

# Taxation of Natural Gas: A Comparative Analysis

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# **TAXATION OF NATURAL GAS: A COMPARATIVE ANALYSIS**

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## **Disclaimer:**

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# **TAXATION OF NATURAL GAS: A COMPARATIVE ANALYSIS**

## **Executive Summary**

### **The Importance of Marcellus Shale Gas to West Virginia**

The development of Marcellus Shale natural gas promises to be an economic boon to the State's economy. In a recent study the Bureau for Business and Economic Research studied the impact of Marcellus Shale gas and related industries in the State, estimating a generation of 7,600 jobs and \$2.35 billion in business volume with \$14 million in taxes.

Using three different potential growth paths, the same growth path as in past years, 5 percent faster growth and 20 percent faster growth, the results (which CBER considers conservative) were spectacular. Looking forward to 2015, even if growth remains steady, 6,600 new jobs will be created. A 5 percent and 20 percent increase in development would increase new employment to 8,800 and 19,600, respectively.

### **Purpose of the Study**

The purpose of this study is to compare the taxes levied on natural gas production in West Virginia with other producing states. Rather than answering the question as to whether or not these taxes are too high, it is the intention of this report to provide fairly detailed information on how other states tax natural gas. The expectant result is to place into perspective the discussion of how to effectively tax the natural gas industry in West Virginia, including the expected rapid expansion of development of the Marcellus Shale gas.

Experience shows that taxes and other fees do play a part in where drilling, extracting and manufacturing of gas transpires. The natural gas field does not respect state boundaries. By placing wells near state borders, gas from one state can be easily transported to another. Gas processing and manufacturing businesses usually gather near drilling sites, and for that reason close parity, particularly with surrounding states, is desirable.

### **States Included**

In selecting the states for the study, we began with those surrounding West Virginia, as most have at least some natural gas production and most will participate either to a greater or lesser degree in extracting Marcellus Shale. These states include Kentucky, Maryland, Ohio, Pennsylvania and Virginia. The top ten states in natural gas production were then investigated as they had the most experience with natural gas taxation. These states include Alabama, Alaska, Arkansas, Colorado, Louisiana, New Mexico, Oklahoma, Texas, Utah and Wyoming. Other states with Marcellus Shale, New York and Tennessee, which were not included in the prior classifications were also considered. One state, Mississippi, which is the Appalachian Region was included for completeness.

## **Taxes Included**

While there are a variety of taxes levied at the state and local levels in these states, the overall distribution of taxes imposed lacks uniformity. Further, the methods used to calculate the taxes vary substantially. In some cases, both the determination of the tax and its rate are set at the state level. In others, this is a local process. The taxes investigated are:

- Real property taxes
- Personal property taxes
- Severance or production taxes
- Corporation income taxes
- Sales and use taxes
- Permits, bonds and other environmental taxes or fees.

Unemployment taxes, workers compensation premiums and other special levies were not included. At the outset it should be noted that 11 of the states, including West Virginia, apply all six of the taxes to natural gas.

## **Tax Comparisons**

### *Real Property Tax*

Only two of the states studied, Alabama and Wyoming, do not impose real property taxes. In many cases, such as Alaska, New Mexico and Utah, market or full value is used as the base by state directive. Other states use fractional or partial assessments ranging from 20 percent in Alaska to 87.5 percent in Colorado. By comparison, West Virginia assesses property at 60 percent of value. Most of the states leave the determination of market value to local assessors, either with or without state guidance as to how it is determined.

In some states the determination of market value is performed at the state level and then distributed to the local assessors for assessment. West Virginia and Alaska are two examples of this process. While all three methods, cost, market (comparative sales) or income approach, may be used, the income approach is most prevalent. West Virginia utilizes a yield capitalization model while in Alaska, a net income approach is used where the income from the well in previous years less expenses is the determinant of value.

In a few states, the rate of the property tax is calculated by dividing the appraised value by the budgets of the local governments. This calculation ensures that the local governments receive the revenue needed for the upcoming fiscal year. West Virginia sets maximum mill levy rates for all four classes of property. In some states, the tax rate is determined by the type or age of the gas field. West Virginia taxes gas reserves<sup>1</sup> at a rate of \$1 per acre. Other states, such as Kentucky, do not impose a tax on gas reserves.

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<sup>1</sup> In this sense, natural gas reserves are considered natural gas deposits located in the ground which have not been extracted. This does not include natural gas which has been extracted and is being stored in an underground container.

### *Personal Property*

Four of the states levy no taxes on natural gas personal property (Kentucky, New York, Ohio and Wyoming). In almost all cases the assessment level and tax rates are the same as for real property. Colorado is an exception, where personal property is assessed at 29 percent of market value compared to 87.5 percent for real property. The value of personal property is usually derived from cost manuals produced either by national organizations, state property tax offices, consultants or the local jurisdiction.

### *Severance Tax*

Only Maryland, New York and Pennsylvania do not levy some form of severance tax. Alaska levies a production tax and Alabama levies a privilege tax. These taxes are conducted in the same manner as the severance tax and differ in name alone. Many states using the severance tax base the tax on gross value (amount produced times average price paid) and frequently states allow deductions for certain expenses related to drilling, extracting, transporting, cleaning and manufacturing the gas when it reaches the point of purchase. West Virginia is one of the few which does not make those allowances.

Rates between the states vary considerably. While West Virginia's is a flat 5 percent, other states have tiered rates depending on the type of well or the level of production. Alaska has the highest rate at 25 percent of net value, but allows for significant deductions for support of local schools, institutions of higher education and other governmental and charitable institutions. It is the only statewide tax used in Alaska. Top rates in other states range from 8 percent in Alabama and 7 percent in Oklahoma, both of which impose tiered rates. One of the few taxes Wyoming levies on natural gas is the severance tax, which supplies the vast majority of the State's revenue from natural gas.

### *Corporate Income Taxes*

Wyoming is the only state without some form of a corporate income tax. The highest rate at 9.99 percent is in Pennsylvania. Alaska has a tiered tax from 1 percent to 9.4 percent. Louisiana has tiered rates ranging from 4 to 8 percent while New Mexico's tax ranges from 4.8 to 7.6 percent. West Virginia has a flat rate of 8.5 percent which is scheduled to decrease. Corporate income taxes are not as big a consideration, as most gas operating companies are organized as exempt entities.

### *Sales and Use Taxes*

Making comparisons between the states regarding sales and use taxes on natural gas is difficult due to the variety of exemptions which states allow. While rates may be comparable if sales and use taxes are applied to business inputs, including those to gas production and distribution, the application of the tax in one state and not in another makes comparison challenging.

Among other states, West Virginia, Kentucky, Maryland and Pennsylvania each levy a 6 percent tax. The only states with a higher tax are New Mexico, ranging from 5.125 to 8.6875 percent dependent on location, and Mississippi, ranging from 1.5 to 7 percent depending on use. States which allow local governments to "piggy back" include Arkansas, New York, Tennessee and Texas.

### *Permits, Bonds and Other Environmental Taxes and Fees*

These fees include drilling permits, bonds and fees for environmental restoration and inspection of gas facilities. Every state studied except Louisiana requires a permit fee and a bond for natural gas production. West Virginia's permit fee of \$650 far outweighs the other states included, with many requiring permit fees of \$300 or less. Bond amounts and requirements varied greatly with some states, such as Alaska, requiring a minimum of \$100,000 while others such as Texas require \$2 per foot of well depth.

In most of the states studied there are no separate environmental fees (Kentucky, Maryland, New York and Pennsylvania) while western states use taxes or fees based on production (Alaska, Texas, Utah and Wyoming). In those states with no separate fees or taxes for environmental conservation, many earmark a portion of other tax revenues for funding.

### **Conclusion**

West Virginia places more taxes and fees on natural gas production than most of the other states which were studied. From the information now available, it is not possible to determine if the burdens of these taxes are creating a barrier to the development of Marcellus Shale in the State. But West Virginia is in competition with nearby states which hold Marcellus Shale for exploration, drilling and manufacturing. There are many factors which determine location, but, holding other things equal, state and local taxes will be an influential factor.

Considering surrounding states' real and personal property taxes, West Virginia's taxes appear to be high, particularly in those states where personal property is exempted. Since the severance tax is not tiered, it is larger than the tax imposed in Ohio, Kentucky and Virginia. And while Pennsylvania and Maryland do not have severance taxes at this time, discussions are underway in the former.

Many firms in the natural gas industry are organized as exempt from the corporate income tax. Only Pennsylvania has a higher rate as of this date; that gap will increase as the West Virginia tax is scheduled to diminish. While sales and use taxes on business services and other inputs were unable to be fully investigated, West Virginia does exempt some, but not all, business-to-business transactions.

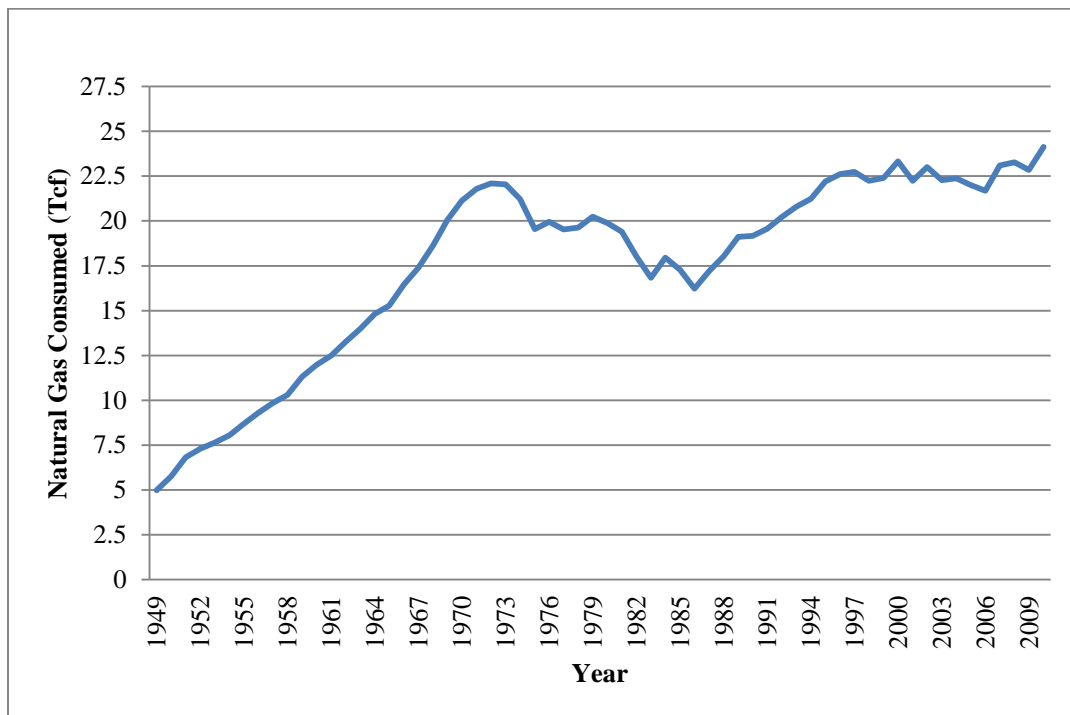
Regarding environmental fees including licenses and drilling permits, Kentucky and Pennsylvania have no separate environmental fees to permits and bonds. Maryland does have high bonding requirements, but there is very little drilling activity presently transpiring in that state.

Overall, West Virginia appears to have one of the highest tax burdens on natural gas compared to the five surrounding states. Further investigation could provide more answers to invite developments in Marcellus Shale gas production to the State.

## Introduction

Natural gas is an important resource for the daily function of many societies throughout the world. An excess of 24 trillion cubic feet (Tcf) of natural gas was consumed in the United States in 2010 (EIA 2011). The vast majority of this resource was delivered to consumers and was largely consumed by the electric power sector. Natural gas consumption increased steadily from 1949 through the 1960s and has fluctuated dramatically since the early 1970s. The lowest consumption since 1970 occurred in the mid-1980s when natural gas consumption declined to just over 16 Tcf. The highest level of consumption, in excess of 24 Tcf, occurred in 2010. Figure 1 illustrates the United States consumption of natural gas from 1949 to 2010.

**Figure 1 United States Natural Gas Consumption 1949-2010**



Energy Information Administration.

## Types of Natural Gas Deposits

Natural gas is extracted in many forms, including deep natural gas, tight natural gas, coalbed methane, shale gas, geopressurized zones and methane hydrates (NaturalGas.org 2011). Deep natural gas is found at least 15,000 feet below the earth's surface. Due to its location deep underground, it can be very expensive to extract. Tight natural gas occurs within a mostly impermeable formation, such as within hard rock or sandstone.

Coalbed methane is natural gas captured within a coal seam. Coalbed methane is disrupted when coal mining occurs and can be a safety hazard unless handled properly. Shale gas refers to natural gas trapped underneath or between shale formations. Geopressurized zones, typically located between 10,000 and 25,000 feet below the earth's surface, are formations under high pressure which hold natural gas deposits. Methane hydrates are "formations...made up of a

lattice of frozen water” which hold molecules of methane (NaturalGas.org 2011). The exploration of methane hydrates is a relatively new process.

### **The Focus on Marcellus Shale**

Many types of shale gas formations exist in the United States. Barnett and Haynesville Shale are found in the southern states of Texas and Louisiana. Fayetteville and Woodford Shale are found in the Midwestern states of Arkansas and Oklahoma. Marcellus Shale is found in the Appalachian region (NaturalGas.org 2011). Appendix A provides a map of shale gas plays in the United States.

Marcellus Shale is part of the Devonian shale formation in the Appalachian basin and holds a still undetermined amount of undeveloped but technically recoverable natural gas. In 2011, the United States Geological Survey (USGS) estimated that natural gas reserves in excess of 84 Tcf exist in these shale formations alone (Coleman, et al. 2011). A separate estimate approximated the reserves to exceed 400 Tcf (EIA 2011). This enormous wealth of untapped natural gas has drawn much attention from researchers and natural gas producing companies exploring the potential to extract the resource. But the attention has not mounted without speculation.

Recent debates have centered on the extraction of natural gas from Marcellus Shale and the possible environmental impacts of such production. Because of the type of formation and its location deep below the earth’s surface, production of Marcellus Shale gas is an expensive process. Natural gas producers use a combination process of horizontal drilling and hydraulic fracturing to penetrate the shale and extract the resource (Chesapeake Energy 2011). The hydraulic fracturing method uses a larger amount of water<sup>2</sup> than other more conventional natural gas extraction methods.

In hydraulic fracturing, a mixture of water, sand and other implements is used to fracture the rock of the formation to extract the gas. The mixture of water and other resources used in the fracturing process is dependent on the region where the drilling is taking place (Chesapeake Energy 2010). One example of a fracking fluid mixture is comprised of 99 percent water and sand with the additional 1 percent including resources such as (Chesapeake Energy 2011):

- Acid
- Antibacterial agent
- Breaker
- Corrosion inhibitor
- Friction reducer
- Gelling agent
- Iron control
- Scale inhibitor
- Surfactant.

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<sup>2</sup> Water usage estimates for hydraulic fracturing can range from 600,000 gallons to 5 million per well (Chesapeake Energy 2010).

Issues have been raised on proper treatment to protect local drinking water and the environment. In response, efforts have been made at both the federal and state level to prevent drinking water issues related to shale gas extraction. The Clean Water and Safe Drinking Water Acts regulate potential contaminants to ground and drinking water. The Safe Drinking Water Act implemented the Underground Injection Control (UIC) program to prohibit “liquid wastes” from being injected into underground drinking water sources (Ground Water Protection Council 2009).

At the state level, the Pennsylvania Department of Environmental Protection has established water treatment regulations for gas well operators to follow. These regulations require drilling operators to properly seal gas wells in efforts to protect fresh water aquifers (PADEP 2011). Regulations are also in place regarding “frac fluid,” the remaining water used in hydraulic fracturing, so that it is properly treated to remove harmful chemicals and minerals.

## **Review of the Literature**

Marcellus Shale natural gas has incited much literary attention in recent years. While many published studies have focused on the economic benefits of shale gas production, literature examining the potential environmental impacts is less prevalent.

Considine<sup>3</sup> has focused on the economic impact of Marcellus Shale production in multiple studies in recent years. A 2010 study of increased drilling in the Appalachian region estimated that the economy could experience employment of over 72,000 jobs in the year 2011 alone and could rise to nearly 102,000 by 2020 assuming low extraction levels (Considine 2010). The study also estimated that by year 2020, approximately \$1.14 billion and \$0.95 billion would be added to Federal and state and local taxes, respectively. By comparison, estimates for high development<sup>4</sup> of the Marcellus Shale formation anticipated employment of nearly 283,000 by 2020 and total additions to federal and state and local taxes of over \$6 billion (Considine 2010).

In a recent study, Higginbotham, et al. (2010) examined the economic impact of developing Marcellus Shale in West Virginia. The study estimated total employment of 7,600 jobs and assorted state taxes<sup>5</sup> of \$14.5 million (Higginbotham, et al. 2010). Total value added from the production of Marcellus Shale gas exceeded \$1 billion. The economic impact was also forecast to 2015 at current levels (no growth), 5 percent and 20 percent growth in drilling activity each year. Estimating 5 percent growth each year, employment would increase to 8,800 jobs by 2015. If development grew at 20 percent each year, employment was estimated to be nearly 20,000 jobs.

A separate study on the State of Pennsylvania found positive economic impacts of developing Marcellus Shale as well. This study estimated 29,000 jobs and \$240 million from state and local taxes for 2008 (Considine, et al. 2009). Forecasting forward over a decade, assuming continued

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<sup>3</sup> While the works of Dr. Considine project remarkable economic benefits from the production of Marcellus Shale natural gas, some critics question the validity of his results (Campbell 2011, League of Women Voters of Pennsylvania 2009). Because his papers are widely cited, we include his estimates in our review.

<sup>4</sup> Considine (2010) estimates 1,738 wells drilled by 2020 for his low development estimate and 4,842 wells drilled by 2020 for his high development estimate.

<sup>5</sup> “Assorted other state taxes” include personal, corporate net income, business franchise, sales and use taxes.

growth of Marcellus Shale development in the State, estimates increased to 175,000 jobs annually and \$12 billion in tax revenues. From 2008 to the forecasting estimate, total value added estimates increased from \$2.3 billion to an excess of \$13 billion.

From an environmental standpoint, a recent study examined the impacts of electricity generation from coal and natural gas on freshwater resources in the United States (Grubert and Kitasei 2010). In their study, Grubert and Kitasei state that, in addition to being the larger greenhouse gas emitter, coal-fired power plants used more water for electricity generation than natural gas power plants. The authors also found that the extraction of coal had a “higher potential for long-term degradation of water resources” than the extraction of natural gas (Grubert and Kitasei 2010).

### **Taxation Methods of Natural Gas Producing States**

This report focuses on the taxation methodologies of 19 natural gas producing states. The states chosen include the 10 largest natural gas producing states, states which border West Virginia and states which are included in the Appalachian region or hold<sup>6</sup> Marcellus Shale. Table 1 identifies the states chosen and the rationale for each inclusion. A complete list of natural gas producing states by production is provided in Appendix B.

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<sup>6</sup> While a measure of Marcellus Shale exists in New Jersey, no natural gas was produced in 2009. Therefore this state is not included in this study.

**Table 1 Characteristics of States Chosen**

<b>Rank</b>	<b>State</b>	<b>Top Producer</b>	<b>Marcellus Shale</b>	<b>Appalachian Region</b>	<b>Bordering State to WV</b>
9	Alabama	X			
10	Alaska	X			
7	Arkansas	X			
5	Colorado	X			
17	Kentucky			X	X
2	Louisiana	X			
31	Maryland			X	X
20	Mississippi			X	
6	New Mexico	X			
22	New York		X	X	
19	Ohio		X	X	X
4	Oklahoma	X			
13	Pennsylvania		X	X	X
23	Tennessee		X	X	
1	Texas	X			
8	Utah	X			
16	Virginia		X	X	X
14	West Virginia		X	X	
3	Wyoming	X			

Natural gas is subject to a variety of taxes within these states. The taxes which are the focus of this report include:

- Real property taxation
- Personal property taxation
- Severance taxation
- Corporation income taxation
- Sales and use taxation
- Environmental taxation or fees.

Because both real and personal property taxation methods are complex, an overview of valuation methods is provided for reference. Following the overview, a summary of the taxation methods used in the selected states is provided.

### **Overview of Property Valuation**

Property valuation of natural gas property for taxation purposes is one of the most complex taxation structures examined in this report. While some property types, such as barren natural gas property in West Virginia, are taxed on a flat rate basis (in this case \$1 per acre), other valuation

methods require much more detail to complete. This section discusses how fair market value is determined.

Fair market value, or simply market value, has been defined in many ways. According to the Appraisal Institute (2008), market value is defined as

“the most probable price, as of a specified date, in cash, or in terms equivalent to cash, or in other precisely revealed terms, for which the specified property rights should sell after reasonable exposure in a competitive market under all conditions requisite to a fair sale, with the buyer and seller each acting prudently, knowledgeably, and for self-interest, and assuming that neither is under undue duress” (Appraisal Institute 2008).

In general, the definition of market value involves an open sale between a buyer and seller, neither of whom feel pressured into the transaction. For comparison, West Virginia Code defines market value as

“the price at or for which a particular parcel or species of property would sell if it were sold to a willing buyer by a willing seller in an arm's length transaction without either the buyer or the seller being under any compulsion to buy or sell.”<sup>7</sup>

The determination of fair market value is generally conducted using three approaches to value:

- Income approach
- Cost approach
- Market (or sales) approach.

While slight variations of these three approaches exist and are discussed in this report, a brief overview of each is provided below.

#### *Income Approach*

The income approach to value considers the potential income a property could generate over a specified time period in the future (Appraisal Institute 2008). This approach frequently uses a capitalization rate to determine potential income, which is then discounted back to present value. Two income approach methods are used in this report:

- Discounted cash flow
- Gross income.

The most common method employed is the **discounted cash flow approach** to valuation. The discounted cash flow analysis uses anticipated market conditions rather than relying on an appraiser's predictions (Appraisal Institute 2008). According to the Appraisal Institute (2008), uses for the discounted cash flow include determination of present value as well as computing a yield rate. This process requires much detail to determine the present value considering the rate

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<sup>7</sup> West Virginia Code §11-1A-3(i).

of return on the property, including factors such as income and expenses. These factors are estimated over a set time period and then discounted to determine the present value of the property being appraised. Through this method,

“the appraiser can account for all cash flows in and out of the real property interest being appraised and estimate the timing of these cash flows so that the time value of money is properly recognized in the analysis” (Appraisal Institute 2008).

This approach is used in those states, like West Virginia, where natural gas reserves are subject to taxation. Once the net income stream is calculated it is spread over the productive life of the well or field. This produces a series of annual incomes which must be discounted to determine the current value of the property.

The factors which are used to establish the discount rate include:

- Safe rate
- Risk rate
- Effective tax rate
- Return on equity rate.

States which use this method have different means of determining the factors which go into the discount rate, making comparisons impossible. Because of the complexity of the discounted cash flow analysis, calculations are typically conducted using spreadsheet software. However, the practicality of this analysis makes it a common choice for valuation.

