



**Before the House Energy and Natural Resources Committee
Testimony on the Current Status of Ohio's Oil and Gas Industry
Tuesday, March 19th, 2019**

Thank you, Chairman Vitale, Vice Chair Kick, and Ranking Minority Member Denson, for allowing me to provide testimony on the current state of the Ohio oil and gas industry. Overall, the industry is seeing dramatic oil and gas production from the Utica Shale. However, challenges still remain.

My name is Matthew Hammond and I serve as the Executive Vice President of the Ohio Oil and Gas Association. The Ohio Oil & Gas Association (OOGA) is a statewide trade association representing nearly 2,000 members who explore for, develop and produce Ohio's oil and natural gas resources. Our mission is to protect, promote, foster and advance the common interests of those engaged in all aspects of the Ohio oil and natural gas producing industry.

Our membership consists of people who professionally represent all phases of the exploration and production (E&P) process and all sizes of producers, from small, independent conventional operators to large independent oil and gas companies exploring Ohio's shale play. OOGA members also include midstream companies, large-scale transmission line companies, contractors, oilfield service and supply companies, manufacturers, gas utilities, and various other professional service providers to the industry. The OOGA has represented Ohio's oil and gas producing industry since 1947.

Large independent producers are the drivers of America's oil and gas resource base. Independent producers drill 90 percent of domestic oil and natural gas wells, produce 82 percent of America's natural gas and 68 percent of America's oil.

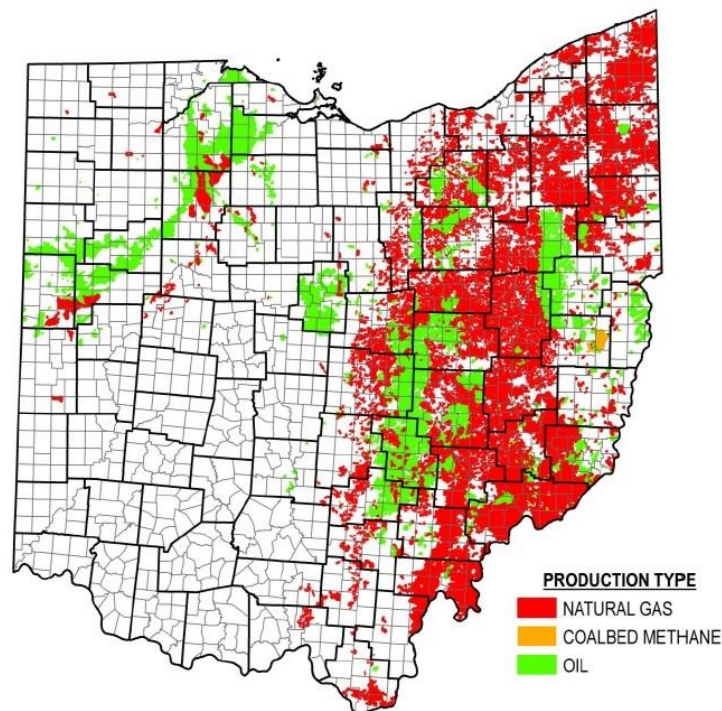
With the increase in Utica Shale activity in Ohio, large independent oil and natural gas companies have expanded into Ohio and invested billions of dollars in acquiring mineral rights, drilling for and producing oil and gas resources, paying lease bonuses and royalties to Ohioans, and are the driving force behind hundreds of thousands of jobs being created in the state.

These companies have explored for oil and natural gas in various shale plays across our country. They, along with Ohio's independent producers, continue to look for ways to improve and expand Ohio's proven oil and natural gas reserves.



Ohio has had a long history of oil and natural gas production. The map below shows where over 250,000 oil and natural gas wells have been drilled in our state since 1860. Ohio currently has more than 50,000 producing oil and natural gas wells operating in 49 of Ohio's 88 counties.

