

COAL SEVERANCE TAX EXPENDITURES



EVALUATION SUMMARY

SEPTEMBER 2020
2020-TE30

THIS EVALUATION WILL BE INCLUDED IN COMPILATION REPORT SEPTEMBER 2020

	COAL TONNAGE EXEMPTION	UNDERGROUND COAL CREDIT	LIGNITIC COAL CREDIT
YEAR ENACTED	1977	1977	1977
REPEAL/EXPIRATION DATE	None	None	None
REVENUE IMPACT (TAX YEAR 2017)	\$5.1 million	\$2.8 million	\$0
NUMBER OF TAXPAYERS	6	3	0
AVERAGE TAXPAYER BENEFIT	\$858,000	\$927,000	\$0
IS IT MEETING ITS PURPOSE?	Yes, to some extent	Yes, but its effectiveness varies substantially	No

WHAT DO THESE TAX EXPENDITURES DO?

COAL TONNAGE EXEMPTION—Exempts the first 300,000 tons of coal produced each quarter from the coal severance tax.

UNDERGROUND COAL CREDIT—Allows operators who produce coal from underground mines to claim a credit against their coal severance tax liability for 50 percent of the tax from the coal that was mined underground.

LIGNITIC COAL CREDIT—Allows taxpayers to claim a credit against their coal severance tax liability for 50 percent of the tax from the production of lignitic coal, which is a low-rank coal that generates less energy than higher-rank coals because of its lower carbon content and higher moisture content.

WHAT IS THE PURPOSE OF THESE TAX EXPENDITURES?

Statute does not explicitly state a purpose for any of the coal severance tax expenditures. We inferred the following purposes:

- **COAL TONNAGE EXEMPTION**—Support the Colorado coal industry by reducing its severance tax burden.
- **UNDERGROUND COAL CREDIT**—Reduce the severance tax burden on coal mined underground, based on legislators' understanding that it is more expensive to mine coal underground than on the surface.
- **LIGNITIC COAL CREDIT**—Reduce the severance tax burden on lignitic coal mining operations because lignitic coal sells for a lower price due to its lower quality.

WHAT DID THE EVALUATION FIND?

We determined that:

- The COAL TONNAGE EXEMPTION is meeting its purpose to some extent because it has reduced the severance tax liabilities of coal mining operations and may have helped some coal mines, particularly those operating on the margins of profitability, stay operational in the short-term. However, the Coal Tonnage Exemption has not likely had a significant impact on the long-term viability of coal mines in Colorado.
- The UNDERGROUND COAL CREDIT may be meeting its purpose to a limited extent because it reduces the tax liability of underground mines, but its effectiveness can vary significantly based on the costs of each mining operation.
- The LIGNITIC COAL CREDIT is not meeting its purpose because lignitic coal has not been mined in Colorado for many years and is not likely to be mined in the future.

WHAT POLICY CONSIDERATIONS DID THE EVALUATION IDENTIFY?

The General Assembly could consider:

- Reviewing the effectiveness of the COAL TONNAGE EXEMPTION, clarifying its intended purpose, and establishing performance measures and goals for the exemption.
- Reviewing and clarifying the purpose of the UNDERGROUND COAL CREDIT. Since underground mining is not necessarily more costly or less profitable than surface mining, the General Assembly may want to determine whether the credit continues to serve its intended purpose and could consider changes to its structure to provide more uniform tax treatment to coal mines.
- Repealing the LIGNITIC COAL CREDIT because it has not been used recently and is unlikely to be used in the future.

COAL SEVERANCE TAX EXPENDITURES

EVALUATION RESULTS

WHAT ARE THE TAX EXPENDITURES?

This evaluation covers the following three severance tax expenditures provided to coal mining operations in Colorado:

- **COAL SEVERANCE TAX TONNAGE EXEMPTION [SECTION 39-29-106(2)(b), C.R.S.]** (Coal Tonnage Exemption) exempts the first 300,000 tons of coal produced in each quarter, which is up to 1.2 million tons per year, from the coal severance tax.
- **COAL SEVERANCE TAX CREDIT FOR COAL MINED UNDERGROUND [SECTION 39-29-106(3), C.R.S.]** (Underground Coal Credit) allows operators who produce coal from underground mines to claim a credit against their coal severance tax liability for 50 percent of the tax from the coal that was mined underground.
- **COAL SEVERANCE TAX CREDIT FOR LIGNITIC COAL PRODUCTION [SECTION 39-29-106(4), C.R.S.]** (Lignitic Coal Credit) allows operators who mine lignitic coal to claim a credit against their coal severance tax liability for 50 percent of the tax from the production of lignitic coal. Lignitic coal is a type of coal that generates less energy than other types of coal (i.e., anthracite, bituminous, and subbituminous) because of its lower carbon content and higher moisture content.

A taxpayer can claim some or all of the coal severance tax expenditures, depending on the type of mine they operate. For example, a business operating an underground, lignitic, coal mine would qualify for all three tax expenditures. This would effectively eliminate the taxpayer's entire severance tax liability since the Underground Coal Credit and Lignitic

Coal Credit are both equivalent to 50 percent of taxpayers' severance tax liability (after applying the Coal Tonnage Exemption) and can be claimed concurrently.

Coal is subject to severance tax based on the tonnage extracted. Statute [Section 39-29-106(1) and (5), C.R.S.] establishes the base tax rate at \$0.36 per ton, plus a quarterly adjustment for inflation, which statute requires the Department of Revenue to calculate. As of April 2020, the total tax rate on coal was \$0.814 per ton.

In 1977, with House Bill 77-1076, the General Assembly created the current coal severance tax and all of the coal severance tax expenditures. When the Coal Tonnage Exemption was enacted, the first 8,000 tons of coal per quarter were exempt. In 1984, with House Bill 84-1208, due to economic conditions in the coal industry in Colorado, the General Assembly increased the exemption from 8,000 tons per quarter to 25,000 tons per quarter for 3 years. In 1986 [House Bill 86-1247] and 1990 [House Bill 90-1326], the General Assembly extended the temporary increase in tons exempted. In 1999, with House Bill 99-1249, the General Assembly permanently increased the Coal Tonnage Exemption to 300,000 tons per quarter, and it has remained unchanged since that time. The Underground Coal Credit and the Lignitic Coal Credit have remained unchanged since their enactment in 1977.

