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Time to Stop Losing the Revenue We Need: A Severance Tax Is Still A Good Idea

Introduction

Recently, we pointed out that despite a $13 billion surplus—including $5 billion and the Rainy Day Fund as well as a projected $8 billion surplus in the General Fund budget this year—the state of Pennsylvania would start running operating deficits in the next fiscal year, just to carry out the work it does this year.[1] And those deficits don't include the funds needed to meet the moral, and now constitutional, requirement to fully and fairly fund K-12 education, let alone to meet the state's other needs. We called for the state to modestly start raising taxes now, with the goal of securing enough new revenues over the next five years to combine with the accumulated surplus. This would give us enough funds to overcome the projected budget deficits and meet the needs of the state. But we also said that, given how unequal our state and local tax system is today, new revenues should come primarily from wealthy corporations and the richest among us, who today pay taxes at half the rate of middle- and low-income Pennsylvanians.

One way to raise new revenue to meet the state needs is to finally institute a severance tax on natural gas fracking. It looked like the votes were there to pass a modest severance tax in the Pennsylvania House in 2015 and 2016, but continued opposition by the Republican leaders of the House blocked such a tax from coming to a vote. Now that the Republican leadership roadblock to a severance tax in the House is gone, it's time to reconsider such a tax.

The revenues raised by such a tax would vary from time to time, depending on how much gas is drilled and the price of gas. But our research shows that the state has lost $3.6 billion in revenues that might have been realized by a modest severance tax in the last dozen years. We also estimate that, depending on the price of natural gas, such a tax could raise an additional $400 million to $1.5 billion per year for our state in the next ten years.

Gas production and prices

In 2014, Pennsylvania became the second-largest natural gas producer in the U.S. and remains so today, only behind Texas.[2] In 2021, gas production exceeded 7.5 trillion cubic feet and continues

[1] Marc Stier and Diana Polson, Pennsylvania Budget Outlook: Short-term and Long-term, Pennsylvania Budget and Policy Center, February 14, 2023, https://krc-pbpc.org/research_publication/pennsylvania-budget-outlook-short-term-and-long-term/.

[2] U.S. Energy Information Administration, "Pennsylvania State Energy Profile: Pennsylvania Quick Facts," https://www.eia.gov/state/print.php?sid=PA.

to rise each year. Despite increased production, Pennsylvania remains the only major gas-producing state that allows companies to drill without paying taxes that increase with the volume of gas extracted.

Drilling companies do not make up for Pennsylvania's lack of a severance tax by paying the currently established impact fee, which is a "per well" tax, in which the tax revenue does not vary with the volume and value of the gas extracted from the well. So, while gas production has increased seven-fold since 2011, impact fee payments have not. Instead, revenues raised from the impact fee have fluctuated between $146 million and $275 million per year.

This report shows that Pennsylvania's failure to implement a severance tax like every other large gas-producing state has cost us nearly $3.6 billion over the last dozen years. In 2021 alone, a severance tax would have captured $651 million more than the impact fee did and we estimate that it would have brought in $1.7 billion more in 2022 because of the spike in gas prices.

Gas prices rose in 2022 for a few reasons. Electric generating plants continued to move from coal to natural gas, because the latter is both cheaper and releases less climate-changing greenhouse gas. A relatively cold winter increased the demand for gas for heating and a relatively hot summer led to increased demand for natural gas to generate electricity. Partly in response to Russia's invasion of Ukraine a year ago, European countries sought to diminish imports of natural gas from Russia and took advantage of new facilities to import liquified natural gas from the United States and other countries. Liquified natural gas exports were less than 1% of US production in 2015 but grew to 10% by 2019 and grew again in 2022. Overcoming barriers to transporting natural gas meant that the US price for natural gas was far more influenced by prices elsewhere in the world—and European prices were seven times domestic prices in 2022.[3]

Natural gas prices dropped sharply at the end of 2023 and are likely to stay low for some time. The drop was due to some relatively warm winter months both in the United States and Europe and to efficiencies and behavioral changes in the use of natural gas in response to high prices earlier in the year. In addition, natural gas production in the United States reached record levels in the first ten months of 2022 at 12% higher than the average production from 2017 to 2021.[4] Moreover, US exports were limited by damage to the Freeport LNG export terminal.[5]

It is difficult to predict future gas prices because they depend on uncertain weather and political events. But some trends that will lead to higher prices are likely to continue, including higher export of US-produced natural gas, which will reduce the domestic supply, when the Freeport terminal comes back online in the next few months and other export facilities are developed. So

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[3] Robert Rapier, "Why Natural Gas Prices Quadrupled in Two Years," *Forbes*, September 27, 2022, https://www.forbes.com/sites/rrapier/2022/09/27/why-natural-gas-prices-quadrupled-in-two-years/?sh=6caff7863ccf and Rebecca Leber, "Why Americans will pay higher natural gas prices this winter," *Vox*, November 24, 2022, https://www.vox.com/policy-and-politics/23462844/natural-gas-us-prices-winter-2022.

