



How North Dakota Returns “Unconventional” Oil Revenue to Local Governments

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Introduction

This brief shows how North Dakota’s local governments receive production tax revenue from unconventional oil extraction. Fiscal policy is important for local communities for several reasons. Mitigating the acute impacts associated with drilling activity and related population growth requires that revenue is available in the amount, time, and location necessary to build and maintain infrastructure and to provide services. In addition, managing volatility over time requires different fiscal strategies, including setting aside a portion of oil revenue in permanent funds.¹

The focus on unconventional oil is important as horizontal drilling and hydraulic fracturing technologies have led a resurgence in oil production in the U.S. Unconventional oil plays require more wells to be drilled on a continuous basis to maintain production than comparable conventional oil fields. This expands potential employment, income, and tax benefits, but also heightens and extends public costs.

This brief is part of a larger project by Headwaters Economics that includes detailed fiscal profiles of major oil-producing states—Colorado, Montana, New Mexico, North Dakota, Oklahoma, Texas, and Wyoming—along with a summary report describing the key fiscal differences between these states. These profiles will be updated regularly. The various approaches to taxing oil make comparisons between states difficult, although not impossible. We apply each state’s fiscal policy, including production taxes and revenue distributions, to a typical unconventional oil well. This allows for a comparison of how states tax oil extracted using unconventional technologies, and how this revenue is distributed to communities. Detailed state-profiles and the larger report are available at <http://headwaterseconomics.org/energy/state-energy-policies-nd>.

North Dakota Summary

- North Dakota levies two production taxes at the state level with a combined “base” tax rate of 11.5 percent. As a result of incentives and deductions, the effective tax rate over ten years of production from a typical unconventional oil well is 11.2 percent, which ranks second (after Wyoming) among the seven oil-producing states we compare (Figure 1).
- North Dakota’s revenue allocations are regressive with respect to community distributions. Local governments retain the first \$5 million generated from the gross production tax, and 25 percent of additional revenue generated locally during each biennium. Counties with the most oil production receive the most revenue, in absolute terms, but retain a declining share as tax receipts climb.
- Four of the seven states (Colorado, Montana, Texas, and Wyoming) return a greater share of revenue collections to local governments than North Dakota.
- North Dakota is one of two states (the other is Colorado) that make direct distributions to cities based on the location of drilling and population-related impacts. It is more common to make distributions to jurisdictions based solely on where production takes place.
- North Dakota saves the largest amount and share of total revenue (about 46% into the Legacy Fund) compared to other energy-producing states. How the proceeds will be spent is still undetermined.

Figure 1. Comparison of Production Tax Revenue Collected from a Typical Unconventional Oil Well