Coal severance tax is imposed on "every person engaged in the severance of coal," which are coal mine operators. Operators complete and file the Coal Severance Tax Return (Form DR 0020C) to calculate the severance tax due and claim the Coal Tonnage Exemption, the Underground Coal Credit, and the Lignitic Coal Credit, if applicable.

WHO ARE THE INTENDED BENEFICIARIES OF THE TAX EXPENDITURES?

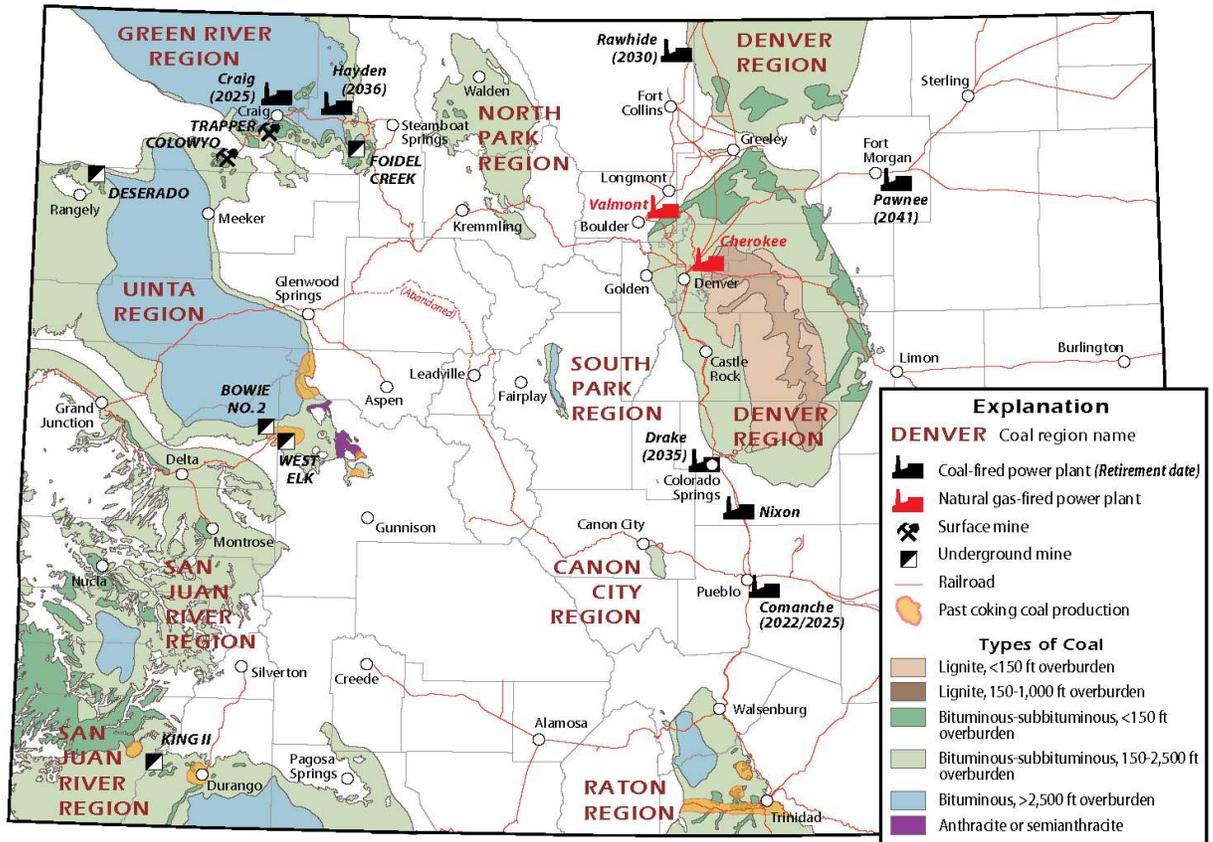
Statute does not explicitly state the intended beneficiaries of the coal severance tax expenditures. Based on statute, we inferred that the intended beneficiaries of all three tax expenditures are coal mine

operators in the state, with underground and lignitic coal mining operations as the intended beneficiaries of the Underground Coal Credit and the Lignitic Coal Credit, respectively. According to data from the Division of Reclamation, Mining and Safety (DRMS), which is an agency within the Colorado Department of Natural Resources, in 2019, there were six actively producing coal mines in Colorado. Four of the mines were underground mines and two were surface mines. In 2019, according to data reported by the mines to the DRMS, approximately 74 percent of the total coal mined in Colorado was mined underground, with the remaining 26 percent mined on the surface.

There are four types of coal, with higher ranked coal having higher carbon content and being able to produce more heat energy. From highest to lowest quality, these types of coal are (1) anthracite, (2) bituminous, (3) subbituminous, and (4) lignite. Bituminous, subbituminous, and lignite coals are typically used to generate electricity. Anthracite and higher quality bituminous coal can be used to produce coke, which is used in steelmaking.

Colorado has deposits of all coal types, but currently only bituminous and subbituminous coal are mined in the state. According to the U.S. Energy Information Administration and publicly available information published on the mines' websites, the two surface mines in Colorado produce subbituminous coal and the four underground mines produce bituminous coal. EXHIBIT 1.1 shows the location of the active mines and the types of coal in Colorado.

EXHIBIT 1.1 ACTIVE COAL MINES¹ IN COLORADO AND TYPES OF COAL



SOURCE: Map from *Information Series 82 Colorado Mineral and Energy Industry Activities 2018-2019* by Michael K. O'Keeffe and Karen A. Berry, Colorado Geological Survey.

¹ The Bowie No. 2 mine in Delta County was idle and was not producing coal in 2018.

WHAT IS THE PURPOSE OF THE TAX EXPENDITURES?

Statute does not explicitly state a purpose for any of the coal severance tax expenditures. Therefore, we inferred the following purposes:

- **COAL TONNAGE EXEMPTION**—Based on the statutory language, committee summaries from amending legislation [House Bill 99-1249], and the legislative declaration from House Bill 99-1249, we inferred that the purpose of this exemption is to support the Colorado coal industry by reducing its severance tax burden.

