INNOVATION OHIO

FRACKING, FAIRNESS AND THE FUTURE

Making Sure Ohio Taxpayers And Workers Share In The Benefits

INTRODUCTION

Ohio's oil and gas resources have caught the attention of drillers, investors and political leaders alike. Thanks to a process known as hydraulic fracturing ("fracking"), and a move to horizontal drilling (as opposed to traditional vertical wells) oil and gas trapped deep under the surface can be extracted in sufficient volumes to make drilling in layers of shale deep below the ground economically feasible. Geologists estimate that the amount of natural gas trapped in the shale rock beneath Ohio could be enough to fuel the state for 21 years.[viii] Industry estimates place the size of the natural gas reserve at 20 trillion cubic feet. Similarly, the potential to recover oil from Ohio's shale has drawn industry insiders to remark that the Utica shale may represent one of the biggest domestic oil finds in 40 years, with state estimates ranging as high as 5.5 billion barrels of oil.[ix]

Ohio's shale resources are trapped in two main geologic formations, the Marcellus and the Utica. Both span an area beneath several northeastern states, Lake Erie and southeastern Canada. The Marcellus was the first to capture the attention of oil and gas exploration companies, with most of the early focus on natural gas recovery from the Marcellus shale under Pennsylvania. More recently, companies have set their sights on Ohio's Utica shale, located deeper below the earth than the Marcellus, but curving upward so steeply that under portions of Ohio, the shale is within 2000 feet of the surface, making the oil and gas trapped within the rock easier and cheaper to obtain. Ohio's shale resources are also of interest because of early indications that it contains a mixture of natural gas, oil and other liquids, making drilling more economically worthwhile, even if natural gas prices continue to decline.

COMMUNITY IMPACTS

A shale boom like the one predicted to occur in Ohio can have a large impact on communities. As energy companies start to drill throughout Ohio, Ohio's oil and gas-rich areas will experience an influx of workers, including large numbers of workers from out of state. Heavy equipment on local roads may cause damage and increase maintenance expenses. Pollutants and dust may contaminate the air. Lessons learned from the experiences of other states could prove valuable to Ohio as it moves forward with fracking.

Road and transportation maintenance have been especially hard hit by the Marcellus Shale drilling in Pennsylvania, and increased drilling activity is expected to have a similar impact in New York. In Northern Pennsylvania, traffic from heavy trucks and equipment, traveling to the state's Marcellus shale, have caused extensive damage to the roads. A spokesperson for the District 3 Office of the Pennsylvania State Department of Transportation said:

> *"Our roads are taking quite a beating," he said. "This is really new territory for us. We've never seen this kind of widespread, all-at-once wear and tear that our roads are now experiencing."*[x]

In New York, a memo from the New York Department of Transportation revealed that "Pavement structural damage done by the passage of a single large truck is equivalent to that done by about 9,000 automobiles."[xi] Areas with heavy drilling are expecting 1.5 million heavy truck trips annually and could see an increase in peak hour trips by 36,000 trips per hour. A similar impact can be expected in Ohio. This type of traffic—on rural roads that aren't designed for such loads— will quickly result in expensive maintenance costs.

But the impact of the oil and gas drilling boom extends far beyond infrastructure. In Northern Pennsylvania, local businesses, hotels and restaurants have benefited from the large number of out of state workers and their spouses. This influx has also created problems. Oil and gas workers, who frequently receive rental stipends from the energy companies, often secure rental housing and live in mobile homes, hotels and apartments. The increased demand for housing has driven up rent in rural areas, which, in turn, has displaced many long-time residents. Areas that saw few homeless people have experienced a sudden increase in family homelessness and in families doubling or tripling up in their living quarters.

> *"Abby Thorborg, vice president of the shelter group and the county's part-time housing specialist, said the arrival of gas workers with generous housing allowances made a small homelessness problem much worse. She's seen 134 families in her office this year, up from 17 in 2008. She estimates 75 percent of Tioga residents with nowhere to live were displaced by gas workers."*[xii]

The demand for social services, too, has spiked throughout Northern Pennsylvania. Officials report that communities have had to deal with more people, more social service referrals and more crime.

> *"Police calls for service in Bradford County, which has more Marcellus wells than any other county in the state, are up 25 percent this year, The Associated Press reported. Drunken-driving arrests rose 60 percent last year."* [xiii]

Environmental/Health Concerns

While hydraulic fracturing may be a relatively common drilling technique that is beginning to be used in many locations across the U.S., the health risks associated with it remain unknown. In Colorado, the Agency for Toxic Substances and Disease Registry (ATSDR) tested 14 drilling sites in 2008 for possible air pollutants and found higher than average levels of cancer-causing chemicals that the Agency suggested could be cause for concern in the future.

> *"Fifteen contaminants were detected at levels the federal government considers above normal. Among them were the carcinogens benzene, tetrachloroethene and 1,4-dichlorobenzene. The contamination fell below the thresholds for unacceptable cancer risk, but the agency called it cause for concern and suggested that as drilling continued, it could present a possible cancer risk in the future."*[xiv]

In at least one documented example, a family in Pennsylvania who had been exposed to fracturing chemicals had developed rashes and blisters in their noses and throats. Family members asked doctors to draw blood samples to test for chemicals associated with the hydraulic fracturing process. The doctors reported finding high levels of arsenic, toluene, and benzene, chemicals found near other gas well sites.[xv]

While such anecdotal reports continue to emerge, there is a clear lack of scientific research regarding the health effects of hydraulic fracturing. In August of 2011, a leading national children's physicians group called for more epidemiological research and disclosure of chemicals used during the drilling process.[xvi] At a recent conference in Virginia, leading research physicians called for a fracking moratorium until further research could be done to better understand the health effects related to the practice.[xvi]i

Spills at hydraulic fracturing sites have even been found to result in instances of livestock poisoning.[xviii]

In addition to being associated with possible health consequences, hydraulic fracturing is connected to multiple environmental concerns, such as increased air pollution and a probable contamination of local water supplies.