[4]Paolo Agnolucci, Peter Nagle, and Kaltrina Temaj, "Bubble: Trouble: what's behind the highs and lows of natural gas markets," World Bank Blogs, February 22, 2023, https://blogs.worldbank.org/opendata/bubble-trouble-whats-behind-highs-and-lows-natural-gas-markets.

[5] Arathy Somasekhar and Deep Kaushi Vakil, "Fire-damaged Freeport LNG gest U.S. approval for partial restart," Reuters, February 21, 2023, https://www.reuters.com/business/energy/fire-damaged-freeport-lng-receives-approval-partial-restart-2023-02-21/.

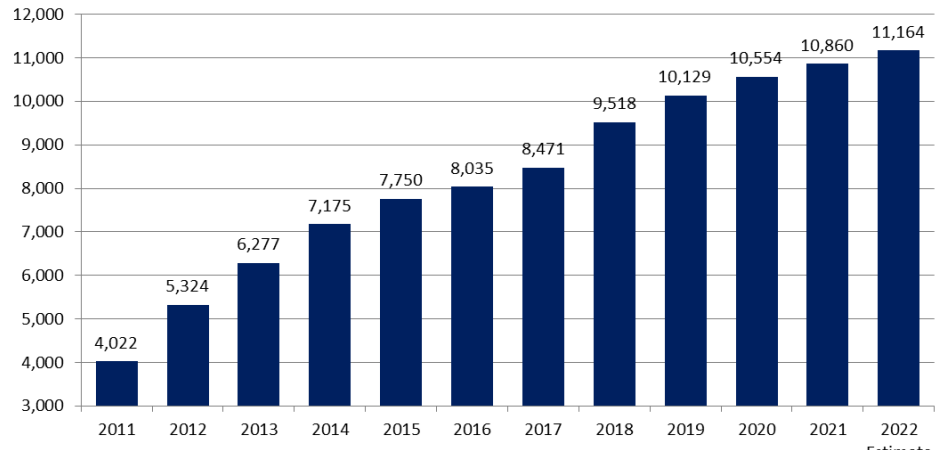
we cannot predict future tax revenues. It is clear, however, that the state will continue to lose hundreds of millions of dollars in tax revenue each year—and potentially even higher amounts—until we institute a severance tax.

Pennsylvania cannot afford to leave this money on the table any longer, given the state's desperate need for revenue to invest in education, human services, environmental protection, and job creation.