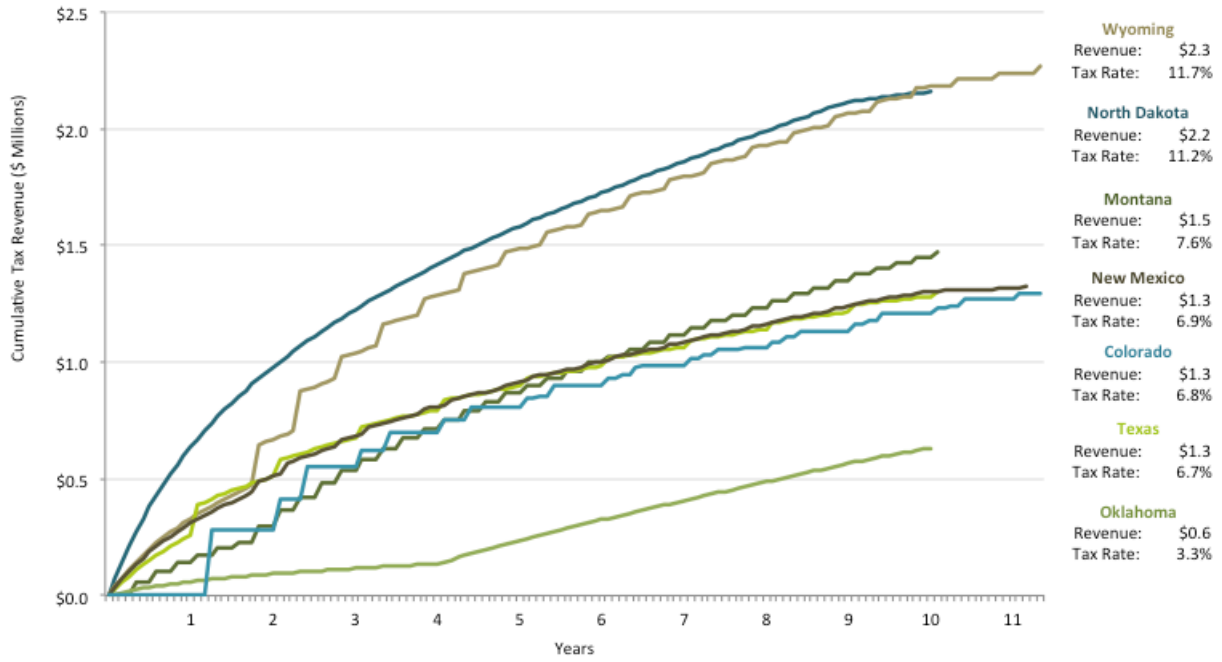
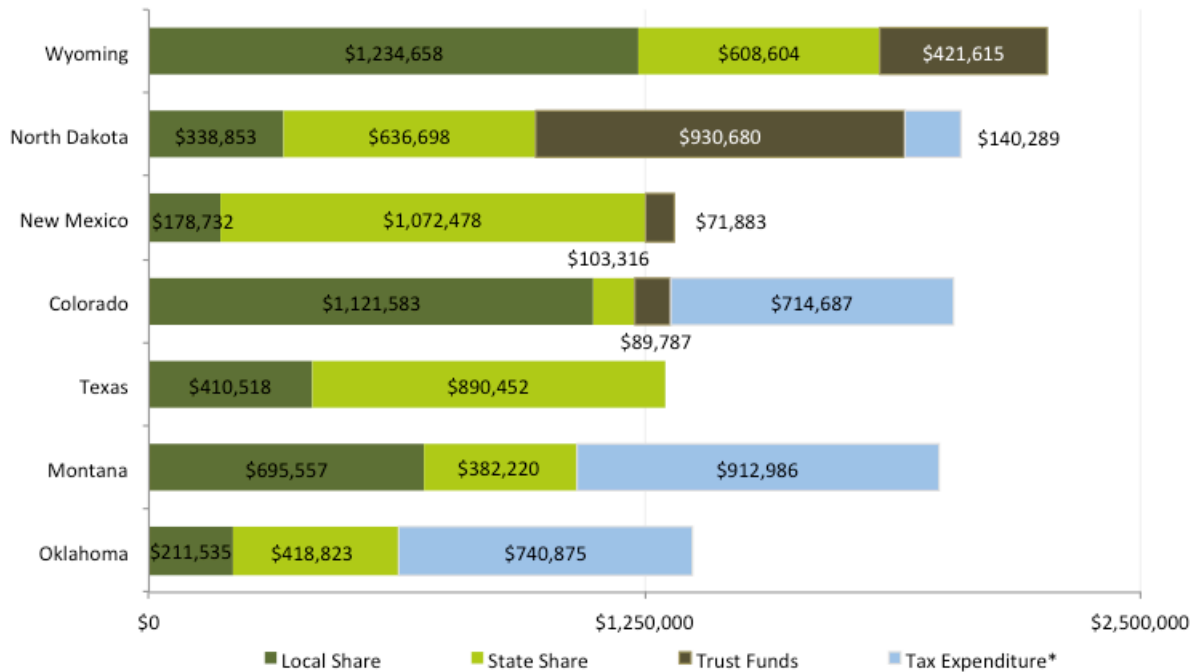


Figure 2. Comparison of Distribution of Production Tax Revenue from a Typical Unconventional Oil Well



*Tax Expenditure refers to the value of production tax incentives and tax relief funded with production tax revenue.

Unconventional Oil Well Performance

Unconventional oil is produced using horizontal drilling and hydraulic fracturing technologies. While no two wells are identical, unconventional wells all share a typical production profile, characterized by relatively high rates of initial production followed by steep production declines.² This makes it possible to construct a typical well profile—in this case using data from Montana’s Elm Coulee field in the Bakken formation. We use this well profile to determine how a state’s taxation and distribution policies combine to deliver revenue to local governments over ten years in terms of amount, timing, location, and predictability.³

There were 789 horizontal oil wells drilled in the Elm Coulee between 2000 and 2012.⁴ Average oil production peaked at 246 barrels per day in the first month, declining to 122 barrels per day after one year—a 51 percent decline in the first year. Cumulatively, the average Elm Coulee well produces 227,374 barrels of oil over ten years (Figure 3). At a fixed price of \$85 per barrel, the typical well generates \$19.3 million in cumulative production value over ten years (Figure 4).

