

A SURVEY OF STATE SEVERANCE TAXES ON NATURAL GAS: PERSPECTIVE FOR PENNSYLVANIA

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ABSTRACT: Advances in natural gas extraction capabilities have resulted in a dramatic increase in gas production from the Marcellus Shale formation underlying Pennsylvania and several neighboring states. These developments have engendered a debate over whether or not Pennsylvania should impose a severance tax on natural gas. The following article briefly summarizes these developments and explains the concept of a severance tax. It then examines potential legal barriers to the imposition of such a tax, concluding that neither the state nor federal constitution prohibits the Commonwealth from imposing a severance tax. Finally, it presents a survey of the tax-structuring approaches taken by other natural gas producing states and offers some basic insights arising from that data.

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I. Introduction

Advances in natural gas extraction technology have resulted in a dramatic increase in gas production from the Marcellus Shale formation underlying Pennsylvania and several neighboring states. These developments have engendered a debate in Pennsylvania over whether or not the Commonwealth should impose a severance tax on natural gas. The following article presents an effort to inform two main components of that debate: first, the nature of Pennsylvania's legal authority to enact such a tax; second, other states' approaches to taxing natural gas production.

The article proceeds in three parts. This Part will briefly summarize recent developments in gas production and explain the concept of a severance tax. Part II examines potential legal barriers to the imposition of such a tax, concluding that neither the state nor federal constitution prohibits the Commonwealth from imposing a severance tax. Part III surveys the tax-structuring approaches taken by other natural gas producing states, for the first time presenting state policy data alongside recently released shale gas production data and comprehensive citations to state tax measures for easy legislative reference. It then offers some basic insights that can be drawn from the data presented, including confirmation that Pennsylvania is unique among gas producing states in imposing no state or local gas production taxes. The article concludes, in Part IV, with a brief discussion of how the information presented here might be relevant in the context of the current political climate in Pennsylvania, which appears to favor the adoption of impact fees or other measures compensating localities for externalities created by gas production activities.

A. Recent State and National Developments in Natural Gas Production

The Marcellus Shale formation is a layer of sedimentary rock that underlies eight states, including most of Pennsylvania. Geologists and the oil and gas industry have been aware of the presence of large quantities of natural gas in the Marcellus Shale since the 1930s, but the depth of the formation and dispersion of the gas throughout pockets of the impermeable shale made commercial extraction economically unfeasible.¹ In 2002, however, Texas gas producers began combining the use of hydraulic fracturing technology, developed in the previous decade, with horizontal drilling techniques to extract commercially viable quantities of natural gas from the geologically similar Barnett Shale formation in central Texas.² The advances initiated in the Barnett Shale have had dramatic results for both the United States and Pennsylvania.

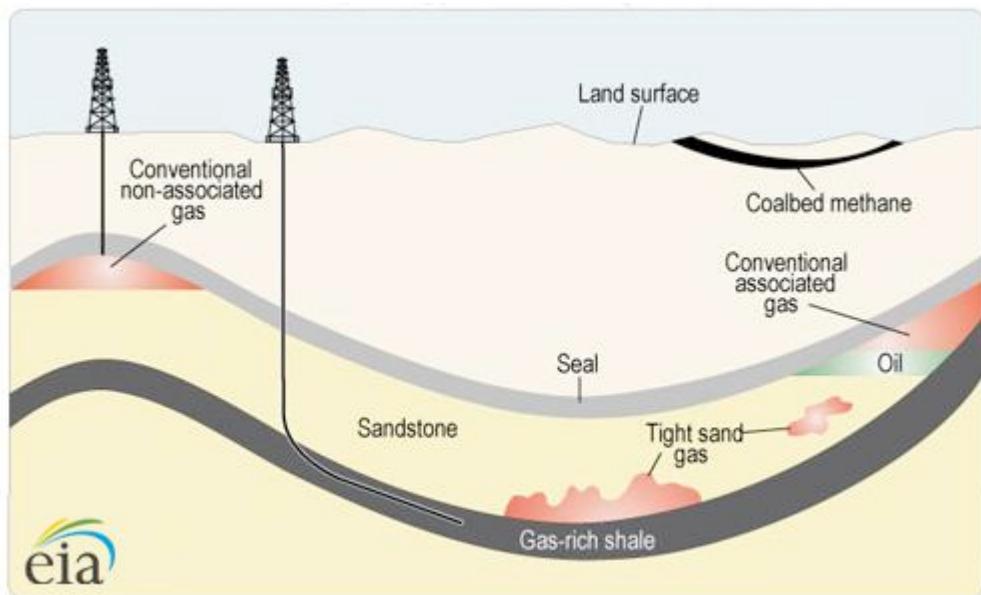
The new extraction capability has resulted in tremendous upward revision of estimates of recoverable shale gas resources and anticipated production. In 2003, the National Petroleum Council estimated national shale gas reserves to be 35 Trillion cubic

¹ John A. Harper, *The Marcellus Shale—An Old “New” Gas Reservoir in Pennsylvania*, PA. GEOLOGY, Spring 2008, at 3-5. See also Thomas A. Mitchell, *The Future of Oil and Gas Conservation Jurisprudence: Past as Prologue*, 49 WASHBURN L.J. 379, 405 (2010).

² J. Zach Burt, *Playing the "Wild Card" in the High-Stakes Game of Urban Drilling: Unconscionability in the Early Barnett Shale Gas Leases*, 15 TEX. WESLEYAN L. REV. 1, 5-6 (2008) (explaining that an increase in natural gas prices made application of the new techniques to shale production economically feasible); Loyd E. East, Jr. et. al., *Successful Application of Hydratjet Fracturing on Horizontal Wells Completed in a Thick Shale Reservoir*, Paper SPE 91435, presented at SPE Eastern Regional Meeting, Charleston, Wv., Sept. 15, 2004, available at <http://www.onepetro.org/mslib/servlet/onepetropreview?id=00091435> (identifying 2002 as the first year horizontal drilling and hydraulic fracturing were employed together).

feet (“Tcf”); five years later, the Petroleum Gas Committee estimated 615 Tcf.³ Based on the most recent production and exploration data, the U.S. Energy Information Administration (“EIA”) this year estimated reserves at 827 Tcf.⁴ Based on that number, the EIA anticipates U.S. shale gas production to double in the next fifteen years, becoming the country’s largest source of natural gas. According to these projections, shale gas, which supplied 3.5% of U.S. energy consumption in 2009, could supply about 11% of the country’s energy by 2035.⁵

Figure 1: Illustration of Shale Gas and Other Resources⁶



³ MIT ENERGY INITIATIVE, INTERIM REPORT, THE FUTURE OF NATURAL GAS 11 (2010).

⁴ ENERGY INFORMATION ADMINISTRATION, REPORT NO. 0383ER, ANNUAL ENERGY OUTLOOK 2011 EARLY RELEASE OVERVIEW 8 (2011).

⁵ The EIA projections place shale production at 45% of total gas production by 2035 (with the next largest source, tight sands gas, contributing only 22%) and estimate natural gas production to supply 24% of total national energy consumption. *Id.* at 6-9.

⁶ Energy Information Administration, *What is shale gas and why is it important?*, Dec. 16, 2010, http://www.eia.doe.gov/energy_in_brief/about_shale_gas.cfm (last visited February 22, 2011).

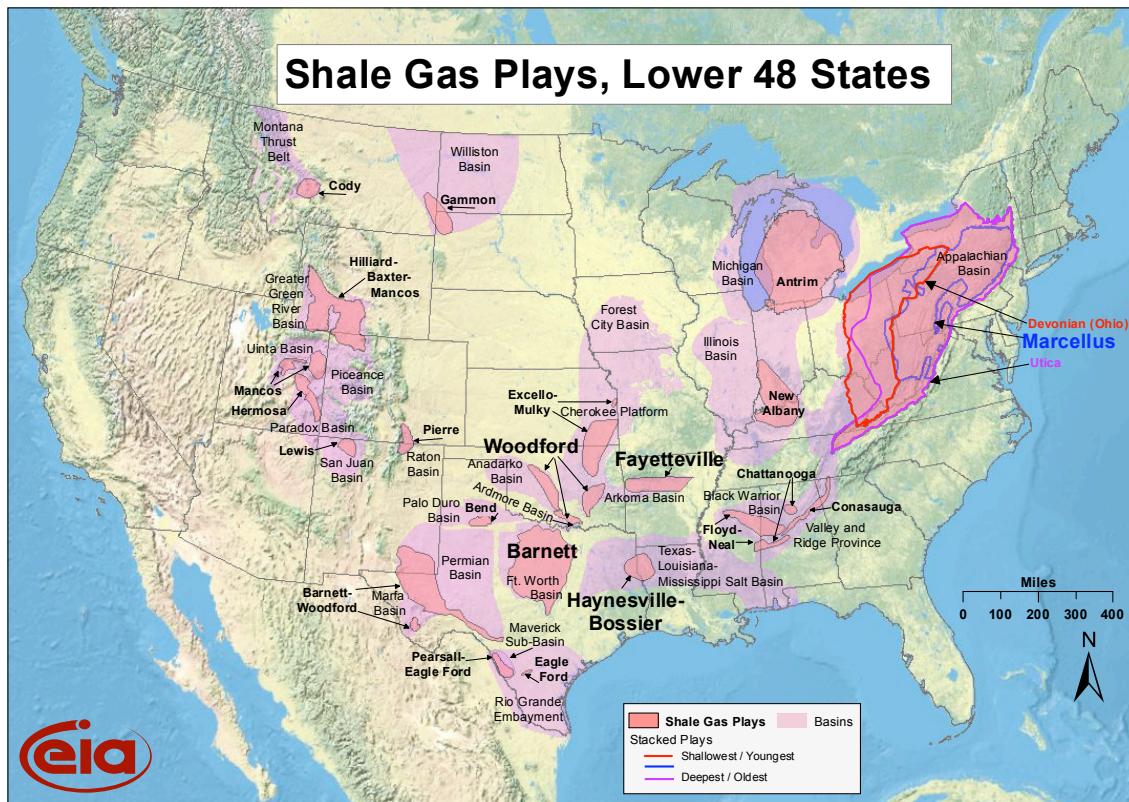
At the center of this anticipated surge of development is the Marcellus Shale, underlying large portions of Ohio, New York, West Virginia, and most of Pennsylvania, as shown below in Figure 2. Given the high variability of subsurface conditions, there is considerable uncertainty about future production from shale plays, but one geologist at Pennsylvania State University has estimated that the Marcellus contains over 360 Tcf of gas, and several studies have suggested the formation could contain enough gas to accommodate all U.S. energy consumption for twenty years.⁷

The Marcellus Shale is the least developed of major U.S. shale basins, but its proximity to large Northeastern markets, which have traditionally relied on imported gas, results in break-even wellhead gas prices that are lower than those in other U.S. shale plays. This factor, combined with the sheer size of the Marcellus, has created enormous interest in its development.⁸

⁷ Mary Esch, *Gas Yield from Marcellus Shale Goes Up*, CHARLESTON GAZETTE, Nov. 4, 2008, at A6, available at 2008 WLNR 21144443. See also, TIMOTHY J. CONSINDINE ET. AL., PENN STATE UNIVERSITY, THE ECONOMIC IMPACTS OF THE PENNSYLVANIA MARCELLUS SHALE NATURAL GAS PLAY: AN UPDATE iv (2010) (industry funded study finding that “the Marcellus Shale has the potential to be the second largest gas field in the world”). But see ENERGY INFORMATION ADMINISTRATION, REPORT No. 0383ER, ANNUAL ENERGY OUTLOOK 2011 EARLY RELEASE OVERVIEW 8 (2011) (“Well characteristics and productivity vary widely. . . . Many shale formations, such as the Marcellus Shale, are so large that only a small portion of the entire formation has been intensively production-tested.”).

