



# A Comparative Analysis of Selected Petroleum-Producing States

The Oil & Gas Industry's Fiscal Contribution  
to State Governments

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# CONTENTS

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## 02 OVERVIEW

- 03 Summary of Findings
- 04 Fiscal Contributions to Government
- 06 Methodology

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## 11 COMPARISONS BETWEEN STATES

- 16 Summary of Comparative Findings
- 18 State Production Profiles
- 20 Government Revenue

---

## 22 NEW MEXICO

- 23 Production Profile
- 27 Revenue

---

## 30 TEXAS

- 31 Production Profile
- 35 Revenue

---

## 38 NORTH DAKOTA

- 39 Production Profile
- 42 Revenue

---

## 44 OKLAHOMA

- 45 Production Profile
- 49 Revenue

---

## 51 COLORADO

- 52 Production Profile
- 56 Revenue

---

## 59 WYOMING

- 60 Production Profile
- 63 Revenue

---

## 65 UTAH

- 66 Production Profile
- 69 Revenue

---

## 71 KANSAS

- 72 Production Profile
- 76 Revenue

---

## 78 MONTANA

- 79 Production Profile
- 83 Revenue

---

## 85 APPENDIX

- 86 Summary of Figures
- 87 Data Sources
- 89 Index Prices



# Overview

Development and production of oil and natural gas resources in the western states provides significant revenue contributions to numerous local and state government entities. Government fiscal resources are substantially impacted by the operations of these economic enterprises, affecting both public services and resources available to citizens living in their communities. The revenue obligations placed on the industry can significantly impact the development climate for a state's oil and natural gas resources.

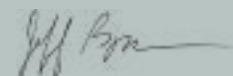
It's frequently expressed that these revenue contributions should be raised or lowered. The goal of this analysis isn't to offer opinions about the sufficiency of the revenue contribution in support of state governments. Instead, it's to provide a valid basis to compare the fiscal contributions of oil and natural gas production activities among the nine states included in the study area.

The complexities of fees, taxes, and royalties contributed by oil and natural gas producers in each state have made prior comparative efforts extremely difficult and potentially inconclusive. Acknowledging our significant appreciation for the contributions of previous analysts, it's our hope to build on them. We're incredibly thankful to the many individuals who assisted and shared their knowledge while compiling this large volume of data and information. We couldn't have accomplished this without their assistance.



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## SUMMARY OF FINDINGS

Comparing government revenue streams from oil and natural gas production activities among the producing states included in this study resulted in three significant conclusions when considering the industry's fiscal contribution to government resources. Our analysis compares government revenues obtained from oil and natural gas production activities, stated as a percentage of a state's total value of petroleum production.

### DIRECT ROYALTY AND TAX CONTRIBUTIONS

Although revenue contributed by oil and gas production taxes as a percentage share of production value is significant and relatively consistent among all of the analyzed states, the direct revenue contributions from production royalties set several states apart in shares of total production value contributed.

The share of value generally ranges from 9% to 12%. At 12.8% of estimated production value, Texas obtains a higher share of value from taxes than the other states surveyed. If tax policy impacts the industry's investment and production decisions, any change to the way a state taxes the industry could impact the competitive market position of the state's producers.

### STRUCTURE OF GOVERNMENT REVENUE

Royalty revenue earned by several states in the form of land income—defined by existing federal and state lease terms and subject to market value dynamics—is a significant attribute to several state's revenues.

New Mexico and Wyoming are roughly comparable in land income attributes, with Texas obtaining the highest dollar level of royalty contributions.

### INVESTMENTS IN PERMANENT FUNDS

A third fiscal component of oil and natural gas revenue are annual state receipts provided by investments of historic production-related revenues in permanent funds, which provide several state governments with large, stable revenue streams in the form of investment income.

**If tax policy impacts the industry's investment and production decisions, any change to the way a state taxes the industry could impact the competitive market position of the state's producers.**

# FISCAL CONTRIBUTIONS TO GOVERNMENT

This report looks at the contributions to state and local government revenue of the oil and gas industry. Our analysis compares revenue contributions for the largest western onshore producing states in the context of the fiscal obligations they place on the productive value of each state’s resources.

Moss Adams surveyed a number of similar research efforts performed in these same producing states. The complexities of the various fees, taxes, and royalties contributed by oil and natural gas producers in each state make comparisons extremely difficult and potentially inconclusive.

The oil and natural gas resource assets located in the study area are variously managed by private, state, tribal, and federal owners.<sup>1</sup>

State and local governments obtain fiscal revenue from the development of these resources as tax revenue and land income. The development of oil and gas resources on private lands produces a variety of tax-related revenue which is incorporated in our analyses, but private royalties are excluded.<sup>2</sup> Where the state holds lands in trust and manages oil and gas resources, revenue may be earned as both taxes and royalties.

The diversity of resource ownership between state, federal, tribal, and private owners is a substantial foundation of the government revenue opportunities provided from the oil and natural gas resource development within a state. Land ownership is a significant structural foundation of the revenue obtained by state and local governments.

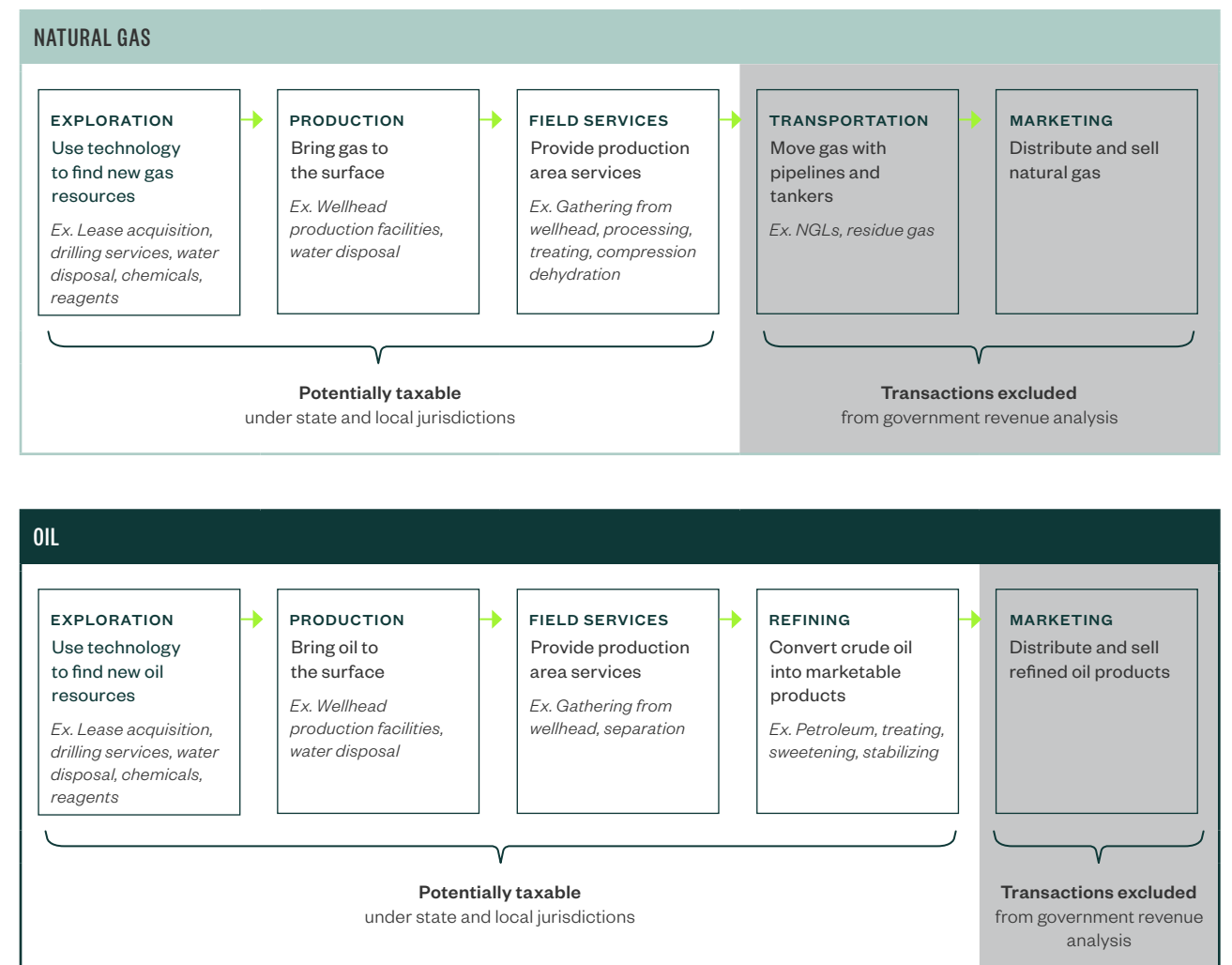
In producing states, economic activities that provide revenue to governments start with property or lease acquisition costs and field services, including landmen, roustabouts, drilling rigs, truckers, and consulting geologists or engineers.

## PRODUCTION VALUE CHAIN

The cost of developing operating properties is significant, but production-related activities produce the bulk of the revenue, collected in the form of taxes and royalties. The production value chain is generally completed by gathering and other field services activities, such as water hauling or trucking liquid products. Oil and gas must be treated and natural gas is conditioned so that they can enter interstate market pipelines.

A producer’s total production value is affected by a variety of obligations to government, but must provide sufficient revenue to offset the costs of development and operations, as well as pay other private interest owners in those production activities. The production-related activities that potentially generate government revenue are broken out with brackets in the diagrams below.

FIGURE 1: Oil and Natural Gas Production Value Chain



1 The remainder of this discussion combines tribal and federal government resource management activities and tabulates revenues from oil and gas lease operations on federally managed lands which are distributed to states. States don't share in tribal royalties, and tribal royalties are excluded from this analysis. The development of tribal oil and gas resources aren't insignificant in the study area, and taxable sales transactions related to off-reservation oil and gas business activities aren't identified separately. The production volume and value from tribal lands is otherwise included within the total federal lands production data.

2 We also recognize that income taxes are paid by private royalty owners on their royalty income, but were unable to identify an estimation method for this revenue and excluded private royalty income tax revenues from our analyses.



# METHODOLOGY

This analysis is limited to onshore oil and natural gas production in Colorado, Kansas, Montana, New Mexico, North Dakota, Oklahoma, Texas, Utah, and Wyoming. It's important to note that what may appear similar frequently isn't—for example, severance taxes aren't defined or administered the same between states.

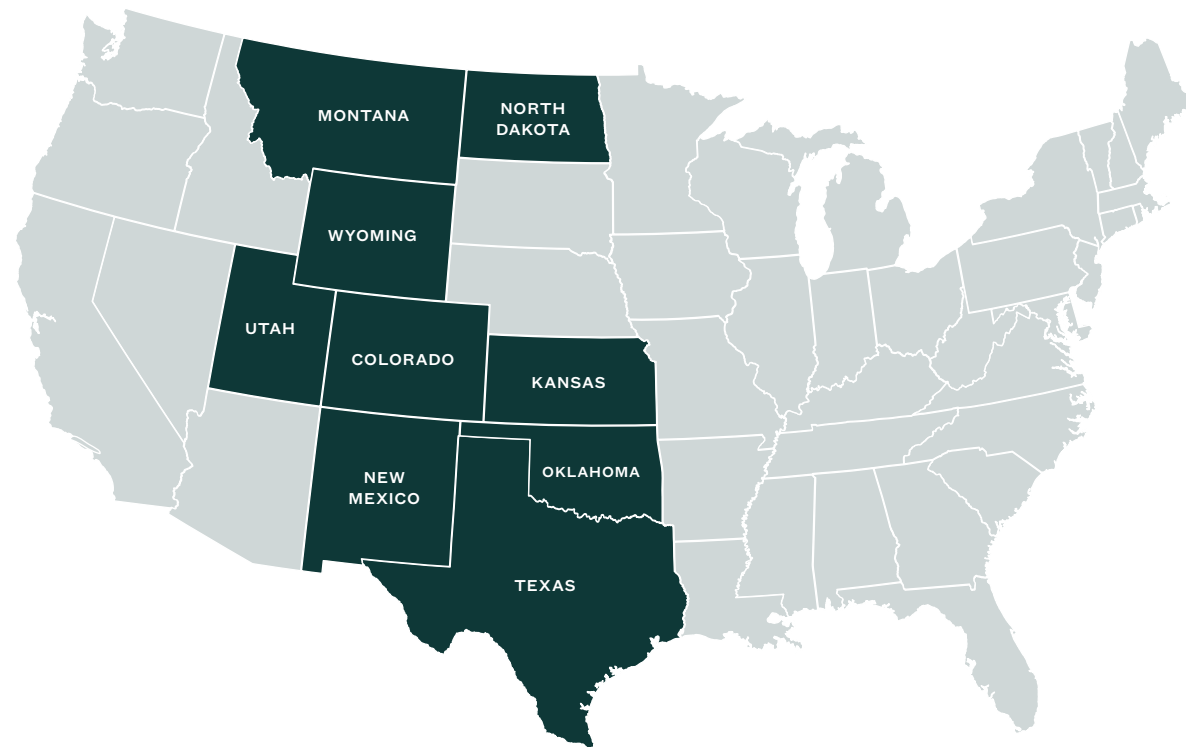
Our approach seeks to reduce this confusion by:

- Aggregating revenue received by state and local governments by category
- Comparing fiscal revenue to the total production value<sup>3</sup>
- Characterizing revenue contributions to each state in the context of cost recovery, private royalty obligations, and the distribution of federal mineral lease royalties

Our methods aim to provide a valid comparative basis between states with vastly different levels of oil and gas resource production activities by comparing the industry's revenue contributions in the context of government revenue receipts as a percentage of total production value.

These comparisons include nine states, as shown in Figure 2.

**FIGURE 2: Study Area Map**



<sup>3</sup> The method of estimating total production value—discussed in greater detail later on—used published oil and gas pricing data for nearly 50 market locations throughout the study area, and pricing data were applied recognizing location and quality adjustments common to localized production.

## KEY

**Government Revenue Data** This was sourced from revenue agencies in each state and involved multiple agencies in most states. Revenue data was collected with respect to fees, bonuses, royalties, sales and gross receipts taxes, production taxes, and the taxation of field services through processing activities in production areas.<sup>4</sup>

**Production Areas** Each area is identified by county in each state, along with estimated production value in these geographic areas. Market value was compiled from a variety of published price data.

**Production Data** This data is tied to monthly reported oil and natural gas volumes reported by the US Energy Information Administration (EIA) and supplemented, when available, with additional detail at the county level from federal, state, tribal, private, and state trust lands.<sup>5</sup> Figure 3 and Figure 4 (pages 12 and 13) present an overview of the locations and volumes of oil and natural gas production in the study area.

**Abbreviated terms** The industry sometimes uses specific, nonstandard abbreviations.

NATURAL GAS		OIL	
cf	cubic feet	bbl	barrels
Mcf	1,000 cubic feet	Mbbl	1,000 barrels
MMcf	1 million cubic feet	MMbbl	1 million barrels

**Production Value** We obtained discreet pricing data for nearly 50 locations throughout the study area where pricing information is reported either as a posted price or published index price based on monthly transaction volumes.<sup>6</sup> For individual production areas, such as the Texas Permian Basin, we developed composite prices reflecting availability of multiple price series for both oil and gas. Figure 5 and Figure 6 (pages 14 and 15) report calculated production value by aggregated pricing pools, which is used in the analysis.

**Valuation of Natural Gas Production** Valuations are impacted by the recovered natural gas liquids (NGLs) entrained in wellhead gas streams. The recovery of NGLs generally occurs in the production area and results in a volumetric reduction of 5%–15% between the wellhead and in the marketed production of residue gas. Since about 2015, NGLs have been valued at up to an approximate 30%–50% net premium over the wellhead value of the unprocessed gas, which we applied to the reported recoveries of NGLs.<sup>7</sup>

<sup>4</sup> For all states, except Texas, revenue data is provided on a fiscal year July through June basis. For Texas, the fiscal year data is for September through August. The analytical method employed isn't compromised by different fiscal year definitions. For each state, we relied on fiscal year revenue and monthly production data. Results are compared on a fiscal year basis, ignoring the two-month shift between Texas and the other states without significant consequence to the validity of the analysis.

<sup>5</sup> Obtained principally from each producing state at a monthly county level and calibrated to match reported monthly statewide EIA data.

<sup>6</sup> Price data was obtained from Bloomberg terminal tickers, which is available to Moss Adams through subscription. As such, we're unable to publish monthly price data tables for each individual series.

<sup>7</sup> EIA provides data as to the Btu composition of the gas reported as entering each processing facility within our study area (US Energy Information Administration, EIA-757 Processing Capacity, <https://www.eia.gov/naturalgas/ngqs/#?report=RP9&year1=2014&year2=2014&company=Name> [to be updated October 2018]). This data allows estimates of the net uplift obtained in each producing area that's provided by the recovery of NGLs because the Btu content of the gas stream correlates with the entrained liquids available for recovery.



## GOVERNMENT REVENUE DATA LIMITATIONS

While revenue data related to development, production, and operating activities is frequently reported and easily extracted from available fiscal revenue reports, other data, such as personal income tax, must be estimated based on reported income taxes and economic activities in the relevant sectors.<sup>8</sup>

Almost all of the revenue data in this report is sourced directly from public fiscal accounting records and reports.<sup>9</sup>

## ESTIMATION

Including income tax and sales and use tax data required some estimation, as none of the states report these taxes as they directly relate to production activities. To analyze income tax revenue, we identified personal income associated with the oil and gas sectors of each state's economy<sup>10</sup> and applied a composite personal income tax rate, revealed by each state's tax revenue records.<sup>11</sup>

It's particularly notable that the oil and gas industry frequently structures exploration and development activities as partnerships. This income is reported as personal income for pass-through entities. Estimating personal income tax revenue associated with oil and gas development allows us to capture a significant component of the industry's operations.<sup>12</sup>

<sup>8</sup> The North American Industrial Classification System (NAICS) is commonly relied on in government revenue accounting and facilitates the ability to isolate economic activities in oil and natural gas production-related activities for such estimates.

<sup>9</sup> Specific sources are cited and identified with narrative discussion with respect to the data reported for each of the nine states investigated, and such source information is identified with narrative discussion of each state's profile.

<sup>10</sup> US Department of Commerce, Bureau of Economic Analysis, "Personal Income (by sector and state)," [https://www.bea.gov/data/income-saving/personal-income]

<sup>11</sup> As a result of the estimation method used for income taxes in this analysis, it wasn't useful to attempt calibrating specific income tax revenue to published reports of oil and gas industry income.

<sup>12</sup> Corporate income taxes aren't included in this analysis. The diversity of many corporate operations, beyond production-related activities, which are the focus of this report, can't be disentangled to identify corporate tax revenue related to production-related activities in any particular state. In addition, these corporate economic activities allow many deductions, net operating loss carryforwards, and other complexities that preclude a discrete statement of corporate income tax paid in relationship to just the oil and gas production activities.

Sales and use tax revenue was estimated by the total value of economic activities within various North American Industry Classification System (NAICS) codes, which was then compared to state and local tax rate derived from statewide revenue and output data. The sector estimates developed were identified as being directly related to oil and gas production.<sup>13</sup> 2016 economic output data was the latest sector output data available, and 2017 estimates were based on statewide revenue growth rates from 2016–2017.<sup>14</sup>

It should be noted that not all government revenue issues can be fully addressed as a result of research scope and related timing constraints. For example, the specifics of government distributions of oil and gas revenue is often a topic of interest, with some states dedicating certain revenue streams to specific beneficiaries, while other portions of these revenue flow to general state expenditure coffers.

Many government revenue policies concerning the oil and natural gas industry activities—such as deductible expenses from taxes and royalties—could be more fully addressed through further development of the data and analytics compiled in this report. Developing these insights in a multiyear time series analysis also has great potential for improved understanding of each state's comparative position to the issues raised here.

## LIMITATIONS

Revenue from oil and natural gas production is frequently dedicated to specific public purposes or funds. We've attempted to identify all oil and natural gas production-related revenue flowing to state and local governments, but within the current scope of this investigation, we aren't able to report on how the revenue is specifically distributed.

Some revenue is dedicated to permanent trust funds, such as New Mexico's trust land royalties. Other revenue flows directly to the state's general expenditure account, such as federal mineral lease revenue, which in the case of New Mexico is distributed directly to the general fund. Although revenue distribution is interesting and important, this analysis focuses on the total contributions of the oil and gas industry to government revenue.

<sup>13</sup> For example, drilling oil and gas wells (NAICS 213111), oil and gas pipeline and related structures construction (NAICS 237120), oil and gas field machinery and equipment manufacturing (NAICS 333132), etc.)

<sup>14</sup> Census Bureau, US Department of Commerce, "2016 State and Local Government Finance Datasets and Tables" [https://www.census.gov/data/datasets/2016/econ/local/public-use-datasets.html]



# Comparisons Between States

This analysis can be considered a comparison of the contributions of oil and gas producers to state and local revenue, including metrics reflecting the industry's percentage contributions among the producing states. We've chosen to compare the large western onshore oil- and gas- producing states, with a particular interest in assessing how revenue differs between states as a proportion of production value.

Presenting this comparison as a proportion of production value equalizes the scale between states. For example, if revenue were only discussed in dollar terms, Texas would dwarf every other state, with about 10 times the production volume and five times the revenue of New Mexico.

The production volumes throughout the nine-state area analyzed are graphically represented in the color-scale shaded mapping of county production volumes for fiscal year 2017, with natural gas production volumes reflected in Figure 3 and oil production volumes shown in Figure 4. Similarly, Figure 5 and Figure 6 depict estimated natural gas and oil production value, respectively, in each of the counties comprising the nine-state study area for fiscal year 2017.

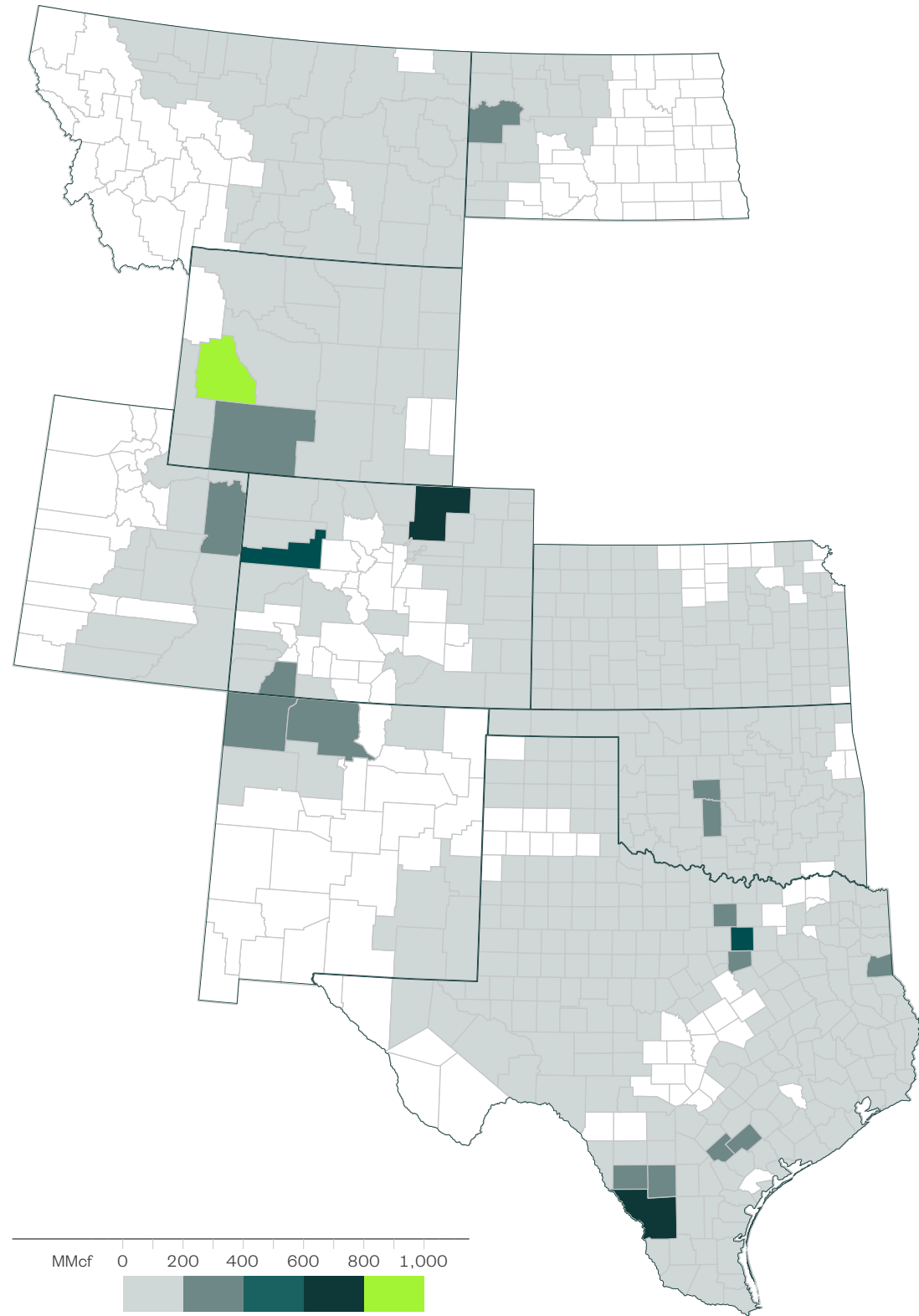
Two observations should be noted in the maps below. First, there's a broad geographic distribution of production areas in these states, with several areas of high volume and value. Second, the geographic size of each county influences the reported production data. For instance, a small county may have a high rate of production per square mile, but a geographically large county may have greater total production volume or value than an adjacent smaller county, even if it's producing at a lower volumetric rate per square mile.