Figure 3: Production Profile from a Typical Unconventional Oil Well

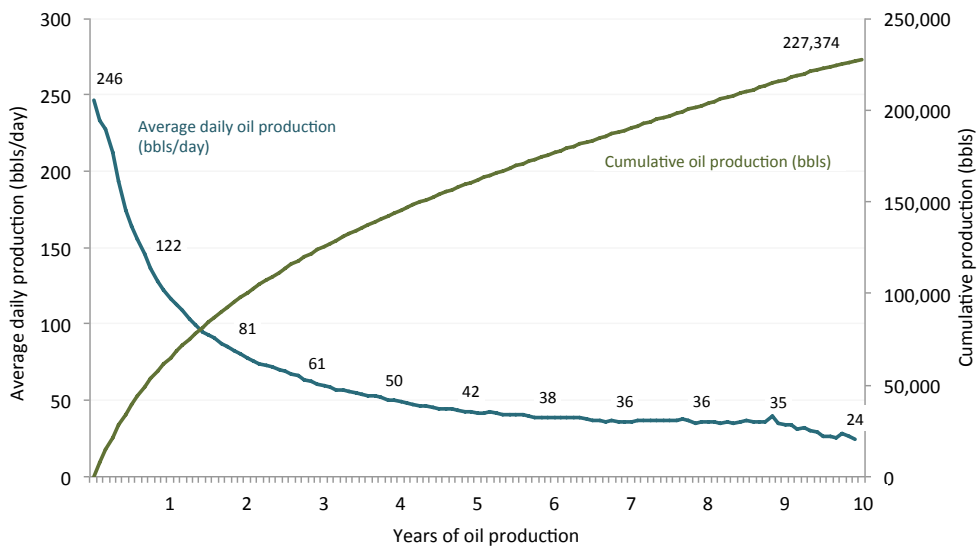
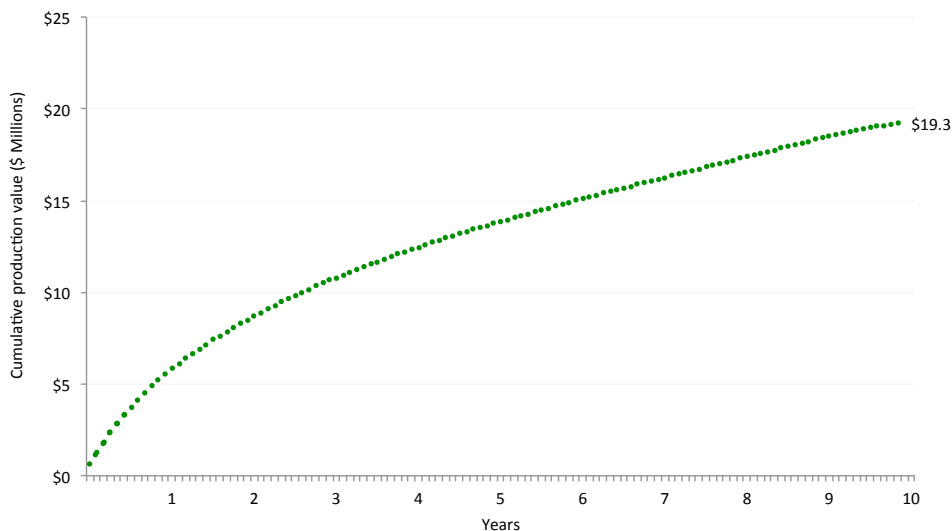


Figure 4: Cumulative Production Value from a Typical Unconventional Oil Well



Profile of North Dakota Production Taxes

North Dakota levies two state production taxes: the oil extraction tax, and the oil and gas gross production tax. The oil extraction tax of 6.5 percent is retained entirely at the state level. The oil and gas gross production tax of five percent is levied in lieu of property taxes, and a share of the revenue is distributed to local governments.

