A Research Paper by

The Impact of Federal Coal Royalty Reform on Prices, Production, and State Revenue

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ABOUT HEADWATERS ECONOMICS

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

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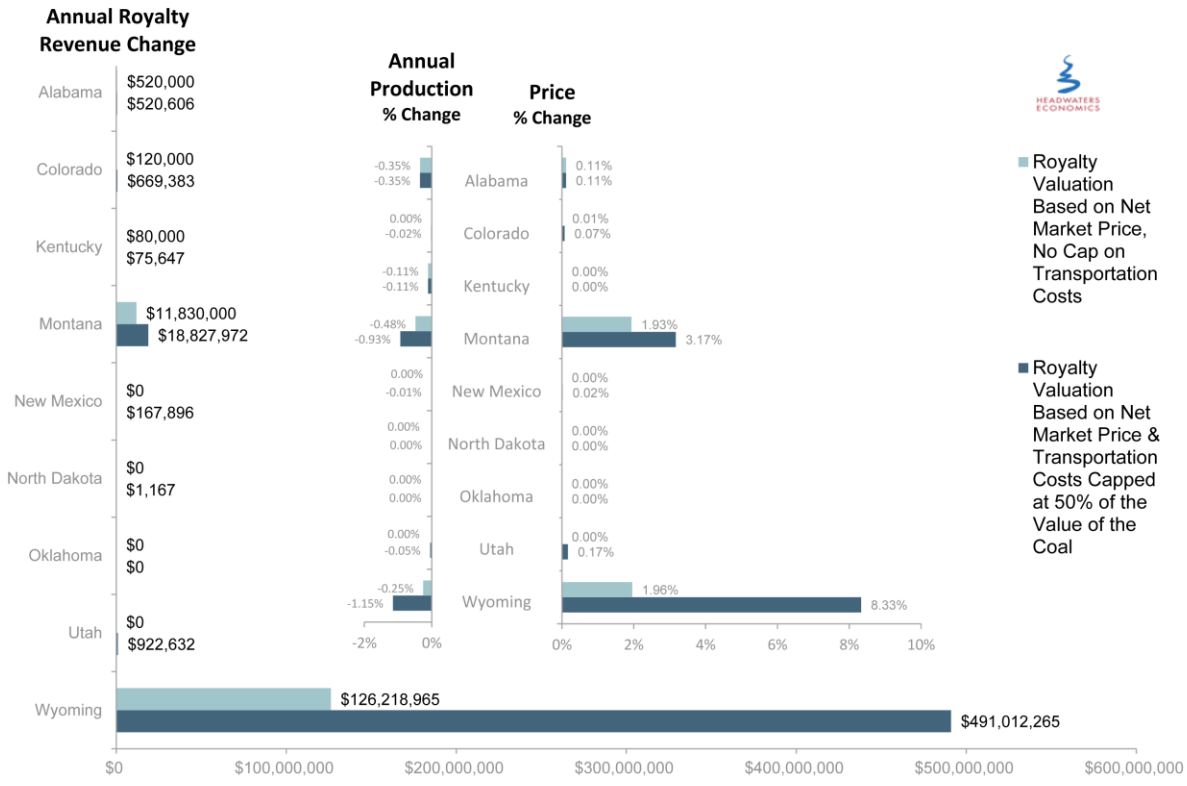
I. EXECUTIVE SUMMARY

The Office of Natural Resources Revenue (ONRR) of the Department of Interior has proposed to reform the way federal coal is valued for federal royalty assessment.[1] The proposed rule would change the method for determining the price used for valuation for non-arm's length sales of coal to simplify compliance for industry and compliance review for ONRR. The proposed rule would use arm's length transactions to value coal for royalties for both arm's length and non-arm's length sales.

The proposed rule also asks for additional comment about how the regulation could be finalized, including what alternative methods might be used to value coal sold in non-arm's length sales,[2] and whether transportation cost deductions should be limited.[3]

This report presents data and analysis that evaluate the revenue, price, and production implications of federal royalty reform on coal deliveries to the domestic power sector. We model three scenarios for how the final rule could be implemented: 1.) valuing coal based on the first arm's length sale price, 2.) valuing coal based on delivered prices net of transportation costs, and 3.) valuing coal based on delivered prices net of transportation costs, which are capped at 50 percent of the value of coal. Scenario One is not expected to change revenue, production, or price. The results of Scenarios Two and Three are shown in Figure 1 in terms of revenue, delivered prices, and production changes had reforms been in place from 2008 to 2013.

Figure 1: Changes in Royalty Revenue, Coal Production, and Coal Price from Two Federal Coal Royalty Reform Scenarios



Scenario One, proposed by ONRR, would have no effect on revenue, prices, or production.

We find that changes in federal royalty policy could have substantial revenue benefits for federal and state governments with limited impact on coal production or prices on federal lands. Specifically:

- If the rule is implemented using net delivered prices to reveal the value of federal coal for royalty assessment, royalty revenue could increase by $139 million annually (a 20% increase), with 91 percent of new revenue generated in Wyoming. On average, gross delivered prices would rise by $0.28 per ton, or a 1.6 percent increase. Demand for coal for the domestic power sector would fall by nearly 1 million tons annually, a 0.2 percent decline.

- If transportation cost deductions were limited to 50 percent of the net delivered price of coal, revenue would increase by $512 million annually (a 73% increase) with 96 percent of the additional revenue coming from Wyoming. On average, gross delivered prices would rise by $1.17 per ton, or a 6.7 percent increase. Demand for coal for the domestic power sector would fall by 4.3 million tons, a 1 percent decline.

At the state level, higher federal royalty distributions to the states outweighs declines in state tax revenue that would occur due to tax interactions that lower the taxable value of state severance taxes where royalties are deductible expenses, and from the small declines in production. Overall, the largest changes in revenue, price, and production are expected to occur in Montana and Wyoming. Montana could receive between $5.1 and $8.8 million in additional annual revenue. Wyoming could receive between $58 and $234 million in additional annual revenue.

Because of significant data limitations, we do not have price statistics on arm's length and non-arm's length sales from ONRR to analyze the outcomes of reforms that would use the first arm's length transaction price. Results for the other two scenarios are only robust for Montana and Wyoming, where the large majority of sales from mines with active federal leases are to the domestic power sector. The results for the other states with active federal leases–Alabama, Colorado, Kentucky, New Mexico, North Dakota, Oklahoma, and Utah–are less robust.

Concerns with the current regulation related to coal royalty valuation include: that the current regulation is unwieldy for industry and ONRR to follow; that the current regulation lacks transparency; and that the current regulation is outdated and changes in the coal market may have led to undervaluation of federal coal in some instances. For example, companies have arguably exploited a loophole that allows mines to transfer coal for low mine prices to affiliates who then remarket coal to consumers at the higher full commodity value of the coal.

Reforms that would utilize the first arm's length sale price would address the first concern by using contract prices for royalty valuation. However, the challenges associated with this analysis speak to the opaque nature of the current regulation and this reform would do little to add transparency. ONRR's assessment that proposed reforms would not generate additional revenue suggests arm's length price reforms would not effectively close the "affiliate" loophole. This is at least partially due to the fact that the loophole would remain open for independent brokers.

Further reforms that would use net delivered prices would lead to greater transparency by revealing to the public the prices used for royalty valuation. These reforms also appear to be the most efficient and effective way to value federal coal for royalty assessment without introducing new distortions with regard to contract and sale structures.

We hope these data and analysis will be useful to decision makers, states and communities seeking to understand the likely outcome of changes to federal coal royalty regulations, and the impact these changes are likely to have on governmental revenue and on coal prices and production.

II. INTRODUCTION

Coal extracted from federal land is an important source of energy and revenue in the United States. Bonus payments and royalty revenue from minerals extracted from public lands and waters represent the largest non-tax source of income for the federal government. Distributions of federal royalty revenue to states and state and local severance taxes also make up a significant share of revenue for coal-producing states.

The U.S. government owns roughly 1/3 of total coal reserves. Production from federal leases has increased steadily from a low of about 3 percent of all mining in 1960 to 43 percent of total domestic coal production in 2014. The increase in federal coal production was ushered in by a shift toward large western surface mines—80 percent of federal production now comes from the Powder River Basin in Wyoming and Montana.[4]

Despite the importance of coal revenue streams and the large share of coal extracted from federal leases, little information is available to describe accurately the return to the public from taxation of federal coal resources. The Bureau of Land Management (BLM) and the Office of Natural Resources Revenue (ONRR) administer the federal coal-leasing program and have multiple and diverse objectives: a fair return for U.S. taxpayers, economic development and jobs, energy costs and security, and environmental protection.

Recent reports from the U.S. Government Accountability Office (GAO)[5] and the Department of Interior (DOI) Inspector General[6] raised issues with the BLM's leasing program and the royalty valuation process. Concerns raised include: that the current regulation is unwieldy for industry and ONRR to follow; that the current regulation lacks transparency; and that the current regulation is outdated and changes in the coal market may have led to undervaluation of federal coal in some instances.

The Office of Natural Resources Revenue (ONRR) of the Department of Interior has proposed to reform the way federal coal is valued for the purpose of assessing federal royalties.[7] The proposed rule would change the method for determining the price used for valuation for non-arm's length sales of coal. In the current regulation, ONRR defines five benchmarks that industry follows sequentially to determine the gross value of coal sold in non-arm's length transactions that should be used for royalty valuation. The proposed rule would replace the benchmarks with the single method of using arm's length transactions in all cases to value coal for royalties. The rule is intended to simplify industry compliance and compliance review for ONRR.

The proposed rule asks for additional comment on additional ways that federal coal could be valued for royalty purposes and whether transportation costs should be limited. Specifically, the rule asks: "What other methodologies might ONRR use to determine the royalty value of coal not sold at arm's length that we may not have considered?;" and "…whether we should limit coal allowances to 50 percent of the value of the coal."