Impact Fee Payments Stagnate as Gas Production Mushrooms

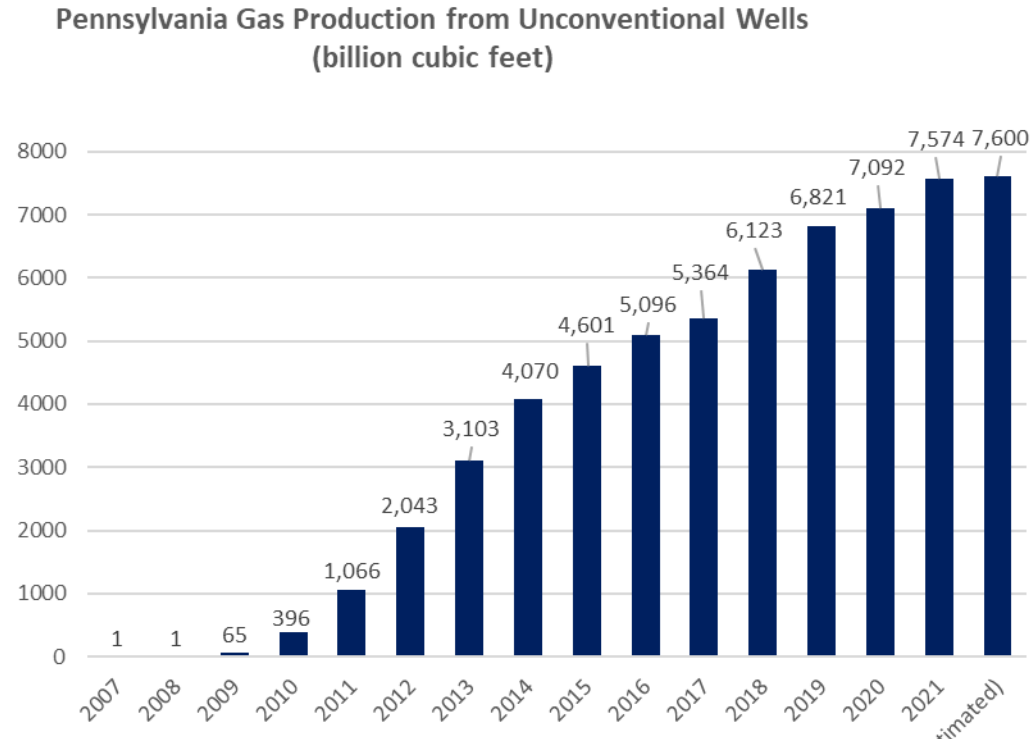
Pennsylvania's impact fee charges companies a fee for each well they drill. The fee is based on the number of years since a well was drilled and the price of natural gas. But the tax does not go up in proportion to the price of natural gas or vary with the amount of gas produced. Instead the fee declines year after year even if the volume of gas produced goes up. There has been a steady increase in the number of horizontal wells and in gas production since 2011 (figures 1 and 2). Yet figure 3 shows that more wells and gas production have not meant more revenue for the state. Impact fee revenue has hovered between $146 million and $275 million and has not steadily increased the way gas production has since 2011.

Figure 1



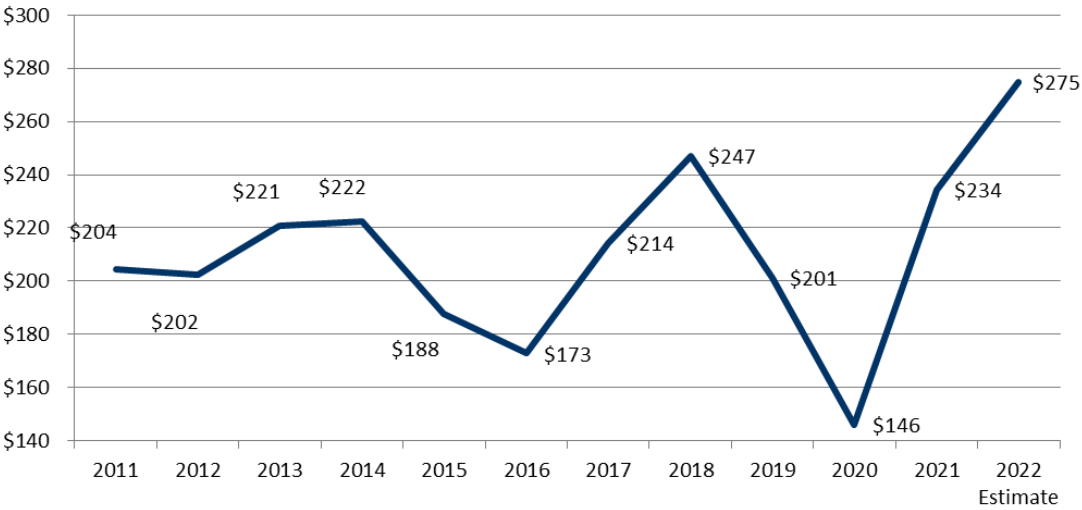
Source: Pennsylvania Budget and Policy Center analysis of Pennsylvania Public Utility Commission Producer Impact Fee reports, online at https://www.act13-reporting.puc.pa.gov/Modules/Reports/Reports.aspx. Data for 2021 from http://www.ifo.state.pa.us/download.cfm?file=Resources/Documents/Impact_Fee_Update_Outlook_2022.pdf and 2022 from http://www.ifo.state.pa.us/download.cfm?file=Resources/Documents/2022-Impact-Fee-Estimate.pdf