- **UNDERGROUND COAL CREDIT**—Based on the statutory language and testimony from the enacting legislation [House Bill 77-1076], we inferred that the purpose of the Underground Coal Credit is to reduce the severance tax burden on coal mined underground, due to underground mines being more costly to operate. When it was created, legislators discussed their understanding that it was more expensive to produce coal from underground mines than coal mined from surface mines. Because the coal severance tax is a tonnage tax on the amount of coal extracted, the General Assembly wanted to account for higher costs incurred by operators in mining coal underground versus mining coal on the surface by reducing their severance tax liability.

- **LIGNITIC COAL CREDIT**—Based on the statutory language, testimony from the enacting legislation [House Bill 77-1076], and research on lignitic coal chemical properties and historical market prices, we inferred that the purpose of the Lignitic Coal Credit is to reduce the severance tax burden on lignitic coal mining operations because lignitic coal gets a lower price due to its lower quality. Because the coal severance tax is a tonnage tax on the amount of coal extracted, the General Assembly wanted to account for lignitic coal receiving a lower price than other types of coal. Additionally, in the 1970s, there was an energy crisis. At the time the severance tax and Lignitic Coal Credit were passed, legislators expressed concerns about dependency on foreign-produced oil and discussed that on a national basis, many of the power plants had switched to coal. Therefore, they may have been anticipating an increase in demand for all types of coal that could be mined in Colorado, including lignitic coal, and may have intended the credit to reduce the financial barriers of mining this type of low-priced coal in light of a new severance tax being imposed.

ARE THE TAX EXPENDITURES MEETING THEIR PURPOSES AND WHAT PERFORMANCE MEASURES WERE USED TO MAKE THIS DETERMINATION?

Overall, we found that the coal tax expenditures are either meeting their purpose to a limited extent or not at all, concluding on each as follows:

- The **COAL TONNAGE EXEMPTION** is meeting its purpose to some extent because it has reduced the severance tax liabilities of coal mining operations and may have helped some coal mines, particularly those operating on the margins of profitability, stay operational in the short-term. However, the Coal Tonnage Exemption has not likely had a significant impact on the long-term viability of coal mines in Colorado.
- The **UNDERGROUND COAL CREDIT** may be meeting its purpose to a limited extent because it reduces the tax liability of underground mines, but its effectiveness can vary based on the costs of each mining operation. Specifically, for the most expensive underground mining operations, the credit is too small to significantly offset the additional cost of mining underground. Conversely, the costs of operating relatively less expensive underground mines may be the same or lower than the costs of surface mines. Therefore, for these mines, there may be no additional underground mining costs to offset and the credit may act as an additional tax benefit that favors underground mines over surface mines.
- The **LIGNITIC COAL CREDIT** is not meeting its purpose because lignitic coal has not been mined in Colorado for many years and is not likely to be mined in the future.

Statute does not provide quantifiable performance measures for any of the coal severance tax expenditures. Therefore, we created and applied the following performance measures to determine the extent to which the coal severance tax expenditures are meeting their inferred purposes:

PERFORMANCE MEASURE #1: *To what extent has the COAL TONNAGE EXEMPTION reduced the severance tax liability of Colorado coal mining operations?*

RESULTS:

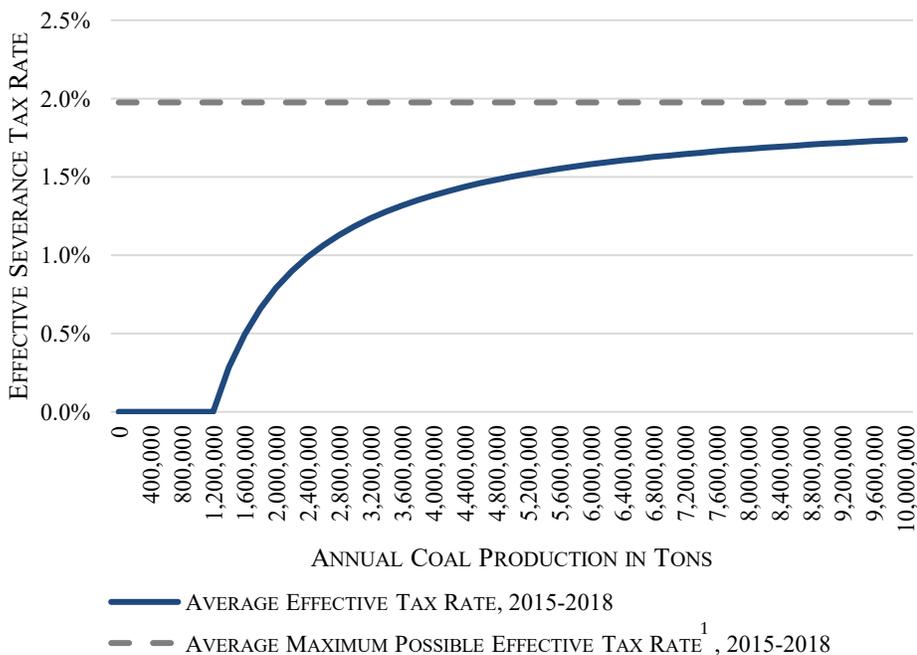
We examined the Tax Year 2017 severance tax returns for operators of the six coal mines operating in the state in 2019 and found that the Coal Tonnage Exemption reduced the operators' severance tax liabilities by between 25 percent and 100 percent. Additionally, based on our estimate of the gross incomes of each of the mines, we estimated that the Coal Tonnage Exemption reduced the effective severance tax rate as a percentage of gross income of the coal mines by between 0.5 percent and 1.9 percent in Tax Year 2017, resulting in the mines having an effective severance tax rate of between 0 percent and 1.4 percent of gross income, before taking into consideration the Underground Coal Credit and the Lignitic Coal Credit.

We also compared the severance tax savings as a result of the Coal Tonnage Exemption to the potential gross income of each mine. We lacked data on each mine's actual gross income for the year because that information is not reported on the Coal Severance Tax Return (Form DR 0020C). However, we estimated the possible gross income of each mine by multiplying the production reported by each mine on its Coal Severance Tax Return by a price of \$43 per ton, which was the average sales price of coal in Colorado in 2017, as reported by the U.S. Energy Information Administration in its 2018 Annual Coal Report. The actual price received by each of the six Colorado mines may differ from this amount depending on the specific quality of the coal mined, whether it was sold to an affiliate company, and whether it was sold through a contract or at market rates, all of which would impact the accuracy of our estimate.

