



May 2018

BLACK LUNG BENEFITS PROGRAM

Options for Improving Trust Fund Finances

Accessible Version

May 2018

GAO Highlights

Highlights of [GAO-18-351](#), a report to congressional requesters

Why GAO Did This Study

With revenue of about \$450 million in fiscal year 2017, the Trust Fund paid about \$184 million in benefits to more than 25,000 coal miners and eligible dependents. However, the Trust Fund also borrowed about \$1.3 billion from the Treasury's general fund in fiscal year 2017 to cover its debt repayment expenditures. Adding to this financial challenge, the coal tax that supports the Trust Fund is scheduled to decrease by about 55 percent beginning in 2019. GAO was asked to review the financial position of the Trust Fund and identify options to improve it.

This report examines (1) factors that have challenged the financial position of the Trust Fund since its inception and (2) the extent to which Trust Fund debt may change through 2050, and selected options that could improve its future financial position. GAO reviewed Trust Fund financial data from fiscal years 1979 through 2017. GAO also interviewed officials from the Departments of Labor, Treasury, Health and Human Services (HHS) and representatives of coal industry and union groups. Using assumptions, such as the about 55 percent coal tax decrease and moderately declining coal production, GAO simulated the extent to which Trust Fund debt may change through 2050. GAO also simulated how selected options, such as forgiveness of debt, could improve finances. The options simulated are not intended to be exhaustive. Further, GAO is not endorsing any particular option or combination of options.

GAO provided a draft of this report to DOL, Treasury, and HHS. The agencies provided technical comments, which were incorporated as appropriate.

View [GAO-18-351](#). For more information, contact Cindy Brown Barnes, (202) 512-7215, brownbarnesc@gao.gov.

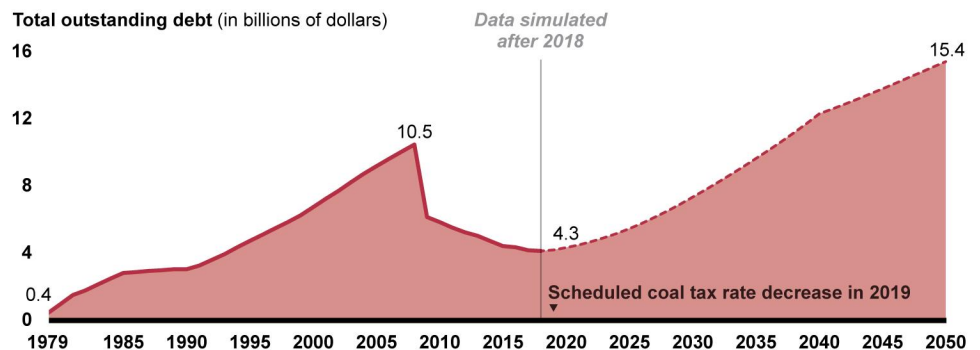
BLACK LUNG BENEFITS PROGRAM

Options for Improving Trust Fund Finances

What GAO Found

Multiple factors have challenged Black Lung Disability Trust Fund (Trust Fund) finances since it was established about 40 years ago. Its expenditures have consistently exceeded its revenues, interest payments have grown, and actions taken that were expected to improve Trust Fund finances did not completely address its debt. When necessary to make expenditures, the Trust Fund borrows with interest from the Department of the Treasury's (Treasury) general fund. Because Trust Fund expenditures have consistently exceeded revenue, it has borrowed almost every year since 1979, its first complete fiscal year, and as a result debt and interest payments increased. Legislative actions were taken over the years including (1) raising the rate of the coal tax that provides Trust Fund revenues and (2) forgiving debt. For example, the Energy Improvement and Extension Act of 2008 provided an appropriation toward Trust Fund debt forgiveness; about \$6.5 billion was forgiven, according to Department of Labor (DOL) data (see figure). However, coal tax revenues were less than expected due, in part, to the 2008 recession and increased competition from other energy sources, according to DOL and Treasury officials. As a result, the Trust Fund continued to borrow from Treasury's general fund from fiscal years 2010 through 2017 to cover debt repayment expenditures.