The use of horizontal fracturing also poses a risk to the preservation of Ohio's natural resources. While the federal Environment Protection Agency is currently in the process of evaluating the risk posed to local water supplies, that report is not due until 2014. Nevertheless, EPA and state studies in Wyoming, Pennsylvania, Louisiana and elsewhere have found significant links between hydraulic fracturing and water contamination. [xix, xx, xxi]

Contamination, however, is not the only potential water problem. Overuse is another. Hydraulic fracturing in a single well typically requires between one and five million gallons of water and wells can be fractured multiple times to stimulate well activity. Beginning this month, all well developers in Texas must disclose to the state the amount of water they intend to use and where that water will come from.[xxii]

Last but certainly not least is the problem of earthquakes. Since March of 2011, Youngstown, which had never recorded an earthquake in its history, has experienced eleven tremors, including a 4.0 quake on New Year's Eve. Eastern Ohio, of course, is home to dozens of injection wells that are used to dispose of hydraulic fracturing waste, including one very close to the epicenters of the 2011 quakes. When seismic experts from Columbia University concluded the quakes were probably caused by the injection of thousands of barrels of waste water into a nearby injection well, Ohio shut down those wells pending further tests.[xxiii] Although our policy recommendations do not address the potential risks related to waste water injection wells, certainly these issues should be resolved before proceeding.

A Struggle for Ohio's Local Governments

Given the potential impacts to infrastructure, public health and the environment, communities in Ohio's oil and gas-rich regions must begin to prepare for the impacts of increased drilling and hydraulic fracturing activity. These demands may require additional social services, police and fire presence and road maintenance. Communities must also be prepared to address environmental and health concerns should they arise, such as the clean up and restoration of water supplies.

All these demands are promising to hit local governments at a time when resources are already stretched to the breaking point. In Ohio, local governments and school districts are coping with the dual impacts of declining tax revenues and unprecedented cuts in the state budget. Governor Kasich's two-year budget for state fiscal years 2012 and 2013 reduced the amount counties and political subdivisions receive from the state's Local Government Fund by 25% in the first year and 50% in the second year. These funds are typically used to provide exactly the types of services—police and fire, social services and infrastructure—that will be in greater demand when drilling activity increases. In Carroll County, where 40 wells have been already been permitted, local governments and schools were cut by more than $2 million dollars in the state budget. In Jefferson County, where 15 wells have been permitted, local governments and schools were cut by more than $8.3 million.[xxiv] When the increased need for services is combined with deep state budget cuts and the concomitant loss of revenue, school districts, local governments and taxpayers are put in an untenable position. We offer recommendations on how Ohio can ensure local communities have the resources they need to meet these challenges at the end of this report.

JOB CREATION POTENTIAL

With extensive holdings in an area that promises vast oil and gas resources, it is inevitable that oil and gas drillers will invest and create jobs in Ohio. Estimates vary, however, as to the number of jobs that will be created. An economic impact study, funded by the oil and gas industry, put the number at 200,000.[xxv] Another study by researchers at the Ohio State University estimated job creation will be closer to 20,000.[xxvi] Actual employment numbers from Pennsylvania show employment in the Marcellus industries grew in that state by 5,669 over a three year period.[xxvii]

In any scenario, the history of oil and gas booms indicates that job creation will be temporary, lasting only until Ohio's shale oil and gas resources are sapped and it is no longer economically feasible to continue pursuing them. As the OSU study puts it, "drilling activity usually begins with a wave of drilling and construction in the initial phases, followed by a significant slowdown in jobs as the production phase requires a much smaller number of permanent employees."

In the boom phase, however, job creation is rapid and specialized. According to the president and interim chief investment officer for JobsOhio (the state's new semi-private corporation to oversee economic development) jobs from expanded oil and gas drilling will include "diesel mechanics, engineers, CDL-licensed truck operators, geologists-a whole range of trained people."[xviii] However, the experience in Pennsylvania, which is five to six years ahead of Ohio in terms of shale-drilling activity, is that many of the jobs are so specialized that they have gone to out-of-state workers. According to a November 2010 report from the Pennsylvania College of Technology's Workforce Development and Continuing Education Department, nearly 70 percent of Pennsylvania's Marcellus jobs went to non-Pennsylvania residents.[xxix]

Indeed, Governor Kasich, has expressed frustration at the inability to get information from oil and gas drillers about the type of training that will be needed to stop the practice of bringing in workers from out of state who have already been trained.

> *"If you see trucks from Pennsylvania, Texas, that doesn't go down real well with people in Ohio. So we've got to get Ohioans trained. Now, our problem has been getting the companies to tell us what they want. So I'm badgering – we're going beyond badgering – I'm starting to pound on them: 'tell us what you need to get trained.'" […] "But we've got to know what they want."*[xxx]

MEET THE FRACKERS

In 2011, 101 permits were issued for horizontal drilling into Ohio's Marcellus and Utica shale, compared to just five in 2010 and three in 2009.[xxxi] Of the 101 horizontal drilling permits issued in 2011, over half, 53, were issued in the last three months of 2011 alone. Companies are investing at a breakneck pace, purchasing mineral rights from landowners in nearly half of the state's counties, and assembling sufficient holdings to begin what is primarily an exploration phase of Ohio's shale resources.

Major players

Chesapeake, the largest of the drillers, holds nearly 1.4 million acres in Ohio's shale play.[xxxii] EnerVest and its subsidiary, EV Energy Partners control 780,000 acres at last count.[xxxiii] In total, six companies have reported holdings in excess of 100,000 acres (see Table 1), while dozens more are assembling positions with the intent to drill or sell their stakes to investors or industry late-comers at a profit. Among other players that are currently purchasing leases in Ohio are Exxon-Mobil's XTO subsidiary and Chevron. In all, thirteen companies have already acquired permits in Ohio's Marcellus and Utica shale and a number have wells under construction or in production.