Oil & Gas Production in Ohio



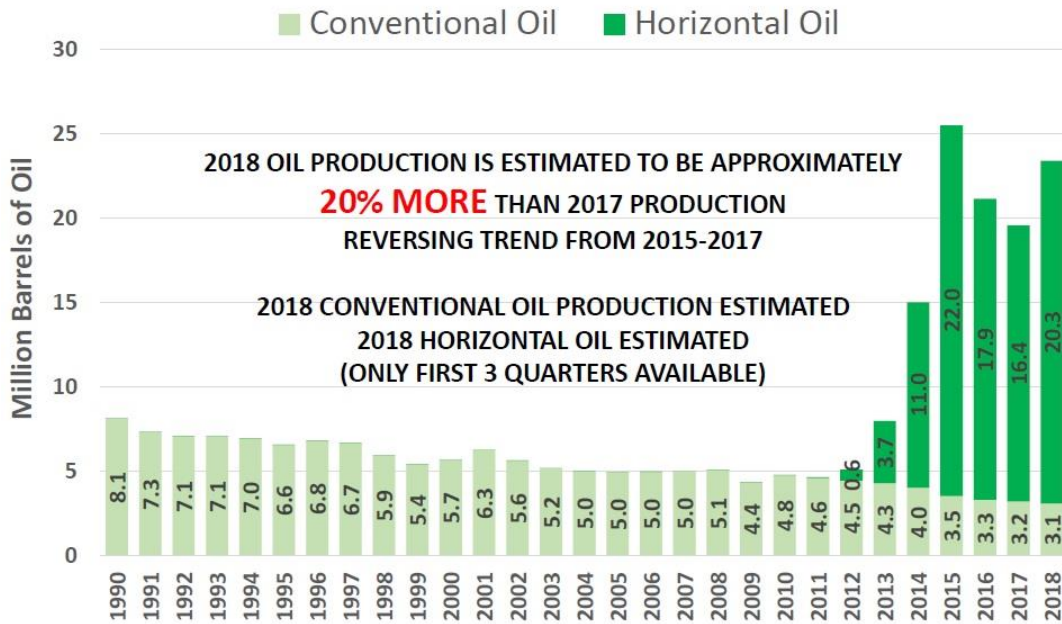
ODNR annually tracks combined oil and natural gas production, which includes the annual reported production volumes for both conventional and unconventional oil and natural gas wells. According to official 2017 data, Ohio's combined conventional and shale production was over 20 million barrels of oil (20,019,409) and 1.7 trillion cubic feet of natural gas (1,769,866,334 Mcf)¹ for the year.

Looking at 2018 data below, you see an increase in oil production for the first time since 2015. Estimated 2018 combined production for oil rose to 23.4 million barrels, which is a 20% increase from 2017 production totals.