Figure 2



Source: Pennsylvania Budget and Policy Center analysis of data from Pennsylvania Department of Environmental Protection, online at https://www.paoilandgasreporting.state.pa.us/publicreports/Modules/Welcome/ProdWasteReports.aspx. Click on "Production Report" and then select a combination of reporting periods (e.g., 12 individual months or two six-month periods) for unconventional wells that add up to each of the years from 2011 to 2016. Click "View Report" on the right and production data come up for each well, along with a "Gas Total" figure at the top for the year in question. For 2007 to 2010, we used data on unconventional wells in Michael Wood, "Gas Production Booms, Drillers' Corporate Taxes Plummet," June 9, 2014; http://www.pennbpc.org/gas-production-booms-drillers-corporate-tax-payments-plummet. 2021 production number is from: http://www.ifo.state.pa.us/download.cfm?file=Resources/Documents/Impact_Fee_Update_Outlook_2022.pdf and 2022 estimate is from http://www.ifo.state.pa.us/download.cfm?file=Resources/Documents/2022-Impact-Fee-Estimate.pdf

Figure 3



Source: Pennsylvania Budget and Policy Center analysis of PA Public Utility Commission Producer Impact Fee reports, online at https://www.act13-reporting.puc.pa.gov/Modules/Reports/Reports.aspx. Data for 2021 from http://www.ifo.state.pa.us/download.cfm?file=Resources/Documents/Impact_Fee_Update_Outlook_2022.pdf. Data for 2022 from http://www.ifo.state.pa.us/download.cfm?file=Resources/Documents/2022-Impact-Fee-Estimate.pdf

State legislators and former governor Tom Corbett structured the impact fee as a per-well fee rather than as a severance tax tied to the volume and market value of gas produced in the state. This was done, in part, so it could be labeled a "fee," not a tax. As a result, the impact fee fails to provide a steady source of revenue that grows with the volume and value of gas produced in the state.

Forgoing a severance tax and lowering overall taxes on drilling companies have not led to an increase in drilling or production relative to neighboring states.[6] Instead, Pennsylvania is allowing companies to extract natural gas without paying a severance tax, which would help the state pay for essential investments and services such as education, health care, and human services.

Gas Corporations Avoid Paying Taxes

As shown in our previous brief, gas corporations are not making up for the lack of a severance tax through other corporate tax payments. In fact, two-thirds of gas companies in Pennsylvania avoid making corporate tax payments by structuring their drilling operations as pass-through entities so they are only subject to the state's 3.07% personal income tax rate instead of the 9.99% corporate net income tax rate (which is set to start decreasing due to changes made in the 2022-23 enacted budget). The one-third that are not pass-through entities lower their Pennsylvania taxable corporate net income using tax loopholes as well as federal and state tax breaks for gas drilling. For example,

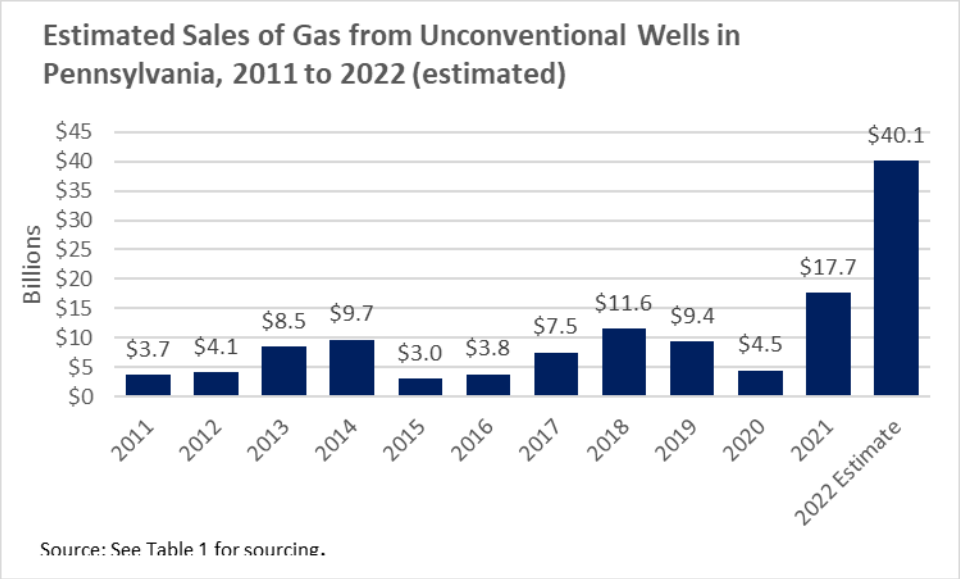
[6] Headwaters Economics, "What Do Local Governments Receive from Oil and Gas Production Taxes?" December 2016, https://headwaterseconomics.org/dataviz/oil-gas-local-governments-production-tax-revenue/.