Table 1 - Major holders of Utica shale acreage in Ohio (as of 1/24/12)

Company	Land Holdings	Shale permits[A]	Active wells[B]
Chesapeake Energy	1,357,000 acres	76	27
Enervest & EVEP	780,000 acres	7	0
Anadarko	300,000 acres	10	4
Consol Energy	200,000 acres	4	1
Hess Corporation	185,000 acres	6	4
Devon Energy	110,000 acres	2	1

Source: Ohio Department of Natural Resources
A – permits for horizontal drilling operations in Ohio's Marcellus or Utica shale
B – horizontal wells that are categorized by ODNR as "drilling", "drilled", "completed" or "producing"

Chesapeake Energy

Based in Oklahoma City, Chesapeake Energy (NYSE: CHK) is the nation's second largest natural gas producer. Based on current stock prices, the company's total value is approximately $14.8 billion. In 2010, Chesapeake reported profits of $1.32 billion on $10.88 billion in revenue.[xxxiv] CEO Aubrey McClendon's $112 million compensation in 2008 made him the highest-paid CEO in the S&P 500 for 2008.[xxxv] Last year, he was in the top 30. Since 2008, he has been paid $151 million.[xxxvi] The company has received considerable investor scrutiny for its executive compensation practices, with Institutional Shareholder Services singling out the company and a handful of others for having excessively non-performance based pay.[xxxvii]

Chesapeake's Ohio holdings of 1.357 million acres make the company the largest player in the state by a considerable margin. Chesapeake claims its Utica holdings may be worth as much as $20 billion to shareholders.[xxxviii] The company is primarily focused on the recovery of natural gas liquids and oil, found in the central and east-central portions of the state. Chesapeake has been issued more drilling permits than any other company, with 76 issued to date, and has been the most active in drilling, with 27 active wells. They are permitted to drill in Carroll, Columbiana, Geauga, Guernsey, Harrison, Jefferson, Mahoning, Portage, Stark and Tuscarawas counties. The company recently agreed to drill 50 new wells per year as part of a joint venture agreement to sell a portion of its stake in the Utica shale.[xxxix]

Because of its early-mover advantage in the state, the company has been able to monetize its landholdings by selling stakes in its Ohio leases for a price greatly inflated over what it originally paid. A recent transaction saw 25% of Chesapeake's Utica holdings sell for $2 billion, a valuation of nearly $15,000 per acre.[xl] This is nearly $12,500 more per acre than the company paid to acquire the mineral rights from Ohio landowners. A separate financial offering recently raised $750 million from the sale of preferred stock in a subsidiary that holds 45% of the company's Utica leases.[xli]

EnerVest and EV Energy Partners

EnerVest, based in Houston, TX, is a privately-held investment group that buys and manages natural gas assets to generate cash flow for its investors. EnerVest, in turn, created and owns 71% of publicly-traded EV Energy Partners (NYSE: EVEP). Both companies are already producing natural gas from traditional wells in Ohio, but have heavily invested in Ohio's Utica shale. Combined, the companies hold 780,000 acres, operated by EnerVest and through a partnership with Chesapeake Energy.[xlii]

The companies are focused on the liquids-rich portion of the shale play, currently drilling delineation wells to determine the location of the wet gas (where natural gas liquids can be found) and oil phases. As of January 24, the companies had permits to drill in eight locations in Carroll, Jefferson and Stark counties.

While EnerVest is a privately held firm and no market valuation is available, its EV Energy Partners subsidiary has a market value of $2.3 billion with 2010 revenues of $243 million and profits of $65 million.[xliii] EnerVest indicates it earned $988 million in revenue for the year.[xliv] Mark Houser was recently promoted to CEO and President of EV Energy Partners. His 2010 compensation was $416,000. The Chairman of EVEP is John Walker, whose 2010 compensation in that role was $439,000.[xlv] Walker is also President and CEO of EnerVest.

Anadarko Petroleum

Based in Houston, TX, Anadarko Petroleum is likely the third-largest holder of Ohio Utica shale acreage, recently reporting 300,000 acres under lease.[xlvi] The company has been acquiring land for the past year and a half, focused on the liquids-rich region of the state. Currently in the exploratory phase, Anadarko holds 10 horizontal drilling permits in Coshocton, Guernsey, Muskingum and Noble Counties, and has begun work on four wells to date.

The company has a market value of $39.7 billion and had reported 2010 revenue of $12.98 billion. The company posted a net loss for the year, due primarily to a settlement with BP over liability for the Gulf oil disaster. However, before interest, taxes, depreciation, amortization and the one-time BP charge, the company posted $6.7 billion in profit for 2010. James Hackett, Chairman and CEO, enjoyed cash and stock compensation worth $23.5 million in 2010.[xlvii]

Consol Energy

Consol Energy (NYSE: CNX) is a diversified fuels producer based in Canonsburg, PA. Traditionally a coal company, Consol also produces oil and gas from properties in the Appalachian and Illinois basin. The company owns 200,000 Utica acres, in the liquids and oil rich portion of the play, and recently announced a deal to partner with Hess in exchange for 50% of its Ohio Utica holdings.[xlviii] The company has indicated it will spend $50 million to drill the jointly-operated wells, focusing on Portage, Tuscarawas, Mahoning and Noble Counties, while Hess will be active in Belmont, Jefferson, Harrison and Guernsey counties.[xlix]

CNX, the company's natural gas division, currently holds permits for four wells in Ohio but indicates they will drill a total of 11 wells this year, ramping up to 33 new wells it will drill in 2014.[l]

Consol's market capitalization is $8.9 billion, and the company reported 2010 revenue of $5.87 billion and a net profit of $541 million. Chairman and CEO, Brett Harvey, took home cash and stock compensation worth $9.6 million in 2010.[li]

Hess Corporation

Hess Corporation, based in New York, owns 185,000 acres of Ohio Utica shale leases.[lii] The company acquired its leases through acquisitions, purchasing Marquette Exploration in September, 2011, which boosted its position by 85,000 acres. Hess also acquired a 50% stake in Consol Energy's 200,000 acres. The Marquette acquisition values the acquired leases at nearly $9,000 per acre. Through its purchase of Marquette, the company is active with drilling permits in Belmont and Jefferson Counties. As part of its partnership with Consol, the company will additionally operate in Harrison and Guernsey counties.[liii]

Hess has a market value of $19.8 billion, and reported revenue of $37.8 billion and profits of $6.5 billion in 2010. John B. Hess, chairman and CEO, received $5.3 million in compensation for 2010.[liv]

Devon

Based in Oklahoma City, Devon Energy is a natural gas exploration and production company that operates in the United States and Canada. The company reports holdings of 110,000 acres in Ohio's Utica shale[lv] and currently holds permits to drill in Ashland and Medina Counties.

Chairman and Co-Founder, Larry Nichols, took home $4.7 million in compensation in 2010, while CEO John Richels was paid $3.9 million.[lvi]

Ohio Land Rush is Underway

Chesapeake Energy claims the Utica shale play will be the country's "most profitable," describing it as "the most frenzied new leasehold play in the industry since the Haynesville in 2008."[lvii] The Haynesville shale play in Louisiana has been estimated to involve reserves of natural gas as large as 250 trillion cubic feet, turning landowners into millionaires overnight.[lviii] Chesapeake has equally high hopes for the Utica shale, calling it "the biggest thing to hit Ohio since the plow."