The other income approach is used when reserves are not taxed and only the value of current producing property is included in the property tax base. This approach is called by various names such as the **gross or net income** approach. In most states this calculation consists of taking average prices for gas during the tax year multiplied by the amount of production to obtain gross income at the wellhead. From gross income is subtracted the expenses of transporting, cleaning, gathering and manufacturing the gas at the point of sale. The remaining value is then used as the taxable value.

#### *Cost Approach*

The cost approach to value considers the cost of the property new (or a close substitute) and then applies depreciation to determine value (Appraisal Institute 2008). Depreciation can be determined by comparing the current market value of the property to the cost new (or replacement cost) or by a depreciation schedule or straight-line depreciation method.

#### *Market (or Sales) Approach*

The market approach, also called the sale or sales comparison approach, to value considers the value of similar properties which were recently sold, currently listed for sale or for which a sale is pending to determine value (Appraisal Institute 2008). This approach is only useful when information on comparable sales is available.

## Overview of Included States

Of the 19 states examined, only Alabama and Wyoming do not levy a **real property tax** on natural gas. Seven states (Arkansas, Louisiana, Mississippi, New York, Ohio, Tennessee and Texas) provide guidance to the counties or parishes for how natural gas real property should be valued and/or the rates that should be used. The local governments of Oklahoma, Pennsylvania and Virginia each determine the valuation methods and rates to be used and whether natural gas real property is taxed. Of the remaining states, many consider one or all three approaches to value. West Virginia uses a yield capitalization model, assessed at 60 percent, and Kentucky and New Mexico assess at set rates per \$100 and \$1,000 of value, respectively.

Most states tax natural gas **personal property** in a very similar manner as real property. Kentucky, New York, Pennsylvania and Wyoming do not levy a personal property tax on machinery and equipment related to natural gas production. The seven states which provided state guidelines for real property taxation provide guidance to local governments for personal property taxation as well. Local governments in Oklahoma, Pennsylvania and Virginia are also able to establish individual valuation methods and rates. Four states, including West Virginia, determine fair market value to appraise natural gas personal property and New Mexico establishes the same \$20 per \$1,000 of value as for real property.

Maryland, New York and Pennsylvania do not levy a **severance tax** on the production of natural gas. West Virginia, Alabama and Kentucky each impose a severance tax on the gross value of natural gas produced while other states such as Colorado and Louisiana impose the severance tax on the gross annual income, gross receipts, sale price or other determinations of value.

The **corporation income tax** is fairly straight forward in most states although determining taxable income can be quite complex. Natural gas corporations in nine states, including West Virginia, are taxed based on a percentage of taxable income. Other states, such as Mississippi and Alaska, use tiered rates. These rates may be dependent on an increasing income (ex. rates set as a percentage of the first \$10,000 and so on) or for ranges (ex. rates set based on the total taxable income over the year). Ohio levies a commercial activities tax, Texas levies a franchise tax and Wyoming does not impose a tax on a natural gas corporation's income.

The **sale and use taxes** imposed on natural gas are easily the most comparable. Other than Alaska and Ohio, neither of which impose a sales or use tax, rates range from as low as 1.5 percent in Mississippi to 8.6875 percent in New Mexico. West Virginia and four other states each impose a 6 percent sales and use tax. Five states allow local governments to impose an additional tax to the state-imposed tax.

**Permits, bonds and environmental taxes or fees** are the most consistent in the states studied in that nearly every state has set a requirement. Every state but Louisiana<sup>8</sup> required some amount of a permit fee and a bond before natural gas drilling could commence. The lowest permit fee is imposed in Wyoming (\$50) and the highest exists in West Virginia (\$650). The range for bonds was varied greatly in amount and determination. Some states impose a per-well bond while others use well depth and number of wells permitted to determine the amount. Surprisingly the

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<sup>8</sup> Louisiana requires a filing fee for the permit but neither an official permit fee or bond amount was specified.

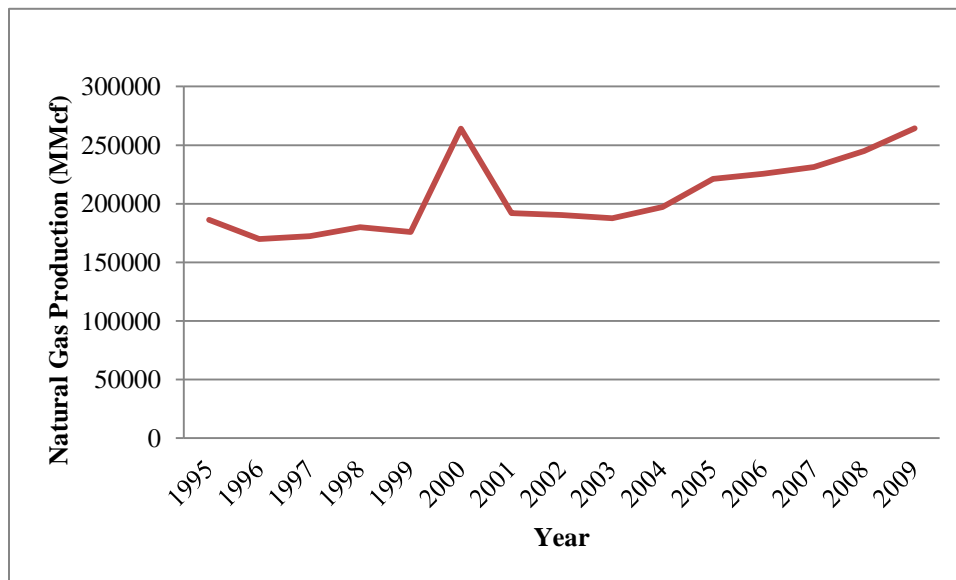
imposition of an additional environmental tax or fee on natural gas production was fairly nonexistent. While most bonds are required to ensure that gas wells will be properly plugged after drilling has ceased, about half of the states impose an additional tax or fee. Those that do impose seem to impose taxes or fees in small amounts. (Texas levies a conservation tax of \$0.0007 per Mcf of gas produced.) Four other states siphon a portion of severance taxes or violation fees to fund conservation efforts.

Appendix C provides a brief overview of each state's taxation methods while more detail is provided in the sections to follow.

## West Virginia

West Virginia was ranked as the 14<sup>th</sup> largest natural gas producing state by 2009 production. Over a 15 year period, production in West Virginia has increased steadily. A sharp spike in natural gas production occurred in 2000 when production increased from 176,015 million cubic feet (MMcf) to 264,139 MMcf. Production decreased the following year to 191,889 MMcf and has been on a steady incline since. West Virginia natural gas production over a 15 year period is provided in Figure 2.

**Figure 2 West Virginia Natural Gas Production 1995-2009**



Energy Information Administration, State Energy Data System.

While West Virginia does hold Marcellus Shale reserves within its borders, there are no specific or additional taxes imposed on gas produced from this formation. Instead, any natural gas produced from Marcellus Shale in West Virginia is taxed the same as other gas reserves. Natural gas taxation methods in this State are detailed in the subsections below.

## Real Property Tax

The State of West Virginia values producing and reserve natural gas real property by the standards discussed below and assesses the appraisal at 60 percent of value. Once the assessment is complete, the counties apply applicable local levy rates.

Producing<sup>9</sup> natural gas real property in West Virginia is valued through a yield capitalization model on net receipts for the working interest and a yield capitalization model on gross royalty payments for the royalty interest. The capitalization rate<sup>10</sup> used to value producing natural gas property is determined each year by the Tax Commissioner using both a discount and property tax component.<sup>11</sup> The discount component is comprised of five subcomponents:

- Safe rate
- Risk rate
- Nonliquidity rate
- Management rate
- Inflation rate.

The **safe rate** refers to a rate of return on an investment which poses low risk. This rate is calculated using a three year weighted average of interest rates as given on 13 week United States Constant Maturity Treasury Yields.

The **risk rate** is an estimation of the interest rates which are required on loans for either purchase or development of natural gas property. This calculation is made by first determining the prime interest rate charged by banks for the previous three years and adding 2 percent to each rate. This rate is compared to the 13 week United States Constant Maturity Treasury Yields as used for the safe rate. A weighted average of the prime interest rates, increased by 2 percent each year, is then calculated.

The **nonliquidity rate** uses a yearly survey to estimate the amount of time natural gas property will remain on the market before being sold. United States Constant Maturity Treasury Yields of at least 13 weeks are then examined to identify those with similar time differentials. The interest differential between the rates is the nonliquidity rate.

The **management rate** is the cost of managing the investment and is set at a rate of 0.5 percent.

The **inflation rate** is an estimation of the consumer price index of the United States Department of Labor, Bureau of Statistics. A three year weighted average of this rate is used for the inflation rate.

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<sup>9</sup> West Virginia Code of State Rules §110-1J-4.1.

<sup>10</sup> West Virginia Code of State Rules §110-1J-4.5.

<sup>11</sup> The property tax component refers to “a rate reflecting a provision for returning to an investor a sum of money equal to property taxes paid over the economic life of an investment” per West Virginia Code of State Rules §110-1J-3.20.

The value of nonproducing natural gas property is determined by taking the “sum of the projected annual income stream from delay rental<sup>12</sup> during the lease term discounted in each year by a capitalization rate.”<sup>13</sup>

Nonproducing natural gas property that is considered barren of the natural resource, as well as abandoned or plugged natural gas property, is valued at \$1 per acre. A cap of 125 acres per natural gas well is imposed on abandoned or plugged natural gas property.

### **Personal Property Tax**

The State of West Virginia considers natural gas personal property “commercial and industrial personal property” for taxation purposes. Commercial and industrial personal property is appraised at fair market value with consideration<sup>14</sup> of three valuation methods:

- Cost approach
- Income approach
- Market data approach.

The cost approach is the most widely effective method used to appraise natural gas personal property due to data available. The cost approach is implemented using an estimated value of the property and the amount of accrued depreciation. The three types of depreciation considered<sup>15</sup> for the cost approach are:

- Physical deterioration
- Functional obsolescence
- Economic obsolescence.

Once the appraised value is determined the property is assessed at 60 percent and then subject to the current levy rate in each county.

### **Severance Tax**

West Virginia levies a severance tax<sup>16</sup> on the privilege of producing natural gas at the rate of 5 percent of the gross value<sup>17</sup> produced, derived from the sale of natural gas. This tax does not apply<sup>18</sup> to natural gas:

- Which is freely supplied to a surface owner

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<sup>12</sup> A delay rental or delay lease is the amount paid by the lessee to the lessor for an extension of time to begin production. If a lease has run its term and no production has taken place the property returns to the lessor. If the lease wants to “delay” further production from the site the amount paid for the extension is called the delay lease.

<sup>13</sup> West Virginia Code of State Rules §110-1J-4.7.

<sup>14</sup> West Virginia Code of State Rules §110-1P-2.5.3.1.

<sup>15</sup> West Virginia Code of State Rules §110-1P-2.2.1.1.

<sup>16</sup> West Virginia Code §11-13A-3a(b).

<sup>17</sup> Gross value refers to the “value of natural gas at the wellhead immediately before transportation and transmission” per West Virginia Code §11-13A-2(c)(6)(G).

<sup>18</sup> West Virginia Code §11-13A-3a(a).

- From a well that produced less than 5,000 cubic feet of natural gas, on average, each day during the prior calendar year
- Which was not of marketable quantities for five consecutive years during a maximum 10 year period.

### **Corporation Income Tax**

Natural gas producing companies in the State are subject to the same corporation net income tax<sup>19</sup> as other corporations. The rate is currently 8.5 percent of West Virginia taxable income. As of January 1, 2012, the corporation net income tax rate will decrease to 7.75 percent so long as the balance of funds in the Revenue Fund Shortfall Reserve Fund and the Revenue Fund Shortfall Reserve Fund – Part B is not equal to or in excess of 10 percent of the General Revenue Fund as budgeted for the 2012 Fiscal Year.

The determination of this tax involves adjustments to increase or decrease federal taxable income. The majority of the additions are items which are exempt from the federal taxable income and include:

- Interest received on state and local bonds not issued for West Virginia entities
- Taxes paid to foreign governments
- Operating losses from operations outside the United States.

Corporations in West Virginia may also deduct from the corporation net income tax certain items which are included in the company's federal tax liability. These deductions include:

- State tax refunds and overpayments
- Employee contributions to medical savings accounts
- Deductions received from foreign operations corporations.

The State uses an apportionment formula to determine the amount of income to be taxed. The apportionment formula includes:

- Apportionable income
- Property factor
- Payroll factor
- Sales factor.<sup>20</sup>

**Apportionable income** refers to the portion of the corporation's gross income received in the State of West Virginia.

The **property factor** is a fraction of the value of property used by the corporation during the taxable year. The numerator of the fraction is the average value of the corporation's real and tangible personal property, whether owned or rented, which is used in the State. The denominator of the fraction is the average value of the corporation's real and tangible personal

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<sup>19</sup> West Virginia Code §11-24-4(5).

<sup>20</sup> West Virginia Code §11-24-7(e).

property, whether owned or rented, plus the average value of the corporation’s real and tangible personal property leased and used during the taxable year.

The **payroll factor** is a fraction of the compensation paid by the corporation during the taxable year. The numerator of the fraction is the total compensation paid in the State for compensation. The denominator of the fraction is the total compensation paid during the taxable year.

The **sales factor** is a fraction of the gross receipts of the corporation during the taxable year. The numerator of the fraction is the gross receipts derived from transactions and activity in the regular course of business (or business income) minus returns and allowances. The denominator of the fraction is the total gross receipts derived from transactions and activity in the regular course of business during the taxable year. Any interest and dividends from obligations of the federal government, whether in the numerator or denominator of the sales factor fraction, are to be omitted.

This three factor formula is provided in Equation 1.

#### Equation 1 West Virginia Apportionment Formula

$$WV \text{ Tax. Income} = App. \text{ Income} \times \frac{\frac{Prop}{All \ Prop} \times \frac{Payroll}{Total \ Payroll} \times 2 \frac{Sales}{All \ Sales}}{4}$$

It is important to note that the sales factor is weighted by 50 percent while the property and payroll factors are each weighted by 25 percent.

#### Sales and Use Tax

The West Virginia sales tax<sup>21</sup> is set at 6 percent. Currently, sales of natural gas delivered through mains or pipes to consumers are exempt<sup>22</sup> from the sales tax. Purchase of tangible personal property<sup>23</sup> for use in the State is also subject to a 6 percent use tax.<sup>24</sup>

#### Permits, Bonds and Other Environmental Taxes or Fees

West Virginia requires a permit fee<sup>25</sup> of \$650 for natural gas wells to ensure that the well will be properly plugged once extraction is complete. This fee is not imposed on applications to either plug or replug a well only. Well operators are also required to submit an erosion and sediment control plan with each well work permit to outline stabilization and drainage methods.<sup>26</sup>

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<sup>21</sup> West Virginia Code §11-15-3(b).

<sup>22</sup> West Virginia Code §11-15-9(a)(1).

<sup>23</sup> Tangible personal property includes “electricity, water, gas, and prewritten computer software” per West Virginia Code §11-15A-1(12).

<sup>24</sup> West Virginia Code §11-15A-2(a).

<sup>25</sup> West Virginia Code §22-6-2(c)(10).

<sup>26</sup> West Virginia Code §22-6-6(d).

Before a permit is issued, a bond (or multiple bonds) must be furnished to ensure proper plugging of a well after extraction has ended. Operators have the option of including any or a combination of the following types of bonding:

- Surety bonding
- Collateral bonding (including cash and securities) letters of credit
- Establishment of an escrow account
- Self-bonding.<sup>27</sup>

Each bond is required to be the sum of \$5,000. Operators planning to introduce liquid pressure into the well to recover natural gas may opt to furnish a \$50,000 blanket bond instead of a separate bond.<sup>28</sup>

A proposed drilling fee on Marcellus Shale production has been met by opposition of the West Virginia Oil and Natural Gas Association (Ross 2011). The proposition would impose a fee of \$10,000 for the first well and \$5,000 for each additional well. Those opposed felt that the imposition would “make West Virginia drillers uncompetitive with those in Pennsylvania and Ohio” (Ross 2011). Corky Demarco, executive director of the West Virginia Oil and Natural Gas Association, suggested that a portion of the severance tax could be used rather than imposing a drilling fee to pay for well inspectors.

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<sup>27</sup> West Virginia Code §22-6-26(d).

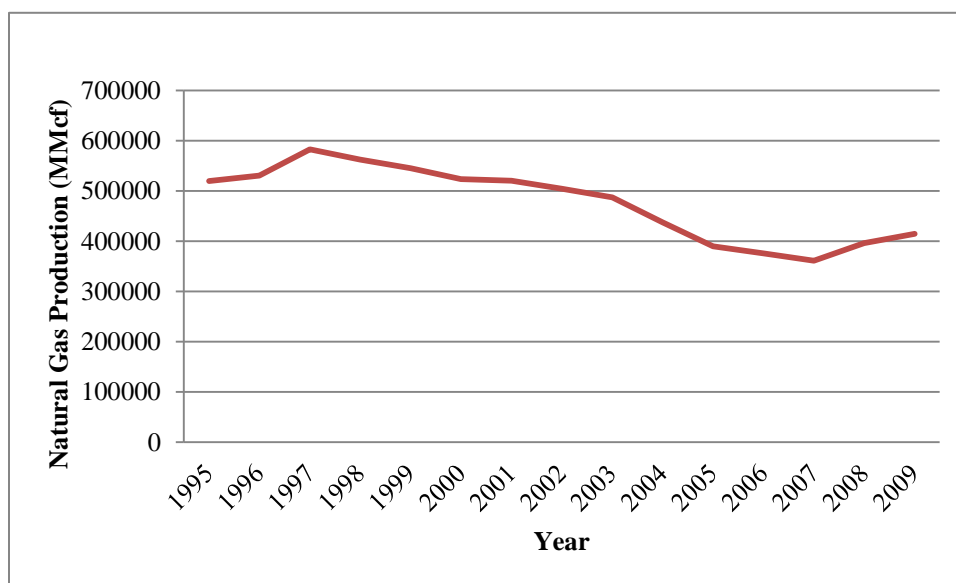
<sup>28</sup> West Virginia Code §22-6-26(c).

## Other Natural Gas Producing States

### Alabama

Alabama was ranked as the 9<sup>th</sup> largest natural gas producing state by 2009 production. Over the past 15 years, production of natural gas in the State peaked in 1997 and began a steady decline through 2007. Figure 3 provides an illustration for 15 years of production in Alabama.

**Figure 3 Alabama Natural Gas Production 1995-2009**



Energy Information Administration, State Energy Data System.

### *Real Property Tax*

Alabama does not levy a real property<sup>29</sup> tax against natural gas reserves within the State. The land where natural gas property is located is still appraised based on its current use. However, its value is not appreciable based on the prospect of natural gas production or exploration (McLaney 2011).

### *Personal Property Tax*

The State of Alabama assesses natural gas personal property at a rate of 20 percent of fair market value (Alabama Department of Revenue 2011). Market value<sup>30</sup> of personal property in Alabama is determined using procedures set forth in the Alabama Personal Property Appraisal Manual. The manual establishes that equipment and machinery used in the production of natural gas is given a five year economic life (Alabama Department of Revenue 2005). The book value of the drilling equipment is then depreciated yearly based on composite factors which are used to determine the fair market value over the course of its life (McLaney 2011).

<sup>29</sup> Code of Alabama §40-20-12.

<sup>30</sup> Alabama Administrative Code §810-41-.04.

Historical costs are typically multiplied by a trending factor which is useful in determining the replacement cost new of equipment and machinery. Trending factors incorporate price increases or decreases reflected as a percentage of the base year. Composite conversion factors are the product of a trending factor and the remaining economic life percentage of the personal property. Multiplying the historical cost, or book value, by the yearly conversion factors determines the market value of the personal property.

A personal property tax<sup>31</sup> of 6.5 mills per \$1,000 of assessed value is levied. Counties and cities may levy additional millage rates in addition to those imposed by the State. The average millage rate for localities is 43 mills, inclusive of the 6.5 mills imposed by Alabama (Alabama Department of Revenue 2011).

### *Severance Tax*

In Alabama there are two types of taxes which apply to gas production. The production tax is a 2 percent tax on the gross value of the gas at the point of production (SPEE 2011). The privilege tax is comprised of four rates based on natural gas production. These rates<sup>32</sup> are:

- 3.65 percent on the proceeds from offshore production from depths greater than 8,000 feet below mean sea level
- 4 percent on either onshore or offshore gas wells producing 200 thousand cubic feet (Mcf) or less per day
- 6 percent on offshore wells producing greater than 200 Mcf at depths less than 6,000 feet or onshore wells permitted on or after July 1984
- 8 percent on all other production not covered by other privilege tax provisions.

Some wells are eligible for a reduced privilege tax. Any well permitted between July 1, 1996 and July 1, 2002 will qualify for a 50 percent tax rate reduction for five years from first production so long as it is not a replacement well.

### *Corporation Income Tax*

The corporate income tax in Alabama is based on the corporation's net taxable income derived from business conducted within the State. A three factor formula is used in the calculation which includes property, payroll and double-weighted sales to total net income. The rate of the corporate income tax is 6.5 percent (Alabama Department of Revenue 2011).

### *Sales and Use Tax*

Alabama imposes a sales tax on the retail sale of all tangible personal property sold in the State. A sales tax of 4 percent is applied to sales of natural gas (Alabama Department of Revenue 2011). Natural gas sold for agricultural use is exempt<sup>33</sup> from the sales tax.

Alabama also imposes a use tax<sup>34</sup> of the same percentage on natural gas in the State. No exemptions<sup>35</sup> apply to this tax for natural gas.

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<sup>31</sup> Code of Alabama §40-8-2.

<sup>32</sup> Code of Alabama §40-20-2(a) and §40-20-21.

<sup>33</sup> Code of Alabama §40-23-4(a)(33).

*Permits, Bonds and Other Environmental Taxes or Fees*

Alabama requires natural gas producers to supply a permit fee<sup>36</sup> of \$300 and a bond<sup>37</sup> for each well dependent on the well depth:

- \$5,000 for a well 5,000 feet or less in depth
- \$10,000 for a well 5,001 feet to 10,000 feet in depth
- \$15,000 for a well 10,001 to 15,000 feet in depth
- \$30,000 for a well 15,001 to 20,000 feet in depth
- \$50,000 for a well 20,001 feet or more in depth.

In lieu of the above per-well bonds, a producer can submit a \$100,000 blanket bond which may apply to more than one well.

Funds generated from the gross production tax are used as a source of income for the Alabama Oil and Gas Board.<sup>38</sup> The Board is responsible for monitoring and enforcing various regulations<sup>39</sup> concerning oil and gas production in Alabama. This includes establishing and enforcing rules pertaining to proper drilling, casing and plugging of wells and prevention of pollution of fresh water supplies, among other activities. The income generated from the gross production tax is used to fund the administration of the Board and its activities related to oil and gas environmental conservation.

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<sup>34</sup> Code of Alabama §40-23-61.