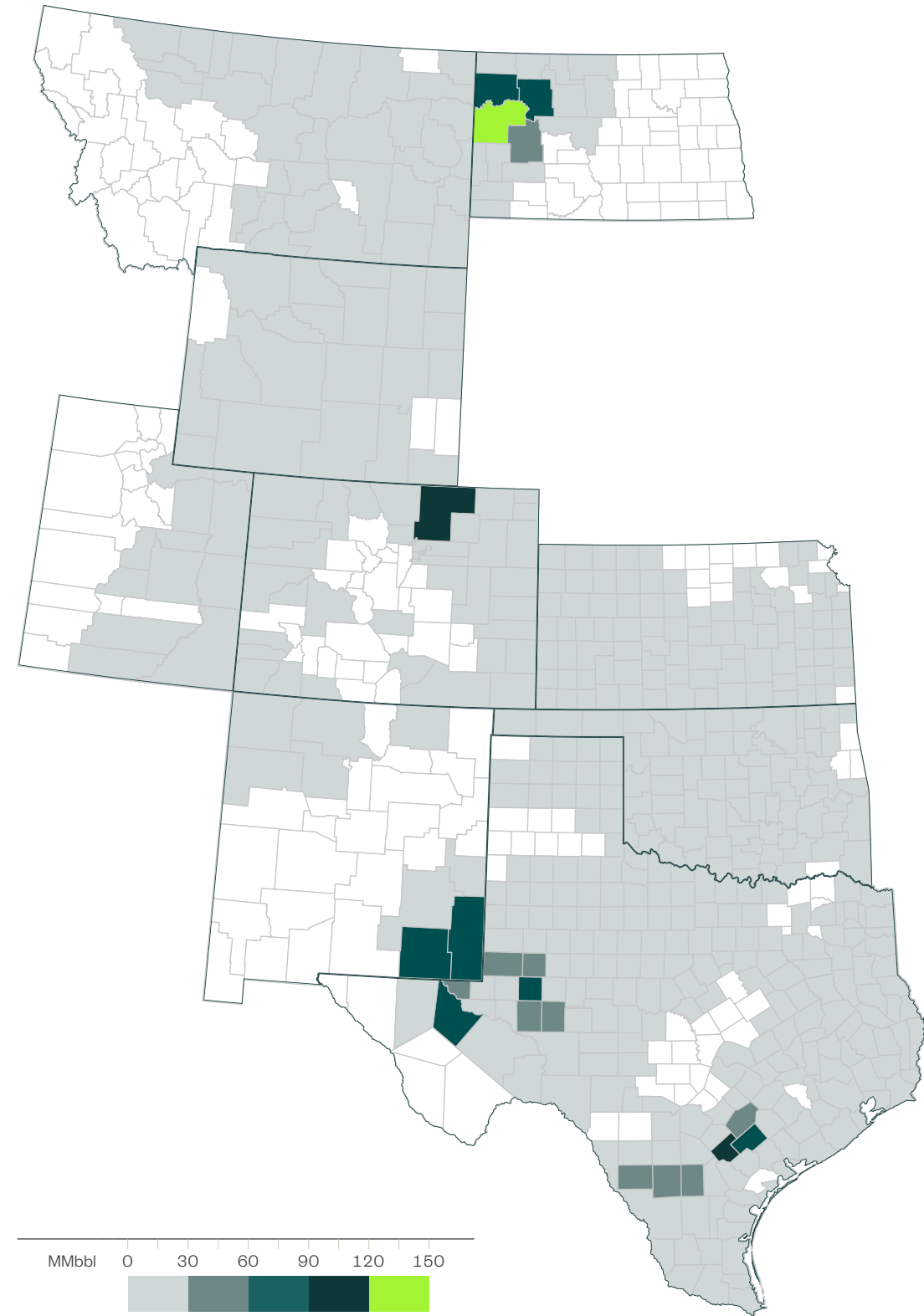


## PRODUCTION VOLUME

**FIGURE 3: Natural Gas Production Volume**  
Study Area, FY2017 (MMcf)

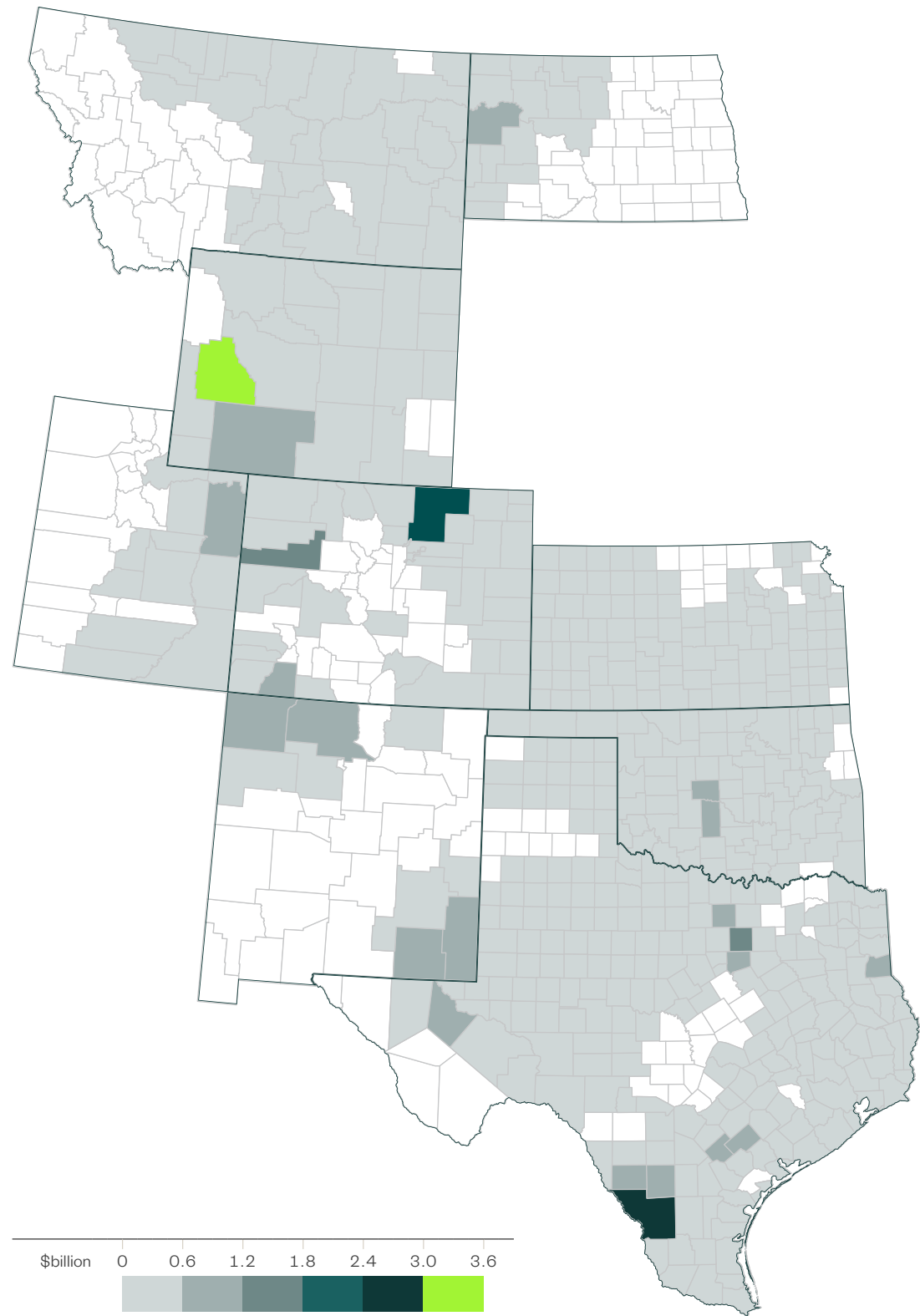


**FIGURE 4: Oil Production Volume**  
Study Area, FY2017 (MMbbl)

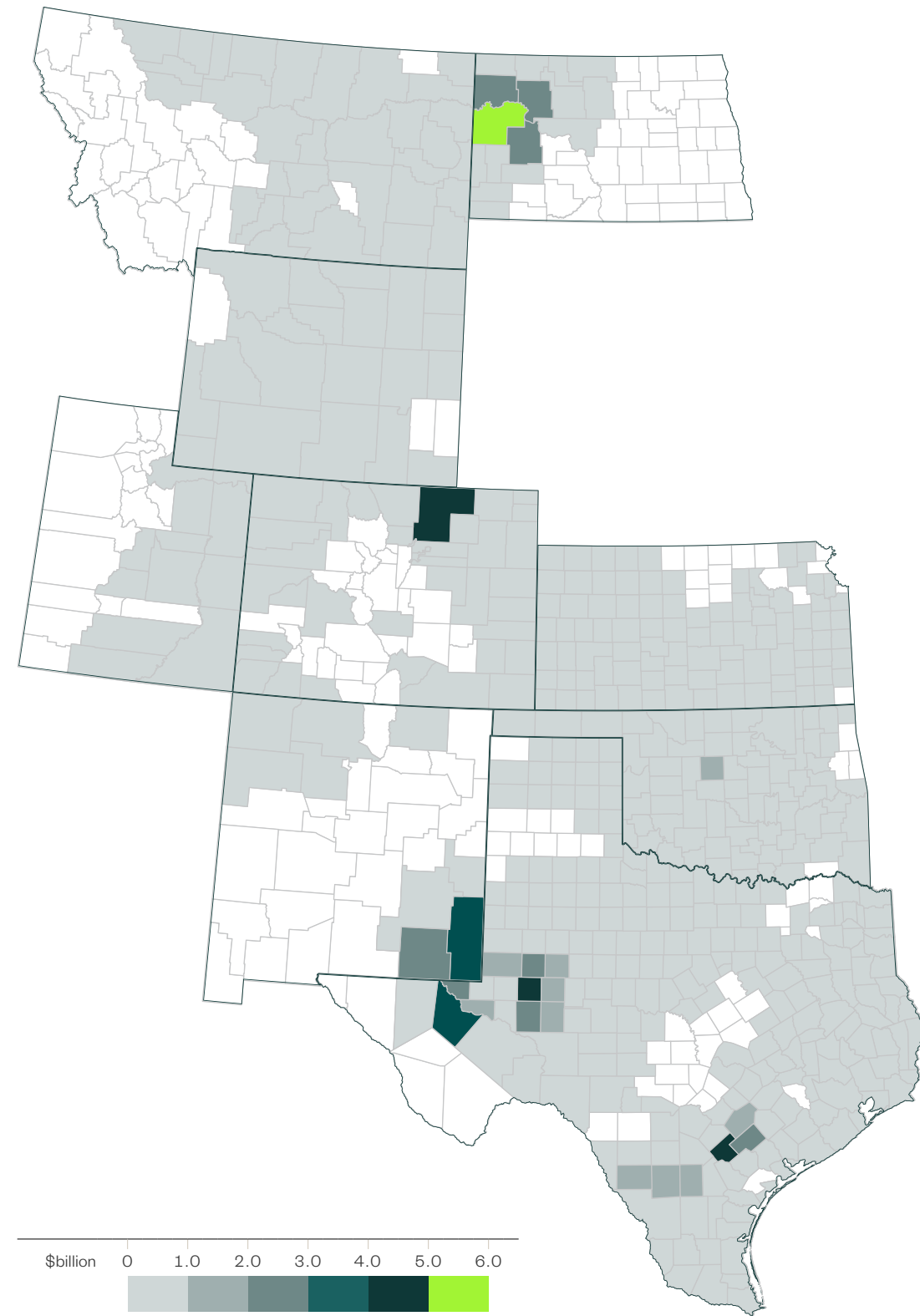


**PRODUCTION VALUE**

**FIGURE 5: Natural Gas Production Value**  
Study Area, FY2017 (\$billion)



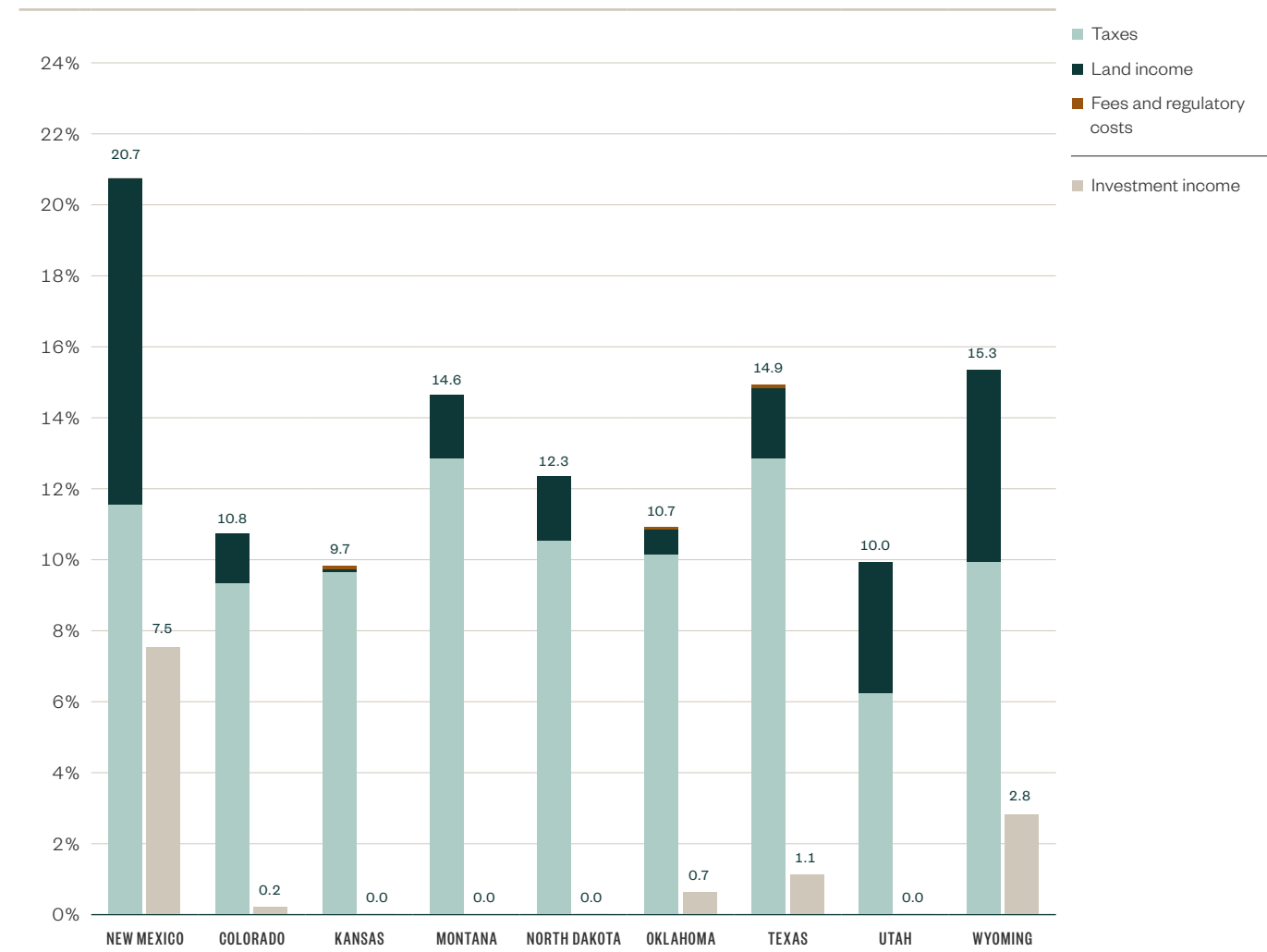
**FIGURE 6: Oil Production Value**  
Study Area, FY2017 (\$billion)



# SUMMARY OF COMPARATIVE FINDINGS

Comparing individual states by calculating revenue as a percentage of their total production value also allows us to compare each state's oil and gas revenue policies. The following graphic summarizes the significant results of this analysis and compares fiscal year 2017 results for the states in the study.

**FIGURE 7: Revenue as Percentage of Estimated Production Value**  
Study Area, FY2017

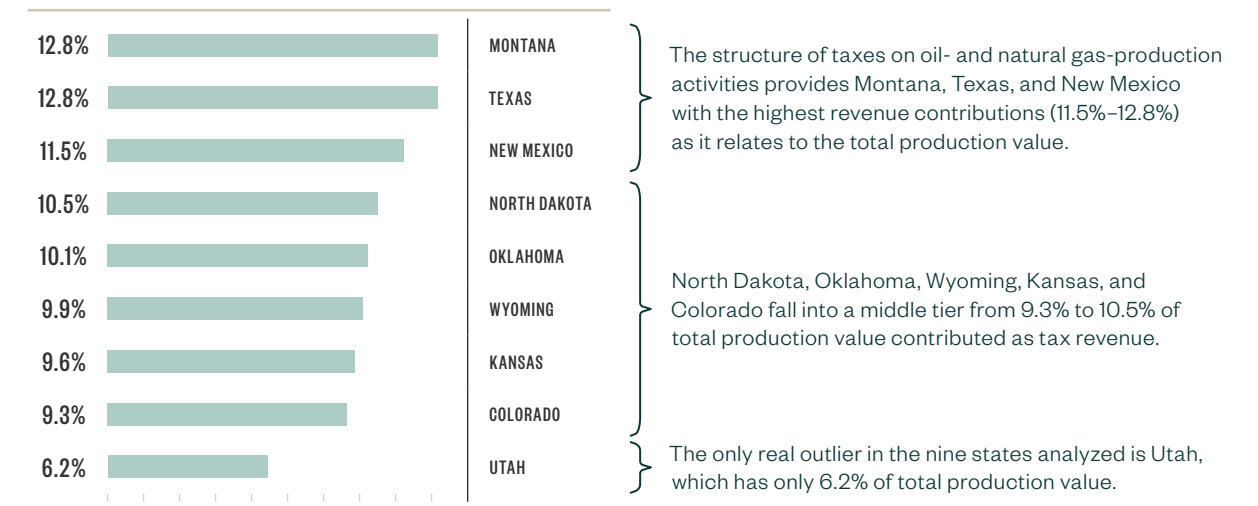


Note that investment income isn't received from current year production value. For comparative purposes between states, the magnitude of investment income can be scaled in relationship to the current annual total production value in a state. While this investment income is current year income, it's derived from investment of prior-period production revenue by the state in question.

Two observations are most apparent when comparing the states in our study area.

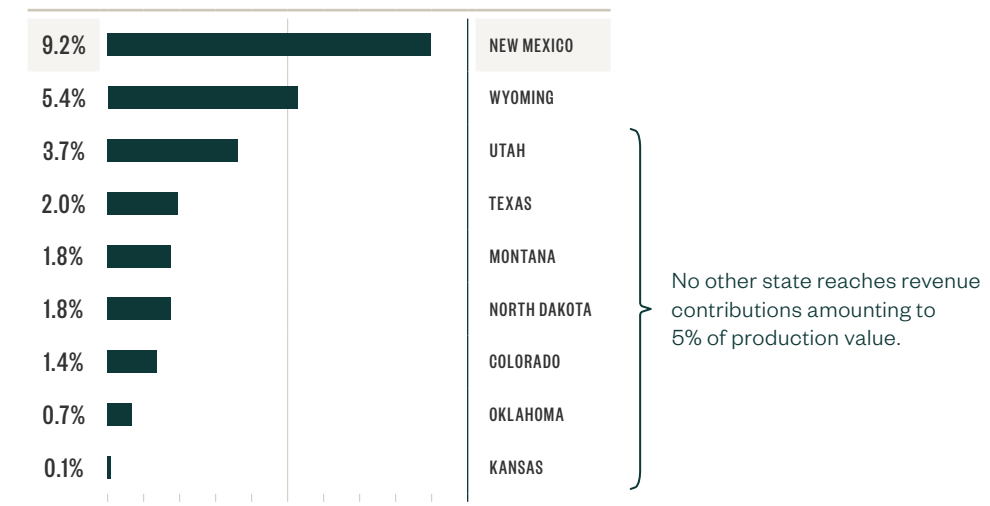
First, the structure of taxes on oil and natural gas production activities provides Montana, Texas, and New Mexico with the highest revenue contributions (11.5%–12.8%) as it relates to the total production value, as seen in Figure 8.

**FIGURE 8: Tax Revenue as Percentage of Estimated Production Value**  
Study Area, FY2017



As Figure 9 reflects, the percent of total production value contributed in land income to the state is what sets New Mexico apart from the other producing states. The bulk of this income is in state trust land royalties and federal lease royalties, which contribute revenue equal to 9.2% of the total value of oil and gas production in the state. Wyoming obtains revenue equal to 5.4% of the value of statewide oil and gas production, but no other state reaches revenue contributions from land income amounting to 5% of production value.<sup>15</sup>

**FIGURE 9: Land Revenue as Percentage of Estimated Production Value**  
Study Area, FY2017



<sup>15</sup> New Mexico's federal royalty revenue is distributed for current year budget requirements, while state trust land revenue is deposited in the state's Land Grant Permanent Fund and then invested to provide interest income. In New Mexico, the distributed interest income in fiscal year 2017 of \$795 million is equal to 7.5% of the total production value.

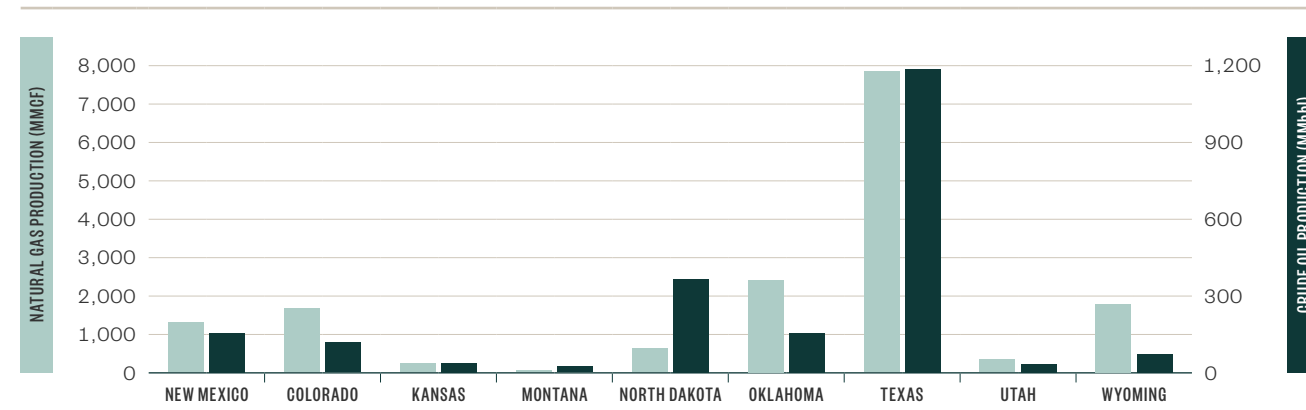


# STATE PRODUCTION PROFILES

Having established that the percentage of production value is an appropriate basis for the state-to-state comparisons, this analytical requirement is clearly illustrated by comparing the volumes of oil and natural gas productions in each of the study area states.

**FIGURE 10: Production Volume**

Study Area, FY2017

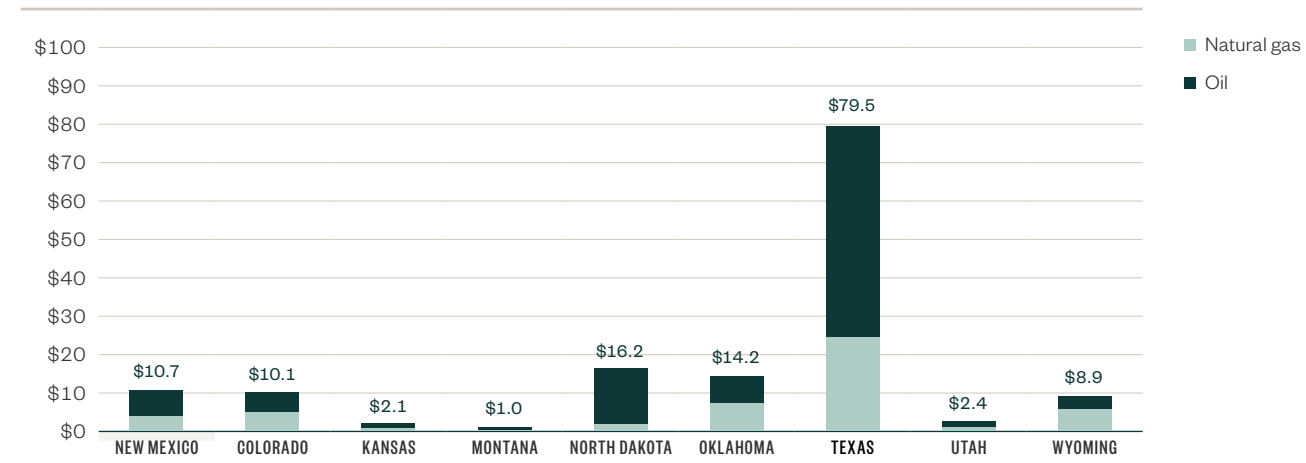


The graphics illustrate why it's essential to use revenue contributions as a percent of total value. Texas production volumes obscure everything else if it isn't scaled relative to the other states. While the revenue policy issues remain the same in each of the states, the scale of the impact is simply different.

Charting the estimated production value further illustrates the importance of the scaling method employed for the state-to-state comparative analysis. The following graphic reflects each state's total oil and natural gas production value for 2017.

**FIGURE 11: Estimated Production Value**

Study Area, FY2017 (\$billion)



The pricing in our analysis is provided by nearly 50 locations throughout the study area where pricing information is reported either as a posted price or published index price for monthly transaction volumes.<sup>16</sup> For individual production areas, such as the Texas Permian Basin, we've developed composite prices reflecting availability of multiple price series for both oil and gas.

The methodology included special consideration of the differences in value exhibited in different production regions by considering revenue contributions as a percentage of total production value. Various economic factors contribute to geographic price differences, including conditions of markets served, access to pipeline capacity, quality of resources produced, and other conditions affecting market supply and demand.

The oil and gas industry participates in a form of market price discovery by reporting various oil and natural gas transactions at specific locations throughout producing areas. In other cases, market prices are posted publicly by various media services. Based on more than 33 reported natural gas pricing locations, and more than a dozen oil pricing locations, price or composite price of production was assessed for from each county for both oil and natural gas.<sup>17</sup>

Figures 5 and 6 show the calculated production value by aggregated pricing pools, which is used in this analysis.

<sup>16</sup> As price data was obtained from Bloomberg terminal tickers, which is available to Moss Adams through subscription, we're unable to publish monthly price data tables for each individual series. The Index Data in the Appendix identifies pricing locations relied upon for this analysis.

<sup>17</sup> We openly acknowledge there's no precise way to assign value to production at a county level. However, our approach has attempted to associated location-based production value in an oil and gas tax policy-related analysis.

# GOVERNMENT REVENUE

## TAXES

Texas and Montana imposed the highest levels of taxes on the value of production in the 2017 fiscal year. At 11.5% of production value, New Mexico collected the third-highest percentage of revenue contributions from taxes on oil and natural gas production activities. The remaining states are largely consistent, ranging from 9.3% to 10.5% of the production value. Utah's taxation of oil and gas production value is substantially lower than the other eight states.

The first and most common form of revenue is generated through taxes, but there are two more revenue types analyzed in this study.

## LAND INCOME

A second category is land income, which exists primarily in the form of state and federal royalties and is defined by existing federal and state lease terms. Land income is affected by dynamic market values, such as changes in price and production volume. In several states, land income is a significant structural component of government revenue. Wyoming is the closest to New Mexico in land income as a percentage of production value, and Utah and Texas have royalty earnings exceeding 2% of the value of oil and gas production.

Most comparative analyses have only focused on the tax obligations imposed on oil and gas production, in some cases excluding royalties paid directly to the state. However, royalty revenue shouldn't be disregarded in those states where production obligations provide this income. Where such revenue is derived from a state's share of oil and gas royalties on federal lands, direct payment is received pursuant to the 52% and 48% split between federal and state earnings.

Most states in the study also hold mineral estate ownership rights, which are held in trust for specific public beneficiaries and also receive oil and gas royalty revenue. These beneficiaries are generally public schools, but may include other public institutions such as hospitals or prisons. In most of the public lands owned and managed by a state, management of these trust land assets and structures is established by the state constitution and held in trust by designated authorities.

## INVESTMENT INCOME

The third major fiscal component of oil and natural gas royalty or severance tax revenue is investment income, which comes from investments in permanent funds.

Although annual trust land revenue may be deposited in permanent funds by the states, distributions of annual investment income can contribute significant additional operational revenue. Permanent fund investments can be viewed as public policy decisions, as the distributions of investment income on these investments can go to various beneficiaries or public purposes.

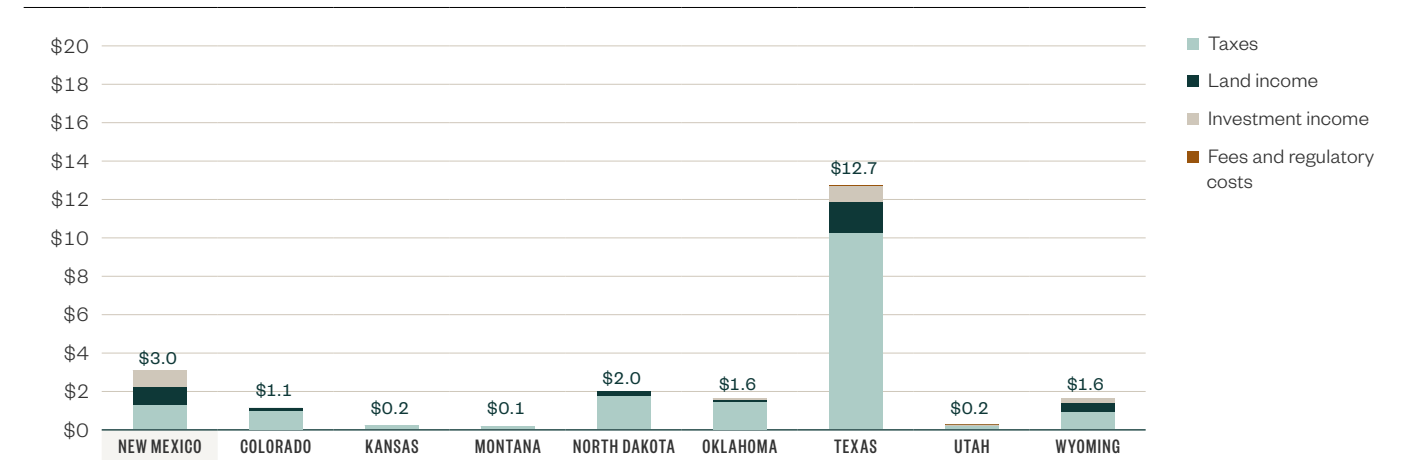
We've factored significant direct revenue contributions from royalty income into our analysis, including both federal and state royalties as land income. Additionally, we report investment income—such as Land Grant Permanent Fund investments—separately from direct income categories due to differences in the nature of these income streams. To accurately scale levels of investment income in each state, we compared current-year investment income to estimated state production values.

Of the states in the study, New Mexico has the largest percentage share of investment revenue as related to annual production value, but Texas has more investment income due to the size of its permanent funds. Wyoming also sees

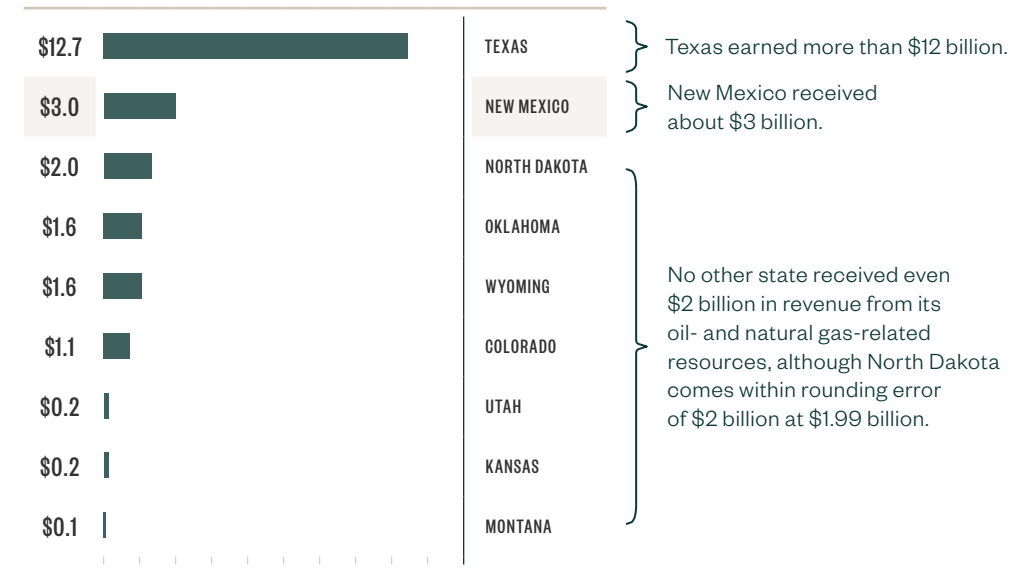
significant additions to their revenue streams from investment income earnings, due to their investment and management of oil and gas permanent funds.