To date, most of the companies have been in an acquisition mode, or as one company termed it, a "land rush." Chesapeake Energy recently reported that it was acquiring land at a pace of almost 1,000 net acres per work day and planned to have most of its leases wrapped up by the end of 2011. They expect to start releasing well results soon, but have avoided doing so thus far for fear of driving up lease prices.

Some analysts worry that Chesapeake is overhyping the amount of oil and gas available, in an attempt to drive up the price for leases and unload their position on late entrants to the market. In one recent deal, the company sold 25% of its Ohio holdings for $2 billion, recapturing all of its spending to date, and reflecting an enormous price appreciation compared to what the company paid to purchase those assets in the first place.

Whether the potential is real or hype, investors are stepping in to pay ever-increasing amounts for Ohio mineral rights. A September deal between CONSOL and Hess valued shale land holdings at approximately $6,000 per acre.[lix] Also in September, Hess announced the acquisition of Marquette Exploration, valuing that company's holdings at over $8,800 per acre.[lx] Then, in November, Chesapeake announced an agreement to sell a portion of its holdings for $15,000 per acre.[lxi] Clearly a land rush is on with out of state companies willing to pay increasingly inflated amounts in the hope of reaping even greater rewards down the road.

Political Activity

According to a report issued by *Common Cause Ohio*, oil and gas drillers and their associations and lobbyists contributed $2.8 million to the campaigns of state candidates, committees and parties in Ohio in the past decade, including $213, 519 to Governor Kasich, $71,195 to House Speaker Bill Batchelder and $64,713 to Senate President Tom Niehaus. During that time, Ohio's Republican Senate Campaign Committee collected $114,750, while the Ohio House Republican Organizing Committee took in another $95,500.[lxii]

The industry's generosity to state officials has been met with legislative success. In its online list of legislative priorities, the Ohio Oil and Gas Association cited "access to the resource base" as its top issue,[lxiii] calling upon state officials to open state lands to drilling. Showing their responsiveness to the industry, the Ohio General Assembly in 2011 passed—and the Governor signed—House Bill 133, which permits oil and gas drilling on state lands, including wildlife areas and parks. Also in 2011, the General Assembly enacted a new tax break for oil companies as part of the state transportation budget.

Questionable Tactics Against Landowners

Today developers are engaged in a massive push to secure mineral rights on land above Ohio's shale. While there is no public database that tracks leases between developers and landowners, many of the nation's largest oil and gas producers already secured hundreds of thousands of acres of land. While these leases do represent wealth-making opportunities for Ohio landowners, the amount received by the landowner in royalties from gas or oil production is typically only a small percentage of the value to developers who stand to make millions of dollars from every well.

While the majority of leases entered into between landowners and developers are done in good faith, there are still reports that landmen and their employers' are entering into leases that benefit developers at the expense of landowners. After reviewing over 110,000 oil and gas leases from Texas, Maryland, Pennsylvania, Ohio, and West Virginia, *The New York Times* found that leases continually lacked adequate provisions to protect the landowner.[lxiv] For example:

- Less than half of the leases contained language requiring developers to reimburse the landowner for water contamination after drilling begins.
- Half the leases did not contain provisions requiring developers to compensate landowners for damaged property or livestock.
- Leases granted developers broad rights to remove trees and existing structures, as well as the right to decide where to store chemicals. They also gave developers the ability to run generators and spotlights throughout the night near homes.
- Leases rarely required developers to disclose to landowners potential environmental hazards that federal law requires to be disclosed to shareholders.

A recent Reuters-MSNBC investigation showed that Chesapeake Energy, the largest player in Ohio, has used shell companies to acquire leases in Michigan. When test wells came up dry, the shell companies failed to make good on commitments to pay signing bonuses, leaving landowners empty handed. The shell corporations hold few or no assets, making them difficult or impossible to sue. A contract law professor put it this way: "It suggests they might have had a strategy going in of not honoring their agreements," he says. "The shells would have facilitated that" because Chesapeake could blame the shells for the cancellations, suffering no damage to its reputation or its corporate checkbook. Elsewhere in Ohio, reports have surfaced of a found memo appearing to guide landmen in the use of deceptive and misleading tactics in approaching landowners in order to obtain drilling rights.[lxv]

HUNDREDS OF BILLIONS IN POTENTIAL REVENUE

Most experts agree that the immense quantity of natural resources in Ohio represents a tremendous financial opportunity for the oil and gas industry. Chesapeake Energy CEO Aubrey McClendon has personally valued the combined discoveries at half a trillion dollars.[lxvi]

> The CEO of Chesapeake has valued the combined discoveries at ***half a trillion*** dollars.

Estimates of the amount of natural gas available in Ohio's shale, and the drilling activity that will occur to obtain it, are widely available from both industry and state geologists. The Ohio Department of Natural Resources has estimated that there are 3.8 to 15.7 trillion cubic feet of natural gas in the Utica shale.[lxvii] In their September report, the industry group, Ohio Oil and Gas Energy Education Program (OOGEEP) projected natural gas reserves to be as large as 20 trillion cubic feet, with an estimated market value of $108 billion.[lxviii]

To determine the estimated projections of tax revenue and natural gas value in Ohio, we used several assumptions, all derived from the OOGEEP analysis:

1. Over its lifetime, each well will produce, on average, 5 billion cubic feet (5 BCF).
2. Production (and associated tax payments) begins in the year following the drilling of the well.
3. The portion of a well's total lifetime production will occur as follows:

Year	Estimated Percentage of Well Production
Year 1	17%
Year 2	9%
Year 3	6%
Year 4	5%
Year 5 and beyond	4% each year thereafter

4. To determine the estimated value of the Utica Shale to the oil and gas industry, we used the market price of natural gas found in the OOGEEP report of $4.50 per MCF, multiplied by a factor of 1.2 to account for the presence of natural gas liquids in the production mixture.
5. To estimate severance tax revenue, we used the market price of natural gas of $4.50 per MCF found in the OOGEEP report.

Using these assumptions, one can estimate the value of new natural gas wells in the Utica shale. For example, the OOGEEP report projects that the average well will produce approximately 5 billion cubic feet of natural gas over its lifetime. The average well will generate $25.1 million in revenue over its lifetime ($5.40/MCF[lxix] x 5 billion). To put these figures in context, the Ohio Department of Natural Resources stated that a traditional natural gas well in the Appalachian Basin produces 200-500 million cubic feet (MMCF) over its lifetime—one tenth of the volume that is expected from new Utica shale hydrofracking wells.