This report presents data and analysis that evaluate the revenue, price, and production implications of federal royalty reform on coal deliveries to the domestic power sector. In the next section, we provide an overview of the current federal royalty regulations as they relate to coal valuation. Next, we describe the data and methods used to evaluate the implications of federal royalty reform on revenue, delivered prices, and production. We define three scenarios for how the final regulation could be implemented including valuing coal based on the first arm's length transaction, valuing coal using net delivered prices and a limit on transportation deductions equal to 50 percent of the value of coal. The

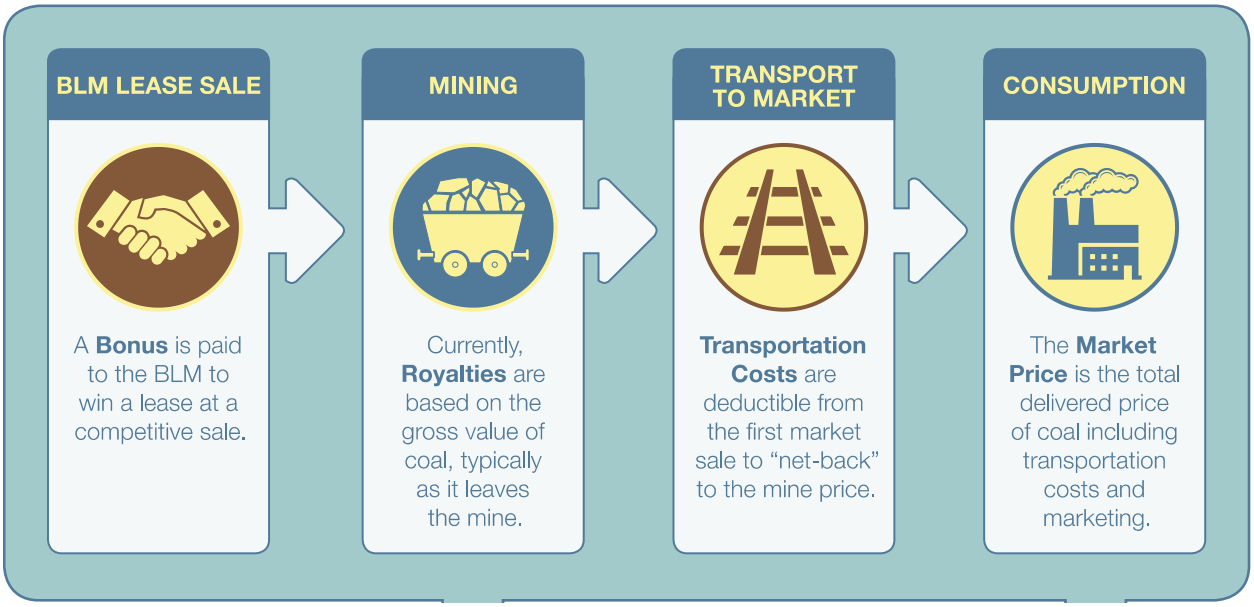
next section describes the results and in the Conclusion we offer some thoughts on what the findings mean for reforms.

Coal Fiscal Policy Primer

Coal extracted from federal leases will pay a variety of royalties, bonus payments and local, state, and federal production taxes on the value or volume of coal. Figure 2 shows the current fiscal policy related to federal coal leasing. Lessees first pay a "bonus" to secure a federal lease at a competitive lease sale. Once production on federal leases begins, royalties are paid on the actual value of production, defined as the gross value of coal FOB (or "freight on board") at the mine.[8] "Downstream" from the mine, the coal is transported primarily by railroad, but also by truck, waterway, and conveyor belt to a domestic power plant, industrial consumers, or exported to foreign markets depending on its energy content and other qualities.

The market price or gross delivered price (the price paid by the consumer) is the gross value of coal and transportation costs. We find that often the market price less transportation costs is higher than the value of coal sold at the mine. The difference is an estimate of the portion of the value of coal captured by affiliated and independent coal brokers that is currently not exposed to royalties but could be if the final regulation defines the net delivered price as the gross value of coal for royalty assessment.

Figure 2: Current U.S. Coal Royalty Structure



In addition to federal bonus payments and royalties, coal extracted from federal leases will also pay state severance taxes. State severance taxes are paid on all coal extracted, or "severed" from the earth in each state. Industry also pays corporate income taxes on profits earned, and the general tax structure in each state will levy a mix of sales taxes, property taxes, charges for services, and fees on the economic activity associated with coal mining. The sidebar *"Revenues from Oil, Natural Gas, and Coal Production on Federal Lands"* on the next page defines the several bonuses, royalties, and taxes coal companies pay.

Taken together, royalties and state severance taxes are the largest source of revenue from coal mining, greatly outstripping taxes on the related economic activity, including sales taxes, property taxes, and income taxes.

About half of federal coal royalty collections are distributed back to the state where the coal is extracted. States use these revenues and revenue from state taxes for a variety of purposes. In this report, we describe how these revenues are allocated to state governments, local governments, and to permanent savings.

State governments typically retain the largest share of royalty and production tax revenue from coal extraction. A large share of these dollars is directed to state General Funds and is used to support state operating budgets and basic governmental services. Some portion is also typically allocated to specific uses, including education, infrastructure projects, and environmental funds.

Each state allocates a share of revenue to local governments. In Colorado, Utah and Wyoming, local governments tax the value of coal directly through the local property tax structure. In other states including Montana, North Dakota and New Mexico, the state levies a severance tax in lieu of local taxation and makes direct distributions to local governments where coal is extracted. Several states, including Colorado and Wyoming also use state severance tax revenue to fund local impact grant programs.

Finally, some states save a portion of annual coal revenue in permanent trusts. Montana allocates half of the state severance tax to the Coal Tax Trust Fund. Wyoming and New Mexico also utilize permanent funds to invest a portion of the annual revenue to provide a lasting fiscal legacy from the depletion of non-renewable resources. The income earned from these funds are also used for a variety of purposes, including community impact assistance programs and deposits to state General Funds.

One of the purposes of this report is to describe the change in revenues states could expect from federal reforms. Because these revenues will come from different sources (higher distributions of federal coal royalties and lower state production taxes) we also track how the allocation of revenue to state and local governments and investments in permanent savings may change.

Revenues from Coal Production on Federal Lands

Bonus Payments and Rents: Companies pay bonuses (a premium paid to the BLM to win a leasing contract to mine in a specific area) through the competitive leasing process, and fees or rents to maintain a lease. Bonuses are one-time payments generally calculated on a price per ton basis. Rental payments are charged on a per acre basis and are paid annually to maintain the lease.

Royalties: Royalties are production taxes paid on the volume or value of coal extracted annually to the owner of the resource, including federal, tribal, state, and private landowners. Federal royalties are paid to the U.S. Treasury, and roughly half are returned to the states where drilling takes place. Federal royalties are 12.5 percent for surface coal, oil and natural gas; 18.75 percent for offshore oil and natural gas; and 8 percent for coal extracted from underground mines. Most states charge higher royalties of 16.67 to 25 percent on oil and natural gas while state coal royalty rates tend to mirror federal coal royalty rates.

State Production Taxes: A production tax is any tax levied against the production value or volume of coal, oil, and natural gas extracted or "severed" from the earth. Montana levies a severance tax, a gross production tax in lieu of local government property taxes, and the Resource Indemnity Tax.

Federal Production Taxes: The federal black lung excise tax and abandoned mine fees are levied at a fixed rate on each ton of coal extracted.

Corporate Income Taxes: Production taxes and royalties are distinct from corporate income taxes levied on net profits. The federal corporate income tax rate is 35 percent and Montana's state corporate income tax is 6 percent. Compared to production taxes, bonus payments, and royalties, corporate income tax is paid on a smaller tax base (net profit compared to gross production value), and generates relatively less revenue for the federal and state governments.

General Taxes and Fees on Mining Activity: State and local governments also levy taxes and fees on the value of labor, purchases, land, and equipment associated with drilling and mining activities. These include sales, property, and personal income taxes, charges for services, license and permit fees, and other miscellaneous revenue. The general tax structure can be important to local governments, but the role they play varies from state to state. Revenue generated from the general tax structure is relatively small compared to federal royalty distributions and state production taxes.

III. DATA AND METHODS

In this section, we describe the data and methods used to estimate the likely implications of the proposed rule on revenue, prices and production.

Three Reform Scenarios

The proposed rule considers reforms to federal coal royalty valuation that would clarify that coal sold thorough non-arm's length sales will be valued for royalties using the price received at the first arm's length (or market) transaction net of allowable transportation and washing costs. Under the current regulation, the lessee follows a sequential set of five benchmarks to determine the price to use for royalty valuation. The proposed regulation would eliminate the benchmarks in favor of using the first arm's length sale price for royalty valuation in all instances.

The rule also asks additional questions, including: "What other methodologies might ONRR use to determine the royalty value of coal not sold at arm's length that we may not have considered?;" and "…whether we should limit coal allowances to 50 percent of the value of the coal."[9]

In a previous report we proposed that ONRR use net delivered prices (or market prices) to value coal for royalty assessment. In theory, the gross commodity value of coal is the delivered price less transportation costs. Using net delivered prices reveals the gross commodity value of coal required for federal royalty valuation. This reform would improve transparency and provide a consistent and fair valuation method for all sales of federal coal without regard to the sale structure.

Lessees would be required to pay royalties on the same delivered price whether they market coal directly to consumers, transfer coal to affiliates, or sell at the mine to independent coal brokers. In the majority of sales where mines and affiliates are marketing coal directly to consumers, the net delivered price is known. When delivered prices are unknown to the lessee, they would be required to report delivered prices for similar sales based on their own marketing contracts, prices reported for deliveries to regulated utilities, and spot market and index prices for coal sold into similar markets. Mines would add the additional royalty liability to the first arm's length sale price when this price is not to a consumer.