<sup>35</sup> Code of Alabama §40-23-62.

<sup>36</sup> State Oil and Gas Board of Alabama Administrative Code §400-1-2-.01(2)(a).

<sup>37</sup> State Oil and Gas Board of Alabama Administrative Code §400-1-2-.03.

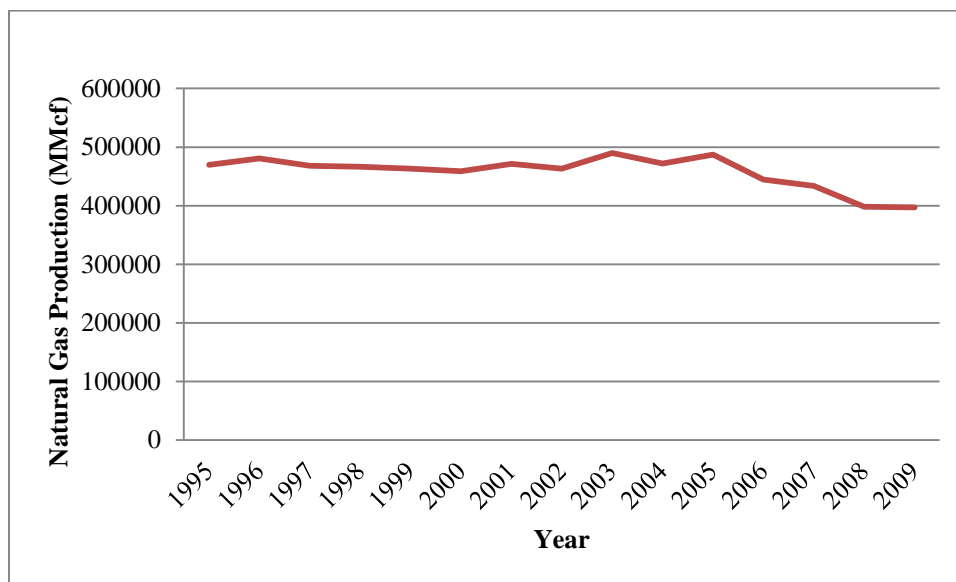
<sup>38</sup> Code of Alabama §9-17-25.

<sup>39</sup> Code of Alabama §9-17-6.

## Alaska

Alaska was ranked as the 10<sup>th</sup> largest natural gas producer by 2009 production. State production of natural gas has experienced little fluctuation since 1995 with a period of decline beginning in 2005. Alaska's natural gas production over a 15 year period is provided in Figure 4.

**Figure 4 Alaska Natural Gas Production 1995-2009**



Energy Information Administration, State Energy Data System.

### *Real Property Tax*

Alaska imposes a tax on active natural gas real property of 20 mills (or 2 percent) of taxable value (Dickinson and Wood 2009). The vast majority of producing gas property is not subject to the tax as it is owned by the state or native authority. Taxable value is determined by the State Property Tax Group based on 100 percent of fair market value, which is to be the estimated price in an open market between a willing buyer and seller.<sup>40</sup> While all three approaches (market, cost and income) may be used for gas property, the income approach is most frequently employed due to the lack of reliable<sup>41</sup> market data on sales. This approach is calculated considering the annual gross income less expenses.

The cost approach is used for real property associated with the production of gas. In using the income approach, the price and volume at the wellhead is determined with deductions of expenses in drilling, gathering, transporting and manufacturing as well as royalty payments. These vary with the maturity of the economic life of the reserves. All non-gas related property is taxed at the local level. Reserves<sup>42</sup> are not taxable in Alaska.

<sup>40</sup> Alaska Statute §43.56.060(c).

<sup>41</sup> There are less than 150 entities that are liable for the property tax on natural gas.

<sup>42</sup> Alaska Statute §43.58.

### *Personal Property Tax*

The Property Tax Group of Alaska is responsible for assessing all natural gas exploration, production and pipeline transportation property located in the State. The gas property tax rate<sup>43</sup> is also 20 mills (2 percent) of taxable value.

The taxation methodology varies depending on the type of gas property being assessed. Exploration property is examined through sales value and market conditions. Production property is assessed through replacement cost new, less depreciation based on the economic life of the reserves. Pipeline property taxation is calculated by the replacement cost new, less depreciation based on the economic life of the reserves. The income and sales values methods are also used when data is available (Alaska Oil and Gas Association 2011).

### *Severance Tax*

Rather than a severance tax, Alaska imposes a production tax on natural gas produced in the State. The current tax rate is 25 percent of the net value of gas. Net value is defined as the gross value at the point of production less the expenses of gathering transporting cleaning and manufacturing. Credit is given for local support of schools, state higher education institutions, charitable organizations, civic improvement organizations and other local entities.

The rate of tax is determined by the price of natural gas converted to BTU equivalent barrels of oil using the following schedule:

- If the producer's average monthly production tax value per BTU equivalent barrel is less than \$92.50, the tax rate equals 0.4 percent multiplied by the difference between the average monthly production tax value and \$30<sup>44</sup>
- If the producer's average monthly production tax value per BTU equivalent barrel is greater than \$92.50, the tax rate equals 0.1 percent multiplied by the difference between the average monthly production tax value and \$92.50.<sup>45</sup>

The production tax for gas produced in the Alaskan North Slope (above 68 degrees North latitude) is calculated differently based on the price of gas compared to the price of Alaska North Slope crude oil. The levy of this tax for gas produced north of 68 degrees North latitude cannot be less than:<sup>46</sup>

- 4 percent gross value at point of production when the average price per barrel of Alaska North Slope crude oil is more than \$25
- 3 percent gross value at point of production when the average price per barrel of Alaska North Slope crude oil is more than \$20 and less than \$25
- 2 percent gross value at point of production when the average price per barrel of Alaska North Slope crude oil is more than \$17.50 and less than \$25

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<sup>43</sup> Alaska Statute §43.56.010(a).

<sup>44</sup> Alaska Statute §43.55.011(g)(1).

<sup>45</sup> Alaska Statute §43.55.011(g)(2).

<sup>46</sup> Alaska Statute §43.55.011(f).

- 1 percent gross value at point of production when the average price per barrel of Alaska North Slope crude oil is more than \$15 and less than \$17.50
- 0 percent gross value at point of production when the average price per barrel of Alaska North Slope crude oil is less than \$15.

### *Corporation Income Tax*

All corporate entities in Alaska pay income taxes. However, the method of taxation for natural gas taxpayers is unique. For natural gas taxpayers, the world-wide income is subject to tax, not just water's edge (United States borders) income (Alaska Oil and Gas Association 2011). The formula for calculating this income tax is provided in Equation 2.

#### **Equation 2 Alaska Corporation Income Tax for Natural Gas Taxpayers**

$$\frac{\text{Alaska Property}}{\text{World - Wide Property}} + \frac{\text{Alaska Sales}}{\text{World - Wide Sales}} + \frac{\text{Alaska Production}}{\text{World - Wide Production}} \times \frac{1}{3}$$

The tax rates for the corporate income taxes are as follows (Alaska Oil and Gas Association 2011):

- 1 percent of the first \$10,000
- 2 percent on the second \$10,000
- 3 percent on the third \$10,000
- 4 percent on the fourth \$10,000
- 5 percent on the fifth \$10,000
- 6 percent on the sixth \$10,000
- 7 percent on the seventh \$10,000
- 8 percent on the eighth \$10,000
- 9 percent on the ninth \$10,000
- 9.4 percent on the amount above \$90,000.

### *Sales and Use Tax*

Alaska does not impose either sales or use taxes (Alaska Department of Revenue 2010).

### *Permits, Bonds and Other Environmental Taxes or Fees*

Alaska requires a \$100 permit fee<sup>47</sup> before natural gas producers can commence drilling. A bond<sup>48</sup> of at least \$100,000 per well or \$200,000 per blanket bond (to cover all of the operator's wells in Alaska) is also required. If the operator demonstrates that the cost of well abandonment will be less than \$100,000, the bond required for that well may be reduced. Alaska implements a conservation tax of \$0.004 per 50 Mcf of natural gas extracted (SPEE 2011).

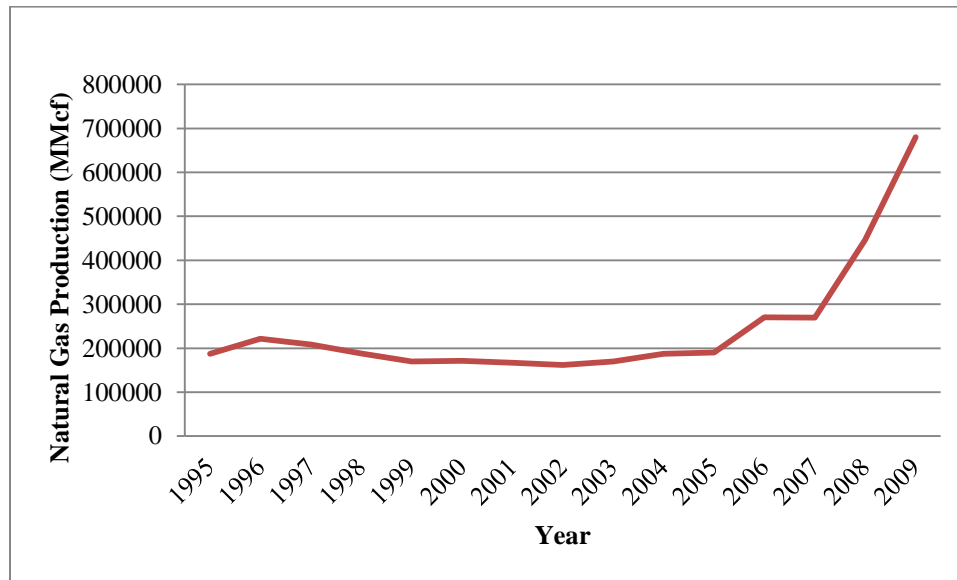
<sup>47</sup> Alaska Administrative Code §20-25.005(c)(1).

<sup>48</sup> Alaska Administrative Code §20-25.025(b).

## Arkansas

Arkansas was ranked as the 7<sup>th</sup> largest natural gas producing state as of 2009 production. Natural gas production remained relatively steady from 1995 to 2005 and then began increasing rapidly through 2009. A 15 year period of natural gas production in Arkansas is provided in Figure 5.

**Figure 5 Arkansas Natural Gas Production 1995-2009**



Energy Information Administration, State Energy Data System.

### *Real Property Tax*

In Arkansas, counties levy ad valorem taxes on natural gas real property (Dix 2009). These rates vary by county. However, the State government is involved in establishing the formulas and pricing guidelines by which the assessment of natural gas property is based. It is important to note that in cases where mineral rights are retained with surface rights, there is no separate property tax listing if there is no known and proven value of the reserves (Arkansas Assessment Coordination Department 2011).

The Assessment Coordination Department in Arkansas is responsible for establishing an annual price per Mcf of natural gas. This price is based on a three year average and is a key factor in determining the assessed value. For instance, by multiplying the annual price per Mcf by 365 days, the annual value per Mcf is determined. Once the annual value per Mcf is known, the working interest percentage of ownership, typically 87.5 percent, is applied. A 13 percent deduction in value is taken to account for production expenses and a 20 percent assessment is applied to arrive at the working interest assessed value. The following equation exemplifies how the assessed value is determined (Arkansas Assessment Coordination Department 2011):

#### **Equation 3 Working Interest Assessed Value per Mcf of Average Daily Production**

$$\text{Assessed Val.} = \text{Annual Val.} \times \text{Work. Int.} \times (1 - \text{Prod. Exp. Rate}) \times \text{Assessment Rate}$$

A similar process is used to calculate the assessed value for royalty interest owners. However, the royalty interest value is typically based on 12.5 percent ownership ratio and does not include a deduction for production expenses.

The annual production in Mcf per year divided by 365 results in the average daily production value for the relevant producing well. This value is multiplied by the working interest assessed value per Mcf average daily production to determine the total assessed value on the well.

The tax rates from the relevant jurisdictions are applied to the taxable assessed value in order to generate the property tax payment owed by the producer. Franklin and Crawford County are two counties with a history of natural gas production within the State. In 2009, Franklin County's overall rate was set at \$46.73 per \$1,000 assessed value. Crawford County's overall rate was set at \$48.09 per \$1,000 assessed value (Arkansas Assessment Coordination Department 2010).

### *Personal Property Tax*

Arkansas counties are responsible for determining the personal property assessment values for equipment and machinery used in natural gas extraction activities. However, a procedure has been established by the State to determine this value.

The Well Production Equipment (WPE) Assessed Value formula is only applicable to the working interest. The State mandates that a Well Production Equipment multiplier of \$1 per vertical foot of well depth<sup>49</sup> be used to calculate the assessed value of equipment used in production. The following equation exemplifies how the assessed value for personal property related to natural gas extraction is calculated (Arkansas Assessment Coordination Department 2011):

#### **Equation 4 Assessed Value Calculation of Well Production Equipment**

$$\text{Assessed Val.} = \text{WPE multiplier} \times \text{Vert. Well Depth} \times \text{Assessment Rate}$$

Once the assessed value of relevant equipment is determined, the property tax payment for personal property can be generated. In Arkansas, the property tax rates do not distinguish between real and personal property (Arkansas Assessment Coordination Department 2010). Therefore, the millage rates for Franklin and Crawford as mentioned above apply to the WPE assessed value as well.

### *Severance Tax*

Arkansas levies a severance tax on natural gas production as a percentage of the market value of gas sold. The market value<sup>50</sup> is defined as the actual cash receipts received by the producer from the sale less the costs for dehydrating, treating, compressing and delivering the gas realized by the producer. These rates<sup>51</sup> are:

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<sup>49</sup> It is noted that certain counties differ on whether the full depth of the well or the producing depth of the well is used in this determination. Generally this covers equipment from the sales meter to the bottom of the well.

<sup>50</sup> Arkansas Code §26-58-101(10).

<sup>51</sup> Arkansas Code §26-58-111(5).

- 1.5 percent of market value for new discover gas
- 1.5 percent of market value for high-cost gas
- 1.25 percent of market value for marginal gas
- 5 percent of market value for all natural gas which is not defined as new discovery or marginal gas
- 5 percent of market value for high-cost gas following the cost recovery period.

High-cost gas refers to natural gas which is produced from:

- Any gas well completed within a shale formation
- Any gas well in which the production is from a completion that is located at a depth of more than 12,500 feet below the surface of the earth
- A tight gas formation
- A geopressured brine
- Coal seams.

Marginal gas includes production from all zones and braches at a single well without regard to whether the production is separately metered.

A new discovery gas well is defined as any conventional gas well that is completed as a well capable of producing gas. New discovery gas means that natural gas is produced from a new discovery gas well and is eligible for the 24 month reduced severance tax rate.

#### *Corporation Income Tax*

Arkansas levies corporate income taxes at tiered rates. The Arkansas taxable income is derived using a three factor apportionment method involving (Arkansas Economic Development Commission 2010):

- Property owned by the corporation
- Payroll of the corporation
- Sales and receipts of the corporation.

It is important to note that the sales and receipts factor is double weighted. The corporate income tax rates are (Arkansas Economic Development Commission 2010):

- 1 percent of the first \$3,000
- 2 percent of the next \$3,000
- 3 percent of the next \$5,000
- 5 percent of the next \$14,000
- 6 percent of the next \$75,000
- 6.5 percent of income in excess of \$100,000.

This tax is structured so that if a corporation has an income of only \$10,000, the first \$3,000 would be taxed at 1 percent, the second would be taxed at 2 percent, and the remaining \$4,000 would be taxed at 3 percent. Similarly, if a corporation has an income of \$150,000, portions of

the income would be taxed at increasing rates and the final \$50,000 would be taxed at 6.5 percent.

### *Sales and Use Tax*

The Arkansas sales tax is 6 percent of the gross receipts from the sales of tangible personal property and certain selected services, including sales of natural gas (Arkansas Economic Development Commission 2010). In addition to Arkansas' state sales and use tax, each city or county may levy a local sales and use tax. Local taxes are capped at \$25 for each 1 percent of tax assessed per single transaction. A single transaction is determined by each local taxing jurisdiction.

### *Permits, Bonds and Other Environmental Taxes or Fees*

Arkansas requires a \$300 permit fee<sup>52</sup> to apply for a permit to drill, deepen or re-enter a plugged natural gas well. A financial assurance surety bond<sup>53</sup> is also required of the operators. The amount ranges from \$3,000 to \$50,000 and is dependent on several factors. A blanket financial assurance surety bond<sup>54</sup> may be posted dependent on the number of wells:

- \$25,000 for up to 25 wells
- \$50,000 for 26 to 100 wells
- \$100,000 for 101 or more wells.

The Arkansas Oil and Gas Commission reserves the right to assess a charge<sup>55</sup> of no more than 10 mills against each Mcf of natural gas produced and saved from a gas well. The funds collected from such charges are to be used solely to pay the expenses and other costs associated with the administration of the Commission and its activities.

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<sup>52</sup> Arkansas General Rules and Regulations Rule B-1(b)(5).

<sup>53</sup> Arkansas General Rules and Regulations Rule B-2(d)(1).

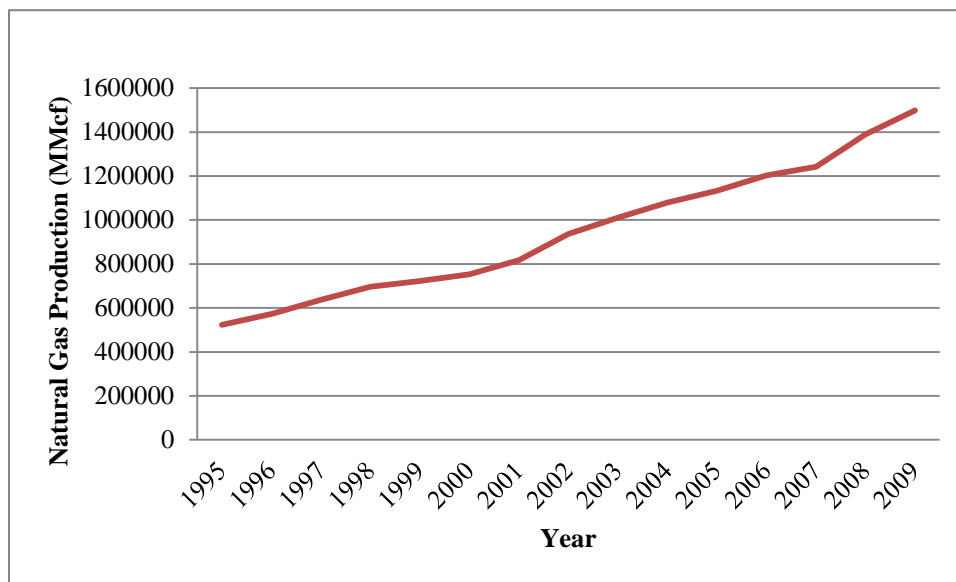
<sup>54</sup> Arkansas General Rules and Regulations Rule B-2(f)(4).

<sup>55</sup> Arkansas Code §15-71-107.

## Colorado

Colorado was ranked as the 5<sup>th</sup> largest natural gas producing state by 2009 production. During a 15 year period from 1995 to present, Colorado has experienced a steady increase in natural gas production in the State. This trend is represented by Figure 6.

**Figure 6 Colorado Natural Gas Production 1995-2009**



Energy Information Administration, State Energy Data System.

### *Real Property Tax*

Colorado values natural gas real property for assessment at 87.5 percent of the gross value of natural gas during the previous calendar year.<sup>56</sup> The gross value is determined by production at the well head less expenses including extraction, transportation and preparation to point of sale. Natural gas real property used for secondary and tertiary recovery is assessed at 75 percent of gross value (Colorado Division of Property Taxation 2010). This assessment value is then subject to local mill levy rates. In 2010, the average mill levy rate for Colorado counties was 73.218 mills (Colorado Division of Property Taxation 2011).

### *Personal Property Tax*

Personal property, including machinery and equipment used to produce natural gas, is assessed at 29 percent of actual value (Colorado Oil and Gas Association 2011). The value is determined by deducting depreciation and obsolesces. As with real property, this value is then subject to local mill levy rates.

### *Severance Tax*

In Colorado, natural gas is the largest contributor to severance tax collections. There are four provisions that affect a natural gas operator's severance tax liability. The first provision is a

<sup>56</sup> Colorado Revised Statutes §39-7-102.

graduated severance tax rate between 2 and 5 percent, depending on the gross annual income for natural gas. The following illustrates that graduated tax rate (Colorado Legislative Council Staff 2010):

- 2 percent for gross income under \$25,000
- 3 percent for gross income greater than \$25,000 and less than \$100,000
- 4 percent for gross income greater than \$100,000 and less than \$300,000
- 5 percent for gross income in excess of \$300,000.

The second provision allows operators to deduct 87.5 percent of the real property taxes paid on the value of production during the previous years from their severance tax liability.

The third provision discusses “stripper wells” which are natural gas wells that produce 90 Mcf or less per day. Production from stripper wells is exempt<sup>57</sup> from Colorado’s severance tax.

The final provision allows operators to deduct transportation, processing and manufacturing expenses from their gross income when determining their severance tax liability (Colorado Legislative Council Staff 2010).

#### *Corporation Income Tax*

Colorado’s corporate income tax rate is 4.63 percent (Colorado Oil and Gas Association 2011). For tax years beginning on or after January 1, 2009, Colorado determines the corporation income tax using a single factor apportionment method (Colorado Department of Revenue 2009). The single factor used is the sales factor.

#### *Sales and Use Tax*

Colorado levies a sales tax on the sale of natural gas dependent on the date of the transaction. Sales of natural gas which occurred before March 1, 2010 or will occur after June 30, 2012 and were used for commercial consumption are subject to the sales tax (State of Colorado 2010). However, natural gas sold during these time frames for the following uses are exempt from the tax:

- Processing
- Manufacturing
- Mining
- Refining
- Irrigation
- Construction
- Telegraph, telephone and radio communication
- Street and railroad transportation services
- All industrial uses.<sup>58</sup>

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<sup>57</sup> Colorado Revised Statutes §39-29-105(1)(b).

<sup>58</sup> Colorado Revised Statutes §39-26-102(21).

For the time period between March 1, 2010 and June 30, 2012, the nine exempt uses listed above are eligible for taxation except for natural gas sold for use in (State of Colorado 2010):

- Agriculture
- Electricity generation
- Railroads.

Regardless of the date of sale, natural gas sold solely for residential use, storage or consumption is exempt from this tax. The sales tax rate in Colorado is 2.9 percent. Local governments may impose an additional sales tax.

*Permits, Bonds and Other Environmental Taxes or Fees*

Colorado requires a permit fee<sup>59</sup> of at most \$200 before natural gas producers can begin drilling a well in the State. Before permission to drill is granted, natural gas operators must also submit at least one proof of financial assurance.<sup>60</sup> While a bond of an unspecified amount is one of the available options, it is not specifically required for drilling.

Colorado imposes an environmental tax<sup>61</sup> of 1.7 mills per \$1 of the market value of natural gas at the well head, whether the gas was produced, saved, sold and/or transported from the field where produced. Monies generated from this tax fund the Colorado Oil and Gas Conservation Fund.