The states that receive investment income also realize the additional benefit of creating predictable revenue streams to help stabilize their respective governments' budgeting tasks.

**FIGURE 12: Government Revenue by Category**  
Study Area, FY2017 (\$billion)



**FIGURE 13: Distribution of Revenue**  
Study Area, FY2017 (\$billion)





STATE PROFILE:

# New Mexico

New Mexico has the greatest percentage share of total oil and natural gas production value directly contributed to government revenue when compared with the rest of the states in this analysis, due to several factors:

- High net tax rates on oil and natural gas production
- A large percentage of production value obtained through royalty earnings due to more production occurring on public oil and gas leases, whether state or federal
- A large portion of revenue invested in permanent funds augmenting current year revenue contributions

The structure of New Mexico's revenue streams offers several policy considerations. Compared with New Mexico, no other state in the study area:

- Receives as much of the total production value as government tax, land income, and investment income revenue
- Has the same exposure to the changing market value of produced petroleum commodities in its direct revenue streams through production value-related taxes and royalty income
- Benefits to the same degree from permanent fund income management and revenue stability through investment income from permanent funds

## PRODUCTION PROFILE

### OIL

**3<sup>RD</sup> LARGEST**

**OIL-PRODUCING STATE**  
behind only Texas and North Dakota

**Lea County** ⬇️

largest oil-producing county

### NATURAL GAS

**9<sup>TH</sup> LARGEST**

**NATURAL GAS PRODUCER<sup>18</sup>**  
in the United States

**Eddy County** ⬇️<sup>19</sup>

largest natural gas-producing county

### REGIONS

Primary oil- and gas-producing regions:

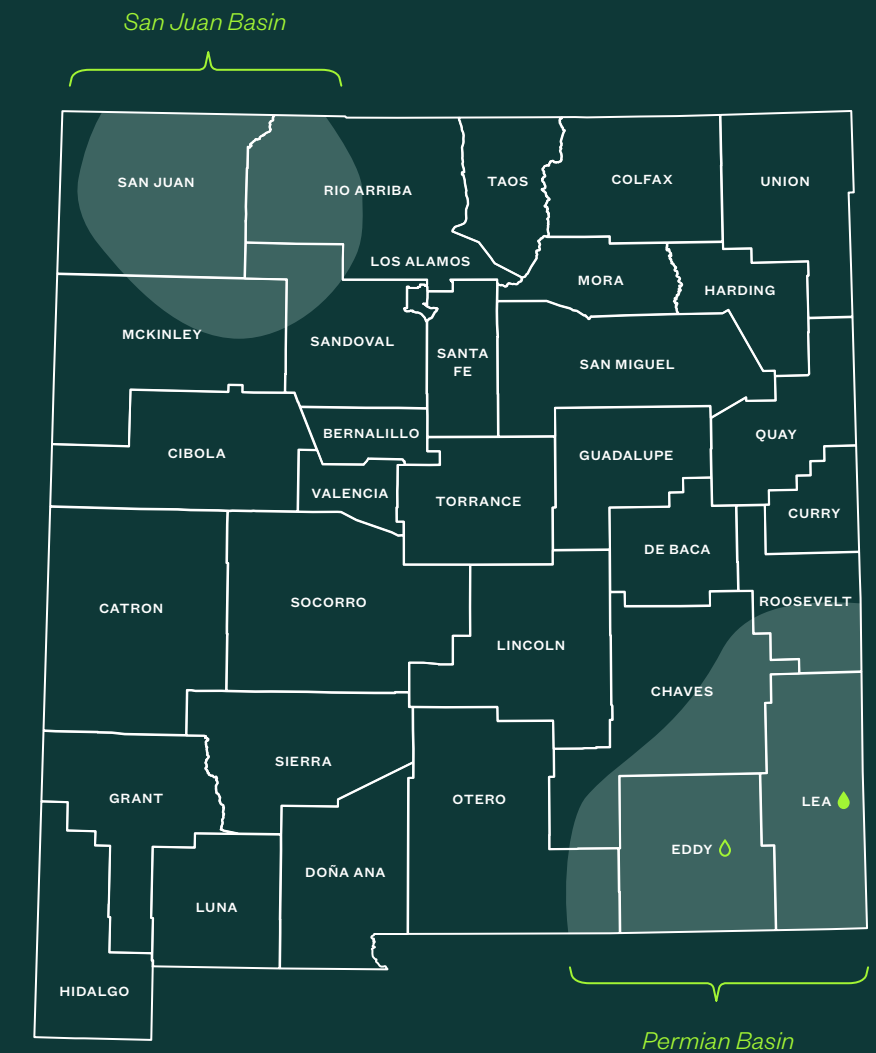
**San Juan Basin**

in the northwest corner of the state

**Permian Basin**

in the southeast corner of the state

*These stats are accurate as of March 2019.*



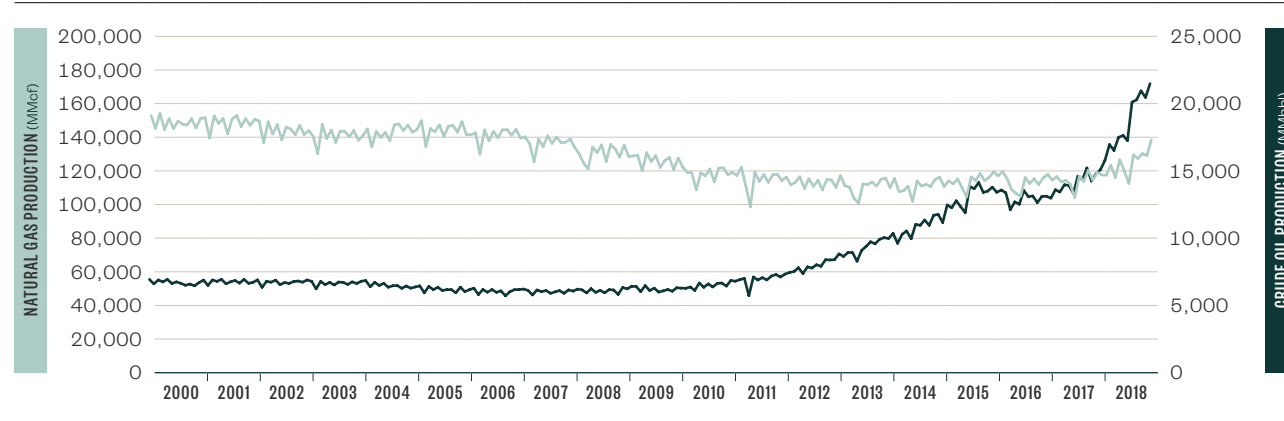
<sup>18</sup> Energy Information Administration, US Department of Energy, "Natural Gas Marketed Production" (ng\_prod\_sum\_a\_epg0\_vgm\_mmof\_m.xls) and "Crude Oil Production" (pet\_ord\_crpdn\_ado\_mbb1\_m.xls), accessed at <http://www.eia.gov/dnav/>.

<sup>19</sup> While San Juan County was the largest natural gas-producing county in New Mexico in our comparison year of FY2017, it was surpassed by Eddy County in FY2018.



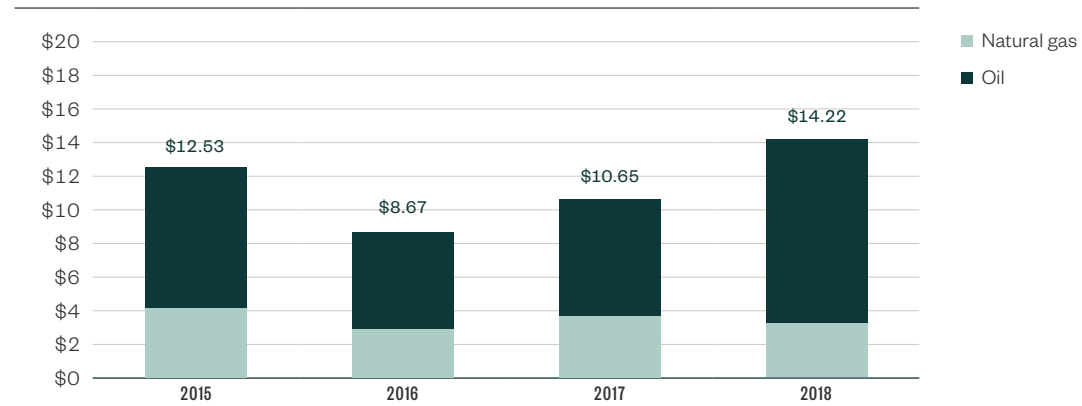
## PRODUCTION VOLUMES AND VALUE

**FIGURE 14: Production Volume**  
New Mexico, FY2000–FY2018



Since 2010, New Mexico's oil production has increased exponentially. Associated gas production in the traditionally oil-producing Permian has even reversed the decade-long decline in natural gas production.

**FIGURE 15: Estimated Production Value**  
New Mexico, FY2015–FY2018 (\$billion)

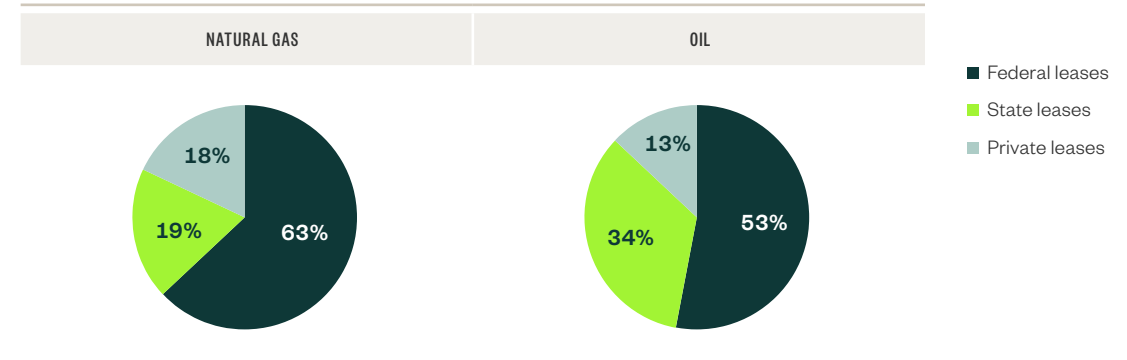


## PRODUCTION BY LAND TYPE

A significant amount of production takes place on public lands, in the form of both state trust lands and federal mineral leases. Compared with most of the other states in the study, New Mexico derives a large share of its oil and gas-related government revenue from this land income.

The following graphic depicts the distribution of production volumes for natural gas and oil in fiscal year 2018.

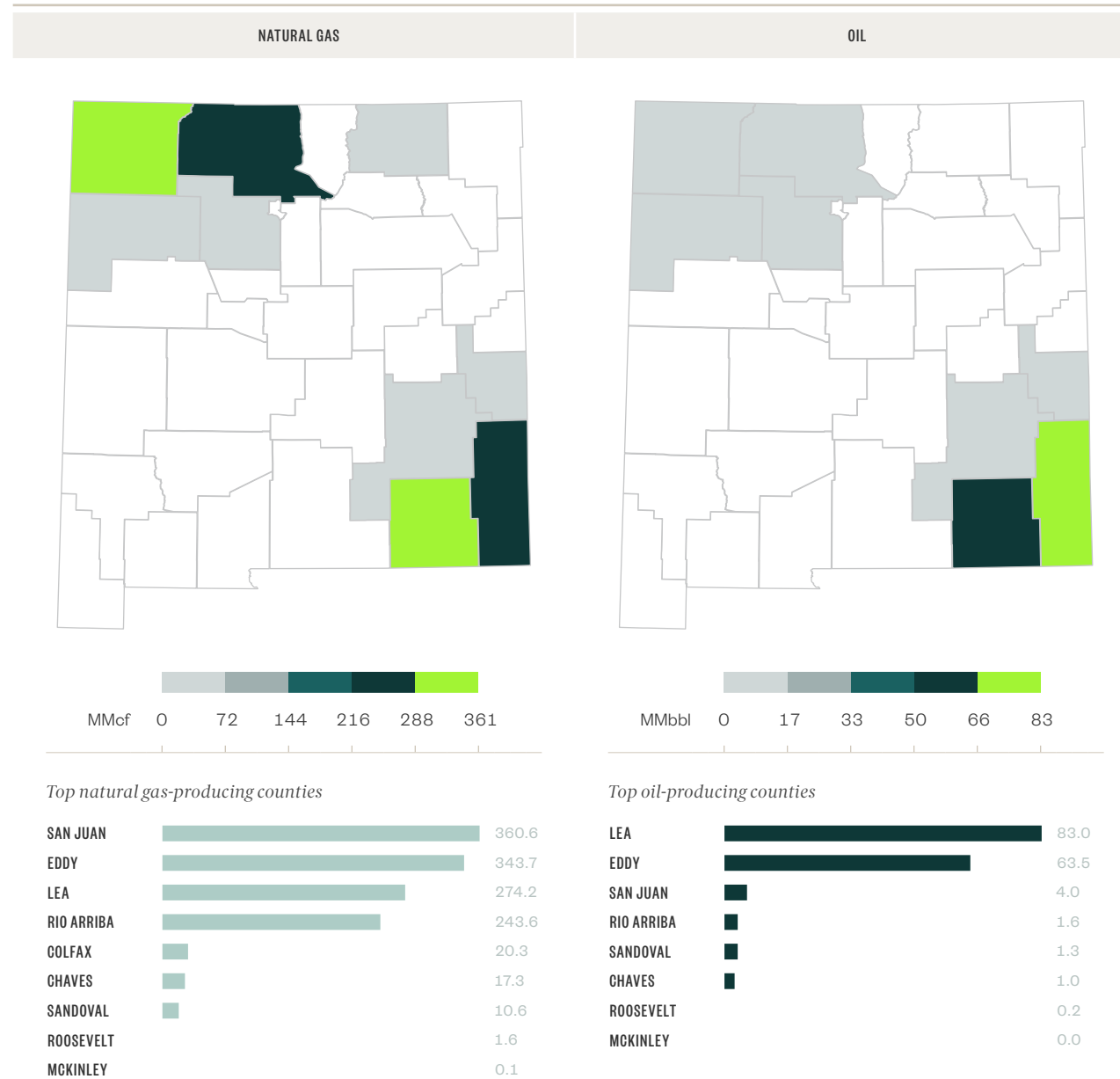
**FIGURE 16: Production by Land Type**  
New Mexico, FY2018



This finding is significant because only one other state—Wyoming—approaches a similar share of production that provides royalty income directly to government entities. Royalty earnings are categorized in our analysis as land income, which also includes fees, rent, and bonus payments received by the state.

## PRODUCTION BY COUNTY

**FIGURE 17: Production Volumes by County**  
New Mexico, FY2017



Historically, New Mexico's production value was derived primarily from natural gas. Advances in production technologies led to an oil production boom which—combined with the long, steady decline in natural gas prices—tipped the production value balance in favor of crude oil around 2010. In fiscal year 2018, which spans the production months from July 2017–June 2018 production months, oil accounted for more than 75% of the total production value in New Mexico.

## REVENUE

The New Mexico oil and gas industry contributes significant revenue to New Mexico's government, primarily in the form of tax revenue, land income, and, to a lesser degree, investment income.

### GOVERNMENT REVENUE CATEGORIES

The following table lists types of revenue that make up the larger revenue categories, which span taxes, land income, and investment income. The specific types of revenue—production and income taxes, for example—are further disaggregated to the individual revenue programs, such as oil and gas severance tax and oil and gas rentals.

**TABLE 1: Government Revenue Sources, by Type and Program**  
New Mexico, FY2015–FY2018 (\$million)

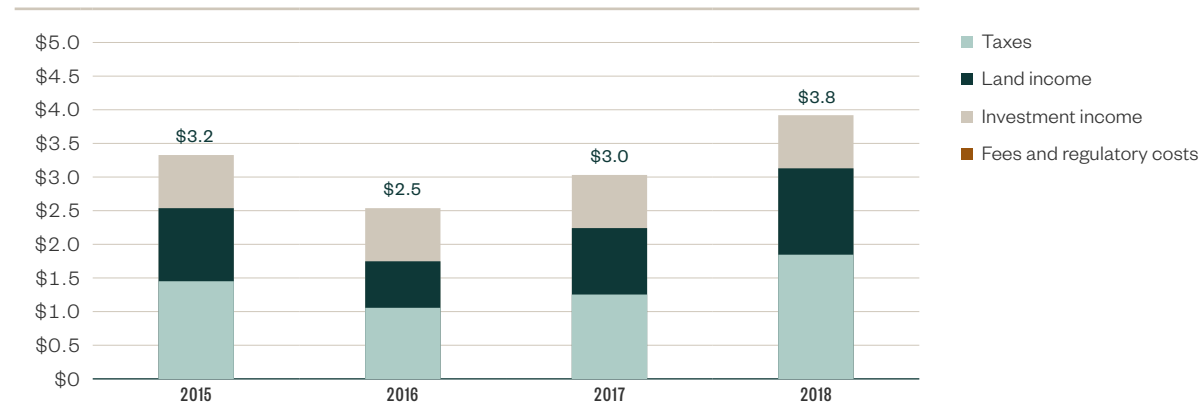
Category	Type	Name	2015	2016	2017	2018
<b>Taxes</b>	Production Taxes	Oil and Gas Severance Tax	412.0	257.3	338.1	491.1
		Emergency School Tax	374.2	232.4	307.9	441.0
		Oil and Gas Conservation Tax	23.8	13.0	17.1	24.9
	Property Taxes	Ad Valorem Production Tax	127.5	84.4	119.9	171.8
		Ad Valorem Production Equipment Tax	26.0	31.2	22.1	19.5
	Processing Taxes	Natural Gas Processors Tax	18.6	20.4	10.5	10.6
Sales & Use Taxes	Gross Receipts and Compensating Tax		370.9	277.9	354.1	511.0
		Personal Income Tax	67.0	48.5	56.8	82.0
<b>Land Income</b>	Federal Mineral Leasing		395.7	302.8	474.1	500.0
	State Lands Rents, Royalties & Bonus	State Oil and Gas Royalties	653.5	406.3	434.6	583.7
		Oil and Gas Bonus	38.0	36.7	65.3	107.0
		Oil and Gas Rentals	2.1	2.0	1.9	1.8
<b>Investment Income</b>	Land Grant Permanent Fund Income		576.9	634.8	617.7	689.2
	SLO Oil and Gas Interest		4.0	3.9	2.9	3.4
	Severance Tax Permanent Fund Interest		159.0	168.4	174.4	210.0
<b>TOTAL</b>			<b>3,249.0</b>	<b>2,520.1</b>	<b>2,997.4</b>	<b>3,847.0</b>

\* Available directly from state-published sources and don't require estimation.

## SUMMARY OF NEW MEXICO GOVERNMENT REVENUE

In the 2016–2017 fiscal year, New Mexico collected \$3 billion in revenue from activities related to oil and natural gas production. This data is summarized in the following graphic.

**FIGURE 18: Government Revenue by Category**  
New Mexico, FY2015–FY2018 (\$billion)



The government revenue data included in this analysis reflects both state and local collections, as well as the state’s share of the federal royalty income. However, producers are also obligated to pay private royalties and lease operating expenses from the total production value. As these costs aren't factored into this analysis, this isn't an analysis of the total burdens placed on producers. Instead, it reflects the industry’s revenue contribution to state and local governments from production activities.

## PERMANENT FUNDS

New Mexico dedicates state trust land royalty income to the Land Grant Permanent Fund, which was valued at \$18 billion as of September 30, 2018. Investment income distributed approximately \$689.2 million in 2018 to public beneficiaries.

A portion of the severance tax collections are invested in the Severance Tax Permanent Fund, which was valued at \$5.3 billion. It generated an additional \$210 million in investment income to the state in fiscal year 2018.<sup>20</sup>

With the exception of Texas, no other state in our study has established permanent funds and related investment earnings of this magnitude as of fiscal year 2017. However, compared to New Mexico, these funds are a significantly smaller share of the Texas total government revenue stream.

Notably, some of these revenue streams are related to the dynamic value of production, which fluctuates with market prices, while other streams are tied to fixed fees or one-time payments, such as bonuses.

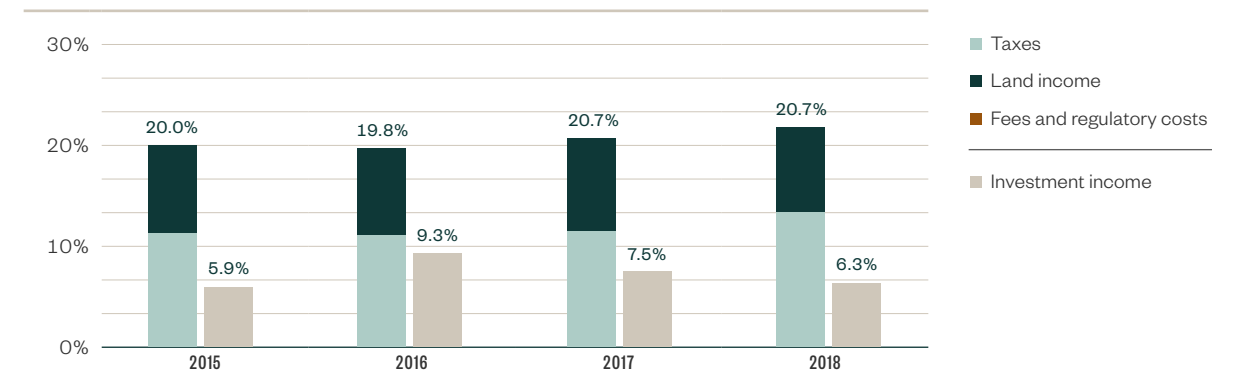
<sup>20</sup> New Mexico State Investment Council, current fund balances as of September 30, 2018, and distributions reported for fiscal year 2017. [<http://www.sic.state.nm.us/dashboard.aspx>, accessed November 7, 2018].

## REVENUE AS A SHARE OF PRODUCTION VALUE

Total New Mexico oil and gas production values for fiscal year 2017 totaled approximately \$10.65 billion. Of that, approximately \$3 billion flowed to state and local governments in the form of revenue from tax revenue, land income, and investment income.

As can be seen in the following graphic, the percentage of the total New Mexico production value providing revenue to government has fluctuated in recent years. This is simply the product of the dynamic production value, primarily related to increased oil production in the southeast part of the state.

**FIGURE 19: Revenue as Percentage of Estimated Production Value**  
New Mexico, FY2015–FY2018







STATE PROFILE:

# Texas

- By far the largest producer of oil and natural gas in the United States, with corresponding dominance in revenue.
- Compared to North Dakota, the second largest oil producer in the United States, Texas produced over three times as much oil.
- Texas also distinguishes itself by the amount and quality of readily available revenue data it provides.

The granular data provided by the Texas Comptroller of Public Accounts allows for finer disaggregation than any other state in the study area, as evidenced by the largest array of specifically-identified revenue streams of any state examined.

## PRODUCTION PROFILE

### OIL

#### 1<sup>ST</sup> LARGEST

##### OIL-PRODUCING STATE

three times more than the second largest producer, North Dakota

Market changes combined with improved drilling and extraction technologies have caused a nearly seven-fold increase in oil production over the past decade.

##### Karnes County

largest oil-producing county

### NATURAL GAS

#### 1<sup>ST</sup> LARGEST

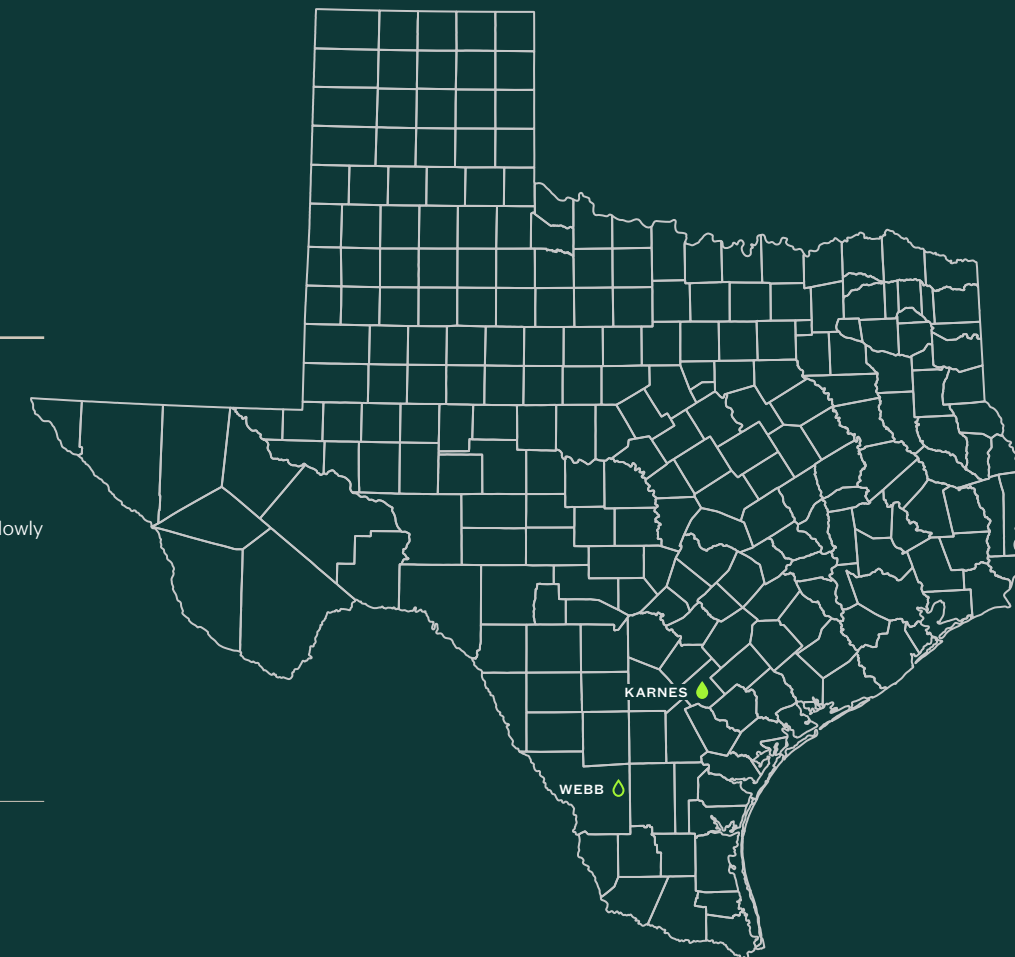
##### NATURAL GAS PRODUCER

in the United States

Natural gas production has grown more slowly over time, but is also approaching record levels.

##### Webb County

largest natural gas-producing county

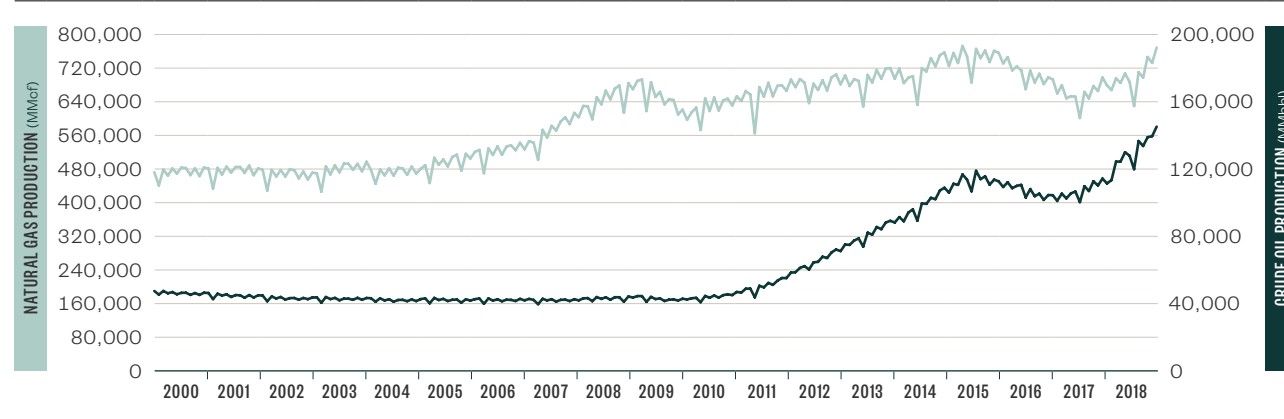


*These stats are accurate as of March 2019.*

## PRODUCTION VOLUMES AND VALUE

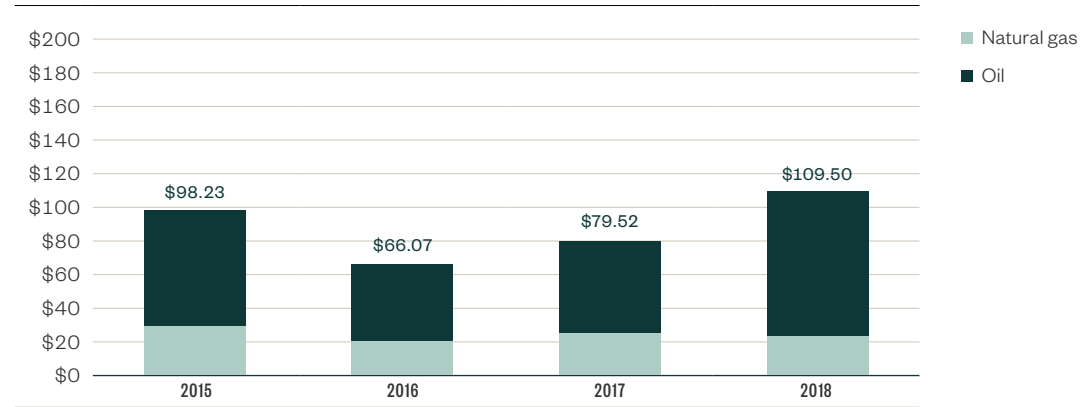
After a slight decline between mid-2015 and early 2017, Texas resumed its exponential growth in oil, and increased its rate of natural gas production, largely due to associated gas.