Trust Fund Actual and Simulated Outstanding Debt, fiscal years 1979 through 2050



Source: GAO analysis of data from the Departments of Labor and Treasury (actual data) and GAO simulation. | GAO-18-351

GAO's simulation suggests that Trust Fund borrowing will likely increase from fiscal years 2019 through 2050 due, in part, to the coal tax rate decrease of about 55 percent that will take effect in 2019 and declining coal production. The simulation estimates that Trust Fund borrowing may exceed \$15 billion by 2050 (see figure). However, various options, such as adjusting the coal tax and forgiving interest or debt, could reduce future borrowing and improve the Trust Fund's financial position. For example, maintaining the current coal tax rates and forgiving debt of \$2.4 billion could, under certain circumstances, balance the Trust Fund by 2050, whereby revenue would be sufficient to cover expenditures. However, a coal industry representative said that maintaining or increasing the coal tax would burden the coal industry, particularly at a time when coal production has been declining. Further, Treasury officials noted that the costs associated with forgiving Trust Fund interest or debt would be paid by taxpayers.

Contents

Letter		1
	Background	4
	Multiple Factors Have Challenged Trust Fund Finances Resulting in Growing Debt	7
	Trust Fund Borrowing Will Likely Continue to Increase through 2050, and Multiple Options Could Reduce Future Debt	11
	Agency Comments	26
<hr/>		
Appendix I: Black Lung Disability Trust Fund Simulation Methodology		28
Appendix II: Results of GAO's Black Lung Disability Trust Fund Simulations		37
Appendix III: GAO Contact and Staff Acknowledgments		42
Appendix IV: Accessible Data		43
	Data Tables	43
<hr/>		
Tables		
	Table 1: Black Lung Disability Trust Fund Simulations	13
	Table 2: Future Black Lung Beneficiaries Simulation Methodology	29
	Table 3: Future Coal Tax Revenue Simulation Methodology	31
	Table 4: Definitions for Various Black Lung Disability Trust Fund Expenditures and Revenues (Excluding Black Lung Benefits and Coal Tax Revenue)	32
	Table 5: Options That May Affect Black Lung Disability Trust Fund Finances	33
	Table 6: Future Black Lung Beneficiaries and Coal Tax Revenue Sensitivity Analysis	35
	Table 7: Summary of Black Lung Disability Trust Fund Balances in Fiscal Year 2050 Given Various Options and Assumptions Regarding Coal Production and New Beneficiaries	38
	Table 8: Estimated Amount of Debt Forgiveness in Fiscal Year 2019 Needed to Balance the Black Lung Disability Trust Fund by 2050 Given Various Coal Tax Rates and Assumptions About Future Coal Production and Black Lung Beneficiaries	40

Table 9: Estimated Average Tax per Ton of Coal Starting in Fiscal Year 2019 Needed to Balance the Black Lung Disability Trust Fund by 2050 Given Various Debt Forgiveness Options and Assumptions About Future Coal Production and Black Lung Beneficiaries	41
Data Table for Highlights figure, Trust Fund Actual and Simulated Outstanding Debt, fiscal years 1979 through 2050 (in billions of dollars)	43
Data Table Figure 1: Black Lung Beneficiaries, Fiscal Years 1979 through 2017	45
Data Table Figure 2: Black Lung Disability Trust Fund Revenue and Black Lung Benefit Payments and Administrative Costs, Fiscal Years 1979 to 2017	46
Data Table for Figure 3: Black Lung Disability Trust Fund Principal Amount of Outstanding Debt to Treasury's General Fund, Fiscal Years 1979 to 2017	47
Data Table Figure 4: Black Lung Disability Trust Fund Actual and Simulated Revenue Based on Moderate Case Assumptions, Fiscal Years 2009 through 2050	49
Data Table Figure 5: Black Lung Disability Trust Fund Simulated Revenue and Black Lung Benefit Payments and Administrative Costs Based on Moderate Case Assumptions, Fiscal Years 2018 through 2050	50
Data Table Figure 6: Black Lung Disability Trust Fund Simulated Principal Amount of Outstanding Debt to Treasury's General Fund Based on Moderate Case Assumptions, Fiscal Years 2018 through 2050	51
Data Table Figure 7: Simulated Effects of Adjusting the Coal Tax on Black Lung Disability Trust Fund Principal Amount of Outstanding Debt to Treasury's General Fund Based on Moderate Case Assumptions, Fiscal Years 2018 through 2050	52
Data Table Figure 8: Simulated Effects of Forgiving Interest on Black Lung Disability Trust Fund Principal Amount of Outstanding Debt to Treasury's General Fund Based on Moderate Case Assumptions, Fiscal Years 2018 through 2050	53
Data Table Figure 9: Simulated Effects of Forgiving Debt (Principal and Interest) on Black Lung Disability Trust Fund Principal Amount of Outstanding Debt to Treasury's General Fund Based on Moderate Case Assumptions, Fiscal Years 2018 through 2050	54