We also consider the revenue, price and production effects of limiting transportation cost deductions to 50 percent of the value of coal.

Estimating Changes in Royalty Revenue

We model three scenarios for how the final rule could be implemented: valuing coal based on the first arm's length sale price; valuing coal based on net delivered prices; and responding to the second question asked by the proposed rule, a cap on transportation deductions equal to 50 percent of the value of coal.

In order to model the outcomes of these scenarios, we require data on freight-on-board (FOB) prices used for royalty valuation under the current regulation, royalty rates applied to federal coal sales, and delivered price and transportation costs for sales to the domestic power sector.

Information regarding federal production, sales value and reported prices are from ONRR.[10] These data are used to estimate current prices used for royalty valuation and average royalty rates applied to federal coal in each state.

Dividing total coal sales value by the sales volume reveals the current FOB price at the mine used for royalty valuation. Dividing royalties due by the total sales value reveals the average royalty rate. Royalty rates are set at a minimum of 12.5 percent of the gross value of coal extracted from surface mines and 8 percent for coal extracted from underground mines. Coal lessees can apply for a royalty rate reduction if the current royalty rate imposes economic hardship that would otherwise result in abandoning the lease, or in less than full recovery of leased coal.[11] Table 1 shows reported prices and royalty rates for federal coal extracted between 2008 and 2013.

Table 1: Sales Volume, Sales Value, Royalties, and Reported Royalty Rate, 2008-2013

State	Sales Volume (tons)	Sales Value	Royalty Payment Due	Royalty Per Ton	Reported Price	Reported Royalty Rate
Alabama	10,247,787	$ 522,147,639	$ 37,867,926	$3.70	$50.95	7.3%
Colorado	131,470,351	$ 5,520,508,089	$ 337,536,012	$2.57	$41.99	6.1%
Kentucky	1,269,656	$ 99,528,263	$ 7,457,101	$5.87	$78.39	7.5%
Montana	163,732,383	$ 2,484,233,697	$ 293,172,400	$1.79	$15.17	11.8%
New Mexico	30,853,083	$ 1,522,423,690	$ 77,073,304	$2.50	$49.34	5.1%
North Dakota	19,746,655	$ 336,468,928	$ 7,498,851	$0.38	$17.04	2.2%
Oklahoma	4,249,094	$ 216,007,519	$ 5,532,999	$1.30	$50.84	2.6%
Utah	83,541,665	$ 3,030,170,335	$ 208,244,898	$2.49	$36.27	6.9%
Wyoming	2,648,832,479	$ 33,574,704,628	$ 4,126,196,048	$1.56	$12.68	12.3%
Total	**3,093,943,153**	**$ 47,306,192,788**	**$ 5,100,579,536**	**$1.65**	**$15.29**	**10.8%**

*Royalties per ton, reported price, and royalty rate are weighted averages.

Data on market prices, transportation costs and quantities delivered to the domestic power sector are from the Energy Information Administration (EIA) 923 reports.[12] Additional price and transportation cost estimates were downloaded from SNL Financial, a data subscription service that provides energy industry data, including estimates for delivered prices and transportation costs to unregulated utilities and power plants. Royalty rates are calculated from reported prices and royalties due to ONRR.

Net delivered prices and transportation costs are estimated only for deliveries to the domestic power sector from mines with active federal leases during the assessment period 2008 to 2014. EIA and SNL energy data include the Mine Safety and Health Administration (MSHA) ID for all coal deliveries, identifying the mine where the coal is sourced. These MSHA IDs are matched to a table correlating BLM lease IDs with the MSHA ID of the associated mines. Table 2 shows delivered prices and transportation costs uses in this report, and Appendix A provides more detailed methods on how net delivered prices are calculated.

Table 2: Weighted Average Delivered Prices and Transportation Cost for Coal Sales to the Domestic Power Sector, 2008-2013

	All Coal Deliveries to the Power Sector				Coal Deliveries from Mines with Federal Leases			
State	Thousand Tons	Transportation Cost	Delivered Price	FOB Mine Price	Thousand Tons	Transportation Cost	Delivered Price	FOB Mine Price
Alabama	40,371	$15.93	$77.14	$61.21	1,260	$ 18.36	$ 83.50	$ 65.13
Colorado	140,923	$12.05	$53.63	$41.57	138,570	$ 12.20	$ 53.92	$ 41.73
Kentucky	503,924	$16.47	$73.14	$56.67	1,483	$ 24.32	$ 126.07	$ 101.75
Montana	176,488	$10.08	$30.71	$20.63	137,901	$ 8.59	$ 30.23	$ 21.64
New Mexico	161,305	$4.88	$36.80	$31.92	82,412	$ 6.70	$ 41.89	$ 35.19
North Dakota	158,484	$0.73	$17.05	$16.32	158,484	$ 0.73	$ 17.05	$ 16.32
Oklahoma	3,069	$4.32	$35.88	$31.56	2,803	$ 4.27	$ 33.21	$ 28.93
Utah	118,960	$11.27	$42.21	$30.94	112,036	$ 11.62	$ 42.52	$ 30.89
Wyoming	2,809,267	$15.96	$31.30	$15.34	2,573,019	$ 16.04	$ 31.54	$ 15.50
Total	**4,112,791**	**$14.47**	**$37.60**	**$23.13**	**3,207,965**	**$ 14.39**	**$ 32.45**	**$ 18.05**

*Transportation cost, delivered price, and FOB mine price are weighted averages.

We find differences between the FOB mine price reported to ONRR for royalty purposes and the net market price estimated using published delivered prices and transportation costs. This difference between the reported price and the net market price is an estimate of the commodity value of coal that would be exposed to royalties if the price used for valuation is changed from the value of coal FOB to the commodity value of coal delivered to the ultimate consumer.

However, we do not find differences in every state. The most likely explanation is that withholdings from ONRR do not allow for a careful assessment of price differences for federal coal sales into different markets. ONRR only reports the gross value of all coal sales from federal leases in each state on an annual basis. The value of sales from federal leases will vary based on the qualities of the coal and the market coal is sold into. In general, sales to the domestic power sector receive prices lower than sales to industrial consumers, including coke plants, and export sales. As a result, our results are only robust for states where the large majority of sales from mines with active federal leases are to the domestic power sector. This is true of Montana and Wyoming. The results for the other states are less robust and we do not have data sufficient to analyze the implications of additional reforms in New Mexico, North Dakota, Oklahoma, and Utah.

Scenario One: Arm's Length Sale Prices

The formula to estimate the likely change in royalty revenue for Scenario One is:

Royalty revenue = (first arm's length price - non-arm's length price) * royalty rate

The non-arm's length sale price is the value of coal determined by the current regulation for non-arm's length sales. The first arm's length price is the price that would be used for royalty valuation if the rulemaking is implemented. The royalty rate is the rate applied to each lease, including any royalty rate reductions.

Due to data limitations, we cannot describe the difference between the current prices and prices that would result from valuation using arm's length sales.

Scenario Two: Net Delivered Prices

Scenario Two would determine valuation of federal coal using delivered prices. The net delivered price for deliveries to the domestic power sector is the price paid by a power plant, net of allowable transportation and washing costs. The net delivered price reveals the gross commodity value of federal coal required for royalty valuation.

The formula to estimate the likely change in royalty revenue for Scenario Two is:

Royalty revenue = ((net delivered price – reported price) * tons) * royalty rate

The net market price is the cost of coal delivered to power plants less transportation costs. The reported price is the current value of coal at the mine reported to ONRR for royalty valuation inclusive of all arm's length and non-arm's length sales. Tons are the volume of coal extracted from federal leases and delivered to the domestic power sector.

Scenario Three: Transportation Deductions Capped

Scenario Three considers a cap on these transportation allowances equal to 50 percent of the value of coal.

Royalty revenue = ((transportation costs – (net market price * .5)) * tons) * royalty rate

Transportation costs are the cost of delivering coal from a mine to a domestic power plant.

We assume that the cap on transportation costs only has an effect if the rule is implemented using net delivered prices for royalty valuation. ONRR data shows that the value of transportation and washing deductions combined account for only 0.3 percent of total sales value of coal for all federal coal sold from leases sold since 1990.[13] Under the current regulation, capping transportation costs at 50 percent of the value of coal would result in no additional royalty revenue or cost.

Because Scenario One values coal using the FOB price at the mine, we also assume that transportation costs would remain a small portion of the gross value of coal and a limit on transportation allowances would not result in additional royalty liability. In cases where coal is marketed downstream (remote from the lease) by affiliated brokers, a cap on transportation costs may simply provide a strong incentive to restructure sales so that the consumer takes possession of coal at the lease and is responsible for transporting coal from the mine to the power plant.

Price and Production Effects

An increase in federal royalty revenue is expected to raise the price of delivering coal to domestic power generators and to reduce demand for coal due to competition with natural gas in electricity markets, resulting in lower levels of production. While the direction of change in prices, quantities and revenues is straightforward, the focus of this paper is the associated magnitudes of those changes.

A portion of higher costs to deliver coal to markets may be shifted forward as a higher delivered price, and a portion will be shifted backwards, meaning mines will receive a lower net price for the commodity value of coal.[14] The portion of price that is shifted forward will change the demand for coal due to substitution for natural gas in the power sector.