⁸ MIT ENERGY INITIATIVE, INTERIM REPORT, THE FUTURE OF NATURAL GAS 64-65 (2010). See also Michael De La Merced & Jeffrey Cane, *Confident Deal Makers Pulled Out Checkbooks in 2010*, N.Y. TIMES DEALBOOK, Feb. 23, 2011, <http://dealbook.nytimes.com/2011/01/03/confident-deal-makers-pulled-out-checkbooks-in-2010> (identifying “[a] desire to expand in natural gas, especially in the coveted Marcellus Shale region” as a primary driver of the 23% increase in merges and acquisitions in 2010); Pramod Kulkarni, *Arrival of IOCs and Increasing Legislative Interest Signal Critical Mass for Marcellus*, WORLD OIL, March 2010 (“In 2009, the

Figure 2: Map of Shale Gas Plays, Lower 48 States⁹



If the Marcellus formation represents the most promising theatre of projected U.S. gas production, Pennsylvania is perhaps its center stage.¹⁰ The first unconventional well (a term frequently used to indicate shale gas wells employing horizontal drilling and

Marcellus Shale achieved critical mass—advancing from a frontier niche of US independents to the world’s leading onshore natural gas play.”).

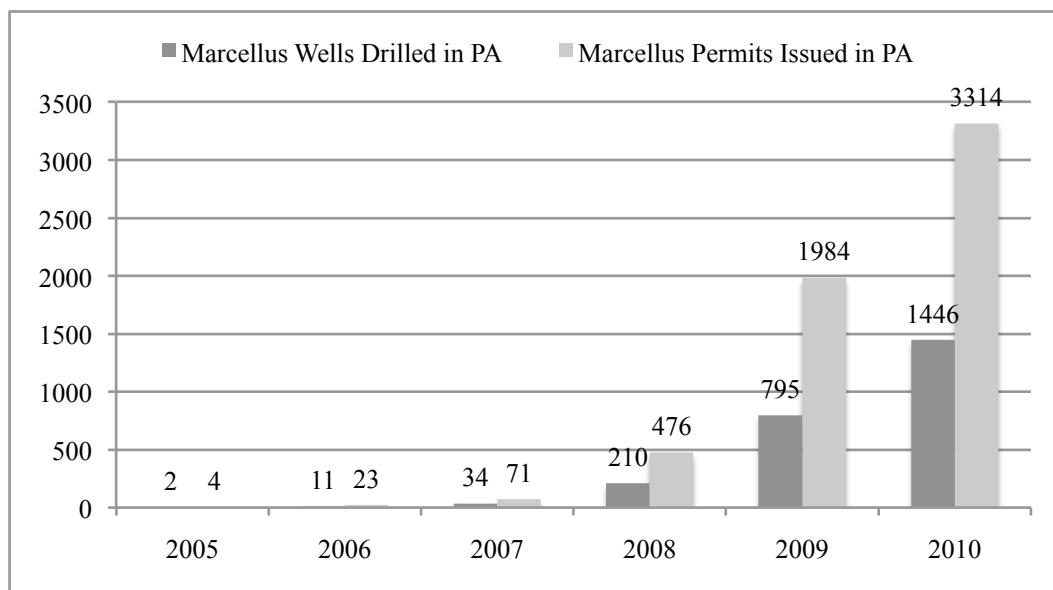
⁹ Energy Information Administration, Shale Gas Plays, Lower 48 States, http://www.eia.gov/oil_gas/rpd/shale_gas.pdf (last visited February 22, 2011).

¹⁰ CORNELL UNIVERSITY COOPERATIVE EXTENSION NATURAL GAS RESOURCE CENTER, WHERE IS THE MARCELLUS SHALE BEING DEVELOPED? 3, <http://cce.cornell.edu/EnergyClimateChange/Natural%20Gas%20Dev/Documents/PDFs/Where%20is%20the%20Marcellus%20Shale%20being%20developed.pdf> (last visited Feb. 22, 2011) (describing a “fairway” through central Pennsylvania as the key locus of Marcellus production).

hydraulic fracturing), drilled in 2003, began producing gas in 2005.¹¹ Since then, the Commonwealth has seen a “frenzy” of gas development activity, in some cases transforming small towns to busy drilling hubs in a matter of months.¹² As shown in Table 1, the number of Marcellus wells drilled in Pennsylvania rose from two in 2005, to 1,446 in 2010, with an even larger number of permits issued each year.

The sharp rise in gas production in Pennsylvania has engendered vigorous public debate as to whether Pennsylvania should impose a severance tax analogous to those enacted by most other natural gas producing states. The following section will provide a basic introduction to severance taxes and the severance tax debate in Pennsylvania.

Table 1: Marcellus Wells Permitted and Drilled in PA (2005-2010)¹³



¹¹ U.S. DEPARTMENT OF ENERGY, MODERN SHALE GAS DEVELOPMENT IN THE UNITED STATES: A PRIMER 21 (2009); John A. Harper, *The Marcellus Shale—An Old “New” Gas Reservoir in Pennsylvania*, PA. GEOLOGY, Spring 2008, at 9.

¹² Clifford Krauss, *There's Gas in Those Hills*, N.Y. TIMES, Apr. 8, 2008, at C1 (“a frenzy unlike any seen in decades is unfolding here in rural Pennsylvania”); Kris Maher, *Gas Rush Reshapes Tiny Towanda*, THE WALL STREET JOURNAL, Dec. 14, 2010 at A3.

¹³ PA. DEPARTMENT OF ENVIRONMENTAL PROTECTION, BUREAU OF OIL AND GAS MANAGEMENT, 2010 YEAR END REPORT, 4 (2011) (permits issued); PA. DEPARTMENT OF

B. Brief Introduction to Severance or Extraction Taxes

Most oil and gas producing states have enacted statutes levying a tax on the extraction or severance of resources from the earth; these are not taxes upon property, but upon the business of removing the resource from the ground.¹⁴ Severance taxes usually apply to non-renewable resources like coal, stone, oil and natural gas, but can also include renewable resources like timber or fish.¹⁵ In some states these taxes are in lieu of property taxes, but in others they are additional taxes.¹⁶ In some states the burden of the tax is borne proportionally by the well operator and other parties with an interest in the gas, but in others the tax is borne by the lessee or producer alone.¹⁷ States distribute revenues raised by severance taxes in a variety of ways: the revenue may be directed to general operating expenses, may be earmarked for specific purposes like conservation projects or education, or may be limited to costs associated with gas extraction.¹⁸ Some states, including Alaska, New Mexico and Wyoming, transfer part of the revenue to a permanent fund intended to provide an alternative revenue source upon exhaustion of energy resources.¹⁹

¹⁴ ENVIRONMENTAL PROTECTION, BUREAU OF OIL AND GAS MANAGEMENT, 2010 YEAR END WORKLOAD REPORT, 1 (2011) (wells drilled).

¹⁵ 4 SUMMERS OIL AND GAS § 49:2 (3d ed. 2010). *See also* Table 3 *infra* Part III.B.

¹⁶ MICHAEL WOOD & SHARON WARD, PENNSYLVANIA BUDGET AND POLICY CENTER, RESPONSIBLE GROWTH: PROTECTING THE PUBLIC INTEREST WITH A NATURAL GAS SEVERANCE TAX 23 (2009).

¹⁷ 4 SUMMERS OIL AND GAS § 49:2 (3d ed. 2010).

¹⁸ *Id.*

¹⁹ WOOD & WARD, *supra* note 15, at 24-25.

¹⁹ *Id.*

Pennsylvania has a long history of oil, gas and coal production and, in 2009, the state was the nation's fifth largest producer of coal and fifteenth largest producer of natural gas.²⁰ Despite its resource wealth, however, the Commonwealth has never imposed a tax on the severance of natural resources. Today, it is the only major fossil fuel producing state that does not levy a mineral extraction tax.²¹

Former Governor Edward G. Rendell signed a law requiring the Pennsylvania General Assembly to enact a severance tax by October 1, 2010, but the chamber took no action on the numerous bills introduced during the 2009-2010 legislative season.²² Despite the subsequent election of Governor Tom Corbett, who opposes an extraction tax, debate on the issue has continued in the Pennsylvania legislature; proposals introduced in February 2011 included both a new severance tax bill and a similar impact fee measure.²³

The following sections will review Pennsylvania's authority to impose a severance tax on natural gas and survey extraction taxes imposed by other natural gas

²⁰ See, Daniel Yergin, *The Prize: The Epic Quest for Oil, Money and Power* 2-18 (1990) (tracing the birth of the modern oil industry to the world's first oil well, drilled in Titusville, Pa. in 1859); John A. Harper, *The Marcellus Shale—An Old “New” Gas Reservoir in Pennsylvania*, PA. GEOLOGY, Spring 2008 (traditional natural gas production in Pennsylvania dates back to the 1930s); ENERGY INFORMATION ADMINISTRATION, REPORT No. DOE/EIA-0584, ANNUAL COAL REPORT 2009 4 (2010).

²¹ WOOD & WARD, *supra* note 15, at 3. See also Table 3 *infra* Part III.B.

²² Francis A. Muracca, *The Marcellus Shale Formation: Pennsylvania’s Natural Gas Severance Tax Controversy*, Jones Day Commentary, October 23, 2010 at 2-3, http://www.jonesday.com/marcellus_shaleFormation (last visited Mar. 4, 2011).

²³ Marc Levy, *GOP Victory Could Boost Natural Gas Drilling*, ASSOCIATE PRESS FINANCE WIRE, Nov. 11, 2010; Tom Barnes, *Taxing Natural Gas is a Political Football in Pennsylvania*, PITTSBURGH POST-GAZETTE, Feb. 27, 2011, at B-7. See also Francis A. Muracca, *The Marcellus Shale Formation: Pennsylvania Lawmakers Face Severance Tax Hurdle*, Jones Day Commentary, Dec. 9, 2010 at 3 http://www.jonesday.com/marcellus_shale_tax_hurdle (describing the possibility of Gov. Corbett supporting a non-punitive severance tax or impact fees proposed by republican lawmakers).

producing states. While this discussion will conclude by identifying some key issues associated with such taxes, it will not attempt to engage with the economic literature regarding the efficiency of severance taxes in general, nor will it offer a final assessment of the desirability of adopting a severance tax in Pennsylvania.²⁴

II. Can Pennsylvania Impose a Severance Tax on Natural Gas?

This section will review Pennsylvania’s authority to impose a severance tax on natural gas production, reviewing potential challenges under both the United States and Pennsylvania constitutions. It concludes that neither the federal or state constitution prohibits Pennsylvania from imposing a severance tax on natural gas production.

