

Analysis-in-Brief: Interstate Tax Comparison of Natural Gas Extraction

The Independent Fiscal Office prepared a report comparing Pennsylvania's impact fee for unconventional gas wells to the severance taxes levied on natural gas extraction in 10 other states. *As noted in the report, the analysis only applies to wells beginning production in 2014, and it does not reflect legacy wells.*

Overview of the Methodology

The report examines an unconventional natural gas well in each of four scenarios consisting of varying production and price assumptions. The production assumptions are designed to provide a reasonable range for a Pennsylvania Marcellus shale well that begins production in 2014. The natural gas price assumptions are based on the U.S. Energy Information Administration (EIA) Henry Hub spot price forecast.

The analysis applies the features of each state severance tax (including the Pennsylvania impact fee) to a gas well under the four scenarios. It uses a 30 year time frame for each well, which is consistent with the EIA methodology. A shorter 15 year time period would have little impact on the analysis because 92 percent of the natural gas is extracted from the well in those first 15 years.

To facilitate meaningful interstate comparisons, the analysis uses a summary statistic referred to as

the effective tax rate. The effective tax rate is equal to the net present value of certain taxes levied upon a single well divided by the net present value of the market value of natural gas from the well over 30 years. The measure includes state severance taxes and local taxes levied on natural gas reserves or annual production.

The effective tax rates computed in this report are for the lifetime of a new well, and they should not be confused with annual rates or averages across existing wells. The lifetime measure allows for a better interstate comparison because annual average tax rates are influenced by gas prices, the age of the wells and the share of production that benefits from special incentives, which can vary significantly from year to year and among states.

Results of the Analysis

The analysis finds that the total effective tax rate (state and local) for a new Pennsylvania well is the lowest among the comparison states. For state severance taxes only (see table, next page), a new Pennsylvania well has an effective tax rate that is second lowest (to Ohio) in the low production scenarios and tied for lowest (with Ohio) in the high production scenarios.

The analysis focuses on new wells because recent advances in technology have significantly

**Total Effective Tax Rates¹ – Wells Beginning Production in 2014
By Production Level and Price Scenario**

	<u>Low Production</u>		<u>High Production</u>	
	Low Price	High Price	Low Price	High Price
Pennsylvania	1.6%	1.3%	0.8%	0.6%
Arkansas	4.2	4.1	4.3	4.5
Colorado	5.6	5.6	5.7	5.7
Louisiana	2.6	2.4	3.2	3.3
Michigan	5.9	5.9	5.9	5.9
North Dakota	2.5	2.3	2.5	2.3
Ohio	1.8	1.4	1.8	1.4
Oklahoma	3.9	3.9	3.9	3.9
Texas	4.6	4.6	4.6	4.6
Virginia	3.0	3.0	3.0	3.0
West Virginia	7.2	7.2	7.5	7.5

¹ Includes both state and local components. See the following page for a breakdown.

increased the amount of natural gas that can be recovered from a Pennsylvania Marcellus shale well, which reduces the effective tax rate. As new wells are placed in production and existing wells pay declining impact fees, the annual average effective tax rate across all wells will decline. For example, using annual data on impact fee collections and production, the average annual effective tax rate of the impact fee is estimated to be: 5.5 percent for 2011, 4.7 percent for 2012 and 2.3 percent for 2013.

Preliminary data suggest that the average annual effective tax rate for 2014 across all wells will be 1.8 percent holding production constant at 2013 levels and using the EIA's price forecast. With higher production, the rate would be lower, which

is consistent with the results of the analysis. The average annual effective tax rate of the impact fee declines over time because it is levied on a per well basis, and does not respond to prices or production.

The analysis discusses the other taxes that are levied on or paid by firms that extract natural gas. These taxes include corporate net income, personal income, sales and use and tangible personal property taxes. However, due to a lack of publicly available data on entity structure, profit margins and apportionment factors for natural gas extractors, the analysis is not able to quantify those amounts.

Additional details are available in the full report, which is available at www.ifo.state.pa.us.

Effective Tax Rates by State, Production Level and Price Scenario For Wells Beginning Production in 2014						
State	Low Production					
	Low Price			High Price		
	State	Local	Total	State	Local	Total
Pennsylvania	1.6%	n.a.	1.6%	1.3%	n.a.	1.3%
Arkansas	3.2	1.0%	4.2	3.2	0.9%	4.1
Colorado	4.5	1.1	5.6	4.6	1.0	5.6
Louisiana	2.6	n.a.	2.6	2.4	n.a.	2.4
Michigan	5.9	n.a.	5.9	5.9	n.a.	5.9
North Dakota	2.5	n.a.	2.5	2.3	n.a.	2.3
Ohio	0.8	1.0	1.8	0.6	0.8	1.4
Oklahoma	3.9	n.a.	3.9	3.9	n.a.	3.9
Texas	3.7	0.9	4.6	3.7	0.9	4.6
Virginia	n.a.	3.0	3.0	n.a.	3.0	3.0
West Virginia	5.8	1.4	7.2	5.7	1.5	7.2
State	High Production					
	Low Price			High Price		
	State	Local	Total	State	Local	Total
Pennsylvania	0.8%	n.a.	0.8%	0.6%	n.a.	0.6%
Arkansas	3.3	1.0%	4.3	3.6	0.9%	4.5
Colorado	4.8	0.9	5.7	4.8	0.9	5.7
Louisiana	3.2	n.a.	3.2	3.3	n.a.	3.3
Michigan	5.9	n.a.	5.9	5.9	n.a.	5.9
North Dakota	2.5	n.a.	2.5	2.3	n.a.	2.3
Ohio	0.8	1.0	1.8	0.6	0.8	1.4
Oklahoma	3.9	n.a.	3.9	3.9	n.a.	3.9
Texas	3.7	0.9	4.6	3.7	0.9	4.6
Virginia	n.a.	3.0	3.0	n.a.	3.0	3.0
West Virginia	5.8	1.7	7.5	5.7	1.8	7.5