To estimate the magnitude of the changes in prices and production associated with the policy changes considered, we constructed a partial equilibrium model of the coal market. The equilibrium condition describes the amount of coal demanded at the current price. Changing the point of royalty valuation or the extent to which transportation costs are deductible will result in a marginal increase in the cost of delivering coal to consumers. The model uses data on quantities, prices, transportation costs and elasticities of supply and demand to predict the how the marginal change in the delivery cost affects prices, quantities, and revenue collections.[15]

State Tax Interactions

In addition to federal royalties, states levy a variety of severance taxes and local government ad valorem taxes on the value of coal, and corporate income taxes at the federal and state level on net profits. Changes in the price and production volume of coal will have an effect on the taxable value used for severance tax collections, and on net profits used for corporate income tax liability.

In several instances, royalties paid to federal, state, and tribal governments are exempt from the taxable value. Reform to federal royalty valuation policy that results in higher federal revenue would result in additional reductions to the taxable value for these state and local taxes.

Appendix B shows relevant state and local government severance (production) taxes in each state, including how taxable value is defined, the tax rate, and relevant deductions and exemptions. These data are used to model the change in severance tax revenue.

Corporate income taxes are levied at the federal and state level. The federal statutory rate is 35 percent and states levy rates ranging from zero (Wyoming) to 7.3 percent in New Mexico.[16] These statutory rates indicate tax liability before accounting for a variety of deductions and benefits in the tax code. For example, coal mining companies can expense exploration and development costs and capital costs can be recovered using percentage depletion.[17] The U.S. Government Accountability Office (GAO) recently estimated the average U.S. corporate income tax across all industries at 17 percent.[18]

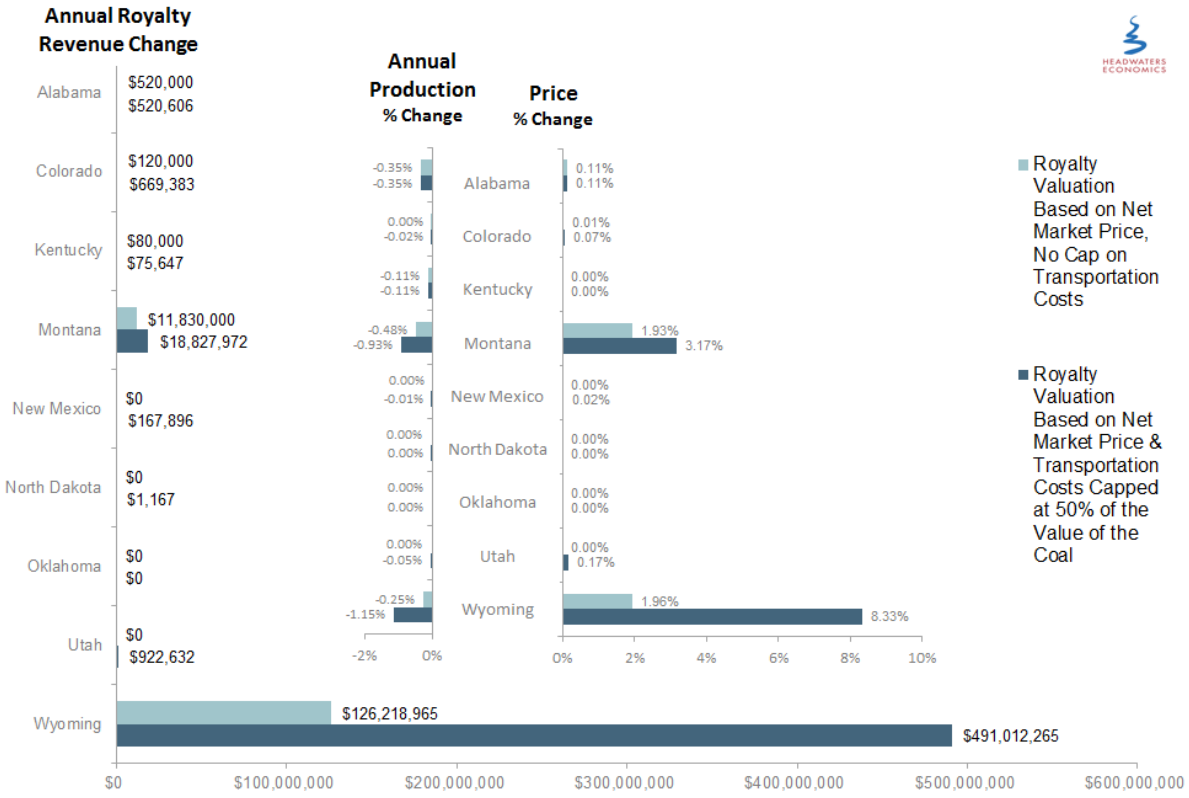
The effective federal corporate income tax rate for the coal industry (including profitable and non-profitable companies) varies significantly over time. Data reported by the New York Times showed the effective rate varied from between 17 to 22.6 percent in 2011 to less than one percent in 2014 when companies were reporting losses.[19] We use a federal effective tax rate for the coal industry of 20 percent and adjust each state's statutory corporate income tax rate down by the same share (the effective rate is 57 percent of the statutory rate).

IV. RESULTS

The main finding is that changes in federal royalty policy could have substantial revenue benefits for federal and state governments with limited impact on coal production from federal lands. Stated differently, we find that not pursuing reforms will generate few benefits in terms of additional coal extraction and related economic activity, but result in significantly less revenue accruing to federal and state governments.

Figure 3 shows how revenue, delivered prices, and production would have changed had reforms described in the three scenarios been in place over the period 2008 to 2013.

Figure 3: Changes in Royalty Revenue, Coal Production, and Coal Price from Two Federal Coal Royalty Reform Scenarios



* Scenario One, proposed by ONRR, would have no effect on revenue, prices, or production.

The main finding is that changes in federal royalty policy could have substantial revenue benefits for federal and state governments with limited impact on coal production from federal lands. Specifically, we find that:

- If the rule is implemented using net delivered prices to reveal the value of federal coal for royalty assessment, we estimate that royalty revenue could increase by $139 million annually (a 20% increase), with 91 percent of new revenue generated in Wyoming. On average, gross delivered prices would rise by $0.28 per ton, or a 1.6 percent increase. Demand for coal would fall by nearly 1 million tons annually, a 0.2 percent decline in coal deliveries to the domestic power sector.

- If additional transportation cost deductions were limited to 50 percent of the net delivered price of coal, revenue would increase by $512 million annually (a 73% increase) with 96 percent of the additional revenue coming from Wyoming. On average gross delivered prices would rise by $1.17 per ton, or a 6.7 percent increase. Demand for coal would fall by 4.3 million tons, a 1 percent decline in coal deliveries to the domestic power sector.

Tables 3 to 6 show detailed results by state for Scenarios Two and Three.

Table 3: Predicted Change in Delivered Price and Annual Production, Net Market Prices

State	Change in Net Delivered Price ($/ton)	Change in Coal Production (tons)	Percent Change in Net Delivered Price	Percent Change in Coal Production
Alabama	$0.08	(1,520)	0.11%	-0.35%
Colorado	$0.01	(445)	0.01%	0.00%
Kentucky	$0.00	(143)	0.00%	-0.11%
Montana	$0.44	(67,744)	1.93%	-0.48%
New Mexico	$0.00	0	0.00%	0.00%
North Dakota	$0.00	0	0.00%	0.00%
Oklahoma	$0.00	0	0.00%	0.00%
Utah	$0.00	0	0.00%	0.00%
Wyoming	$0.30	(907,912)	1.96%	-0.25%

Table 4: Predicted Change in Annual Revenue, Net Market Prices

State	Change in Royalty Revenue	Change in Severance Revenue	Change in Corporate Income Tax Revenue	Percent Change in Royalty Revenue	Percent Change in Severance Revenue	Percent Change in Corporate Income Tax Revenue
Alabama	$520,000	($600)	($33,495)	39.80%	-0.03%	-0.07%
Colorado	$120,000	($2,198)	($10,982)	0.86%	-0.01%	-0.01%
Kentucky	$80,000	($9,853)	($10,474)	30.85%	0%	0%
Montana	$11,830,000	($531,125)	($326,067)	50.07%	-0.48%	-0.87%
New Mexico	$0	$0	$0	0%	0%	0%
North Dakota	$0	$0	$0	0%	0%	0%
Oklahoma	$0	$0	$0	0%	0%	0%
Utah	$0	$0	$0	0%	0%	0%
Wyoming	$126,218,965	($2,406,203)	($2,238,858)	21.78%	-0.36%	-0.60%

Table 5: Predicted Change in Delivered Price and Annual Production, Net Market Prices and Transportation Deductions Limited

State	Change in Coal Prices ($/ton)	Change in Coal Production (tons)	Percent Change in Coal Price	Change in Coal Production
Alabama	$0.08	(1,532)	0.11%	-0.35%
Colorado	$0.03	(2,722)	0.07%	-0.02%
Kentucky	$0.00	(143)	0.00%	-0.11%
Montana	$0.71	(130,977)	3.17%	-0.93%
New Mexico	$0.01	(594)	0.02%	-0.01%
North Dakota	$0.00	(16)	0.00%	0.00%
Oklahoma	$0.00	0	0.00%	0.00%
Utah	$0.05	(5,057)	0.17%	-0.05%
Wyoming	$1.29	(4,119,479)	8.33%	-1.15%

Table 6: Predicted Change in Annual Revenue, Net Market Prices, and Transportation Deductions Limited

State	Change in Royalty Revenue	Change in Severance Revenue	Change in Corporate Income Tax Revenue	Percent Change in Royalty Revenue	Percent Change in Severance Revenue	Percent Change in Corporate Income Tax Revenue
Alabama	$520,606	($513)	($19,199)	32.05%	0.03%	0.10%
Colorado	$669,383	($4,789)	($13,432)	1.86%	0.02%	0.06%
Kentucky	$75,647	($3,139)	($2,246)	9.79%	0.00%	0.00%
Montana	$18,827,972	($349,986)	($256,710)	74.70%	0.62%	3.41%
New Mexico	$167,896	($1,830)	($1,648)	1.88%	0.00%	0.01%
North Dakota	$1,167	($6)	($36)	0.14%	0.00%	0.00%
Oklahoma	$0	$0	$0	0.00%	0.00%	0.00%
Utah	$922,632	($1,791)	($14,658)	4.03%	0.03%	0.08%
Wyoming	$491,012,265	($3,110,821)	$3,127,967	87.94%	0.61%	9.51%

Because of significant data limitations, we do not have price statistics on arm's length and non-arm's length sales from ONRR to analyze the outcomes of reforms that would use the first arm's length transaction price. Results for the other two scenarios are only robust for states where the large majority of sales from mines with active federal leases are to the domestic power sector. This is true of Montana and Wyoming. The results for the other states are less robust and we do not have data sufficient to analyze the implications of additional reforms in New Mexico, North Dakota, Oklahoma, and Utah.