Data Table Figure 10: Simulated Debt Forgiveness Needed in 2019 to Balance the Black Lung Disability Trust Fund by 2050 Given Various Coal Tax Rates Based on Moderate Case Assumptions	55
Data Table Figure 11: Simulated Change in Tax Collection per Ton of Coal Sold That Could Balance the Black Lung Disability Trust Fund by 2050, Based on Various Debt Forgiveness Options and Moderate Case Assumptions	56

Figures

Figure 1: Black Lung Beneficiaries, Fiscal Years 1979 through 2017	5
Figure 2: Black Lung Disability Trust Fund Revenue and Black Lung Benefit Payments and Administrative Costs, Fiscal Years 1979 to 2017	8
Figure 3: Black Lung Disability Trust Fund Principal Amount of Outstanding Debt to Treasury's General Fund, Fiscal Years 1979 to 2017	11
Figure 4: Black Lung Disability Trust Fund Actual and Simulated Revenue Based on Moderate Case Assumptions, Fiscal Years 2009 through 2050	14
Figure 5: Black Lung Disability Trust Fund Simulated Revenue and Black Lung Benefit Payments and Administrative Costs Based on Moderate Case Assumptions, Fiscal Years 2018 through 2050	16
Figure 6: Black Lung Disability Trust Fund Simulated Principal Amount of Outstanding Debt to Treasury's General Fund Based on Moderate Case Assumptions, Fiscal Years 2018 through 2050	17
Figure 7: Simulated Effects of Adjusting the Coal Tax on Black Lung Disability Trust Fund Principal Amount of Outstanding Debt to Treasury's General Fund Based on Moderate Case Assumptions, Fiscal Years 2018 through 2050	19
Figure 8: Simulated Effects of Forgiving Interest on Black Lung Disability Trust Fund Principal Amount of Outstanding Debt to Treasury's General Fund Based on Moderate Case Assumptions, Fiscal Years 2018 through 2050	20
Figure 9: Simulated Effects of Forgiving Debt (Principal and Interest) on Black Lung Disability Trust Fund Principal Amount of Outstanding Debt to Treasury's General Fund	

Based on Moderate Case Assumptions, Fiscal Years 2018 through 2050	21
Figure 10: Simulated Debt Forgiveness Needed in 2019 to Balance the Black Lung Disability Trust Fund by 2050 Given Various Coal Tax Rates Based on Moderate Case Assumptions	25
Figure 11: Simulated Change in Tax Collection per Ton of Coal Sold That Could Balance the Black Lung Disability Trust Fund by 2050, Based on Various Debt Forgiveness Options and Moderate Case Assumptions	26

Abbreviations

DOL	Department of Labor
EIA	Energy Information Administration
EIEA	Energy Improvement and Extension Act of 2008
HHS	Department of Health and Human Services
OMB	Office of Management and Budget
Treasury	Department of the Treasury

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May 30, 2018

The Honorable Robert C. “Bobby” Scott
Ranking Member
Committee on Education and the Workforce
House of Representatives

The Honorable Richard E. Neal
Ranking Member
Committee on Ways and Means
House of Representatives

The Honorable Sander M. Levin
House of Representatives

The Black Lung Disability Trust Fund (Trust Fund), established in 1978 by the Black Lung Benefits Revenue Act of 1977, funds benefits to certain coal miners who have been totally disabled due to pneumoconiosis, also known as black lung disease. Their surviving dependents may also receive compensation. That Act authorized the Trust Fund to pay benefits in certain circumstances including in cases where no responsible mine operator could be identified or when the liable mine operator does not pay. The Trust Fund is financed primarily by a tax on coal produced and sold domestically, which we refer to in this report as the coal tax.¹

The Trust Fund faces financial challenges and borrowed about \$1.3 billion in fiscal year 2017 from the Department of the Treasury’s (Treasury) general fund to cover its total expenditures, according to Department of Labor (DOL) officials who administer the Trust Fund.² Beginning in calendar year 2019, the coal tax will decrease by approximately 55 percent which, in turn, will increase borrowing,

¹The coal tax is imposed on the sale of all domestic coal with two exceptions: (1) lignite coal and (2) exported coal.