We also found that the Coal Tonnage Exemption provides a larger relative benefit to smaller mines. EXHIBIT 1.2 illustrates the average estimated effective tax rate of a given coal mine for Tax Years 2015

through 2018, as a percentage of estimated gross income and after applying the exemption, based on the mine's annual coal production. We presented an average for these years because the effective severance tax rate changes slightly from one year to the next due to changes in both average prices and the severance tax rate per ton of coal. We estimated annual effective severance tax rates by dividing the average annual severance tax rate per ton of coal for the given year by the estimated taxable gross income for a mine producing the given amount of coal, which was determined by multiplying the taxable production amount by the average Colorado price of coal per ton for the given year. Based on coal prices and the coal severance tax rate, which is adjusted based on inflation, we also estimated that between 2015 and 2018 the maximum savings that the Coal Tonnage Exemption could have provided to any mine, on average, would have been about 2.0 percent of estimated gross income, assuming that the coal was sold at the average sales price in Colorado in each year, as reported by the U.S. Energy Information Administration.

EXHIBIT 1.2.
AVERAGE ANNUAL EFFECTIVE SEVERANCE TAX RATES¹
FOR DIFFERENT PRODUCTION QUANTITIES,
TAX YEARS 2015 THROUGH 2018



SOURCE: Office of the State Auditor analysis of data from the U.S. Energy Information Administration and the Department of Revenue.
¹The maximum possible effective severance tax rate on coal mines as a percentage of their estimated gross income changes slightly from year to year as a result of changes in severance tax rates and average Colorado coal prices. Therefore, this line represents the average of the maximum possible effective severance tax rates in each year from 2015 to 2018.

As shown, small mines producing 1.2 million tons of coal or less pay no severance tax because at this production level, all of the coal produced will fall within the exemption. However, as shown, beyond 1.2 million tons, the effective severance tax rate increases as mines produce more coal, with mines producing 10 million tons of coal paying closer to the maximum possible effective rate.

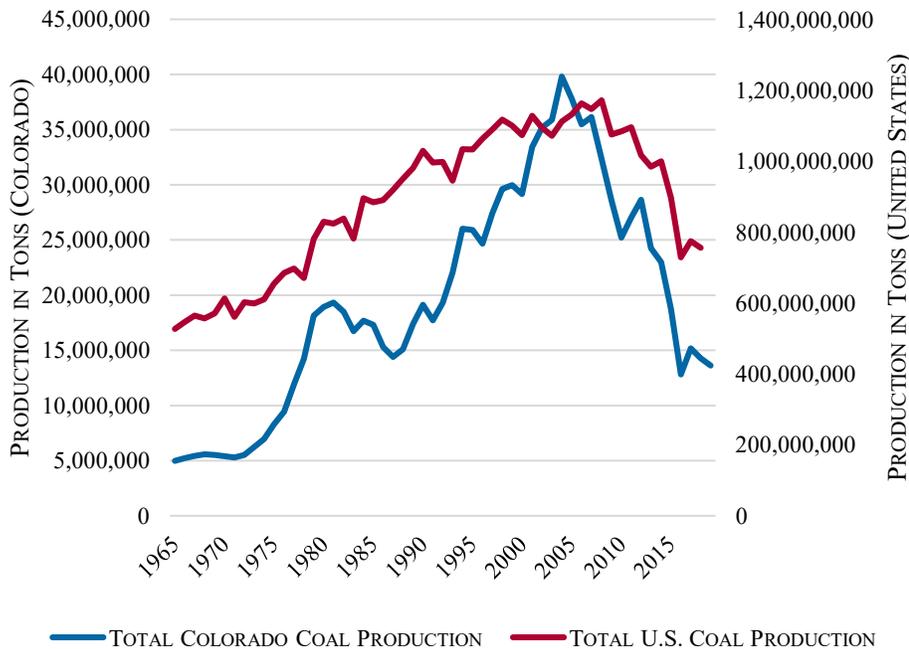
PERFORMANCE MEASURE #2: *To what extent have coal mines remained operational as a result of the COAL TONNAGE EXEMPTION?*

RESULTS:

We determined that the Coal Tonnage Exemption has not likely had a significant impact on Colorado coal mines' ability to stay operational over the long term, although we lacked data to quantify the exemption's long-term effects. Generally, it appears that the exemption does not provide a large enough tax benefit to offset nationwide coal industry production trends. However, it is possible that the exemption may have helped keep some mines, in particular those operating on the margins of profitability, open when coal prices have declined.

Based on our analysis of Colorado coal production data from the Colorado Geological Survey and the Division of Reclamation, Mining, and Safety and our examination of federal publications and data, we found that Colorado's coal mining industry has generally declined over the last 15 years, along with the national coal mining industry, as demonstrated in EXHIBIT 1.3. Coal production in the United States peaked in 2008 and declined to about 65 percent of peak production by 2018. Colorado coal production has followed a roughly similar trend, peaking in the early 2000s and declining significantly since then, from about 40 million tons in 2004 to about 14 million tons in 2019 (about 34 percent of peak production).

**EXHIBIT 1.3.
COAL PRODUCTION IN THE UNITED STATES AND
COLORADO, 1965-2019¹**

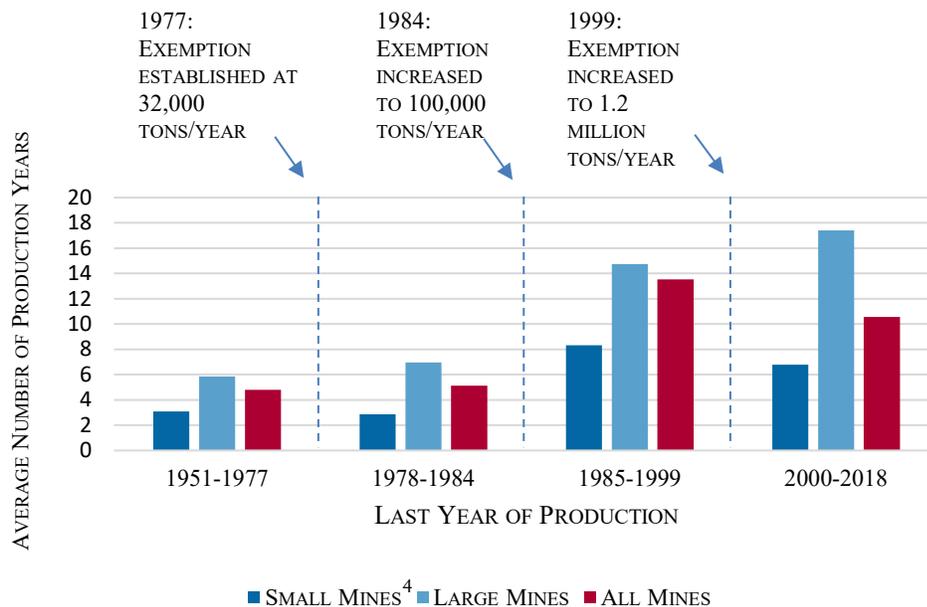


SOURCE: Data from the U.S. Energy Information Administration, Colorado Geological Survey, and Colorado Division of Reclamation, Mining, and Safety.
¹Production data has not yet been published for 2019 for the United States.

