Natural Gas Extraction in the United States

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Introduction

Natural gas consists mostly of methane with a few other hydrocarbon gases mixed in.

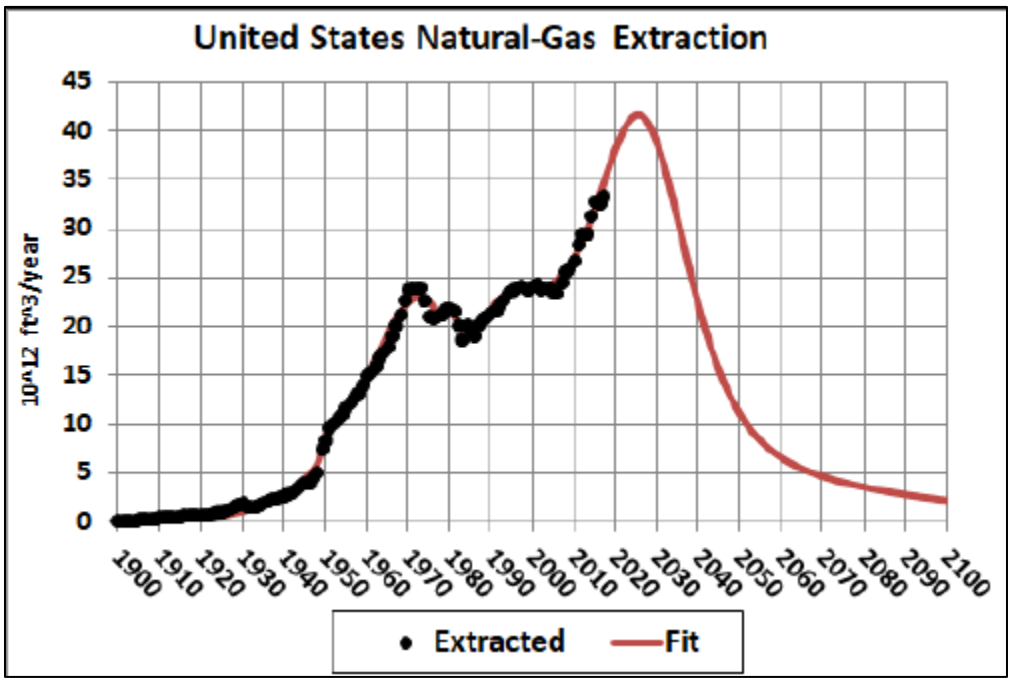
This document is a quantitative history and projection of extraction of natural gas in the various states of the United States.

The data needed for the analysis reported herein are taken from the U.S. Energy Information Agency for recent years and from various documents for early years. The analyses involve fitting a series of Verhulst functions to the extraction data and extrapolated into future years by optimistically using more than the estimated reserves value.

When extraction for recent years is rising and considerable estimated reserves exist the future is approximated by a single peak continuing the rise. When extraction for recent years is falling and considerable estimated reserves exist the future is approximated by a valley followed by a single peak.

United States

The estimated 2016 reserves value is 663.367 x 10^{12} ft^3. The fit used 1326.734 x 10^{12} ft^3, twice the estimated reserves.