A. The Federal Constitution Permits Pennsylvania to Impose a Severance Tax on Natural Gas

As the presence of severance taxes on natural gas in most gas-producing states suggests, the United States Constitution does not prohibit states from imposing taxes on

²⁴ Some economic literature suggests that severance taxes are inefficient. See, e.g., Allyn O. Lockner, *The Economic Effect of the Severance Tax on Decisions of the Mining Firm*, 4 NAT. RESOURCES J. 468 (1964) (concluding that severance taxes tend to reduce speed and total amount of extraction from a mine); ROBERT T. DEACON ET. AL., TAXING ENERGY: OIL SEVERANCE TAXATION AND THE ECONOMY (1990) (arguing that, because of the immobility of the natural resources being taxed, states tend to inefficiently overtax oil severance); Mark Brandly & A.H. Barnett, *The Irreversible Output Effects of Severance Taxes on Oil*, 27 PUBLIC FINANCE REVIEW 511 (1999) (suggesting that, by resulting in closure of wells that require substantial capital to re-open, severance taxes on oil result can in an irreversible decrease in output). But see Bernard L. Weinstein, *Who Pays the Severance Tax?*, 12 POLICY STUDIES JOURNAL 544, 537 (2005) (defending severance taxes as “both an efficient and equitable means of financing the public service costs associated with mineral extraction” and identifying energy prices as the key variable influencing production volume).

the severance of natural resources within their borders. The Supreme Court has, however, recognized certain limits on states' power to impose severance taxes or analogous measures. This section will review the principle Constitutional challenges that have been brought against severance taxes in an effort to clarify the limits of state power in this area.

1. Commerce Clause Challenges and Limitations

States may not impose taxes that impermissibly regulate interstate commerce in a manner reserved for the federal congress by the Commerce Clause of the United States Constitution.²⁵ Two leading cases identify a broad, but not unbounded, range of permissible state taxation of natural resources.

In *Commonwealth Edison Co. v. Montana*, the Supreme Court affirmed a ruling by the Montana Supreme Court upholding Montana's severance tax on coal.²⁶ The court rejected both Commerce Clause and Supremacy Clause challenges to the tax of up to thirty percent of the price of each ton of coal mined in the state (ninety percent of which was sold to out-of-state utility companies).

Because state taxes levied on a local activity preceding entry of the goods into interstate commerce may substantially affect interstate commerce, they are the proper focus of Commerce Clause inquiry. State severance taxes are therefore subject to the four-part test set forth in *Complete Auto Transit, Inc. v. Brady*. Under that test, a state tax

²⁵ "The Congress shall have Power . . . [t]o regulate Commerce...among the several States...." U.S. Const. art. I, § 8, cl. 3. See generally Walter Hellerstein, *Commerce Clause Restraints on State Taxation: Purposeful Economic Protectionism and Beyond*, 85 MICH. L.R. 758, 761 (1987) (reviewing the Supreme Court's most recent spate of state tax decisions and suggesting that the central policy consideration is the prevention of purposeful economic protectionism).

²⁶ 453 U.S. 609 (1981).

does not violate the commerce clause if it (1) is applied to an activity with a substantial nexus with the taxing state, (2) is fairly apportioned, (3) does not discriminate against interstate commerce, and (4) is fairly related to services provided by the state.²⁷

The challenge, brought by Montana coal producers, relied primarily on the fourth prong of *Brady*, attacking the fact that the incidence of the tax fell primarily on out-of-state consumers who received little if any services or benefits from Montana. Rejecting this argument and noting states' "considerable latitude in imposing general revenue taxes," the court held that the fourth prong is satisfied with respect to activities with sufficient nexus to the state as long as the tax is rationally related to that activity.²⁸ That is, as long as the severance tax is facially neutral and levied in a manner bearing some relationship to the amount of the resource received by the taxpayer, the test is satisfied.²⁹

The same year, however, the Supreme Court held, in *Maryland v. Louisiana*, that a "first-use tax" on natural gas imposed by Louisiana violated the commerce clause because the tax impermissibly discriminated against interstate commerce in favor of local interests.³⁰ The tax in question applied to gas originating not in Louisiana, but on the outer continental shelf ("OCS") (land miles off the States' coast in the Gulf of Mexico under that jurisdiction of the Federal Government) that was then piped into processing

²⁷ *Id.* at 617 (citing *Complete Auto Transit, Inc. v. Brady*, 430 U.S. 274, 279 (1977)).

²⁸ *Id.* at 622.

²⁹ *Id.* at 626 ("The simple fact is that the appropriate level or rate of taxation is essentially a matter for legislative, and not judicial, resolution [so long as it is not so arbitrary to become a seizure of property]." (citing *Halson & Randolph v. Kentucky*, 279 U.S. 245, 252 (1929)). *See also Swin Res. Sys., Inc. v. Lycoming County Solid Waste Dept.*, 883 F.2d 245, 254 (3d Cir. 1989) (characterizing *Commonwealth Edison* as standing for the proposition that, where a state has a resource peculiar to that state, it may "exploit [its] monopoly position by exporting tax burdens to other states through facially neutral tax statutes").

³⁰ 451 U.S. 725, 754-755 (1981).

facilities in Louisiana before shipment to other states.³¹ The overall effect of the tax, the rate of which was equal to Louisiana's severance tax on gas produced in the state, was "to equalize competition between gas produced in Louisiana and subject to the state severance tax . . . and gas produced elsewhere not subject to a severance tax."³²

As the result of a system of credits and exemptions, the tax applied to out-of-state consumers of the OCS gas, but not to in-state users. The Court found that this facially discriminatory system impermissibly favored local businesses and consumers in violation of the third prong of the *Brady* test.³³ In finding no legitimate state interest advanced by the facially discriminatory state measures, the court contrasted permissible severance taxes on in-state production with the Louisiana system in question:

To be sure, Louisiana has an interest in protecting its natural resources, and, like most States, has chosen to impose a severance tax on the privilege of severing resources from its soil. But the First-Use Tax is not designed to meet these same ends since Louisiana has no sovereign interest in being compensated for the severance of resources from the federally owned OCS land.³⁴

Commonwealth Edison Co. v. Montana and *Maryland v. Louisiana*, taken together, demonstrate that states enjoy broad, but not unlimited, power to impose severance taxes without violating the Commerce Clause. Provided that Pennsylvania enacted a severance tax on natural gas that bore a rational relationship to the benefit

³¹ *Id.* at 728-729.

³² *Id.* at 732.

³³ *Id.* at 754-755.

³⁴ *Id.* at 758 (citations omitted).

received by a party holding an interest in the gas produced in the Commonwealth (e.g. a tax based on the volume or value of gas), and that did not facially discriminate between in and out-of-state parties, the tax would very likely withstand any Commerce Clause challenge.

2. Supremacy Clause and Federal Preemption Challenges and Limitations

Pursuant to the Supremacy Clause, states may not enact taxes that conflict with federal law or that attempt to regulate an area already being regulated by the federal government.³⁵ Supremacy Clause challenges were brought against state severance taxes in *Commonwealth Edison Co. v. Montana*, *Maryland v. Louisiana*, and *Exxon Corp. v. Eagerton*.³⁶

In *Commonwealth Edison Co.*, Montana coal producers argued that the severance tax was preempted by the Mineral Lands Leasing Act. In that law, Congress proscribed the calculation of royalty payments to the federal government by miners extracting coal from federal lands. By imposing a severance tax, the challengers argued, the Montana

³⁵ “This Constitution, and the Laws of the United States which shall be made in Pursuance thereof...shall be the supreme Law of the Land....” U.S. Const. art. VI, cl. 2. See also *Pacific Gas & Electric Co. v. State Energy Resources Conservation & Development Comm'n*, 103 S.Ct. 1713, 1722 (“Absent explicit preemptive language, Congress’s intent to supercede state law altogether may be found from a ‘scheme of federal regulation so pervasive as to make reasonable the inference that Congress left no room for the States to supplement it,’ ‘because the Act of Congress may touch a field in which the federal interest is so dominant that the federal system will be assumed to preclude enforcement of state laws on the same subject,’ or ‘because the object sought to be obtained by federal law and the character of obligations imposed by it may reveal the same purpose.’” (quoting *Fidelity Federal Savings & Loan Assn. v. de la Cuesta*, 102 S.Ct. 3014, 3022 (1982); *Rice v. Santa Fe Elevator Corp.*, 331 U.S. 218, 230 (1947))).

³⁶ 453 U.S. 609 (1981); 451 U.S. 725 (1981); 462 U.S. 176 (1983).

legislature discouraged coal production in the state, thereby reducing the amount of federal royalties received from production on federal lands in Montana pursuant to the Mineral Lands Leasing Act and “substantially frustrating” the purpose of that federal law.³⁷

Rejecting this argument, the court reasoned that, even assuming Montana’s severance tax had the effect of reducing the royalty payments to the federal government, that fact would not be sufficient to show that the tax was inconsistent with the Mineral Lands Leasing Act. Noting a proviso in the act disclaiming any effect on the rights of states, the court held that, to the contrary of the challengers allegations, the federal law in fact “expressly authorized the States to impose severance taxes on federal lessees without imposing any limits on the amount of such taxes.”³⁸

In *Maryland v. Louisiana*, however, the Supreme Court held that the Louisiana First-Use Tax was preempted by the National Gas Act, and therefore violated the Supremacy Clause. That law protected natural gas owners’ right to recover from their customers certain costs associated with gas production, processing, and transportation, and empowered the Federal Regulatory Commission (“FERC”) to determine the proper allocation of production costs between owners, producers, and consumers of gas in interstate commerce. The parties challenging the First-Use Tax argued that by requiring that the incidence of the tax fall on out of state users of OCS gas passing through Louisiana the state had frustrated the purpose of the section of the Act that empowered FERC to determine what costs could be borne by consumers. Adopting this reasoning and noting that “a statute is void . . . where the law ‘stands as an obstacle to the

³⁷ 453 U.S. 609, 631 (1981).

³⁸ *Id.*

accomplishment and execution of the full purposes and objectives of Congress,”³⁹ the Court held the Louisiana First-Use Tax unconstitutional.³⁹

The Court again delineated the boundary between the states’ and FERC’s authority in *Exxon Corp. v. Eagerton*. In *Eagerton*, Alabama gas producers brought a Supremacy Clause challenge against an Alabama statute that increased the state’s severance tax while also simultaneously barring producers from passing the increased tax on to consumers and exempting royalty owners from incidence of the increase.⁴⁰

The challenge asserted that the provision barring producers from passing on the cost of the tax to consumers was preempted by the Natural Gas Policy Act (“NGPA”), a section of which provided that producers could exceed a federally imposed price ceiling to the extent necessary to recover the cost of a state severance tax. By preventing producers from recovering the cost of the tax from consumers, the challengers argued, the Alabama legislature had impermissibly frustrated the purpose of the NGPA.

The court rejected this interpretation the NGPA, explaining that the provision merely identified an exception to the price ceiling imposed by the Act and did not grant producers an affirmative right to collect the cost of state severance tax from consumers.⁴¹ Nevertheless, the court held that the Alabama law was unconstitutional as applied to out-of-state consumers because, like the Louisiana First-Use Tax, it attempted to allocate costs between producers and consumers of gas in interstate commerce (a responsibility specifically entrusted to FERC under federal law):

³⁹ 451 U.S. 725, 746-751 (1981) (quoting *Hines v. Davidowitz*, 312 U.S. 52, 67 (1940)).

⁴⁰ 462 U.S. 176, 179-180 (1983).

⁴¹ *Id.* at 183; 15 U.S.C. § 3320(a) (Supp. V).

Just as the statute at issue in *Maryland v. Louisiana* was preempted because it effectively shift[ed] the incidence of certain expenses . . . to the ultimate consumer of the processed gas without the prior approval of the FERC, Alabama's pass-through prohibition was preempted, insofar as it applied to sales of gas in interstate commerce, because it required that certain expenses be absorbed by producers.

With respect to in-state consumers, on the other hand, the Alabama law was permissible. Because the NGPA explicitly envisioned state regulation of intra-state energy markets, the court explained, the provision preventing producers from passing the increased tax through to in-state consumers was not preempted by federal legislation and therefore did not violate the Supremacy Clause.⁴²

3. Contract Clause Challenges and Limitations

The gas producers in *Exxon Corp. v. Eagerton* also attacked the provision of the Alabama law exempting royalty owners from the severance tax increase, asserting a Contract Clause violation. The Contract Clause restricts states ability to pass laws retroactively impairing the contract rights of private parties.⁴³ The challengers argued

⁴² *Id.* at 185-187.