Overall, the largest changes in revenue, price and production are expected to occur in Montana and Wyoming. At the state level, higher federal royalty distributions to the states outweigh declines in state tax revenue that would occur due to tax interactions that lower the taxable value of state severance taxes where royalties are deductible expenses, and from the small declines in production. Montana could receive between $5.1 and $8.8 million in additional annual revenue. Wyoming could receive between $124 and $488 million in additional annual revenue.

Montana

Current Federal Royalty and Severance Tax Revenue

Montana has two main production taxes, a state severance tax and a gross proceeds tax collected in lieu of local property taxes. The state also levies a fee to fund environmental clean-up and reclamation related to resource extraction, called the Resource Indemnity and Ground Water Assessment Tax (RIGWAT). Combined, these taxes generated $1.62 per ton, or about 10.6 percent of the net delivered price.[20] Table 7 shows federal royalty distributions and state tax revenue in Montana from 2008-2013.

Table 7: Total Federal Royalty Distributions and State Tax Revenue to Montana

Year	Federal Royalty Distributions	Severance Tax	Gross Proceeds	RIGWAT
2008	$18,018,410	$45,331,871	$12,859,110	$1,366,020
2009	$18,414,891	$49,564,120	$14,458,854	$1,465,476
2010	$20,238,136	$44,177,434	$15,613,757	$1,457,310
2011	$20,784,673	$54,970,717	$15,703,152	
2012	$22,028,834	$52,742,627	$19,826,095	
2013	$20,261,229	$56,573,818	$19,444,335	
Total Revenue	$119,746,172	$303,360,587	$97,905,303	$4,288,806
Total Production (tons)		249,937,405	249,937,405	249,937,405
Revenue Per Ton		$1.21	$0.39	$0.02
Average Price		$15.32	$15.32	$15.32
Effective Tax Rate		7.9%	2.6%	0.1%

Current Allocation of Federal Royalty and Severance Tax Revenue

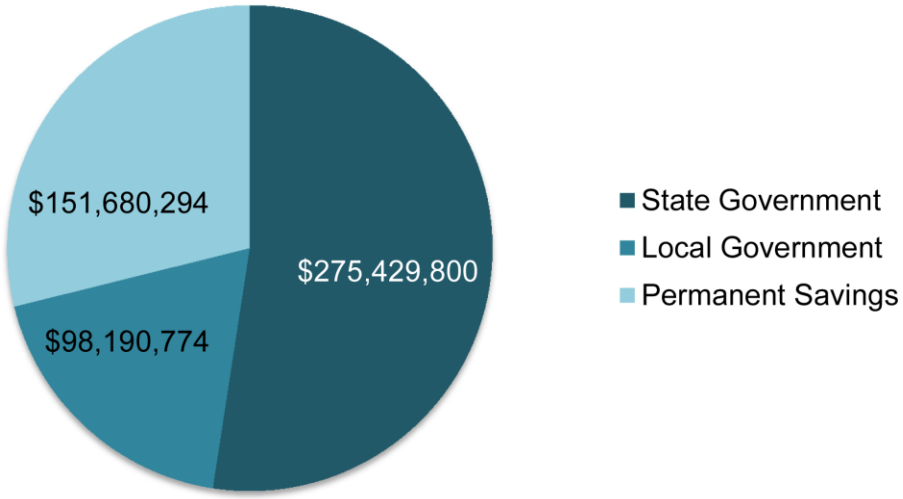
A quarter of federal mineral royalties distributed to Montana are further allocated to the counties and school districts where coal production occurs. The remaining 75 percent is allocated to the state's General Fund.

Half of Montana's coal severance tax is deposited into the Coal Tax Trust Fund, a permanent fund intended to provide long-term fiscal benefits from the depletion of the state's coal resources. Proceeds from the Trust Fund are allocated to a variety of infrastructure and economic development accounts. The remaining coal severance tax is used for a variety of state purposes, with a small share (5.5%) going to a local impact fund. The Gross Proceeds Tax is levied in lieu of local property taxes and about 53 percent of revenue was allocated back to local governments between 2008 and 2014. Table 8 and Figure 4 show the general allocation of federal coal royalty revenue and state and local production taxes.

Table 8: Allocation of Federal Royalty and State Tax Revenue to Montana

Revenue Allocation	Federal Royalty Distributions	Severance Tax	Gross Proceeds	RIGWAT	Total Federal Royalty and State Revenue Allocations
State Government	$89,809,629	$134,995,461	$46,335,904	$4,288,806	$275,429,800
Local Government	$29,936,543	$16,684,832	$51,569,399		$98,190,774
Permanent Savings	$0	$151,680,294			$151,680,294

Figure 4: Allocation of Federal Royalty and State Tax Revenue to Montana



Change in Federal Royalty and Severance Tax Revenue Allocations

Federal royalty reform is expected to generate higher royalty revenue and result in higher costs to deliver coal to the domestic power sector and lower the demand for coal that will lower production from federal leases. The impact on state taxes is the result of higher prices, lower production, and interactions between federal royalty revenue and state severance taxes. For example, in Montana federal royalties paid are deductible from the taxable value used for severance tax purposes.

Montana could receive $5.1 million to $8.8 million in additional annual revenue due to federal royalty reform. This is because the increase in royalty collections greatly outweighs the modeled decline in production and taxable value for state severance taxes.

Revenue is received as higher federal mineral royalty distributions while state taxes decline. The increase in total revenue will result in different allocations based on how each individual tax is distributed between the state, local governments, and permanent savings. Table 9 shows the estimated impacts on state revenue from federal royalty reform.

Table 9: Estimated Impact of Federal Royalty Reform on Revenue Allocations to Montana

Scenario	Revenue Allocation	Change in Federal Royalty Distributions	Change in Combined State Taxes	Net Change in Revenue	Percent Change in Federal Royalty Distributions	Percent Change in Combined State Taxes	Percent Change of Net Revenue Benefit
Net Market Price	Total Revenue	$5,678,400	($531,125)	$5,147,275	28.5%	0.8%	5.9%
	State Government	$5,678,400	($243,093)	$5,435,307	28.5%	0.4%	6.2%
	Local Government	$0	($89,388)	($89,388)	0.0%	0.1%	0.1%
	Permanent Savings	$0	($198,644)	($198,644)	0.0%	0.3%	0.2%
Net Market Price and Transportation Cap	Total Revenue	$9,037,427	($349,986)	$8,687,441	45.3%	0.5%	9.9%
	State Government	$9,037,427	($160,187)	$8,877,240	45.3%	0.2%	10.1%
	Local Government	$0	($58,902)	($58,902)	0.0%	0.1%	0.1%
	Permanent Savings	$0	($130,897)	($130,897)	0.0%	0.2%	0.1%

In Montana, the state government could see a change in federal royalty distributions of 29 to 45 percent. Local governments and the Coal Tax Trust Fund would see no change in revenue.

Wyoming

Current Federal Royalty and Severance Tax Revenue

Wyoming levies a severance tax at the state level and local governments also collect revenue on the gross value of production based on local property tax mill levies. Combined, these taxes generated $1.20 per ton, or about 9.2 percent of the net delivered price. Table 10 shows federal royalty distributions and state tax revenue in Wyoming for 2008-2013.

Table 10: Total Federal Royalty Distributions and State Tax Revenue to Wyoming

Year	Federal Royalty Distributions	Severance Tax	Property Tax
2008	$264,557,943	$238,598,329	$210,884,760
2009	$283,941,537	$273,281,570	$234,168,035
2010	$289,578,588	$269,081,349	$230,576,515
2011	$301,062,012	$294,278,928	$246,002,072
2012	$305,152,852	$293,110,118	$256,803,632
2013	$269,179,394	$282,081,447	$251,614,091
Total Revenue	$1,713,472,326	$1,650,431,741	$1,430,049,105
Total Production (tons)		2,569,311,998	2,569,311,998
Revenue Per Ton		$0.64	$0.56
Average Price		$13.01	$13.01
Effective Tax Rate		4.9%	4.3%