In addition to an overall decline in coal production in the state, it appears that the smaller mines that receive the largest relative benefit from the exemption have stayed in production for fewer years than larger mines that receive relatively less benefit, indicating that the exemption has generally not been a primary factor in keeping mines operational. As discussed in Performance Measure #1, the exemption likely has the greatest impact (measured as a percentage of the mines’ estimated gross income) on small mines producing no more than 1.2 million tons of coal per year, which is the maximum amount allowed under the exemption. Therefore, we assessed production and closure patterns in these “small” mines as compared with “large” mines (those producing more than the exemption’s annual tonnage threshold per year) in four different time periods, based on the enactment year of and years in which the tonnage threshold for the exemption was changed,

as detailed in EXHIBIT 1.4. We found that the number of years in which large mines were actively producing coal increased during each of the four periods, but the number of years in which small mines were actively producing coal was more variable and has decreased by 30 percent since the threshold was increased to 1.2 million tons per year in 1999. Although we were unable to quantify the effects of the exemption compared with other factors that may have affected the closure rates of mines, the decrease in production years of small mines compared with the more substantial increase in production years of large mines indicates that the exemption is likely not a driving factor for keeping small mines in Colorado operational.

EXHIBIT 1.4.
AVERAGE NUMBER OF PRODUCTION YEARS¹ AT COLORADO MINES
BASED ON CLOSURE YEAR², 1951-2018³



SOURCE: Office of the State Auditor analysis of data from the Colorado Geological Survey and the Colorado Division of Reclamation, Mining, and Safety.

¹Only years in which a given mine was actively producing coal are included in the average.

²Closure year is defined as the last year in which the mine reported some coal production.

³We did not include mines that reported production in 1950 or 2019.

⁴ We defined “small” mines as those that (a) would have had their coal severance tax liability completely eliminated by the Tonnage Exemption during the majority of their production years after 1978 and/or (b) had production amounts in the 40th percentile or lower during the majority of their production years prior to 1978. We defined all other mines as “large” mines for our analysis.

Finally, we found that the tax benefit provided by the exemption is most likely to have an impact on keeping mines open when they are only marginally profitable. We performed an analysis of several scenarios regarding coal mines' breakeven prices, or the minimum price of coal per ton needed in order for a given mine to remain profitable, to assess how those prices would change in response to the tax benefit provided by the exemption. According to feedback from stakeholders, there is no single "breakeven price" for the coal industry because operating costs can differ significantly from mine to mine and even on the same property. Although breakeven prices are not well-defined, each mine theoretically has a minimum price below which it cannot continue to operate profitably, and the extent to which the exemption may help a given coal mine to continue operating when prices are low likely corresponds to how the mine's breakeven price compares with current coal prices. For example, average Colorado coal prices dropped from \$38.64 to \$36.12 per ton (about 6.5 percent) between 2014 and 2015. If a small coal mine (producing no more than 1.2 million tons annually) had a breakeven price of \$36 per ton with the exemption in place, then the mine would have been barely able to stay profitable in 2015 when the price of coal dropped. The annual average coal severance tax rate in 2015 was about 79 cents per ton, so without the exemption, the mine's breakeven price would have increased to \$36.79 per ton (a 2.2 percent increase, equal to the maximum severance tax savings possible as a result of the exemption). In this case, the exemption may have helped the mine to stay operational in 2015 because without it, the mine would have been operating at a net loss.

However, if a different small coal mine had a breakeven price of \$28 per ton with the exemption in place, then the mine would have continued to be profitable in 2015 regardless of the exemption's existence, since the breakeven price without the exemption (\$28.79 per ton) would still have been substantially lower than the current price of coal (\$36.12 per ton). Finally, for large mines producing more than 1.2 million tons of coal annually, the exemption would decrease the breakeven price by less than 79 cents per ton because the exemption

would only apply to the first 1.2 million tons of coal produced, resulting in lower severance tax savings as a percentage of gross income. Using the example above, a mine producing about 10 million tons per year would only receive a 9 cent per ton reduction in breakeven price as a result of the exemption compared to 79 cents for a mine producing no more than 1.2 million tons. Therefore, the exemption is likely less effective for larger mines.

PERFORMANCE MEASURE #3: *To what extent does the UNDERGROUND COAL CREDIT offset the additional costs of underground coal mining versus surface coal mining in Colorado?*

RESULTS:

We found that the effectiveness of the Underground Coal Credit is dependent on the costs of each underground mine, which can vary widely depending on the geological conditions of the specific mine and the amount of coal produced at each mine. However, because the typical tax benefit provided by the credit is small in comparison to underground mining costs, it is unlikely to offset a significant portion of the costs for most mines, especially those with the highest costs. Further, because the cost of underground mining of high-quality coal deposits can be less than surface mining of lower quality coal deposits, for some underground mines, the credit does not always function to offset increased costs relative to surface mining, but instead may provide an additional tax benefit favoring underground mines.

To compare mining costs to the benefit provided by the credit, we obtained data on the predicted cost per ton of mining coal in Colorado. The cost data were derived from a regression model developed by economists Ian Lange, Brett Jordan, and Joshua Linn, explained in their working paper *Coal Demand, Market Forces, and US Mine Closures*. The data predict the lowest, average, and highest cost of mining coal underground and on the surface in Colorado in Calendar Year 2012. We calculated that the maximum monetary benefit provided by the Underground Coal Credit was \$0.42 per ton in Tax Year 2012 by

multiplying the Tax Year 2012 average severance tax rate (\$0.84 per ton) by 50 percent (the value of the credit). However, because of the Coal Tonnage Exemption, the actual tax benefit of the Underground Coal Credit is typically less than the maximum. We then compared the benefit provided by the credit to the difference in costs between the lowest, average, and highest cost underground mines and surface mines.