⁴³ “No State shall . . . pass any . . . Law impairing the Obligation of Contracts” U.S. Const. art. I, § 10, cl. 1.

that the Alabama provision impermissibly impaired the contract rights of parties holding gas leases that provided for the pass through of severance taxes to the lessee.⁴⁴

The Court rejected this argument on the basis of long recognized reasoning that the prohibition in the Contract Clause does not deprive the state of its broad power to adopt regulatory measures. To hold otherwise, the court reasoned, would allow private parties to avoid legal restrictions by contracting about them.⁴⁵ Because the statute imposed a generally applicable rule of conduct, the main effect of which was to shield consumers from the burden of the tax increase, and its effect on existing contracts was only incidental, it did not violate the Contract Clause.⁴⁶

4. Double Taxation Challenges

In *Cotton Petroleum Co. v. New Mexico*, a non-Indian oil and gas producer operating on Indian lands brought a constitutional challenge against New Mexico's severance tax, asserting impermissible double taxation.⁴⁷ The producer argued that the imposition of the state severance tax on oil and gas that was already subject to a severance tax imposed by the Indian tribe in control of the land was unconstitutional.

Rejecting this argument, the court explained that, in some cases, taxation by one state of an activity already properly being taxed by another can result in a constitutional infirmity if it demonstrated that the taxing jurisdiction was attempting to seize more

⁴⁴ *Exxon Corp. v. Eagerton*, 462 U.S. 176, 184 (1983).

⁴⁵ *Id.* at 190 ("As Justice Holmes put it, 'One whose rights, such as they are, are subject to state restriction, cannot remove them from the power of the State by making a contract about them. The contract will carry with it the infirmity of the subject matter.'" quoting *Hudson Co. v. McCarter*, 209 U.S. 349, 357 (1908)).

⁴⁶ *Id.* at 190-191.

⁴⁷ 490 U.S. 163 (1989).

revenue than was fairly related to the services it provided.⁴⁸ Where, as in *Cotton*, however, the same activity is taxed multiple times as the result of overlapping jurisdiction of several taxing authorities, the relationship of the taxpayer's benefit to the jurisdiction is not similarly in doubt, and no constitutional violation exists.

5. Import Export Clause Challenges

When imposed on materials being exported to other countries, severance taxes have occasionally been challenged as violating the Import-Export Clause of the United States Constitution, which vests the power to impose import and export duties solely in the Federal Government.⁴⁹ Import-Export Clause analysis involves a three-part test first laid out by the Supreme Court in *Michelin Tire Corp. v. Wages*.⁵⁰ A state law violates the Import-Export Clause if it (1) impinges on the federal government's ability to speak with one voice, (2) effects federal import revenues, or (3) disrupts harmony between the states in a manner that violates the Commerce Clause.

The *Michelin* doctrine was most recently applied in the severance tax context by the Supreme Court of West Virginia in *U.S. Steel Min. Co., LLC v. Helton*.⁵¹ In *U.S. Steel Min. Co.*, the Supreme Court of West Virginia upheld that state's severance tax on

⁴⁸ *Merrion v. Jicarilla Apache Tribe*, 455 U.S. 130, 159, n. 26 (1982); *Cotton Petroleum Corp. v. New Mexico*, 490 U.S. 163, 189 (posing the example of an apportionment tax that results in a states' taxing a multi-state corporation for activity that took place beyond its borders); See, e.g., *Exxon Corp. v. Wisconsin Department of Revenue*, 447 U.S. 207 (1980) (recognizing the potential constitutional problem, though not finding it with respect to Wyoming's apportionment tax on Exxon pursuant to a unitary business analysis).

⁴⁹ U.S. Const. art. 1, § 10, cl. 2.

⁵⁰ *Michelin Tire Corp. v. Wages* 423 U.S. 276, 285 (1976).

⁵¹ *U.S. Steel Min. Co., LLC v. Helton*, 219 W.Va. 1, 4 (2005).

coal against an Import-Export Clause challenge. Finding the second prong of the *Michelin* doctrine irrelevant with respect to severance taxes, and finding no Commerce Clause violation, the court focused on the *Michelin* test's first prong.⁵² As expounded by an earlier U.S. Supreme Court decision, *Container Corp. of America v. Franchise Tax Board*, a state tax will only violates the “one voice” standard if it either implicates foreign policy issues that must be left to the federal government or violates a clear federal directive under a Supremacy Clause preemption analysis.⁵³

The Supreme Court of West Virginia rejected arguments that the increased price of exported coal resulting from the tax impermissibly hampered the state’s competitiveness in the international market. Reasoning that such an objection would apply to nearly any state tax, the court held that a “mere price increase is not the kind of adverse effect on foreign affairs—like causing retaliation by foreign governments—that we think is required.”⁵⁴ While it is likely that some natural gas produced in Pennsylvania will eventually be exported to other countries, pursuant to this analysis, it is unlikely that the tax would ever have an international impact sufficient to run afoul of the *Michelin* doctrine.

6. Summary of Federal Constitutional Limitations

As the preceding discussion indicates, the United States Supreme Court has repeatedly recognized a legitimate state interest in imposing a severance tax on natural gas, and Pennsylvania has broad constitutional authority to enact severance taxes. The

⁵² *Id.* at 6.

⁵³ 463 U.S. 159, 194 (1983).

⁵⁴ *U.S. Steel Min. Co., LLC v. Helton*, 219 W.Va. 1, 6 (2005).

proposed measures so far under consideration in the Pennsylvania legislature appear to fall well within the bounds of this authority.⁵⁵

The Commonwealth's power is not, however, unlimited. Any Pennsylvania severance tax would have to be borne in a manner rationally related to taxpayers' interest in gas extracted in Pennsylvania (e.g. assessed by the volume or value the gas). Any tax must also be facially neutral with respect to in-state and out-of-state interests, and no effort should be made to impose a tax on gas produced outside of Pennsylvania in order to compensate for the severance tax burden on in state production. Further, although the Commonwealth may restrict producers from passing through the costs of the tax to in-state consumers, efforts to allocate the incidence of the tax between in-state and out-of-state parties would likely be subject to constitutional challenges under the Supremacy Clause.

B. The Pennsylvania Constitution Permits Pennsylvania to Impose a Severance Tax

While nearly every state that produces significant quantities of natural gas or coal imposes a severance tax, Pennsylvania, which has long been a major coal producer, has never imposed a severance tax on any natural resource.⁵⁶ However, while some commentators have identified possible constitutional infirmities with respect to specific

⁵⁵ See Michael Wood, Pennsylvania Budget and Policy Center, How to Structure a Severance Tax that is Fair to Pennsylvanians at Appendix 1 (2010), <http://www.pennbpc.org/sites/pennbpc.org/files/Structuring-severance-tax-8-30-2010.pdf> (outlining several of the legislative proposals so far under consideration).

⁵⁶ Francis A. Muracca, *The Marcellus Shale Formation: Pennsylvania's Natural Gas Severance Tax Controversy*, Jones Day Commentary, October 23, 2010 at 3, http://www.jonesday.com/marcellus_shaleFormation (last visited Mar. 4, 2011).

proposed severance tax legislation, no substantive provision of the Pennsylvania Constitution prevents the state from imposing such a tax.⁵⁷

As a preliminary point, the standard for demonstrating that a statute violates the Pennsylvania Constitution is high; it is axiomatic that any party challenging the constitutionality of a statute must meet the heavy burden of demonstrating that the statute "clearly, palpably, and plainly" violates the Constitution.⁵⁸ The court presumes that the legislature did not intend to violate the constitution, and all doubts are resolved in favor of constitutionality.⁵⁹

While the state has never imposed a severance tax, the Pennsylvania Supreme Court, on one occasion, considered constitutional challenges brought against a coal severance tax imposed at the county level. In *Appeal of Certain Taxpayers of Dunkard Twp., Greene County*, the court upheld the county's severance tax on bituminous coal over several constitutional challenges.⁶⁰ That case involved a school district which, facing an impending budget deficit, passed a resolution imposing a tax of \$0.10 per ton of production on the "privilege, transaction or occupation of mining, processing and

⁵⁷ See Nathan Benefield, *Severance Tax Legislation: The Process Stinks Too*, The Commonwealth Foundation Policy Blog (Sept. 29, 2010), <http://www.commonwealthfoundation.org/policyblog/detail/severance-tax-legislation-the-process-stinks-too> (last visited Mar. 15, 2011) (reviewing potential procedural problems with proposed legislation S.B. 1155 (2010)); Katrina Currie, *Severance Tax at Odds with State Constitution*, The Commonwealth Foundation Policy Blog (Oct. 5, 2010) (arguing that, because S.B. 1155 is a revenue bill that did not arise in the House, it is unconstitutional under that state constitution). See also Barnes, *supra* note 23, at B3 (suggesting that the potential procedural infirmities with S.B. 1155 relate to the rush to pass that bill before the former governor left office).

⁵⁸ *Konidaris v. Portnoff Law Associates, Ltd.*, 598 Pa. 55, 62 (2008).

⁵⁹ *Pennsylvanians Against Gambling Expansion Fund, Inc. v. Commonwealth*, 583 Pa. 275, 283 (2005); 1 Pa.C.S. § 1922(3) (strong presumption that legislators intended the statute to be constitutional).

⁶⁰ 359 Pa. 605, 609-10 (1948).

marketing of bituminous coal mined by strip mining methods at the time of its severance.”⁶¹ Taxpayers holding interests in bituminous coal argued that the tax was unconstitutional, asserting both impermissible double taxation (since the coal had already been taxed as real estate), and a violation of the Pennsylvania Constitution’s uniform taxation requirement (since the tax discriminated between strip mining and other production methods).⁶²

The Pennsylvania Supreme Court rejected both of these arguments. Dismissing the double taxation challenge, the court held that imposing a severance tax in addition to other property taxes on a natural resource is not double taxation (while also noting that double taxation itself was nevertheless permissible). “Not only is double taxation constitutionally permissible, but here there is no double taxation. The tax on the coal in place is a property tax; the tax imposed by the resolution under consideration is an excise tax on the privilege or occupation of strip mining coal.”⁶³ With respect to the uniformity challenge, the court found no constitutional difficulty with the distinctions drawn on the basis of production methods for tax purposes. The decision explains:

Nor is there involved any violation of the constitutional requirement of uniformity; a classification for tax purposes between anthracite and bituminous coal has long since been held unobjectionable, the difference between the strip mining of coal and the similar mining or quarrying of other substances as justifying tax classification has also been judicially approved and obviously there are proper grounds also for tax

⁶¹ *Id.*

⁶² *Id.* at 608.

⁶³ *Id.* at 609. (citations omitted).

classification between operators engaged in deep mining and those engaged in strip mining of coal.⁶⁴

While the constitutional analysis adopted in *Taxpayers of Dunkard Twp.* with respect to severance taxes on natural resources remains good law, however, a more recent decision restricted localities from imposing severance taxes on other grounds. In *Independent Oil & Gas Association of Pa. v. Board of Assessment Appeals of Fayette County* (“*IOGA*”), the Pennsylvania Supreme Court overturned a Commonwealth Court decision permitting a county to impose ad valorem taxes on oil and gas interests.⁶⁵

The ruling was primarily based on a question of statutory interpretation. Under the Pennsylvania Constitution, the power to tax must derive from a statutory enactment by the Pennsylvania General Assembly.⁶⁶ As pointed out by the challengers in *IOGA*, the statute empowering local taxation of “real property” was ambiguous as to whether that term was intended to include interests in oil and gas. Holding that the legislature did not intend to include oil and gas rights within the meaning of “real property,” the Pennsylvania Supreme Court effectively barred localities from imposing ad valorem taxes on natural gas. Note, however, that while *IOGA* still stands for the proposition that Pennsylvania localities are not currently empowered to impose ad valorem taxes on natural gas, that decision interpreted the state statute empowering local taxation, not the

⁶⁴ *Id.* at 610.