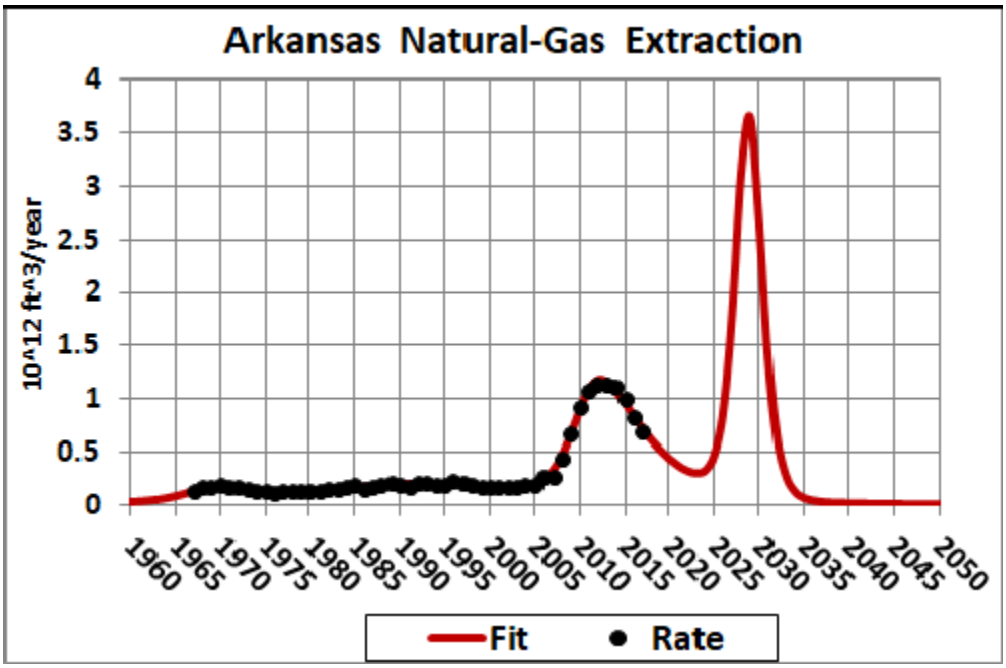


If anyone disagrees with this red curve, please send the author a better depletion curve.

The states with the highest extraction rate over time are listed in alphabetic order.

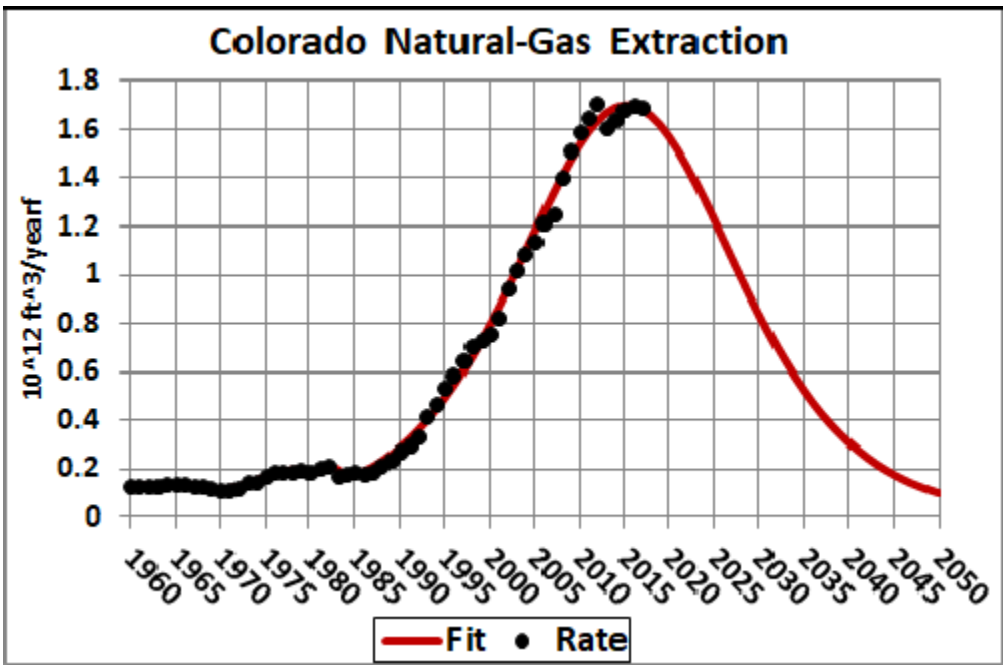
Arkansas

The estimated 2016 reserves value is 14.84 x 10^{12} ft^3. The fit yielded 18.9 x 10^{12} ft^3 to be optimistic. The future peak is assumed to be symmetric.