¹ <http://oilandgas.ohiodnr.gov/production#COMB>



Production Summary – Oil By Year

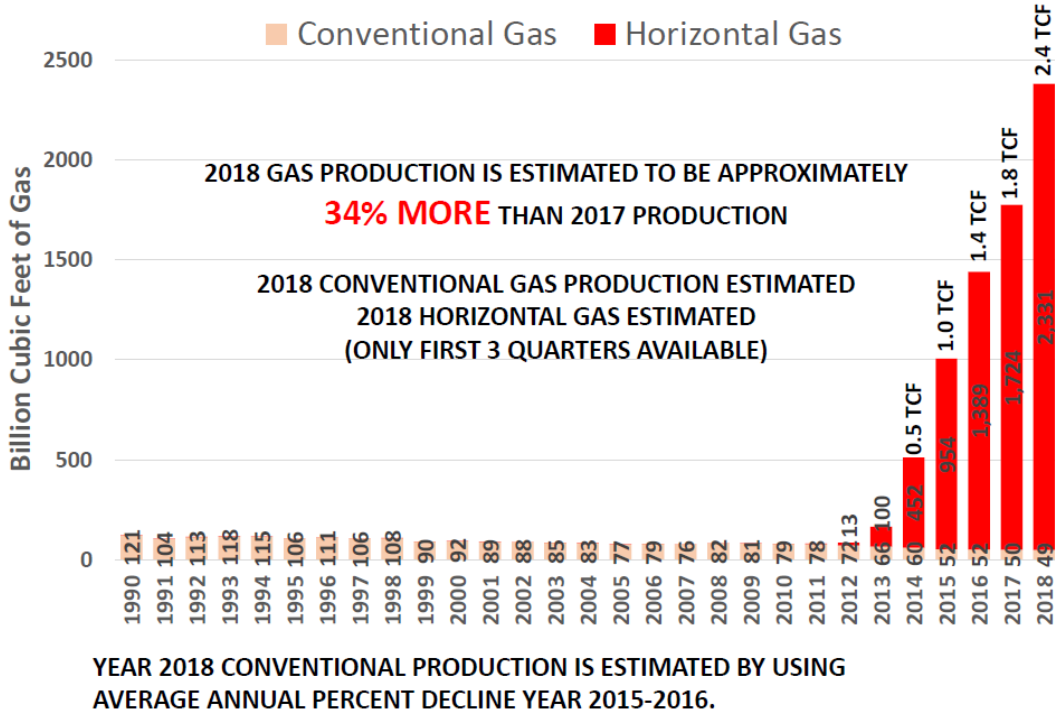


YEAR 2018 CONVENTIONAL PRODUCTION IS ESTIMATED BY USING AVERAGE ANNUAL PERCENT DECLINE FOR YEAR 2015-2017.

There is again another increase in natural gas production from 2017, which has been an annual trend since 2012. The 2018 combined production totals are estimated to be approximately 2.4 trillion cubic feet of natural gas, or a 34% increase from 2017 totals.



Production Summary – Gas By Year



As you can see from both of these graphs, shale production accounts for a dramatic portion of Ohio oil and gas production.

While production continues to climb, we see a different story as it pertains to drilling permits being issued and, ultimately, wells being drilled and being placed into production. Overall, the number of wells being drilled continues to decline. However, the lateral length of shale wells continue to increase.

In 2018, a total of 371 wells were put into production, bringing Ohio to its current total of 2,575 horizontal shale wells. If we break this annual total down further, we show that 90% of this total was from horizontal shale wells and 9% were from vertical wells. The 2018 well total is down substantially since 2004 (even from initial pre-shale totals since 2011), including the lowest total number of wells during this period in 2017 and 2018.



One reason why there is a reduction in wells drilled and turned online is due to the length of the horizontal portion of shale wells. The average combined lateral length per well has reached 17,571 feet. With the onset of shale production, this number has steadily increased since 2011, where it was 4,192 feet.

At the end of 2014, there were 59 rigs drilling Utica wells in Ohio. During that same time, commodity prices collapsed when Saudi Arabia began saturating the global market with cheap oil, which was their effort to hinder oil and gas production in the United States. The price per barrel of oil went from \$95.96 on September 1st to a low of \$44.45 on January 28, 2015, a \$51.51 reduction in price. Oil prices continued to plummet during 2015, ending the year at \$37.04 and falling to \$26.55 in mid-January, 2016.

Producers were forced to drastically reduce rig counts and find innovative and cost effective ways to develop shale formations. Ultimately, producers were searching for ways to make the economics work during a historical downturn. Drilling longer laterals became a way to efficiently develop the Utica Shale.

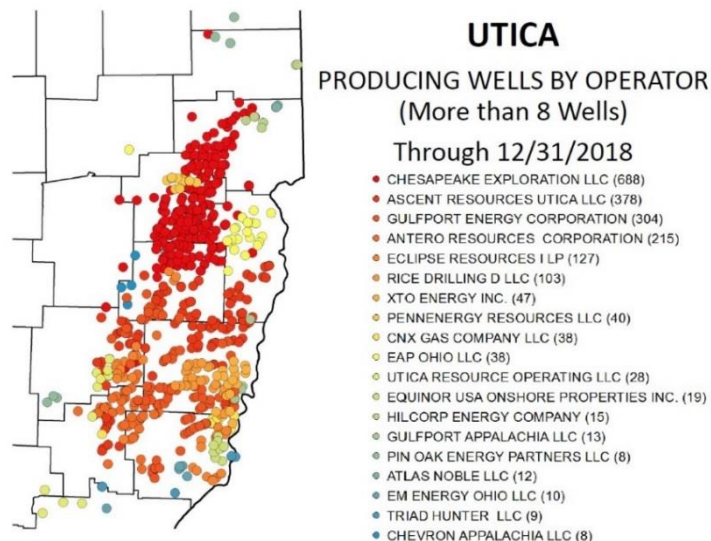
Since the start of the shale play in Ohio, the area of focus has shifted from north east and north central Ohio to mostly south east Ohio. There have been attempts to drill shale wells in Mahoning, Trumbull, and Portage counties in the north east and Medina, Ashland and Richland counties in the north central part of Ohio.

We are now seeing the activity focus on 8 counties in south east Ohio. Those are (in order of most activity) listed below according to the number of producing wells. I should also note that the top 3 counties where drilling occurred accounted for 63% of the oil and gas activity last year. The fairway of the Utica has mostly been established and the footprint has reduced drastically since the beginning of the play.