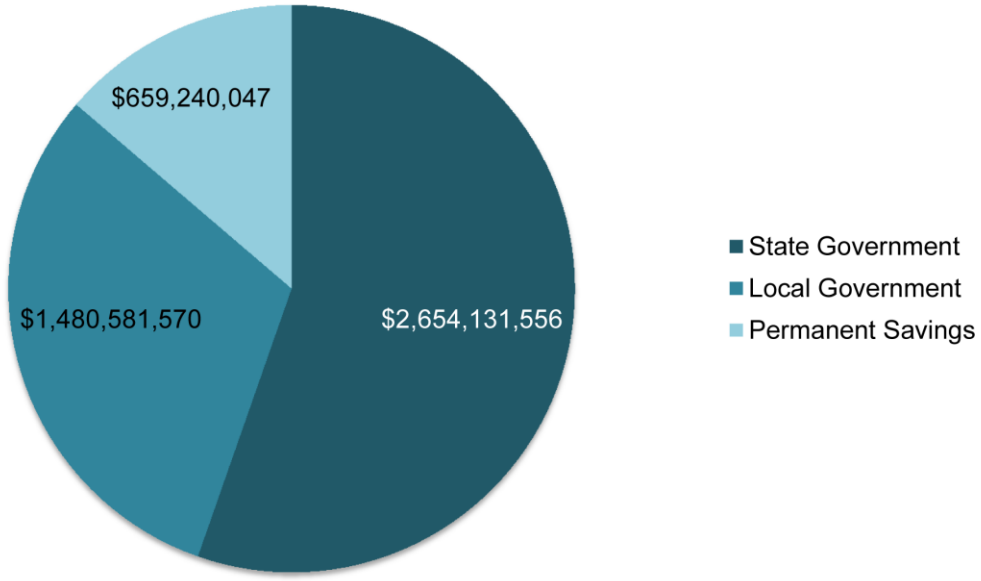
Current Allocation of Federal Royalty and Severance Tax Revenue

Wyoming is one of the states most dependent on revenue from natural resources extraction to fund basic government services. A significant portion of annual revenue is deposited in the state's General Fund and is collected by local governments to fund operating budgets. Wyoming has also made some smart decisions about natural resources revenue. The state maintains a relatively high tax rate on the value of coal and other fossil fuels. The state saves a good portion of severance taxes, building up a permanent fund that provides stable fiscal benefits over time. The state also invests natural resource revenue into education and infrastructure. Table 11 and Figure 5 show the general allocation of federal coal royalty revenue and state and local production taxes.

Table 11: Allocation of Federal Royalty and State Tax Revenue to Wyoming

Year	Federal Royalty Distributions	Severance Tax	Property Tax	Total Federal Royalty and State Revenue Allocations
State Government	$1,713,472,326	$940,659,229	$0	$2,654,131,556
Local Government	$0	$50,532,465	$1,430,049,105	$1,480,581,570
Permanent Savings	$0	$659,240,047	$0	$659,240,047

Figure 5: Allocation of Federal Royalty and State Tax Revenue to Wyoming



Change in Federal Royalty and Severance Tax Revenue Allocations

Even though Wyoming is expected to receive significant benefits in terms of higher federal royalty distributions to the state, revenue will be received from different sources and the allocation to local government and permanent savings would actually decline slightly as a result of federal royalty reform. Table 12 shows the results. Wyoming could receive $58 million to $234 million in additional annual revenue due to federal royalty reform. State government could see a change in federal royalty distributions of 21 to 83 percent.

Table 12: Estimated Impact of Federal Royalty Reform on Revenue Allocations to Wyoming

Scenario	Revenue Allocation	Change in Federal Royalty Distributions	Change in Combined State Taxes	Net Change in Revenue	Percent Change in Federal Royalty Distributions	Percent Change in Combined State Taxes	Percent Change of Net Revenue Benefit
Net Market Price	Total Revenue	$60,585,103	($2,406,203)	$58,178,900	21.2%	0.5%	7.3%
	State Government	$60,585,103	($734,761)	$59,850,342	21.2%	0.1%	7.5%
	Local Government	$0	($1,156,501)	($1,156,501)	0.0%	0.2%	0.1%
	Permanent Savings	$0	($514,941)	($514,941)	0.0%	0.1%	0.1%
Net Market Price and Transportation Cap	Total Revenue	$235,685,887	($3,110,821)	$232,575,066	82.5%	0.6%	29.1%
	State Government	$235,685,887	($949,924)	$234,735,963	82.5%	0.2%	29.4%
	Local Government	$0	($1,495,164)	($1,495,164)	0.0%	0.3%	0.2%
	Permanent Savings	$0	($665,733)	($665,733)	0.0%	0.1%	0.1%

Wyoming discontinued direct payments to counties from federal mineral royalty distributions in order to maximize Payments in Lieu of Taxes (PILT) to counties (the PILT "full payment amount" is reduced by the amount of Federal Mineral Royalties the county receives, along with other federal revenue sharing payments [e.g., Forest Service and BLM payments] that accrue directly to county governments). The decrease in federal mineral royalty payments to counties was offset by an increase in state severance tax distributions to counties. However, if federal royalty reforms are implemented in a way that increases royalty revenue, local governments in Wyoming would see a decline in revenue. The state may consider changes to allocation formulas that keep local governments whole.

V. CONCLUSION

The main finding is that changes in federal royalty policy could have substantial revenue benefits for federal and state governments with limited impact on coal production from federal lands. Stated differently, we find that not pursuing reforms will generate few benefits in terms of additional coal extraction and related economic activity, but result in significantly less revenue accruing to federal and state governments.

Implementing the proposed rule using the first arm's length sale price would result in little to no new revenue in ONRR's assessment. We do not have data on arm's length and non-arm's length sale prices for coal FOB at the mine that we could use to provide an independent analysis.

In theory the price set at the mine should be revealed using any one of the five benchmarks currently employed. The arm's length sale method should not reveal a different FOB price at the mine than is currently being used for royalty valuation. Further, because the proposed rule would still allow for independent brokers to remarket coal to consumers without royalty liability, the proposed rule could create a preference for particular sale structures (potentially disadvantaging affiliated mining and logistics companies) without resulting in additional revenue.

Using Net Delivered Prices Offers Multiple Benefits

Changing the price used for valuation to net delivered prices has multiple advantages over using the first arm's length sale price. The gross commodity value of federal coal is best revealed by determining its value delivered to the consumer less transportation costs. This method of valuation closes the loophole that may allow for companies to structure sales using affiliated brokers to artificially reduce the commodity value of federal coal that is required for royalty valuation. Most importantly, using net delivered costs would close the loophole for all sales, not only for sales where coal is marketed directly by mines and their affiliates.

The net delivered price and the first arm's length sale price are the same price for all sales where mines and their affiliates are marketing coal directly to consumers. In these instances, the contract value reveals the price that would be used for royalty valuation.

In instances where independent brokers (or mines) are purchasing coal at the mine and remarketing the same coal downstream to consumers, the delivered price is unknown to the lessee responsible for royalty payment. In these cases, ONRR would define the process lessees would use to determine the net market price. The lessee would be responsible for estimating the net market price following ONRR rules. The lessee would add any additional royalty liability above the arm's length sale price, and pay royalties to the federal government.

Using net delivered price has significant transparency advantages, and similar benefits to streamline the assessment process for industry and ONRR compliance audits. Delivered prices are known for sales to regulated utilities (independent of the sale structure). Additional price data is revealed by sales on spot markets, and by market index prices for coal of varying qualities delivered to domestic and export markets. Market analysis firms including Platts and SNL Energy track market prices and transportation costs closely and could be used to reveal prices that would be used by mines for royalty valuation. This transparency would also allow for public review of federal royalty valuation without necessarily revealing contract prices, mining and marketing costs, and other proprietary data.

Many other factors other than fuel costs affect prices for electricity, including available generation capacity and the cost of switching between competing fuels, local transmission and reliability constraints, fuel purchase or power supply contracts, other operating variable costs, and environmental regulations. As a result, only a fraction of the increase in delivered costs can be passed forward as higher utility rates.[21]

Do Not Base Transportation Deduction Limit on Natural Gas Regulation

The proposed regulation asks if transportation cost deductions should be limited to 50 percent of the value of coal. The question is relevant because the natural gas regulation includes this limitation on transportation costs. We find that such a limit would increase royalty revenue significantly with a modest decline in production.

The regulation as it applies to natural gas is intended to avoid "gaming" by the natural gas industry. Vertically integrated companies who are delivering natural gas to customers remote from the lease could inflate transportation costs to limit royalty obligations.[22] Placing a cap on deductible costs provides a check against gaming while still providing for reasonable cost deductions.

In the coal market, a cap equal to a percent of the value of coal is unlikely to function this way. Transportation costs are a much larger share of total delivered prices. In our analysis, we modeled a limit on transportation costs equal to 50 percent of the value of coal. Sales that travel longer distances would pay higher royalties because of higher transportation costs without regard to whether gaming is actually taking place.

If the goal is to limit gaming in the coal market, better options may include a fixed percent of transportation costs that would be deductible (to encourage cost reduction) or limits on cost deductibility based on an index of transportation costs for deliveries from states to different markets. A threshold could be set using market prices for deliveries on each route that would limit the ability of integrated companies to game the system by inflating costs beyond reasonable thresholds.

Appendix A: Estimating Market Prices and Transportation Costs

Deliveries to the Domestic Power Sector

The Energy Information Administration (EIA) publishes the price of coal deliveries to the domestic power generation sector. These data report the mine and state where the coal originated and the state and power plant where it was delivered for all regulated utilities.[23] SNL Energy, a data subscription service that provides energy industry data, gathers and reports these same data and provides additional estimates for delivered prices and transportation costs to unregulated utilities and power plants.[24]

All monthly coal deliveries to the electric power sector between October 2007 and September 2014 (federal fiscal years 2008 to 2014) including deliveries to regulated and private power generators were downloaded from SNL Financial. These data include identifiers for the mine and plant, tons delivered (Q), estimated transportation costs (T), delivered cost per ton (p), and original transportation mode (barge, mine mouth, railroad, or truck).

Each record was linked to a MSHA ID, which was then matched to a table listing the MSHA ID of all mines with Federal leases.[25] Of the 144,205 records in the SNL dataset between FY2008 and FY2014, 19,737 (11%) were missing the MSHA ID and deleted from the dataset. Thirty-one percent of these records missing a MSHA ID were also missing the mine state; of those records with a mine state, Kentucky accounts for 20 percent, Ohio for 11 percent, and West Virginia for 23 percent of these records that could not be linked back to a specific mine.