²When necessary for the Trust Fund to make relevant expenditures, funds are appropriated to the Trust Fund as “repayable advances,” and then those advances must be repaid with interest to the general fund of the U.S. Treasury. We refer to this process as annual borrowing from Treasury’s general fund because, for reporting purposes, we often refer to the total amount of the repayable advances made in a particular fiscal year. According to the Department of the Treasury, the general fund includes assets and liabilities used to finance the daily and long-term operations of the U.S. government as a whole.

according to DOL projections. Additionally, coal production has been declining as the coal industry faces challenges from increased competition from other energy sources, which may further affect future Trust Fund revenue.³ With less revenue contributed by mine operators through the coal tax, increased federal funding may be needed because under federal law the Trust Fund borrows from Treasury's general fund to cover its expenditures.

Given the potential for increased federal funding of Trust Fund expenditures as a result of the decreasing tax rate, you asked us to review the financial position of the Trust Fund and to identify options that could improve its future financial position. This report examines (1) factors that have challenged the financial position of the Trust Fund since its inception; and (2) the extent to which the Trust Fund's debt may change through 2050, and selected options that could improve its future financial position.

To address our first objective, we reviewed relevant federal laws, regulations, policy, and guidance as well as agency documentation. We primarily focused on changes to the coal tax rates and other legislative actions taken that were expected to improve the financial position of the Trust Fund, such as debt refinancing and forgiveness provisions contained in the Energy Improvement and Extension Act of 2008 (EIEA). We also reviewed publicly available Trust Fund financial data obtained from the DOL Office of Workers' Compensation Programs' Annual Reports to Congress and annual bulletins issued by the Treasury. We examined information on Trust Fund revenue and expenditures from 1979 (the Trust Fund's first complete fiscal year) through 2017, the most recent year data were available at the time of our review.⁴ For example, we reviewed the annual amounts of coal tax revenue collected and the annual amounts paid by the Trust Fund in black lung benefits, administrative costs, and debt servicing. We assessed the reliability of the data by discussing it with relevant agency officials and reviewing it for missing data, outliers, or obvious errors. We determined that the data were sufficiently reliable for the purposes of our review. Additionally, we interviewed officials from DOL's Office of Workers' Compensation

³U.S. Department of Energy, Energy Information Administration, *Annual Coal Report 2016* (Washington, D.C.: November 2017).

⁴We received fiscal year 2017 Trust Fund financial data from DOL officials which we incorporated, as appropriate.

Programs and Mine Safety and Health Administration; the Department of the Treasury's Offices of Federal Program Finance and Tax Analysis; the Department of Health and Human Services' (HHS) National Institute for Occupational Safety and Health and the Health Resources and Services Administration, which funds black-lung-related grant programs; the National Mining Association (an organization that represents the mining industry); and the United Mine Workers of America (an organization that represents coal miners).

To address our second objective, we simulated the extent to which Trust Fund debt may change through 2050 and how various options may affect future Trust Fund finances. Our simulations are based on various assumptions and simulate Trust Fund revenues and expenditures from fiscal years 2016 through 2050.⁵ To develop these simulations, we used actual and projection data from (1) DOL for fiscal years 2015 through 2040; (2) Treasury's Office of Tax Analysis for fiscal years 2011 through 2015; (3) the Department of Energy's Energy Information Administration (EIA) for calendar years 2015 through 2050; and (4) the Office of Management and Budget (OMB) for fiscal year 2017. We ran each simulation multiple times using different sets of assumptions about the number of future black lung beneficiaries and future coal production. Doing so provided a range of estimates about the Trust Fund's future borrowing needs and provided insight on the sensitivity of its overall financial position relative to its various revenues and expenditures. In this report, we generally present the results of a moderate set of assumptions for each simulation. For more information on our simulation methodology and the full range of results, see appendixes I and II. We assessed the reliability of the data used to develop our simulations by interviewing knowledgeable agency officials and reviewing relevant supporting documentation describing the various inputs and assumptions used, if applicable. We also reviewed DOL, Treasury, EIA, and OMB data for outliers, obvious errors, or missing data. We determined that the data were sufficiently reliable for the purposes of this report.