North Dakota's tax structure collects a relatively high share of revenue from new unconventional production compared to other oil-producing states. However, the effective tax rate could fall significantly if oil prices drop below "trigger" thresholds, which activate lower tax rates and incentives.

Below we offer a detailed look at how the two taxes apply to unconventional oil production using the typical well profile in the previous section. The results are displayed in Figure 5 and Table 1.

Oil Extraction Tax

Base Rate: The oil extraction tax is 6.5 percent of the gross production value of oil. Gross production value is defined as the market value of production, without deductions for transportation or processing costs. Royalty interest in oil produced on federal, state, municipal, or tribal government land is exempt from the extraction tax. This analysis assumes that the well is drilled on private property, and the royalty interest is not exempt from the extraction tax.⁵ North Dakota offers a reduced rate of four percent if the price of oil drops below a "trigger" price, adjusted annually for inflation. The current trigger price is \$52.20, so the existing rate is the full 6.5 percent base tax rate.

Stripper Wells: Wells producing less than 30 barrels per day are exempt from the extraction tax. The typical unconventional oil well described in the previous section reaches this threshold in the ninth year of production, and would be exempt from the extraction tax after that point.

Production Incentives: The lesser amount of either the value of the first 75,000 barrels or \$4.5 million in gross production value from the first 18 months after completion of a horizontal well drilled and completed after April 30, 2009 is subject to a reduced oil extraction tax rate of two percent. The extraction tax drilling incentive for horizontal wells is tied to a price threshold that is not currently in effect (the trigger price for the calendar year January 1, 2013, through December 31, 2013, is \$52.20).⁶

Timing of Collections: The oil extraction tax is assessed monthly.

Additional Provisions: The oil extraction tax offers a host of exemptions and incentives for different kinds of production. Secondary and tertiary recovery projects, inactive wells brought back into production, well workover projects, and new vertical wells are all eligible for lower rates or exemptions. These various provisions are not considered in this study because they do not apply directly to oil produced from new unconventional oil wells. As unconventional plays age, and secondary production and recompletions become more common, these additional provisions in the tax code may become more important.

Gross Production Tax

Base Rate: The gross production tax is five percent of the gross production value of oil. Gross production value is defined as the market value of production, without deductions for transportation or processing costs. Royalty interest in oil produced on federal, state, municipal, or tribal government land is exempt from the gross production tax. This analysis assumes that the well is drilled on private property, and the royalty interest is not exempt from the gross production tax.

Stripper Wells: There are no exemptions from the gross production tax for stripper wells.

Production Incentives: There are no incentives offered from the gross production tax.

Timing of Collections: The gross production tax is assessed monthly.

Additional Provisions: There are no additional provisions of note.

Tax Revenue Formula Applied to the Typical Unconventional Oil Well

The formula to estimate production taxes based on production from the typical well for each month is:

If the price of oil is greater than \$52.20;
If average daily oil production is greater than 30 barrels per month; and
If the well is completed on private land;

$$\text{Tax Revenue} = \text{Gross production value} * (\text{extraction tax rate} * \text{gross production tax rate}).$$