Transportation costs (T) are reported for regulated utilities in the U.S. by the Energy Information Administration.[26] Where these costs are not reported, SNL energy estimates transportation costs based on waybill samples from the U.S. Department of Transportation, Surface Transportation Board.[27] These data were missing for 4,572 records (4% of the remaining dataset), which were deleted from the analysis dataset. Twenty-two percent of these records missing transportation costs were from an unknown state, 27 percent were from Kentucky, and 20 percent were from West Virginia. Of the remaining records, 62 (0.05%) were missing price per ton and total delivered cost. Fifteen percent of these records were from West Virginia and 68 percent were from Wyoming. The final analysis dataset contained 124,944 records.

For deliveries listed as "mine mouth", which indicates that the power plant is located at the mine, transportation costs were set to $0.

In the final analysis dataset, 37 percent of coal deliveries originated from mines with Federal leases. We assume that delivered coal prices and transportation costs from these mines will be constant for coal produced from federal leases associated with the mine, and from state and private leases associated with the same mine.

The total quantity of coal delivered (Q) is the sum of deliveries from all mines that have federal leases in each state.

The weighted average delivered cost per ton (p) from a particular state was calculated using the following formula, dividing the total cost of deliveries by the total quantity delivered within the state. *S* indexes the state, *m* indexes the mine and *l* indexes the plant:

$$\frac{\sum_s p_{m,l} * Q_{m,l}}{\sum_s Q_{m,l}}$$

The weighted average transportation cost per ton (T) from a particular state was calculated using the following formula, dividing the total transportation costs by the total quantity delivered within the state:

$$\frac{\sum_s T_{m,l} * Q_{m,l}}{\sum_s Q_{m,l}}$$

Table A1 summarizes the quantity delivered, weighted average delivered cost per ton and transportation cost per ton, by state for deliveries from all mines in the state and for deliveries from mines with federal leases.

Table A1: Weighted Average Delivered Prices and Transportation Cost for Coal Sales to the Domestic Power Sector, 2008-2014

	All Coal Deliveries to the Power Sector				Coal Deliveries from Mines with Federal Leases			
State	Thousand Tons	Transportation Cost	Delivered Price	FOB Mine Price	Thousand Tons	Transportation Cost	Delivered Price	FOB Mine Price
Alabama	40,371	$15.93	$77.14	$61.21	1,260	$ 18.36	$ 83.50	$ 65.13
Colorado	140,923	$12.05	$53.63	$41.57	138,570	$ 12.20	$ 53.92	$ 41.73
Kentucky	503,924	$16.47	$73.14	$56.67	1,483	$ 24.32	$ 126.07	$ 101.75
Montana	176,488	$10.08	$30.71	$20.63	137,901	$ 8.59	$ 30.23	$ 21.64
New Mexico	161,305	$4.88	$36.80	$31.92	82,412	$ 6.70	$ 41.89	$ 35.19
North Dakota	158,484	$0.73	$17.05	$16.32	158,484	$ 0.73	$ 17.05	$ 16.32
Oklahoma	3,069	$4.32	$35.88	$31.56	2,803	$ 4.27	$ 33.21	$ 28.93
Utah	118,960	$11.27	$42.21	$30.94	112,036	$ 11.62	$ 42.52	$ 30.89
Wyoming	2,809,267	$15.96	$31.30	$15.34	2,573,019	$ 16.04	$ 31.54	$ 15.50
Total	**4,112,791**	**$14.47**	**$37.60**	**$23.13**	**3,207,965**	**$ 14.39**	**$ 32.45**	**$ 18.05**

*Transportation cost, delivered price, and FOB mine price are weighted averages.

Statutory Royalty Rates

The royalty rate is the rate applied to each lease, including any royalty rate reductions. The BLM and coal operators negotiate royalty rates on a lease-by-lease basis, but generally are set at a minimum of 12.5 percent of the gross value of coal after it is extracted from surface mines and 8 percent for coal extracted from underground mines. Coal lessees can apply for a royalty rate reduction if the current royalty rate imposes economic hardship that would otherwise result in abandoning the lease, or in less than full recovery of leased coal. Rate reductions are also granted to encourage the greatest utilization of federal coal,[28] even in instances when high-cost or low-value coal would otherwise be uncompetitive in the domestic energy market.

The BLM makes a determination and has discretion to grant royalty rate reductions if three basic requirements are met:

1. The royalty rate reduction must encourage the greatest ultimate recovery of the coal resource.
2. The royalty rate reduction must be in the interest of conservation of the coal and other resources.
3. The reduced royalty rate is necessary to promote development of the coal resource.[29]

Royalty rate reductions occurred on at least 30 out of 83 leases (36 percent of leases) offered for sale since 1990.[30] The GAO found that the royalty rate that lessees pay varied between 5.6 percent in Colorado and 12.2 percent in Wyoming.[31] Table 1 shows the average royalty rate paid on federal coal between 2008 and 2013.

APPENDIX B: ROYALTY AND PRODUCTION TAX SUMMARIES BY STATE

Alabama

Coal Excise and Privilege Tax

Tax of $0.135 per ton of coal severed.[32] Tax revenue is distributed to local governments to support local services and economic development.[33] The tax was reauthorized for a period of 10 years in 2011.[34]

Coal and Lignite Excise and Privilege Tax.

Tax of $0.20 per ton of coal or lignite severed.[35] The entire tax is distributed to local governments. Municipalities receive half of the tax on coal extracted within their jurisdiction. County governments receive the other half of the revenue and also receive 100 percent of revenue extracted within the unincorporated county jurisdiction.[36]

Property Tax

Coal production is not subject to real property taxation in Alabama.

Colorado

Federal Mineral Royalty Distributions

All federal mineral royalties distributed to Colorado are directed to local governments in some form. Half of the revenue is allocated to local schools: 1.7 percent is distributed directly to local school districts and 48 percent is directed to the State Public School Fund. Distributions to schools are capped at $76 million for the Public School Fund and $4.1 million for direct distributions in FY2015.[37] Any spillover amounts are distributed to a permanent fund for higher education.

Forty percent of Federal Mineral Royalties are deposited into the Energy and Mineral Impact Assistance Fund to be distributed by the Colorado Department of Local Affairs (DOLA) back to counties, cities, and school districts using both direct distributions and impact grants to affected communities. Direct distributions are made using a variety of impact metrics, including employment in mining and measures of mineral activity. Program guidelines and payment statistics can be accessed on the DOLA website.[38]

The purpose of the Energy and Mineral Impact Assistance Program is to assist political subdivisions that are socially and/or economically impacted by the development, processing, or energy conversion of minerals and mineral fuels. The department is assisted by a twelve-member Energy and Mineral Impact Assistance Advisory Committee, which meets several times each year, to consider applications for grants and low-interest loans. Eligible entities to receive grants and loans include municipalities, counties, school districts, special districts and other political subdivisions and state agencies. The kinds of projects that are funded include—but are not limited to—water and sewer improvements, road improvements, construction/improvements to recreation centers, senior centers and other public facilities, fire protection buildings and equipment, and local government planning.[39]

Ten percent of Federal Mineral Royalties is allocated to the Colorado State Water Conservation Board which deposits the funds in a perpetual base account used for loans for state water projects (10% of the total capped at 17.7 million in FY2015).[40] Any spillover amounts allocated to schools or the Water Conservation Board are allocated to a permanent fund for higher education.

In addition to royalty revenue, bonus payments from coal lease sales are shared between two permanent funds for local governments and higher education.[41]

The local government and higher education permanent funds have been raided in recent years. In 2009 for example, two bills transferred a total of $50.7 million to the state's General Fund.[42]

Coal Severance Tax

The state's severance tax is a per ton levy adjusted quarterly based on the producers' price index as published by the Bureau of Labor Statistics.[43] The base tax rate is $0.60 per ton, and the current inflation adjusted rate is $0.842 per ton. The tax is levied after the first 300,000 tons extracted each quarter.[44] Underground coal and lignite coal is taxed at half the per ton rate.

Property Taxes

Coal is also taxed as real property by local governments in Colorado. The taxable value of producing coal mines is based on an income formula that includes the volume of coal extracted, the price of coal extracted, and other factors, including the royalty rate based on the mining method. Prices are index prices published in the Colorado Real Property Valuation Manual. Importantly, the royalty rates used in the income formula are also published in the Manual and are set at 6 percent for underground coal and 9 percent for surface coal. That means changes to federal coal valuation policy will not have a direct effect on local property tax collections in Colorado without modification to the Manual.

Assessed value is 29 percent of gross taxable value. The average tax rate for county and school district levies was 59.895 (or 5.99%) in 2013.[45] The effective rate on taxable value is 29 percent of the 5.99 percent tax rate.

Kentucky

Severance Tax

The severance tax is 4.5 percent of the value of coal extracted, or a minimum of $0.50 per ton.[46] The tax rate is lowered to between 3.75 percent and 2.25 percent for factors including the thickness of the coal seam and the depth and the water drainage conditions of the mine.[47]

Gross value is defined as the price received by the "taxpayer" less certain costs, including transportation costs. The gross value is not reduced by royalties.[48] That means federal royalty collections are not considered deductible costs, and changes in federal royalty valuation will not affect the gross value on which state severance taxes are levied.

Severance tax revenue is allocated to the Transportation Cabinet for spending on state highways and to the Department for Energy Development and Independence for energy research and development (capped at $3 million annually). Any revenue in excess of the distributions to these funds is deposited in the state General Fund.[49] All revenue is used for state priorities and none is distributed to local governments or saved in a permanent trust.