⁶⁵ 572 Pa. 240 (2002).

⁶⁶ *Id.* at 243.

Pennsylvania Constitution. Therefore, the legislature could reverse the ruling simply by explicitly authorizing localities to impose taxes on oil and gas interests.⁶⁷

The Pennsylvania Supreme Court also recently considered a Contract Clause challenge analogous to those that might be brought against a severance tax on natural gas. In *South Union Twp. v. Department of Environmental Protection*, the court affirmed the Commonwealth Court of Pennsylvania's dismissal of claims challenging a waste disposal fee of four dollars per ton imposed by the Pennsylvania Environmental Resources Code.⁶⁸ The claimants had argued that the fee unconstitutionally impaired the rights of parties to certain waste disposal contracts.

In the decision affirmed by the Pennsylvania Supreme Court, the Commonwealth Court applied the same Contract Clause analysis used by the United States Supreme Court to federal constitutional challenges and found no impermissible deprivation of contract rights. Noting that the state's police power could not be hampered by private contracts, the Commonwealth Court held that petitioners had failed even to plead facts that could have sustained the heavy burden of demonstrating clear, palpable and plain violations of the Pennsylvania Constitution.⁶⁹

Taken together, *Taxpayers of Dunkard Twp.* and *South Union Twp.* suggest that a severance tax enacted by the Pennsylvania legislature would not be vulnerable to

⁶⁷ State Sen. Gene Yaw recently indicated that he planned to propose legislation to overturn IOGA. Eric Boehm, *Senator Wants Property Taxes To Mitigate Local Impacts Of Gas Drilling*, PA. INDEPENDENT, Feb. 4, 2011, <http://paindependent.com/2011/02/senator-wants-property-taxes-to-mitigate-local-impacts-of-gas-drilling> (last visited Feb. 20, 2011).

⁶⁸ 578 Pa. 564, 2004 Pa. LEXIS 1637 (2004), affirming 839 A.2d 1179, 2003 Pa. Commw. LEXIS 926 (Pa. Commw. Ct. 2003).

⁶⁹ S. Union Twp. v. Dep't of Entvl. Prot., 839 A.2d 1179, 2003 Pa. Commw. LEXIS 926 (Pa. Commw. Ct. 2003), affirmed by 578 Pa. 564, 2004 Pa. LEXIS 1637 (2004).

significant challenges under the Pennsylvania Constitution. Furthermore, were the state legislature to overturn *IOGA* by empowering local taxation of oil and gas interests, such local measures would enjoy similar constitutional legitimacy.

III. A Survey of State Taxes on Natural Gas Production

Having laid out the general boundaries of constitutional permissibility, the following section will survey both state natural gas production levels (in Table 2) and state taxes on that production (in Table 3). This section will also offer basic conclusions suggested by the data presented and make several observations regarding their relevance given the current political climate in Pennsylvania.

Table 3, which provides an overview of state resource tax policy alongside shale gas production data for each of the 34 natural gas producing states, is perhaps the core contribution of this section. Building on the few similar surveys compiled by earlier commentators, the data here contains updated tax rates and policy information. It also presents state severance tax rates alongside state shale gas production information that only recently became available.⁷⁰ Further, it presents state severance tax information, for the first time, with comprehensive citations to the corresponding provisions of state law for easy legislative reference.

⁷⁰ See, e.g., MICHAEL WOOD & SHARON WARD, PENNSYLVANIA BUDGET AND POLICY CENTER, RESPONSIBLE GROWTH: PROTECTING THE PUBLIC INTEREST WITH A NATURAL GAS SEVERANCE TAX 27 (2009); Judy Zelio & Lisa Houlihan, *State Energy Revenues Update*, National Conference of State Legislatures (2008), <http://www.ncsl.org/IssuesResearch/BudgetTax/StateEnergyRevenuesUpdate/tabcid/12674/Default.aspx>.

A. Introduction to Natural Gas Production by State

Before laying out the severance tax policies adopted by gas producing states, it will be helpful to ground that discussion with a brief overview of state-by-state gas production. The following discussion will present both total production data as well as recently-released shale gas production data, and suggest that, given the substantial differences between traditional and shale gas production, the new shale-specific data may be more appropriate for policy comparisons between Pennsylvania and other states.

1. State Production Data: Which States Produce Natural Gas?

The Energy Information Administration (EIA), the statistical and analytical agency within the U.S. Department of Energy, identifies thirty-two states as producers of natural gas.⁷¹ Since 1980, the EIA has conducted a mandatory survey of natural gas producers and published an annual report containing the resulting data.⁷²

Table 2, below, summarizes the EIA's well count and production data for the last three years, as well as another traditional indicator of energy production activity, the Baker Hughes Rig Count. The Rig Count has been conducted by one of the world's largest oilfield services providers since 1944. The portion sampled in Table 2 indicates

⁷¹ ENERGY INFORMATION ADMINISTRATION, REPORT DOE/EIA-0131(09), NATURAL GAS ANNUAL 2009 170-171 (2010) *available at* <http://www.eia.gov/FTPROOT/natgas/013109.pdf>.

⁷² *Id.* at Appendix A, Summary of Data Collection and Report Methodology.

the average number of rotary rigs drilling new gas wells in each state during any month in 2010, as well as a “snapshot” of active drilling during the week of February 27, 2011.⁷³

Significantly, Table 2 also includes a set of relevant information that has only recently become available. Recognizing the importance of the recent developments in shale gas production, the EIA Annual Report published in 2010 included, for the first time, a separate breakout of shale gas production for states with significant unconventional drilling activity.⁷⁴ To the extent that this new data provides a uniform measure of unconventional drilling activity across jurisdictions, it may provide a useful tool for policy analysis of these developments.

⁷³ See notes accompanying Table 2, *infra*.

⁷⁴ ENERGY INFORMATION ADMINISTRATION, NATURAL GAS ANNUAL 2009, *supra* note 43, at 171.

Table 2: Natural Gas Production by State (Ranked by Total Marketed Production)

	PRODUCTION																	
	TOTAL MARKETED GAS PRODUCTION (MCF) Source: EIA (1) (2)						SHALE GAS PRODUCTION (MCF) Source: EIA (3)				PRODUCING WELLS Source: EIA (4)			ACTIVE DRILLING RIGS (NEW WELLS) Source: Baker Hughes Rig Count (5) (6)				
State	2009 Total Prod Rank	2009 Total Marketed Production	2008 Total Prod Rank	2008 Total Marketed Production	2007 Total Prod Rank	2007 Total Marketed Production	2009 Shale Prod Rank	2009 Shale Production (Estimated)	2008 Shale Prod Rank	2008 Shale Production	2009 Total Prod. Gas Wells	2008 Total Prod. Gas Wells	2007 Total Prod. Gas Wells	2010 Average Active Rig Count (5)	Snapshot Active Drilling Rigs 2/27/11	Snapshot By Type:	Horizontal	Directional
Texas	1	6,123,180	1	6,960,693	1	6,123,180	1	1,893,711	1	1,651,709	93,507	87,556	76,436	659	354	63	256	35
Wyoming	2	2,047,882	2	2,274,850	2	2,047,882	NA	0	NA	0	25,710	28,969	27,350	40	33	5	1	27
Oklahoma	3	1,783,682	3	1,886,710	3	1,783,682	4	301,028	3	188,489	43,600	41,921	38,364	128	105	7	94	4
New Mexico	4	1,517,922	4	1,446,204	4	1,517,922	10	2,040	NA	0	44,784	44,241	42,644	62	8	2	3	3
Louisiana	5	1,365,333	6	1,377,969	5	1,365,333	3	436,582	5	27,075	18,860	19,213	18,145	192	157	22	113	22
Colorado	6	1,242,571	5	1,389,399	6	1,242,571	12	1,000	NA	NA	27,021	25,716	22,949	58	54	8	6	40
Alaska	7	433,485	9	398,442	7	433,485	NA	0	NA	0	261	261	239	8	0	0	0	0
Utah	8	376,409	8	433,566	8	376,409	NA	0	NA	0	5,774	5,578	5,197	27	12	3	0	9
Kansas	9	365,877	10	374,310	9	365,877	NA	0	NA	0	21,243	17,862	19,713	20	1	1	0	0
California	10	307,160	11	296,469	10	307,160	NA	0	NA	0	1,643	1,645	1,540	32	4	0	0	4
Alabama	11	270,407	12	257,884	11	270,407	13	93	10	73	6,913	6,860	6,591	5	1	0	0	1
Arkansas	12	269,886	7	446,457	12	269,886	2	510,897	2	265,917	6,314	5,592	4,773	39	32	2	29	1
Michigan	13	264,907	15	153,130	13	264,907	5	125,562	4	130,727	10,600	9,995	9,712	0	0	0	0	0
West Virginia	14	231,184	13	244,880	14	231,184	7	20,058	7	4,126	50,602	49,364	48,215	23	20	5	15	0
Pennsylvania	15	182,277	14	198,295	15	182,277	6	79,000	NA	NA	57,356	55,631	52,700	85	110	9	96	5
Montana	16	116,848	18	112,529	16	116,848	8	7,000	6	13,000	7,031	7,095	6,925	7	0	0	0	0
Virginia	17	112,057	16	128,454	17	112,057	NA	0	NA	0	7,303	6,426	5,735	2	0	0	0	0
Kentucky	18	95,437	17	114,116	18	95,437	9	5,000	8	2,000	17,152	16,290	16,563	6	4	0	4	0
Ohio	19	88,095	20	84,858	19	88,095	NA	0	NA	0	34,963	34,416	34,416	7	7	5	0	2
Mississippi	20	73,460	19	96,641	20	73,460	NA	0	NA	0	2,320	2,343	2,315	11	4	2	1	1
North Dakota	21	60,255	21	52,444	21	60,255	NA	NA	NA	NA	196	194	200	114	0	0	0	0
New York	22	54,942	22	50,320	22	54,942	NA	0	NA	0	6,628	6,675	6,680	1	0	0	0	0
Tennessee	23	3,942	24	4,700	23	3,942	NA	0	NA	0	310	285	305	0	0	0	0	0
Indiana	24	3,606	23	4,701	24	3,606	NA	0	NA	0	563	525	2,350	3	0	0	0	0
Florida	25	1,778	26	2,436	25	1,778	NA	0	NA	0	NA	NA	NA	1	0	0	0	0
Nebraska	26	1,555	25	3,082	26	1,555	NA	0	NA	0	285	322	186	2	0	0	0	0
Illinois	27	1,394	28	1,193	27	1,394	NA	0	NA	0	51	45	43	2	0	0	0	0
South Dakota	28	995	27	1,644	28	995	11	1,561	9	1,098	89	71	71	1	0	0	0	0
Arizona	29	655	30	523	29	655	NA	0	NA	0	6	6	7	0	0	0	0	0
Oregon	30	409	29	778	30	409	NA	0	NA	0	24	21	18	0	0	0	0	0
Maryland	31	35	31	28	31	35	NA	0	NA	0	7	7	7	0	0	0	0	0
Nevada	32	5	32	4	32	5	NA	0	NA	0	0	0	4	6	0	0	0	0
Missouri	50	0	50	0	50	0	NA	0	NA	0	0	0	0	0	NA	NA	NA	NA