Figure 5: North Dakota Tax Policy Applied to a Typical Unconventional Oil Well

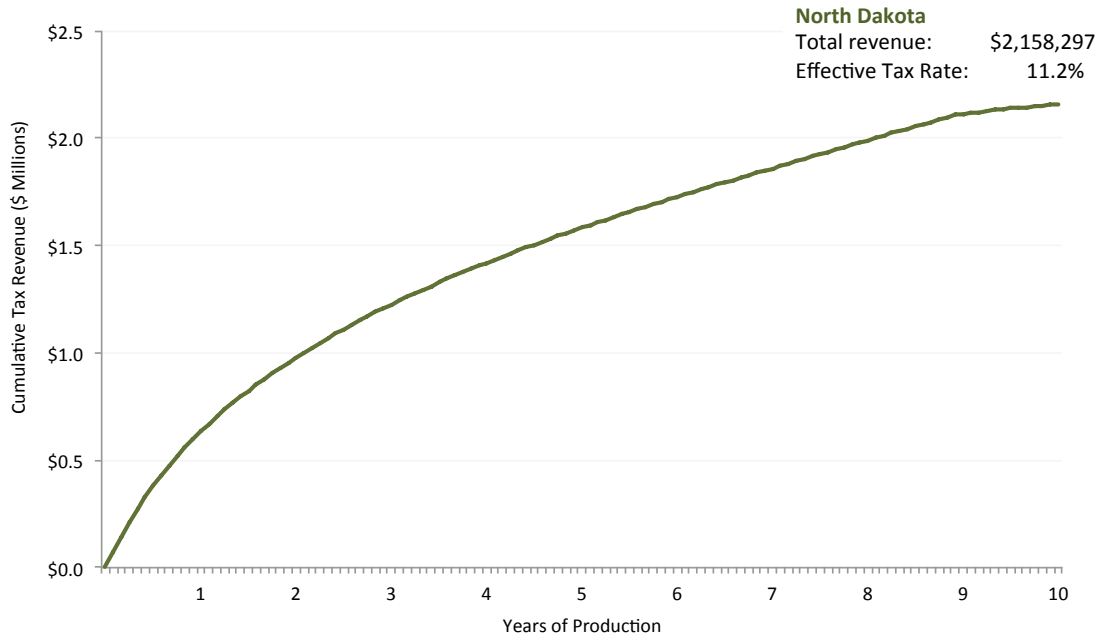


Table 1: North Dakota Tax Policy Applied to a Typical Unconventional Oil Well

Production year	Oil extraction tax rate	Gross production tax rate	Gross Production Value of Oil Production	Oil extraction tax revenue	Gross production tax revenue	Total Revenue	Effective tax rate (based on tax year)
1	5.00%	6.50%	\$5,530,321	\$276,516	\$359,471	\$635,987	11.50%
2	5.00%	6.50%	\$2,984,622	\$149,231	\$194,000	\$343,232	11.50%
3	5.00%	6.50%	\$2,146,014	\$107,301	\$139,491	\$246,792	11.50%
4	5.00%	6.50%	\$1,686,964	\$84,348	\$109,653	\$194,001	11.50%
5	5.00%	6.50%	\$1,412,756	\$70,638	\$91,829	\$162,467	11.50%
6	5.00%	6.50%	\$1,250,365	\$62,518	\$81,274	\$143,792	11.50%
7	5.00%	6.50%	\$1,160,428	\$58,021	\$75,428	\$133,449	11.50%
8	5.00%	6.50%	\$1,136,597	\$56,830	\$73,879	\$130,709	11.50%
9	5.00%	0.53%	\$1,121,166	\$56,058	\$66,936	\$122,994	10.97%
10	5.00%	0.00%	\$897,516	\$44,876	\$0	\$44,876	5.00%
11							
Cumulative			\$19,326,749	\$966,337	\$1,191,960	\$2,158,297	11.15%

Figure 5 and Table 1 shows that the average tax rate over ten years is 11.2 percent. The average tax rate falls below the base tax rate of 11.5 percent because average daily oil production falls below 30 barrels of oil after 108 months of production. After this point, the well no longer pays the extraction tax of 6.5 percent, lowering the base tax rate to 5 percent over the last year of production from the well, lowering the effective tax rate from 11.5 percent to 11.2 percent.

Profile of North Dakota Production Tax Distribution Policies

Distribution of revenue from the two taxes has been aptly described as a system of filling pot after pot. Distributions to various purposes depend on the total amount of revenue collected.⁷ As collections increase, allocations to funds and jurisdictions that receive money initially are capped, or the percent of allocations change as thresholds are met, “spilling” additional revenue at increasing rates into new accounts.

Because of the variable nature of the distribution system, it is impossible to track how revenue generated from any individual well is allocated. Instead, we estimate revenue distributions to local governments using estimates prepared by the North Dakota Legislative Council Staff that illustrate how tax revenues are allocated based on total projected tax collections for the FY 2013 to 2015 Biennium.⁸ We then allocate total revenue generated from the typical well (about \$2.2 million) using these estimates.

To simplify comparisons between states, we group distributions into several main purposes: state share, tribal share, local share, permanent savings (or trust fund allocations), and tax expenditures (the value of production tax incentives and tax relief funded with production tax revenue).

One important characteristic of North Dakota’s distribution policy is that it returns a relatively small share to local governments. The gross production tax is levied in lieu of local property taxes, but it has a regressive formula with respect to local governments. Local governments receive only 36 percent of the gross production tax directly or through impact grants (the local share is only 16 percent of total gross production tax and extraction tax revenue combined). Of the funds allocated to direct distributions, local governments receive one hundred percent of the first \$5 million in gross production tax revenue collected in each county. After the \$5 million threshold is exceeded, local governments

then receive only 25 percent of additional gross production tax revenue. The counties with the most oil production effectively receive the smallest share of revenue from production that occurs locally.