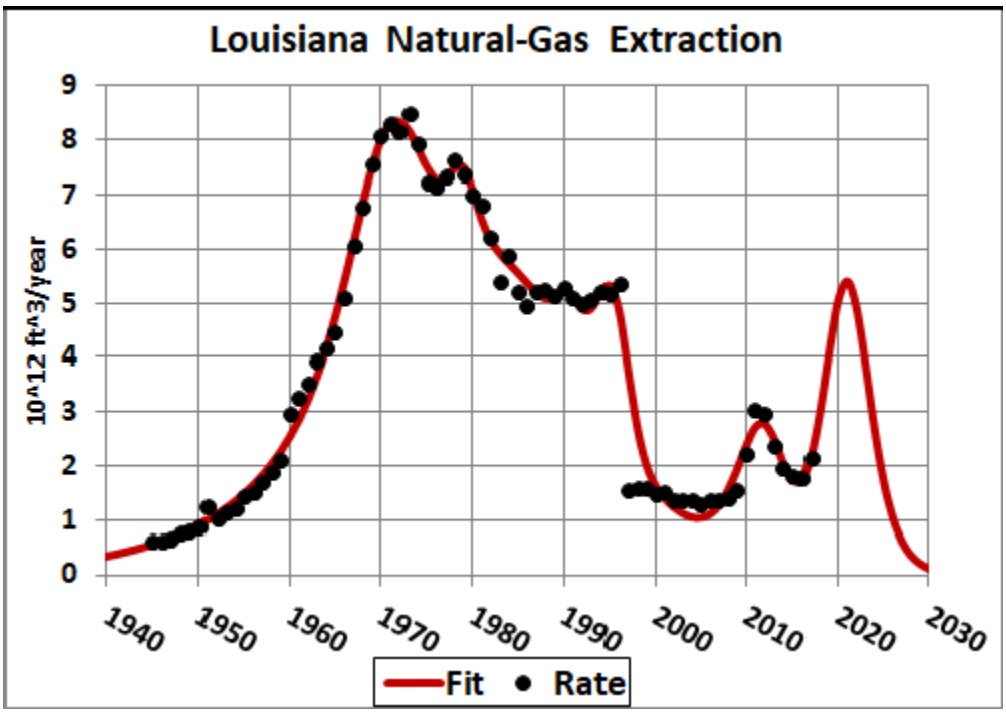
Colorado

The estimated 2016 reserves value is 17.76 x 10^{12} ft^3. Used is 25.21 x 10^{12} ft^3 to be optimistic. The current peak is assumed to be symmetric.



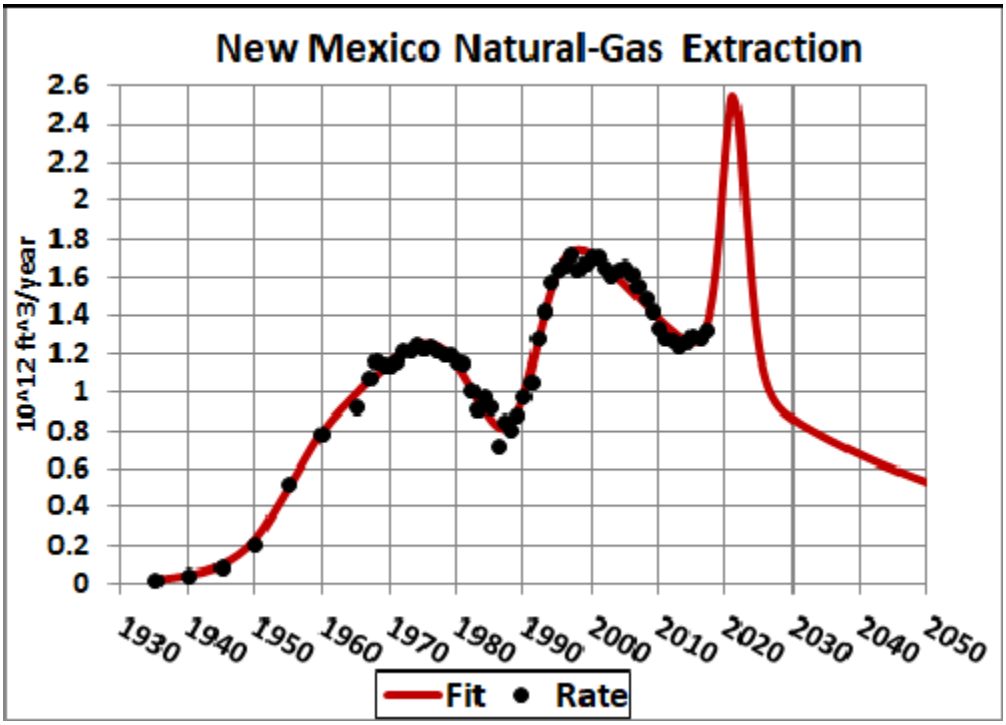
Louisiana

The estimated 2016 reserves value is 17.82 x 10^{12} ft^3. Used is 34.41 x 10^{12} ft^3 to be optimistic. The future peak is assumed to be symmetric.