**FIGURE 20: Production Volume**  
Texas, FY2000–FY2018



While production volumes reached record highs in 2018, prices are still well behind the peak of 2015.

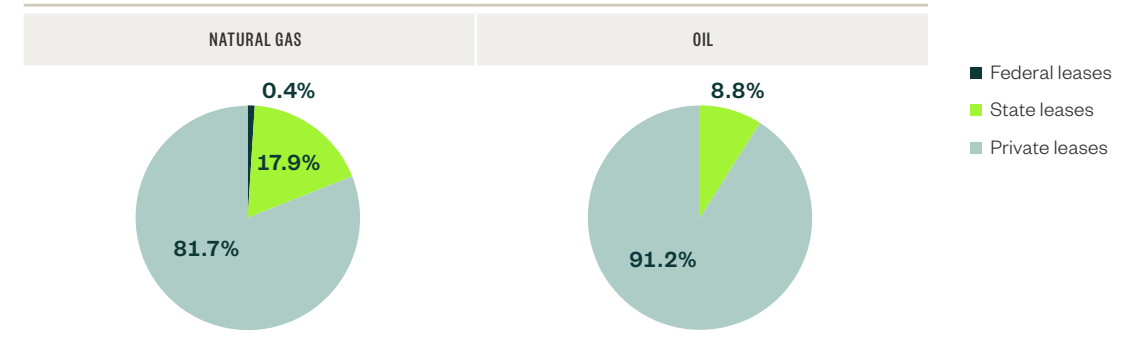
**FIGURE 21: Estimated Production Value**  
Texas, FY2015–FY2018 (\$billion)



## PRODUCTION BY LAND TYPE

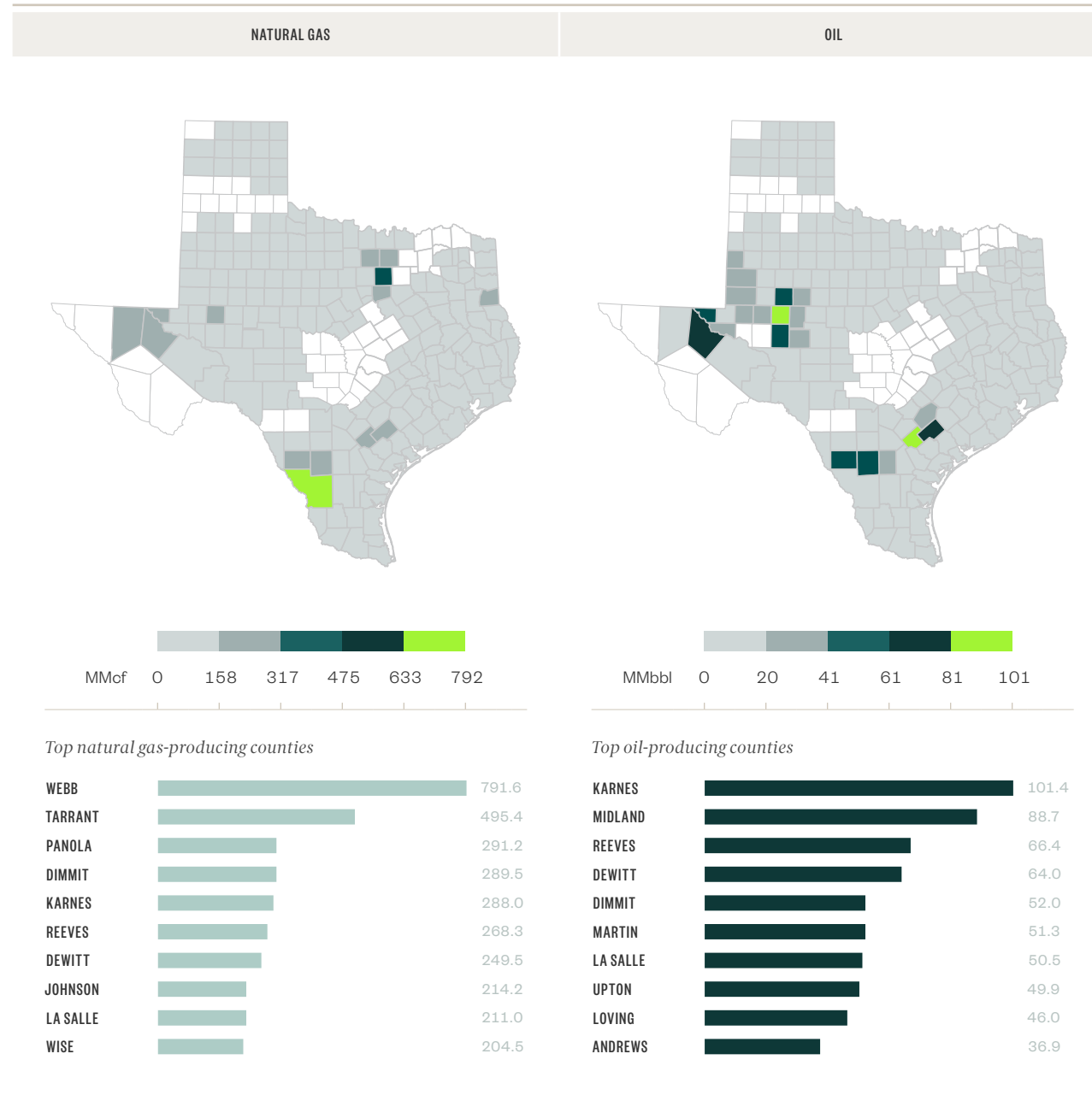
As illustrated in Figure 22, production in Texas occurs overwhelmingly on private lands—81.7% of natural gas, and 91.2% of oil, by volume.

**FIGURE 22: Production by Land Type**  
Texas, FY2018



## PRODUCTION BY COUNTY

**FIGURE 23: Production Volumes by County**  
Texas, FY2017



Texas sits on top of some of the largest oil- and gas-producing formations in the country. These include the Permian in western Texas and eastern New Mexico, the Eagle Ford Shale in the southern part of the state, the Haynesville Shale in the east, and the Barnett Shale in the northern part of the state.

Data acquired from the Texas Railroad Commission indicates that 224 of 254 counties in Texas produced at least some oil over the study period, and 217 with at least some natural gas production. This is about half of the counties in the study area. Some of the counties in high-producing regions appear to be lightly-shaded, but this is due to the large number of geographically-small counties.

## REVENUE

### GOVERNMENT REVENUE CATEGORIES

#### Taxes

Texas, like most states in the study area, derives the lion's share of revenue from taxes on oil and gas resources. Along with Kansas, Texas levies a property tax on oil and gas reserves. Texas's largest oil and gas-related tax revenue sources are sales and use taxes and property taxes.

#### Land Income

Texas state trust lands are split into two broad categories based on whether they're managed by the General Land Office or the University Lands System. Both categories of land are managed separately, and have different beneficiaries. Texas gains very little revenue from federal leases due to the low share of production on federal lands.

**TABLE 2: Government Revenue Sources, by Type and Program**  
Texas, FY2015–FY2017 (\$million)

Category	Type	Name	2015	2016	2017	
Taxes	Production Taxes	Crude Oil Production Tax	2,877	1,703.9	2,107.3	
		Natural Gas Production Tax	1,280.4	578.8	982.8	
		Oil Regulation Tax	2	0.4	0	
		Sulphur Tax	3.5	0.7	0	
	Property Taxes	Condensate Production Tax	0	0	0	
		Ad Valorem Tax	4,830	4,130	3,120	
	Processing Taxes	Sales & Use Taxes	4,506.1	3,234.1	3,977	
	Personal Income Tax	Texas Has No Income Tax	0	0	0	
	Land Income	Federal Mineral Leasing	Federal Mineral Leasing	6.2	5.5	6.5
		State Lands Rents, Royalties & Bonus	Gas Royalties from Lands Owned by Educational Institutions	261	199.7	292.9
Gas Royalties from Other State Lands			11.6	6.8	8	
Gas Royalties from Parks and Wildlife Lands			2.3	1.2	2.2	
Oil Royalties from Lands Owned by Educational Institutions		889.8	571.5	768.9		
Oil Royalties from Other State Lands		30.6	15	15.4		
Oil Royalties from Parks and Wildlife Lands		1.2	0.5	0.5		
Oil and Gas Bonus		179.8	207.8	476.1		
Oil and Gas Rentals		24.1	15.9	41.2		
Brine and Water Receipts		14.2	6.3	10.7		

Category	Type	Name	2015	2016	2017	
<b>Investment Income</b>		Permanent University Fund Distribution to the Available University Fund	763.6	772.9	839.4	
		Interest on Oil Overcharge Loans	1.2	1.2	1.2	
		Interest on Land Sales, Public School Land	0	0	0	
<b>Fees &amp; Regulatory Costs</b>		Oil and Gas Regulation and Cleanup Fee Surcharge	25.1	18.3	23.3	
		Oil and Gas Violations	16.6	13.7	11.1	
		Oil and Gas Well Drilling Permit	8.6	4.6	6.8	
		Oil Field Clean Up Fee	6.8	6.6	6.4	
		Natural Gas Regulatory Fee	5.2	5.1	5.1	
		Land Office Administrative Fees	2.3	2.4	2.8	
		Land Office Fees	1.4	1.2	1.9	
		Oil and Gas Compliance Certification Reissue Fee	0.9	0.7	0.7	
		Abandoned Well Site Equipment Disposal	0.5	0.2	0.3	
		Oil Spill Prevention and Response Act Violations	0.2	0.1	0.1	
		Injection Well Regulation	0.1	0.1	0.1	
	<b>TOTAL</b>			<b>15,752.4</b>	<b>11,504.9</b>	<b>12,708.9</b>

### Investment Income

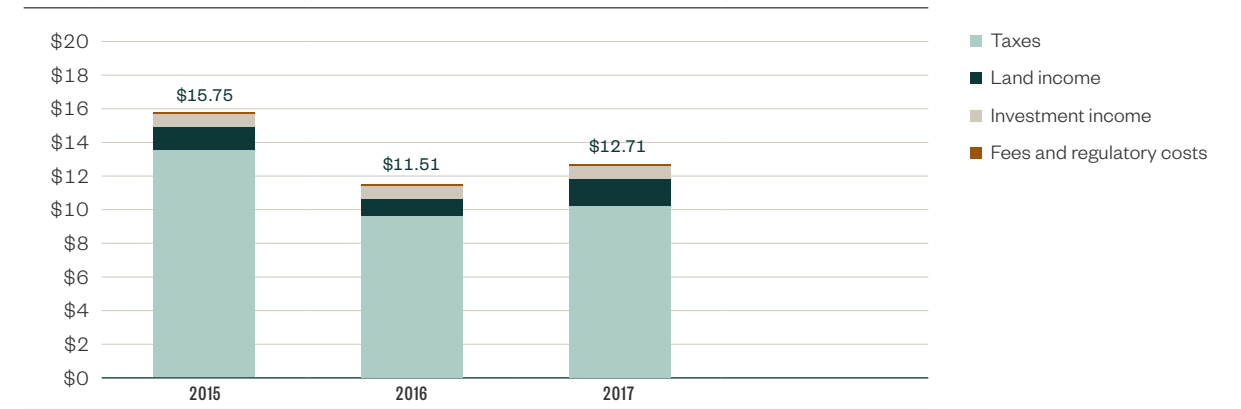
Texas receives investment revenue related to onshore oil and gas production from the Permanent University Fund, which makes annual distributions of a portion of its earnings into the Available University Fund for the benefit of Texas' university system.

### SUMMARY OF TEXAS GOVERNMENT REVENUE

Due to high production volumes, Texas collects the largest amount of revenue from oil and gas production in the nine-state study area. The largest proportion of this is from taxes.

**FIGURE 24: Government Revenue by Category**

Texas, FY2015–FY2017 (\$billion)



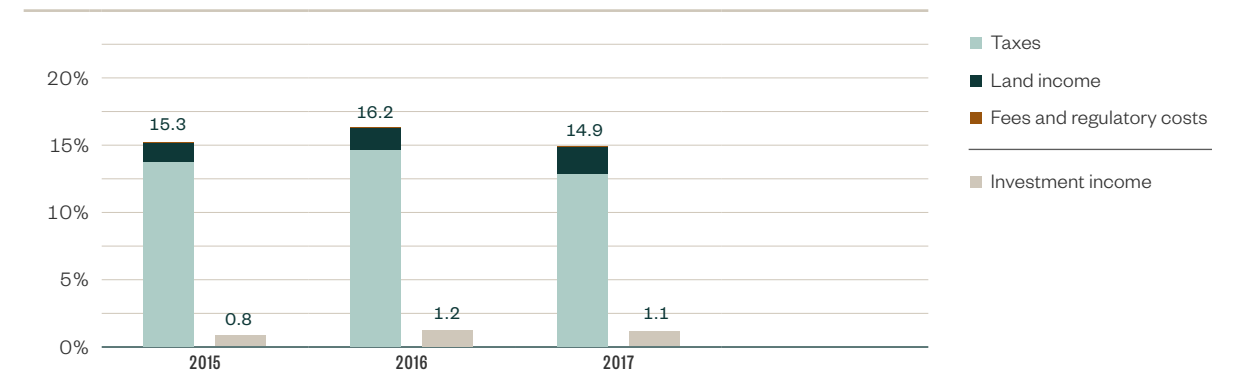
The government revenue data included in this analysis reflects both state and local collections, as well as the state's share of the federal royalty income. However, producers are also obligated to pay private royalties and lease operating expenses from the total production value. As these costs aren't factored into this analysis, this isn't an analysis of the total burdens placed on producers. Instead, it reflects the industry's revenue contribution from production activities to state and local governments.

### REVENUE AS A SHARE OF PRODUCTION VALUE

Texas is tied with Montana for the highest percentage of tax revenue from oil and gas as a share of production value.

**FIGURE 25: Revenue as Percentage of Estimated Production Value**

Texas, FY2015–FY2017







STATE PROFILE:

# North Dakota

The timing of this study presents a picture of North Dakota that would likely be different if undertaken a year earlier or later.

- During the 10-year period before December 2015, oil production had been growing at an average year-over-year rate of more than 29%.
- Corresponding revenue peaked in fiscal year 2015.
- In fiscal years 2016 and 2017, tax revenue decreased sharply, both in dollars and percent of production value.
- Production tax rates were also lowered during the years examined, which further reduced revenue as a share of production value.

## PRODUCTION PROFILE

### OIL

#### 2<sup>ND</sup> LARGEST

##### OIL-PRODUCING STATE

behind only Texas

The tenfold increase in oil production over the last decade makes North Dakota the second largest oil-producing state in the nation.

#### McKenzie County

largest oil-producing county

### NATURAL GAS

#### 11<sup>TH</sup> LARGEST

##### NATURAL GAS PRODUCER

in the United States

Associated gas has increased at a similar rate, placing North Dakota as the 11th largest natural gas producer.

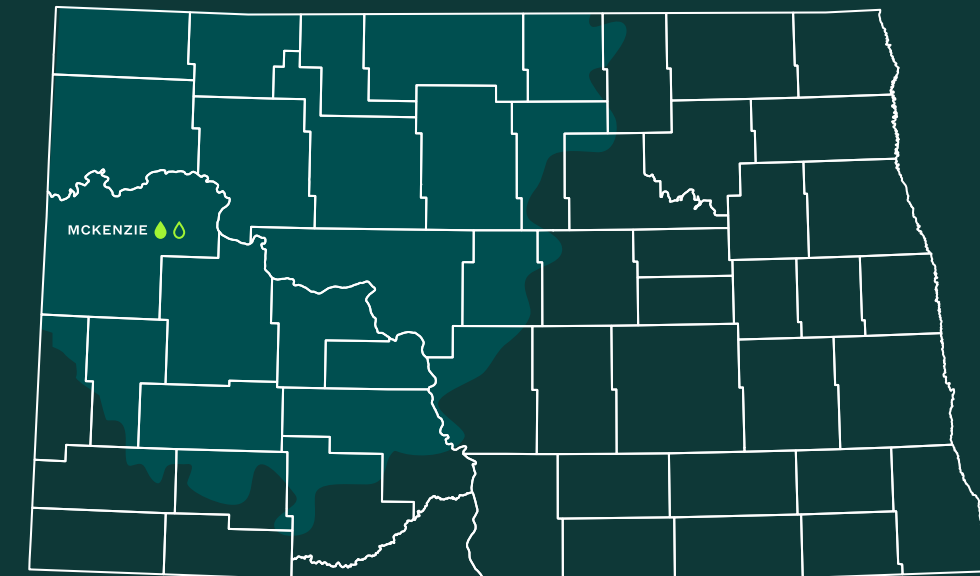
#### McKenzie County

largest natural gas-producing county

### REGION

#### Bakken Formation

Nowhere is the shale oil revolution more evident than in the Bakken Formation, which is the foundation of the state's resource base.



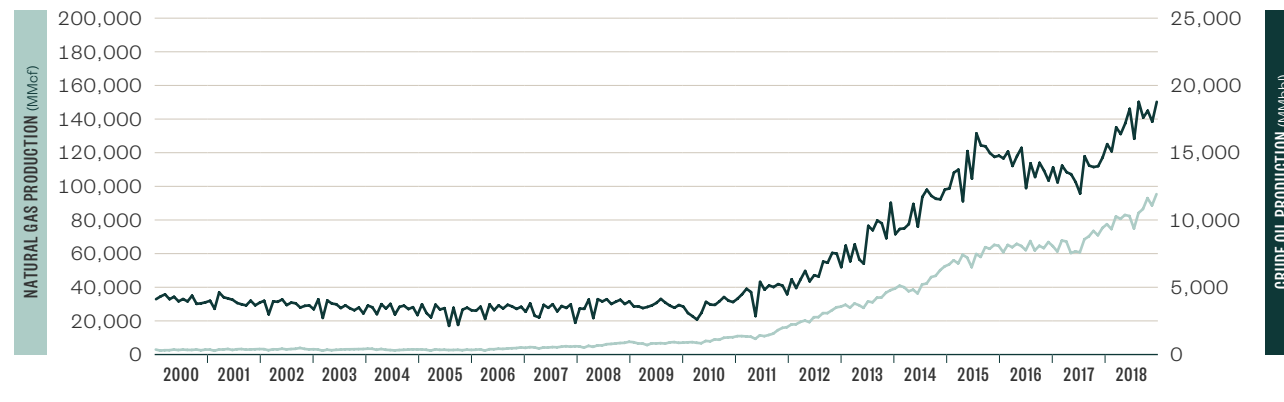
Bakken Formation

*These stats are accurate as of March 2019.*

## PRODUCTION VOLUMES AND VALUE

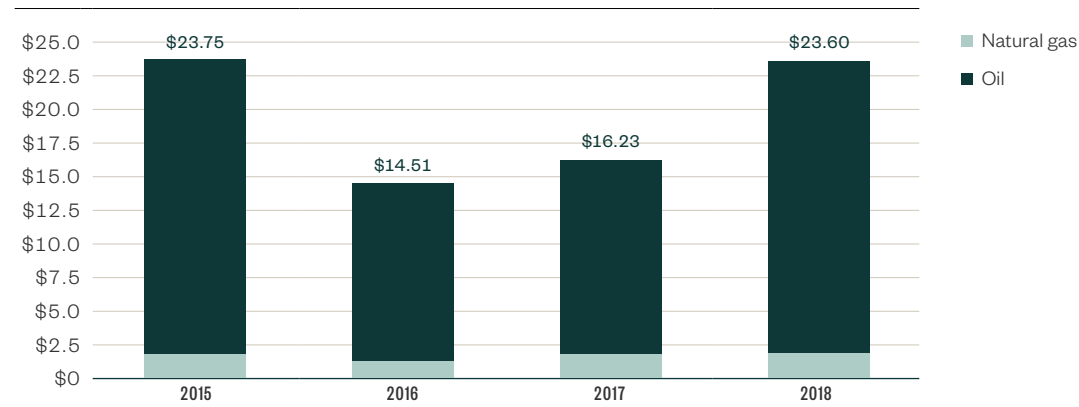
The shale oil revolution manifested in the Bakken Formation, located in western North Dakota. Previously thought of as uneconomical oil, it's now being produced at a rate of nearly 20 MMbbl per month due to improvements in development and production technology. The rapid growth in production resulted in significant infrastructure constraints, particularly on the natural gas side. Figure 26 illustrates the exponential growth of oil and gas production in North Dakota over the past decade.

**FIGURE 26: Production Volume**  
North Dakota, FY2000–FY2018



The dominance of oil resources in North Dakota becomes apparent in Figure 28. Approximately 92% of North Dakota's statewide estimated production value is related to oil resources, with nearly \$22 billion of crude oil produced in fiscal year 2018. Natural gas value amounted to about \$1.8 billion.

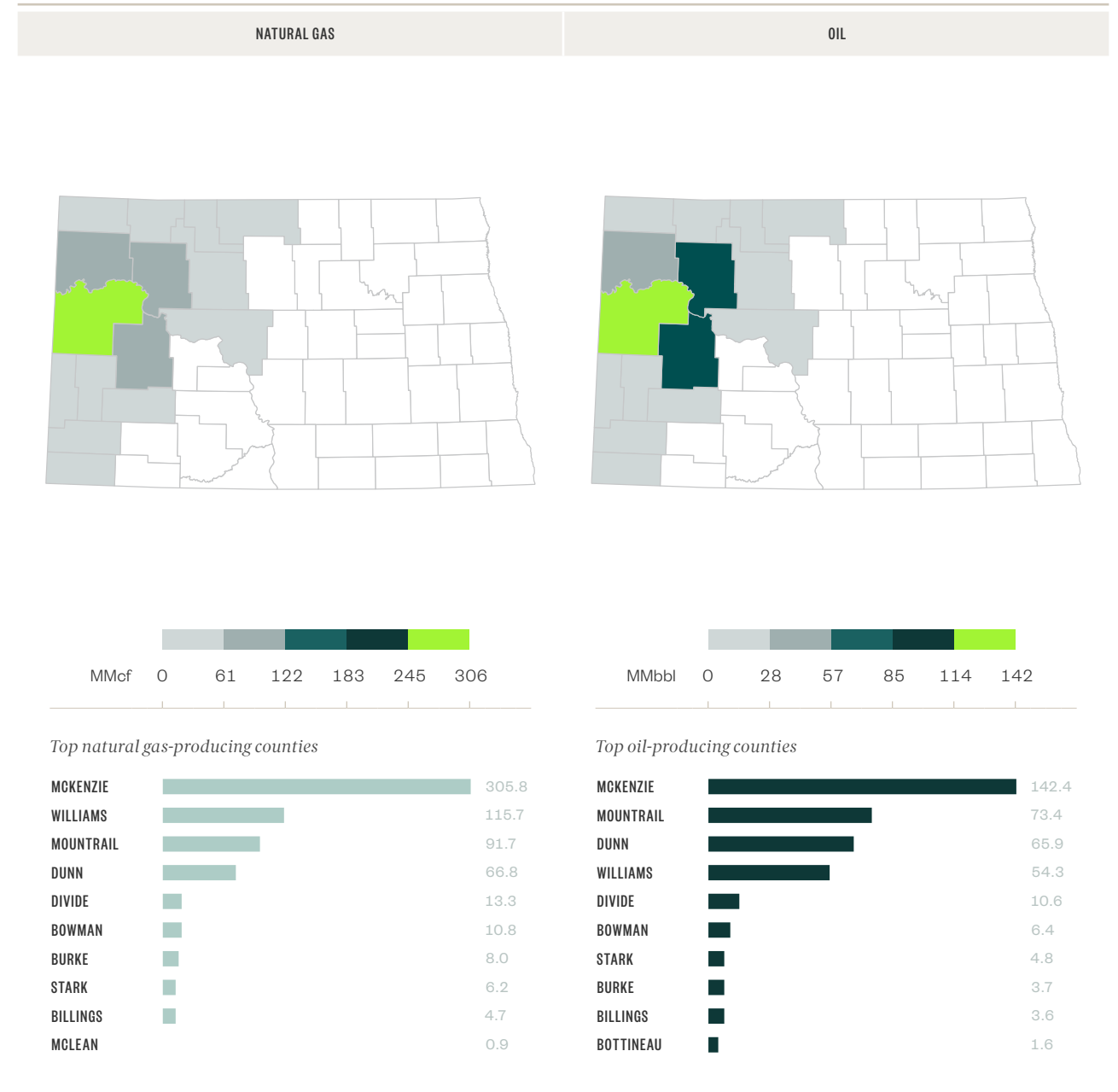
**FIGURE 27: Estimated Production Value**  
North Dakota, FY2015–FY2018 (\$billion)



## PRODUCTION BY COUNTY

Production is largely concentrated in McKenzie County, in the heart of the Bakken formation. Based on state-provided production data, McKenzie County is the highest oil-producing county in the nine-state study area, with fiscal year 2018 production of over 169 MMbbl, as compared to about 200 MMbbl for the entire state of New Mexico.

**FIGURE 28: Production Volumes by County**  
North Dakota, FY2017



# REVENUE

## GOVERNMENT REVENUE CATEGORIES

### Taxes

North Dakota levies an oil and gas production tax, as well as an oil extraction tax that applies only to crude oil production. The Natural Gas Production Tax is based on the volume of production, as opposed to the value of the resources produced.

### Land Income

North Dakota gets some revenue from royalties on both state and federal leases, but the combined total is less than one-fifth of the revenue received from oil and gas-related taxes.

### Investment Income

North Dakota dedicates 30% of oil and gas production tax revenue to the North Dakota Legacy Fund, but the fund was only recently created and hasn't made any distributions to this point.<sup>21</sup> The fund had a total investment value of \$5.6 billion dollars as of October 2018, but is stipulated by statute to not make any distributions before fiscal year 2018.

**TABLE 3: Government Revenue Sources, by Type and Program**

North Dakota, FY2015–FY2017 (\$million)

Category	Type	Name	2015	2016	2017
<b>Taxes</b>	Production Taxes*	Oil and Gas Production Tax	1,286.7	750.5	734.9
		Oil Extraction Tax	1,514.3	732.9	719.9
	Sales & Use Taxes	Sales & Use Taxes	286.7	162.7	218.9
	Personal Income Tax	Personal Income Tax	29.3	14.8	29.1
<b>Land Income</b>	Federal Mineral Leasing	Federal Mineral Leasing	71.1	52.8	84.6
	State Lands Rents, Royalties & Bonus*	Bonus	333.4	192.7	192.9
		Royalties	17.1	12.8	8.6
<b>Investment Income</b>	ND Legacy Fund Made No Distributions Prior to FY18		0	0	0
<b>TOTAL</b>			<b>3,538.6</b>	<b>1,919.2</b>	<b>1,989</b>

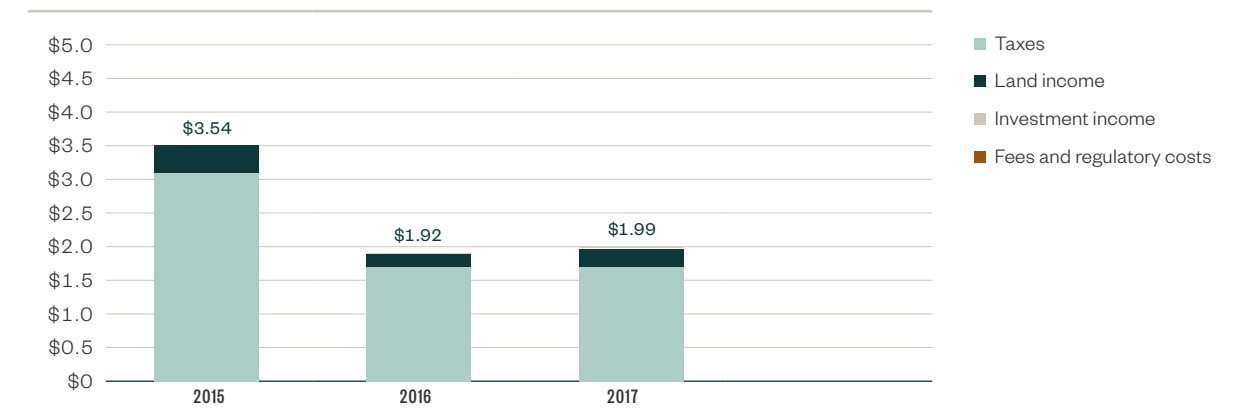
\* Available directly from state-published sources and don't require estimation.