By projecting the revenue potential of a single well, one can generate natural gas revenue projections for Ohio's industry as a whole. The OOGEEP report estimates that 3,423 wells will be drilled to completion in Ohio. The drilling of these wells is projected to be staggered over a period of five years from 2011 and 2016. Based on these variables, the industry will realize $85.9 billion in total revenue, averaging $3.9 billion in revenue a year over the lifetime of the wells drilled in the next five years alone. Taking into account industry production curve projections, it is estimated that in 2016, these wells will be operating at their peak potential, generating over $10.9 billion of revenue for well developers that year alone. [See Appendix 1] According to industry production forecasts, revenue from the gas wells drilled in the next five years will continue until 2033.

While our revenue estimates only take into consideration the value of natural gas in Ohio, it is important to note that the reason for the immense interest in Ohio is due to the additional presence of natural gas liquids and crude oil. Chesapeake believes the Utica shale region is divided between a western oil phase, a central wet gas phase, and an eastern most dry gas phase. While this division makes the Utica shale analogous to the Eagle Ford Shale in South Texas in makeup, Utica is believed to be economically superior.[lxx] The Ohio Department of Natural Resources estimates that there are 1.3 to 5.5 billion barrels of oil under the Utica shale in Ohio.[lxxi] Even though the industry has not released any production estimates, given the current market price for a barrel of oil ($100)[lxxi] the crude oil alone in the Utica shale could be worth $130 billion to $550 billion. The extraordinary value of the oil may be one reason why recent reports have surfaced claiming that the industry may be more interested in the oil potential of the region than the natural gas potential.[lxxiii]

These estimates show that shale plays in Ohio represent enormous financial opportunity for the oil and gas industry over the next decade. As shown in the previous section, leaders in the oil and gas industry are already working to maximize the potential revenue from these reserves. Since these companies will generate enormous profits over the coming years, it is vital that Ohio be positioned to ensure that the wealth generated by these resources is shared with Ohio and Ohioans, not simply pocketed by the corporations.

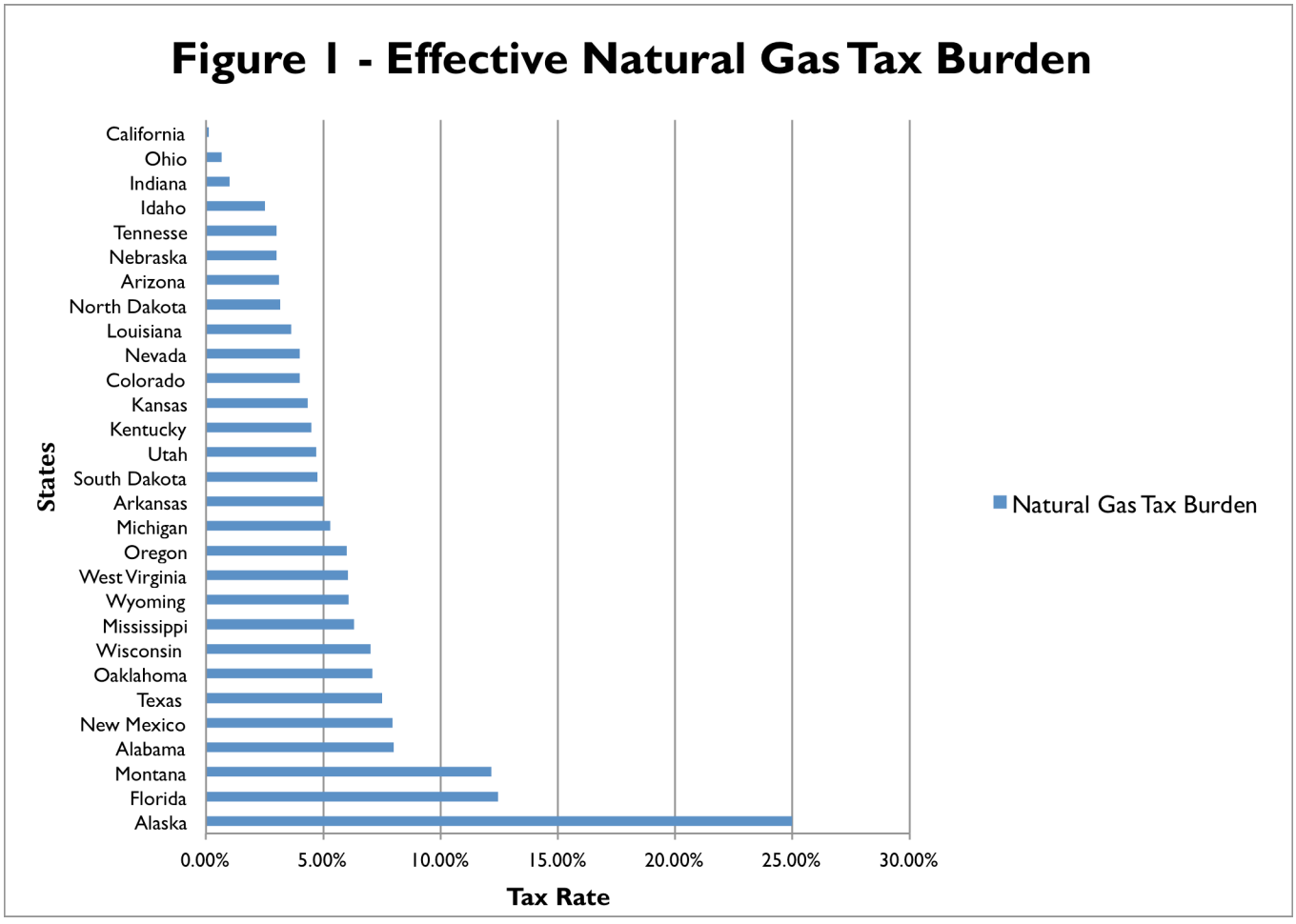
PAYING THEIR FAIR SHARE?

Currently, oil and gas producers pay an Ohio severance tax of $.03 per MCF and $.20 per barrel of oil. No tax is currently levied in Ohio on the extraction of natural gas liquids. The severance tax is levied at the point of sale, which is considered advantageous to Ohio since the tax burden is thus shifted to buyers from out of state. It is also important to note the Ohio severance tax, unlike that of many other states, is levied on the *volume* of gas produced and not on its *value*. Severance tax revenue is currently used to fund the Ohio Department of Natural Resources regulatory functions related to the oil and gas industry.