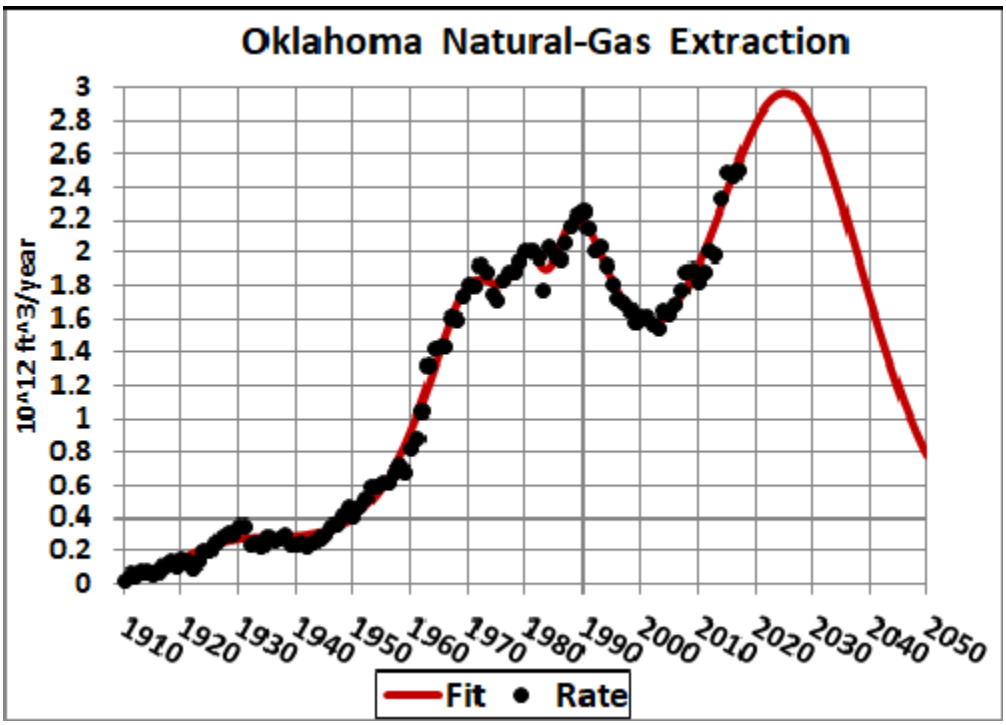
New Mexico

The estimated 2016 reserves value is 27.88 x 10^{12} ft^3. Used is 56 x 10^{12} ft^3 to be optimistic. The future peak is assumed to be symmetric.



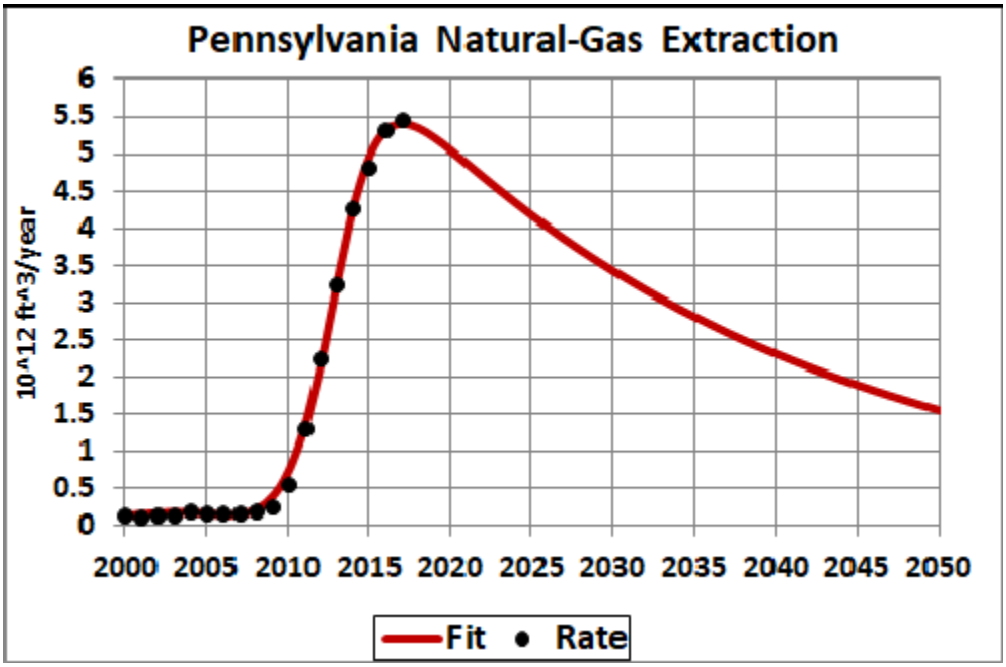
Oklahoma

The estimated 2016 reserves value is 66.11 x 10^{12} ft^3. Used is 80.71 x 10^{12} ft^3 to be optimistic. The future peak is assumed to be symmetric.