In addition to this tax, a portion of the severance tax may provide additional monies to this fund. Of severance taxes collected, 96 percent funds State funds, such as the Conservation Fund, while the remaining 4 percent is distributed to the local jurisdictions where the natural gas was produced.

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<sup>59</sup> Colorado Revised Statutes §34-60-106(1)(f).

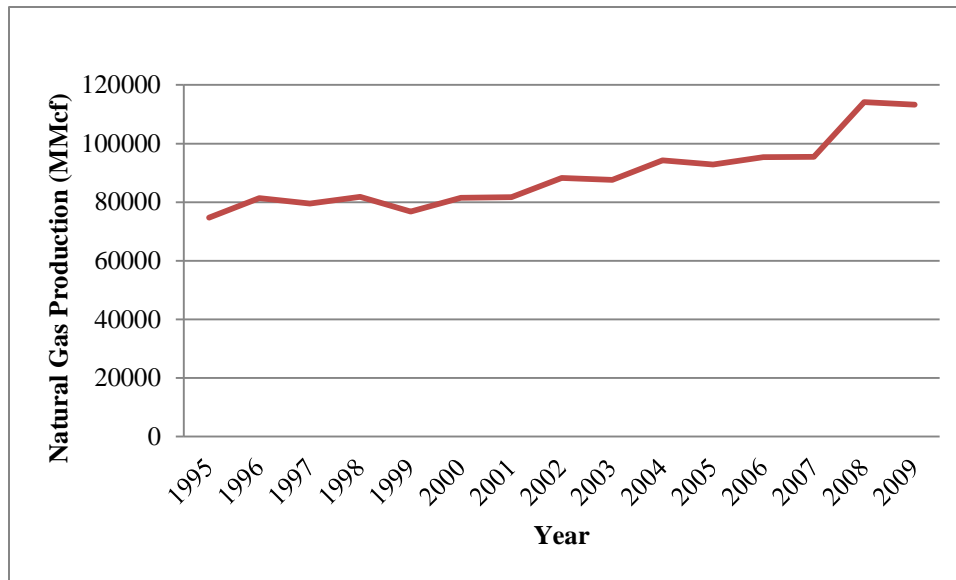
<sup>60</sup> Colorado Revised Statutes §34-60-106(13)(c).

<sup>61</sup> Colorado Revised Statutes §34-60-122(1)(a).

## Kentucky

Kentucky was ranked as the 17<sup>th</sup> largest natural gas producer by 2009 production. While natural gas production in the State has increased since 1995, it has also experienced fluctuation from year to year. A 15 year representation of Kentucky natural gas production is provided in Figure 7.

**Figure 7 Kentucky Natural Gas Production 1995-2009**



Energy Information Administration, State Energy Data System.

### *Real Property Tax*

Kentucky uses the Gas Assessment Guidelines to value natural gas producing property in the State. This valuation is calculated using four factors and is illustrated in Equation 5 (Kentucky Department of Revenue 2011).

#### **Equation 5 Kentucky Gas Assessment Calculation**

$$\text{Assessment Value} = \text{Total \$ Value} \times \text{Int. Ownership} \times \text{Dept. Factor} \times \text{Allow. Credit}$$

The **total dollar value** factor is the total dollar value (less severance tax) of production for the lease or well. The production value considered is for the year prior to the January 1<sup>st</sup> assessment date.

The **interest ownership** factor is a decimal representation of ownership of the lease or well. If the owner only owns the working interest in the lease or well, the interest ownership is 0.875. If the owner owns both the working and royalty interests then the interest ownership is 1. In such an instance, two assessment values are calculated using the appropriate departmental gas property assessment factor (described below) for each interest ownership factor and summed.

The **departmental gas property assessment** factor depends on the total dollar value (less severance tax) of production. If the value is \$6,500 or less the working interest factor is 1.68 and the royalty and overriding interest factor is 2.35. If the value exceeds \$6,500 the working interest factor is 3.08 and the royalty and overriding interest factor is 4.34.

The **allowance credit** factor is 0.33 for the first year of gas production, 0.67 for the second year of gas production and 1 for all other years of gas production.

Once the assessment value is determined, the real property tax rate of \$0.122 per \$100 of assessed value for natural gas is applied (Office of Property Valuation 2010). Natural gas reserves in Kentucky are not taxed (Hall 2011).

### *Personal Property Tax*

Kentucky does not impose a tax on natural gas personal property (Hall 2011).

### *Severance Tax*

Kentucky imposes a severance tax<sup>62</sup> at a rate of 4.5 percent of the gross value of natural gas at the point of extraction.

### *Corporation Income Tax*

Kentucky imposes a progressive corporate income tax<sup>63</sup> using three tax rates dependent on the corporation's taxable income. These tax rates are:

- 4 percent on the first \$50,000 of taxable income
- 5 percent on the second \$50,000 of taxable income
- 6 percent on all taxable income in excess of \$100,000.

### *Sales and Use Tax*

Kentucky imposes a 6 percent sales tax<sup>64</sup> on the gross receipt of goods and services including the distribution, transmission and transportation expenses for natural gas. Natural gas classified for residential use and sellers or resellers of natural gas are exempt<sup>65</sup> from this tax.

### *Permits, Bonds and Other Environmental Taxes or Fees*

Kentucky requires a \$300 permit fee<sup>66</sup> for permits to drill, deepen or reopen natural gas wells. A bond<sup>67</sup> is also required for each well dependent on depth:

- \$500 for wells 500 feet or less in depth
- \$1,000 for wells 501 feet to 1,000 feet in depth
- \$1,500 for wells 1,001 feet to 1,500 feet in depth

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<sup>62</sup> Kentucky Revised Statutes §143A.020.

<sup>63</sup> Kentucky Revised Statutes §141.040(6).

<sup>64</sup> Kentucky Revised Statutes §139.200(2)(f).

<sup>65</sup> *Ibid.*

<sup>66</sup> Kentucky Revised Statutes §353.590(2).

<sup>67</sup> Kentucky Revised Statutes §353.590(5).

- \$2,000 for wells 1,500 feet to 2,000 feet in depth
- \$2,500 for wells 2,001 feet to 2,500 feet in depth
- \$3,000 for wells 2,501 feet to 3,000 feet in depth
- \$3,500 for wells 3,001 feet to 3,500 feet in depth
- \$4,000 for wells 3,501 feet to 4,000 feet in depth
- \$5,000 for wells 4,001 feet or more in depth.

For wells deeper than 4,000 feet, a bond in excess of \$5,000 may be required if “the particular circumstances of the drilling of the well warrant an increase in the bond amount” provided above.<sup>68</sup> Operators also have the option of posting a blanket bond rather than a per-well bond. The blanket bonds available are dependent on the type of well operator.

A qualified well operator may post a blanket bond<sup>69</sup> equal to:

- \$10,000 for up to 25 wells
- \$25,000 for 26 to 100 wells
- \$50,000 for 101 to 500 wells
- \$100,000 for 501 or more wells.

A nonqualified well operator may post a blanket bond<sup>70</sup> equal to:

- \$50,000 for up to 100 wells
- \$100,000 for 101 or more wells.

To be classified<sup>71</sup> as a qualified well operator, the operator must:

- Have had a blanket bond in place prior to July 15, 2006 and have no outstanding, unabated violations
- Have demonstrated a record of compliance with statutes and administrative regulations of the division for 3 years, or
- Provide proof of financial ability to plug and abandon wells covered by the blanket bond.

As with most other bonds, the bonds imposed by Kentucky will cover the plugging and reclamation of the well site if the well is forfeited. The Commonwealth of Kentucky does not impose any other environmental taxes or fees on the production of natural gas (Hall 2011).

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<sup>68</sup> Kentucky Revised Statutes §353.590(6).

<sup>69</sup> Kentucky Revised Statutes §353.590(9).

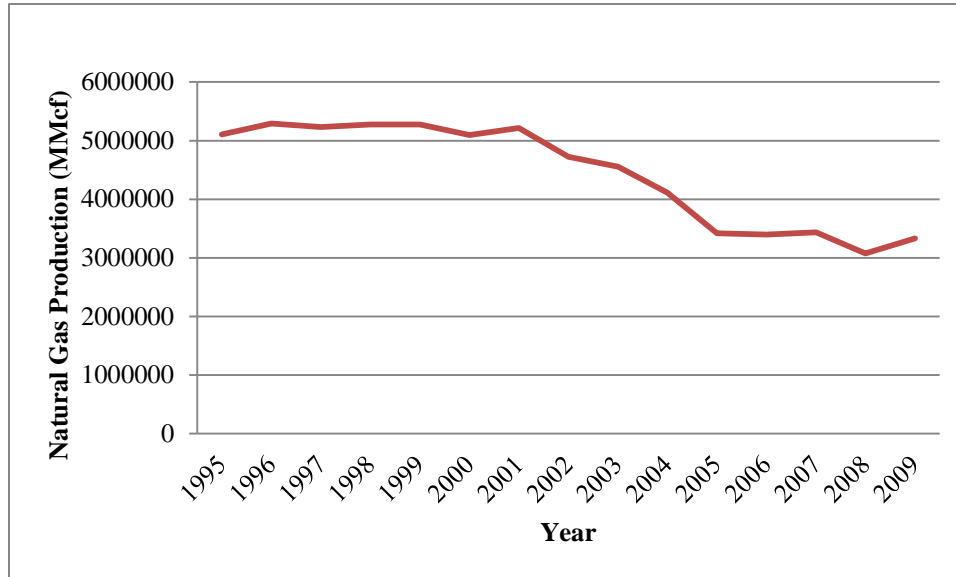
<sup>70</sup> *Ibid.*

<sup>71</sup> Kentucky Revised Statutes §353.590(10).

## Louisiana

Louisiana was ranked the 2<sup>nd</sup> largest natural gas producing state by 2009 production. From 1995 to 2001, Louisiana natural gas production remained relatively stable. Since that time, production has decreased dramatically reaching a low of 3.07 Tcf in 2008 during that 15 year period. A slight increase in production was realized in 2009. Natural gas production figures for Louisiana are provided in Figure 8.

**Figure 8 Louisiana Natural Gas Production 1995-2009**



Energy Information Administration, State Energy Data System.

### *Real Property Tax*

Louisiana does not impose a real property tax<sup>72</sup> at the state level but does provide guidelines for the local parishes to follow. Per state guidelines, natural gas real property is appraised using fair market value considering the income, sales and cost approaches (Comeaux n.d.). To appraise natural gas wells in Louisiana, the location of the well, by parish, is determined as either Region 1 or Region 2.<sup>73</sup> Natural gas reserves in Louisiana are not subject to real property taxes (LOGA 2008).

The year of completion of the well is also used to determine the percent good factor.<sup>74</sup> This factor reduces the valuation dependent on the age of the well over a 17 year period. For example, a well completed in 2010 would have a percent good factor of 96 percent while a well completed in 2000 would have a percent good factor of 46 percent.

Adjustments to the value are also made for economic obsolescence. Any wells which produce 100 Mcf or less of gas per day are reduced by 40 percent. After this reduction, any wells which

<sup>72</sup> Louisiana Administrative Code §61-V-901.

<sup>73</sup> A Region 3 classification is used for offshore wells.

<sup>74</sup> Louisiana Administrative Code §61-V-907.

produce 10 Mcf or less of gas per day are reduced by an additional 60 percent. Inactive (shut-in) wells are reduced by 90 percent.

Once the fair market value is determined, natural gas real property is assessed at 15 percent of value and then subject to the millage rate of the parish where it is located. Red River Parish and Caddo Parish are two of the largest natural gas producing localities in Louisiana. The 2011 millage rate for Red River Parish is 116.45 mills (Womack 2011). This parish also levies an additional fee of \$0.60 per mile to fund the Red River Levee.

The property tax in Caddo Parish is dependent on the municipality where the property is located (Lewis 2011). A rate of 133.82 mills is levied in the municipalities of Shreveport, Vivian and Bossier and a rate of 136.94 mills is levied in the municipalities of Rodessa, Morringport, Oil City, Blanchard and Greenwood. Both Red River and Caddo Parishes are located in Region 1 for the location classification.

#### *Personal Property Tax*

Louisiana does not impose a personal property tax<sup>75</sup> at the state level. Instead, personal property is taxed at the local level. The Red River Parish and Caddo Parish value natural gas personal property using the cost approach (Comeaux n.d.). The same assessment and millage rates used for real property are then applied.

#### *Severance Tax*

Louisiana imposes a 1 percent severance tax<sup>76</sup> on the value of gross receipts of natural gas production.

#### *Corporation Income Tax*

Louisiana imposes a progressive corporate income tax<sup>77</sup> using five tax rates dependent on the corporation's taxable income. These tax rates are:

- 4 percent on the first \$25,000 of taxable income
- 5 percent on the second \$25,000 of taxable income
- 6 percent on the next \$50,000 of taxable income
- 7 percent on the next \$100,000 of taxable income
- 8 percent on all taxable income in excess of \$200,000.

#### *Sales and Use Tax*

Louisiana levies a 2 percent sales tax<sup>78</sup> on natural gas sold in the State with the exception<sup>79</sup> of natural gas sold directly to farmers for use with farm products.

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<sup>75</sup> Louisiana Administrative Code §61-V-901.

<sup>76</sup> Louisiana Administrative Code §61-I-2903.

<sup>77</sup> Louisiana Revised Statutes §47-32(C).

<sup>78</sup> Louisiana Administrative Code §61-4303(A)(1).

<sup>79</sup> Louisiana Administrative Code §61-4401(D).

*Permits, Bonds and Other Environmental Taxes or Fees*

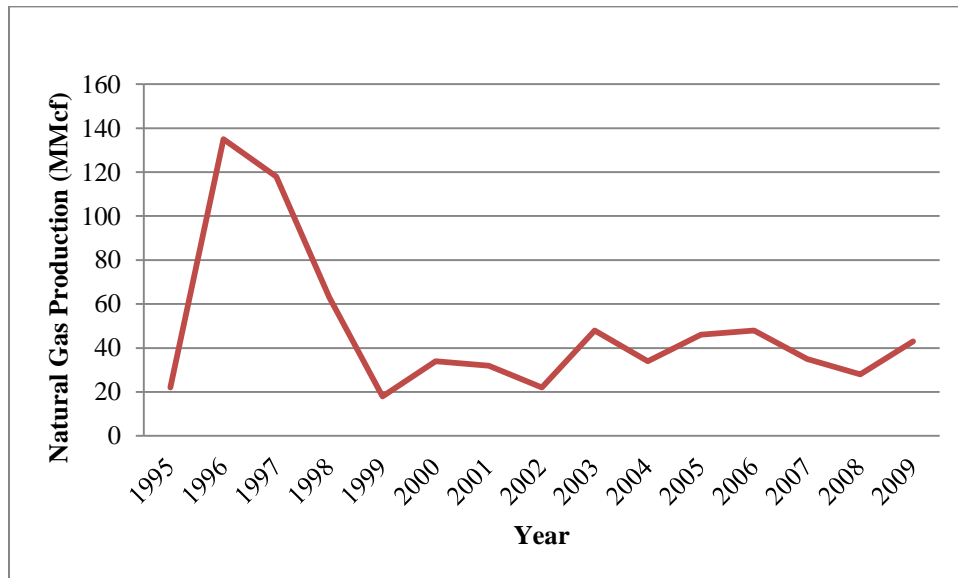
Louisiana requires a filing fee<sup>80</sup> of \$100 for submitted natural gas drilling applications. However, a separate permit fee or bond is not specified.

Louisiana imposes an oilfield site restoration fee<sup>81</sup> at a rate of \$0.003 per Mcf of natural gas. With regard to stripper and incapable wells, this fee is augmented to reflect the proportion of the reduced severance tax rate (dependent on well type) to the respective full rate production fees.

**Maryland**

Maryland was ranked as the 31<sup>st</sup> largest natural gas producing state by 2009 production. In the 15 year period spanning from 1995 to 2009, Maryland natural gas production fluctuated dramatically. A sharp production increase (to 135 MMcf from 22 MMcf) in 1996 was the largest annual production in the State during this time frame. Figure 9 provides Maryland natural gas production figures during this 15 year period.

**Figure 9 Maryland Natural Gas Production 1995-2009**



Energy Information Administration, State Energy Data System.

Marcellus Shale reserves are located in a portion of western Maryland. Governor Martin O’Malley implemented a Marcellus Shale Safe Drilling Initiative earlier this year requiring a study on the potential impacts to public health, safety, the environment and natural resources of drilling Marcellus Shale in the State, and whether allowing production in the State would be beneficial (O’Malley 2011). The Initiative requires an initial report by August 1, 2012 and a final report two years later.

<sup>80</sup> Louisiana Administrative Code §43-105(F).

<sup>81</sup> Louisiana Revised Statutes §30-87.

### *Real Property Tax*

The State of Maryland is responsible for the valuation of real property and the local governments are responsible for levying the tax (Sikorski 2011). However, natural gas real property is not valued and therefore not taxed in the State.

### *Personal Property Tax*

As with real property, natural gas personal property is not valued or taxed in the State of Maryland (Sikorski 2011).

### *Severance Tax*

While Maryland does not currently impose a severance tax on the production of natural gas, recommendations in favor of severance tax legislation are planned for presentation by December 31, 2011 (Maryland Department of the Environment 2011).

### *Corporation Income Tax*

Maryland imposes a corporate income tax of 8.25 percent on a corporation's Maryland taxable income (Comptroller of Maryland 2011).

### *Sales and Use Tax*

The State of Maryland levies a 6 percent sales and use tax on natural gas sold in the State (Comptroller of Maryland 2011). Natural gas sold for residential purposes is exempt<sup>82</sup> from this tax.

### *Permits, Bonds and Other Environmental Taxes or Fees*

The State of Maryland requires a permit before the drilling of natural gas can occur. However, a permit fee<sup>83</sup> is not included in the application process. Along with the required permit application, Maryland requires natural gas operators to submit either a bond<sup>84</sup> not to exceed \$100,000 for each natural gas well or a blanket bond not to exceed \$500,000 for all of an applicant's natural gas wells. Applicants are also required to submit the following environmental plans:

- A sediment and erosion control plan
- A stormwater management plan
- A reclamation plan for restoring the well site
- A pit design plan (this plan will prevent any drilling liquid from coming into contact with any waters in Maryland)
- A spill prevention, control and countermeasures plan.

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<sup>82</sup> Annotated Code of Maryland §03.06.01.10.

<sup>83</sup> Annotated Code of Maryland §26.19.01.06.

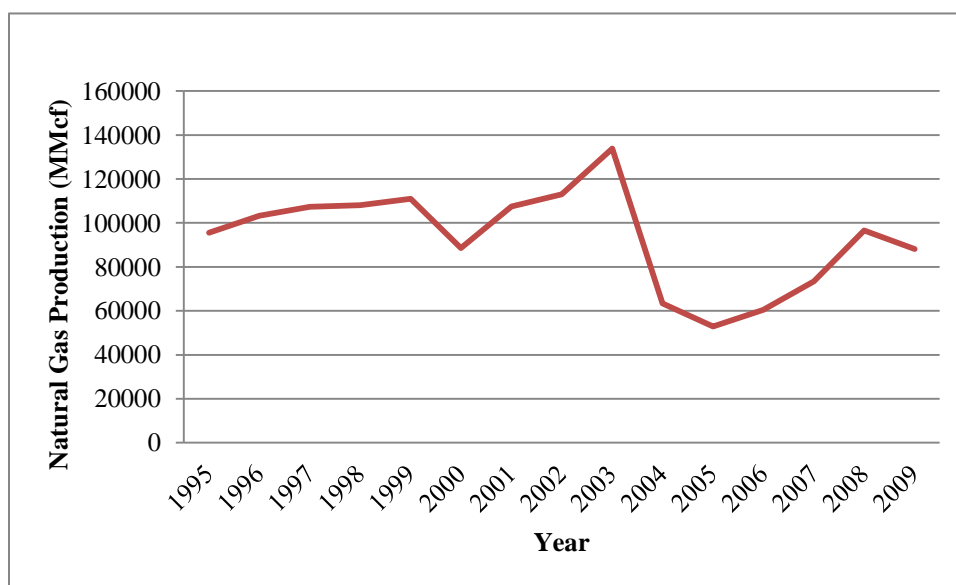
<sup>84</sup> Annotated Code of Maryland §26.19.01.06(C)(5)(a).

Operators are additionally tasked with notifying “owners or leaseholders of property within 2,000 feet of a well proposed in an underground storage reservoir that existed on July 1, 1990” of plans to drill.<sup>85</sup>

## Mississippi

Mississippi was ranked as the 20<sup>th</sup> largest natural gas producing state by 2009 production. The State has experienced considerable variation in its natural gas production in recent years. Production peaked in 2003 at nearly 134 Bcf and decreased sharply to nearly 53 Bcf two years later. A graphical representation of the previous 15 years of production data is provided in Figure 10.

**Figure 10 Mississippi Natural Gas Production 1995-2009**



Energy Information Administration, State Energy Data System.

### *Real Property Tax*

The State of Mississippi gives local governments the jurisdiction to tax natural gas real property but provides guidelines for the counties to follow. State Code requires natural gas real property to be appraised at fair market value (also referred to as true value) considering all three valuation approaches and sets the assessment rate for this property type at 15 percent of value. State Code also exempts<sup>86</sup> natural gas reserves from property taxation.

To determine the real property tax imposed on natural gas, two of the largest natural gas producing counties, Forrest and Covington, were contacted. In Forrest County, natural gas real property is assessed at 15 percent of fair market value, determined using comparable sales approach to value, and then subject to the local millage rate (Templeton 2011). The rate for 2010 was 143 mills.

<sup>85</sup> Annotated Code of Maryland §26.19.01.06(C)(10).

<sup>86</sup> Mississippi Code Annotated §27-25-721.

In Covington County, natural gas real property is assessed at 15 percent of true value (Covington County 2007). True value, similar to market value, is determined considering three approaches<sup>87</sup> to value:

- Income capitalization approach
- Cost approach
- Market data approach.

A tax rate of 69.5 mills is applied to this assessment.

#### *Personal Property Tax*

The State of Mississippi also gives local governments the jurisdiction to tax natural gas personal property. Similar to the real property tax, personal property related to natural gas production is assessed at 15 percent of fair market value, determined using the cost approach to value, and then subject to the county's mill rate of 143 mills in Forrest County (Templeton 2011). Personal property related to natural gas production in Covington County is assessed at a rate of 15 percent of true value, determined considering three approaches to value, and then taxed at a rate of 69.5 mills (Covington County 2007).

#### *Severance Tax*

Mississippi imposes a severance tax<sup>88</sup> of \$4.50 per Mcf of natural gas produced (Mississippi State Tax Commission 2009).

#### *Corporation Income Tax*

Mississippi imposes a progressive corporation income tax using three tax rates dependent on the corporation's taxable income (Mississippi Department of Revenue 2011). These tax rates are:

- 3 percent on the first \$5,000 of taxable income
- 4 percent on the second \$5,000 of taxable income
- 5 percent on all taxable income in excess of \$10,000.