2018 Completions – Top 10 Counties

COUNTY	TOTAL	% TOT	HORIZONTAL	VERTICAL
BELMONT	98	26%	97	1
MONROE	95	26%	94	1
JEFFERSON	42	11%	42	0
HARRISON	30	8%	30	0
GUERNSEY	29	8%	28	1
NOBLE	21	6%	20	1
CARROLL	12	3%	11	1
WASHINGTON	6	2%	3	3
ASHLAND	6	2%	3	3
COLUMBIANA	5	1%	4	1
OTHER	27	7%	1	26
TOTAL	371	100%	333	38

Below is a chart breaking down the top operators of these Utica Shale wells.





I have also included a chart detailing the top operators for 2018 in the State of Ohio. You will see that Ascent Resources was the most active operator during 2018, drilling 70 wells. The top 4 most active companies listed below account for 52% of the wells drilled during 2018.

Top 12 Most Active Operators – By Wells

OPERATOR	% TOT WELLS	2018 WELLS	▲% 2017
ASCENT RESOURCES UTICA LLC	19%	70	-11%
GULFPORT ENERGY CORPORATION	12%	45	-4%
ANTERO RESOURCES CORPORATION	11%	39	77%
RICE DRILLING D LLC	10%	36	-14%
CHESAPEAKE EXPLORATION LLC	9%	35	-40%
ECLIPSE RESOURCES I LP	9%	32	23%
CNX GAS COMPANY LLC	6%	24	118%
GULFPORT APPALACHIA LLC	4%	14	-70%
EAP OHIO LLC	2%	9	N/A
EQUINOR USA ONSHORE PROPERTIES	2%	9	N/A
COLUMBIA GAS TRANSMISSION LLC	2%	6	500%
TRIAD HUNTER LLC	2%	6	N/A

Since shale development has started, this list of operators continues to change due to several mergers and acquisitions. Most recently, Encino Energy spent \$2 billion to acquire over 1 million acres (800 wells) from Chesapeake Energy, Ohio's number one (and first) Utica Shale producer. Also, this year Eclipse Resources merged with Blue Ridge Mountain Resources to form a new company called Montage Resources. Last year, Ascent Resources bought out Hess Corporation for \$1.5 billion which included over 100,000 acres and 93 wells. Additionally in 2018, PennEnergy acquired the assets of REX Energy for \$600 million. Back in 2017, EQT bought Rice Energy for \$6.7 billion.

These mergers and acquisitions has resulted in consolidation within the industry. We are seeing a transition from companies with assets throughout the United States to companies who have assets in one or two states with the potential for growth within their asset portfolio. Consolidation among shale producers is expected to continue as companies focus on the core assets of their portfolio and efficiently spend capital.



We are also seeing some consolidation within our conventional operators as well. Factors contributing to these consolidations include opportunities to sell their wells or acreage to other operators, lack of acreage they can acquire at an affordable price, and, most prevalently, the impact of natural gas prices on their current and future wells.

Commodity prices continue to present one of the biggest challenges for the industry. Oil and gas producers craft an economic business plan based on the best information available at the time. This includes considerations such as geology and quality of the targeted formation, calculated economics of the reservoir, current commodity prices, and access to markets to achieve the best commodity price possible.

Again, since Ohio is predominantly a natural gas play, I will focus on natural gas prices. The chart below shows the past 10 years of New York Mercantile Exchange (NYMEX) pricing for natural gas.





As you can see, natural gas reached a high point in December, 2009 of \$6.82 per Mcf. Fast forward to March 11th, 2019, where the price for the same Mcf of natural gas is now \$2.86. There is approximately a \$4.00 difference in natural gas prices on NYMEX for the same gas.

Oil and gas producers also have costs to getting their gas to market that are deducted out of the price they receive for the gas. These costs include gathering and transportation, marketing fees, and processing, to name a few. The price the marketer receives for the natural gas on a producer's behalf is not the actual price a producer receives for the gas.

While NYMEX pricing is what most stakeholders point to, producers in the Appalachian Basin are typically priced at Dominion South Point, a local hub in the region, which is lower than the NYMEX price.

For example, NYMEX futures pricing for March, 2019 was \$2.85 per Mcf. However, Ohio producers received \$2.62 per Mcf for their gas on the Dominion system (where the majority of Ohio produced natural gas flows). That is a \$0.23 per Mcf, per well discounted price that our members must take and base their businesses on.