To identify options that may improve future Trust Fund finances, we interviewed officials from DOL, Treasury, HHS, the National Mining

⁵Our simulations began in fiscal year 2016 because fiscal year 2015 was the last complete fiscal year for which DOL data were available when we began our review. Our simulations extend through fiscal year 2050 because that is as far as the EIA produces coal production forecasts which we relied on in developing our simulations relative to future coal tax revenue.

Association, and the United Mine Workers of America. We then selected options to simulate based, in part, on these interviews and the availability of DOL and other data. These options included adjusting the coal tax, forgiving interest on some or all Trust Fund debt, forgiving some or all Trust Fund debt, or various combinations of these options. The options we simulated are not intended to be exhaustive and we are not endorsing any particular option or combination of options.

We conducted this performance audit from February 2017 through May 2018 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Background

Black lung benefits include both cash assistance and medical benefits. Maximum cash assistance payments generally ranged from about \$650 to \$1,300 per month in fiscal year 2017, depending on the number of dependents the miner has.⁶ Miners receiving cash assistance are also eligible for medical benefits that cover the treatment of their black-lung-related conditions, which may include hospital and nursing care, rehabilitation services, and drug and equipment charges, according to DOL documentation. DOL estimates that the average annual cost for medical treatment in fiscal year 2017 was approximately \$6,980 per miner.

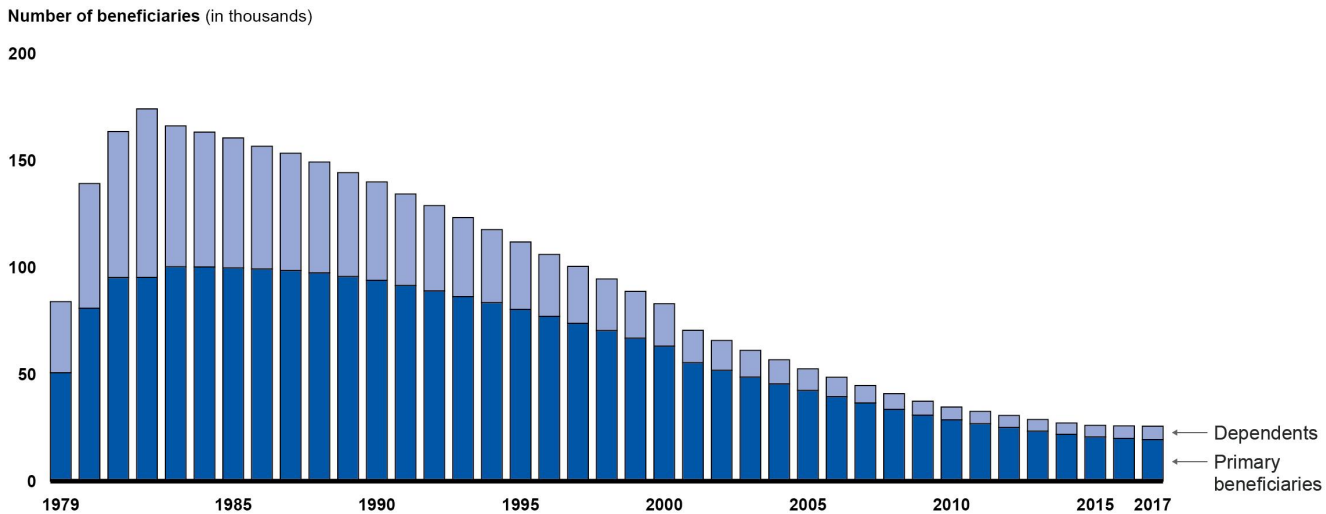
There were about 25,700 total beneficiaries (primary and dependents) receiving black lung benefits during fiscal year 2017 (see fig. 1).⁷ The

⁶Benefit rates are set by federal law, which specifies that in the case of total disability, a miner receives 37.5 percent of the monthly pay rate of a federal employee at grade GS-2, step 1. Benefit levels are increased by 50 percent if the miner has one dependent, 75 percent if the miner has two dependents, and 100 percent if the miner has three or more dependents. If state workers' compensation benefits are less than federal black lung benefits, then the federal benefits cover the difference. Social Security Disability Insurance benefits are also reduced for recipients of black lung benefits.