As shown in EXHIBIT 1.5, we found that the lowest and average cost underground mines are generally less costly to operate than surface mines, meaning that the credit provides an additional benefit to underground mines that are not more costly to operate. Further, because the highest cost underground mines are significantly more costly to operate than the highest cost surface mines (i.e., \$18.01 per ton more in operations costs versus \$0.42 per ton in credits), the credit does little to offset the difference in costs for these underground mines.

EXHIBIT 1.5 ANALYSIS OF SURFACE MINE COSTS COMPARED TO UNDERGROUND MINE COSTS			
	Lowest Cost Mine	Average Cost Mine	Highest Cost Mine
Underground Mine Predicted Cost per Ton of Coal (2012)	\$26.92	\$32.13	\$53.66
Surface Mine Predicted Cost per Ton of Coal (2012)	\$32.47	\$34.09	\$35.65
Additional cost (savings) for underground mine per ton	(\$5.55)	(\$1.96)	\$18.01
Maximum credit value per ton	\$0.42	\$0.42	\$0.42
Percentage of Additional Underground Mining Costs Offset by Credit	N/A	N/A	2.3%

SOURCE: Office of the State Auditor analysis of mine cost data provided by Ian Lange, Assistant Professor of Business and Economics at Colorado School of Mines. The predicted costs were derived from a regression model developed by Ian Lange, Brett Jordan, and Joshua Linn and explained in their working paper *Coal Demand, Market Forces, and US Mine Closures*.

As discussed, based on its legislative history, at the time the General Assembly created the Underground Coal Credit, it appeared to have the understanding that underground mining was typically more expensive compared to surface mining in the state. This may have been the case in

1977 when the credit was established and is true in certain other areas of the country, such as in Wyoming, where surface mine coal extraction costs can be as low as around \$10 per ton because the coal seams are thick and large volumes of coal can be extracted relatively quickly. However, some surface mine operators in Colorado face challenges that can make extracting coal more expensive, such as mining on the side of a mountain, narrower coal seams, and needing to remove more soil and rock layers that sit above or between coal seams to access more of the coal. These factors can drive surface mine operators' costs up to comparable levels as some of the underground mines operating in the state.

Underground and surface mine operators in the state also reported that mining costs can be highly variable, which means the credit's effectiveness also varies. Generally, costs that mine operators mentioned they incur were consistent with the regression model cost data we used. However, among mines, or even within a single mine, the costs can vary significantly in different periods depending on a variety of factors, including the volume of coal extracted and the particular conditions of the mine or part of a mine. For example, if there is less market demand for coal, mines decrease their production, and their extraction costs per ton increase because the mines are unable to take advantage of economies of scale that allow them to spread out their fixed costs. Underground mine operators told us that if they are mining in an area with favorable geological conditions, their costs can be as low as in the upper \$20s per ton compared to \$40 to \$50 per ton if they are mining in an area that is more geologically challenging.

PERFORMANCE MEASURE #4: *To what extent is the LIGNITIC COAL CREDIT being used to reduce the severance tax burden on the production of lignitic coal?*

RESULTS:

According to data from the U.S. Energy Information Administration's Annual Coal Reports, lignite coal has not been mined in Colorado since

at least 1993, which is the furthest back the agency reports on state-level production of coal by type. However, according to stakeholders, it is likely that lignitic coal has not been mined in Colorado since much earlier than 1993. Therefore, it is unlikely that anyone has benefited from the Lignitic Coal Credit since at least 1993, but likely earlier than that. We found evidence that there may have been interest in mining lignitic coal in Colorado in the 1970s and 1980s (e.g., mining prospects), but we were unable to confirm that any production of lignitic coal occurred between the enactment of the severance tax and Lignitic Coal Credit in 1977 and 1993.

Colorado has large deposits of lignite coal, primarily in the areas east and south of Denver. However, it is unlikely that lignitic coal will be mined in Colorado for several reasons:

- There are abundant sources of subbituminous coal nearby (e.g., in Wyoming) that are relatively inexpensive to mine. Subbituminous coal is a higher quality coal than lignitic coal with higher carbon content and lower moisture content, so it is generally more favorable for energy generation than lignitic coal since it is capable of producing more energy on a per-unit basis.
- The cost to mine and transport lignitic coal, combined with the low price it receives, may make it uneconomical to mine. Lignitic coal is typically mined close to the power plant in which it will be used in order to reduce transportation costs, which can be expensive. It is unlikely that lignitic coal would be used in Colorado to generate power because many coal power plants have either been converted to natural gas or retired, or will be in the near future. This transition away from coal power plants to natural gas power plants was promoted by Colorado legislation in 2010 [House Bill 10-1365, which is known as the Clean Air – Clean Jobs Act]. Additionally, the cost of renewable energy sources (e.g., solar, wind) has decreased and use of these sources has increased.

WHAT ARE THE ECONOMIC COSTS AND BENEFITS OF THE TAX EXPENDITURES?

We examined the Tax Year 2017 Coal Severance Tax Returns (Form DR 0020C) for the operators of the six mines that were actively producing coal in 2019 and found that in Tax Year 2017:

- The **COAL TONNAGE EXEMPTION** resulted in \$5.1 million in foregone revenue to the State. We calculated this revenue impact by multiplying the exempt amount of tons reported by each operator in each quarter on their Coal Severance Tax Return by the prevailing coal severance tax rate in that quarter.
- The **UNDERGROUND COAL CREDIT** resulted in an additional \$2.8 million in forgone revenue to the State. If the Coal Tonnage Exemption were not in place, the Underground Coal Credit would have a revenue impact of \$4.4 million, which we calculated by multiplying the tons reported by each operator in each quarter on their Coal Severance Tax Return by the prevailing coal severance tax rate in that quarter and then multiplying that by 50 percent.
- The **LIGNITIC COAL CREDIT** resulted in \$0 in foregone revenue to the State because it is not used.

Therefore, the total revenue impact to the State of the coal severance tax expenditures in Tax Year 2017 was \$7.9 million. In comparison, the total coal severance tax liability of taxpayers in Tax Year 2017 was \$4.0 million.