Mississippi also imposes a franchise tax which is levied at \$2.50 per \$1,000 of employed capital, with a minimum tax of \$25.

#### *Sales and Use Tax*

Mississippi imposes a sales tax<sup>89</sup> for natural gas sold. A tax of 1.5 percent is levied if the natural gas is sold for industrial use and 7 percent if the natural gas is sold for commercial use. Natural gas sold for residential use is exempt.

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<sup>87</sup> Mississippi Code Annotated §27-35-50(2).

<sup>88</sup> Mississippi Administrative Code §35.VIII.2.01.

<sup>89</sup> Mississippi Code Annotated §27-65-19.

*Permits, Bonds and Other Environmental Taxes or Fees*

Mississippi levies drilling, permit and ownership transfer fees to fund the Oil and Gas Conservation Fund. The permit fee is \$600 and the ownership transfer fee is \$100.<sup>90</sup> An Emergency Plugging Fund also exists and is funded by a \$100 annual tax on each non-plugged natural gas well (MSOGB 2009). Proof of financial responsibility<sup>91</sup> in lieu of a formal bond is also required. This requirement is dependent on the well depth:

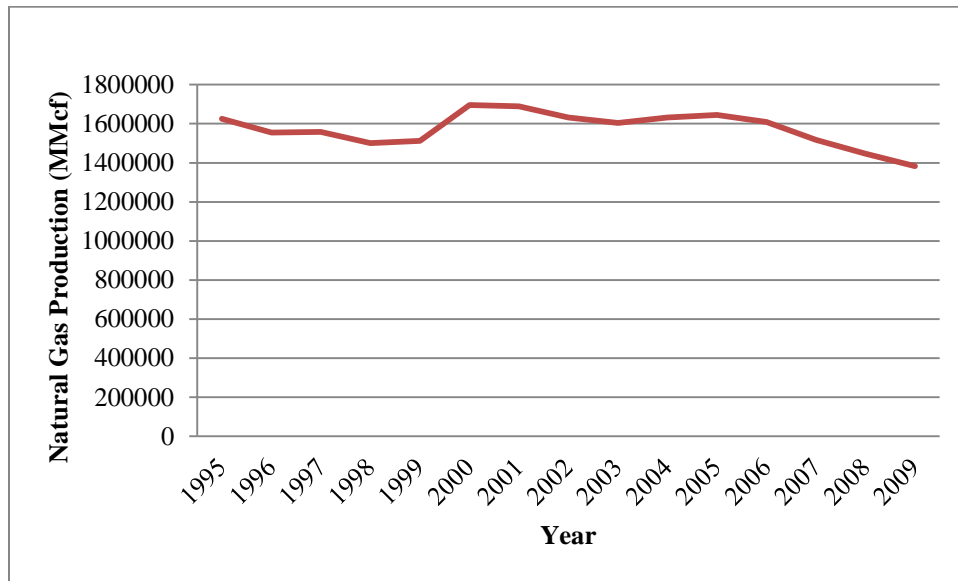
- \$20,000 for wells up to 10,000 feet in depth
- \$30,000 for wells 10,001 feet to 16,000 feet in depth
- \$60,000 for wells 16,001 feet in depth or greater.

A blanket financial responsibility of \$100,000 may be paid in lieu of per-well payments.

**New Mexico**

New Mexico was ranked as the 6<sup>th</sup> largest natural gas producing state by 2009 production. Natural gas production in the State has remained relatively stable in recent years, beginning a period of decline in the early 2000s. A 15 year production history is provided in Figure 11.

**Figure 11 New Mexico Natural Gas Production 1995-2009**



Energy Information Administration, State Energy Data System.

<sup>90</sup> Mississippi Code Annotated §53-3-13.

<sup>91</sup> Mississippi Rules and Regulations Rule 4(c)(2).

### *Real Property Tax*

New Mexico taxes natural gas real property<sup>92</sup> at a set rate of \$20 per \$1,000 of market value determined by either sales of comparable property, income or cost methods.<sup>93</sup> These rates are allocated as follows:

- \$11.85 per \$1,000 value to be allocated to the county
- \$0.50 per \$1,000 value to be allocated to the school district
- \$7.65 per \$1,000 value to be allocated to the municipality.

### *Personal Property Tax*

Natural gas personal property<sup>94</sup> in New Mexico is taxed at the same rate as real property per \$1,000 of taxable value. The taxable value<sup>95</sup> of natural gas producing equipment is 27 percent of the value of products produced.<sup>96</sup>

### *Severance Tax*

New Mexico levies a severance tax<sup>97</sup> on the privilege of producing natural gas at a rate of 3.75 percent of the taxable value. Taxable value<sup>98</sup> is determined as the value of the natural gas excluding:

- Royalties paid or due to the United States or the State of New Mexico
- Royalties paid or due to any Indian tribe, Indian pueblo or Indian who is a ward of the United States
- The “reasonable expense” of transporting the natural gas from the production site to the first place of market.

### *Corporation Income Tax*

New Mexico imposes a progressive corporation income tax<sup>99</sup> using three tax rates dependent on a corporation’s taxable income. These rates are:

- 4.8 percent on the first \$500,000 of taxable income
- 6.4 percent on the second \$500,000 of taxable income
- 7.6 percent on all taxable income in excess of \$1,000,000.

The corporation income tax is calculated using a three factor formula of property, payroll and sales (Tax Information and Policy Office 2009). As with West Virginia, the sales factor is double weighted.

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<sup>92</sup> New Mexico Statutes Annotated §7-37-7(B).

<sup>93</sup> New Mexico Statutes Annotated §7-36-15(B).

<sup>94</sup> New Mexico Statutes Annotated §7-34-4.

<sup>95</sup> New Mexico Statutes Annotated §7-34-3(B).

<sup>96</sup> New Mexico Statutes Annotated §7-36-23.

<sup>97</sup> New Mexico Statutes Annotated §7-29-4(1).

<sup>98</sup> New Mexico Statutes Annotated §7-29-4.1.

<sup>99</sup> New Mexico Statutes Annotated §7-2A-5.

### *Sales and Use Tax*

New Mexico levies a gross receipts tax, rather than a sales tax, on the sale of goods and services in the State.<sup>100</sup> The rate of the tax varies between 5.125 percent and 8.6875 percent of gross receipts dependent on the location of the business (New Mexico Taxation and Revenue Department 2011). Natural gas sold for resale or for consumption out of state is exempt<sup>101</sup> from this tax.

### *Permits, Bonds and Other Environmental Taxes or Fees*

New Mexico requires financial assurance<sup>102</sup> on each well dependent on the well's depth and location. For eight<sup>103</sup> counties, the bond amount is \$5,000 plus \$1 per foot of projected well depth. For all other counties the bond is \$10,000 plus \$1 per foot of projected well depth. A blanket financial assurance bond is also available in the amount of \$50,000. While a permit<sup>104</sup> is required for drilling a natural gas well, no permit fee amount is provided.

New Mexico also levies an oil and gas conservation tax<sup>105</sup> on the production of natural gas in the State. This tax is imposed at a rate of 0.19 percent of taxable value of products sold.

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<sup>100</sup> New Mexico Statutes Annotated §7-9-3.5.

<sup>101</sup> New Mexico Administrative Code §3.2.121.9(A).

<sup>102</sup> New Mexico Administrative Code §19.15.8.9(D)(2).

<sup>103</sup> The eight counties are Chaves, Eddy, Lea, McKinley, Rio Arriba, Roosevelt, Sandoval and San Juan.

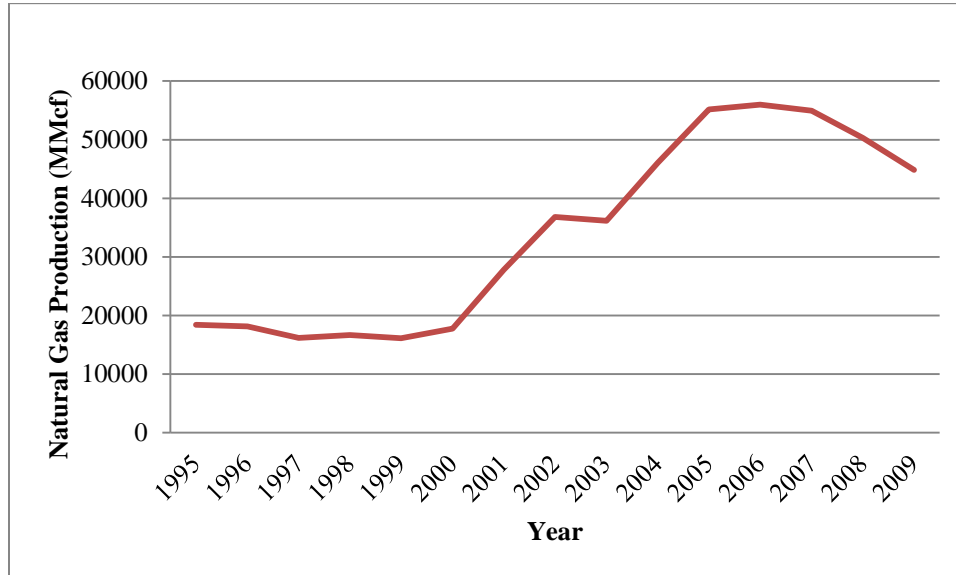
<sup>104</sup> New Mexico Administrative Code §19.15.14.

<sup>105</sup> New Mexico Statutes Annotated §7-30-4(A).

## New York

New York was ranked as the 22<sup>nd</sup> largest natural gas producing state by 2009 production. Natural gas production in the State experienced a rapid increase in 2000 before beginning to slow and decrease in 2007, although 2009 production remained substantially greater than annual production in the late 1990s. A graphical representation of this trend over a 15 year period is provided in Figure 12.

**Figure 12 New York Natural Gas Production 1995-2009**



Energy Information Administration, State Energy Data System.

Much of southern New York State holds Marcellus Shale deposits. But due to increasing environmental concerns and regulatory issues, production of this formation for its natural gas reserves has been greatly decreased. New York does not impose a Marcellus Shale-specific tax.

### *Real Property Tax*

New York does not levy a real property tax<sup>106</sup> on a statewide level. Real property taxes are handled on a municipal basis through collection by counties, cities, towns, villages, school districts and other special districts which use the revenues to fund local services (New York Department of Taxation and Finance 2010).

The assessment of natural gas property is unique in New York. Natural gas real property is grouped into economic units which include gas reserves, as well as all equipment and fixtures<sup>107</sup> necessary to extract and collect the gas available for commercial sale (New York State Valuation Services 2011). The production, income and expense data from each economic unit within a given region is used as the basis for determining that region's economic profile.

<sup>106</sup> New York Real Property Tax Laws §3-2-308.

<sup>107</sup> This specifically pertains to all pipes, pipelines, drilling and service rigs, vehicles and associated equipment used for the drilling, extraction, production and peroration of gas as well as solution mining activities.

The State's Office of Real Property Tax Services (ORPTS) is involved in determining the appropriate unit of production value for an economic profile comprised of each natural gas economic unit within relevant districts (Murdock 2011). By using production and expense data from various gas wells and a discounted net cash flow analysis, the taxable assessed value of natural gas real property can be computed.

Three basic assumptions underlie this method for proper valuation of natural gas properties in New York (New York State Valuation Services 2011):

- Gross income per Mcf increases at a fixed rate for five years and then remains constant
- Operating expenses per Mcf increases at a fixed rate for five years and then remains constant
- Allocation of cost per Mcf of depletion equals the value per Mcf of the reserve of the property.

Also, various factors are relevant to the discounted net cash flow (DNCF) model that is used in valuation of natural gas real property (New York State Valuation Services 2011):

- Production decline rates and income/expense growth rates
- Gross income and operating expenses
- Remaining economic life of property
- Real property taxes
- Net income
- Depreciation
- Depletion
- Income and other taxation
- Capital investment
- Landowner royalty payments
- Rate of return
- Calculation of the net present worth.

In order to calculate the unit of production value for a given year, the state utilizes production and expense data from each economic unit that comprises the particular economic profile. A typical natural gas producing company's average sales price per Mcf of natural gas is determined by dividing gross income by production for the year. Companies report their sales prices to the ORPTS and the average of the sum of all reported sales prices is the value used for the economic profile (Kergel 2011).

The model also operates on the assumption that there is a 12.5 percent royalty payment associated with each economic unit. Therefore, this percent of value and any overriding royalty interest (ORI)<sup>108</sup> is deducted from the sales price to produce the operating gross income per Mcf.

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<sup>108</sup> ORI is defined as the fractional interest in the gross production of oil and gas under a lease, in addition to the usual royalties paid to the lessor, free of any expense for exploration, drilling, development, operating, marketing and other costs incidental to the production and sale of oil and gas produced from the lease. It is an interest carved

Similarly, average operating and depletion expenses are computed for each economic profile based on the data from the various economic units. Once these values are deducted from the operating gross income value, a net cash flow per Mcf is determined for the given year (Kergel 2011).

The next step involves determining the appropriate final discount rate for the DNCF model. This rate is based on the combination of a statutory factor and an average short-term federal rate. The statutory factor<sup>109</sup> is set at 17.50 percent and represents variables such as risk, non-liquidity, intangibles, and taxation (Kergel 2011). The short-term federal rate, set by the Federal Reserve, is determined based on the average of monthly short-term rates set over a period of the 5 calendar years on which the economic profile is based (Kergel 2011). The sum of these values produces the total overall discount rate and is determined annually. The final discount rate is the five-year average of the total overall discount rates of the previous five years

Finally, the discounted net cash flow is computed by dividing the net cash flow for the given year by the final discount rate.<sup>110</sup> This value, however, is not the value used in determining the assessed value. The discounted net cash flow from the preceding five years is summed and its average is calculated as the five year unit of production value which is used for assessment purposes (Kergel 2011). The assessed value calculation is provided in Equation 6.

#### **Equation 6 New York Determination of Assessed Value for Natural Gas Economic Units**

$$\text{Assessed Val.} = \text{Annual Prod.} \times \text{Five Year Unit Prod.Val.} \times \text{Equalization Rate}$$

Equalization rates are established based on the assessment ratios determined for each taxing jurisdiction and approved at the state level. The property tax payment is computed by applying the tax rate of the individual municipalities to the assessed value. It is the responsibility of the natural gas producer to pay the tax, not the property owners who leased out the land (Murdock 2011).

Chemung and Steuben are the largest natural gas producing counties in New York (NYDEC 2009). Assessment rates in Chemung County vary by municipality. Larger districts who reevaluate property on a frequent basis apply a uniform assessment percentage close to full market value. Of the 12 municipalities, eight districts are assessed at 100 percent, one district at 97 percent and one district at 90 percent (Chemung County 2011).<sup>111</sup> Chemung County levies a tax rate of \$6.98 per \$1,000 of assessed value (Murdock 2011).

Assessment rates in Steuben County also vary by municipality. Exactly half of the 34 taxing districts in the county assess at 100 percent. The LOAs of the other municipalities range between

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out of the lessee's share of the oil and gas, ordinarily called the working interest, as distinguished from the owner's reserved royalty interest.

<sup>109</sup> New York Real Property Tax Laws §5-5-592.

<sup>110</sup> *Ibid.*

<sup>111</sup> Two smaller districts within Chemung County are assessed at a very low ratio of 1.85 percent due to infrequency of revaluations.

2.76 to 95.79 percent of market value (Steuben County 2010). In Steuben County, natural gas property is taxed at a rate of \$8.76 per \$1,000 of assessed value (Flaitz 2011).

### *Personal Property Tax*

New York does not levy a personal property tax<sup>112</sup> on machinery and equipment used to produce natural gas. Because of the methodology used in determining the value of economic units for natural gas real property, the equipment and fixtures used in production, exploration and distribution are already incorporated into the property tax framework.

### *Severance Tax*

New York does not levy a severance tax on the production of natural gas (NCSL 2011).

### *Corporation Income Tax*

Taxation on corporate net income in New York varies depending on how businesses are classified within the State. Natural gas producing companies are classified as manufacturers and are subject to a corporation income tax<sup>113</sup> rate of 6.5 percent applied to the company's corporate net income.

### *Sales and Use Tax*

New York imposes a 4 percent sales and use tax<sup>114</sup> on all consumers. In addition to this tax, local districts can also levy an additional sales and use tax. Receipts from the sale of natural gas are included within this tax framework with the exception of natural gas sold for resale.

### *Permits, Bonds and Other Environmental Taxes or Fees*

New York imposes regulations for reclamation fees<sup>115</sup> on natural gas extracted in the State. A set fee of \$100 is imposed when the drilling permit is granted, and additional fees are imposed dependent on the depth of the well. The smallest fee is \$190 for a well depth between 0 and 500 feet. The largest fee is \$3,800 for a well depth between 9,501 and 10,000 feet with an additional \$190 imposed for every 500 feet of well depth in excess of 10,000 feet. Recent legislation has also proposed requiring a surety bond for natural gas wells drilled in the State (DiNapoli 2011).

Financial security<sup>116</sup> required by the State of New York for natural gas wells is complex. The amount is dependent on two factors: the depth of the wells and the number of wells. The smallest amount of financial security required is \$2,500 for 1 well less than 2,500 feet in depth. The largest<sup>117</sup> amount is applied to a well that is more than 6,000 feet in depth and cannot exceed \$250,000.

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<sup>112</sup> New York Real Property Tax Laws §3-1-300.

<sup>113</sup> New York Tax Laws §9-A-210(a)(vi).

<sup>114</sup> New York Tax Laws §28-1105.

<sup>115</sup> New York Environmental Conservation Laws §23-1903.

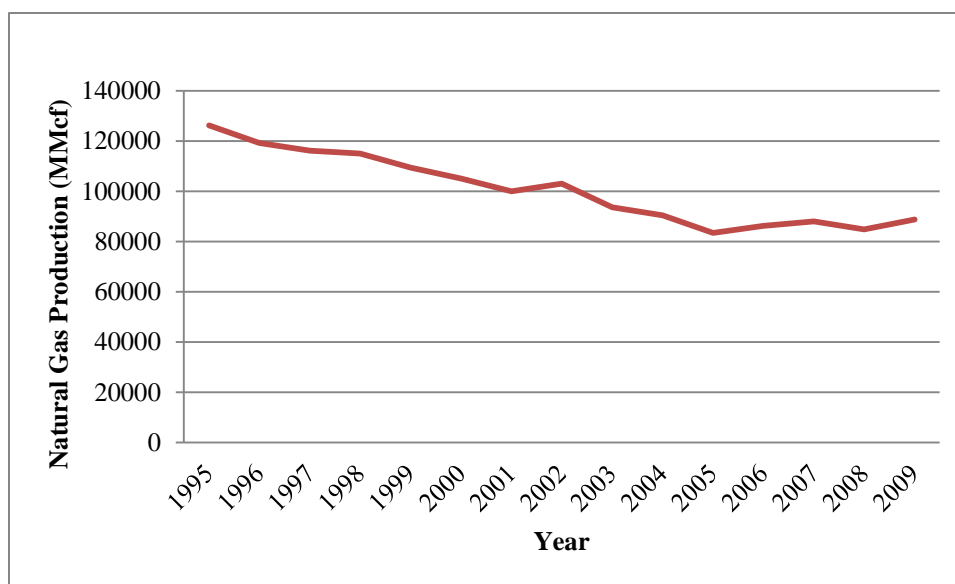
<sup>116</sup> New York Regulations §551.5.

<sup>117</sup> New York Regulations §551.6.

## Ohio

Ohio was ranked as the 19<sup>th</sup> largest natural gas producing state by 2009 production. Natural gas production in the State has experienced a slow and steady decline since 1995 with production increasing only slightly in 2002, 2006-2007 and 2009. Figure 13 illustrates this production trend over a 15 year period from 1995 to 2009.

**Figure 13 Ohio Natural Gas Production 1995-2009**



Energy Information Administration, State Energy Data System.

Although Marcellus Shale deposits are found in the majority of eastern Ohio, the State does not levy a Marcellus Shale-specific tax.

### *Real Property Tax*

Real property taxation<sup>118</sup> of natural gas property in Ohio is conducted on the county level. No tax may be imposed on non-producing natural gas reserves. Also, no other value is added to the value of the surface property due to income generated through a lease or purchase of mineral rights to natural gas (County Auditor's Association of Ohio 2011).

State guidelines also mandate how the market value for natural gas property is determined. It is important to note that these guidelines utilize natural gas production in a single period as the basis for determining the value of the remaining reserves each period thereafter (Dixon 2011). Generally, natural gas reserves are valued using a discounted cash flow analysis which is codified<sup>119</sup> in statute. There are three inherent assumptions which underlie the discounted cash flow analysis:

- Each well has a 10 year life

<sup>118</sup> Ohio Revised Code §5713.01(A).

<sup>119</sup> Ohio Revised Code §5713.051

- Expenses are 85 percent of gross revenue<sup>120</sup>
- Discount rate should always be inflated by 13 percent.

The State uses an annual average declining balance method in order to measure the net present value of the reserves and compute a gas multiplier. The gross price from the first year of production serves as a base year for all other year's calculations. The gross price<sup>121</sup> is the unweighted average price per Mcf of natural gas produced from Ohio wells and first sold during the preceding five-year period. During each year of the ten year life, the gross revenue values are adjusted by multiplying the gross price by the relevant annual declining rates:<sup>122</sup>

- First year: 1 Mcf multiplied by gross price
- Second year: 0.870 Mcf multiplied by gross price
- Third year: 0.757 Mcf multiplied by gross price
- Fourth year: 0.659 Mcf multiplied by gross price
- Fifth year: 0.573 Mcf multiplied by gross price
- Sixth year: 0.498 Mcf multiplied by gross price
- Seventh year: 0.434 Mcf multiplied by gross price
- Eighth year: 0.377 Mcf multiplied by gross price
- Ninth year: 0.328 Mcf multiplied by gross price
- Tenth year: 0.286 Mcf multiplied by gross price.

The gross revenue values<sup>123</sup> serve as the basis for determining the net income and present value data for each year. For example, net income for each year is derived by applying the expense rates, which total 85 percent, to each period's gross revenue value. Then, the net income is multiplied by the present worth factor<sup>124</sup> to determine the present value for each period (Shoup 2011).

Once the present values from each 10 years of the well's life are summed, the total net present value (NPV) is determined. The annualized NPV<sup>125</sup> is then calculated by multiplying the NPV by 365 days (Shoup 2011). In Ohio, an assessment rate of 35 percent is applied to the market value of natural gas real property (Sullivan and Sobul 2010). The annualized NPV figure multiplied by this assessment rate of 35 percent produces the gas multiplier (Shoup 2011). This multiplier is the figure used to determine the taxable assessed value of natural gas property depending on the level of production for each year.

<sup>120</sup> The 85 percent expense assumption is based on a combination of factors that are associated with production of natural gas. This includes a 15 percent royalty expense, a 40 percent average operating expense, and a 30 percent capital recovery expense. See Ohio Revised Code §5713.051(14)(15)(16).