⁷We excluded black lung beneficiaries whose claims were filed on or before December 31, 1973, as these awards are generally funded from Treasury's general fund, and not from the Trust Fund.

decrease in the number of beneficiaries over time has resulted from a combination of declining coal mining employment and an aging beneficiary population, according to DOL officials. Further, black lung beneficiaries could increase in the near term due to the increased occurrence of black lung disease and its most severe form, progressive massive fibrosis, particularly among Appalachian coal miners, according to HHS officials.⁸

Figure 1: Black Lung Beneficiaries, Fiscal Years 1979 through 2017



Source: GAO analysis of Department of Labor data. | GAO-18-351

Notes: We excluded black lung beneficiaries whose claims were filed on or before December 31, 1973, as these awards are generally funded from Treasury’s general fund, and not the Trust Fund.

Black lung claims are processed by DOL’s Office of Workers’ Compensation Programs. Contested claims are adjudicated by DOL’s Office of Administrative Law Judges, which issues decisions that can be

⁸Recent HHS National Institute for Occupational Safety and Health studies have found increases in the prevalence of black lung disease among long tenured Appalachian coal miners and have documented hundreds of miners with the most severe form of the disease, progressive massive fibrosis, receiving care at two clinics in Kentucky and Virginia—see D.J. Blackley, L.E. Reynolds, C. Short, R. Carson, E. Storey, C.N. Halldin, A.S. Laney, “Progressive Massive Fibrosis in Coal Miners From 3 Clinics in Virginia,” *Journal of the American Medical Association*, February 6, 2018 (319(5):500–501); and D.J. Blackley, J.B. Crum, C.N. Halldin, E. Storey, A.S. Laney, “Resurgence of Progressive Massive Fibrosis in Coal Miners — Eastern Kentucky, 2016,” *Morbidity and Mortality Weekly Report*, December 16, 2016 (65:1385–1389).

appealed to the Benefits Review Board.⁹ Claimants and mine operators may further appeal these agency decisions to the federal courts. If an award is contested, claimants can receive interim benefits, which are generally paid from the Trust Fund according to DOL officials, while their claims are in the appeals process. Final awards are either funded by mine operators—who are identified as the responsible employers of claimants—or the Trust Fund, when responsible employers cannot be identified or do not pay.¹⁰ In fiscal year 2017, black lung claims had an approval rate of about 29 percent, according to DOL data. Of the 19,430 primary black lung beneficiaries receiving benefits during fiscal year 2017, 64 percent (12,464) were paid from the Trust Fund, 25 percent (4,798) were paid by liable mine operators, and 11 percent (2,168) were receiving interim benefits, according to DOL officials.

Black Lung Disability Trust Fund revenue is primarily obtained from mine operators through the coal tax. The coal tax is imposed at two rates, depending on whether the coal is extracted from underground or surface mines. The current tax rates are \$1.10 per ton of underground-mined coal and \$0.55 per ton of surface-mined coal, up to 4.4 percent of the sales price. Therefore, if a ton of underground-mined coal is sold for less than \$25, than the tax paid would be less than \$1.10. For instance, if a ton of underground-mined coal sold for \$20, than it would be taxed at 4.4 percent of the sales price, or \$0.88.¹¹ To a lesser extent, the Trust Fund also receives other miscellaneous revenue from interest payments, and various fines and penalties paid by mine operators, among other sources, according to DOL documentation. Coal tax revenue is collected from mine operators by Treasury's Internal Revenue Service and then transferred to the Trust Fund where it is then used by DOL officials to pay black lung benefits and the costs of administering the program.

⁹For additional information on the black lung claim adjudication process see GAO, *Black Lung Benefits Program: Administrative and Structural Changes Could Improve Miners' Ability to Pursue Claims*, [GAO-10-7](#) (Washington, D.C.: October 30, 2009).

¹⁰Mine operators liable for black lung awards must secure the payment of their benefits liability by either qualifying as a self-insurer or by purchasing and maintaining a commercial insurance contract (including a policy or contract procured from a state agency).