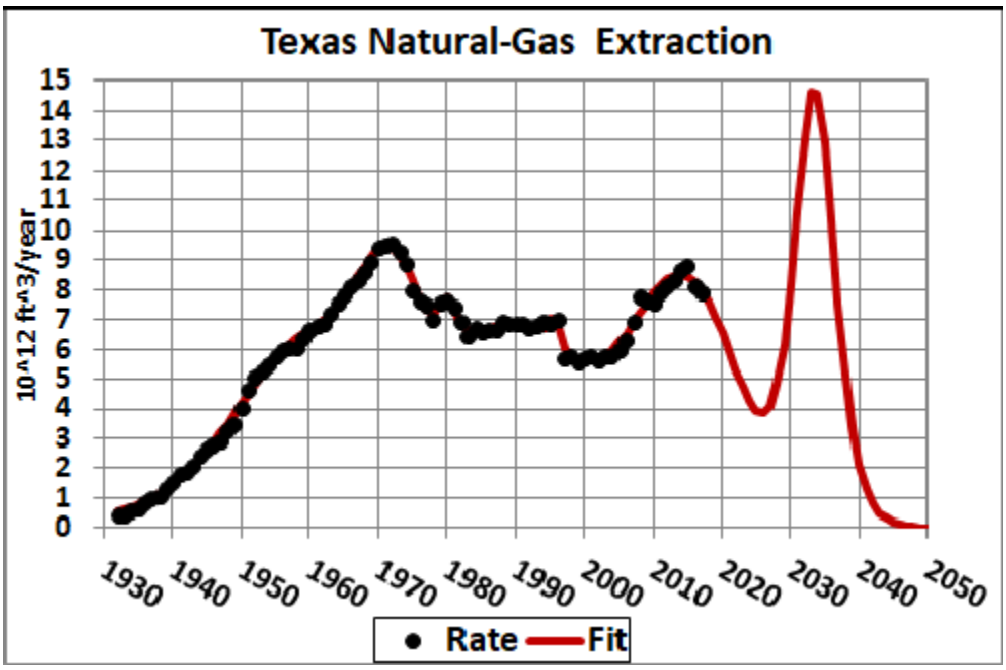
Pennsylvania

The estimated 2016 reserves value is 124.497 x 10^{12} ft^3. Used is 144.628 x 10^{12} ft^3 to be optimistic. The current peak is assumed to be skewed into the future to match the skewing in the microanalysis by J. David Hughes in Drilling Deeper.



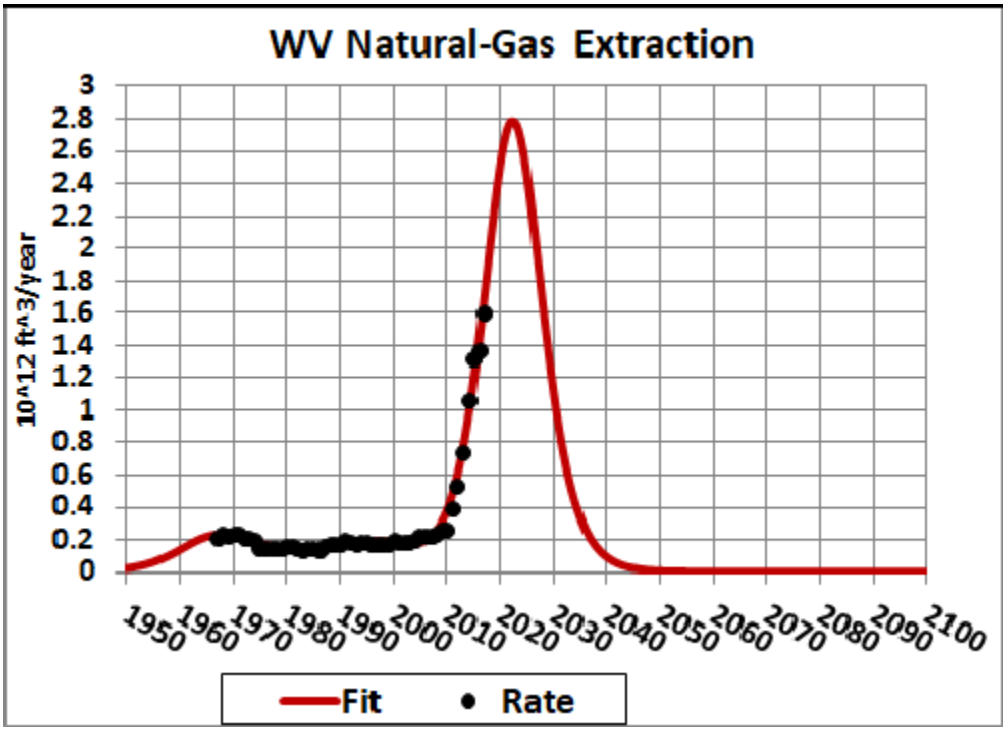
Texas

The estimated 2016 reserves value is 162.4 x 10^{12} ft^3. Used is 174.5 x 10^{12} ft^3 to be optimistic. The future peak is assumed to be symmetric.