## SUMMARY OF NORTH DAKOTA GOVERNMENT REVENUE

Between fiscal years 2015 and 2016, North Dakota's oil and gas revenue fell by over 45% due to sharp declines in oil prices and a corresponding drop in production, which created a highly volatile reduction in the state's revenue. While production volumes recovered to peak levels, prices haven't, and revenue remained well below the 2015 level in 2017.

**FIGURE 29: Government Revenue by Category**

North Dakota, FY2015–FY2017 (\$billion)

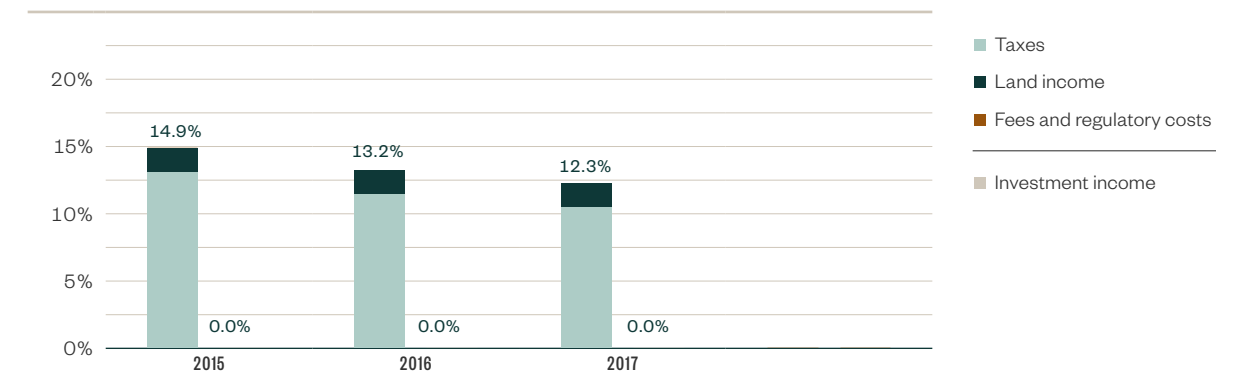


## REVENUE AS A SHARE OF PRODUCTION VALUE

North Dakota revenue has also fallen as a percent of production value, as price-triggered oil extraction tax incentives were repealed by state legislature and replaced with permanently reduced tax rates effective January 1, 2016. Natural gas, which had been taxed at a rate of \$0.1106 per Mcf in fiscal year 2016, was taxed at \$0.0601 in fiscal year 2017.<sup>22</sup>

**FIGURE 30: Revenue as Percentage of Estimated Production Value**

North Dakota, FY2015–FY2017



<sup>22</sup> State of North Dakota Office of the State Tax Commissioner, "53rd Biennial Report for the Biennial Period of July 1, 2015 Through June 30, 2017"

<sup>21</sup> North Dakota Constitution, Article X, Section 26





STATE PROFILE:

# Oklahoma

- Cushing, Oklahoma, which has been referred to as the pipeline crossroads of the world, is the location of the benchmark West Texas Intermediate price for crude oil.
- While the recent lifting of the US export ban has somewhat reduced its market importance, it's still a vital trading hub for US oil produced from many surrounding states.

With taxation levels at about 10% on the total value of production, Oklahoma is similar to New Mexico in terms of taxes. However, with a far lower share of production on public lands, the similarities end there.

## PRODUCTION PROFILE

### OIL

#### 4<sup>TH</sup> LARGEST

##### OIL-PRODUCING STATE

in the United States

Oklahoma is the fourth largest oil producer, and the third largest natural gas producer in the United States.

#### Kingfisher County

largest oil-producing county

### NATURAL GAS

#### 3<sup>RD</sup> LARGEST

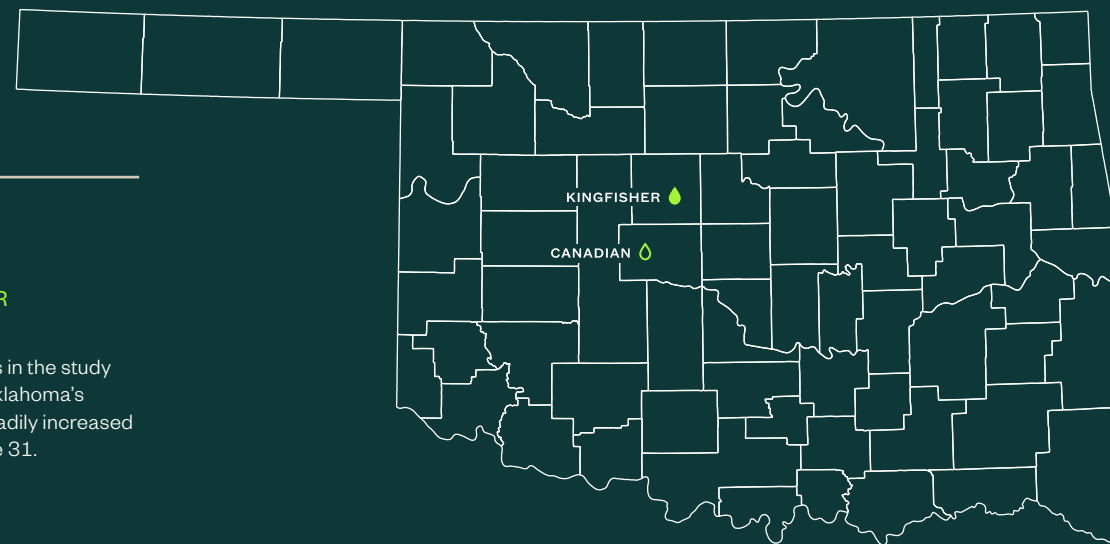
##### NATURAL GAS PRODUCER

in the United States

Unlike some of the other states in the study area, including New Mexico, Oklahoma's natural gas production has steadily increased since 2000, as shown in Figure 31.

#### Canadian County

largest natural gas-producing county

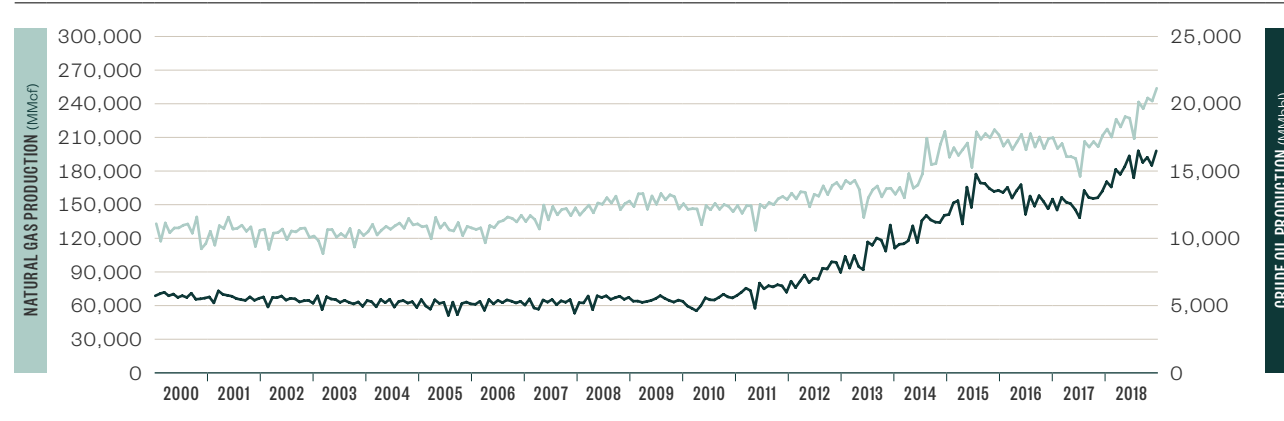


*These stats are accurate as of March 2019.*

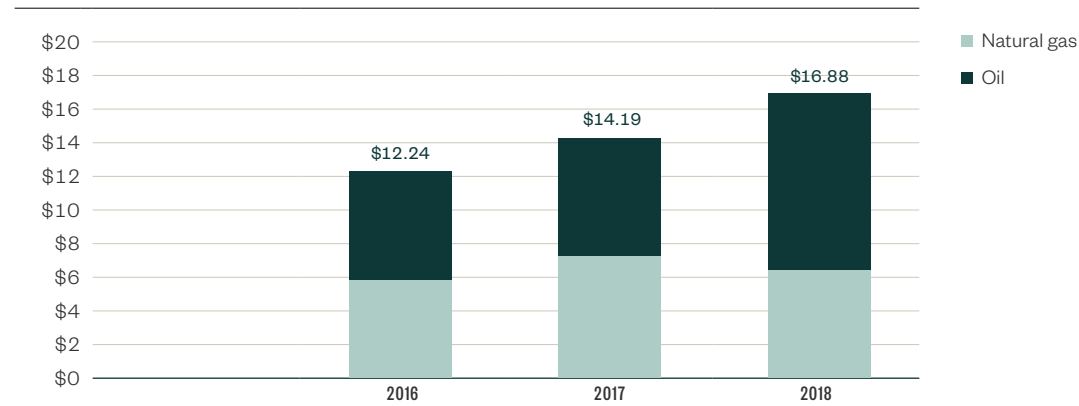


## PRODUCTION VOLUMES AND VALUE

**FIGURE 31: Production Volume**  
Oklahoma, FY2000–FY2018



**FIGURE 32: Estimated Production Value**  
Oklahoma, FY2016–FY2018 (\$billion)



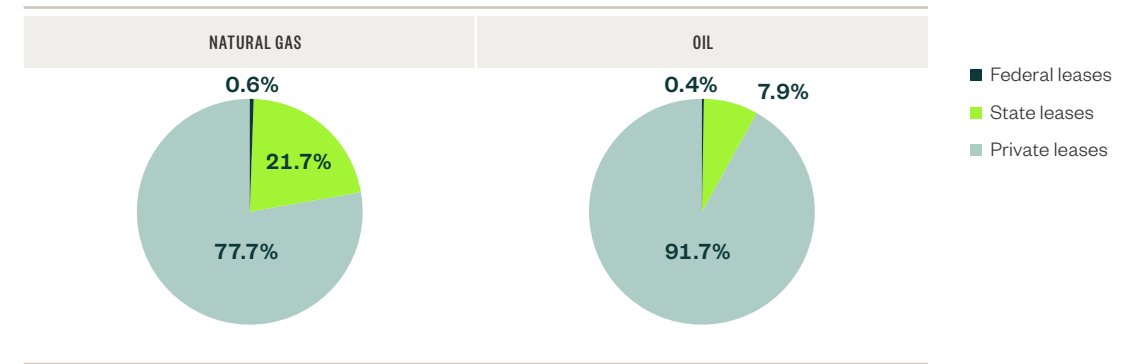
Oklahoma's steadily increasing production volume has overwhelmed price fluctuations in recent years, leading to a relatively steady increase in production value.<sup>23</sup> Oil-related revenue has led the way in the escalating production value, augmented by the increasing strength in oil and gas production volumes, trends which are more pronounced in Oklahoma relative to some of the other states in the study area.

<sup>23</sup> Issues with the availability of county level oil and gas production data prevented the inclusion of fiscal year 2015 production values for Oklahoma.

## PRODUCTION BY LAND TYPE

The Oklahoma Land Office manages 1.1 million mineral acres of trust land, which means Oklahoma generates a fairly significant portion of its natural gas on state trust land—22% in 2018, with state lands only accounting for about 8% of oil production. Federal land, in both cases, provided less than 1% of total production.

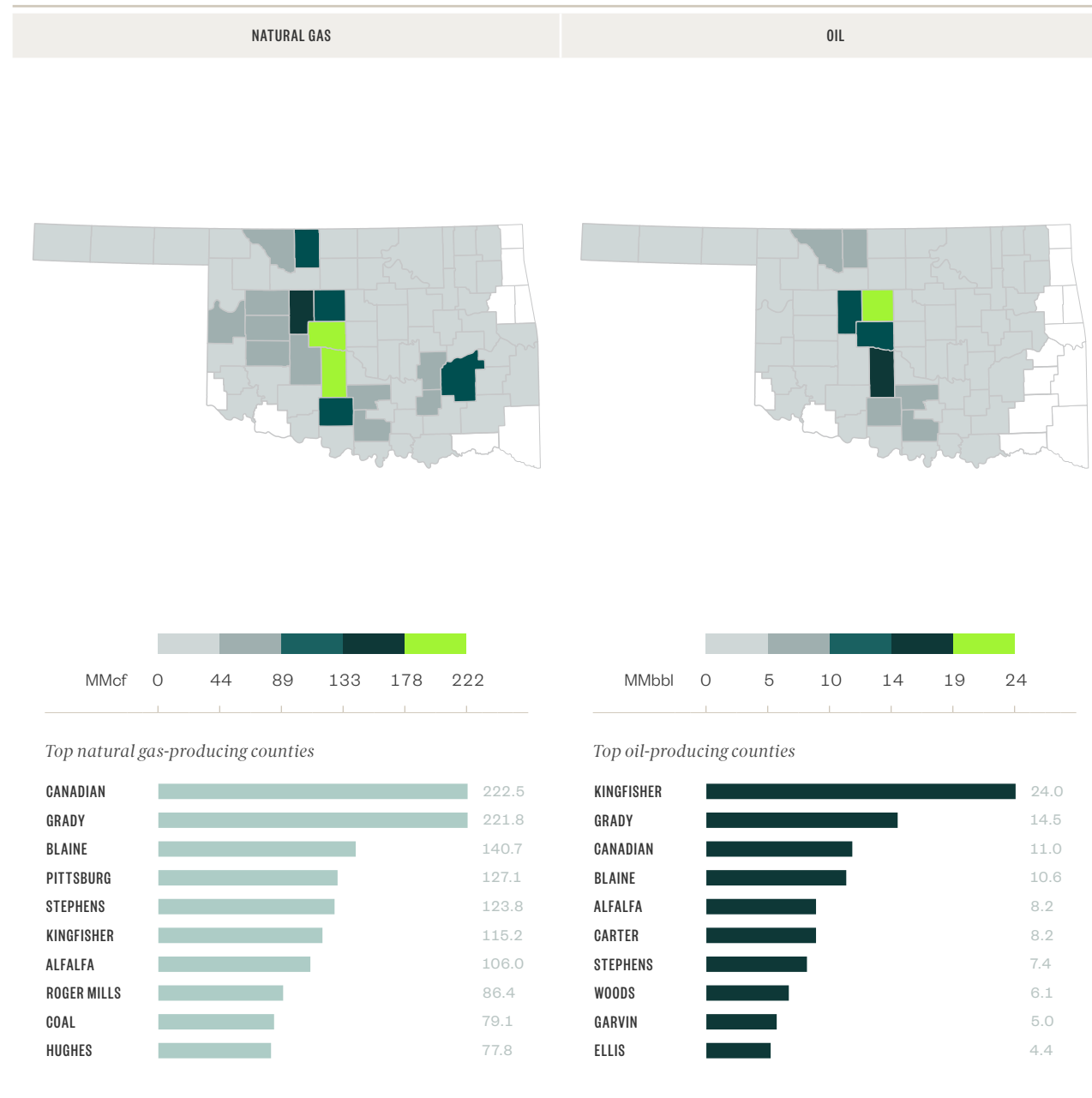
**FIGURE 33: Production by Land Type**  
Oklahoma, FY2018



## PRODUCTION BY COUNTY

Oil and natural gas production occurs in nearly every county in Oklahoma, but the largest concentration is located in the center of the state. Major producing formations include the Ardmore and Anadarko basins, which include the Woodford Shale, the South Central Oklahoma Oil Province (SCOOP), and the Sooner Trend Anadarko Basin Canadian and Kingfisher Counties (STACK).

**FIGURE 34: Production Volumes by County**  
Oklahoma, FY2017



## REVENUE

### GOVERNMENT REVENUE CATEGORIES

#### Taxes

Oklahoma has a gross production tax on the value of oil and natural gas produced, as well as a petroleum excise tax. Oklahoma's severance tax is levied in lieu of property tax at the state level, but local governments levy property tax on oil and gas-related property.

#### Land Income

Oklahoma receives significant revenue from royalties on state lands, and a small amount from federal mineral leasing. This is a direct reflection of the significant revenue contributions provided to numerous local and state government entities through the development and production of oil and natural gas from federal resources in the western states.

#### Investment Income

The Commissioners of the State Land Office of Oklahoma manage a portfolio of investments valued at about \$2.5 billion as of fiscal year 2017, which generates interest and dividends for the state.

**TABLE 4: Government Revenue Sources, by Type and Program**  
Oklahoma, FY2015–FY2017 (\$million)

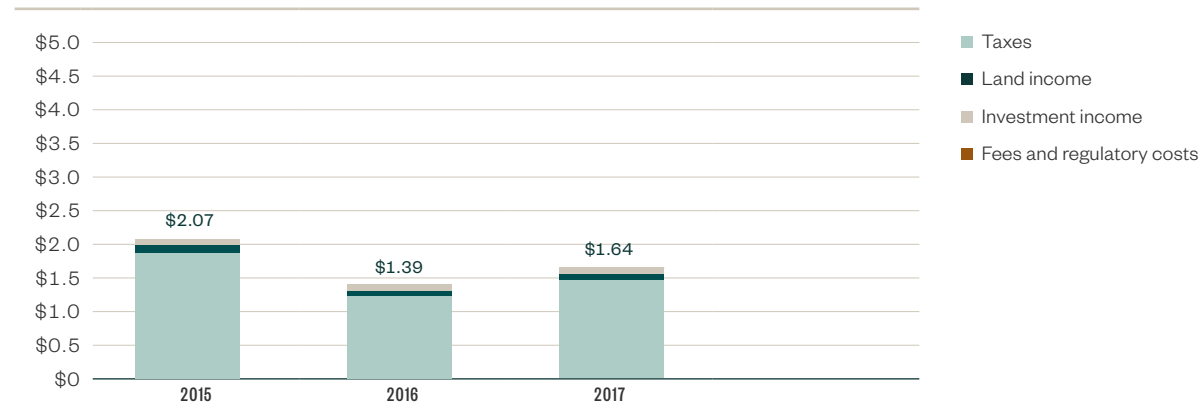
Category	Type	Name	2015	2016	2017
Taxes	Production Taxes*	Gross Production Tax	683.5	355.9	429.8
		Petroleum Excise Tax	14.3	10.7	12.2
	Property Taxes	163.6	172.6	186.5	
	Sales & Use Taxes	736.1	515.4	594.4	
	Personal Income Tax	258.0	162.7	225.4	
Land Income	Federal Mineral Leasing		9.3	6.0	4.6
	State Lands Rents, Royalties & Bonus*	Rents and Royalties	106.1	71.8	82.3
		Miscellaneous	7.9	5.3	11.7
Investment Income	Land Office Dividends*		34.1	36.7	36.3
	Land Office Interest*		55.4	54.4	55.5
<b>TOTAL</b>			<b>2,068.4</b>	<b>1,391.5</b>	<b>1,638.6</b>

\* Available directly from state-published sources and don't require estimation.

## SUMMARY OF OKLAHOMA GOVERNMENT REVENUE

With similar oil production levels but significantly higher natural gas production, Oklahoma receives more total tax revenue than New Mexico, at about \$1.4 billion in fiscal year 2017.

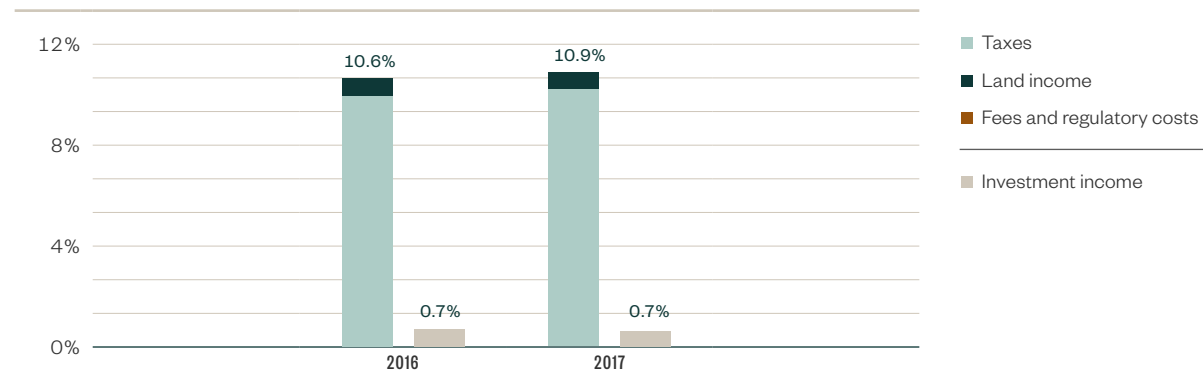
**FIGURE 35: Government Revenue by Category**  
Oklahoma, FY2015–FY2017 (\$billion)



## REVENUE AS A SHARE OF PRODUCTION VALUE

As with nearly all of the states in this study, Oklahoma's difference in government revenue from oil and gas production largely comes down to land ownership, particularly the very low percentage of production that takes place on federal lands. Oklahoma garners an amount of government revenue similar to New Mexico. However, land income really sets the two apart.

**FIGURE 36: Revenue as Percentage of Estimated Production Value**  
Oklahoma, FY2016–FY2017



## STATE PROFILE:

# Colorado

- With a combined 11% of production value flowing to taxes and land income in fiscal year 2017, Colorado ranks sixth in revenue contributions to state and local government.
- A unique factor in the state's structure of fiscal income is Colorado's ad valorem credit against severance taxes, which offers a credit based on production against severance tax obligations.

# PRODUCTION PROFILE

## OIL

**6<sup>TH</sup> LARGEST**

**OIL-PRODUCING STATE**  
in the United States

**Weld County** 🟢

largest oil-producing county

## NATURAL GAS

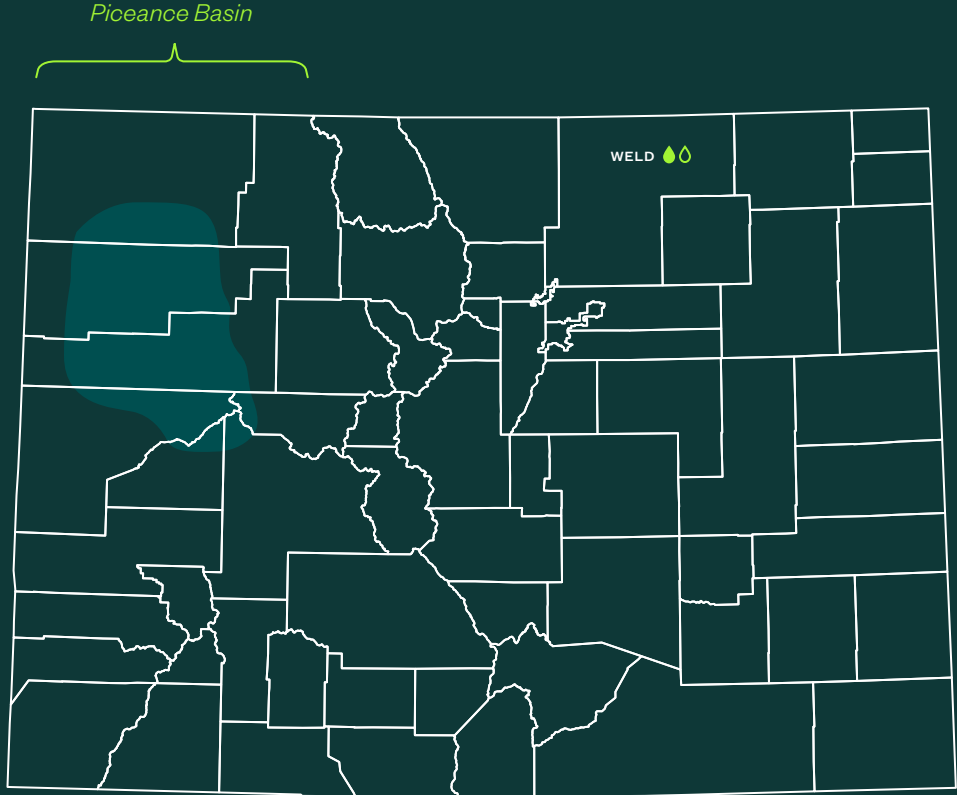
**6<sup>TH</sup> LARGEST**

**NATURAL GAS PRODUCER**  
in the United States

**Weld County** 🟢

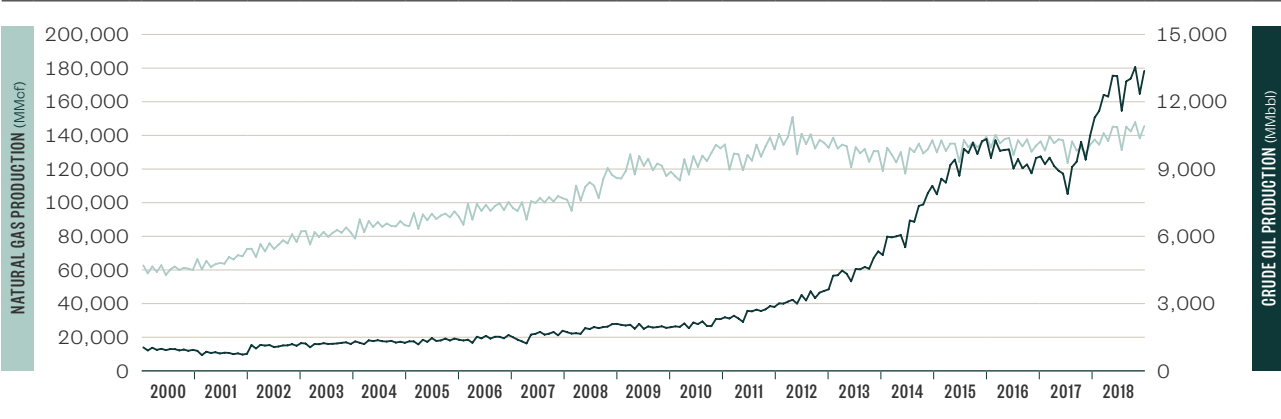
largest natural gas-producing county

*These stats are accurate as of March 2019.*



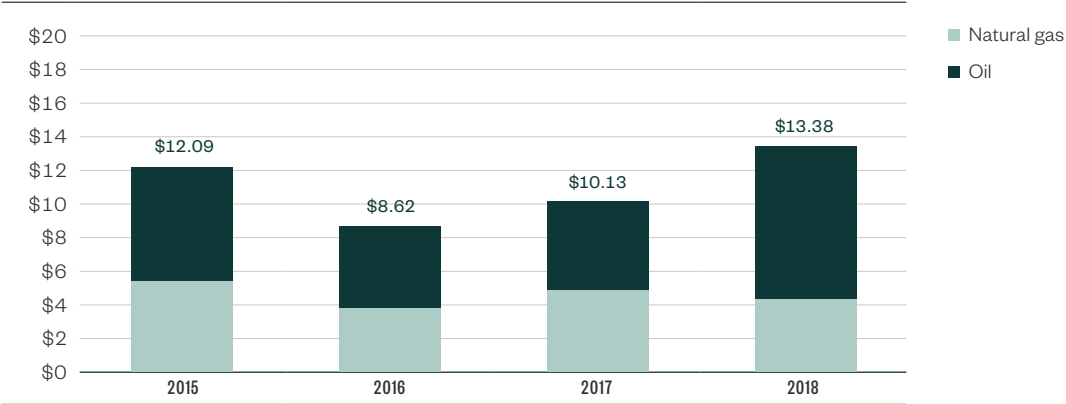
## PRODUCTION VOLUMES AND VALUE

**FIGURE 37: Production Volume**  
Colorado, FY2000–FY2018



The following graphic reflects the relationship between Colorado’s oil and natural gas production value with its total oil production, showing significant strength in recent years.

**FIGURE 38: Estimated Production Value**  
Colorado, FY2015–FY2018 (\$billion)

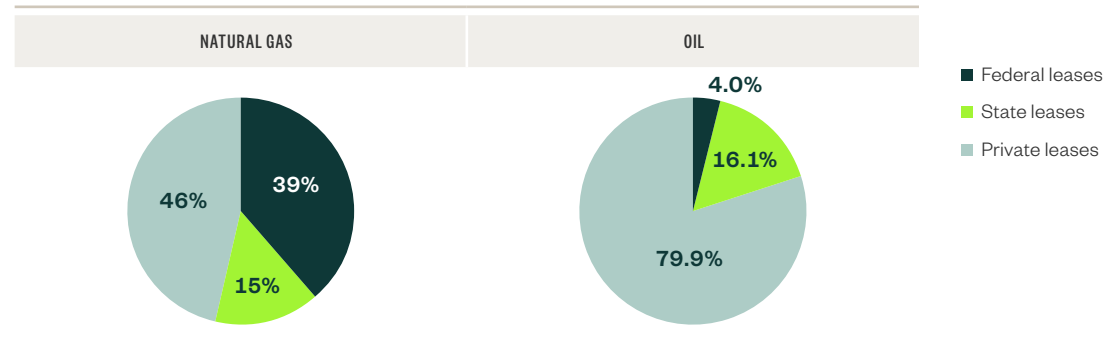




## PRODUCTION BY LAND TYPE

Colorado oil and gas production is largely a tale of two production areas. The Denver-Julesburg Basin in the northeast portion of the state produces the vast majority of crude oil and significant gas volumes, while the Piceance and San Juan basins on the western slope provide a significant portion of the natural gas produced in the state. This is also important in terms of land ownership, with the northeast corner of the state where oil production is highest largely privately owned, while the western slope has a high percentage of federal land. This is evident in the following graphic, which reflects a much greater share of Colorado natural gas produced on federal leases compared to oil.