While low commodity prices are a challenge for oil and gas producers, consumers, both residential and commercial, have recognized significant savings on low natural gas prices. In fact, the Consumer Energy Alliance (CEA) produced a study showing that Ohioans have saved \$40 billion in low natural gas prices from 2006-2016.

What is contributing to this discounted price of natural gas? Simply put: supply. Ohio is situated in what is deemed a natural gas supply glut. As discussed earlier, the Utica Shale is producing tremendous amounts of natural gas. The Marcellus Shale play in Pennsylvania and West Virginia is another large natural gas reservoir. Before shale development, pipeline development started out west in an effort to move gas to a more profitable market to the east. The Rockies Express Pipeline (REX), the largest natural gas pipeline built in North America, transported natural gas from the Rocky Mountains and terminated in Clarington, Ohio (Monroe County), right into the Utica and Marcellus Shale region. In 2015, REX completed a project on the existing line that would in part reverse the flow of gas in the pipeline, moving natural gas from Ohio to Illinois.

If the abundant supply of natural gas, accompanied by low natural gas prices, is a challenge for the industry, there are two obvious answers: demand opportunities and



open access to a competitive market place. Oil and gas producers in the Appalachian Basin need natural gas power generation opportunities, large-scale end users, and pipeline capacity to markets to achieve the best commodity prices possible.

As it pertains to pipeline projects, I would like to focus on five major projects that have been key to the development of the Utica Shale play. First, Kinder Morgan built a 215 mile, \$500 million pipeline that carries 50,000 barrels a day of ethane (a byproduct of natural gas utilized by the chemical industry). The 250 mile NEXUS line by Enbridge cost \$1.5 billion to develop and carries 1.5 bcf of natural gas a day. Additionally Enbridge completed their OPEN line, which is a 76 mile line that cost \$468 million to develop and that carries .55 bcf of natural gas a day. TransCanada's LEACH line is carrying 1.5 bcf of natural gas a day through 161 miles of pipe at the cost of \$1.4 billion. The largest project is the ROVER project from Energy Transfer which totaled \$4.3 billion and was a dual 42 inch line that runs 570 miles carrying 3.2 bcf of natural gas a day. All of these projects total 1,272 miles for a total cost of \$8.1 billion in Ohio investments.

Another way to keep investment dollars in Ohio is to utilize the natural gas supplies in the area by building natural gas fired power plants. In doing so, you create additional burner tips for natural gas, potentially resulting in projects such as new manufacturing facilities and continued price savings for consumers.

Currently there are 12 projects in different stages of design, approval, and construction. If all 12 become operational, it would result in another \$11 billion in investment, creating approximately 14,000 direct jobs, generating over 11,000 megawatts of power, with the ability to provide a cheap, reliable source of electricity to over 9 million homes. The investments in natural gas fired power generation facilities are a direct result of oil and gas producers developing the Utica Shale. There are 4 new plants currently operational, which are located in Carroll, Trumbull, Lucas, and Butler counties. Additionally, AEP recently converted a plant to natural gas which is located in Vinton County.

In addition to pipeline and power plant activity, there is still the possibility PTT Global will build an ethane cracker plant in Ohio. An ethane cracker plant takes ethane and, through extreme heat, refines it into polyethylene, which is used in the chemical industry. Ethane is the basis for those within the chemical industry to craft their products.



While we are awaiting the final investment decision from PTT Global Chemicals on their plant, the project has earned the necessary permits to start construction. Their potential site is located in Dillies Bottom between the Ohio River and Route 7 in Belmont County. The site selected by PTT Global was a former First Energy power plant that the State of Ohio spent \$14 million clearing the site in preparation for this project. The size of the project is yet to be announced but it is reported it could be a \$5 to \$10 billion investment.

Currently, all of the ethane cracker plants in the United States are located in the Gulf Coast. There is an ethane cracker plant in Sarnia, Canada, as well. Ethane is being developed in the Appalachian Basin and is moving to the Gulf Coast to be processed into polyethylene. The end product is pellets that are used in the chemical industry, that are then shipped back to the region for Ohio's chemical manufacturers.