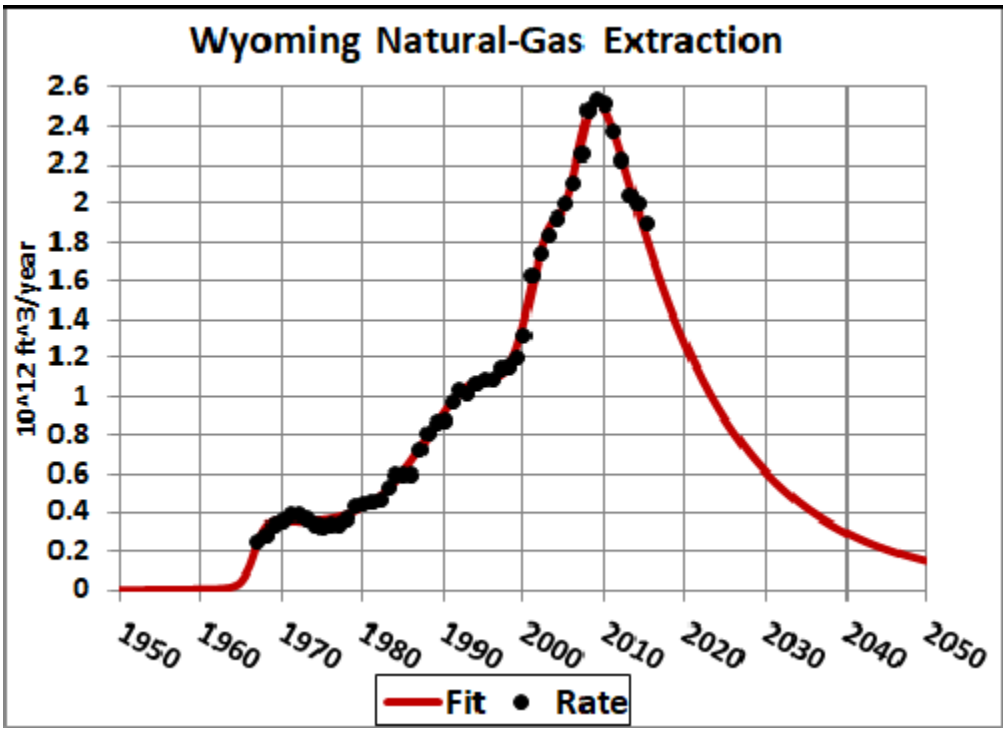
West Virginia

The estimated 2016 reserves value is 23.03 x 10^{12} ft^3. Used is 33.43 x 10^{12} ft^3 to be optimistic. The future peak is assumed to be symmetric.