**FIGURE 39: Production by Land Type**  
Colorado, FY2018

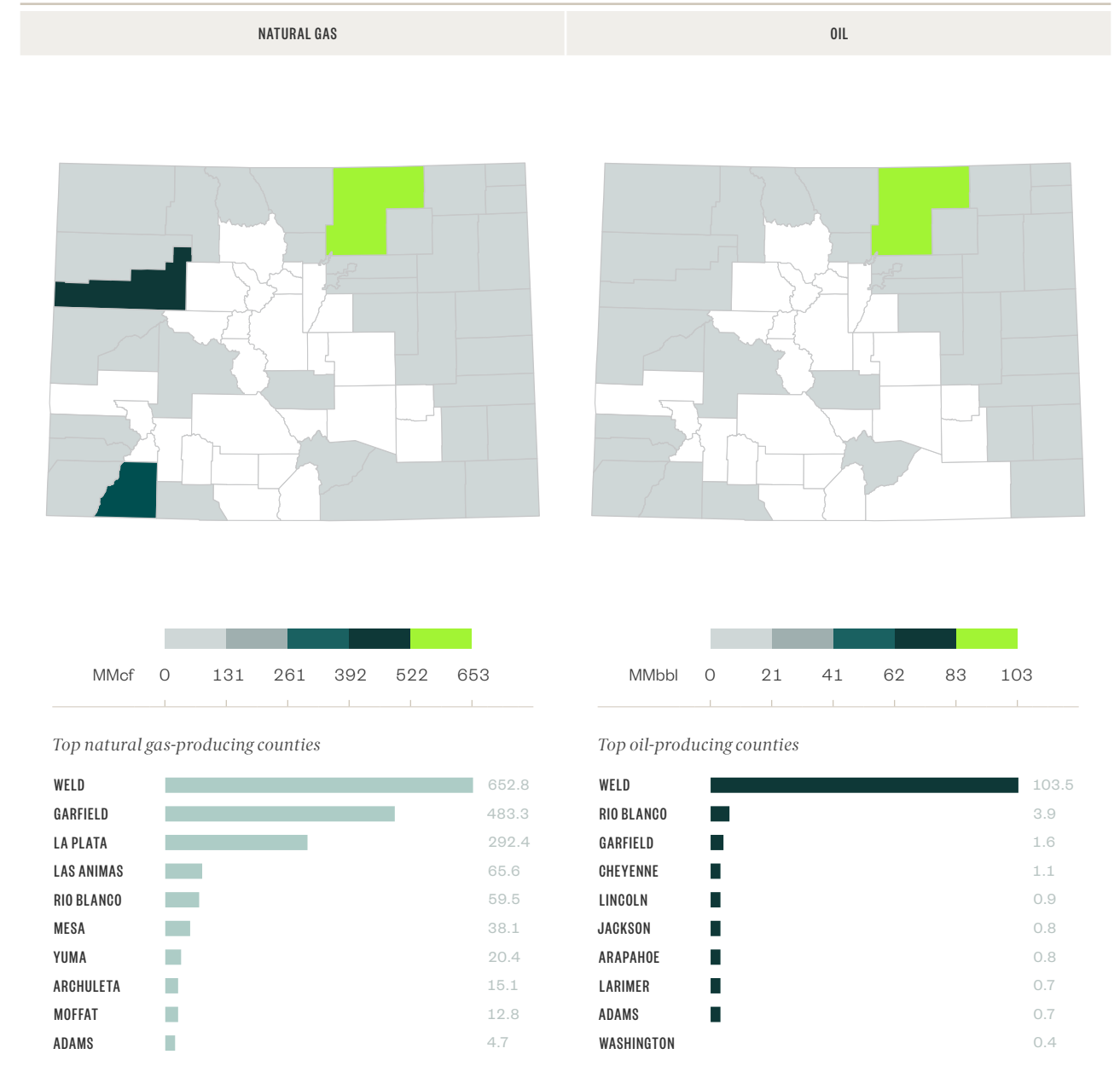


## PRODUCTION BY COUNTY

Weld County in north-central Colorado dominates both oil and natural gas production. Not only is it currently the state production leader, it's also the focus of a great deal of recent exploration and development activities. As part of the Wattenberg field in the Denver-Julesburg Basin, the productive resources are generally described as a component of the Niobrara Formation, which extends across Colorado, Wyoming, and Nebraska.

The northwestern slope production in Colorado is provided from the Piceance Basin formation, which extends into eastern Utah. Production in southwestern Colorado occurs in the San Juan Basin resources, which extend through northwestern New Mexico and southeastern Utah. Western slope production is predominantly natural gas resources, but significant natural gas liquids, condensate, and oil are also produced from these properties. In the production volume maps which follow, it's apparent that oil and natural gas production occurs throughout Colorado, except in the mountainous regions in the central part of the state.

**FIGURE 40: Production Volumes by County**  
Colorado, FY2017



# REVENUE

## GOVERNMENT REVENUE CATEGORIES

Colorado severance tax reporting for our data year, FY2017, represented a significant challenge. In April 2016, the Colorado Supreme Court struck down a departmental position narrowly construing the transportation and processing deductions allowed to taxpayers. As a result of the Supreme Court case, the department undertook a rewrite of the severance tax regulation completed in 2017 and significantly expanded on the allowable transportation and processing costs that could be deducted in calculating severance tax due.

Taxpayers began filing protective refund claims long before the case was finally decided in early 2016. The department paid out those refund claims beginning in 2016 and through 2017. It's believed refunds were still being processed and paid in 2018.

We were able to obtain the following data from the Colorado Department of Revenue.

**TABLE 5: Net Oil & Gas Collections**  
Colorado, FY2014–FY2018 (\$million)

Category	2014	2015	2016	2017	2018
<b>Collections</b>	272.6	323.3	132.1	112.2	199.1
<b>Refunds</b>	(37.4)	(38.6)	(53.0)	(126.5)	(103.0)
<b>TOTAL</b>	<b>235.2</b>	<b>284.7</b>	<b>79.0</b>	<b>(14.3<sup>24</sup>)</b>	<b>96.1</b>

As can be seen from the table, oil and gas collections very roughly track with the price of oil reflecting a one-year lag, which may correspond to the annual filing of severance tax returns. However, refunds appear to reflect an almost immediate response to the BP decision, which may reflect the ability to file claims at any time, and the department's determination to pay refunds as soon as practicable.

Consistent with other states' data stating severance taxes net of refunds paid, we were required to estimate the baseline level of natural refunds to subtract from \$112 million in severance tax receipts. We suspect 2016 refunds may already have reflected some refund payments in response to the BP case, so we chose to use only the 2014 and 2015 refund amounts as reflective of a natural refund level. This approach also allows for the possibility that the FY2017 collections may reflect an artificially deflated amount of oil and gas collections as an overcorrection to the BP case. This could be the result of deflated estimated payments from taxpayers expecting to file 2016 returns with a significant refund that could be carried forward to the 2017 return.

Taken together, a 2017 estimate of oil and gas severance tax collections net of natural refunds of \$14 million appears to be reasonable, but it should be recognized that this number has a much higher degree of uncertainty than the numbers from other states, none of which experienced a similar recalibration of the severance tax calculation.

<sup>24</sup> Fiscal year 2017 Total Oil and Gas Net Collections was estimated by subtracting the average refunds for fiscal years 2014 and 2015 from the Oil and Gas Collections of \$112 million. This calculation was done in order to estimate what the collections would have looked like but for the Colorado Supreme Court decision in the BP case. These aren't the actual collections, but illustrate the potential collections during fiscal year 2017.

## Taxes

Colorado taxes oil and gas production directly, in the form of the oil and gas severance tax and the oil and gas conservation levy. A portion of the ad valorem tax as assessed by local governments is also based on the value of production.

The severance tax has several unique features. It's assessed on an annual basis, although a withholding feature requires 1% of all proceeds paid to interest owners for oil and gas sales to be withheld by the disbursing and remitted on a quarterly basis. The severance tax rate is determined using a sliding scale based on the owners' total Colorado oil and gas income during the production year. A credit of 87.5% of the ad valorem tax related to production is allowed to be taken against the severance tax liability.

Property taxes are estimated using reported valuations and average mill on a county level.

Sales and use taxes and individual income taxes have been estimated for Colorado by the same standardized methodology we applied in other states.

## Land Income

Colorado collects land income from leases on both state trust and federal land. The Colorado State Land Board administers about \$4 million acres of subsurface land, on which it collects rents, royalties, and bonus revenue. Colorado also collects a share of the royalties from federal leases.

## Investment Income

Oil and gas-related investment income in Colorado consists of earnings of the Public School Permanent fund. The fund provided \$17 million in revenue to Colorado in fiscal year 2017.

## Permanent Funds

Colorado dedicates 95% of its royalties from state trust lands to the Public School Permanent Fund, with the remaining 5% used for operational expenses.

**TABLE 6: Government Revenue Sources, by Type and Program**  
Colorado, FY2015–FY2017 (\$million)

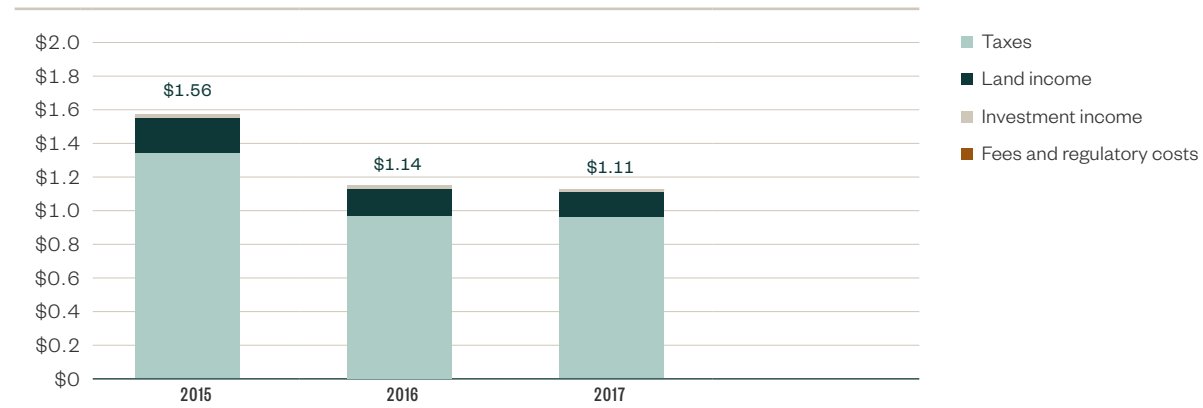
Category	Type	Name	2015	2016	2017
<b>Taxes</b>	Production Taxes*	Oil & Gas Conservation Tax	7.2	5.7	7.1
		Oil & Gas Severance Tax	24.3	28.6	0
	Property Taxes		675.1	444.5	421
	Sales & Use Taxes		323.3	242.8	309.3
	Personal Income Tax		297.9	237.1	209.4
<b>Land Income</b>	Federal Mineral Leasing		53.3	55.6	58.3
	State Lands Rents, Royalties & Bonus*	Natural Gas Royalties	26.1	17.5	20.7
		Oil Royalties	79.2	42.1	44
		Oil & Gas Rentals	2	1.6	1.2
	Bonus	50.7	42.7	20.3	
<b>Investment Income</b>	Public School Permanent Fund Interest		17.5	17.5	16.6
<b>TOTAL</b>			<b>1,556.6</b>	<b>1,135.7</b>	<b>1,107.9</b>

\* Available directly from state-published sources and don't require estimation.

## SUMMARY OF COLORADO GOVERNMENT REVENUE

Colorado's oil and gas revenue declined over the study period. However, fiscal year 2018 revenue not included here is likely to increase, as production value in fiscal year 2018 has surpassed the peak production value in fiscal year 2015. The \$144.5 million in fiscal year 2017 land income isn't insignificant. However, it's more significant that about 85.5% of the state's oil and gas revenue is obtained from its tax programs, which equated to \$946.8 million in fiscal year 2017.

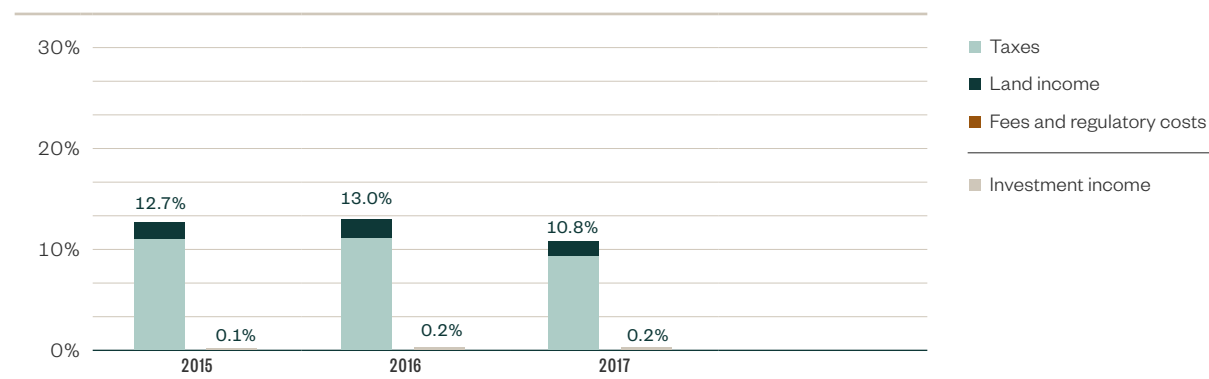
**FIGURE 41: Government Revenue by Category**  
Colorado, FY2015–FY2017 (\$billion)



## REVENUE AS A SHARE OF PRODUCTION VALUE

Colorado faced a combination of factors in fiscal year 2017 that depressed its revenue as a percent of production value. The timing of tax collections and tax credits, discussed earlier, and the interaction between the two tell a large part of the story. The 2018 fiscal year percentage was expected to return to the percentages seen in fiscal years 2015 and 2016.

**FIGURE 42: Revenue as Percentage of Estimated Production Value**  
Colorado, FY2015–FY2017



## STATE PROFILE:

# Wyoming

- Wyoming is most comparable to New Mexico in terms of the balance between taxes and land income as sources of revenue.
- Unlike some of the other states, Wyoming hasn't seen a significant increase in production values and associated government revenue, as prices haven't fully recovered from the 2014–2015 crash.
- Wyoming is the eighth largest producer of both oil and natural gas in the United States.

# PRODUCTION PROFILE

## OIL

**8<sup>TH</sup> LARGEST**

**OIL-PRODUCING STATE**  
in the United States

**Campbell County** 

largest oil-producing county

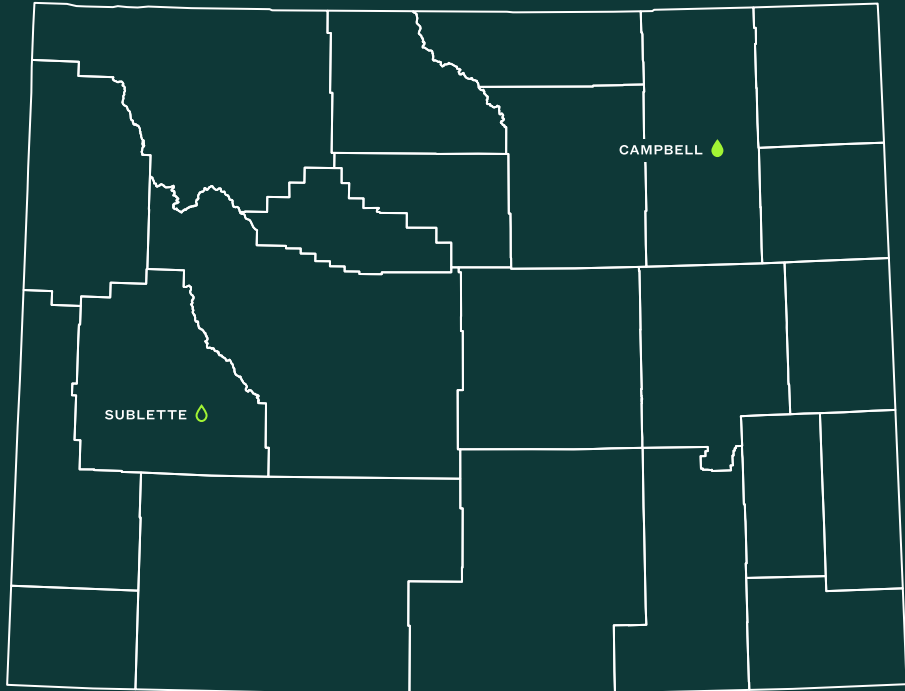
## NATURAL GAS

**8<sup>TH</sup> LARGEST**

**NATURAL GAS PRODUCER**  
in the United States

**Sublette County** 

largest natural gas-producing county

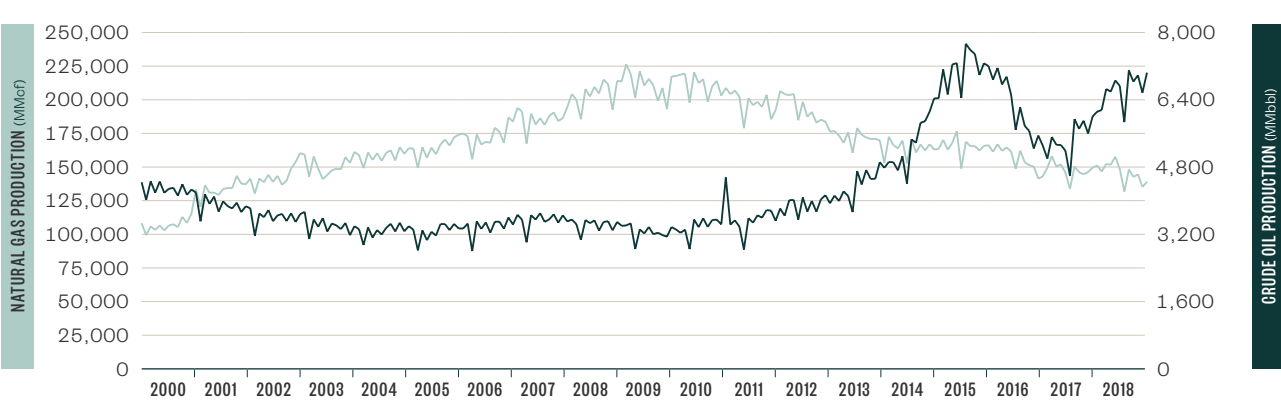


*These stats are accurate as of March 2019.*

## PRODUCTION VOLUMES AND VALUE

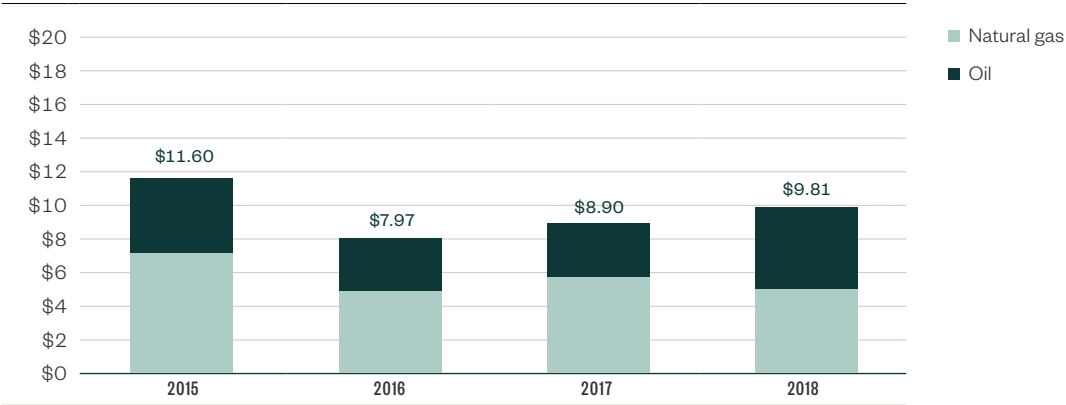
Natural gas production has been steadily declining from a peak in 2009, and while oil production volumes have increased from the trough in 2017, they haven't yet regained peak 2015 levels.

**FIGURE 43: Production Volume**  
Wyoming, FY2000–FY2018



Like New Mexico, one interesting change is the shift in production value. While the value used to primarily come from natural gas production, it's now almost evenly split between oil and gas. This change happened somewhat suddenly in Wyoming. In 2015, about 61% of Wyoming's total production value was contributed by natural gas. By fiscal year 2018, that share was about 51%.

**FIGURE 44: Estimated Production Value**  
Wyoming, FY2015–FY2018 (\$billion)

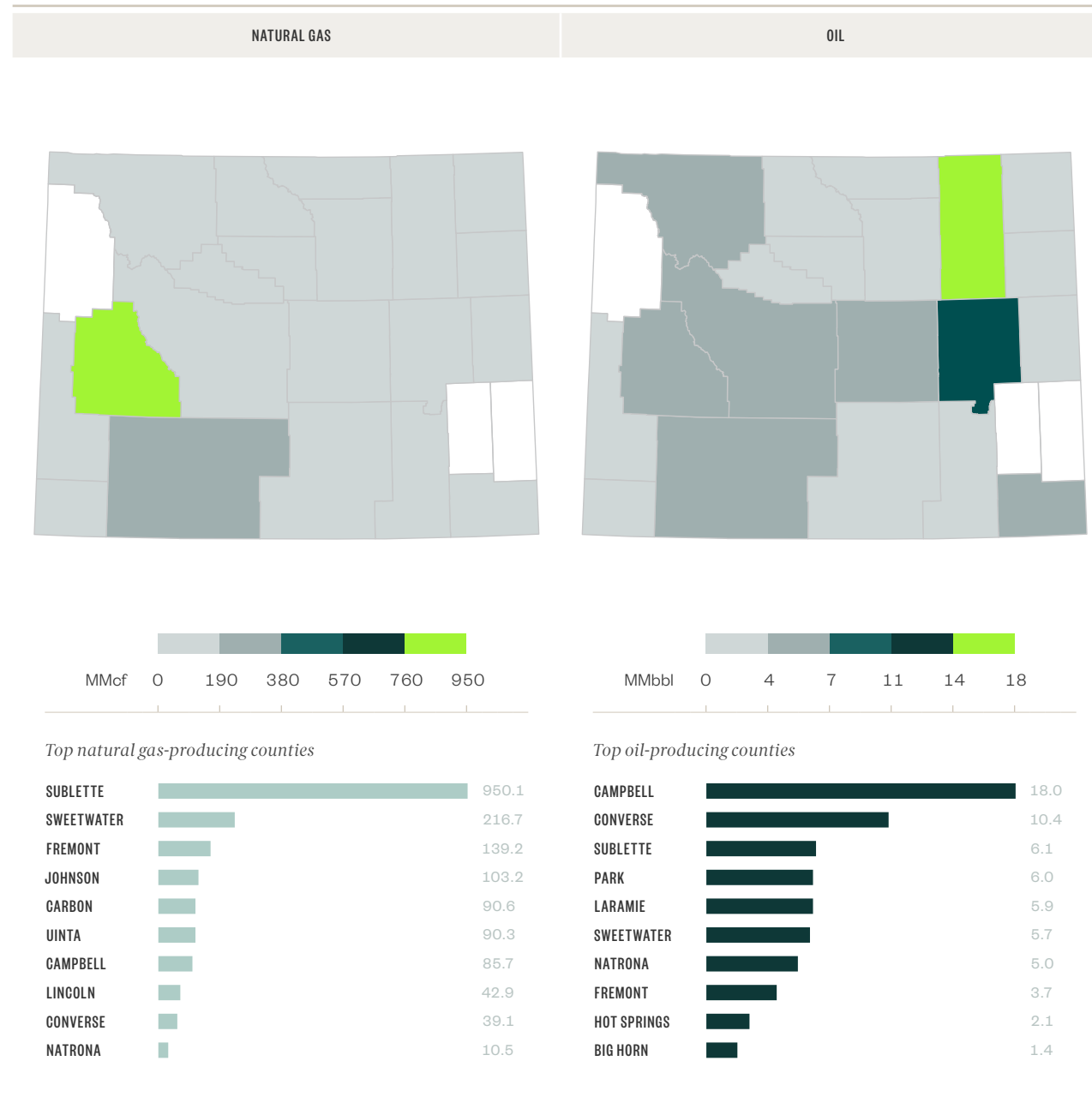




## PRODUCTION BY COUNTY

Sublette County in western Wyoming produces just over half of the natural gas in the state, while the largest oil-producing county—Campbell County in northeastern Wyoming—produces approximately one quarter of the total oil.

**FIGURE 45: Production Volumes by County**  
Wyoming, FY2017



## REVENUE

### GOVERNMENT REVENUE CATEGORIES

#### Taxes

Wyoming receives a percentage of tax revenue from oil and gas production comparable to most of the other states in the study. However, it's one of two states in the study with no individual income tax.

#### Land Income

Wyoming receives the second-highest percentage of total land income, with much more of that revenue—about 75%—coming from federal mineral leases.

#### Investment Income

We identified two significant sources of investment income related to oil and gas production in Wyoming: The Common School Permanent Land Fund and the Permanent Wyoming Mineral Trust Fund.

**TABLE 7: Government Revenue Sources, by Type and Program**  
Wyoming, FY2015–FY2017 (\$million)

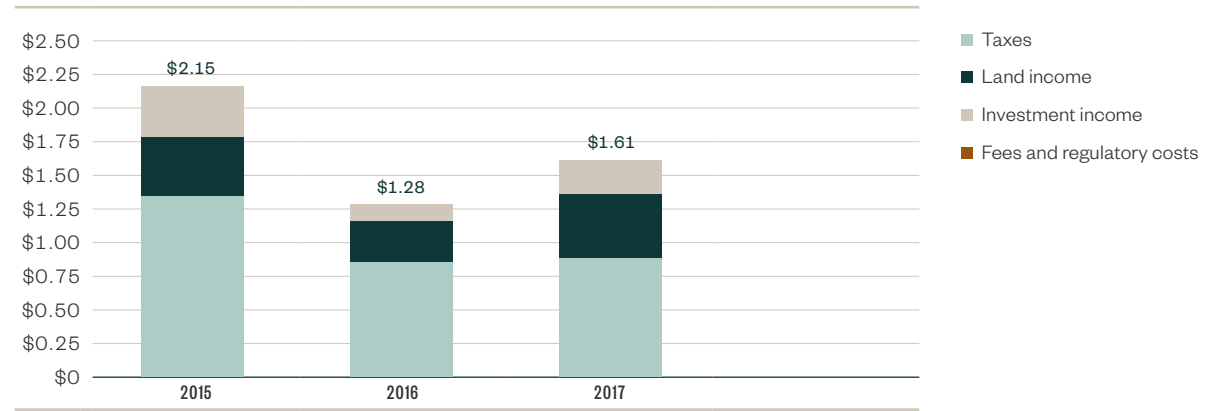
Category	Type	Name	2015	2016	2017
<b>Taxes</b>	Production Taxes*	Severance Tax, Natural Gas	175.5	143.2	188.8
		Severance Tax, Oil	188.3	142.2	186.7
	Property Taxes		727.8	397.7	316.6
	Sales & Use Taxes		243.4	171.2	188.9
	Personal Income Tax	Wyoming Has No Income Tax	0	0	0
<b>Land Income</b>	Federal Mineral Leasing		293.2	231.3	365.9
	State Lands Rents, Royalties & Bonus*		144.3	76.7	116
<b>Investment Income</b>	Investment Income*	Common School Permanent Land Fund	88	31	64
		Total Distribution Inc. (Gross of Fees)			
		Permanent Wyoming Mineral Trust Fund	292	88	181
		Total Distribution Inc. (Gross of Fees)			
<b>TOTAL</b>			<b>2,152.5</b>	<b>1,281.4</b>	<b>1,607.8</b>

\* Available directly from state-published sources and don't require estimation.

## SUMMARY OF WYOMING GOVERNMENT REVENUE

Wyoming derives most of its oil- and gas-related government revenue from taxes. The largest single tax type is property tax.