Notes:

- EIA Notes: Beginning with monthly data for January 2006, "Other States" volumes include all of the natural gas producing states except: Alaska, Louisiana, New Mexico, Oklahoma, Texas, Wyoming, and the Gulf of Mexico. "Other States" volumes prior to January 2006 include: Arkansas, Illinois, Kentucky, Maryland, Missouri, Nebraska, Nevada, New York, Ohio, Pennsylvania, South Dakota, Tennessee, Virginia, and West Virginia. Data for 2009 are estimated. Monthly preliminary (from January 2009 to present) state-level data for the production series, except marketed production, are not available until after the final annual reports for these series are collected and processed. Final annual data are generally available in the third quarter of the following year. For years prior to 2007, coalbed production data are included in Gas Well totals. See Definitions, Sources, and Notes link above for more information on this table. Release Date: 1/28/2011 Next Release Date: 2/25/2011
- Available at http://tonto.eia.doe.gov/dnav/ng_ng_prod_sum_a_EPG0_VGM_mmcf_a.htm (last visited Feb. 25, 2011).
- Available at http://tonto.eia.doe.gov/dnav/ng_ng_prod_sum_a_EPG0_FGS_mmcf_a.htm (last visited Mar. 3, 2011).
- Available at http://www.eia.doe.gov/dnav/ng/NG_PROD_WELLS_S1_A.htm (last visited Feb. 25, 2011).
- Baker Hughes Notes: The Baker Hughes North American Rotary Rig Count is a weekly census of the number of drilling rigs actively exploring for or developing oil or natural gas in the United States and Canada. A rotary rig rotates the drill pipe from surface to drill a new well to explore for, develop and produce oil or natural gas. The Baker Hughes Rotary Rig count includes only those rigs that are significant consumers of oilfield services and supplies. To be counted as active a rig must be on location and be drilling or 'turning to the right'. A rig is considered active from the moment the well is "spudded" until it reaches target depth or "TD". Rigs that are in transit from one location to another, rigging up or being used in non-drilling activities such as workovers, completions or production testing, are NOT counted as active.
- Baker Hughes, *North American Rotary Rig Count, U.S. Annual Average by State 1987-2010*, available at http://investor.shareholder.com/bhi/rig_counts/rc_index.cfm (last visited Feb. 27, 2011) (2010

2. Brief Analysis of State Production Data

As noted by other commentators on Pennsylvania natural gas development, Pennsylvania ranks fifteenth in total natural gas production according to the most recent EIA data for 2009.⁷⁵ That rank, which reflects the state's consistently significant traditional, shallow-well production industry, has remained substantially unchanged since at least 2004. Indeed, only Texas, the country's number one gas producer, had more operating natural gas wells in 2009.⁷⁶

While Pennsylvania is the fifteenth largest of thirty-two states in terms of total natural gas production, however, Table 2 demonstrates that the Commonwealth is in even more rarified company with respect to gas production from shale formations like the Marcellus Shale. According to EIA data, only thirteen states produced any natural gas from shale formations in 2009. Among these states, Pennsylvania ranked sixth, producing nearly four times as much shale gas as West Virginia, the next largest producer.

Though Pennsylvania shale production lagged behind its traditional production in 2009, the tremendous reserve estimates in the Marcellus region combined with both

⁷⁵ See, e.g., MICHAEL WOOD & SHARON WARD, PENNSYLVANIA BUDGET AND POLICY CENTER, RESPONSIBLE GROWTH: PROTECTING THE PUBLIC INTEREST WITH A NATURAL GAS SEVERANCE TAX 27 (2009); Francis A. Muracca, *The Marcellus Shale Formation: Pennsylvania's Natural Gas Severance Tax Controversy*, Jones Day Commentary, October 23, 2010 at 2-3, http://www.jonesday.com/marcellus_shale_formation (last visited Mar. 4, 2011); ROSE M. BAKER & DAVID L. PASSMORE, PENN STATE INSTITUTE FOR RESEARCH IN TRAINING AND DEVELOPMENT, BENCHMARKS FOR ASSESSING THE POTENTIAL IMPACT OF A SEVERANCE TAX ON THE PENNSYLVANIA ECONOMY 6 (Sep., 2010), available at <http://ssrn.com/abstract=1667022> (last visited Feb. 28, 2011).

⁷⁶ *Id.* at 4.

the EIA development projections and the skyrocketing demand for Marcellus well permits as indicated by Pennsylvania Department of Environmental Protections (*presented supra* in Table 1) suggest that Pennsylvania shale production will soon overtake traditional gas production in the Commonwealth (assuming the forthcoming 2010 production numbers don't already demonstrate that this is already the case).

The distinction between traditional and shale production is arguably important for policy considerations involving natural gas production because of the substantial differences between traditional and shale gas drilling methods. Unlike the vast majority of traditional wells, shale wells require the implementation of horizontal drilling and hydraulic fracturing.⁷⁷ We can therefore roughly associate shale production levels with the amount of hydraulic fracturing activity taking place in a state.

Hydraulic fracturing, in turn, involves a number of specialized practices. First, hydraulic fracturing requires the injection of between two and four million gallons of water into a single well.⁷⁸ This process can produce over one million gallons of wastewater laced with corrosive salts and radioactive elements; over 1.3 billion gallons of wastewater were produced by Pennsylvania wells over the last three years.⁷⁹ Most of this water must be trucked to and from well sites to scarce specialized treatment

⁷⁷ Energy Information Administration, *What is shale gas and why is it important?*, Dec. 16, 2010, http://www.eia.doe.gov/energy_in_brief/about_shale_gas.cfm (last visited February 22, 2011) (“Without horizontal drilling and hydraulic fracturing, shale gas production would not be economically feasible because the natural gas would not flow from the formation at high enough rates to justify the cost of drilling.”). *See also* the discussion of drilling technology advances *supra* in Part A1.

⁷⁸ U.S. DEPARTMENT OF ENERGY, MODERN SHALE GAS DEVELOPMENT IN THE UNITED STATES: A PRIMER 64 (2009) (noting that the average for Marcellus shale wells is 3.88 million gallons per well).

⁷⁹ Ian Urbina, *Regulation Lax as Gas Wells' Tainted Water Hits Rivers*, NY TIMES, Feb. 27, 2011 at A1 (noting that industry projections anticipate an additional 50,000 wells in the next two decades with a corresponding increase wastewater production).

facilities or disposal wells, and many Pennsylvania towns have seen a corresponding increase in expenses associated with road maintenance and traffic accidents.⁸⁰ Because only half of current Pennsylvania wells have access to gas pipelines, much of the gas produced is also transported by truck, exasperating the pressure placed on local infrastructures by shale drilling.⁸¹ In addition to infrastructure costs, the large amount of wastewater associated with shale wells typically imposes substantial environmental regulation and monitoring costs on state and local governments.⁸²

In short, shale gas production is substantially harder on communities, local governments and the environment than traditional gas production. Given the myriad externalities associated with shale production, policy comparisons between Pennsylvania and other states should take into account states' balance of traditional and shale drilling. For example, while California produces more natural gas than Pennsylvania, that state hosts virtually no shale gas drilling. As a result, California is not faced with many of the external costs tied to gas drilling in Pennsylvania, giving us at least some reason to believe that California policy may not be suitable for adoption in Pennsylvania.

⁸⁰ Kris Maher, *Gas Rush Reshapes Tiny Towanda*, THE WALL STREET JOURNAL, Dec. 14, 2010 at A3.

⁸¹ MIT ENERGY INITIATIVE, INTERIM REPORT, THE FUTURE OF NATURAL GAS 64 (2010).

⁸² MICHAEL WOOD & SHARON WARD, PENNSYLVANIA BUDGET AND POLICY CENTER, RESPONSIBLE GROWTH: PROTECTING THE PUBLIC INTEREST WITH A NATURAL GAS SEVERANCE TAX 14-16 (2009).

B. Survey of State Taxes on Natural Gas Production

Having provided some basic outlines with respect to state gas production, the following discussion will present a survey of certain tax policies adopted by the various gas producing states before offering some general conclusions suggested by the data presented.

1. State Severance Tax Policy Data: How Do States Tax Natural Gas Production?

Table 3, below, includes information on state severance taxes for each of the thirty-two gas producing states, ranked by shale gas production volume. The “Severance Tax” column includes any fees assessed by volume or value of gas produced, whether or not identified by the state as a severance tax (for example, the chart includes several states’ excise or conservation fees). The column titled “Value or Volume” identifies whether the severance tax is imposed by volume or value of the gas produced, or through some combination of the two; a separate column provides legal citations for each of the state provisions identified in the chart.

Table 3 also provides information on ad valorem and corporate income taxes. Ad valorem taxes are typically imposed a component of local property taxes, often allowing a locality to include the value of an interest in gas in the value of the property for the purpose of the local tax assessment. In some cases, state severance tax legislation explicitly precludes localities from imposing ad valorem taxes. In other states, both severance and ad valorem taxes are imposed. With respect to state corporate taxes, note that the corporate tax rate may not apply to a states’ gas producers, many of which are organized as limited liability companies or limited partnerships. For instance,

only twenty-four of the forty-four companies that drilled multiple Marcellus Shale wells in Pennsylvania in 2010 were corporations.⁸³

The information presented in Table 3 is admittedly incomplete, and does not include actual or average local tax rates or other taxes like sales or use taxes that would be paid by oil and gas producers. Despite these caveats, Table 3 should provide a useful tool for comparing policy approaches and production levels. The next section will offer some basic insights that can be drawn from the data.

⁸³ PA. DEPARTMENT OF ENVIRONMENTAL PROTECTION, BUREAU OF OIL AND GAS MANAGEMENT, 2010 WELLS DRILLED BY OPERATOR (2011), <http://www.dep.state.pa.us/dep/deputate/minres/oilgas/2010%20Wells%20Drilled%20by%20Operator.htm> (last visited Mar. 29, 2011) (calculation of companies operating multiple wells and verification of corporate form by author).