<sup>121</sup> Ohio Revised Code §5713.051(A)(11)

<sup>122</sup> Ohio Revised Code §5713.051(A)(13)

<sup>123</sup> The first year gross revenue value is equal to the gross price. Subsequent years' gross revenue values are equal to 87 percent of the previous year's gross revenue due to the 13 percent discount rate assumption.

<sup>124</sup> The present worth factor is equal to  $1 / ((1+i)^{(n-0.5)})$ , where "i" is relevant discount rate and "n" represents the well's life in years. The relevant discount rate is a combination of the annual 13 percent discount established in the statute and the federal short-term rate calculated each year as indicated in Ohio Revised Code §5703.47 Ohio's model utilizes a mid-period discounted cash flow analysis.

<sup>125</sup> The Annualized NPV for wells that have not operated the entire calendar year is computed by multiplying the NPV by the number of days the well has been in operation from the initial start date to December 31.

During the first year of production, the flush year, Ohio allows an exemption of 42.5 percent of the total production in figuring the tax valuation. In subsequent years, a deduction of 50 percent is granted (Testa 2011). In Ohio, average daily production values are the key figure used to calculate taxable value of natural gas property. Once deductions are considered, the daily production value<sup>126</sup> can be computed by dividing the total production by 365 days.

If the average daily production for the well is more than 8 Mcf, the full multiplier is used. If the average daily production is less than 8 Mcf, then half the value of the multiplier is used (Testa 2011). The product of the daily production value and the gas multiplier equals the taxable assessed value of the natural gas property. The relevant municipal levy rates are then applied to produce the various tax payments owed to local governments.

Of the counties in Ohio which comprise the Marcellus Shale,<sup>127</sup> Mahoning and Monroe levy the highest and lowest real property gross tax rates, respectively. In Mahoning County, the property tax rate for natural gas real property in 2009 was 81.77 mills. In Monroe County, the property tax rate for natural gas real property in 2009 was 50.31 mills (Tax Analysis Division 2011). The average millage rate of Marcellus shale counties in Ohio was 59.56 mills. It is important to note that there are limitations on the level of “unvoted” taxes that can be levied against property values. The Ohio Revised Code<sup>128</sup> stipulates that a tax of no more than 1 percent of the taxable assessed value of property can be imposed without voter approval (Tax Analysis Division 2011).

#### *Personal Property Tax*

Ohio no longer imposes a tax on personal property in the State (Ohio Department of Taxation 2011). This includes personal property used in natural gas production. However, the exception to this rule is for tangible personal property owned and used by public utilities, which some natural gas producing companies are considered. Large natural gas producers who utilize pipelines and other transmission mediums are taxed on the personal property used to distribute natural gas (Dixon 2011). This personal property is assessed<sup>129</sup> at 25 percent of fair market value and then subject to local tax rates. The millage rates for public utility personal property in Mahoning and Monroe counties are 81.38 and 49.38 mills, respectively (Tax Analysis Division 2011).

#### *Severance Tax*

Ohio imposes a severance tax<sup>130</sup> on the production of natural gas at a rate of \$0.025 per Mcf natural gas removed.

#### *Corporation Income Tax*

Ohio’s commercial activity tax (CAT) is an annual privilege tax measured by gross receipts of business activities on entities conducting business in the State. Taxpayers whose gross receipts are between \$150,000 and \$1 million are to report on an annual basis. These calendar year

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<sup>126</sup> In cases where a well is not in production during the entire year, the daily average production value is found by dividing the total production minus deductions by the number of days the well was in operation.

<sup>127</sup> Marcellus Shale counties include Belmont, Carroll, Columbiana, Guernsey, Harrison, Jefferson, Mahoning, Monroe, Noble and Washington.

<sup>128</sup> Ohio Revised Code §5705.02

<sup>129</sup> Ohio Revised Code §5727.111(C).

<sup>130</sup> Ohio Revised Code §5749.02.

taxpayers are responsible for a minimum tax of \$150. Those taxpayers whose gross receipts exceed \$1 million are to file and pay on a quarterly basis. Quarterly taxpayers are responsible for the minimum \$150 on gross receipts up to \$1 million, while receipts in excess of \$1 million are taxed at a rate of 0.26 percent.

If a taxpayer is using a calendar quarter tax period, the CAT allows for an exclusion of the first \$250,000 of taxable gross receipts per quarter. If any amount of the taxable gross receipts exclusion remains from the previous three calendar quarters, that amount may also be carried forward and excluded.<sup>131</sup>

### *Sales and Use Tax*

Sales of natural gas are exempt<sup>132</sup> from taxation in Ohio.

### *Permits, Bonds and Other Environmental Taxes or Fees*

Ohio requires a permit fee<sup>133</sup> for all applications to drill, deepen or reopen natural gas wells in the State. The amount of this fee varies:

- \$250 if the well is located in a township with less than 5,000 residents
- \$500 if the well is located in a township with at least 5,000 but less than 10,000 residents
- \$750 if the well is located in a township with at least 10,000 but less than 15,000 residents
- \$1,000 if the well is located in either:
  - A township with least 15,000 residents or
  - A municipal corporation regardless of population.

Well owners must also post a surety bond, or cash in the amount equal to the surety bond. While no bond amount is specified in Code, the bond is held in the event that the well is forfeited, to properly plug and reclaim the well site.

While Ohio does not dedicate a tax or fee for the reclamation of natural gas wells, the Department of Taxation uses revenues generated from the severance tax for conservation, reclamation and remediation purposes.<sup>134</sup>

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<sup>131</sup> Ohio Revised Code §5751.03.

<sup>132</sup> Ohio Revised Code §5739.02(B)(7).

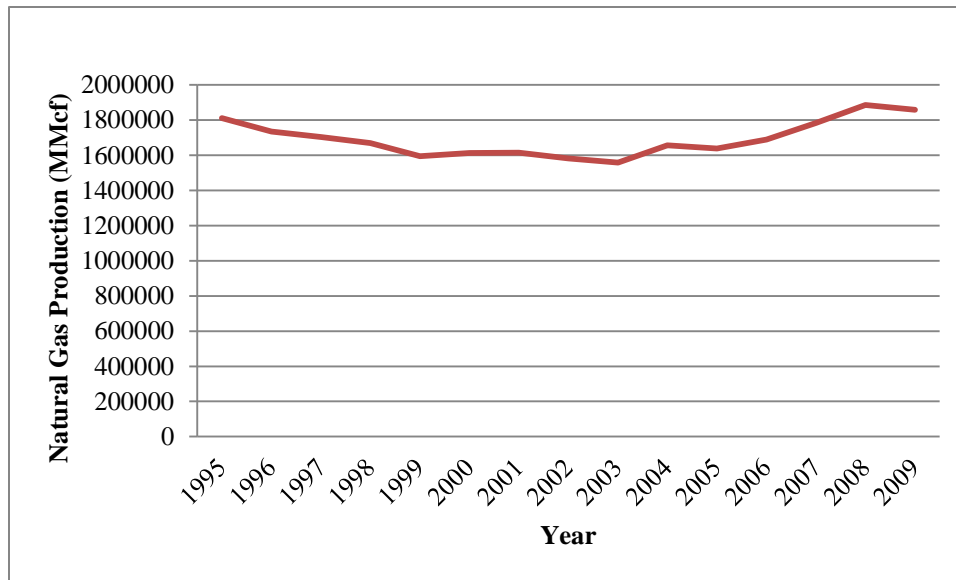
<sup>133</sup> Ohio Revised Code §1509.06(G).

<sup>134</sup> Ohio Revised Code §5749.02.

## Oklahoma

Oklahoma was ranked as the 4<sup>th</sup> largest natural gas producing state by 2009 production. Natural gas production has remained relatively stable during the past 15 years. Production decreased very slightly through the late 1990s and began to increase in 2003. A graphical representation of this trend is provided in Figure 14.

**Figure 14 Oklahoma Natural Gas Production 1995-2009**



Energy Information Administration, State Energy Data System.

### *Real Property Tax*

Oklahoma does not levy statewide real property taxes.<sup>135</sup> Instead, real property is evaluated on the local level in the taxing district where it is located. Assessment levels are between 11 and 13 percent for real property in the State depending on the county where it is assessed.<sup>136</sup> Property tax payments are determined by applying the levy rates set by individual school districts to the assessed value. The county treasurer collects the tax payment due to each district and apportions it to various municipal entities based on their budgets (Haynes 2011).

The majority of gas producers in the State do not own the rights to the land where the natural gas is extracted (Emmert 2011). Land is typically leased to companies who extract the natural gas. These companies are then responsible for payment of the gross production tax to the State but are exempt from real property taxation associated with natural gas production.<sup>137</sup> The landowners are solely responsible for the valuation of their land and the appropriate real estate taxes associated with it. It is noted that county assessors do not inflate the value of real property due to the presence of natural gas resources or the possibility for extraction (Emmert 2011).

<sup>135</sup> Oklahoma Statutes §68-2701(A).

<sup>136</sup> Oklahoma Constitution Article X, Section X-8.

<sup>137</sup> Oklahoma Statutes §68-2805(5).

### *Personal Property Tax*

Personal property<sup>138</sup> is taxed at the local level in Oklahoma. Taxpayers who own tangible personal property used in natural gas production must file a property tax return with each county where the personal property is located. In Oklahoma, personal property is assessed between 10 and 15 percent of its fair market value.<sup>139</sup>

Various Oklahoma counties have contracted the private firm, Visual Lease Services (VLS), and charged them with affirming the fair market value of equipment and machinery used in production activities within the state. The firm reassesses tangible property values in order to verify returns submitted by companies. They also acted as a credible consultant should any company appeal their assessment (Emmert 2011). Each county in Oklahoma chooses whether to contract with private firms like VLS or conduct appraisals themselves via guidelines<sup>140</sup> from the State (Haynes 2011).

The two largest natural gas producing counties in Oklahoma are Pittsburgh and Latimer. Pittsburgh County still retains their contract with VLS due to their extensive knowledge and experience regarding exploration related equipment (Haynes 2011). Personal property used to extract natural gas is assessed at a rate of 13 percent of fair cash value (Fields 2011). Municipal levy rates for personal property in Pittsburgh County range from 74.38 to 98.70 per \$1,000 of assessed value (Oklahoma Assessor 2010).

Officials in Latimer County have discontinued their services with VLS due to budgetary shortfalls. The county assessor's office is now responsible for determining fair market value via rules established by the Oklahoma State Tax Commission.<sup>141</sup> Natural gas personal property in Latimer County is assessed at a rate of 10 percent of fair cash value (Emmert 2011). Municipal levy rates for personal property in Latimer County range from 76.29 to 93.58 per \$1,000 of assessed value (Oklahoma Assessor 2010).

### *Severance Tax*

In Oklahoma, a gross production tax<sup>142</sup> is levied on the extraction of natural gas in the State. This tax is dependent on the average price of Oklahoma gas. Natural gas production is taxed at a rate of:

- 7 percent if the average gas price is greater than or equal to \$2.10 per Mcf
- 4 percent if the average gas price is greater than or equal to \$1.75 per Mcf but less than \$2.10 per Mcf
- 1 percent if the average gas price is less than \$1.75 per Mcf.

These rates are effective until July 1, 2013, at which time the gross production tax on the extraction of natural gas will be 7 percent of gas produced in Oklahoma.<sup>143</sup>

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<sup>138</sup> Oklahoma Statutes §68-2701(A).

<sup>139</sup> Oklahoma Constitution Article X Section X-8.

<sup>140</sup> Oklahoma Administrative Code §710:10-2-5.

<sup>141</sup> Oklahoma Administrative Code §710:10.

<sup>142</sup> Oklahoma Statutes §68-1001(B)(4).

<sup>143</sup> Oklahoma Statutes §68-1001(B)(5).

### *Corporation Income Tax*

In Oklahoma, corporations pay a flat rate of 6 percent on all taxable income.<sup>144</sup> Taxable income refers to total receipts once deductions and credits are taken into account.

### *Sales and Use Tax*

A sales tax<sup>145</sup> of 4.5 percent is levied on the sale of natural gas in Oklahoma. Counties can also levy a sales tax of up to 2 percent in addition to the state sales tax. State sales tax does not apply to natural gas utility bills for residential property, but municipal and county taxes in effect at the time of sale are applicable. A use tax<sup>146</sup> is also levied on the use of natural gas at the same rate of 4.5 percent of the purchase price.

### *Permits, Bonds and Other Environmental Taxes or Fees*

Oklahoma requires natural gas producers to provide a surety bond<sup>147</sup> in the amount of \$25,000. While a permit is required for drilling, no permit fee is included.

The State does not dedicate any other tax or fee for natural gas reclamation purposes but does dedicate severance tax revenues for conservation, remediation and reclamation of natural gas wells.<sup>148</sup>

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<sup>144</sup> Oklahoma Statutes §68-2355(D).

<sup>145</sup> Oklahoma Statutes §68-1354(A)(2).

<sup>146</sup> Oklahoma Statutes §68-1402.

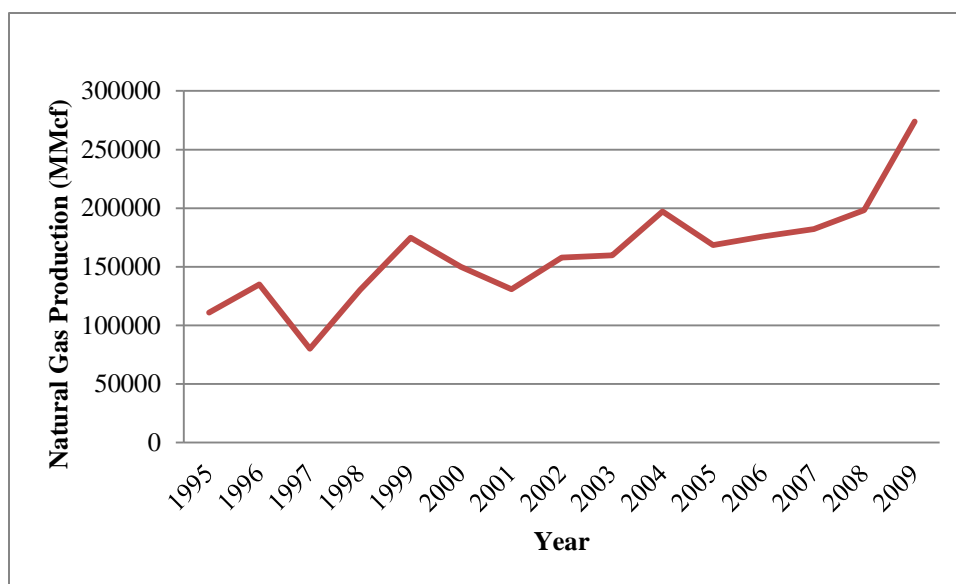
<sup>147</sup> Oklahoma Administrative Code §165:10-1-7(b)(14).

<sup>148</sup> Oklahoma Statutes §68-1004.2.

## Pennsylvania

Pennsylvania was ranked as the 13<sup>th</sup> largest natural gas producing state by 2009 production. Although production has fluctuated substantially since 1995, the overall trend increased by nearly 163 Bcf in the previous 15 years. Figure 15 provides a graphical representation of this time frame.

**Figure 15 Pennsylvania Natural Gas Production 1995-2009**



Energy Information Administration, State Energy Data System.

While a large portion of Pennsylvania holds Marcellus Shale deposits, no taxes specific to natural gas produced from this shale formation are levied in this state. A potential Marcellus Shale “impact fee” is currently being considered. This fee is discussed in the Pennsylvania Severance Tax section.

### *Real Property Tax*

Real property taxes<sup>149</sup> are not assessed at a statewide level in Pennsylvania. Instead, these taxes are reserved for local governing authorities. In Pennsylvania, land is not appreciable solely in its potential for natural gas exploration, but generally in the case where an actual production site is located on a parcel of land. The acreage associated with the production and exploration of natural gas will be valued according to procedures established on a per county basis. Thus, the Commonwealth offers no guidelines for how natural gas property should be valued. It is also important to note that real property associated with natural gas pipeline production is exempt from taxation in Pennsylvania (Brown 2011).

Bradford and Susquehanna Counties are the largest natural gas producers in Pennsylvania (PADEP 2011). Bradford County does not assess natural gas real property. A parcel of land where a natural gas well site is located is also not subject to any appreciation in value (Kolodziej

<sup>149</sup> Pennsylvania Code §61-609.11.

2011). Generally, real property within Bradford County is assessed at a predetermined ratio of 50 percent (Bradford County, PA 2011). It was subject to a millage rate of 11.08 in 2009 (Kolodziej 2011). Tax payment is derived by multiplying the mill rates to the assessment value. Each taxing jurisdiction establishes its own mill rates depending on budgetary needs (Bradford County, PA 2011).

In Susquehanna County, there is not a set method for determining the market value of natural gas produced within the county because it is also not subject to real property taxation. Generally, real property within the county is assessed at a predetermined ratio of 50 percent (Button 2011). It was subject to a millage rate of 11.50 per \$1,000 of assessed value in 2009 (Susquehanna County Government 2009). Property tax payments are derived by multiplying the local mill rates to the assessed value of the property.

### *Personal Property Tax*

Pennsylvania does not levy or collect a personal property tax on a statewide level (Bjur 2009). This tax is also established on a per county basis depending on when counties have last conducted reevaluations (Brown 2011). In Susquehanna and Bradford Counties, equipment and machinery associated with natural gas production is not subject to personal property taxation (Button 2011).

### *Severance Tax*

Pennsylvania does not levy a severance tax on the extraction of natural gas (Penn State College of Agricultural Sciences 2010). However, Pennsylvania political leaders have recently debated the idea of assessing an “impact fee” on Marcellus Shale wells (Associated Press 2011). Recently, the Governor of Pennsylvania, Tom Corbett, outlined a plan for implementing such a fee. The plan allows counties the right to adopt an impact fee (Pennsylvania Office of the Governor 2011). If the impact fee is implemented, a tiered fee base would be imposed on natural gas production from each Marcellus Shale well over a 10 year period.

- Impact fee of \$40,000 for the first year
- Impact fee of \$30,000 for the second year
- Impact fee of \$20,000 for the third year
- Impact fee of \$10,000 for each of the next seven years.

Three-fourths of revenues collected from this fee would benefit localities. The distribution of revenues of that number will be apportioned accordingly:

- 36 percent for host counties
- 37 percent for host municipalities
- 27 percent for all municipalities within a host county.

The remaining 25 percent of revenue collected from the impact fees would be allocated for the state government. Funds would be used for road maintenance within Marcellus Shale counties, conservation efforts, pipeline safety initiatives, emergency response and public health investigation and education (Kasey 2011).

### *Corporation Income Tax*

Pennsylvania imposes a corporation income tax at a rate of 9.99 percent of taxable income (Pennsylvania Department of Revenue 2010). However, exceptions exist. If a corporation is organized as a limited partnership (LP), limited liability corporation (LLC) or Subchapter S Corporation, the corporation can pay the lesser personal income tax rate of 3.07 percent so long as there are a limited number of shareholders within the State (Pennsylvania Budget and Policy Center 2009). The Pennsylvania Budget and Policy Center (2009) also estimates that 70 percent of Marcellus Shale drillers will be eligible for the personal income tax rate.

### *Sales and Use Tax*

Natural gas purchased for non-residential use which is not intended for use by a non-profit organization is subject to a 6 percent sales tax<sup>150</sup> in Pennsylvania.

### *Permits, Bonds and Other Environmental Taxes or Fees*

Pennsylvania requires a \$100 permit fee<sup>151</sup> before permission to drill will be granted. In addition, a bond<sup>152</sup> of \$2,500 per well or a blanket bond of \$25,000 for all wells is required. In the event the well site is forfeited before being properly plugged, the bond will cover the cost of plugging the well and reclaiming the affected area. Pennsylvania does not currently impose any other environmental taxes or fees for the reclamation of natural gas wells (Pennsylvania Budget and Policy Center 2011).

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<sup>150</sup> Pennsylvania Code §61-32.25.

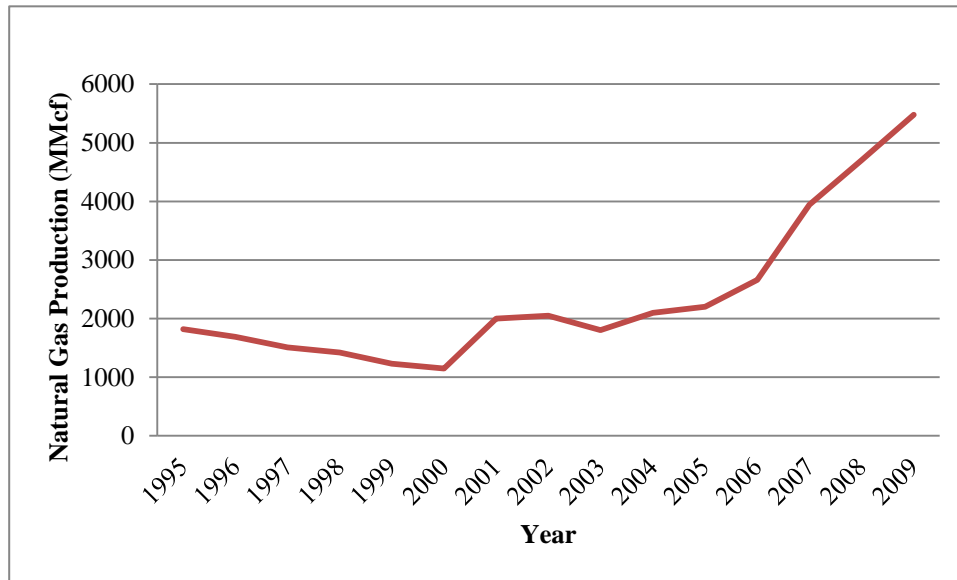
<sup>151</sup> Pennsylvania Statutes and Consolidated Statutes Annotated §58-11- 601.201(d).

<sup>152</sup> Pennsylvania Statutes and Consolidated Statutes Annotated §58-11- 601.215(a).

## Tennessee

Tennessee was ranked as the 23<sup>rd</sup> largest natural gas producing state by 2009 production. The State experienced a slow decline in natural gas production in the late 1990s before beginning to increase. This trend is provided in Figure 16.

**Figure 16 Tennessee Natural Gas Production 1995-2009**



Energy Information Administration, State Energy Data System.

Tennessee holds only a very small portion of Marcellus Shale in its borders. However, no tax specific to Marcellus Shale natural gas is levied in this State.

### *Real Property Tax*

In Tennessee, real property is assessed as a percentage of fair market value and expressed as an amount per \$100 of assessed value (Tennessee State Board of Equalization 2011). The State is responsible for establishing assessment ratios for various classifications of property. The percentages vary depending on the classification of the property. For instance, in Tennessee, public utility real property is assessed at a rate of 55 percent. Commercial and industrial real property is assessed at a rate of 40 percent. Residential property and farm property are assessed at 25 percent.<sup>153</sup>

Real property in Tennessee is also a local specific tax<sup>154</sup> in that the revenue generated is used for purposes of local governments. In most cases, county assessors are responsible for appraising property values within their districts, applying the appropriate assessment percentage and levying a uniform tax rate to all property within their jurisdiction (Tennessee Division of Property Assessments 2011). However, with the case of natural gas real property, the State has established

<sup>153</sup> Tennessee Constitution Article II, Sections 28 and 29.