According to the recent *Policy Matters Ohio* report, the oil and gas industry paid $2.6 million in severance taxes and $9.4 million in total taxes in 2010.[lxxiv] While it is true that the oil and gas industry pays other taxes in Ohio—the Commercial Activity Tax, state income taxes, and property taxes—all other industries and businesses in Ohio are required to pay these same taxes.

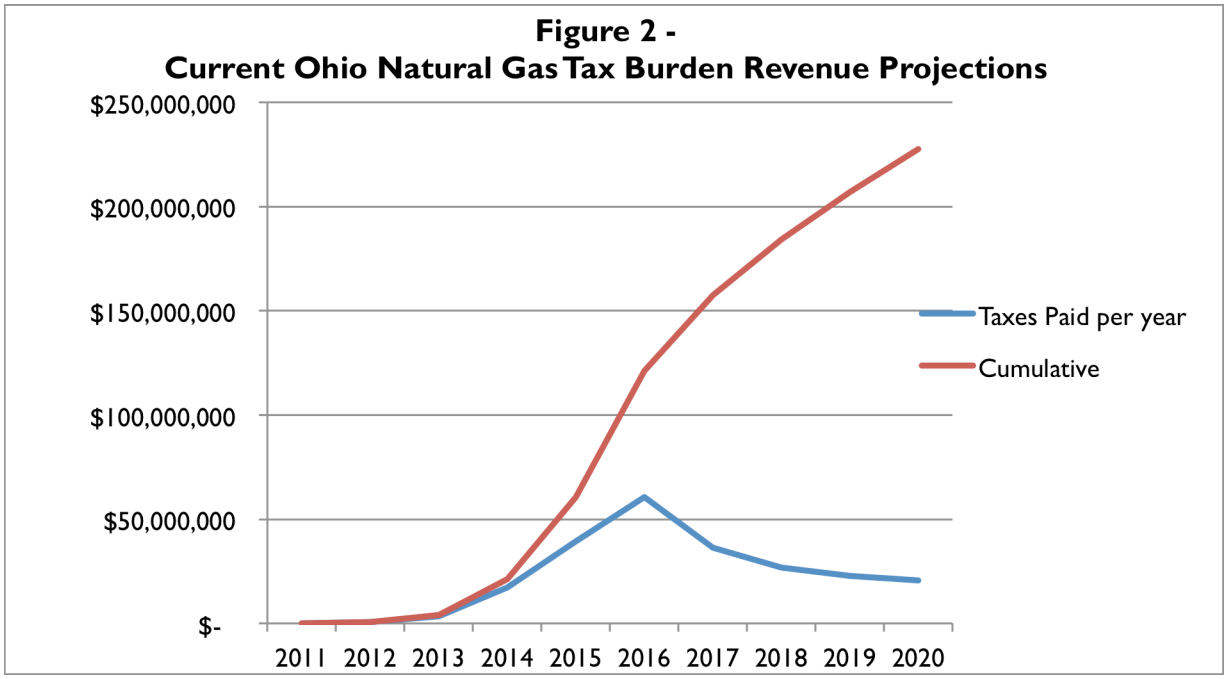
The tax rate on natural gas in Ohio is relatively small, in both nominal and effective terms. Figure 1 ranks the oil and gas producing states that levy a tax by their effective natural gas tax burden. This chart shows that the effective severance tax rate in Ohio (.66%) is only slightly higher than the lowest state, California (.13%).[lxxv]

In other words, Ohio's severance tax is the second lowest amongst states that levy a tax. It is important to note that actual severance tax rates vary significantly from state to state. Because of deductions, additional production fees, and assessments, the nominal rate between two states may be similar, while the *effective* rate may differ significantly. Figure 1 represents the effective tax burden on natural gas production in each state which includes severance tax rates, additional production assessments, and in some instances relevant deductions.



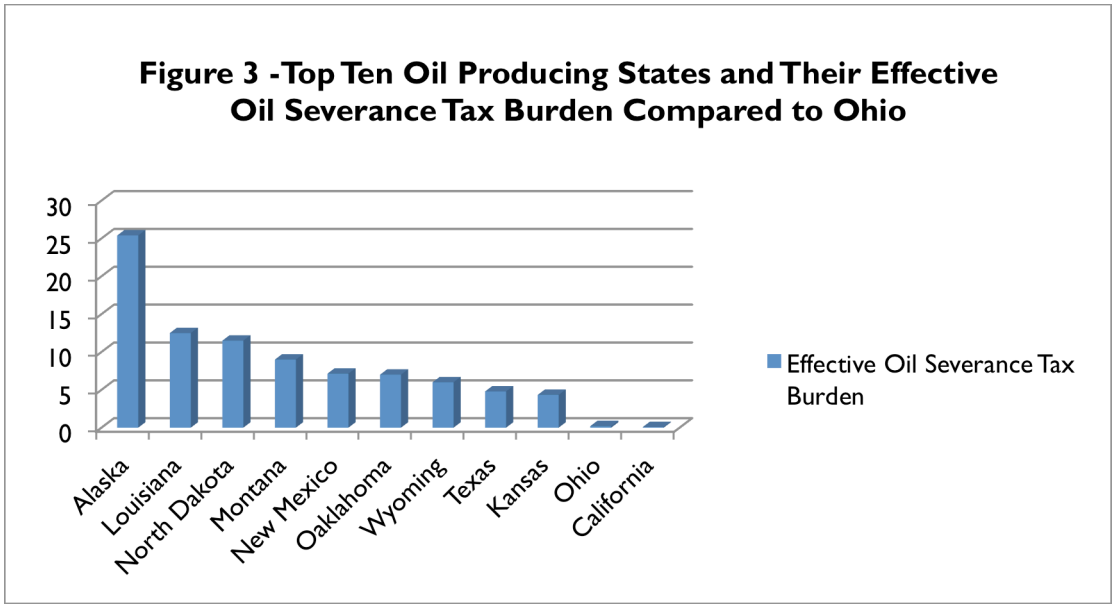
Source: Innovation Ohio, using state tax data provided by the Society of Petroleum Evaluation Engineers[lxxvi]

Figure 2 illustrates the anemic severance tax collections Ohio will receive over the course of the next ten years, based on industry projections of natural gas production.[lxxvi] Without legislative action, Ohio is estimated to collect $227 million dollars, total, over the next ten years at the current severance tax rate. While the industry is expected to pocket over $40.9 billion dollars in the next ten years, Ohio will share in just 0.55 percent of it.