Table 3: State Natural Gas Tax Policy (Ranked by Shale Gas Production)

	PRODUCTION			TAX POLICY								
	SHALE GAS PRODUCTION Source: EIA (1) (2)	TOTAL MARKETED GAS PRODUCTION Source: EIA	PRODUCING WELLS Source: EIA	SEVERANCE TAX Source: State Tax Codes (Compiled by Author)								
STATE	Shale Rank	2009 Shale Prod.	Total Prod. Rank	2009 Total Marketed Production	2009 Total Producing Gas Wells	Current State Severance Tax Rate		Value or Volume	Local Ad Valorem Tax Assessed on Interests in Gas?	Corp. Tax Rate (3)	Citations	
Texas	1	1,893,711	1	6,123,180	93,507	7.5% of market value Rate reduced to about 3.7% for "high cost" wells until 50% of drilling costs are recovered (4)		Value	Yes. Appraised by method that takes into account the future income from the sale of gas based on an average price of gas.	0%	Severance Taxes (Tex. Tax Code §§ 201.001 through 204.010); Certification for Severance Tax Exemption or Reduction for Gas Produced from High-Cost Gas Wells; Tax Reduction for Incremental Production; Tax Administration	
Arkansas	2	510,897	12	269,886	6,314	5% of market value Rate reduced to 1.5% for first 3 years, and for "high cost" wells Rate reduced to 1.25% for "marginal" wells (>100 TCF/day) Pre-2009, rate was \$.003/TCF		Value	Yes. When mineral rights severed or being developed, assessed separately.	6.50%	Severance Taxes (Ark. Stat. Ann. §§ 26-58-101 through 26-58-303; Code Ark. R. 006 05 071, Rule 2008-4 (natural gas severance tax rules); Ad Valorem (Ark. Code Ann. § 26-16202; Garvan v. Potlatch Corp., 278 Ark. 414 (1983) (undeveloped minerals remain subjoined to the surface for a single assessment));	
Louisiana	3	436,582	5	1,365,333	18,860	\$.164/MCF Rate adjusted annually (7/1/2009-6/30/2010 rate was \$.331/MCF) Rate reduced to \$.013 for "incapable" (low producing) wells		Volume	No. Severance tax in lieu of ad valorem.	8%	Natural Resources Severance Tax (LAC 61:1.2901 through 61:1.2903; La. Rev. Stat. Ann. §§ 47:631 to 47:646; See LA R.S. 47:633 for rate calculation); Franchise tax on gas pipelines (La. Rev. Stat. Ann. §§ 47:1031 to 47:1040).	
Oklahoma	4	301,028	3	1,783,682	43,600	7% Production tax when monthly average price > \$2.10/TCF Rate reduced to 4% when monthly average price \$1.75-\$2.10, and to 1% when monthly average price < \$1.75 Levied on production times average price calculated by the state each month Tiered rates expire in 2013, replaced by flat 7% rate Horizontal wells drilled pre-7/1/2011 exempt until "payback" or up to 4 years Horizontal wells drilled post-7/1/2011 taxed at reduced rate of 1% until "payback" or up to 4 years Wells reactivated after 2 years of inactivity exempt for 28 months						Gross Production Tax on Asphalt, Ores, Oil and Gas, and Royalty Interests--Exemptions (Okla. Stat. tit. 68, §§ 1001 to 1024; Okla. ADC 710.45-1-1; But see Proposed stat 2011 OK H.B. 2121); Additional Excise Tax on Gas (Okla. Stat. tit. 68, §§ 1102); Production tax in lieu of Ad Valorem (Okla. Stat. tit. 68, §§ 2805; Dilworth v. Fortier, 1960 OK 5 (Okla. 1960) (holding that the gross production tax was in lieu of the ad valorem tax)).
Michigan	5	125,562	13	264,907	10,600	5% of gross cash market value Rate reduced to 4% for "stripper" and "marginal" wells		Value	No. Severance tax in lieu of ad valorem.	4.95%	Severance Tax on Oil or Gas (MCLs §§ 205.301 through 205.317; for 2011 oil and gas fee, see http://www.michigan.gov/documents/taxes/381f_302843_7.pdf)	
Pennsylvania	6	79,000	15	182,277	57,356	None		None	No. No statute authorizes localities to impose ad valorem tax on gas interests.	9.99%	Local governments not empowered to impose ad valorem tax on gas interests (<i>Independent Oil and Gas Ass'n of Pennsylvania v. Board of Assessment Appeals of Fayette County</i> , 572 Pa. 240 (2002) (holding that the ad valorem tax statute of the state did not authorize the ad valorem taxation of oil and gas interests))	
West Virginia	7	20,058	14	231,184	50,602	5% of market value of proceeds of sale + \$.047/MCF		Hybrid	Yes. Property classified as "natural resources property" and taxed according to the present value of expected revenue for life of well	8.50%	Severance Tax (W. Va. Code §§ 11-13A-1 through 11-13A-25); Severance Tax; Information to Be Utilized for Calculating Distribution of Oil and Gas Severance Taxes; Reduced Severance Tax Rates for Thin Seams of Coal (W. Va. CSM §§ 110-13A-1 through 110-13A-4); Ad Valorem Taxes (W. Va. Code § 11-4-9; see W. Va. Code § 11-14-11 (statewide appraisal of oil and gas producing properties); W. Va. Code § 11-1C-10 (valuation of oil and gas properties); See also <i>Thaxton v. Beard</i> , 157 W. Va. 381, 201 S.E.2d 298 (1973) (for a tax sale of severed minerals to be valid there must be an assessment of the severed minerals)).	
Montana	8	7,000	16	116,848	7,031	9% production tax on value for producers with "working interest" Rate reduced to 5% for the first 18 months for horizontal wells and the first 1 year for all other wells For "nonworking interests," the rate is 14.8% and is not subject to initial reduction Rate reduced to 9% for "stripper" wells Conservation Tax: up to 3%/TCF of the market value Mandatory .08% contribution to natural resource distribution account		Value	No.		6.75%	Oil and Gas Production Tax; Mining License Taxes (Mont. Code Anno., §§ 15-36-101 through 15-37-221); Conservation Tax (Mont. Code Ann. § 82-11-131). Required distributions to oil and gas natural resource distribution account (Mont. Code Anno., §§ 90-6-1001(1); calculated according to § 15-36-304(7)(b)).
Kentucky	9	5,000	18	95,437	17,152	4.5% of gross value		Value	Yes. Separately controlled gas reserves assessed at fair market value, unless owned in their entirety by the surface owner or the surface owner is not engaged in the production or is primarily farming the land.	6%	Coal Tax; Natural Resources Severance and Processing Taxes (KRS §§ 143.010 through 143.991; see § 143A.020 for imposition, 143A.060 for payment method, and 143A.010(5) for definition of gross value); Oil and Gas Conservation Tax (Ky. Stat. Ann. § 132.820; <i>Associated Producers' Co. v. Board of Sup'r's of Estill County</i> , 202 Ky. 538 (1924) (wells or leases were not exempt from ad valorem taxation and that the legislature did not have the power or intent to relieve the lessee of the property tax upon lease and royalty interests)).	
New Mexico	10	2,040	4	1,517,922	44,784	3.75% severance tax on production value (calculated by deducting certain transportation costs from market price) .19% conservation tax Additional state "ad valorem" production tax set by department of finance by county and "emergency school tax."		Value			Resources Excise Tax; Severance Tax; Severance Tax Bonding (N.M. Stat. Ann. §§ 7-25-1 through 7-27-48). Oil and Gas Severance Tax (N.M. Stat. Ann. §§ 7-29-1 through 7-29-23). Oil and Gas Conservation Tax (N.M. Stat. Ann. §§ 7-30-1 through 7-30-27). Oil and Gas Ad Valorem Production Tax (N.M. Stat. Ann. §§ 7-32-1 through 7-32-28). Oil and Gas Taxes (Severance Tax); Valuation of Minerals (3.18.1.1 through 3.19.4.13 NMAC). Emergency School Tax (N.M. Stat. Ann. §§ 7-31-1 to 7-31-27). But see proposed legislation (2011 NM H.B. 222 (NS)). For estimated totals, see Nat'l Conference of State Legislatures, <i>Taxing Natural Gas Production</i> (2010) available at http://www.ncsl.org/default.aspx?tabid=21582 (last visited Feb. 20, 2011).	
South Dakota	11	1,561	28	995	89	4.5% severance tax .24% conservation tax		Value	No. Administered by state.	7.60%	Mineral Severance Tax; Energy Production Minerals Severance Tax; Conservation Tax on Energy Production Minerals Severance (S.D. Codified Laws §§ 10-39-42 through 10-39B-2).	
Colorado	12	1,000	6	1,242,571	27,021	.5% of value Rate reduced if value of gross production is less than \$300,000, to a minimum of 2% Exemption for low producing wells (>90TCF/day) Deduction for 87.5% of ad valorem taxes		Value	Yes.		4.63%	Severance Tax (C.R.S. 39-29-101 through 39-29-116). Severance Tax (1 CCR 201-10)..
Alabama	13	93	11	270,407	6,913	8% privilege tax on gross production value (calculated by deducting depreciation, return on investment, labor costs, materials, fuel costs, other taxes, insurance, administrative overhead, and transportation costs from market price) Reduced rate of 4% for low producing wells Rate reduced to 3.65% for off-shore wells 2% conservation tax on value of production Additional "Mineral Documentary Tax" of \$.10/acre on gas leases		Value	No. Severance tax in lieu of ad valorem. Yes. Counties may impose both ad valorem and additional excise or privilege taxes.		6.50%	(Oil and Gas; Conservation and Regulation of Production) Tax; Levy (Code of Ala. § 9-17-25). Privilege Tax on Gas Production (Ala. Code §§ 40-20-1 to 40-20-14). Documentary Tax (Code of Ala. § 40-20-32). Exemption from ad valorem tax (Code of Ala. § 40-20-12).
Arizona	NA	0	29	655	6	3.125% of production value		Value		6.97%	Severance Tax (A.R.S. §§ 42-5201 through 42-5205). Oil and Gas Conservation Assessment and Collection of Charges (Cal Pub Resources Code §§ 3400 through 3433).	
California	NA	0	10	307,160	1,643	\$0.00880312/MCF of gas produced (FY2010) Assessed each June based on estimated budget for next fiscal year and production during the prior calendar year		Volume	Yes. Assessed on fair market value.	8.84%	Ad Valorem Tax (Cal. Rev. & Tax. Code §§ 401, 427); <i>California Minerals v. County of Kern</i> , 152 Cal. App. 4th 1016 (5th Dist. 2007) (holding that assessor of oil and gas properties must make a determination of the fair market value of all reserves using the criteria that would be used by knowledgeable buyers and sellers of properties bearing such reserves); <i>Barnsdall Oil Co. of California v. Merriam</i> , 8 F. Supp. 185 (N.D. Cal. 1934) (taxes on oil leases treated as real property taxes within meaning of corporate franchise tax law allowing offset of all personal property taxes and 10% of real property taxes).	