WHAT IMPACT WOULD ELIMINATING THE TAX EXPENDITURES HAVE ON BENEFICIARIES?

If the Coal Tonnage Exemption and the Underground Coal Credit were eliminated, it would result in taxpayers being unable to claim an exemption or credit against their coal severance taxes and, thus, having a higher severance tax liability. Eliminating the Coal Tonnage

Exemption would have increased severance tax liabilities in Tax Year 2017 by approximately \$5.1 million, which would be an increase of 129 percent based on the \$4.0 million in net coal severance tax liability of all taxpayers in Tax Year 2017. Eliminating the Underground Coal Credit would have increased severance tax liabilities on underground mines in Tax Year 2017 by an additional \$2.8 million, which would be an increase of 100 percent based on the \$2.8 million in net coal severance tax liability of underground mine operators in Tax Year 2017.

We spoke with several coal mine operators in the state, as well as an organization that represents mining operations, and they all reported that the Coal Tonnage Exemption and the Underground Coal Credit are very important to the coal mining industry in Colorado. Several mines reported that they operate on small profit margins, and sometimes at a loss depending on the market price of coal, and eliminating these tax expenditures could result in them reducing their workforce or the mine closing. For mines that already have planned closures, operators reported that eliminating these tax expenditures could accelerate the closure dates of those mines. They reported that accelerated closure of the mines could be detrimental to the communities in which they are located because they are relying on the planned remaining time they have to help those communities prepare for the anticipated large job and property tax reductions that will likely result from the closure of the mines.

In some cases, depending on the business model of the specific mine, eliminating the Coal Tonnage Exemption and/or the Underground Coal Credit could also result in higher energy prices for end consumers. Some coal mines sell directly to power plants in the state, particularly those that serve rural areas, so if severance taxes increase, they may pass some or all of the costs on to power plants, which then could potentially pass on the increased costs to their energy consumers. However, not all mines would be able to pass on the increased severance tax costs to their customers; in those cases, the mines would have to absorb the additional

severance tax costs, which those operating on small or negative margins said they are unable to afford.

Because no one is currently mining lignitic coal in Colorado, and we did not identify anyone that has mined lignitic coal recently, there would be no impact on intended beneficiaries if the Lignitic Coal Credit were eliminated. Additionally, we consulted with stakeholders, and they stated that it is very unlikely that lignitic coal will be mined in Colorado in the future.

ARE THERE SIMILAR TAX EXPENDITURES IN OTHER STATES?

We examined the state tax laws of the 24 other states (excluding Colorado) with a severance tax on coal and found:

- **COAL TONNAGE EXEMPTION**—Two states (Kansas and Montana) have a similar exemption. In Kansas, the first 350,000 tons extracted annually from a mine certified by the state geological survey are exempt from the coal severance tax, though there are no coal mines currently operating in the state. In Montana, 50,000 tons per calendar year are exempt from the severance tax. However, if a producer mines more than 50,000 tons in a calendar year, then only the first 20,000 tons are exempt. Additionally, in 2020 the Wyoming legislature passed a bill that temporarily (through July 1, 2030) exempts from the state severance tax all surface coal that is mined in Wyoming and transported to market outside of North America using a coal export terminal in Canada or Mexico.
- **UNDERGROUND COAL CREDIT**—Six states (Indiana, Montana, New Mexico, Ohio, West Virginia, and Wyoming) provide a reduced severance tax rate on coal that is produced from underground mines. EXHIBIT 1.6 shows the effective rate reduction for underground coal, as compared to surface coal, in Colorado and these six other states.

EXHIBIT 1.6. EFFECTIVE RATE REDUCTIONS FOR UNDERGROUND COAL			
State	Effective Rate Reduction for Underground Coal	Number of Underground Mines (2018)	Number of Surface Mines (2018)
Colorado	50 percent	4	2
Indiana	45 percent	6	12
Montana	60-80 percent, based on the BTU of the coal	1	5
New Mexico	4 percent	1	2
Ohio	11 percent	5	11
West Virginia	60-80 percent, based on coal seam thickness	69	86
Wyoming	46 percent	1	15

SOURCE: Office of the State Auditor analysis of Colorado and other states' statutes and U.S. Energy Information Administration data on mine types in each state.

- **LIGNITIC COAL CREDIT**—No other states offer a similar credit. According to U.S. Energy Information Administration data, lignite coal is only mined in significant amounts in North Dakota and Texas. In North Dakota, the coal severance tax rate is \$0.395 per ton, which is less than the tax rate lignite coal would be subject to in Colorado when taking into consideration the Lignitic Coal Credit (\$0.41 as of April 2020). Texas does not levy a coal severance tax.
- Of the 25 states that do not levy a severance tax on coal, only four of them (Illinois, Pennsylvania, Texas, and Utah) had production of over 10 million tons of coal in 2018.

ARE THERE OTHER TAX EXPENDITURES OR PROGRAMS WITH A SIMILAR PURPOSE AVAILABLE IN THE STATE?

Federal law [26 USC 4121] imposes an excise tax on the sale of coal extracted from domestic mines, but provides an exemption for lignite coal. Additionally, the federal excise tax is assessed at a higher rate on underground coal (\$1.10 per ton) than surface coal (\$0.55 per ton), essentially providing a 50 percent rate reduction for surface coal.

WHAT DATA CONSTRAINTS IMPACTED OUR ABILITY TO EVALUATE THE TAX EXPENDITURES?

Due to data limitations, we were unable to track revenue impacts over time and verify that no one has claimed the Lignitic Coal Credit in recent years. The Department of Revenue (Department) captures information from the Coal Severance Tax Return (Form DR 0020C) in GenTax, its tax processing information system. However, the Department only provided us with this information for Tax Years 2015 and 2016, which are the most recent years published in the Department's 2018 Tax Profile and Expenditure Report. The Department was unable to pull data for additional years due to resource constraints, specifically pulling the data systematically would require additional programming to extract it from GenTax (see the Tax Expenditures Overview Section of the Office of the State Auditor's *Tax Expenditures Compilation Report* for additional details on the limitations of Department of Revenue data and the potential costs of addressing the limitations).