As a result of this arrangement, the amount of money North Dakota's tax system returns to local governments ranks fourth among the seven states we analyze. Measured in terms of the share of revenue returned to local governments, North Dakota ranks fifth of seven states.

Below we describe how distributions are made between the state share, tribal share, local share, permanent savings, and tax expenditures. The results are displayed in Figure 6 and Table 2.

Allocations

State Share: The portions of the extraction and production taxes that accrue to the state are directed to the General Fund, the strategic investment and improvements fund, and a state disaster relief fund. Excess revenue is transferred to the Legacy Fund. In addition, the extraction tax contributes to the resources trust fund, energy conservation grant fund, and renewable energy development fund; and the production tax contributes to several other statewide accounts, including an abandoned well reclamation fund and heritage fund.

Tribal Share: Half of the production revenue from within the Fort Berthold Reservation is shared directly with the Three Affiliated Tribes.⁹ The tribal distribution is considered part of the local share for the purposes of cross-state comparisons. The portion that goes to tribal governments is broken out in Figure 6 and Table 2.

Local Share: The gross production tax is levied in lieu of local property taxes and is distributed directly back to local political subdivisions, and contributes to the oil and gas impact grant fund (capped at \$240 million for the FY 2013 to 2015 biennium). The direct distributions are based on a formula that directs 75 percent of collections back to the state after the first \$5 million is distributed wholly to counties. Additional detail on how the local share is allocated between different local governments is provided in the next section.

Permanent Savings: The North Dakota Legacy Fund was created in 2010 when voters approved a constitutional amendment to direct 30 percent of oil extraction and oil and gas gross production taxes to the Legacy Fund. The principal and earnings of the Legacy Fund may not be spent until after June 30, 2017, and any expenditure of principal after that date requires a vote of at least two thirds of the members elected to each house of the Legislative Assembly. Not more than 15 percent of the principal of the Legacy Fund may be spent during a biennium. The Legislative Assembly may transfer funds from any source to the Legacy Fund and such transfers become part of the principal of the Fund. The State Investment Board is responsible for investment of the principal of the Legacy Fund. Interest earnings accruing after June 30, 2017 are transferred to the General Fund at the end of each biennium. Section 21-10-11 provides that the goal of investment for the Legacy Fund is principal preservation while maximizing total return.¹⁰

The Legacy Fund initially received money in September 2011, and already has \$1.2 billion in assets, with roughly \$80 million being added every month (through early 2013).

Twenty percent of oil extraction tax revenue is allocated evenly between the Common Schools Trust Fund and the Foundation Aid Stabilization Fund. Interest income is sent solely to K-12 school districts based on the trust's average assets. Income sources for the Common Schools Trust Fund include the oil extraction tax, tobacco settlement funds, and revenue from state lands. The principal of the Foundation Aid Stabilization Fund may only be spent upon order of the Governor to offset K-12 school revenue shortfalls. Interest income is transferred to the General Fund monthly.¹¹

Tax Expenditures: The state allocates a share of the state's extraction tax collections to property tax relief (estimated at 6.5% of FY 2013-2015 collections).¹²

Figure 6: North Dakota Distribution Policy Applied to a Typical Unconventional Oil Well