Shell is building a \$5 billion ethane cracker plant in Beaver County, PA. It is estimated that it will take 5,000 construction workers and 5 years to finish building the Shell plant. While the Shell ethane cracker is being built in Pennsylvania, it benefits the entire region and can provide construction jobs for Ohioans. The potential for the oil and gas and chemical industries with one ethane cracker plant in the region is substantial. Should PTT Global decide to proceed forward with the ethane cracker in the Ohio, the Appalachian Basin has a great opportunity to build out the infrastructure for its own petrochemical hub. The downstream potential for the region is enormous.

In addition to the ethane cracker plants, we have the opportunity to have an ethane storage facility built in Ohio through the Mountaineer NGL Storage project in Clarrington, Ohio. While we currently have the ability to store natural gas underground, we do not have any facilities in Ohio to store natural gas liquids like ethane. They have selected 200 acres for such a facility and are currently working with the Ohio Department of Natural Resources to receive the permits necessary for construction. Should this project begin, it will mean a \$500 million investment and 200 construction jobs.

All of these downstream investments that I have discussed, including low energy costs for manufacturers already in Ohio, is because of the massive reserves under the Appalachian Basin. If Ohio, Pennsylvania, and West Virginia became a separate country, it would be the third largest natural gas producing country in the world. The region would only trail the remaining states in the United States and Russia. Appalachia has accounted for 85% of U.S. shale gas production growth since the start



of 2011. By 2030, Appalachia is expected to account for more than 40 percent of the nation's natural gas production.

In order to promote this information to the general public, the oil and gas industry has teamed up with the manufacturing sector, local economic development teams, the State of Ohio and others to create a marketing effort called Shale Crescent USA. The idea is simple; go to the 100 largest power users in the world and promote the location of their facilities here in southeastern Ohio to achieve additional cost savings. We not only have the most abundant natural gas resource, it also comes at the cheapest price in the industrialized world, according to data compiled by Shale Crescent USA.

According to a recent IHS Markit study, the Appalachian Basin is now the most profitable place to build a petrochemical plant, exceeding the earnings potential of the Gulf Coast by 4 times as much profit. A major petrochemical investment in southeastern Ohio can offer a cash flow advantage of \$713 million, or 77% higher than a similar project on the Gulf Coast. Additionally, we are within a day's drive to 50% of the markets in the United States, as well as one day's drive to 70% of polyethylene demand. For those unfamiliar, Polyethylene is the most popular plastic in the world. This is the polymer that makes grocery bags, shampoo bottles, children's toys, and even bullet proof vests.

While PTT building the ethane cracker would be a huge benefit to the industry in Ohio and the entire state, the state should continue to pursue additional petrochemical investments in Ohio. According to the American Chemistry Council, Ohio, Pennsylvania, West Virginia, and Kentucky are all in a position to compete for 100,000 jobs in the chemical sector by 2025.

If we add up all of this Ohio investment directly through and because of shale development, it totals over \$70 billion according to JobsOhio. That breaks down into \$46.9 billion in upstream investment, \$18.8 billion in midstream investment, and \$3.7 billion in downstream investment since 2011. Every part of the energy value chain is represented in Ohio.

All of that investment has led to job retention and growth in Ohio. According to the Ohio Department of Jobs and Family Services' 2017 Annual Shale Report, employment increased in all but one of Ohio's five core shale related industries from 2016 to 2017. The number of Ohio jobs in core industries increased from 10,672 to 16,402. There are 181,720 Ohioans working in both core and ancillary shale related jobs. Core shale related industries (primarily oil and gas pipeline construction) added 5,730 jobs in 2017,



a 53.7% increase over the previous year. Employment in ancillary shale related industries grew adding 3,488 jobs.

The key occupations in core and ancillary shale related industries provide family sustaining wages and tend to require specialized skill sets. Among the key shale related occupations, 32 of the top 38 jobs had median annual wages above the state median wage of \$36,500, ranging from \$26,328 to \$97,955.

In addition to these investments and jobs created, our members make investments directly into the communities in which they operate. One example of this is through the Road Usage Maintenance Agreements (RUMAs) that our producer members have voluntarily entered into with county engineers.

RUMAs generally establish the route trucks would take to the location of where the well pad is located prior to the first truck leaving the bay. Many of the roads these companies operated on required improvements before the well pad was developed as they were not in a good enough condition to withstand this traffic.

Between 2011 and 2017, oil and gas companies have directly spent \$302 million dollars on upgrades and repairs to 639 miles of roads, including bridges, ditches and culverts in 8 counties in south east Ohio.

