaled \$110 million in 2008.¹⁹ The promise of economic prosperity convinced many to allow drilling on their lands.

Then, midway through 2008, legislators issued a fracking moratorium, essentially halting the practice until a thorough environmental impact assessment could be conducted.²⁰ It took New York's Department of Environmental Conservation (DEC) 7 years to conduct the assessment. In 2015, the DEC released the 1,448 page report, condemning the practice of hydraulic fracturing.²¹ This led to an eventual outright ban on hydraulic fracturing in New York that same year.²² The ban is not permanent, and could be repealed at some point, but as for now fracking has been outlawed in the state of New York.

Economic Impacts in New York

The early moratorium and eventual ban of hydraulic fracturing within New York has denied New York landowners the opportunity of economic windfalls that their neighbors to the south have received. A paper by Hastings, et al., published in the *Eastern Economic Journal* in 2015, quantified the differences in labor market conditions that neighboring border counties in New York and Pennsylvania have experienced since the fracking boom began. Like Pennsylvania, the areas where fracking would have occurred in New York are mostly rural and lie along the southern border of the state. The Hastings paper found that "New York's fracking moratorium is associated with a statistically significant increase in unemployment." They conclude that their findings are consistent with claims that fracking increases employment opportunities.²³ New York residents are missing out on these opportunities because of the state's ban on hydraulic fracturing.

New York's ban on fracking has done little to curb its appetite for natural gas, however. In 2016, New York was the 6th highest consumer of natural gas in the nation, just below neighboring Pennsylvania.²⁴ Due to the ban, New York must rely on importing natural gas from other states to meet demand. In 2016, New York consumed 1,300 Bcf but only produced just over 13 Bcf, or 1 percent of its annual consumption.²⁵ This means that 99 percent of New York's natural gas is imported, rather than produced within the state. Nearly two-thirds of all natural gas imported to New York in 2016 came from

19 Luciew, J. (2015, February 27). "Marcellus Shale is 'money in the bank' that these landowners can't touch." *PennLive*. Retrieved from http://www.pennlive.com/midstate/index.ssf/2015/02/marcellus_shale_is_money_in_th.html

20 Klopott, F. (2015, June 29). "NY Officially Bans Fracking With Release of Seven-Year Study." *Bloomberg*. Retrieved from <https://www.bloomberg.com/news/articles/2015-06-29/n-y-officially-bans-fracking-with-release-of-seven-year-study>

21 Coin, G. (2015, May 13). "New York finally issues fracking report; next step is formal ban." Retrieved from http://www.syracuse.com/weather/index.ssf/2015/05/new_york_finally_issues_fracking_report_next_step_is_formal_ban.html

22 Coin, G. (2015, June 29). "New York state officially bans fracking." Retrieved from http://www.syracuse.com/news/index.ssf/2015/06/new_york_officially_bans_hydrofracking.html

23 Hastings, K., Heller, L. R., and Stephenson, E. F. (2017, October 2). "Fracking and Labor Market Conditions: A Comparison of Pennsylvania and New York Border Counties." *Eastern Economic Journal*. Vol. 43, Issue 4. Retrieved from <https://link.springer.com/article/10.1057/ej.2015.47>

24 US Energy Information Administration. (2017). "Natural Gas Consumption by End Use." Retrieved from https://www.eia.gov/dnav/ng/ng_cons_sum_a_EPG0_VC0_mmcf_a.htm

25 *Ibid.*, US Energy Information Administration. (2017). "Natural Gas Gross Withdrawals and Production." Retrieved from https://www.eia.gov/dnav/ng/ng_prod_sum_a_EPG0_FGW_mmcf_a.htm

Pennsylvania.²⁶ New York residents are being denied the opportunity to reap the economic benefits their neighbors are realizing across the border in Pennsylvania.

Conclusion

Hydraulic fracturing has been a major economic benefit for Pennsylvania. Fracking has spurred job growth, income, investment in communities via impact fees, and growth in manufacturing. Pennsylvania has become a major supplier of natural gas for the rest of the country, exporting over 4,600 Bcf in 2016.²⁷ Residents in neighboring New York, however, have seen none of these opportunities.

The ban on fracking in New York since 2008 has precluded those living near the Marcellus shale play, mostly rural areas where job opportunities are less abundant, from experiencing the same economic opportunities as their neighbors in Pennsylvania. New York imported 2,600 Bcf of natural gas in 2016.²⁸ Much of that natural gas could have been produced within the state while providing jobs for New Yorkers. It also could have provided tax revenue for rural communities and the state government and spurred investment in those areas as well. Instead, those benefits have been outsourced to neighboring states.

"99 percent of New York's natural gas is imported. Nearly **two-thirds** of all natural gas imported to New York in 2016 **came from Pennsylvania.**"

26 US Energy Information Administration. (2017). "International & Interstate Movements of Natural Gas by State." Retrieved from https://www.eia.gov/dnav/ng/ng_move_ist_a2dcu_SNY_a.htm

27 US Energy Information Administration. (2017). "International & Interstate Movements of Natural Gas by State." Retrieved from https://www.eia.gov/dnav/ng/ng_move_ist_a2dcu_SNY_a.htm

28 Ibid.



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