Because there were only six actively producing mines in 2019, we were able to collect data on amounts of coal extracted, revenue impacts for each of the tax expenditures, and number of claimants of each tax expenditure from GenTax. In order to obtain the data, we manually looked up each taxpayer account in GenTax and downloaded the Coal Severance Tax Return from Tax Year 2017 from each taxpayer's account. However, due to time constraints, we did not conduct a similar analysis for prior years to assess trends.

WHAT POLICY CONSIDERATIONS DID THE EVALUATION IDENTIFY?

THE GENERAL ASSEMBLY MAY WANT TO REVIEW THE EFFECTIVENESS OF THE COAL TONNAGE EXEMPTION AND CLARIFY ITS INTENT. As discussed, we found that the Coal Tonnage Exemption is meeting its purpose to a limited extent because it provides financial support to Colorado's coal mines, but it has not likely made a significant impact on coal mines' long-term ability to stay operational. Overall, the exemption reduced taxpayers' severance tax liability by \$5.1 million in Tax Year 2017, compared to the \$4.0 million in coal severance taxes they paid. We estimate that, on average, this benefit was equivalent to about 1.1 percent of taxpayers' estimated gross income, and the maximum possible annual benefit that the exemption could have provided to any mine between 2015 and 2018 was about 2.2 percent of estimated gross income. Therefore, the exemption may be effective at keeping mines open when the mines are operating on the margins of profitability. Furthermore, mining industry stakeholders indicated that the exemption is important to the industry in the state and helps keep mines operational or delays their closure. However, the benefit provided by the exemption is not large enough to offset the trend of decreasing coal production in Colorado, with production decreasing to about 65 percent of peak production since 2004 due to power plants converting from coal to natural gas, decreasing renewable energy costs, and stricter regulations.

Based on this evaluation, and because statute does not include performance measures or goals for the Coal Tonnage Exemption, we were unable to determine whether the Coal Tonnage Exemption supports Colorado's coal industry to the extent that the General Assembly may have intended. Therefore, the General Assembly may want to review the exemption's effectiveness and amend statute to provide performance measures that clarify the exemption's intent, which would aid future evaluations.

THE GENERAL ASSEMBLY COULD CONSIDER REVIEWING AND CLARIFYING THE PURPOSE OF THE UNDERGROUND COAL CREDIT. As discussed, based on legislative committee discussions at the time the credit was created, we inferred that its purpose was to account for the difference in the costs of underground mining as compared to surface mining, based on legislators' understanding that mining underground was generally more costly than surface mining. We found that the Underground Coal Credit appears to be meeting its purpose to a limited extent because it generally offsets a relatively small portion of underground mines' costs—about \$0.41 per ton in Tax Year 2017, compared to average underground mining costs of about \$32 per ton. However, based on academic research, which modeled mining costs in Colorado, and information we received from stakeholders, underground mining is not necessarily more costly than surface mining in the state, with the average surface mine having costs similar to or slightly higher than the average underground mine, measured on a cost per ton basis. Although in other regions of the United States underground mining is generally more expensive than surface mining, the geological conditions in parts of Colorado make it more expensive to mine on the surface in Colorado. Therefore, the General Assembly may want to review the Underground Coal Credit to determine whether it continues to serve its intended purpose.

In evaluating the Underground Coal Credit, the General Assembly may also want to consider the following factors that may impact the effectiveness of the credit:

- The credit's current structure, coupled with the coal severance tax being levied on a flat per-ton basis, may result in uneven treatment among taxpayers. Although underground coal mining can be more expensive than surface mining depending on the circumstances, the credit may treat taxpayers unevenly because it does not account for the price of coal, which can vary widely based on its quality and market conditions. Specifically, according to nationwide data from the U.S. Energy Information Administration, on average, coal mined underground sold for 176 percent more than coal mined on the surface in 2018 (\$60 versus \$22 per ton) due to its higher quality.

Though we lacked comprehensive Colorado-specific data on coal prices, some stakeholders mining in Colorado reported currently selling their underground-mined coal for just under \$30 per ton. However, due to the potentially higher price an underground mine could receive for its coal, it could have a higher gross income for the same volume of coal as a surface mine. Therefore, depending on their operating costs, some underground mines may receive a credit, which is unavailable to surface mines, despite having a higher profit margin.

Although most states with a coal severance tax impose the tax on each ton extracted as Colorado currently does, the three states with the most coal production in 2018 that impose a coal severance tax (Wyoming, West Virginia, and Kentucky) levy the tax as a percentage of the gross or fair market value of the coal extracted. Colorado levies a severance tax on other resources, such as oil, natural gas, and metallic minerals, based on taxpayers' gross income. If the General Assembly wanted to account for differences in operating costs among mines it could consider imposing the coal severance tax on gross income and allowing all coal mines to deduct extraction costs from their gross income before applying the severance tax. However, none of the other mineral severance taxes in Colorado allow for a deduction based on the costs of extraction.

- Underground coal mines pay a higher federal excise tax than surface mines, which is levied at \$1.10 per ton for underground mines and \$0.55 per ton for surface mines. Therefore, although the federal excise tax did not exist at the time the Underground Coal Credit was established, the credit does function to partially level the combined state and federal excise tax on coal production. For example, in 2020, the combined state and federal tax on coal production is \$1.51 per ton for underground mines and \$1.36 per ton for surface mines. Without the credit, these rates would be \$1.91 for underground mines and \$1.36 per ton for surface mines.

THE GENERAL ASSEMBLY COULD CONSIDER REPEALING THE LIGNITIC COAL CREDIT BECAUSE IT HAS NOT BEEN USED RECENTLY AND IS UNLIKELY TO BE USED IN THE FUTURE. According to data from the U.S. Energy Information Administration, lignite coal has not been mined in Colorado since at least 1993, which is the furthest back the agency reports on state-level production of coal by coal type. However, according to stakeholders, it is likely that lignitic coal has not been mined in Colorado since much earlier than 1993. Therefore, it is unlikely that anyone has benefited from the Lignitic Coal Credit since at least 1993, and likely much earlier than that. Additionally, it is unlikely that anyone will benefit from the Lignitic Coal Credit in the future because (1) there are mineable sources of higher rank coal nearby, many of which are relatively inexpensive to extract, (2) the cost to mine and transport lignitic coal makes it uneconomical to use as an energy source, and (3) because of the high cost to transport and low price of lignitic coal, it is often used close to where it is mined, and it is unlikely to be used in Colorado since many coal power plants have been or are planned to be converted to natural gas or retired.