¹¹For more information on coal production and prices, see U.S. Department of Energy, Energy Information Administration, *Annual Coal Report 2016* (Washington, D.C.: November 2017).

Trust Fund expenditures include, among other things, black lung benefit payments, certain administrative costs incurred by DOL and Treasury to administer the black lung benefits program, and debt repayments. When necessary for the Trust Fund to make relevant expenditures under federal law, the Trust Fund borrows from the Treasury's general fund. When this occurs, the federal government is essentially borrowing from itself—and hence from the general taxpayer—to fund its benefit payments and other expenditures.

Multiple Factors Have Challenged Trust Fund Finances Resulting in Growing Debt

Multiple factors have challenged Trust Fund finances since it was established about 40 years ago. Its expenditures have consistently exceeded its revenue, interest payments have grown, and legislative actions taken that were expected to improve Trust Fund finances did not completely address its debt.¹² Combined black lung benefit payments and program administrative costs exceeded Trust Fund revenue every year for the program's first decade (fiscal years 1979 through 1989), resulting in the accrual of debt.¹³ During the Trust Fund's first three fiscal years in particular, revenue covered less than 40 percent of the Trust Fund's combined benefit payments and administrative costs.¹⁴ For instance, in fiscal year 1980, the Trust Fund received about \$251 million in revenue and paid about \$726 million in black lung benefits and administrative costs.¹⁵

¹²For reporting purposes, Trust Fund expenditures include benefit payments and administrative costs as well as debt repayments (interest and principal). Trust Fund revenue includes coal tax revenue as well as miscellaneous other revenue, such as interest payments and various fines and penalties paid by mine operators, and exclude any amount borrowed from Treasury's general fund.

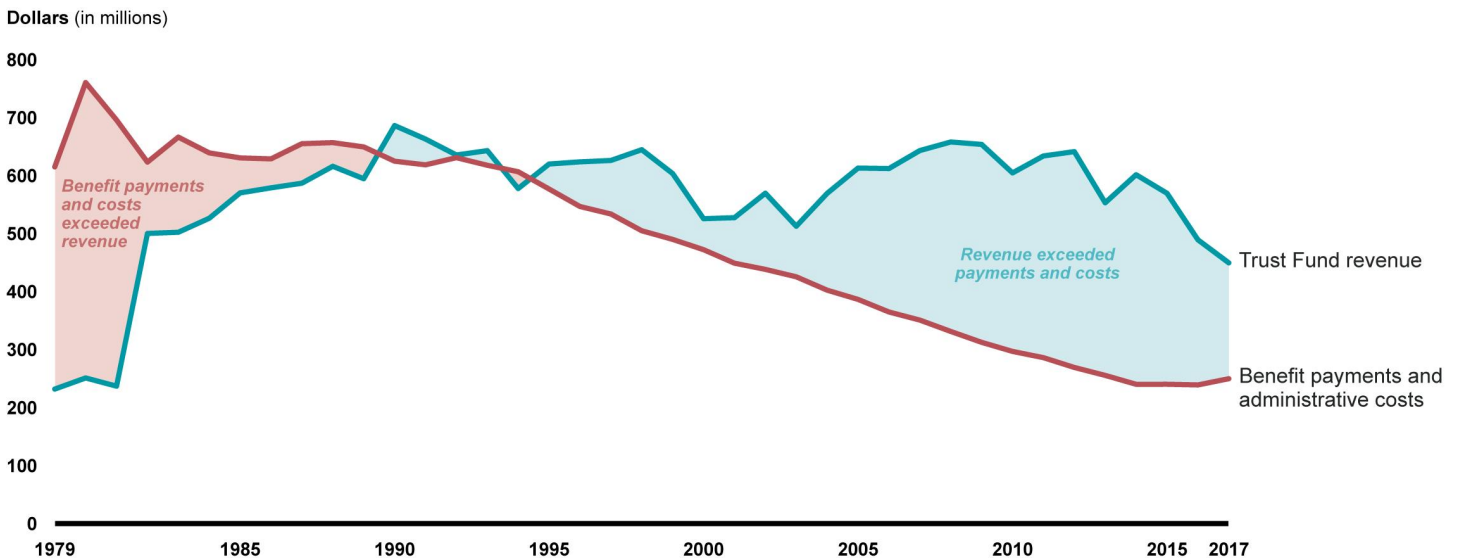
¹³For reporting purposes, the Trust Fund's first decade refers to its first 10 complete fiscal years—1979 through 1989.