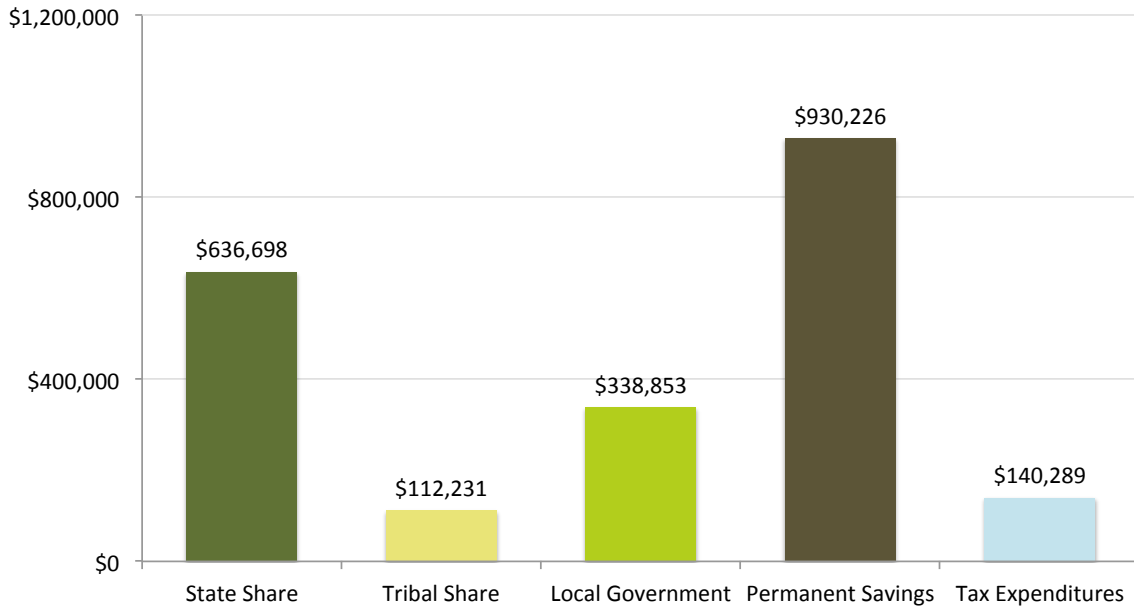


Table 2: North Dakota Distribution Policy Applied to a Typical Unconventional Oil Well

Distribution	Description	Amount	Share of Total
State Share		\$636,698	29.5%
General Fund	General Fund receives direct distributions that are capped, additional distributions as other "pots" fill up, and interest distributions from Trust Funds. Total limit is \$300 million for FY 2013-2015.	\$123,023	5.7%
Infrastructure Spending	The Strategic Investment and Improvements Fund receives direct distributions that are capped, additional distributions as other "pots" fill up. Funding is used for one-time expenditures relating to infrastructure or improving the efficiency and effectiveness of state government.	\$258,996	12.0%
Natural Resources Mgmt.	The Resources Trust Fund receives 20% of oil extraction tax and is used for water projects. The Oil and Gas Research Fund is capped at \$10 million.	\$237,413	11.0%
Other	The Disaster Relief Fund receives up to \$22 million.	\$17,266	0.8%
Tribal Share			
Tribal Share	Half of revenue from the extraction and gross production tax from wells drilled within the Fort Berthold Reservation is shared directly with the Three Affiliated Tribes.	\$112,231	5.2%
Local Share		\$338,853	15.7%
Local Production Taxes		\$0	0.0%
Direct Distributions	A formula directs Gross Production Tax distributions to local governments. The formula changes as revenue increases with the initial \$5 million in revenue going 100% to local governments, but shifting to a 25- 75% split between local governments and the state government respectively thereafter.	\$241,729	11.2%
Impact Grants	Oil and Gas Impact Fund is capped at \$240 million for the FY 2013-2015 biennium.	\$97,123	4.5%
Permanent Savings		\$930,226	43.1%
Natural Resources Trust Fund	30% of oil extraction tax and gross production tax is distributed to the Legacy Fund.	\$699,288	32.4%
Schools Trust Fund	10% of the oil extraction tax to the Common Schools Trust Fund. Interest goes to K-12 funding. Fund revenue sources are the oil extraction tax, tobacco settlement funds, and revenue from state lands. 10% of the oil extraction tax to the Foundation Aid Stabilization Fund. The principle can only be spent on K-12 shortfalls by the Governor. Interest goes to the General Fund.	\$230,938	10.7%
Other Trust Funds		\$0	0.0%
Tax Expenditures		\$140,289	6.5%
Production Tax Incentives		\$0	0.0%
Dedicated Tax Relief	Property Tax Relief Fund receives a portion of the state share up to \$342 million.	\$140,289	6.5%
Total Distributions		\$2,158,297	100.0%

Regressive Returns to Local Governments

Table 2 illustrates how revenue is allocated based on estimated distributions for the FY 2013 to 2015 Biennium. The allocations to local governments are for all local government returns combined. Table 3 shows a breakout of distributions between different types of local government.