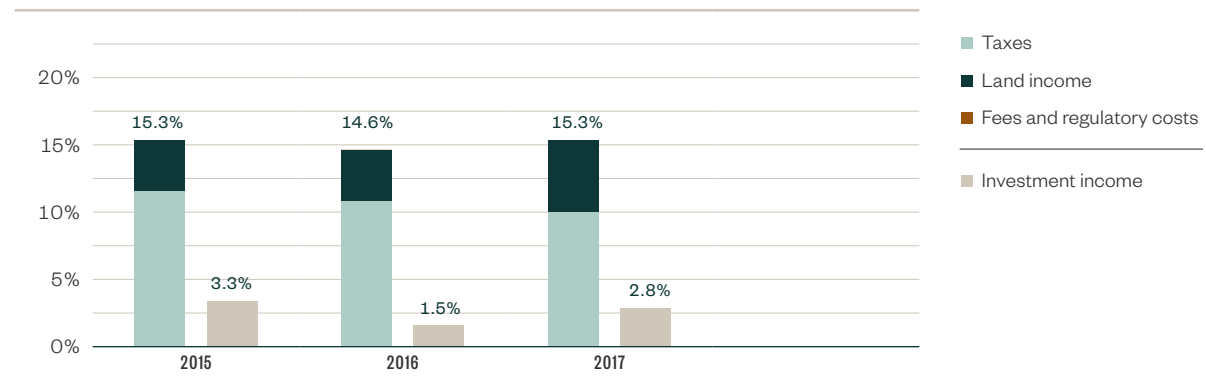
**FIGURE 46: Government Revenue by Category**  
Wyoming, FY2015–2017 (\$billion)



## REVENUE AS A SHARE OF PRODUCTION VALUE

Wyoming comes the closest to New Mexico in terms of total revenue as a percentage of production value, and also in the share of that revenue coming from each of the three large categories. The biggest difference is the amount of revenue from production on state lands, which is much higher in New Mexico due to the larger share of the total reflected by production on state lands.

**FIGURE 47: Revenue as Percentage of Estimated Production Value**  
Wyoming, FY2015–FY2017



### STATE PROFILE:

# Utah

- Utah has the lowest level of total revenue related as a percentage of production value to oil and gas production in the study area.
- It derives the third-highest amount of revenue from land income, as a share of production value.

# PRODUCTION PROFILE

## OIL

**10<sup>TH</sup> LARGEST**

**OIL-PRODUCING STATE**  
in the United States

**Duchesne County** 🟢

largest oil-producing county

## NATURAL GAS

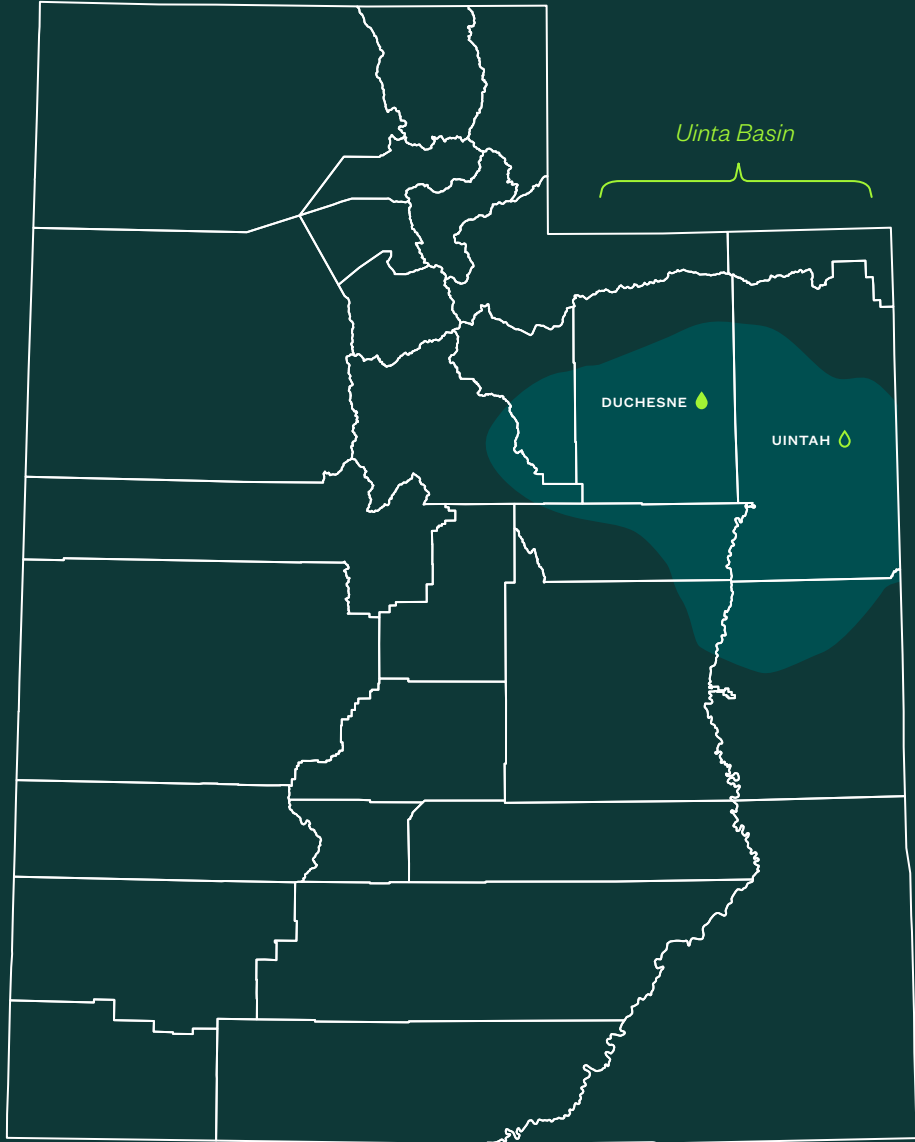
**13<sup>TH</sup> LARGEST**

**NATURAL GAS PRODUCER**  
in the United States

**Uintah County** 🟢

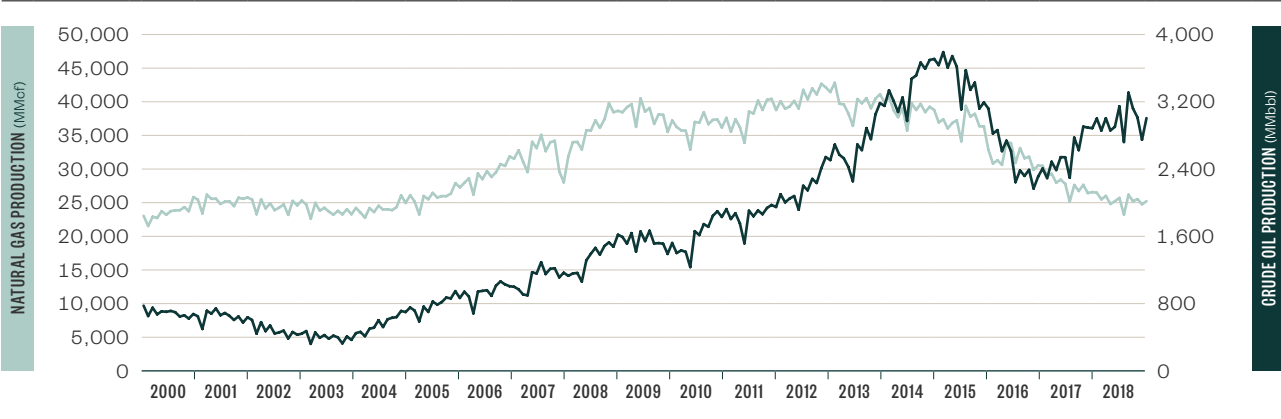
largest natural gas-producing county

*These stats are accurate as of March 2019.*



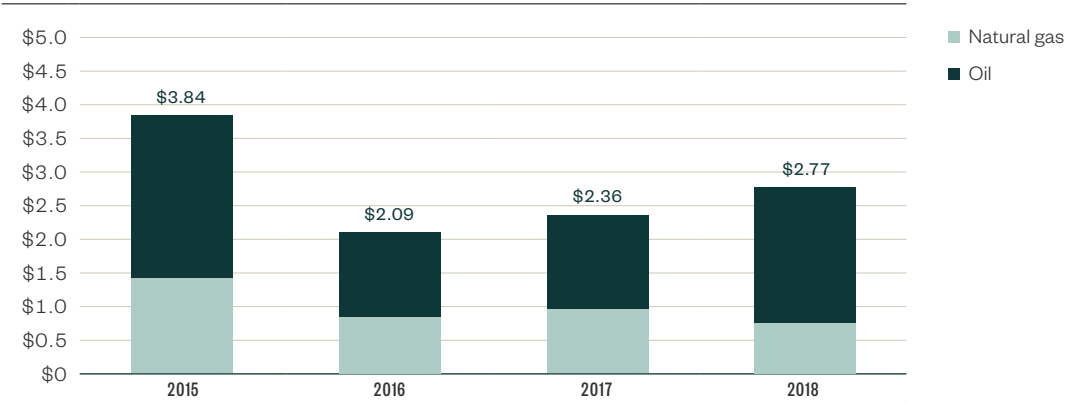
## PRODUCTION VOLUMES AND VALUE

**FIGURE 48: Production Volume**  
Utah, FY2000–FY2018



While still off of the peak levels in 2015, Utah’s production value is growing since the trough in 2016, based entirely on oil production increases, as gas continues to slide from peak production levels. In fiscal year 2018, over 70% of Utah’s total production value was attributed to oil, as opposed to about 63% in fiscal year 2015.

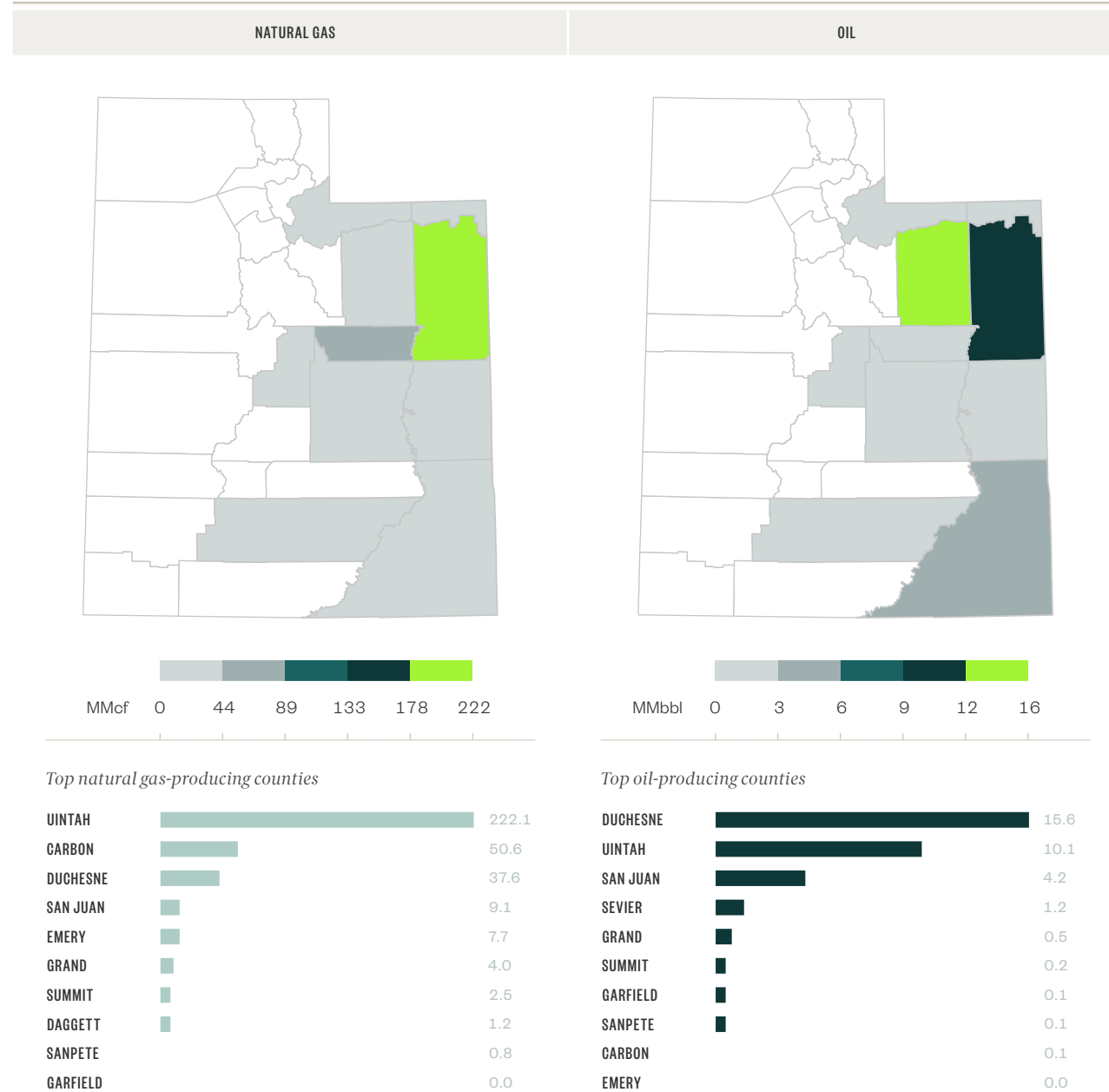
**FIGURE 49: Estimated Production Value**  
Utah, FY2015–FY2018 (\$billion)



## PRODUCTION BY COUNTY

Utah's production of both oil and gas is largely concentrated in the eastern edge of the state, particularly in Duchesne and Uintah County.

**FIGURE 50: Production Volumes by County**  
Utah, FY2017



## REVENUE

### GOVERNMENT REVENUE CATEGORIES

#### Taxes

Utah receives significantly less government revenue as a share of production value than any other state in the study.

#### Land Income

Utah receives more of its land income from federal mineral leasing than from royalties on state trust lands.

#### Investment Income

We were unable to identify investment income due to oil and gas production with any clarity.

**TABLE 8: Government Revenue Sources, by Type and Program**  
Utah, FY2015–FY2017 (\$million)

Category	Type	Name	2015	2016	2017
<b>Taxes</b>	Production Taxes*	Oil & Gas Severance Tax	69.7	20.8	9.3
		Navajo Revitalization Fund	2.7	1.3	1.3
		Uintah Basin Revitalization Fund	6.6	5	3.5
		Oil & Gas Severance Tax Permanent State Trust Fund	0	0	3.1
	Property Taxes		57.7	45.4	46.8
	Sales & Use Taxes		60.8	50.5	57.3
	Personal Income Tax		32.4	26.7	23.9
<b>Land Income</b>	Federal Mineral Leasing		69.1	41.3	51.5
		State Lands Rents, Royalties & Bonus*	61.7	28.9	34.7
<b>Fees &amp; Regulatory Costs*</b>		Oil & Gas Conservation Fee	6.7	3.1	3.3
<b>TOTAL</b>			<b>367.6</b>	<b>222.9</b>	<b>234.6</b>

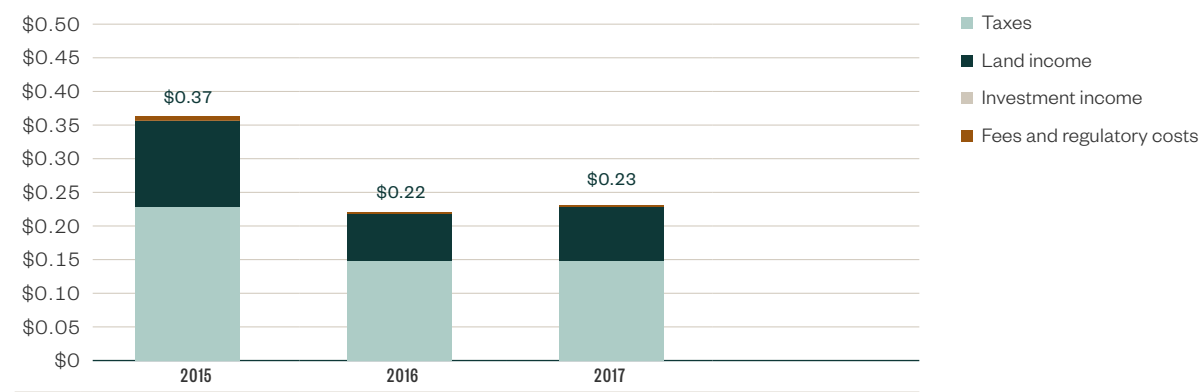
\* Available directly from state-published sources and don't require estimation.



## SUMMARY OF UTAH GOVERNMENT REVENUE

Utah's revenue followed its production value in terms of year over year changes.

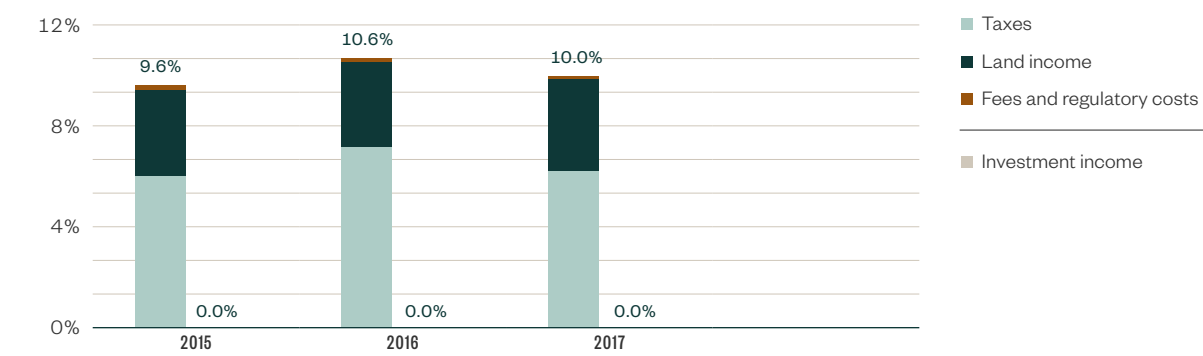
**FIGURE 51: Government Revenue by Category**  
Utah, FY2015–FY2017 (\$billion)



## REVENUE AS A SHARE OF PRODUCTION VALUE

Utah's total revenue as a share of production value are the lowest in the study, largely due to the significantly lower percentage of tax revenue. This difference outweighs the relatively high percentage of land income.

**FIGURE 52: Revenue as Percentage of Estimated Production Value**  
Utah, FY2015–FY2017



## STATE PROFILE:

# Kansas

- Kansas has the lowest combined taxes and land income as a percentage of production volume in our study area. Kansas essentially has no land income, bringing in a total of 0.1% of production value from the state's share of royalties on federal leases.
- We couldn't identify any production on state trust land in Kansas, putting it on the farthest end of the spectrum from New Mexico in terms of land ownership.
- Anecdotally, Kansas is the only state in the study area that isn't a member of the Western States Land Commissioners Association.

# PRODUCTION PROFILE

## OIL

11<sup>TH</sup> LARGEST

OIL-PRODUCING STATE  
in the United States

Ellis County

largest oil-producing county

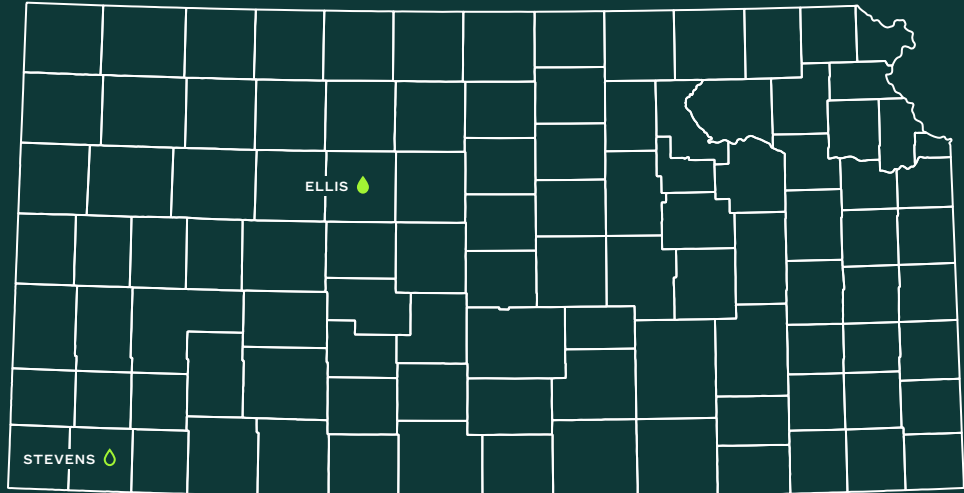
## NATURAL GAS

14<sup>TH</sup> LARGEST

NATURAL GAS PRODUCER  
in the United States

Stevens County

largest natural gas-producing county

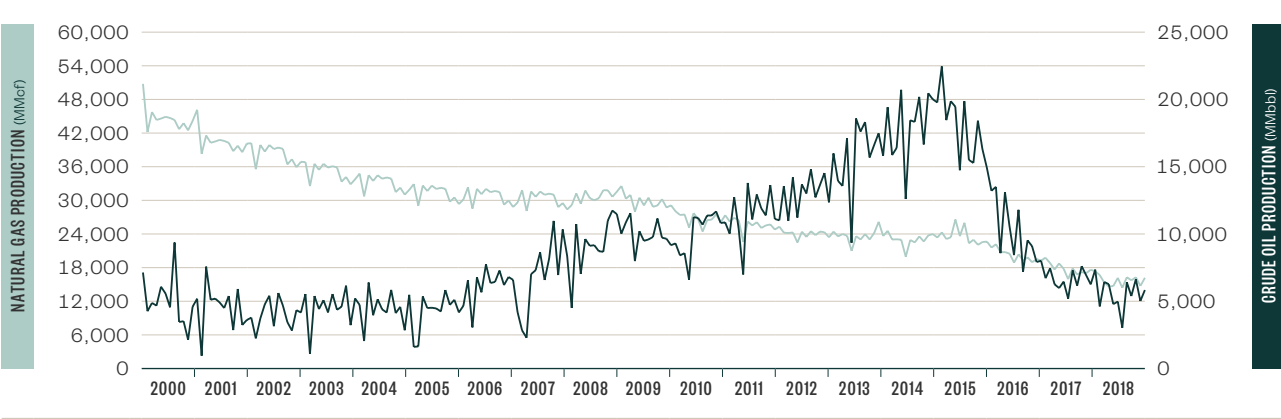


These stats are accurate as of March 2019.

## PRODUCTION VOLUMES AND VALUE

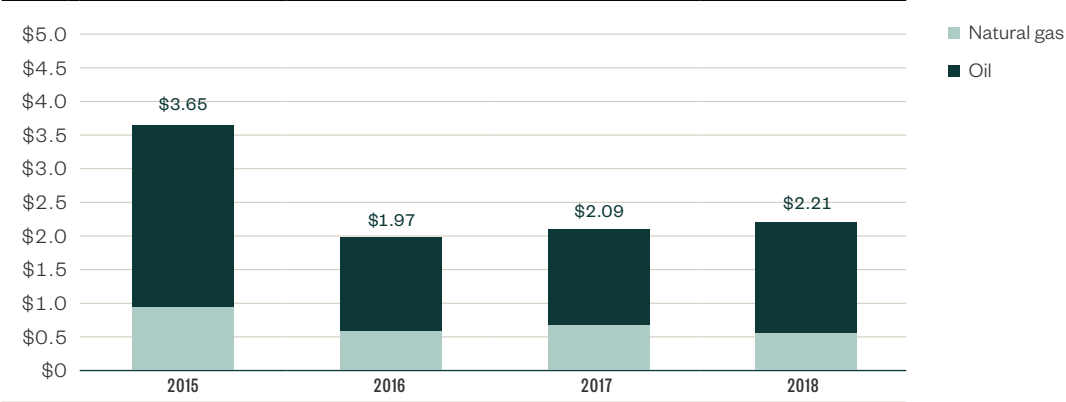
As illustrated in Figure 53, natural gas production has experienced a long, slow decline in Kansas over the last couple of decades. Oil production peaked in 2015 and has steadily declined since. While oil production had seen a long, slow increasing trend through 2015, it has fallen markedly since.

FIGURE 53: Production Volume  
Kansas, FY2000–FY2018



As previously noted, production of oil has been a primary driver of the oil and natural gas sector in Kansas. The following graphic reflects the dominance of the state’s oil production in the value of the industry’s output over the last several years.

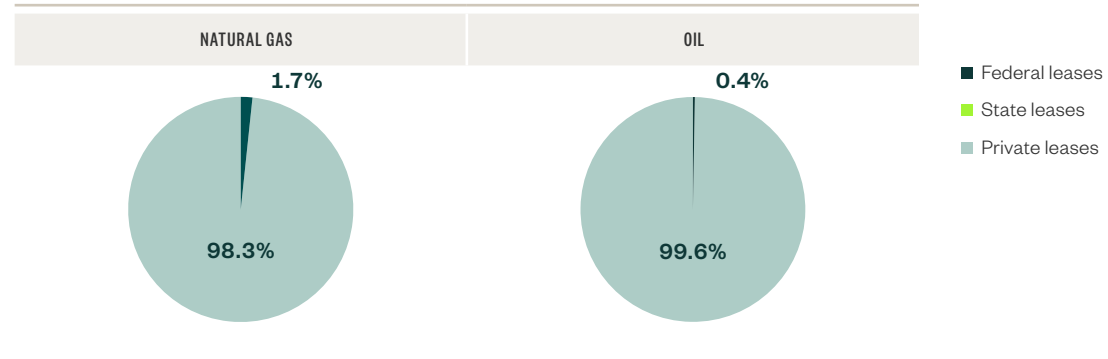
FIGURE 54: Estimated Production Value  
Kansas, FY2015–FY2018 (\$billion)



## PRODUCTION BY LAND TYPE

Nearly all of the oil and natural gas production in Kansas takes place on private land. For this reason, Kansas stands out as the counterexample to New Mexico.

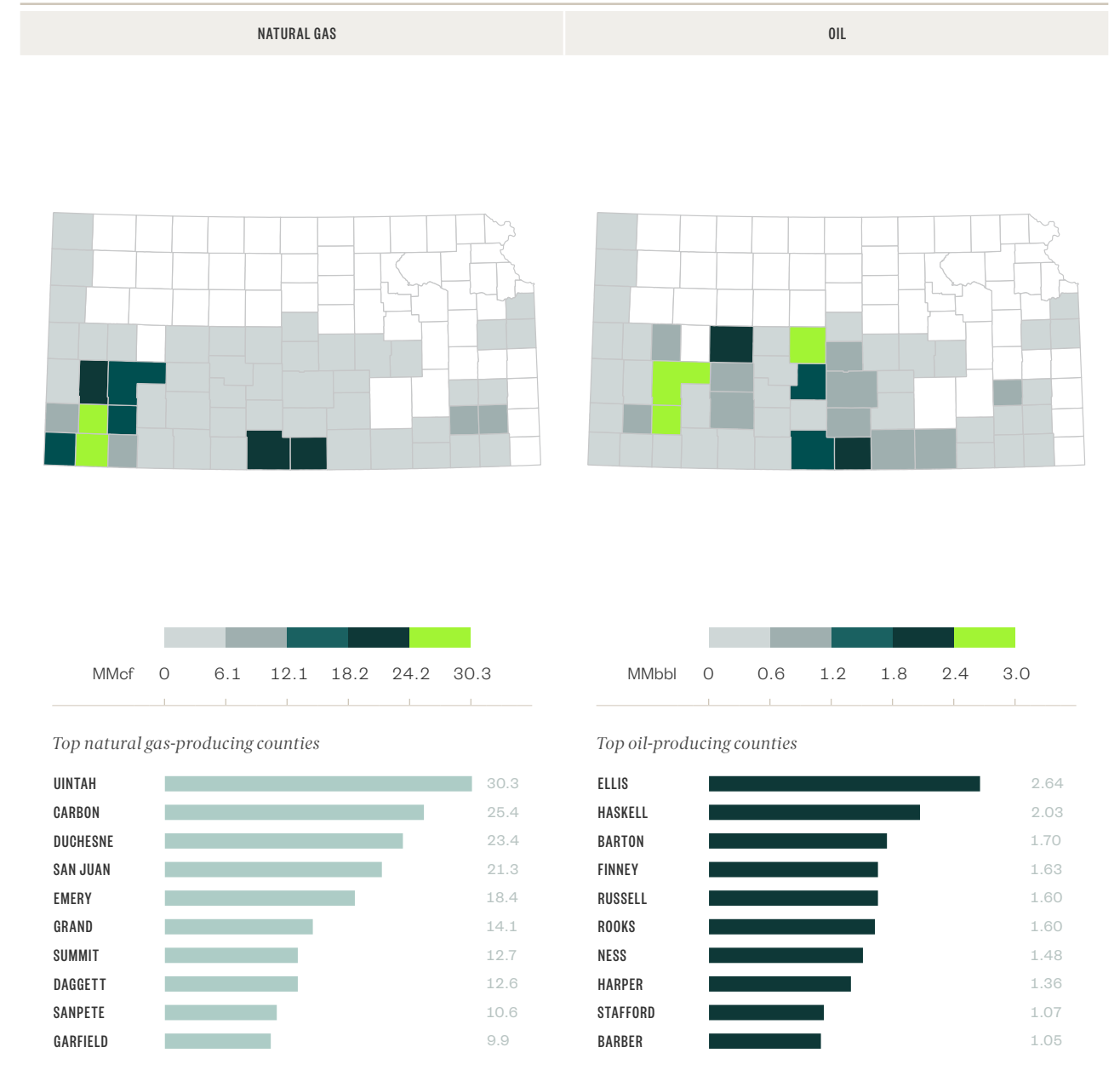
**FIGURE 55: Production by Land Type**  
Kansas, FY2018



## PRODUCTION BY COUNTY

Production of oil and natural gas is concentrated in the southwest quadrant of the state, but is reasonably extensive through the southern half of the state.