<sup>154</sup> Tennessee Code §67-5-102.

a set procedure for valuation that is based on each year's current production value and a discounted cash flow analysis.

The production value of natural gas property in Tennessee for producing companies is based on the average price per Mcf of the preceding year less a 12.5 percent royalty expense. Since reserve studies have not been conducted in Tennessee and the value of the remaining natural gas cannot be known, the income approach uses the production company's revenue as a means to find the real property value (Gibson 2011).

The income generated per well is determined by multiplying the previous year's average Mcf price (less the 12.5 percent royalty expense) by the total production in Mcf for the entire year. This income figure acts as a basis for depreciation of the natural gas property over its five year economic life. At each period of the five year life, the income figure is declines by a 20 percent rate from the previous period. Present worth factors are then applied to each year's income to generate the present value of the property at the base year. The following present worth factors are derived from a 12 percent discount rate established in the State (Tennessee Division of Property Assessment 2011):

- Year 1: 0.892857
- Year 2: 0.797194
- Year 3: 0.711780
- Year 4: 0.635518
- Year 5: 0.567427.

Once these factors are applied to each year's income, the sum of the five present values produces a net present value (NPV) for the natural gas property. This NPV figure is then multiplied by a current appraisal ratio<sup>155</sup> to determine the market value of the property (Tennessee Division of Property Assessment 2011).

In Tennessee, natural gas real property is assessed at a rate of 40 percent (Tennessee Division of Property Assessment 2011). This assessment ratio applied to the market value produces the taxable assessed value of the property. Each county and municipality levies their relevant tax rate to the assessed value to produce the property tax bill.

The two largest natural gas producing counties in Tennessee are Anderson and Morgan (Tennessee Oil and Gas Association 2011). Anderson County's real property tax is set at a rate of \$2.82 per \$100 of assessed value. Morgan County's rate is set at \$2.99 per \$100 of assessed value (Tennessee Division of Property Assessments 2009).

### *Personal Property Tax*

Although revenue from the personal property tax<sup>156</sup> in Tennessee is also committed to local governments, the State mandates how personal property is valued for assessment purposes.

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<sup>155</sup> The appraisal ratio varies by county and is established by the State board of Equalization in Tennessee to reflect adjusted county property values in periods before reevaluations are conducted. The 2009 appraisal ratios for Anderson and Morgan Counties were 0.8094 and 0.8567, respectively.

<sup>156</sup> Tennessee Code §67-5-102.

Tangible property such as household goods and furnishings that are used for private purposes are generally exempt from taxation. However, tangible personal property that is used for purposes such as natural gas exploration, production and extraction is deemed as commercial personal property and subject to taxation within the state (Smith 2011). The equipment and machinery that is used in the drilling and extraction processes is assessed at a rate of 30 percent of market value in Tennessee.<sup>157</sup>

The market value is determined based on the original cost of acquisition of the equipment. This includes shipping, insurance to ship, set up costs and any other cost to get the property on site and operational (Tennessee Division of Property Assessments 2011). Companies submit the book value and year of acquisition to the appropriate county assessor's offices. The assessors then use a depreciation schedule<sup>158</sup> established by the state to determine the current use value of the equipment. Equipment used in natural gas production would be classified as manufacturing machinery and a schedule would be used based on an eight-year depreciable life:

- Year 1: 0.88 percent
- Year 2: 0.75 percent
- Year 3: 0.63 percent
- Year 4: 0.50 percent
- Year 5: 0.38 percent
- Year 6: 0.25 percent
- Year 7: 0.20 percent
- Year 8: 0.20 percent.

Once the market value of the equipment is determined, the 30 percent assessment ratio is applied to generate the taxable assessed value. Counties then apply the appropriate tax rate to generate the property tax bill the company owes for the machinery. Anderson County's personal property tax<sup>159</sup> is set at a rate of \$2.82 per \$100 of assessed value. Morgan County's rate is set at \$2.99 per \$100 of assessed value (Tennessee Division of Property Assessments 2009).

#### *Severance Tax*

A severance tax<sup>160</sup> of 3 percent is imposed on the sale price at the wellhead of natural gas produced in Tennessee.

#### *Corporation Income Tax*

Tennessee imposes an excise tax<sup>161</sup> of 6.5 percent on the net earnings of natural gas corporations doing business in the State.

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<sup>157</sup> Tennessee Code §67-5-901.

<sup>158</sup> Tennessee Code § 67-5-903(f).

<sup>159</sup> Tennessee counties typically use the same rate for real and personal property taxes.

<sup>160</sup> Tennessee Code §60-1-301(a).

<sup>161</sup> Tennessee Code §67-4-2007(a).

### *Sales and Use Tax*

Natural gas sold directly to the consumer for residential use in Tennessee is exempt<sup>162</sup> from a sales tax. All other transactions involving tangible personal property, of which natural gas is included,<sup>163</sup> is subject to a sales<sup>164</sup> or use<sup>165</sup> tax of 4.5 percent. Counties and other municipal entities are also authorized to impose a local sales tax<sup>166</sup> not exceeding 2.75 percent on sales up to \$1600. However, counties are ineligible to levy any tax<sup>167</sup> on the sale, purchase, use, consumption or distribution of natural gas (effective until July 1, 2013).

### *Permits, Bonds and Other Environmental Taxes or Fees*

A permit fee of \$150 is required before drilling a natural gas well in Tennessee (TNDEC 2011). In addition to the permit fee, Tennessee also requires two bonds for natural gas wells. The first is a plugging bond of either \$2,000 per well or a blanket bond of \$10,000 for a maximum of 10 wells. The other bond required is a reclamation bond of \$1,500 per well site.

Tennessee also has an oil and gas reclamation fund<sup>168</sup> which is backed by fees garnered from violations of standards for oil and gas extraction. Fees collected from violations provide revenue for this fund, which allows reclamation work to be completed for lands and waters damaged by surface and subsurface exploration and extraction.

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<sup>162</sup> Tennessee Code §67-6-334(a).

<sup>163</sup> Tennessee Code §67-6-102(91)(a).

<sup>164</sup> Tennessee Code §67-6-202.

<sup>165</sup> Tennessee Code §67-6-203.

<sup>166</sup> Tennessee Code §67-6-702.

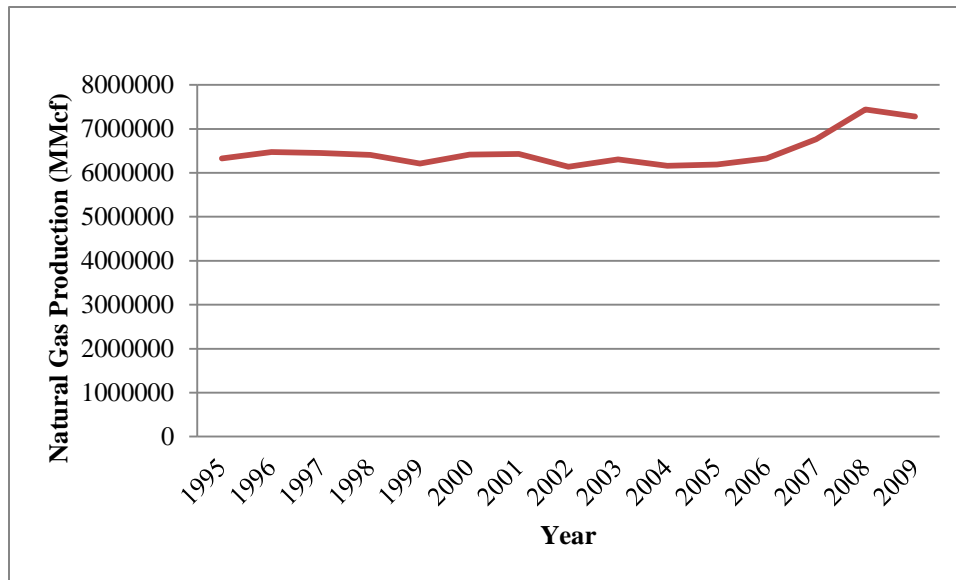
<sup>167</sup> Tennessee Code §67-6-704.

<sup>168</sup> Tennessee Code §60-1-404.

## Texas

Texas was the largest natural gas producing state by 2009 production. Natural gas production in the State of Texas has remained very stable over the last 15 years. In 2008, production peaked at the highest level during this time period in excess of 7 Tcf. Figure 17 illustrates natural gas production in Texas from 1995 to 2009.

**Figure 17 Texas Natural Gas Production 1995-2009**



Energy Information Administration, State Energy Data System.

### *Real Property Tax*

Natural gas real property is assessed at the local level in Texas. The State does, however, provide certain guidelines<sup>169</sup> for county appraisal districts to follow. Appraisal districts may choose any of three approaches to determine the discount rates used:

- Market surveys
- Oil and gas sales analysis
- Weighted average cost of capital (WACC).

County appraisal districts are required to use a discounted cash flow, determined using one of the above approaches, to value natural gas property. Tarrant and Johnson counties are the two largest natural gas producing counties in Texas (RRC 2010). These counties were contacted to determine natural gas taxation methods.

Tarrant County contracts with Pritchard and Abbott, Inc., to appraise all natural gas real property in the county. Natural gas real property is taxed on the reserve value while a severance tax (detailed below) is levied on the produced mineral itself. This property is considered taxable if it is able to be produced on January 1<sup>st</sup> of each year. Pritchard and Abbott, Inc., determines the

<sup>169</sup> Texas Tax Code §1-D-23.175.

present worth of anticipated future income of natural gas real property through the discounted cash flow by analyzing the value of revenue through sales of natural gas (Henderson 2011). The Tarrant County levy rate of 0.2640 plus any relevant school district rate is applied to this value.

Johnson County contracts with Capitol Appraisal Group, LLC, to appraise all natural gas real property in the county. As with Tarrant County, this property is taxed on the reserve value and is considered taxable if it is able to be produced on January 1<sup>st</sup> of each year (Hitt 2011). The appraisal of the property is made using the average price of natural gas and a market condition factor. Projections of production are then discounted using a discounted cash flow to determine the present value of reserves. The Johnson County levy rate of 0.3795 plus any relevant school district rate is applied to this value.

### *Personal Property Tax*

Texas reserves the imposition of a tax on natural gas personal property to the local level. The top two natural gas producing counties, Tarrant and Johnson, were contacted to determine natural gas taxation methods.

Tarrant County values natural gas personal property at the point where the well is plugged or abandoned. While all three approaches to value are considered, the cost approach using net salvage value is used to value this property. The county levy rate of 0.2640 plus any relevant school district rate is applied to this value for taxation.

In Johnson County, Capitol Appraisal Group appraises the value of natural gas-related personal property at the well site (Hitt 2011). A discounted cash flow analysis is applied to the residual value placed on the sale price of the property for the working interest only. From this value, the county levy rate of 0.3795 plus any relevant school district rate is applied.

### *Severance Tax*

Texas levies a severance tax on the production of natural gas in the state at a rate of 7.5 percent<sup>170</sup> of the market value of gas produced. This tax does not apply<sup>171</sup> to gas which has been:

- Injected into the earth in the State, unless it has been sold for that specific purpose
- Produced from oil wells and has been vented or flared in accordance with state laws
- “Used for lifting oil, unless sold for that purpose,” or
- Produced in Texas from either a previously inactive well or a reactivated orphaned well.

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<sup>170</sup> Texas Tax Code §2-I-201.052.

<sup>171</sup> Texas Tax Code §2-I-201.053.

### *Corporation Income Tax*

In lieu of a corporation income tax, Texas levies a franchise tax<sup>172</sup> on natural gas producing companies in the State. The rate of this tax is 0.5 percent of the taxable margin. The taxable margin<sup>173</sup> is determined by first taking the lesser of:

- 70 percent of the corporation's total revenue
- The corporation's total revenue less either the cost of goods sold or the corporation's compensation less compensation paid to an individual while that individual served the United States as an active duty member of the armed forces and the cost of training a replacement for that individual.

The deduction of either the cost of goods sold or the corporation's compensation is chosen at the discretion of the corporation.

The corporation's apportioned margin is then determined. This apportionment is a fraction of the corporation's gross receipts from business conducted in the State divided by the corporation's gross receipts from its entire business.<sup>174</sup> From this amount, other allowable deductions are removed to determine the corporation's taxable margin.

If total taxes owed are less than \$1,000 or the company's revenue is \$300,000 or less, the tax does not have to be paid. Texas allows four discounts on the franchise tax for small businesses in Texas. These discounts apply as follows:

- Discount equal to 80 percent if total revenue is above \$300,000 but less than \$400,000
- Discount equal to 60 percent if total revenue is above \$400,000 but less than \$500,000
- Discount equal to 40 percent if total revenue is above \$500,000 but less than \$700,000
- Discount equal to 20 percent if total revenue is above \$700,000 but less than \$900,000.

### *Sales and Use Tax*

The State of Texas imposes a sales and use tax<sup>175</sup> of 6.25 percent on taxable items sold. Sales and use<sup>176</sup> taxation in Texas is determined at the local level. Cities, counties, transit authorities and special purpose districts may also impose an additional sales and use tax on natural gas. The rates of these additional taxes vary (Window on State Government 2011):

- City: 0.25 percent to 2 percent, depending on local rate
- County: 0.5 percent to 1.5 percent, depending on local rate
- Transit authority: 0.25 percent to 1 percent, depending on local rate
- Special purpose district: 0.125 percent to 2 percent, depending on local rate.

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<sup>172</sup> Texas Tax Code §2-F-171.002 and 171.0021.

<sup>173</sup> Texas Tax Code §2-F-171.101.

<sup>174</sup> Texas Tax Code §2-F-171.106.

<sup>175</sup> Texas Tax Code §2-E-151.051.

<sup>176</sup> Texas Tax Code §3-C-321.

Natural gas sold for several uses, including residential and agricultural use, as well as natural gas used directly in exploring, producing or transporting a material extracted from the earth, is exempt<sup>177</sup> from the sales and use tax.

#### *Permits, Bonds and Other Environmental Taxes or Fees*

Texas requires a permit fee<sup>178</sup> to drill, deepen, plug or reenter a natural gas well. The amount of the fee is dependent on the depth of the well:

- \$200 for wells 2,000 feet in depth or less
- \$225 for wells greater than 2,000 feet but not more than 4,000 feet in depth
- \$250 for wells greater than 4,000 feet but not more than 9,000 feet in depth
- \$300 for wells greater than 9,000 feet in depth.

Natural gas producers are also required to post a bond before drilling begins. Two bonds are available:

- An individual bond<sup>179</sup> of \$2 for each foot of well depth for each well
- A blanket bond<sup>180</sup> of:
  - \$25,000 for up to 10 wells
  - \$50,000 for 11 to 100 wells
  - \$250,000 for 101 or more wells.

In Texas, an Oilfield Cleanup Regulatory Fee on Gas<sup>181</sup> is levied against each Mcf of cubic gas produced. The fee is equal to \$0.0007 per Mcf. Proceeds from the fee are deposited in the State's oil-field cleanup fund.<sup>182</sup> The revenue generated is to be used in various conservation efforts<sup>183</sup> such as controlling and cleaning up oil and gas waste, plugging abandoned wells, conducting on site environmental assessments and other activities.

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<sup>177</sup> Texas Tax Code §2-E-151.317(a).

<sup>178</sup> Texas Natural Resources Code §3-B-85.2021(a).

<sup>179</sup> Texas Natural Resources Code §91.1041.

<sup>180</sup> Texas Natural Resources Code §91.1042.

<sup>181</sup> Texas Natural Resources Code §81.117.

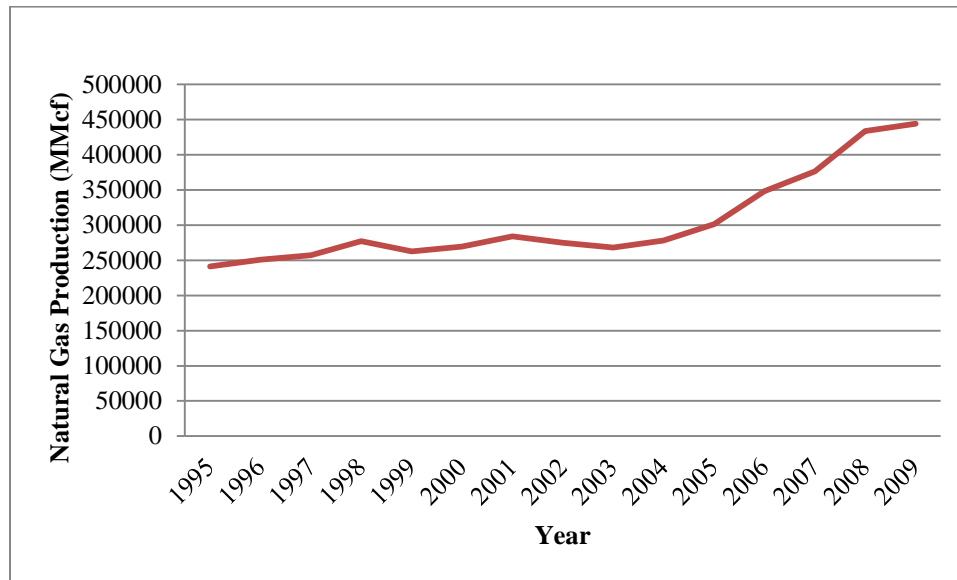
<sup>182</sup> Texas Natural Resources Code §91.110.

<sup>183</sup> Texas Natural Resources Code §91.112.

## Utah

Utah was ranked as the 8<sup>th</sup> largest natural gas producing state by 2009 production. Utah natural gas production remained steady in the late 1990s and early 2000s before beginning to increase in 2003. A graphical representation of this trend over a 15 year period is provided in Figure 18.

**Figure 18 Utah Natural Gas Production 1995-2009**



Energy Information Administration, State Energy Data System.

### *Real Property Tax*

Natural gas real property in Utah is assessed<sup>184</sup> at 100 percent of fair market value. This value is determined using a discounted cash flow analysis on the property (Bredthauer 2011). Fair market value<sup>185</sup> is defined as

“...the amount at which property would change hands between a willing buyer and a willing seller, neither being under any compulsion to buy or sell and both having reasonable knowledge of the relevant facts.”

The property is then subject to the local levy rate. Counties in Utah are responsible for levying a real property tax on natural gas real property and all money collected from the tax stays in the counties (Bredthauer 2011). The two largest natural gas producing counties in Utah are Uintah and Carbon (Krompel 2009). The 2010 levy rates for these counties were 0.010021 and 0.010293, respectively (Utah State Tax Commission 2010).

### *Personal Property Tax*

Similar to natural gas real property, machinery and equipment used to extract natural gas in Utah is assessed at 100 percent of fair market value, determined using a discounted cash flow analysis

<sup>184</sup> Utah Code §59-2-201(1)(a).

<sup>185</sup> Utah Code §59-2-102(12).

(Bredthauer 2011). Counties in Utah are responsible for levying a personal property tax on machinery and equipment used to produce natural gas in the State. 2010 levy rates in Uintah and Carbon, the two largest natural gas producing counties in Utah, were 0.010021 and 0.010293, respectively (Utah State Tax Commission 2010).

### *Severance Tax*

Utah levies a severance tax<sup>186</sup> on the privilege of producing natural gas in the State at a rate of 3 percent of value “up to and including the first \$1.50 per Mcf” and 5 percent of value exceeding \$1.50 per Mcf.

### *Corporation Income Tax*

A corporation income tax<sup>187</sup> is levied on natural gas producing companies conducting business in the State at a rate of 5 percent Utah taxable income with a \$100 minimum tax payment.

### *Sales and Use Tax*

If bought for commercial use, the purchaser of natural gas in Utah is charged a tax<sup>188</sup> of 4.7 percent of the transaction. If bought for residential use, the purchaser of natural gas in Utah is charged a tax<sup>189</sup> of 2 percent of the transaction.

### *Permits, Bonds and Other Environmental Taxes or Fees*

Utah requires natural gas producers to submit a bond<sup>190</sup> before drilling can commence. The amount of the bond<sup>191</sup> is dependent on the depth of the well:

- At least \$1,500 for a well of less than 1,000 feet in depth
- At least \$15,000 for a well of 1,000 feet to 3,000 feet in depth
- At least \$30,000 for a well of 3,000 feet to 10,000 feet in depth
- At least \$60,000 for a well of more than 10,000 feet in depth.

Rather than a per-well bond, a blanket bond<sup>192</sup> may also be used. These bonds are also dependent on well depth:

- At least \$15,000 for a well of less than 1,000 feet in depth
- At least \$120,000 for a well of more than 1,000 feet in depth.

While a permit is required by the State before a well can be drilled, deepened or plugged, no permit fee<sup>193</sup> is listed.

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<sup>186</sup> Utah Code §59-5-102(2)(b).

<sup>187</sup> Utah Code §59-7-104.

<sup>188</sup> Utah Code §59-12-103(2)(a)(i)(A).

<sup>189</sup> Utah Code §59-12-103(2)(b)(i).

<sup>190</sup> Utah Rule R649-3-1.

<sup>191</sup> Utah Rule R649-3-1(5).

<sup>192</sup> Utah Rule R649-3-1(6).

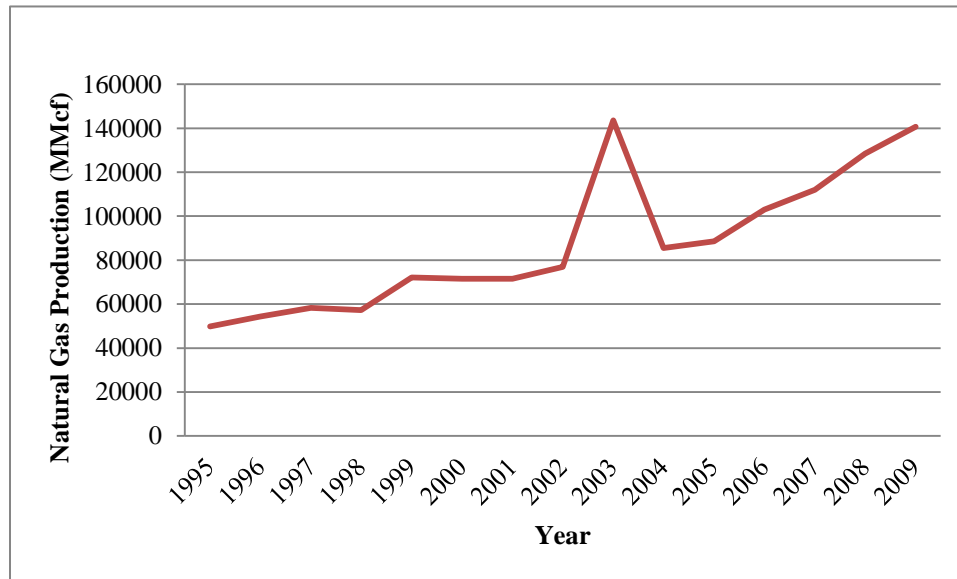
<sup>193</sup> Utah Rule R649-3-4.