Table 3: Estimated Allocation of Production Taxes to All Political Subdivisions, Estimated FY 2013 to 2015 Biennium

Local Share Allocated by Political Subdivision	Estimated Revenue	Percent of Total Gross Production Tax	Percent of Total Taxes (Gross Production and Extraction Tax)
Hub cities	\$91,420,000	4.0%	1.7%
Hub city schools	\$15,250,000	0.7%	0.3%
Counties	\$315,470,000	13.8%	6.0%
Cities	\$106,380,000	4.7%	2.0%
Schools	\$33,920,000	1.5%	0.6%
Townships	\$30,450,000	1.3%	0.6%
Subtotal: Direct Distributions	\$592,890,000	25.9%	11.2%
Impact grant fund	\$240,000,000	10.5%	4.5%
Total Dist. Including Impact Grants	\$832,890,000	36.4%	15.7%

Table 3 shows a more detailed breakout of gross production tax revenue allocated to political subdivisions in North Dakota. For the purpose of the state comparisons, we show the local share as a percent of total tax revenue, including total gross production and extraction tax collections. In North Dakota, local and state officials are also interested in the local share as a percent of only the gross production tax that is levied in lieu of property taxes.

Table 3 shows that the local share adds to 15.7 percent of total extraction and gross production tax collections combined. Local governments will receive 11.2 percent of distributions directly, including 6.0 percent to county governments, 1.7 percent to hub cities, and 0.6 percent to schools. The impact grant fund will contribute an additional \$240 million, or 4.5 percent of the total, some of which will be available to county and city governments, while other grant monies are dedicated to various special districts, including airports. By comparison, local governments will receive 36.4 percent of the gross production tax levied in lieu of property taxes, 25.9 percent directly and 10.5 percent through impact grants.

The regressive distribution formula, however, will result in distributions that vary between political subdivisions within counties based on the total amount of production that occurs locally. Counties that host the largest amounts of production will receive more revenue, but at a declining share of total. For example, McKenzie County, a significant energy producer, will see less than six percent of all revenue that is generated locally in the county, while McHenry County, a much more modest energy producer, will retain a larger share of what is collected locally. It is beyond the scope of this research to determine the exact allocations on a county-by-county basis.

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Headwaters Economics is an independent, nonprofit research group whose mission is to improve community development and land management decisions in the West.

Endnotes

¹ Headwaters Economics. *Oil and Natural Gas Fiscal Best Practices: Lessons for State and Local Governments*. November 2012. http://headwaterseconomics.org/wphw/wp-content/uploads/Energy_Fiscal_Best_Practices.pdf.

² See, for example: Energy Information Administration. 2013a. NEMS Model Documentation 2013: Oil and Gas Supply Module. Appendix 2.C: Decline Curve Analysis. U.S. Department of Energy. Washington, D.C.

³ This same approach is used by other analysts. See, for example, Ernst & Young LLP. 2012. Analysis of Ohio Severance Tax Provisions of H.B. 487. Prepared by Ernst & Young LLP for the Ohio Business Roundtable. <http://jobs-ohio.com/images/Ernst-Young-Severance-Tax-Analysis-Prepared-for-the-Ohio-Business-Roundtable-5-15-12.pdf>. See also Montana Department of Revenue. 2012. Oil and Gas Production Tax Comparison: Montana and North Dakota. Helena, MT. http://revenue.mt.gov/content/committees/legislative_interim_committee/oil_and_gas_prod_tax_comp_july_rtic.pdf.

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⁷ Minneapolis Federal Reserve. FedGazette, July 2012. Oil tax spending: "Pots for this and pots for that." R. A. Wirth. http://www.minneapolisfed.org/publications_papers/pub_display.cfm?id=5134.

⁸ North Dakota Legislative Council. 2013-15 Oil and gas tax revenue allocation flowchart. <http://www.legis.nd.gov/files/resource//15.9055.01000.pdf?20130816150731>.

⁹ Section 57-51.2.

¹⁰ North Dakota Retirement and Investment Office. FY 2012 Audited Financial Statements. Investment Section North Dakota Legacy Fund. (pg. 105). <http://www.nd.gov/rio/SIB/Publications/CAFR/AnnualReport-Investment.pdf>.

¹¹ North Dakota Legislative Council. July 2013. Study of the Foundation Aid Stabilization Fund—Background Memorandum. <http://www.legis.nd.gov/files/events/memorandum/15.9034.01000.pdf?20130812081929>.

¹² North Dakota Legislative Council. 2013-15 Oil and gas tax revenue allocation flowchart.