they use out of state holding companies to shift profits to a neighboring state that has no corporate income tax. Nationally, 11 of 55 corporations that paid no taxes on their 2020 profits were energy corporations including gas companies.[7] After some losses early in the pandemic, oil and gas company profits have been through the roof over the past two years.[8]

The Annual Effective Tax Rate of Pennsylvania's Impact Fee

Figure 4 shows that the total sales from gas produced in Pennsylvania in 2021 was $17.7 billion—the highest it's been over the last 11 years—and projections for 2022 dwarf 2021. In 2021, despite huge increases in sales, extraction companies paid $234 million in impact fees in the state. To compare the impact fee to a true severance tax, we calculate an annual effective tax rate (ETR) of the taxes collected as a percentage of the market value of gas extracted. The ETR in 2021 was 1.3% (see table 1). Our estimate for the 2022 ETR is even lower—0.7%.[9]

Figure 4



As shown in table 1, the effective price (the price of gas minus post-production costs) in 2015 and 2016 ($.65 and $.75 respectively) was less than half the price in the four previous years: 2011 ($3.47), 2012 ($2.00), 2013 ($2.74), and 2014 ($2.38). As the price of gas fell, the market value,

[7] Matthew Gardner and Steve Wamhoff, "55 Corporations Paid $0 in Federal Taxes on 2020 Profits," Institute on Taxation and Economic Policy, April 2, 2021, https://itep.org/55-profitable-corporations-zero-corporate-tax/.

[8] Ishaan Tharoor, "Amid world crises, 'grotesque greed' wins out," *Washington Post*, August 8, 2022, https://www.washingtonpost.com/world/2022/08/08/oil-companies-profits-inflation/.

[9] Independent Fiscal Office, "Analysis of Revenue Proposals, FY 2018-19 Executive Budget," April 2018. As noted in the text, the annual effective tax rate (ETR) is calculated by the revenues collected in a fiscal year divided by the market value of the gas produced. This measure is good for comparing the ETR within one state over time. The annual ETR, however, can fluctuate a lot from year to year because of changes in the volume of gas extracted, price, the age and number of wells, etc. The lifetime ETR is a better calculation to use when comparing state ETRs.

or estimated total sales for extraction companies, plummeted in 2015 and 2016, resulting in an uptick in the effective tax rate (ETR).[10] The price of gas increased in 2017, 2018, and 2019, which led to a lower effective tax rate. In 2020, the price of gas fell again, raising the ETR to 3.3%. In 2021, the price of gas increased to $2.34 per thousand cubic feet, and the ETR dropped again. Estimates so far for 2022 show that the annual ETR is looking to be the lowest it has been over the last 12 years, 0.7%, due to the skyrocketing price of gas. Gas prices dropped at the very end of 2022 and continued to decline in early 2023. If this trend continues, the impact fee's effective tax rate would be higher than 2022.[11] We do not have access to current prices at the trading hubs for Pennsylvania-produced gas. But just for the sake of argument, if we use the current Henry Hub spot price for natural gas of $3.27/Mcf and assume no change in impact fee or production from 2022, the annual ETR would still only be 1.1%.[12]

[10] The effective tax rate is the market value divided by the impact fee.

[11] See this short-term energy outlook from the U.S. Energy Information Administration: https://www.eia.gov/outlooks/steo/report/natgas.php#:~:text=Natural%20Gas%20%20%20%20%20%20,%20%2012.59%20%201%20more%20rows%20.

[12] Henry Hub prices taken from U.S. Energy Information Administration, Henry Hub Natural Gas Spot Price, accessed February 28, 2022, https://www.eia.gov/dnav/ng/hist/rngwhhdm.htm.