Property Tax

Property tax valuation of producing mines is based on the income approach. The formula includes a range of factors, including the mine recovery rate (production) and royalty rates. Assessed value is 100 percent of gross value determined by the income formula. The average property tax rate for county and school district levies is 8.62 percent.[50]

The royalty rate varies by county and mining method. Royalty rates for deep mines range from $2.76 per ton to $3.45 per ton. Surface mine royalty rates range from $2.76 per ton to $3.68 per ton.[51] It appears that the royalty rates are determined for each mine, so a change in federal royalty valuation could have an impact on property tax collections. We assume that a change in federal royalty collections will reduce assessed valuation for property taxes by the same amount.

Montana

Federal Mineral Royalty Distributions

Montana began making direct distributions equal to 25 percent of the state's share of federal mineral royalties to the county of origin in 2005.[52] The remaining 75 percent is deposited in the state's General Fund.[53] State distributions to local governments are compiled and reported by the Montana Association of Counties (MACo).[54]

Coal Severance Tax (MCA 15-35-103)

Montana taxes all coal extracted, or "severed" from the state. The severance tax has several rates based on the type (surface or underground) and quality of coal. The highest rate for surface coal with a heat content greater than 7,000 BTU per pound is 15 percent of the taxable value. The lowest rate for underground coal with a heat content of less than 7,000 BTU per point is 3 percent of the taxable value.[55] Mines producing less than 50,000 tons annually are exempt from the tax.

Taxable value is the price received by the lessee at the mine. In cases where no arm's length sale exists, the severance tax is based on the value of the coal to the final consumer (e.g. a power plant), not the value of the coal to the lessee or an affiliated broker.[56]

Federal royalties are deductible from taxable value, along with a variety of other taxes. The first 20,000 tons of production annually from all mines is exempt from the severance tax.

The Montana Constitution[57] establishes that half of coal severance tax revenue be allocated to the Coal Severance Tax Trust Fund while the other half is directed to other funds[58] including the state's General Fund and a special state account that receives $250,000 for coal and uranium mine reclamation. The remaining balance of the revenue after the reclamation fund distribution is made is allocated to various funds. About 5 percent of the total is allocated to a Local Impact Fund.

Montana Coal Gross Proceeds Tax

Montana has a gross proceeds tax that is levied on the gross value of coal sold in the state. The tax is levied in lieu of local property taxes. Taxable value is defined as the contract sales price, or the price received by the lessee at the mine.

The tax rate is 5 percent of taxable value for surface coal and 2.5 percent for underground coal.

Taxable value is defined as the contract price of coal sold at the mine. The price used to determine value is the "mine price," or the FOB price of coal reported by the lessee or as determined by the Department of Revenue when no arm's length sale exists.

The revenue is proportionally distributed to the appropriate taxing jurisdictions in which production occurred based on the total number of mills levied in fiscal year 1990.[59] Between fiscal year 2008 and 2014, 52 percent of the tax was distributed to local governments and the rest was retained by the state.

Resource Indemnity and Ground Water Assessment Tax (RIGWAT)

The resource indemnity and ground water assessment tax (RIGWAT) was created to indemnify the citizens of Montana for the loss of long-term value resulting from the depletion of natural resource bases, and for environmental damage caused by mineral development. The tax is placed in a trust fund, which is managed by the state Board of Investments.[60]

The tax rate on coal is 0.4 percent of the taxable value. Royalties paid to the federal government are exempt from the tax (taxable value is reduced by the royalty liability). The first $6,500 in RIGWAT liability is exempt.

Revenue is distributed to several state funds and accounts: $366,000 to the Department of Environmental Quality (DEQ) ground water assessment account and $150,000 to the DEQ water storage state special revenue account each biennium. Of the remaining revenue, 25 percent is distributed to the hazardous waste/CERCLA special revenue account and another 25 percent is directed to the environmental quality protection fund; remaining revenue is distributed to the natural resources projects fund.

Reclamation Fee

Montana collects a fee for abandoned mine reclamation on all coal extracted from surface mines. The fee is $0.09 per ton for lignite coal and $0.315 per ton for all other coal.

Property Tax

Coal production is not subject to real property taxation in Montana.

North Dakota

Severance Tax

Tax of $0.375 per ton of coal or lignite severed in the state. An additional $0.02 per ton is levied to benefit the Lignite Research Fund. The severance tax is exempt if the coal extracted is used to heat buildings in North Dakota. The severance tax can be cut in half if the coal is burned in cogeneration plants where renewable energy makes up at least 10 percent of the generating capacity.

Revenue is allocated to the Coal Development Fund, which benefits local governments in a variety of ways. Seventy percent is allocated annually to coal producing counties proportional to respective production; counties further appropriate 40 percent of this income to their county general fund, 30 percent to cities within the county, and 30 percent to school districts. Nonproducing counties within 15 miles of an active coal mine and a city or school distance in those nonproductive counties receive a share of the coal producing county's severance revenue from that particular mine.

Thirty percent of revenue allocated to the Coal Development Fund is further allocated to a trust fund that makes loans to school districts for construction projects as well as loans to cities, counties and school districts impacted by coal development.[61]

Property Tax

Coal production is not subject to real property taxation in North Dakota.

New Mexico

Federal Mineral Royalty Distributions

New Mexico does not make direct distributions to local governments. An annual appropriation is made to the Instructional Material Fund and to the Bureau of Geology and Mineral Resources. The bulk of federal mineral royalties are directed to the Public School Fund.[62]

Severance Tax

New Mexico's severance tax has two parts. The severance tax on coal is levied on a per ton basis with no deductions. The rate is $0.57 per ton on surface coal and $0.55 on underground coal. Starting in 1994, the stated added a coal surtax on each ton of coal extracted that is adjusted annually based on the producer price index published by the Bureau of Labor Statistics.[63] The current rate is $1.28 for surface coal and $1.23 for underground coal.[64]

Tax Rate per Ton	Surface Coal	Underground Coal
Severance	$0.57	$0.55
Severance Surtax	$1.28	$1.23
Total	**$1.85**	**$1.78**

Resource Excise Tax

This is really two taxes, the producers tax and the processors tax levied on the gross value of coal after deducting royalties paid tribal governments. Federal royalties are not exempt from taxable value. The rates are 0.75 percent for each tax, or a combined 1.5 percent.[65] All revenue is deposited in the General Fund.[66]

Gross Receipts Tax

New Mexico levies a gross receipts tax on the value of coal sold in New Mexico. The gross receipts tax rate varies throughout the state from 5.125 percent to 8.6875 percent, depending on the location of the business. It varies because the total rate combines rates imposed by the state, counties, and, if applicable, municipalities where the businesses are located. The business pays the total gross receipts tax to the state, which then distributes the counties' and municipalities' portions to them.[67] The gross receipts tax in Cibola, San Juan, and McKinley counties where coal mining is active is about 6.5 percent outside of incorporated cities.[68]

The taxable value of coal as defined for severance and the resource excise tax is subject to the gross receipts tax. The value of resource excise taxes is deductible from gross receipts taxation.[69] The exemption lowers the effective rate to about 6.4 percent in coal producing counties.

Property Tax

The production value of coal is exempt from property taxation in New Mexico.

Oklahoma

Severance Tax

Oklahoma has no coal severance tax.

Property Tax

The production value of coal is exempt from property taxation in Oklahoma.

Utah

Federal Mineral Royalty Distributions

Utah makes direct distributions from the state's share of federal mineral royalties to the county of origin through the Permanent Community Impact Fund and through direct distributions made by the Utah Department of Transportation.[70] Together, direct distributions and grants return about 80 percent of the state's share of federal mineral royalties to local governments.

The Permanent Community Impact Fund Board (CIB) is a program of the state of Utah which provides loans and/or grants to state agencies and subdivisions of the state (counties, municipalities, schools, and special districts) which are or may be socially or economically impacted, directly or indirectly, by mineral resource development on federal lands.[71]

State Transportation Department Mineral Lease Fund Distributions are available online.[72]

Severance Tax

Utah has no severance tax on coal.

Property Tax

Property taxes on active coal mines in Utah are based on a discounted cash flow model. Taxable value is determined by the annual mineral sales plus income from other sources such as interest, bonuses, subsidies, or premiums. Expenses are deducted from the income, including salaries, severance taxes, sales/use taxes, and state and federal royalty payments.[73] The resulting net revenue is then taxed by a rate established by the county in which the mine resides. Average tax rates for county government and school districts are about 1.1 percent.[74]

Wyoming

Federal Mineral Royalty Distributions

Wyoming does not make direct distributions of Federal Mineral Royalties to counties. Distributions are made based on a complicated formula defined in state statute,[75] and statistics are reported by the Wyoming Consensus Revenue Estimating Group.[76]

In FY1995 direct payments to counties were discontinued in order to maximize PILT payments to counties (the PILT "full payment amount" is reduced by the amount of Federal Mineral Royalties the county receives, along with other federal revenue sharing payments [e.g., Forest Service and BLM payments] that accrue directly to county governments). The decrease in Federal Mineral Royalty payments to counties was offset by an increase in state severance tax distributions to counties.

Federal Mineral Royalties still benefit counties in other ways. They go into the Local Government Capital Construction Account that funds grants from the State Loan & Investment Board (SLIB) to cities, towns, counties, and special districts through the Mineral Royalty Grant Program. Distributions are also made to the Highway Fund County Roads and several funds that benefit school districts.

Severance Tax

Wyoming's severance tax is 7 percent of the gross value of surface coal and 3.75 percent of the gross value of underground coal. Gross value is defined as the value received by the lessee at the mine. Royalties paid to the federal government are deducted from gross value for severance taxes. Severance

taxes are capped at a maximum of $0.60 per ton for surface coal and $0.30 for underground coal.

Property Tax

Local governments in Wyoming also levy property taxes on the gross value of coal. Gross value determined for severance taxation is used for local property tax assessments. Local mill levies vary by jurisdiction. The effective tax rate for Wyoming coal is reported at 4.76 percent.[77]

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