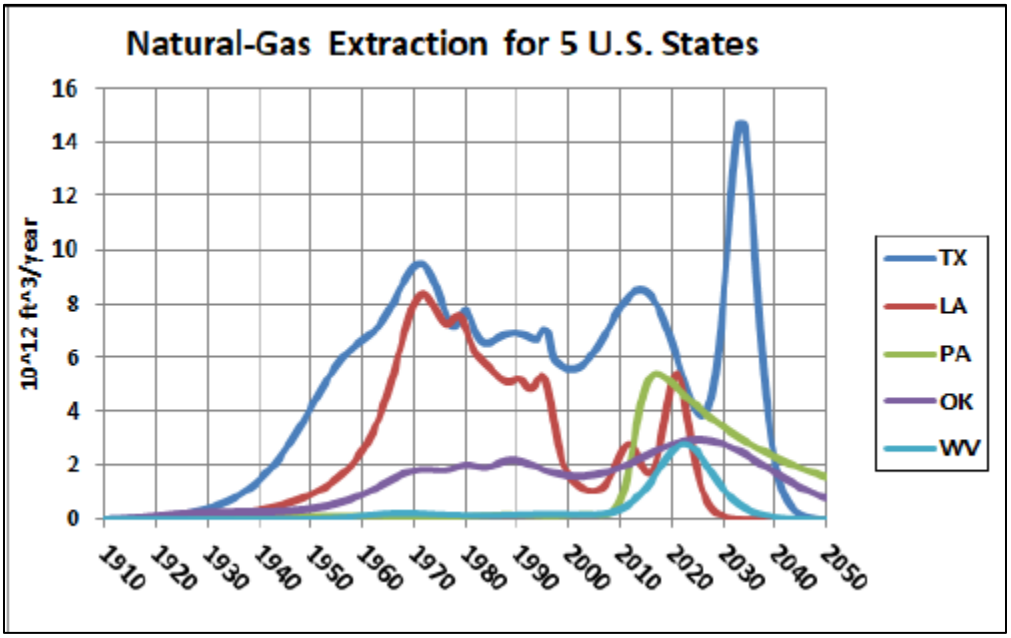


Wyoming

The estimated 2016 reserves value is 42.351 x 10^{12} ft^3. The fit yielded 31.848 x 10^{12} ft^3, less than the estimated reserves.

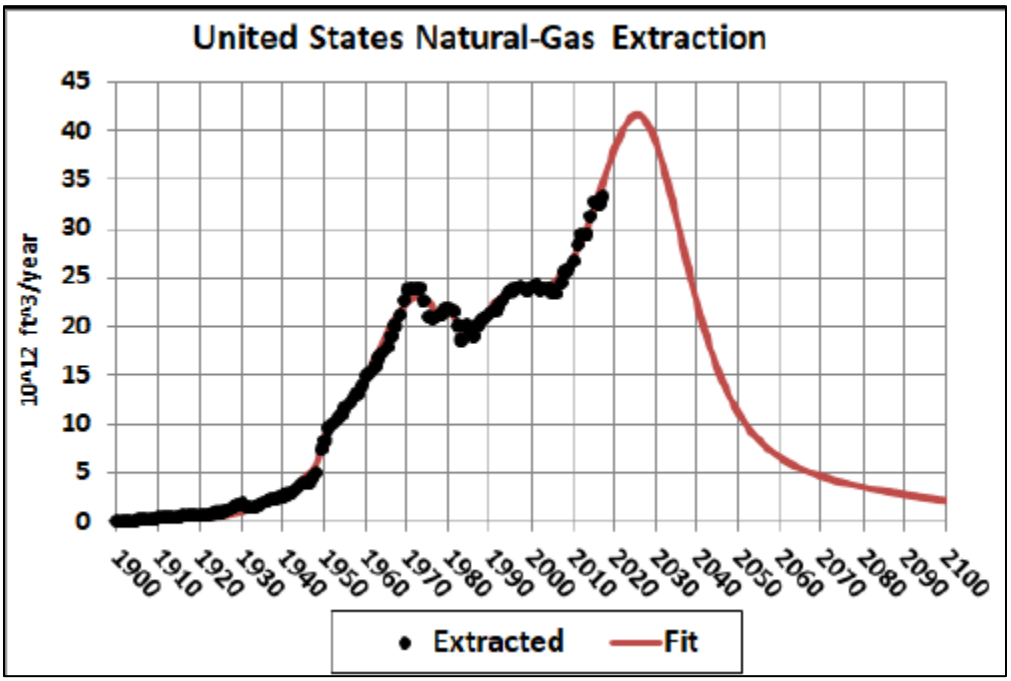


Five U.S. Highest-Extraction States



United States

The estimated 2016 reserves value is 663.367 x 10^{12} ft^3. The fit used 1326.734 x 10^{12} ft^3, twice the estimated reserves.