Table 1

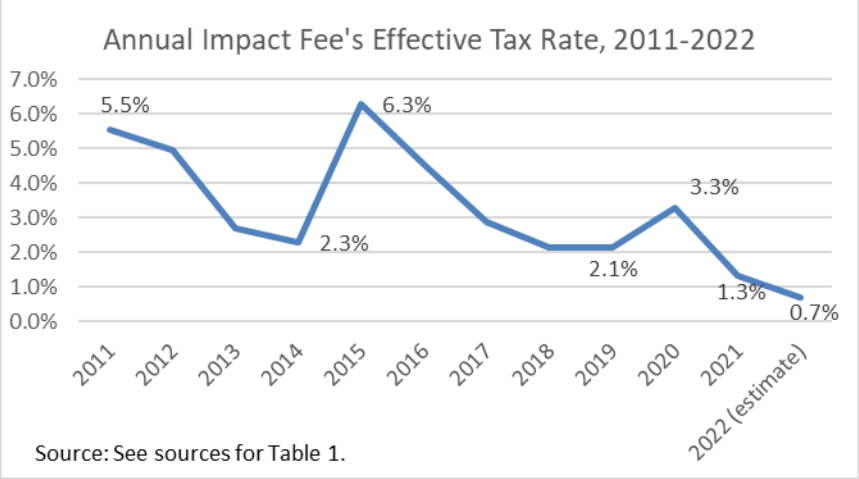
Pennsylvania's Impact Fee Annual Effective Tax Rate (ETR)					
dar Year	Impact Fee Revenues (thousands) (1)	Unconventional Production (MMcf) (MMcf =million cubic feet) (2)	Price of Gas ($/Mcf) (Mcf = thousand cubic feet) (3)	Market Value (thousands)	Annual ETR
2011	$204,210	1,065,824	$3.47	$3,698,409	5.5%
2012	$202,422	2,043,361	$2.00	$4,086,721	5.0%
2013	$227,124	3,102,890	$2.74	$8,501,919	2.7%
2014	$222,437	4,070,390	$2.38	$9,687,529	2.3%
2015	$187,661	4,600,905	$0.65	$2,990,588	6.3%
2016	$172,758	5,096,092	$0.75	$3,822,069	4.5%
2017	$214,424	5,363,481	$1.40	$7,508,873	2.9%
2018	$246,972	6,123,375	$1.90	$11,634,413	2.1%
2019	$200,400	6,821,125	$1.38	$9,413,153	2.1%
2020	$146,300	7,092,046	$0.63	$4,467,989	3.3%
2021	$234,400	7,574,000	$2.34	$17,723,160	1.3%
Estimates for 2022	$274,800	7,600,000	$5.27	$40,052,000	0.7%

(1) Impact fee revenue numbers from Pennsylvania Utility Commission Producer Impact Fee reports (2011-2020): https://www.act13-reporting.puc.pa.gov/Modules/Reports/Reports.aspx. 2019 numbers through 2022 estimates from Independent Fiscal Office (IFO) http://www.ifo.state.pa.us/download.cfm?file=Resources/Documents/2022-Impact-Fee-Estimate.pdf

(2) Production numbers from Pennsylvania Department of Environmental Protection https://www.paoilandgasreporting.state.pa.us/publicreports/Modules/Welcome/ProdWasteReports.aspx; 2021 numbers from http://www.ifo.state.pa.us/download.cfm?file=Resources/Documents/Impact_Fee_Update_Outlook_2022.pdf. 2022 number from: http://www.ifo.state.pa.us/download.cfm?file=Resources/Documents/2022-Impact-Fee-Estimate.pdf

(3) The numbers for the price of gas comes from Independent Fiscal Office (IFO) "2017 Impact Fee Estimate," IFO Research Brief 2018-2; http://www.ifo.state.pa.us/download.cfm?file=/Resources/Documents/NGIFE-2018.pdf and the IFO "2016 Impact Fee Estimate," IFO Research Brief 2017-1; "2021 Impact Fee Estimate," IFO Research Brief, 2021; and the IFO "Impact Fee Update and Outlook," June 2022 at http://www.ifo.state.pa.us/download.cfm?file=Resources/Documents/Impact_Fee_Update_Outlook_2022.pdf. These sources used a weighted average calculation of spot prices at the Dominion South and Leidy trading hubs (calendar year converted to dollars per thousand cubic feet ($1.55 for 2016). The IFO subtracts $0.80 of post-production costs from this price before computing the Effective Tax Rate. For the 2022 estimate, the IFO (http://www.ifo.state.pa.us/download.cfm?file=Resources/Documents/2022-Impact-Fee-Estimate.pdf) includes a 2022 outlook, including a regional price of $6.07 per Mcf (prior to deduction of post-production costs) - like the other years, we subtract post-production costs from this estimate.

Figure 5



How would a severance tax differ from Pennsylvania's impact fee?