In 2018 alone, one oil and gas producer invested over \$22 million in public infrastructure in their operating footprint.

In addition to these private RUMA agreements, our industry pays ad valorem taxes, which flow to local schools and governments. Ad valorem taxes serve as a defacto property tax. According to a report by OOGA and Energy In Depth, from 2010 to 2015, our industry had paid \$45.8 million to public schools and local governments in Belmont, Carroll, Columbiana, Guernsey, Harrison, Jefferson, Monroe, and Noble counties. Additionally, the report projected the industry could pay up to \$250 million in ad valorem taxes by 2025. Updated numbers since the report show local governments have already collected over \$132 million in ad valorem taxes, which is putting the industry on track to meet or even exceed the projected \$250 million figure by 2025.

While 100% of this money stays local, 60% to 70% of it goes directly to schools. Below is a chart of the eight counties seeing prevalent shale production and the funding provided to their local school systems from shale production. In 2017 alone, ad



valorem taxes provided local schools within the eight county Utica play with over \$43 million in revenue.

Year	Belmont	Carroll	Columbiana	Guemsey	Harrison	Jefferson	Monroe	Noble	TOTAL
2010	\$ 3,239.73	\$ 177,732.00	\$ 73,821.00	\$ 218,959.00	\$ 45,875.00	\$ 5,653.00	\$ 113,897.00	\$ 113,139.00	\$ 752,315.73
2011	\$ 5,889.65	\$ 166,687.00	\$ 65,445.00	\$ 204,000.00	\$ 42,005.00	\$ 7,024.00	\$ 129,062.00	\$ 172,945.00	\$ 793,057.65
2012	\$ 5,948.06	\$ 255,821.00	\$ 66,728.00	\$ 279,382.00	\$ 181,697.00	\$ 12,005.00	\$ 118,069.00	\$ 99,443.00	\$ 1,019,093.06
2013	\$ 25,862.85	\$ 1,048,405.00	\$ 121,434.00	\$ 379,962.00	\$ 796,460.00	\$ 115,646.00	\$ 115,607.00	\$ 154,947.00	\$ 2,758,323.85
2014	\$ 758,915.83	\$ 3,381,772.00	\$ 216,954.00	\$ 1,105,735.00	\$ 2,036,462.00	\$ 117,127.00	\$ 862,784.00	\$ 369,989.00	\$ 8,849,738.83
2015	\$ 3,834,014.31	\$ 9,244,863.00	\$ 1,072,685.00	\$ 2,711,412.00	\$ 7,931,754.00	\$ 221,380.00	\$ 3,460,418.00	\$ 3,153,112.00	\$ 31,629,638.31
2016	\$ 4,194,960.00	\$ 11,842,391.49	\$ 847,521.10		\$ 17,305,145.67	\$ 374,967.00	\$ 5,225,577.79	\$ 4,257,530.43	\$ 44,048,093.48
2017	\$ 8,008,790.00	\$ 8,482,825.86	\$ 1,029,629.56		\$ 12,469,710.25	\$ 1,251,726.00	\$ 7,177,381.02	\$ 4,689,845.11	\$ 43,109,907.80
TOTAL	\$ 16,837,620.43	\$ 34,600,497.35	\$ 3,494,217.66	\$ 4,899,450.00	\$ 40,809,108.92	\$ 2,105,528.00	\$ 17,202,795.81	\$ 13,010,950.54	\$ 132,960,168.71

I have provided a lot of data and other information in this presentation. It is my hope one key takeaway for each of you is that if it were not for oil and gas producers making billions of dollars in investments, taking significant risks, and developing the Utica Shale, everything we discussed would not be happening in Ohio today. During my time working for or representing the industry, I have talked about the ripple effect oil and gas development has on the entire state and talking about downstream opportunities. Now, in 2019, so many of those opportunities I have just discussed are becoming a reality.

Thank you once again, Chairman Vitale and members of the House Energy and Natural Resources Committee. I would like to take a moment to thank Marty Shumway, an OOGA member, who recently provided a majority of the oil and gas drilling activity information and pricing data provided in this presentation. I hope that this information has provided you with a brief overview of the Ohio oil and gas industry and its opportunities and challenges. I will now make myself available for any questions should the members of the committee have them.

Respectfully Submitted,

Matthew Hammond
 Executive Vice President
 Ohio Oil & Gas Association