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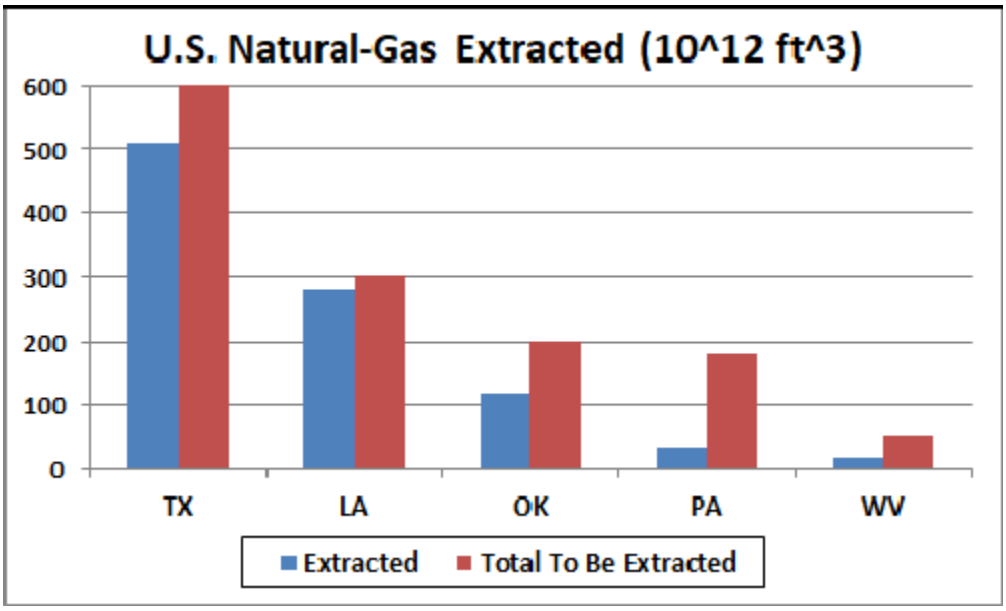
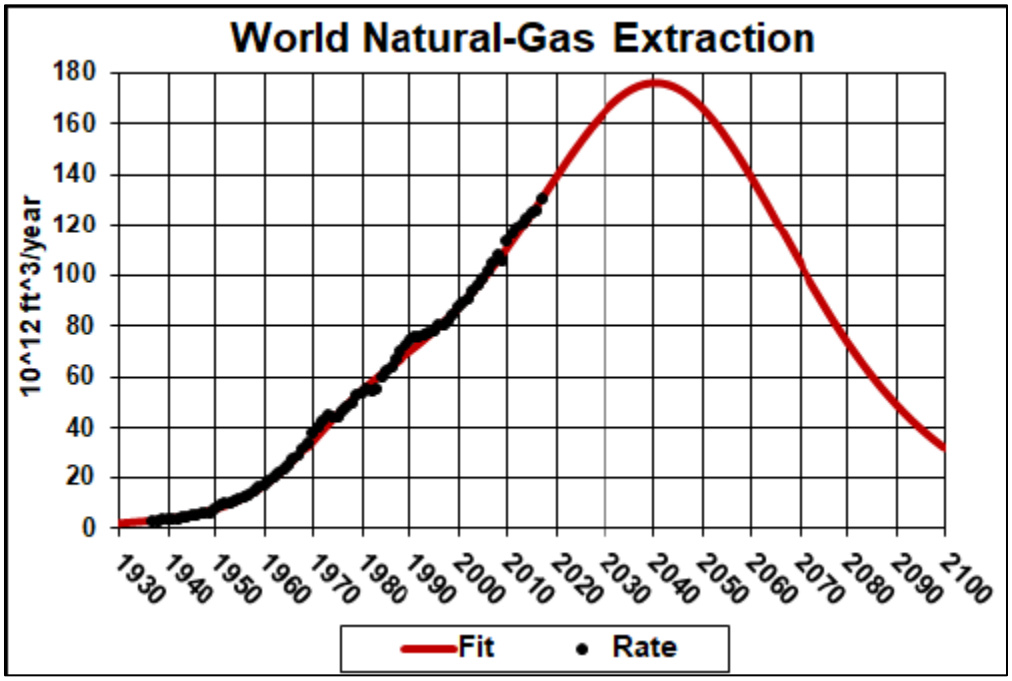


World

The estimated 2016 reserves value is 6963 x 10^{12} ft^3. The fit used 10816 x 10^{12} ft^3 to be optimistic. The current peak is assumed to be symmetric.



There may be a small future peak due to global fracking.

Conclusion

The author does not study natural-gas extraction because he approves of burning it. It is too valuable for making fertilizer and other useful items to waste it by burning it.

Although burning natural gas for energy emits less carbon dioxide than burning coal for energy, methane emissions during drilling for and transporting natural gas, makes burning natural gas as bad as burning coal in causing global warming.

Also, the author does not approve of extracting natural gas by fracking because it depletes the water supply. Drilling for natural gas should be regulated to the maximum extent to keep the damage to the environment as low as possible.

If readers want the Verhulst-function parameters for any of the extraction fits shown above, contact the author L. David Roper at ROPERLD@VT.EDU.

http://www.roperld.com/science/minerals/FossilFuels.htm

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