There are 34 states in the U.S. that produce natural gas, but five states produce the vast majority of it (67% in 2020). These states are Texas (producing 23.9%), Pennsylvania (21.1%), Louisiana (9.5%), Oklahoma (7.6%), and West Virginia (7.1%).[13] Pennsylvania is the only large, natural gas-producing state that does not impose a severance tax. The severance tax rates in the other large gas producing states are all substantial. For example it is 5% in West Virginia, 7% in Oklahoma and 7.5% in Texas.

Many states tax the value of produced natural gas (taking a fraction of the market value), which is the amount of natural gas produced times the price of gas. In Pennsylvania, production has steadily risen since 2008, but the price of gas has fluctuated. But, as happened in 2021 and 2022, production was at an all-time high while the price of gas increased from $0.63 in 2020 to $2.34 in 2021 and to an estimated $5.27 in 2022. When production and gas prices are high, a severance tax brings in significantly more money than an impact fee does. (See the significant difference in 2021 and 2022 in figure 6.)

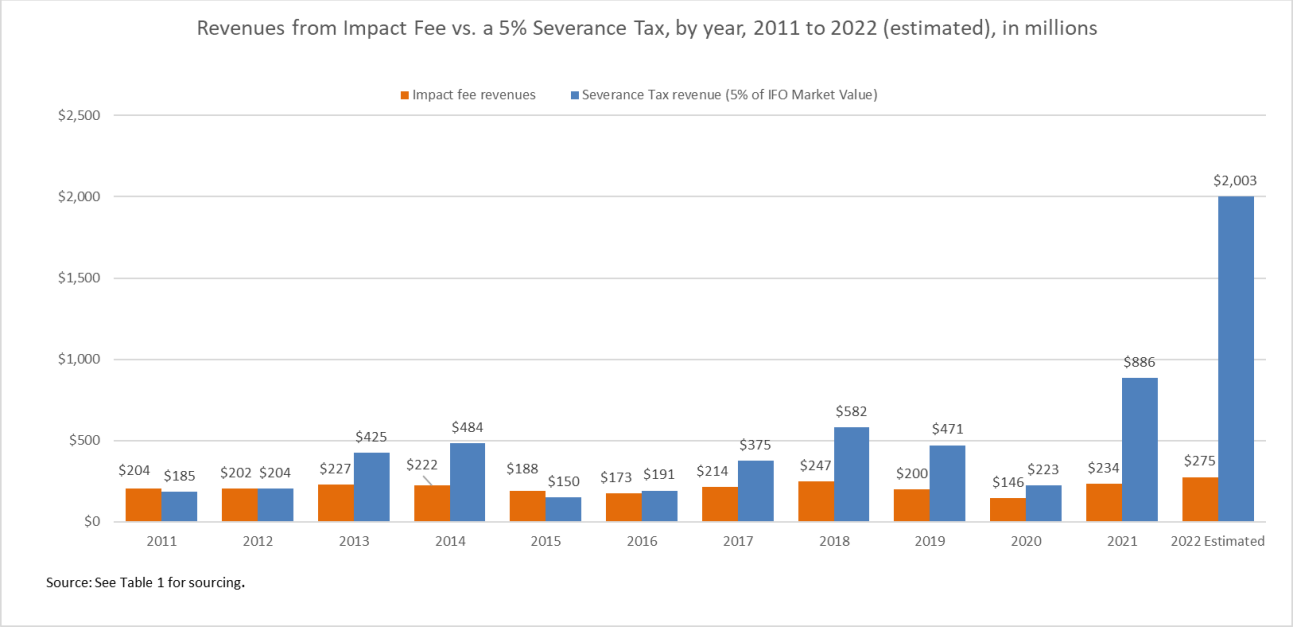
What has the lack of a severance tax cost Pennsylvania?

As figure 6 below shows, revenues from the existing impact fee (orange bar) have remained relatively stable, hovering around $200 million every year. The blue bars show what a 5% severance tax would have brought in every year if Pennsylvania had one. We compute what a severance tax at 5% would have raised by using IFO market value, which embeds the deduction of post-production costs from the price, lowering the IFO's estimate of market value and thus the revenue from a severance tax.