Source: Innovation Ohio, using gas production forecasts from Ohio Oil and Gas Energy Education Program Report[lxxviii]

Ohio's oil tax burden is just as anemic as its projected natural gas severance tax collections. Figure 3 demonstrates that Ohio's oil tax burden of $.20 per barrel of oil ranks it near the bottom when compared to the top ten oil producing states and their effective tax burden on oil production. While Alaska has by far the highest tax burden at a little over 25 percent, Ohio's effective rate of .20 percent ranks it only above California and their rate of .08 percent. While the Ohio Department of Natural Resources has estimated that there is 1.3 billion to 5.5 billion barrels oil in the Utica shale this means the current severance tax would collect between $260 million to $1.1 billion.



Source: Innovation Ohio, using state tax data provided by the Society of Petroleum Evaluation Engineers.

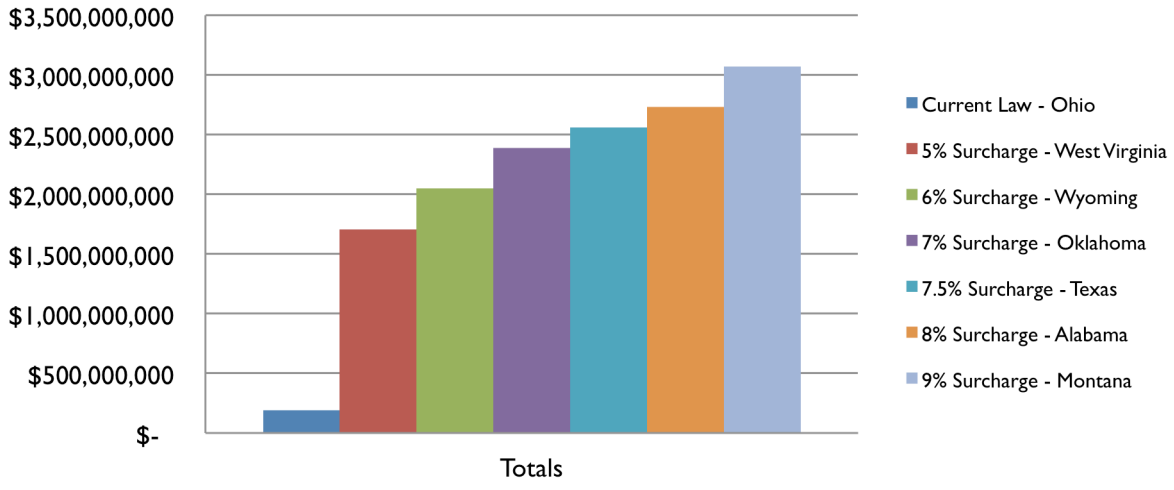
OHIO SHOULD RAISE ITS SEVERANCE FEE

Oil and gas companies from around the country plan to cash in big by exploiting Ohio's natural resources. As state law stands, Ohio will not secure a fair share of wealth associated with these resources. It is important for lawmakers from both political parties to realize that this need not be the case. There are multiple options for determining an appropriate severance tax rate that still encourages oil and gas development but also ensures that an acceptable level of value is retained in Ohio.

Figure 4 below represents multiple potential severance tax rates that Ohio could impose, as well as the projected revenue associated with each rate. Also included are the oil and gas producing states that currently share the same tax rate. As one can see, even if Ohio adopted a severance tax as low as 5 percent, equal to the nominal rate in West Virginia, Ohio would collect over $1.7 billion in new revenue over the course of the next 10 years. If Ohio were to raise the severance tax rate to 7.5 percent, equal to a major oil and gas producing state like Texas, the state would collect over $2.5 billion in new revenue over the next 10 years.

While he's indicated a willingness to consider raising Ohio's severance tax, Governor Kasich has cautioned that raising the tax *too* high might cause the companies to shun Ohio and do their drilling elsewhere. But the fracking industry isn't like the auto, steel or other industries. If companies want to extract oil and gas from shale, they have no alternative but to go where the shale is. Ohio not only has the shale that other states don't, we have one of the largest deposits in the nation. How likely is it that oil and gas companies will leave billions of dollars in profits on the table because they want a lower tax rate?

Figure 4 -Projected Natural Gas Severance Tax Revenue for Ohio Adjusted to Match Other States' Nominal Tax Rate from 2011-2020



Source: Innovation Ohio, gas projections from Ohio Oil and Gas Energy Education Program Report.[lxxix]

It is important to note that oil and gas companies base their exploration decisions on a multitude of factors ranging from productivity, location and activity assumptions, to logistics and market access. As the *Policy Matters* report correctly points out, severance taxes have been shown to have little impact on production and exploration decisions.

> *"A University of Wyoming study found that a two percentage point deduction in the state's oil severance tax would increase production by only 0.7 percent over 60 years while dramatically decreasing state revenue. However, the study also found that raising taxes had a negligible effect on production, and that 'the main effects of the tax increase would be to dramatically increase Wyoming's severance tax revenues and to reduce federal corporate income taxes paid by producers."*

Texas and its Governor, Rick Perry, have long been known as extremely friendly to oil and gas interests. Indeed, Gov. Perry is widely admired in conservative political circles, especially for his views on taxation. Texas' effective tax rates on natural gas and oil are 7.5% and 4.6%, respectively. If Ohio were to establish these same rates, and apply them to oil, gas and natural gas liquids, we would collect an estimated $8.4 billion to $27.8 billion in new revenue.[lxxx]

Severance taxes have little impact on production and exploration decisions.

While a portion of the revenue should be directed toward covering increased regulatory and infrastructure costs, a portion of it should also be directed toward the State's General Revenue Fund. Placing these funds in the General Revenue Fund will allow the State to reimburse school districts and local governments that lost significant amounts of revenue through state budget cuts. Directing this new revenue towards the General Revenue Fund will also meet Governor Kasich's goal of allowing all Ohioans to share in this new wealth.