Utah levies a conservation tax<sup>194</sup> of 0.2 percent on the value<sup>195</sup> at the well of natural gas produced, saved and sold or transported from premises where produced. The proceeds collected from this fee are deposited into the Utah Oil and Gas Conservation Account. Account money is dedicated<sup>196</sup> to administration of the fund, the plugging and reclamation of abandoned oil and gas wells, and education programs addressing issues of the mineral and petroleum resources and industries.

## Virginia

Virginia was ranked as the 16<sup>th</sup> largest natural gas producing state by 2009 production. Over a 15 year period beginning in 1995, production of natural gas in the Commonwealth has increased steadily. A sharp production spike occurred in 2003 before returning to a more normal level in 2004. Figure 19 provides production figures for this time frame.

**Figure 19 Virginia Natural Gas Production 1995-2009**



Energy Information Administration, State Energy Data System.

A small portion of Marcellus Shale deposits are located in Virginia. For the counties contacted in this study, any natural gas produced from this type of formation is taxed in the same manner as other natural gas produced.

### *Real Property Tax*

Because the State does not provide any guidance for valuation or assessment, natural gas real property in Virginia is assessed for taxation at the local level. Dickenson and Wise are the two largest natural gas producing counties in Virginia (VEPT 2011). Natural gas real property is

<sup>194</sup> Utah Code §40-6-14.

<sup>195</sup> Utah Code §59-5-103.1.

<sup>196</sup> Utah Code §40-6-14.5.

valued at fair market value using the cost approach<sup>197</sup> in Dickenson County (Yates 2011). While the cost approach is an unusual valuation method for real estate, it is used in Dickenson County because certain production equipment, such as compressor stations, are considered real property and therefore taxed at the real estate tax rate (Yates 2011). The county real estate property tax of \$0.60 per \$100 of value is then levied.

To value reserves in Dickenson County, a sales analysis of the past six years of natural gas sales is used (Yates 2011). This average sales price is multiplied by several factors, including a royalty rate factor for the owner of the property, to determine a valuation per acre. This valuation is used in increments of \$100 per acre. A value below \$100 would receive a valuation of \$100 per acre. A value between \$100 and \$200 would receive a valuation of \$200 per acre. As Dickenson County is currently conducting its six year assessment cycle, the value of reserve property has yet to be determined. The result of the last assessment cycle was a valuation of \$100 per acre for reserve natural gas property.

Natural gas real property in Wise County is assessed using four categories established by the American Petroleum Institute (Mullens 2011). The assessed value of natural gas wells is determined using the per linear foot cost<sup>198</sup> of the well per year. This cost is multiplied by the depth of the well and the depreciation rate. This calculation is provided in Equation 7.

#### **Equation 7 Valuation of Natural Gas Wells in Wise County, VA**

$$\text{Value} = \text{Cost per Linear Foot} \times \text{Depth of Well} \times \text{Depreciation Rate}$$

The full value is multiplied by the real estate tax rate of \$0.57 per \$100 of value. Wise County does not impose a property tax on natural gas reserves (Mullens 2011).

#### *Personal Property Tax*

Natural gas personal property in Virginia is assessed for taxation at the local level. Dickenson and Wise are the two largest natural gas producing counties in Virginia (VEPT 2011). In Dickenson County, personal property related to natural gas production, including rolling stock and production equipment not considered real estate, are valued using the cost approach (Yates 2011). A tax rate of \$1.69 per \$100 of value is then applied.

Wise County is unique in that the machinery and equipment used to produce natural gas in the county is taxed at the county's real estate rate (Mullens 2011). This equipment is valued at cost using a depreciation schedule and taxed at the rate of \$0.57 per \$100 of value.

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<sup>197</sup> While sales study and income approaches are considered in Dickenson County, the cost approach is determined the best valuation method (Yates 2011). The sales approach is not used because sales of natural gas property in the County are typically between subsidiaries and therefore not arms-length transactions. The income approach is not used because all natural gas produced is transported out of county and therefore there is no local sales data to consider. Using an income approach may convince producers to move to another location and is therefore considered unstable.

<sup>198</sup> The cost per linear foot is determined by estimated the prices and costs associated with drilling the well for production.

### *Severance Tax*

Virginia leaves the discretion of levying a severance tax<sup>199</sup> on the production of natural gas to the local level, capping the rate of tax at a maximum of 1 percent of gross receipts. The counties also reserve the right to levy a license tax on the production of natural gas. The license tax<sup>200</sup> applies to every person engaged in severing gas from the earth and is levied at a rate that is not to exceed 1 percent of gross receipts.

### *Corporation Income Tax*

Virginia levies a 6 percent corporation income tax<sup>201</sup> on corporations doing business in the State.

### *Sales and Use Tax*

Virginia levies a 4 percent sales tax<sup>202</sup> on the sale of natural gas in the State. A separate use tax<sup>203</sup> of the same rate is also levied. Natural gas delivered to consumers through mains, lines or pipes is exempt<sup>204</sup> from these taxes.

### *Permits, Bonds and Other Environmental Taxes or Fees*

Virginia requires natural gas producers to pay a permit fee<sup>205</sup> of \$130 before the drilling or deepening of a well can begin. Bonds<sup>206</sup> are also required to ensure proper plugging of the well and reclamation of the drilling site. The amount of the bond must be at least the sum of \$10,000 per well and \$2,000 per acre of disturbed land. In lieu of individual bonds, a blanket bond can be posted dependent on the number of wells:

- \$25,000 for up to 15 wells
- \$50,000 for 16 to 30 wells
- \$75,000 for 31 to 50 wells
- \$100,000 for 51 or more wells.

A portion of the revenue generated from the license fee can be allocated<sup>207</sup> to the “repair or enhancement of existing water or sewer systems or lines in areas with natural water supplies which are insufficient from the standpoint of quality or quantity” (Yates 2011). This portion is equivalent to one-fourth of the three-fourths of revenue allocated to the Coal and Gas Road Improvement Fund. The county or city can choose whether to initiate this option depending on the degree by which they determine natural gas and other mineral extraction has affected water supplies and other environmental factors.

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<sup>199</sup> Code of Virginia §58.1-3286.

<sup>200</sup> Code of Virginia §58.1-3712.

<sup>201</sup> Code of Virginia §58.1-400.

<sup>202</sup> Code of Virginia §58.1-603.

<sup>203</sup> Code of Virginia §58.1-604.

<sup>204</sup> Code of Virginia §58.1-609.1.

<sup>205</sup> Code of Virginia §45.1-361.29(C).

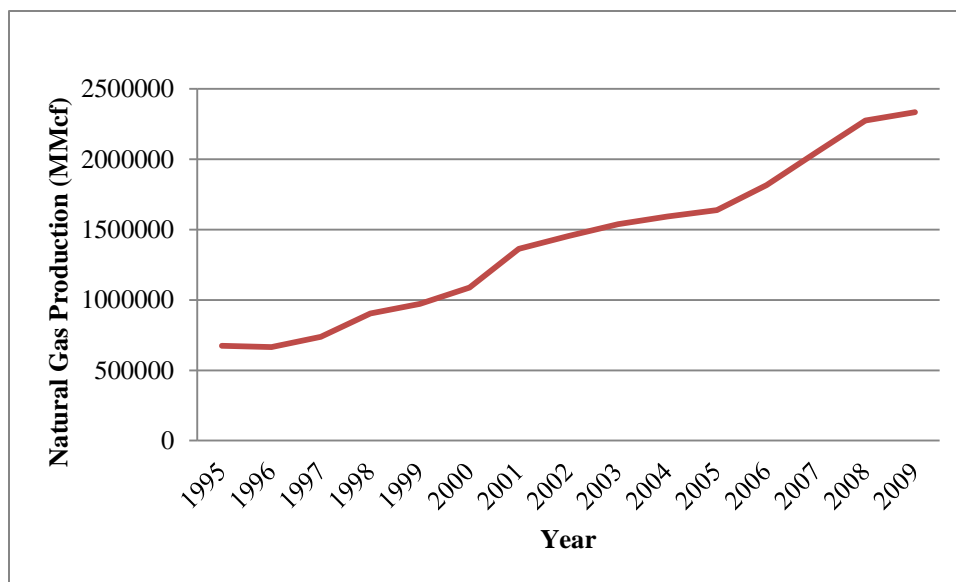
<sup>206</sup> Code of Virginia §45.1-361.31.

<sup>207</sup> Code of Virginia §58.1-3713.

## Wyoming

Wyoming was ranked as the 3<sup>rd</sup> largest natural gas producing state by 2009 production. Natural gas production in the State has been steadily increasing for the previous 15 years. The only decline occurred between 1995 and 1996 when production declined by 7,739 MMcf. A graphical representation of this data is provided in Figure 20.

**Figure 20 Wyoming Natural Gas Production 1995-2009**



Energy Information Administration, State Energy Data System.

### *Real Property Tax*

Natural gas real property is exempted<sup>208</sup> from taxation in Wyoming.

### *Personal Property Tax*

Natural gas personal property is exempted<sup>209</sup> from taxation in Wyoming.

### *Severance Tax*

A severance tax<sup>210</sup> of 6 percent is levied on natural gas produced in the State of Wyoming. This tax rate is imposed by both the Wyoming Constitution and Wyoming Statute as a 1.5 percent tax and a 4.5 percent tax, respectively.

### *Corporation Income Tax*

Income tax laws in Wyoming were repealed in 1998. There is no corporation income tax<sup>211</sup> imposed on natural gas companies in the State.

<sup>208</sup> Wyoming Statutes §39-11-105(a)(xxviii).

<sup>209</sup> *Ibid.*

<sup>210</sup> Wyoming Statutes §39-14-204.

<sup>211</sup> Wyoming Statutes §39-7-101.

### *Sales and Use Tax*

Wyoming levies a sales tax<sup>212</sup> of 3 percent on the sale of natural gas in the State. Natural gas sold for the following uses is exempt:<sup>213</sup>

- Manufacturing, processing or agriculture when consumed directly in one of these processes
- Intrastate transportation of natural gas by pipeline
- Sales of the services provided by professional engineers, geologists or those in similar professions when analyzing and preparing for a gas well.

A use tax<sup>214</sup> of the same rate is also imposed. The exemptions which apply to the use tax are similar to those applied to the sales tax.

### *Permits, Bonds and Other Environmental Taxes or Fees*

A permit fee of \$50 is required to drill or deepen wells in the State (WYSOS 2011). Wyoming also requires for each natural gas well a bond dependent on the well depth (WYSOS 2011):

- \$10,000 for wells less than 2,000 feet in depth
- \$20,000 for wells 2,000 feet in depth or more.

In lieu of the above bonds, a blanket bond of \$75,000 may be posted to cover all wells regardless of depth (WYSOS 2011). These bonds are meant to ensure the proper plugging of wells after production has ceased.

In addition to the severance tax, a conservation tax is charged in Wyoming on the fair market cash value of all natural gas produced, sold and transported within the State. The fair market cash value<sup>215</sup> can be determined using various methods, including:

- Measurements of comparable sales
- Measurements of comparable value
- Netback
- Proportionate profits
- Modified netback.

This value is not to exceed 0.08 percent.<sup>216</sup> The Wyoming Oil and Gas Commission<sup>217</sup> is responsible for reducing or increasing the amount as expenses incurred may require. The most current rate, as of July 1, 2008, is set at 0.04 percent (SPEE 2011). It is also important to note that Wyoming uses revenue garnered from severance taxes to help fund reclamation, remediation and conservation efforts in the state (NCSL 2011).

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<sup>212</sup> Wyoming Statutes §39-15-104(a).

<sup>213</sup> Wyoming Statutes §39-15-105.

<sup>214</sup> Wyoming Statutes §39-16-104(a).

<sup>215</sup> Wyoming Statutes §39-14-203.

<sup>216</sup> Wyoming Statutes §30-5-116.

<sup>217</sup> Wyoming Statutes §30-5-104.

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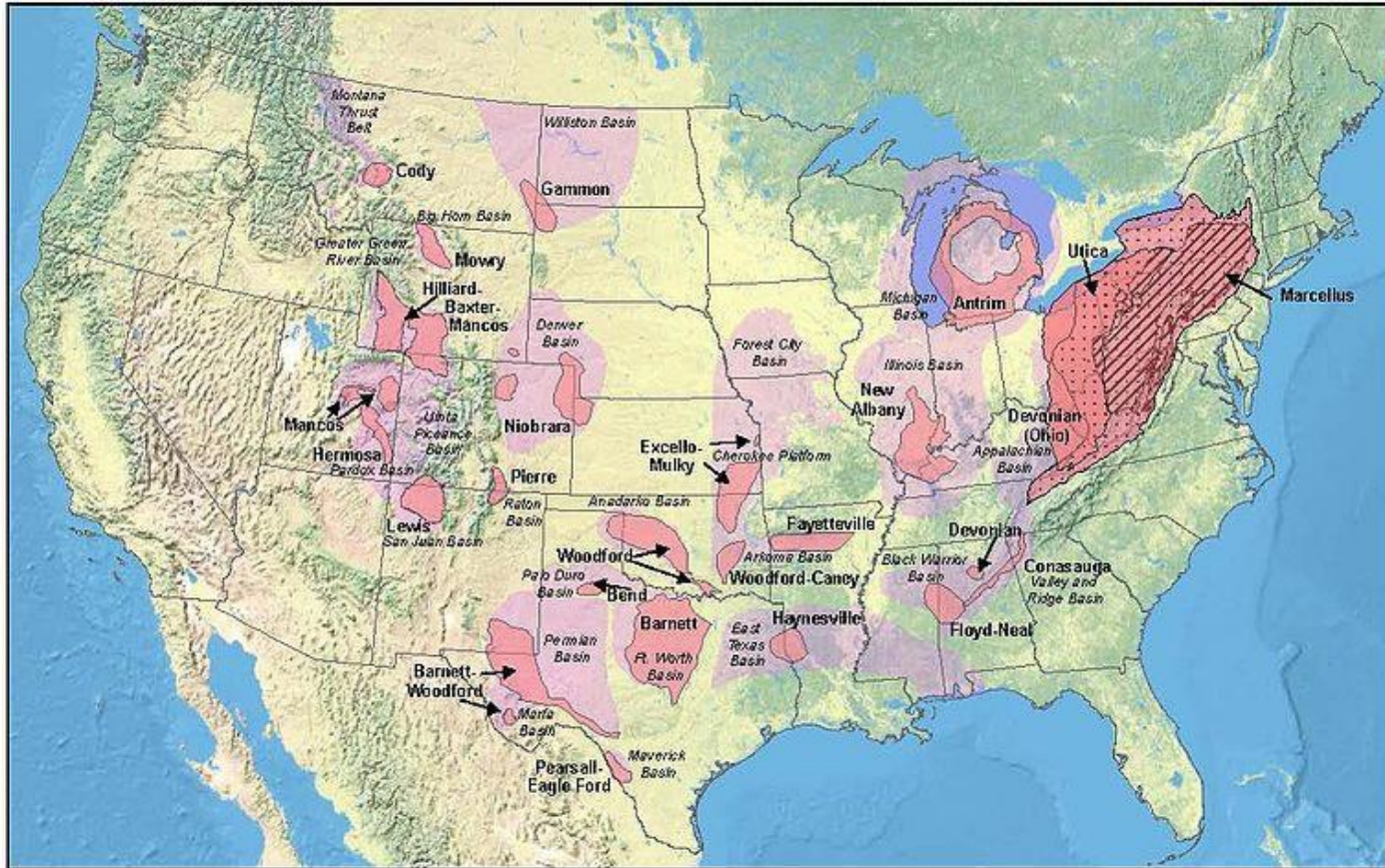
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## Appendix A United States Shale Gas Plays



### United States Shale Gas Plays

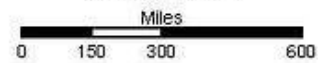


Shale Gas Plays  
Basins

#### Stacked Appalachian Plays

Marcellus  
Utica  
Devonian (OH shale)

November 2008



**Appendix B Natural Gas Production by State 2009**  
(million cubic feet)

<b>Rank</b>	<b>State</b>	<b>Natural Gas</b>
1	Texas*	7,284,520
2	Louisiana*	3,332,956
3	Wyoming*	2,335,328
4	Oklahoma*	1,857,777
5	Colorado*	1,499,070
6	New Mexico*	1,383,004
7	Arkansas*	679,952
8	Utah*	444,162
9	Alabama*	415,049
10	Alaska*	397,077
11	Kansas	354,440
12	California	276,575
13	Pennsylvania*	273,869
14	West Virginia*	264,436
15	Michigan	153,736
16	Virginia*	140,738
17	Kentucky*	113,300
18	Montana	98,245
19	Ohio*	88,824
20	Mississippi*	88,157
21	North Dakota	59,369
22	New York*	44,849
23	Tennessee*	5,478
24	Indiana	4,927
25	Nebraska	2,908
26	South Dakota	2,129
27	Illinois	1,443
28	Oregon	821
29	Arizona	712
30	Florida	257
31	Maryland*	43
32	Nevada	4

Energy Information Administration, State Energy Data System.

\* indicates states included.

**Appendix C Taxation Methods of Natural Gas Producing States**

<b>Real Property Tax</b>	<b>Personal Property Tax</b>	<b>Severance Tax</b>	<b>Corporation Income Tax</b>	<b>Sales and Use Tax</b>	<b>Permits, Bonds &amp; Other Taxes/Fees</b>
<b>West Virginia</b>					
60% of value determined by yield capitalization model	60% of fair market value considering three approaches to value	5% of gross value produced	8.5% of taxable income	6% of sales; exemptions apply	Permit \$650; bond \$5,000+; no other tax or fee imposed
<b>Alabama</b>					
No tax imposed	20% of fair market value using the AL Personal Property Appraisal Manual	2% of gross value; additional privilege tax (3.65% to 8%)	6.5% of taxable income	4% of the sales; exemptions apply	Permit \$300; bond by well depth; production revenue funds conservation
<b>Alaska</b>					
2% of fair market value considering three approaches to value	2% of fair market value considering three approaches to value	Production tax of 25% of net value; conditions apply	10 rates for increasing income (1%-9.4%)	No tax imposed	Permit \$100; bond \$100,000+; \$0.004 per 50 Mcf
<b>Arkansas</b>					
State guidelines with local valuation	State guidelines with local valuation	5 rates dependent on gas type (1.25%-5%)	6 rates for increasing income (1%-6.5%)	6% of gross receipts with local option	Permit \$300; bond \$3,000+; 10 mills per Mcf
<b>Colorado</b>					
87.5% or 75% of gross value dependent on recovery	29% of actual value	4 rates dependent on gross annual income (2%-5%)	4.63% of taxable income	2.9% of sales; exemptions apply	Permit <\$200; bond required; cap of 1.7 mills per dollar of value

**Appendix C Taxation Methods of Natural Gas Producing States (continued)**

<b>Real Property Tax</b>	<b>Personal Property Tax</b>	<b>Severance Tax</b>	<b>Corporation Income Tax</b>	<b>Sales and Use Tax</b>	<b>Permits, Bonds &amp; Other Taxes/Fees</b>
<b>Kentucky</b>					
\$0.122 per \$100 of value	No tax imposed	4.5% of gross value	3 rates for increasing income (4%-6%)	6% on gross receipts; exemptions apply	Permit \$300; bond \$500+; no other tax or fee imposed
<b>Louisiana</b>					
State guidelines with local valuation	State guidelines with local valuation	1% of gross receipts	5 rates for increasing income (4%-8%)	2% of sales; exemptions apply	Filing fee \$100; bond not specified; \$0.003 per Mcf
<b>Maryland</b>					
No tax imposed	No tax imposed	No tax imposed	8.25% of taxable income	6% of sales; exemptions apply	Permit required; bond up to \$100,000; no other tax or fee imposed
<b>Mississippi</b>					
State guidelines with local valuation	State guidelines with local valuation	\$4.50 per Mcf	3 rates for increasing income (3%-5%)	2 rates dependent on use (1.5% & 7%); exemptions apply	Permit \$600; bond \$20,000+; \$100 annual non-plugged well tax
<b>New Mexico</b>					
\$20 per \$1,000 of market value	\$20 per \$1,000 of market value	3.75% of taxable value	3 rates for increasing income (4.8%-7.6%)	5.125%-8.6875% of gross receipts dependent on business location	Permit required; bond \$5,000+; 0.19% taxable value of products sold

**Appendix C Taxation Methods of Natural Gas Producing States (continued)**

<b>Real Property Tax</b>	<b>Personal Property Tax</b>	<b>Severance Tax</b>	<b>Corporation Income Tax</b>	<b>Sales and Use Tax</b>	<b>Permits, Bonds &amp; Other Taxes/Fees</b>
<b>New York</b>					
State guidelines with local valuation	No tax imposed	No tax imposed	6.5% of taxable income	4% of sales; local option applies	Permit \$100+; bond \$2,500+; no other tax or fee imposed
<b>Ohio</b>					
State guidelines with local valuation	No tax imposed	\$0.025 per Mcf	Commercial activities tax, \$150 minimum	No tax imposed	Permit \$250+; bond required; portion of severance tax for conservation
<b>Oklahoma</b>					
Determined at local level	Determined at local level	3 rates dependent on price (1%-7%)	6% of taxable income	4.5% of sales; local option up to 2% & exemptions apply	Permit required; bond \$25,000; Portion of severance tax for conservation
<b>Pennsylvania</b>					
Determined at local level	Determined at local level	No tax imposed	9.99% of taxable income	6% of sales; exemptions apply	Permit \$100; bond \$2,500+; no other tax or fee imposed
<b>Tennessee</b>					
State guidelines with local valuation	State guidelines with local valuation	3% imposed on sale price	6.5% of net earnings	4.5% of sales; local option up to 2.75% & exemptions apply	Permit \$150; bond \$1,500+; funded by violation fees
<b>Texas</b>					
State guidelines with local valuation	State guidelines with local valuation	7.5% of market value of gas produced	0.5% of the taxable margin	6.25% of sales; local option (0.25%-2%) & exemptions apply	Permit \$200+; bond \$2/ft+; \$0.0007 per Mcf

**Appendix C Taxation Methods of Natural Gas Producing States (continued)**

<b>Real Property Tax</b>	<b>Personal Property Tax</b>	<b>Severance Tax</b>	<b>Corporation Income Tax</b>	<b>Sales and Use Tax</b>	<b>Permits, Bonds &amp; Other Taxes/Fees</b>
<b>Utah</b>					
100% of fair market value using discounted cash flow analysis	100% of fair market value using discounted cash flow analysis	2 rates (3% & 5%) dependent on price	5% of taxable income	2 rates (2% & 4.7%) dependent on use	Permit required; bond \$1,500+; 0.2% of produced value
<b>Virginia</b>					
Determined at local level	Determined at local level	Determined at local level; 1% cap	6% of taxable income	4% of sales	Permit \$130; bond \$10,000+; portion of license fee revenues
<b>Wyoming</b>					
No tax imposed	No tax imposed	6% of natural gas produced	No tax imposed	3% of sales	Permit \$50; bond \$10,000+; at most 0.08% of fair market cash value, currently 0.04%