Because prices were depressed between 2013 and 2020, the failure to impose a 5% severance tax has cost the state less revenue than it would have if prices had risen as the IFO and many others expected in 2013. At the time, those expecting higher prices believed the glut that had been depressing prices would go away upon completion of the pipelines, carrying Pennsylvania gas to other markets and to ports—and hence to the global market. But with the recovery of prices in 2021 and the skyrocketing prices in 2022, the failure to enact a standard severance tax is now costing Pennsylvania a lot of revenue—close to $1 billion just in 2021 for a 5% severance tax (set at market value after deducting post-production costs) and $2 billion in 2022 (estimated based on projected data for 2022). As the price of natural gas decreases, as is expected in 2023, revenues from a severance tax would be lower than the 2022 spike (but would still likely be higher than revenue from the impact fee). At the January 2023, we expect that 5% severance tax would bring in roughly $700 to 800 million a year more than just the impact fee. Gas prices will continue to fluctuate. But a severance tax would ensure that, especially in years like 2021 and 2022 when gas prices spiked, the people of Pennsylvania, as well as the natural gas producers, would share in the windfall created by skyrocketing prices.

[13] https://www.eia.gov/energyexplained/natural-gas/where-our-natural-gas-comes-from.php.

Figure 6



So, in the last 11 years, how much revenue has Pennsylvania lost out on by not having a severance tax? With a 5% severance tax of the IFO's market value, Pennsylvania lost out on $1.9 billion between 2011 and 2021. In 2022 alone, estimates show that Pennsylvania lost out on nearly that much in a single year—$1.7 billion.

Table 2

How much more money would a 5% severance tax raise than Pennsylvania's existing Impact Fee? (in thousands)

	5% Severance Tax
Calendar Year	Severance Tax Revenue @ 5% of IFO Market Value Minus Impact Fee Collections
2011	-$19,290
2012	$1,914
2013	$197,972
2014	$261,940
2015	-$38,132
2016	$18,345
2017	$161,020
2018	$334,749
2019	$269,534
2020	$77,414
2021	$680,917
Cumulative revenue loss (2011-2021)	$1,946,383

Source: See Table 1 for sourcing.

It's Time for a Real Severance Tax in Pennsylvania

As production continues to grow, and if prices remain high, Pennsylvania will lose out on millions, possibly billions, of dollars of revenue each year. The impact fee in Pennsylvania will not capture any additional growth the way a severance tax would as gas production continues to grow and revenues remain high, as they are expected to in coming years due to a combination of rising production volume and rebounding prices. [14]

Opponents of a severance tax have a series of talking points that have consistently raised over the years. They are as false today as when we answered them five years ago.[15] But there is one we should mention here: a severance tax will not raise natural gas prices for Pennsylvanians. For one thing, as we have shown, the cost of natural gas varies greatly over time and that variation is shaped by weather, international affairs, and international shipping capacity than by taxes. And second, because of the way pipelines run, most of the natural gas produced in Pennsylvania is consumed in other states. If anyone is going to pay more as a result of a Pennsylvania severance tax, it is consumers in other states. If severance taxes raise the price of gas, Pennsylvanians are *already paying higher prices* because those taxes are imposed in every other gas producing state.

While Pennsylvania should be, and is (especially with the help of the federal Infrastructure Investment and Jobs Act and the Inflation Reduction Act), moving towards renewable energy, our state should also be taxing the natural gas companies that are extracting Pennsylvania's natural resources. Other natural, resource-rich states impose more reasonable taxes on resource extraction, including through severance taxes on the value of gas extracted. They then use these resources to invest in K-12 education, higher education, human services, economic diversification, and natural resource protection to improve quality of life and the environment in their state. Wyoming and North Dakota, for example, each invest three to five times per capita what Pennsylvania does in higher education. These states use severance taxes, in part, to rank first and third place in investment per capita in higher education. Pennsylvania languishes in forty-seventh place.

A 5.0% severance tax would put Pennsylvania in line with many other natural gas-rich states. If future years look anything like 2021 or 2022, a 5% severance tax could bring in close to $1 billion per year or more. Imagine what our state could do with that revenue? Invest in our underfunded schools, in our universities, in the human services that support the most vulnerable Pennsylvanians. Our state, our communities, and our children live with choices made by lawmakers regarding taxing highly profitable companies and funding critical investments—as long as gas drilling occurs within our state, companies should be adequately taxed. It's time for Pennsylvania to make the right choice and enact a real severance tax.

[14] https://www.eia.gov/todayinenergy/detail.php?id=50898

[15] See John Neurohr and Marc Stier, "Four Misconceptions About a Severance Tax," Pennsylvania Budget and Policy Center, May 2, 2018, https://krc-pbpc.org/wp-content/uploads/severance_tax_misconceptions_update_june2018.pdf.