**FIGURE 56: Production Volumes by County**  
Kansas, FY2017



# REVENUE

## GOVERNMENT REVENUE CATEGORIES

### Taxes

The sole significant source of government revenue from oil and gas comes in the form of taxes. Kansas, like Texas, levies a property tax on the value of oil and gas reserves, which is the primary revenue source. Kansas also directly taxes oil and gas production in the form of oil and natural gas severance taxes. Sales and use taxes were estimated in the same manner as all other states.

### Land Income

Federal mineral leasing is the sole source of land income in Kansas, but produces a relatively nominal \$1.1 million in revenue (FY17).

### Investment Income

We identified no oil and gas-related investment income in Kansas.

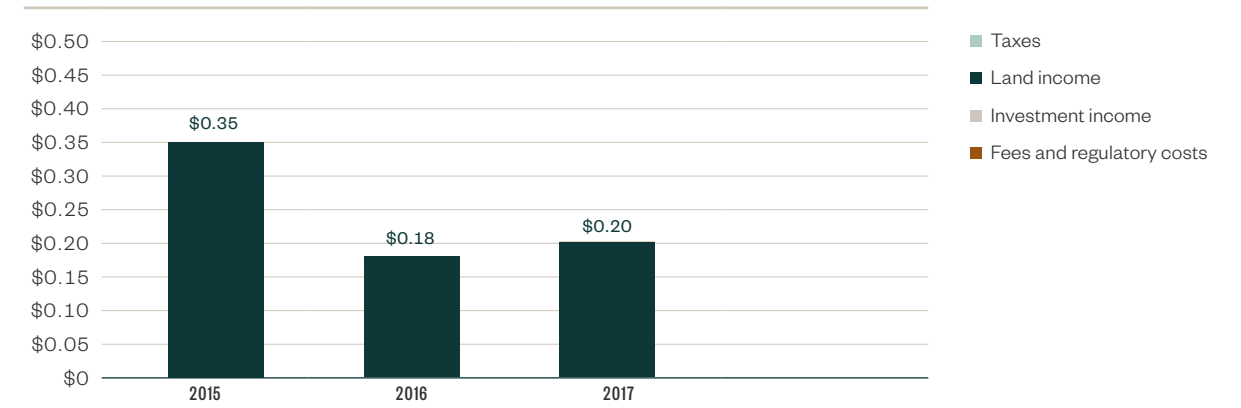
**TABLE 9: Government Revenue Sources, by Type and Program**  
Kansas, FY2015–FY2017 (\$million)

Category	Type	Name	2015	2016	2017
<b>Taxes</b>	Production Taxes*	Natural Gas Severance tax	34.2	11.3	17.8
		Oil Severance Tax	87.2	32.5	33.8
	Property Taxes	133.4	68.6	88.4	
	Sales & Use Taxes	47	31.6	37.2	
	Personal Income Tax	46.9	35.4	23.1	
<b>Land Income</b>	Federal Mineral Leasing	1.2	1	1.1	
<b>Investment Income</b>	No Permanent Fund Investment Income Identified		0	0	0
<b>TOTAL</b>			<b>349.9</b>	<b>180.4</b>	<b>201.4</b>

\* Available directly from state-published sources and don't require estimation.

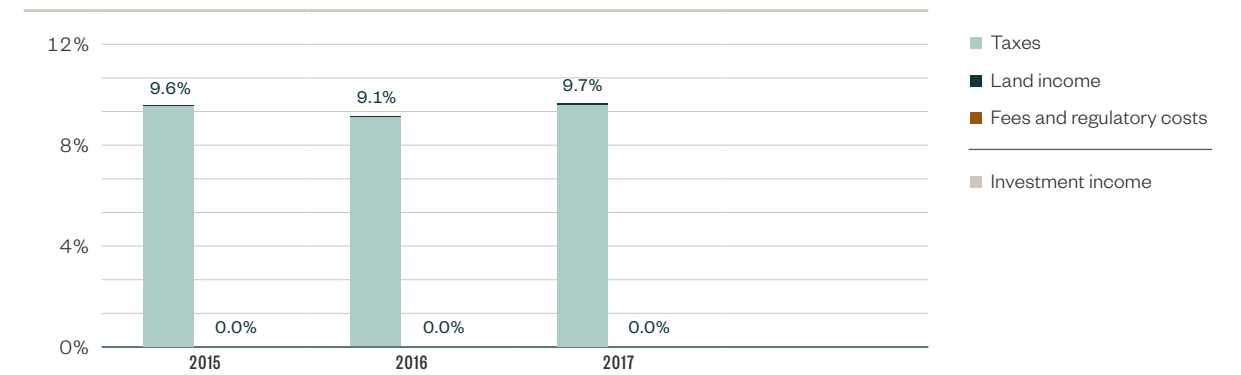
## SUMMARY OF KANSAS GOVERNMENT REVENUE

**FIGURE 57: Government Revenue by Category**  
Kansas, FY2015–FY2017 (\$billion)



## REVENUE AS A SHARE OF PRODUCTION VALUE

**FIGURE 58: Revenue as Percentage of Estimated Production Value**  
Kansas, FY2015–FY2017







STATE PROFILE:

# Montana


More than any state in the study—with the possible exception of Kansas—Montana’s oil and gas production volumes haven’t recovered from recent declines. As a result, Montana’s revenue from oil and gas-related sources is down considerably from peak levels. The development of nontraditional resources in other states through horizontal drilling and completion technology hasn’t provided the same opportunities seen in many of the producing areas investigated.

## PRODUCTION PROFILE

OIL

13<sup>TH</sup> LARGEST

OIL-PRODUCING STATE  
in the United States


Richland County 

largest oil-producing county

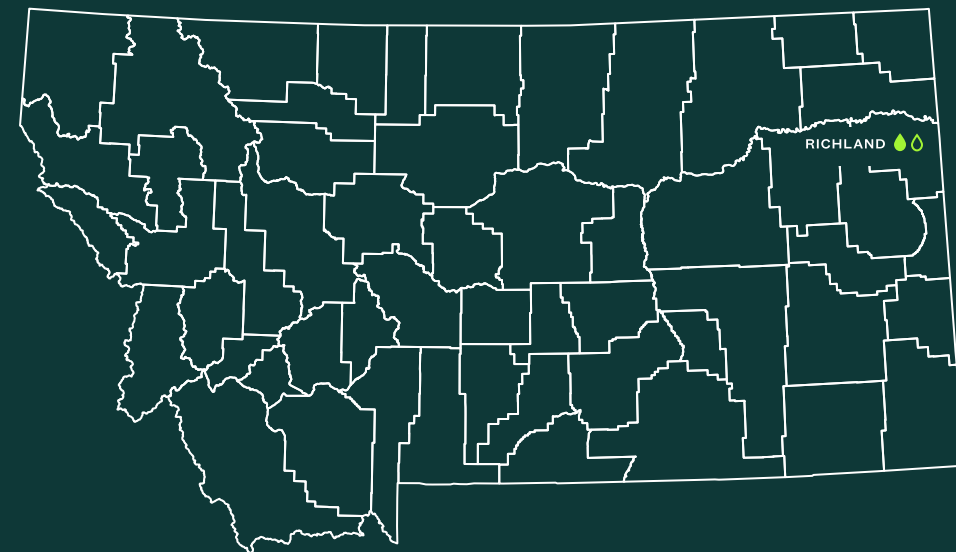
NATURAL GAS

20<sup>TH</sup> LARGEST

NATURAL GAS PRODUCER  
in the United States

Richland County 

largest natural gas-producing county

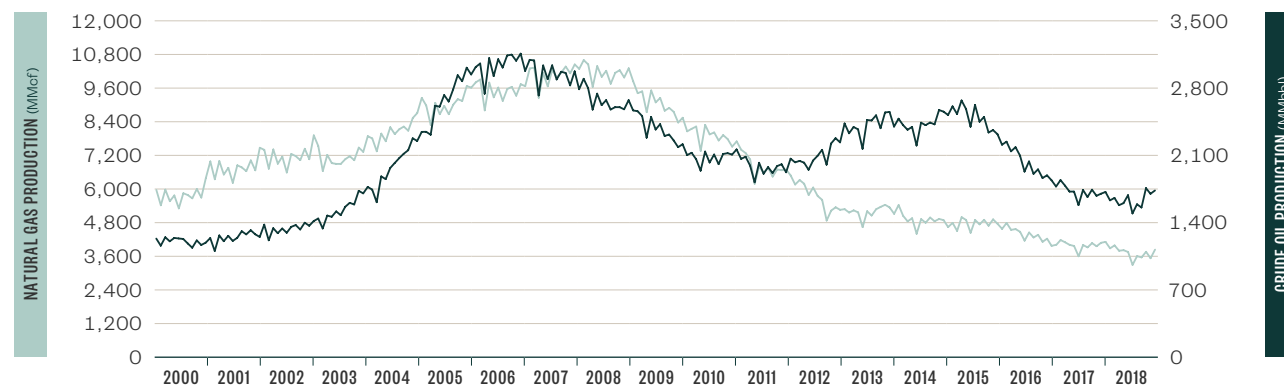


*These stats are accurate as of March 2019.*

## PRODUCTION VOLUMES AND VALUE

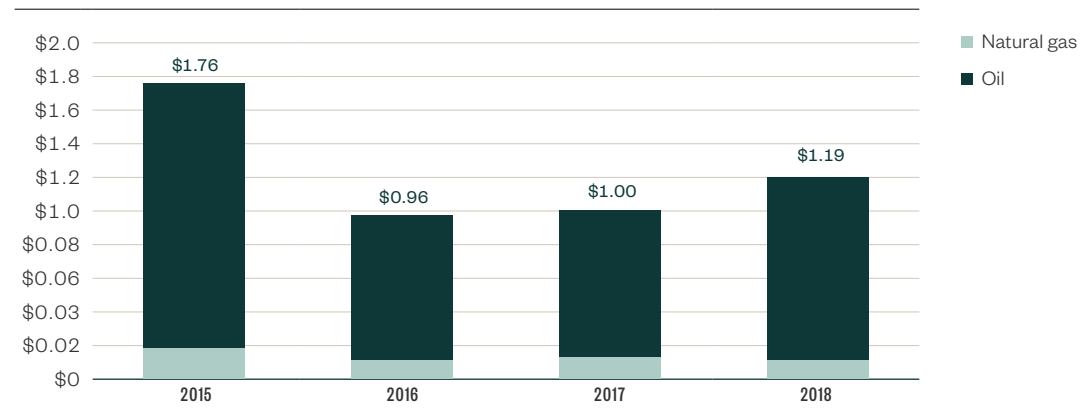
While natural gas production volumes continue to steadily decline from their peak in 2008, oil production is showing signs of a potential increase in late 2018, following steady declines from the recent peak in 2015. New development activities primarily address oil prospects, and oil is the more significant petroleum resource found in Montana.

**FIGURE 59: Production Volume**  
Montana, FY2000–FY2018



Production value has increased in the past several years, primarily on the strength of market prices, since the trough in fiscal year 2016. However, oil production value remains down by over 31% in fiscal year 2018 from fiscal year 2015, and natural gas production value is down nearly 40% over the same time period.

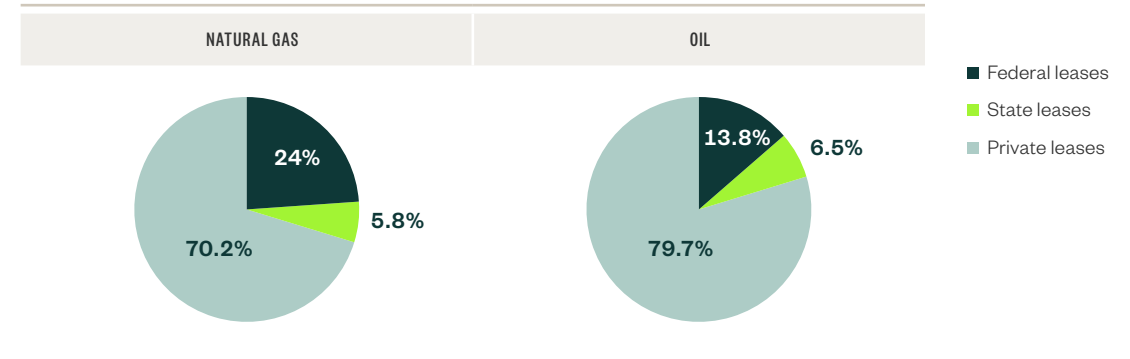
**FIGURE 60: Estimated Production Value**  
Montana, FY2015–FY2018 (\$billion)



## PRODUCTION BY LAND TYPE

Montana produces about 70% of its natural gas and 80% of its oil on private lands. Federal leases account for 24% of natural gas production and 14% of oil production.

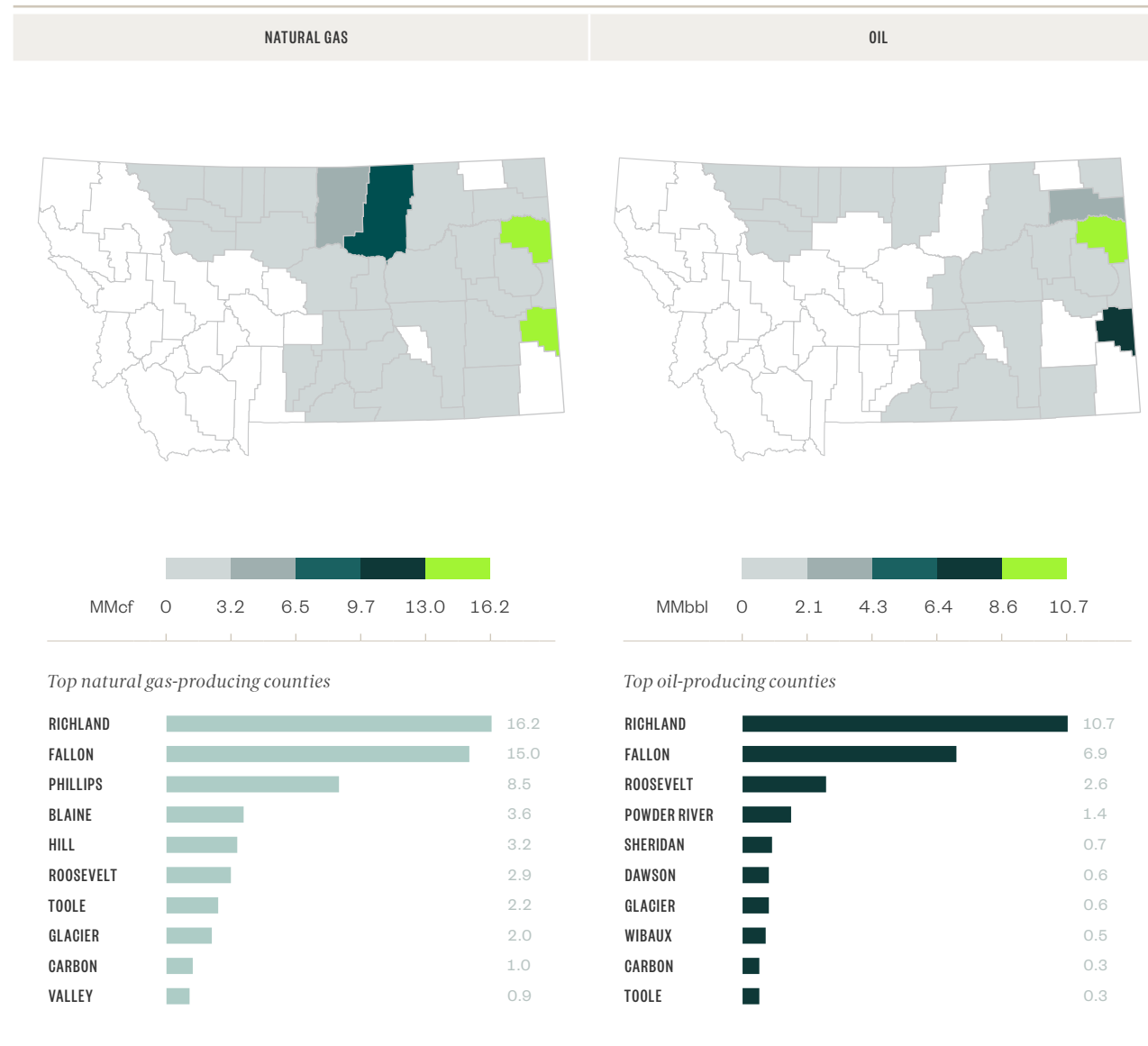
**FIGURE 61: Production by Land Type**  
Montana, FY2018



## PRODUCTION BY COUNTY

The eastern edge of Montana sits in the Bakken Shale formation, which has become one of the most important oil-producing regions of the country due to recent changes in extraction technology. Two counties, Richland and Fallon, are number one in both oil and natural gas production in Montana. Together, they account for about 69% of statewide oil production, and 53% of natural gas production.

**FIGURE 62: Production Volumes by County**  
Montana, FY2017



## REVENUE

### GOVERNMENT REVENUE CATEGORIES

#### Taxes

One distinguishing feature of Montana's tax regime is the absence of a sales and use tax.

#### Land Income

Montana receives a small amount of land income from both state and federal leases. While state royalties, rents, and bonuses have previously been significantly larger than revenue from federal mineral leases, in fiscal year 2017 they were roughly similar.

#### Investment Income

We couldn't identify any oil and gas-related investment income in Montana.

**TABLE 10: Government Revenue Sources, by Type and Program**  
Montana, FY2015–FY2017 (\$million)

Category	Type	Name	2015	2016	2017
<b>Taxes</b>	Production Taxes*	Oil and Natural Gas Production	188.4	95.4	100.2
	Sales & Use Taxes		0	0	0
	Personal Income Tax		32.7	24	27.8
<b>Land Income</b>	Federal Mineral Leasing	Federal Mineral Leasing	12.2	4.3	8.8
		Oil and Gas Royalties	14.8	7.9	7.5
	State Lands Rents, Royalties & Bonus	Oil and Gas Rents & Bonus	5.2	1.6	1.7
<b>Investment Income</b>	No Permanent Fund Investment Income Identified		0	0	0
<b>TOTAL</b>			<b>253.3</b>	<b>133.2</b>	<b>146</b>

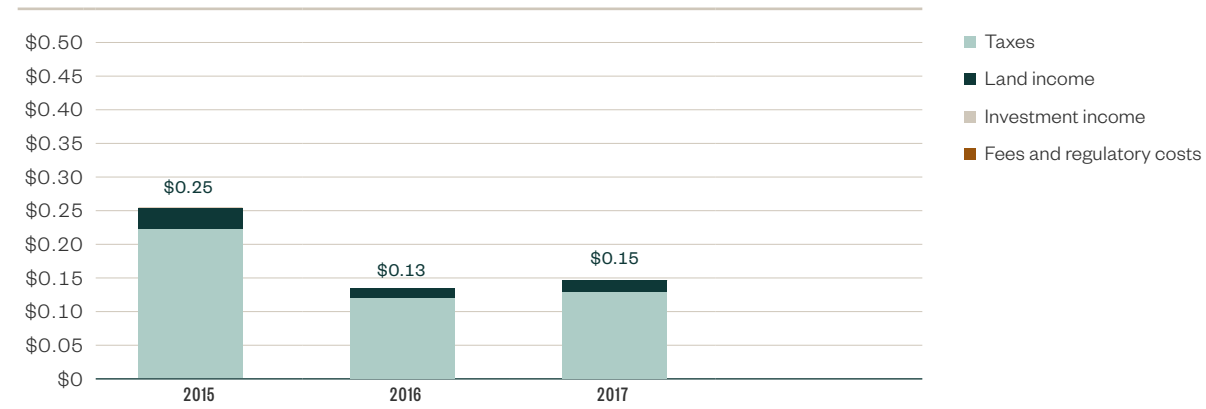
\* Available directly from state-published sources and don't require estimation.

# Appendix

## SUMMARY OF MONTANA GOVERNMENT REVENUE

In fiscal year 2017, Montana received about 87% of its oil and gas-related revenue from taxes, and the remaining 13% from land income. Revenue in fiscal year 2017 was about 56% of peak fiscal year 2015 revenue.

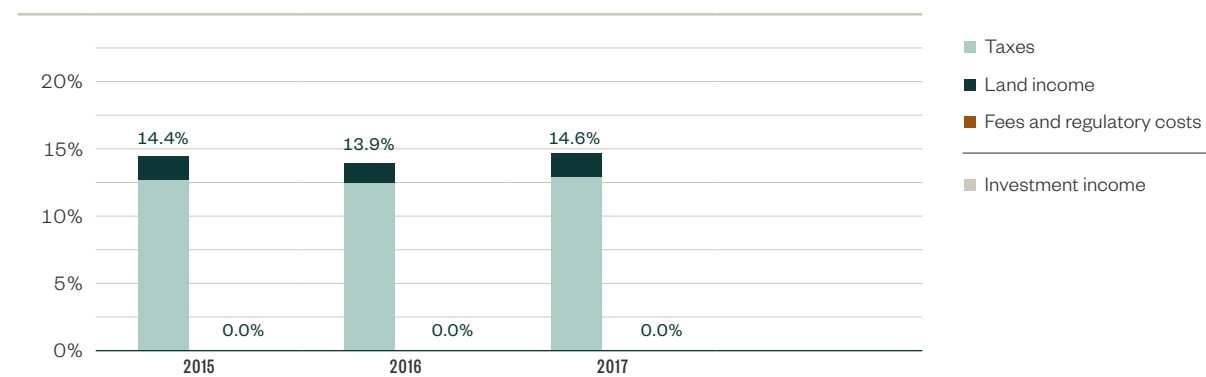
**FIGURE 63: Government Revenue by Category**  
Montana, FY2015–FY2017 (\$billion)



## REVENUE AS A SHARE OF PRODUCTION VALUE

Revenue as a share of production value increased in fiscal year 2017, largely based on price-based severance tax incentives in effect in fiscal year 2016.<sup>25</sup> In percentage terms, fiscal year 2017 revenue was similar to fiscal year 2015, though the dollar amount is much lower.

**FIGURE 64: Revenue as Percentage of Estimated Production Value**  
Montana, FY2015–FY2017



<sup>25</sup> "Production Tax Rates Imposed On Oil and Natural Gas - Exemption", 15-36-304, MCA



# SUMMARY OF FIGURES

## OVERVIEW

- 05 **FIGURE 1:** Oil and Natural Gas Production Value Chain
- 06 **FIGURE 2:** Study Area Map

## COMPARISONS BETWEEN STATES

- 12 **FIGURE 3:** Natural Gas Production Volume
- 13 **FIGURE 4:** Oil Production Volume
- 14 **FIGURE 5:** Natural Gas Production Value
- 15 **FIGURE 6:** Oil Production Value
- 16 **FIGURE 7:** Revenue as Percentage of Estimated Production Value
- 17 **FIGURE 8:** Tax Revenue as Percentage of Estimated Production Value
- 17 **FIGURE 9:** Land Revenue as Percentage of Estimated Production Value
- 18 **FIGURE 10:** Production Volume
- 18 **FIGURE 11:** Estimated Production Value
- 21 **FIGURE 12:** Government Revenue by Category
- 21 **FIGURE 13:** Distribution of Revenue

## NEW MEXICO

- 24 **FIGURE 14:** Production Volume
- 24 **FIGURE 15:** Estimated Production Value
- 25 **FIGURE 16:** Production by Land Type
- 26 **FIGURE 17:** Production Volumes by County
- 28 **FIGURE 18:** Government Revenue by Category
- 29 **FIGURE 19:** Revenue as Percentage of Estimated Production Value

## TEXAS

- 32 **FIGURE 20:** Production Volume
- 32 **FIGURE 21:** Estimated Production Value
- 33 **FIGURE 22:** Production by Land Type
- 34 **FIGURE 23:** Production Volumes by County
- 37 **FIGURE 24:** Government Revenue by Category
- 37 **FIGURE 25:** Revenue as Percentage of Estimated Production Value

## NORTH DAKOTA

- 40 **FIGURE 26:** Production Volume
- 40 **FIGURE 27:** Estimated Production Value
- 41 **FIGURE 28:** Production Volumes by County
- 43 **FIGURE 29:** Government Revenue by Category
- 43 **FIGURE 30:** Revenue as Percentage of Estimated Production Value

## OKLAHOMA

- 46 **FIGURE 31:** Production Volume
- 46 **FIGURE 32:** Estimated Production Value
- 47 **FIGURE 33:** Production by Land Type
- 48 **FIGURE 34:** Production Volumes by County
- 50 **FIGURE 35:** Government Revenue by Category
- 50 **FIGURE 36:** Revenue as Percentage of Estimated Production Value

## COLORADO

- 53 **FIGURE 37:** Production Volume
- 53 **FIGURE 38:** Estimated Production Value
- 54 **FIGURE 39:** Production by Land Type
- 55 **FIGURE 40:** Production Volumes by County
- 58 **FIGURE 41:** Government Revenue by Category
- 58 **FIGURE 42:** Revenue as Percentage of Estimated Production Value

## WYOMING

- 61 **FIGURE 43:** Production Volume
- 61 **FIGURE 44:** Estimated Production Value
- 62 **FIGURE 45:** Production Volumes by County
- 64 **FIGURE 46:** Government Revenue by Category
- 64 **FIGURE 47:** Revenue as Percentage of Estimated Production Value

## UTAH

- 67 **FIGURE 48:** Production Volume
- 67 **FIGURE 49:** Estimated Production Value
- 68 **FIGURE 50:** Production Volumes by County
- 70 **FIGURE 51:** Government Revenue by Category
- 70 **FIGURE 52:** Revenue as Percentage of Estimated Production Value

## KANSAS

- 73 **FIGURE 53:** Production Volume
- 73 **FIGURE 54:** Estimated Production Value
- 74 **FIGURE 55:** Production by Land Type
- 75 **FIGURE 56:** Production Volumes by County
- 77 **FIGURE 57:** Government Revenue by Category
- 77 **FIGURE 58:** Revenue as Percentage of Estimated Production Value

## MONTANA

- 80 **FIGURE 59:** Production Volume
- 80 **FIGURE 60:** Estimated Production Value
- 81 **FIGURE 61:** Production by Land Type
- 82 **FIGURE 62:** Production Volumes by County
- 84 **FIGURE 63:** Government Revenue by Category
- 84 **FIGURE 64:** Revenue as Percentage of Estimated Production Value

## APPENDIX

# DATA SOURCES

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## INDEX PRICES

### Natural Gas

Agua Dulce Hub Texas Natural Gas Spot Rate

Cheyenne Hub Natural Gas Spot Price

CIG Mainline South Rookies Natural Gas Spot Price

Colorado Interstate Gas Mainline Natural Gas Daily Spot Price

EIA Henry Hub Natural Gas Spot Price

El Paso Blanco New Mexico (San Juan Basin-non Bonded)

El Paso Natural Gas Waha Pool Natural Gas Spot Price

El Paso San Juan Bondad Station Spot Natural Gas Price

Gas Transmission Northwest Main Oregon Spot Natural Gas Price

Gulf Coast Natral Gas Spot Price/ ANR Southeast

Henry Hub Natural Gas Spot Price

Houston Ship Channel Natural Gas Daily Spot Price

Katy Texas Area Natural Gas Spot Price

Mid-Continent N. Natural Mainline Natural Gas Spot Price/ Demarc

Mid-Continent Natural Gas Spot Price/ NGPL Mid-Continent

Mid-Continent Natural Gas Spot Price/ Texas Oklahoma East

Natural Gas Carthage Texas Spot Price

Natural Gas Columbia Mainline/ Perryville Louisiana Spot Price

Natural Gas El Paso Permian Spot Price

Natural Gas Pipline Co./ NGL Amarillo Line Natural Gas Spot Price

Natural Gas Spot Price/ El Paso Blanco New Mexico (San Juan Basin)

Natural Gas Spot Price/ El Paso South Mainline

Natural Gas Transwestern Permian Basin Spot

Natural Gas Transwestern San Juan/ Thoreau Point Spot Price

Natural Gas Waha Hub Spot Price

Northwest Pipeline Rocky Mountain Pool/ Rockies Natural Gas Spot Price

Northwest Pipeline Wyoming Pool Spot Natural Gas Price

Oneok Gas Transportation OGT Natural Gas Spot Price

Panhandle Eastern Oklahoma Field Zone Natural Gas Daily Spot Price

Pine Prairie Hub Natural Gas Spot Price

Rocky Mountain Natural Gas Spot Price/ Kern River Opal Wyoming

Transwestern Pipeline Central Pool Natural Gas Spot Price

Tres Palacios Hub Natural Gas Spot Price

White River Hub Natural Gas Spot Price

### Oil

Nebraska Crude Oil West Posted Price

Oklahoma Crude Oil Crushing Sweet Posted Price

Plains Eagle Ford Light Crude Oil Posted Price

Plains North Louisiana Crude Oil Posted Price

Shell Williston Basin North Crude Oil Posted Price

Sunoco East Texas Sweet Crude Oil Posted Price

Sunoco Light Louisiana Sweet Crude Oil Posted Price

US Crude Oil Bakken Clearbrook MN Spot

US Crude Oil Bakken Guernsey

US Crude Oil Deepwater Southern Green Canyon Spot

US Crude Oil WTI Crushing OK Spot

US Crude Oil WTI Midland Spot

US Crude Oil WTI Posting-Plus Spread

US Crude Oil WTS Spot

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