LANDOWNER PROTECTIONS – A BILL OF RIGHTS

Hydraulic fracturing, like any other oil and gas activity, is not risk free, and lawmakers need to consider policy options that protect landowners and the environment as much as possible from these risks. Ohioans should be made aware of their rights and responsibilities prior to leasing their mineral rights. To meet these goals, lawmakers should reform existing hydraulic fracturing chemical disclosure requirements, strengthen existing water testing requirements, and direct the Attorney General to draft and enforce a "Landowner Bill of Rights."

Current law requires all well owners to submit to the Department of Natural Resources well logs containing information on the materials used to fracture a well within 60 days of completion of the well.[lxxxi] Lawmakers should amend this section of law so that well owners are required to submit this information prior to the well's stimulation, and should direct the Department of Natural Resources to disclose these reports in a clear and concise manner on their website so citizens know what chemicals are being used at specific wells. Or, alternatively, lawmakers could direct the Department to require well owners to disclose the chemicals they use during the fracturing process to an industry website such as FracFocus.org, which is already used voluntarily by some Ohio drillers.

Existing rules promulgated by the Department of Natural Resources require well owners, prior to receiving a drilling permit, to test water wells within 300 feet of the proposed oil or gas well location, but such testing is only required in urbanized areas.[lxxxii] Lawmakers should pass legislation requiring the testing of water supplies prior to drilling within 1,500 feet of any oil and gas well location, urban or rural. This change will bring Ohio more in line with similar states that are experiencing shale drilling booms. For example, Pennsylvania assumes that if water quality is adversely impacted within 1,000 feet of a well head, the well owner is presumed responsible. This legal presumption is causing drillers to voluntarily test water supplies within 2,500 feet, and in some cases, up to 5,000 feet from the well location.[lxxxiii]

Lawmakers should direct the Attorney General to draft a landowner's "Bill of Rights" which would inform the landowner of the rights and responsibilities they have when entering into a mineral lease. Landowners should be required to sign and file the document with their county recorders when the also file a new mineral lease.

Components of a "Bill of Rights" should include:

- Disclosure of fracturing chemicals: Prior to drilling, landowners should ask to be notified of what chemicals will be used during the drilling and hydraulic fracturing process. The developer should also disclose any chemicals that will be brought to the surface during the drilling process.
- The placement of the well on the surface level and its proximity to existing structures and property lines. Although recent legislation changed existing 'setback' requirements it is important for landowners to know that the new amounts are only minimum requirements. The landowner is allowed to negotiate with the developer prior to the signing of the lease over the locations of the wellhead and its subsequent parts.
- Baseline testing of water, air, and soil prior to lease signing is critical so that both parties are aware of existing environmental levels *before fracking begins*. That way, both the landowner and the developer know how much damage was done in the event of future spills or contamination.
- Landowners should also be apprised of what and how much vegetation the company plans to remove, and where it intends to build access roads on the owner's property. Wells that are hydraulically fractured are large operations that require significant amounts of land. Depending on the location of the well, developers may wish to clear cut trees or remove existing structures.
- Landowners should be told that they have the right to negotiate with developers on the location of water storage tanks that may hold the wastewater or, alternatively, on the construction of any wastewater ponds the developer plans to create.
- Developer liability of contamination of local water supplies or soil due to the drilling process and reclamation efforts need to be clearly spelled out. Obviously, developers should be held responsible for any environmental damage they cause in the drilling process. Moreover, prior to signing the lease, landowners should know what steps developers will take to return the land to its original state after well construction is completed.
- Any other rights and responsibilities the Attorney General believes that landowners should know about prior to signing a new mineral rights lease. The Attorney General's office should work with stakeholders to develop and enforce the signing of these Bills of Rights prior to the completion of any mineral rights lease.

A "HIRE OHIO" POLICY

Though job estimates vary widely, it is reasonable to assume that a full-blown shale boom in Ohio could generate tens of thousands of new jobs. With a statewide unemployment rate still above 8%, Ohioans understandably believe that they will be the beneficiaries of new employment opportunities. Indeed, the oil and gas industry feeds that expectation in nearly every press release.

But there is no guarantee that these jobs will go to Ohioans. Anecdotal evidence from areas where wells are already operating indicates that job site parking lots are replete with cars sporting out-of-state license plates, often from Texas and Louisiana.

Ohio workers are highly skilled, hard-working and adaptable. All they need is a chance. And as the oil and gas industry has sought to win public support for fracking, the promise of jobs has been its principal selling point.

Because Innovation Ohio believes that Ohio jobs should, whenever possible, go to Ohioans, we propose that the Governor and General Assembly establish and promote a "Hire Ohio" policy. Such a policy, we suggest, could create financial incentives such as slightly reduced tax rates for companies meeting a goal of hiring a designated percentage of their workforce from Ohio. Lawmakers could additionally establish a tax break for companies that establish their own training programs and then hire the Ohioans who graduate.

Certainly other ideas should be considered. The important thing is that companies be incentivized to hire Ohioans on the front end of a fracking operation, not weeks, months or years after a project has begun. Ohioans need jobs now. And before state officials give hydraulic fracturing a green light, they must do everything possible to ensure that Ohioans are hired for the jobs that will be created.

CONCLUSION

Innovation Ohio agrees with environmentalists and most Ohio citizens that before policy-makers give a green light to hydraulic fracturing in our state, the momentous health, safety and environmental issues surrounding the process must be satisfactorily resolved. As we said at the outset of this report, creating jobs will do little good if we poison our people and destroy our state in the bargain.

But assuming those concerns can be resolved and that fracking goes forward, IO is genuinely excited about the extraordinary economic benefits that could result. At the same time, we believe that those benefits must be shared fairly with *all* Ohioans, not simply transferred out of state or allowed to flow down a one-way street in the direction of Big Oil. After all, Ohio's oil and gas are natural resources that belong to us, not the oil companies. To be sure, those companies are entitled to a fair profit for the work they will do and the investments they will make. But regular Ohioans also deserve a fair share and a fair shake. Ohio farmers and other landowners selling mineral rights should not be cheated or misled. Ohio workers should not be passed over for the new jobs that will be created or effectively locked out of competing for them. And schools districts, local governments and local taxpayers are entitled to some relief from the devastating pressure put on them by deep and continuing state budget cuts.

That's why it is not enough for Ohio's elected officials to stand on the sidelines or to simply act as oil and gas industry cheerleaders. The big oil companies are perfectly capable of watching out for themselves. Regular Ohioans need to know someone's watching out for them.

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