Table 3: State Natural Gas Tax Policy (Ranked by Shale Gas Production) Continued

	PRODUCTION			TAX POLICY						
	SHALE GAS PRODUCTION Source: EIA (1) (2)	TOTAL MARKETED GAS PRODUCTION Source: EIA	PRODUCING WELLS Source: EIA	SEVERANCE TAX Source: State Tax Codes (Compiled by Author)						
STATE	Shale Rank	2009 Total Prod Rank	2009 Total Marketed Production	2009 Total Producing Gas Wells	Current State Severance Tax Rate	Value or Volume	Local Ad Valorem Tax Assessed on Interests in Gas?	Corp. Tax Rate (3)	Citations	
Illinois	NA	0	27	1,394	51	.1% of value of production	Value	Yes. Assessed separately at one third of fair market cash value.	7.30% Oil and Gas Production Assessment (225 ILCS 728 § 1 to § 99; gas rate at § 30). Ad valorem tax authority (765 Ill. Comp. Stat. 505 § 7).	
Kansas									Production Taxes Includable in Natural Gas Purchase Price (K.S.A. §§ 55-1424 through 55-1427). Mineral Severance Tax (K.S.A. §§ 79-4216 through 79-4231). Ad Valorem (Kan. Stat. Ann. §§ 79-330, 79-331, 79-420; Angle v. Board of County Com'r's of Rush County, 214 Kan. 708 (1974) (in assessing values the taxing authorities must take notice of rapid decline characteristics and not assume stable well production)).	
Nebraska									Fractional Interests in Oil, Gas, or Hydrocarbon Units or Fields; Taxation (R.R.S. Neb. § 57-234). Oil and Gas Severance Tax (R.R.S. Neb. § 57-701 through 57-719). Ad valorem tax authority (Neb. Rev. Stat. § 77-103).	
New York									Gas property designated as "economic unit" assessed on gas interests, including the unextracted oil and gas, equipment, fixtures and pipelines.	
Ohio	NA	0	22	54,942	6,628	None	None	7.10%	Ad valorem (N.Y. Real Prop. Tax Law §§ 590 to 597). Severance Tax (ORC Ann. 5749.01 through 5749.99). Ad valorem (Ohio Rev. Code Ann. § 5713.04; see § 5713.05 (increase or decrease in value of mineral lands); § 5713.051. (formula for calculating value of reserves)).	
Virginia									Authorizations of local severance tax (Va. Code Ann. § 58.1-372 (2010); see also <i>Tiller v. Excelsior Coal & Lumber Corporation</i> , 110 Va. 151, 65 S.E. 507 (1909) (separate taxation of estate or interest in minerals)).	
Wyoming									Wyo. Stat. Ann. §§ 39-14-201 to 39-14-212; see Wyo. Stat. Ann. § 39-14-203 (methods of calculating value of production); Wyo. Stat. § 39-14-204 (variable severance tax rate); see also Wyo. Const. Art. XV, § 3 (constitutional provision for production tax). Severance Tax Administration; Ad Valorem and Severance Taxes on Mineral Production (WCWR 011-000-005 through 011-000-006). See also <i>Milliron Oil Co. v. Connaghan</i> , 76 Wyo. 330, 302 P.2d 256 (1956) (mineral interest in land is subject to assessment only when and as such minerals are produced).	
Mississippi									Severance Taxes. (Miss. Code Ann. §§ 27-25-1 through 27-25-723). Liquefied Compressed Gas Tax (Miss. Code Ann. §§ 27-59-1 through 27-59-325). [State Oil and Gas Board] Tax Imposed to Pay for Administration Expenses (Miss. Code Ann. § 53-1-73). Gas Sevance Tax; Petroleum Tax (CMSR 35-008-002 through 35-009-003). Ad valorem tax exemption (Miss. Code Ann. § 27-31-73; see Miss. Code Ann. § 27-31-75 (application for exemption); see also Miss. Code Ann. § 27-31-77 (mineral documentary tax)).	
Alaska	NA	0	7	433,485	261	25-50% of production value less landowner's royalty interest and certain transportation costs	Value	No. Severance tax in lieu of ad valorem.	9.40% Gas Exploration and Development Tax Credit (Alaska Stat. § 43.20.043). Oil and Gas Production Tax and Oil Surcharge; Oil and Gas Exploration, Production, and Pipeline Transpiration Property Tax (Alaska Stat. §§ 43.55.011 through 43.56.210).	
Florida	NA	0	25	1,778	NA	\$.285/MCF (adjusted annually by application of an adjustment factor related to the previous years' average gas price; 2009-2010 rate was \$.563/MCF)	Volume	No. Severance tax in lieu of ad valorem.	5.50% Tax on Production of Oil and Gas and Severance of Solid Minerals (Fla. Stat. §§ 211.01 through 211.34). Severance Taxes and Fees (12B-7.003 through 12B-7.031, F.A.C.).	
North Dakota	NA	NA	21	60,255	196	\$.0914/MCF (adjusted annually; 2009-2010 rate was \$.1831/MCF)	Volume	No. Severance tax in lieu of ad valorem.	6.40% Oil and Gas Gross Production Tax; Oil Extraction Tax (N.D. Cent. Code, §§ 57-51-01 through 57-51-1-08). Coal Taxes; Oil and Gas Gross Production and Oil Extraction Taxes (N.D. Admin. Code 81-08-01-01 through 81-09-03-11). [Production of Oil and Gas] Taxation (Tenn. Code Ann. §§ 60-1-301 through 60-1-302). Severance Taxes (Tenn. Code Ann. §§ 67-7-101 through 67-7-212).	
Tennessee	NA	0	23	3,942	310	3% of market value	Value	No. Severance tax in lieu of ad valorem.	6.50% Severance Taxes (Tenn. Code Ann. §§ 67-7-101 through 67-7-212).	
Maryland	NA	0	31	35	7	None	None	No.	8.25% Ad valorem Taxation of Mineral Rights (§ 259.220 R.S.Mo.).	
Missouri	NA	0	50	0	0	None	None	Yes.	6.25% Petroleum Severance Tax (Burns Ind. Code Ann. §§ 6-8-1-1 through 6-8-1-28). Petroleum Severance Tax (45 IAC 6-1-1 through 45 IAC 6-1-15).	
Indiana	NA	0	24	3,606	563	The greater of 1% of the value of production or \$.03/MCF	Hybrid	No.	8.50%	
Nevada						5% extraction tax on net proceeds of gas Rate reduced as low as 2% for wells with net proceeds of less than \$4M and the net proceeds of which represent less than half of the wells gross proceeds (i.e. oil well); gradually reduction relative to the ratio of net to gross proceeds Note: reduction does not apply to a royalty interest in gas, which remains taxed at 5%.				Assessment and Taxation of Net Proceeds of Minerals (Nev. Rev. Stat. Ann. §§ 362.100 through 362.240; see § 362.140 for rate calculation). Proceeds of Minerals (NAC 362.010 through 362.090).
Oregon	NA	0	30	409	24	6% of gross value at time of production 5% of value when market price > \$1.50/MCF Rate reduced to 3% when market price < \$1.50/MCF As interpreted, tax imposed on value of unrefined gas at well head (significantly lower than the post production value used elsewhere) Low producing and highly speculative wells are exempt	Value	No.	7.90% Oil and Gas Tax (ORS §§ 324.050 through 324.520). Oil and Gas Tax (Or. Admin. R. 150-324.050-(A) through 150-324.050-(F)).	
Utah									Severance Tax on Oil, Gas, and Mining; Mineral Production Tax Withholding (Utah Code Ann. §§ 59-5-101 through 59-6-104). Oil and Gas Tax; Severance Tax (U.A.C. R865-150-1 through R865-16R-1). Conservation Tax (Utah Code Ann. § 40-6-14).	

- Notes**
- EIA Notes: 2009 Data are estimated. Monthly preliminary (from January 2009 to present) state-level data for the production series, except marketed production, are not available until after the final annual reports for these series are collected and processed. Final annual data are generally available in the third quarter of the following year. For years prior to 2007, coalbed production data are included in Gas Well totals. See Definitions, Sources, and Notes link above for more information on this table. Release Date: 1/28/2011 (Next Release Date: 2/25/2011)
 - Available at http://tonto.eia.doe.gov/dnav/ng/ng_prod_sum_a_EPG0_FGS_mmcfa.htm (shale production); http://tonto.eia.doe.gov/dnav/ng/ng_prod_sum_a_EPG0_VGM_mmcfa.htm (total gas production); http://www.eia.doe.gov/dnav/ng/NG_PROD_WELLS_S1_A.htm (total producing wells).
 - Corporate income tax data compiled by The Tax Foundation, available at <http://www.taxfoundation.org/taxdata/show/230.html> (last visited March 2, 2011).
 - The Texas legislature is considering repeal of the "high cost" well exemption. Dave Montgomery, *Texas Tax Break for Natural Gas Production Scrutinized Amid Budget Shortfall*, FORTH WORTH STAR-TELEGRAM, Feb. 17, 2011, available at <http://www.star-telegram.com/2011/02/16/2855320/texas-tax-break-for-natural-gas.html> (last visited Mar. 29, 2011).

2. Brief Analysis of State Severance Tax Policy Data

Perhaps the most obvious insight arising from the data presented in Table 3 is that Pennsylvania is strikingly distinct from other gas producing states in imposing no severance or ad valorem taxes on natural gas production. Of the thirty-two natural gas producing states, Pennsylvania is unique in imposing no tax on gas production while also forbidding any local tax assessment. Although two other gas-producing states, New York and Virginia, impose no state-level tax, both allow localities to impose a tax on natural gas production. As implied by the production data, however, these states differ from Pennsylvania in a more fundamental sense: neither produces substantial quantities of natural gas, either from shale or traditional wells.⁸⁴

As mentioned above, Pennsylvania is the sixth largest shale gas producing state. Of the other nine states in the top ten, all have enacted a severance tax, and five also authorize localities to impose an additional ad valorem tax. Four of the top ten also impose smaller state-level taxes or fees in addition to the severance tax: Oklahoma imposes an additional “excise tax”; Michigan collects an additional “oil and gas fee”; Montana and New Mexico collect an additional “conservation fee”. Of the top ten shale gas producing states, only Texas imposes no corporate income tax.

⁸⁴ While Virginia does not host significant natural gas reserves, the dearth of shale gas production in New York, which overlies a large part of several shale formations, is the result of that state’s moratorium on shale drilling. See *The Madness of New York*, THE WALL STREET JOURNAL, Dec. 16, 2010 (explaining that the state has not issued a permit for gas drilling that would require hydraulic fracturing for 3 years because of environmental concerns).

IV. Conclusion

This paper has attempted to bring together information regarding state approaches to taxing natural gas production that might be useful to those considering potential tax measures in Pennsylvania. As discussed *supra* in Part I.B, the adoption of a typical severance tax appears unlikely given the current political climate in Pennsylvania. Recent developments may nevertheless render the findings presented here relevant for Pennsylvania policy makers.

On March 28, 2011, Pennsylvania Governor Tom Corbett expressed willingness to consider measures identified as “impact fees” by some state legislators and currently under consideration by an advisory commission convened by the Governor.⁸⁵ While the specifics of the fees under consideration remain to be determined, the measures being discussed appear to be principally aimed at allowing localities to collect some revenue from gas well operators to compensate for externalities created by shale drilling.

Several points arising from this research may be useful to consideration of such impact fees. Localities in other states typically receive tax revenue from gas production in two ways: ad valorem taxes and distributions from state-level severance taxes.⁸⁶

⁸⁵ Robert Swift, *Counties Weigh Impact Fee*, THE SCRANTON TIMES-TRIBUNE, Mar. 29, 2011 at A1; John L. Micek, *Corbett: 'We've got to find a balance'*, ALLENTEW CALL, Mar. 29, 2011 at A11.

⁸⁶ Although detailed data regarding the distribution of proceeds from state severance taxes is not included in Table 3, research by the National Conference of State Legislatures indicates that many states direct a portion of these severance tax revenues to local governments. See Judy Zelio & Lisa Houlihan, *State Energy Revenues Update*, National Conference of State Legislatures (2008), <http://www.ncsl.org/IssuesResearch/BudgetTax/StateEnergyRevenuesUpdate/tabid/12674/Default.aspx> (last visited Mar. 28, 2011) (identifying 15 states: Colorado, Florida, Kansas, Kentucky, Louisiana, Mississippi, Montana, New Mexico, North Dakota, Oklahoma, Oregon, South Dakota, Tennessee, West Virginia, Wyoming). For a more detailed survey of states' distributions

Fifteen of the thirty-two gas producing states allow localities (generally counties) to directly levy taxes on natural gas interests. As shown in Table 3, there is significant variety in the structure of ad valorem taxes. In one state, New Mexico, the State Department of Finance participates in the administration of these taxes by setting the ad valorem tax rate for each county. In the majority of gas producing states, however, local taxes appear to be authorized by the state but administered primarily by local governments.

This discussion has not exhausted the conclusions that might be drawn from the state policy data presented here. By presenting an overview of the various structures of state and local taxes imposed by other states on natural gas production, however, this research may provide a solid foundation on which to conduct further policy analysis.

of state-level severance tax revenue, *see* MICHAEL WOOD & SHARON WARD, PENNSYLVANIA BUDGET AND POLICY CENTER, RESPONSIBLE GROWTH: PROTECTING THE PUBLIC INTEREST WITH A NATURAL GAS SEVERANCE TAX 28-29 (2009).