¹⁴Administrative costs include various expenditures related to the administration of the Black Lung Benefits Program such as legal, financial, and investigative support provided by DOL's Benefits Review Board, Administrative Law Judges, and the Office of the Inspector General, according to DOL documentation.

¹⁵This is equivalent to about \$665 million and \$2 billion in 2018 after adjusting for inflation.

Beginning in 1982, revenue increased as a result of the Black Lung Benefits Revenue Act of 1981 that doubled the coal tax rates from \$0.50 to \$1 per ton of underground-mined coal and from \$0.25 to \$0.50 per ton of surface-mined coal, up to 4 percent of the sales price.¹⁶ Even with the tax rate increase, combined benefit payments and administrative costs continued to exceed revenue throughout the 1980s (see fig. 2). As a result, the Trust Fund borrowed from Treasury’s general fund to cover the annual differences between its expenditures and revenues, and by fiscal year 1989 the Trust Fund’s outstanding debt to Treasury’s general fund exceeded \$3 billion.¹⁷

Figure 2: Black Lung Disability Trust Fund Revenue and Black Lung Benefit Payments and Administrative Costs, Fiscal Years 1979 to 2017



Source: GAO analysis of data from the Department of Labor and the Department of Treasury. | GAO-18-351

Notes: Trust Fund revenue includes coal tax revenue as well as miscellaneous other revenue such as interest payments and various fines and penalties paid by mine operators. Trust Fund debt servicing costs are not included and all amounts are presented in nominal dollars.

¹⁶The coal tax rate increase was set to expire on the earlier of January 1, 1996, or the first January 1 after 1981 as of which the Trust Fund was free of any balance of repayable advances (which we refer to as annual borrowing from Treasury’s general fund) and unpaid interest on such advances, when the tax rate would revert to its prior level of \$0.50 or \$0.25 per ton of underground or surfaced-mined coal, respectively, up to 2 percent of the sales price.

¹⁷This is equivalent to about \$5.4 billion in 2018 after adjusting for inflation.

Beginning in fiscal year 1990, Trust Fund revenue generally began to exceed combined benefit payments and administrative costs, and, in fact, total Trust Fund cumulative revenue collected from fiscal years 1979 through 2017 exceeded total cumulative benefit payments and administrative costs incurred during these years. However, interest owed from earlier years of borrowing led to more borrowing and debt. From fiscal years 1979 through 1989, the Trust Fund borrowed—primarily through 30-year term loans according to Treasury officials—from Treasury’s general fund at interest rates that varied from about 6.5 percent to about 13.9 percent. In fiscal year 1985, for instance, the Trust Fund paid about \$275 million in interest, which was equal to about half of the total revenue collected that year.¹⁸ Since fiscal year 1990, revenue has generally exceeded combined benefit payments and administrative costs, although interest payments on the Trust Fund’s outstanding debt kept the fund in a position whereby its total expenditures continued to exceed its total revenues.¹⁹ As a result, the principal amount of the Trust Fund’s total outstanding debt to Treasury’s general fund increased and exceeded \$10 billion by fiscal year 2008.²⁰

Legislation has been enacted over the years that was expected to improve Trust Fund finances:

- In 1981, the Black Lung Benefits Revenue Act of 1981 doubled the coal tax rates from \$0.50 cents to \$1 per ton of underground-mined coal, and from \$0.25 cents to \$0.50 cents per ton of surface-mined coal, up to 4 percent of the sales price (as mentioned previously).
- In 1986, the Consolidated Omnibus Budget Reconciliation Act of 1985 established a 5 year moratorium on interest accrual with respect to repayable advances to the Trust Fund (which we refer to as annual borrowing from Treasury’s general fund), and increased the coal tax rates to \$1.10 per ton of underground-mined coal, and \$0.55 per ton of surface-mined coal (up to 4.4 percent of the sales price), where they have remained since.

¹⁸This is equivalent to about \$556 million in 2018 after adjusting for inflation.

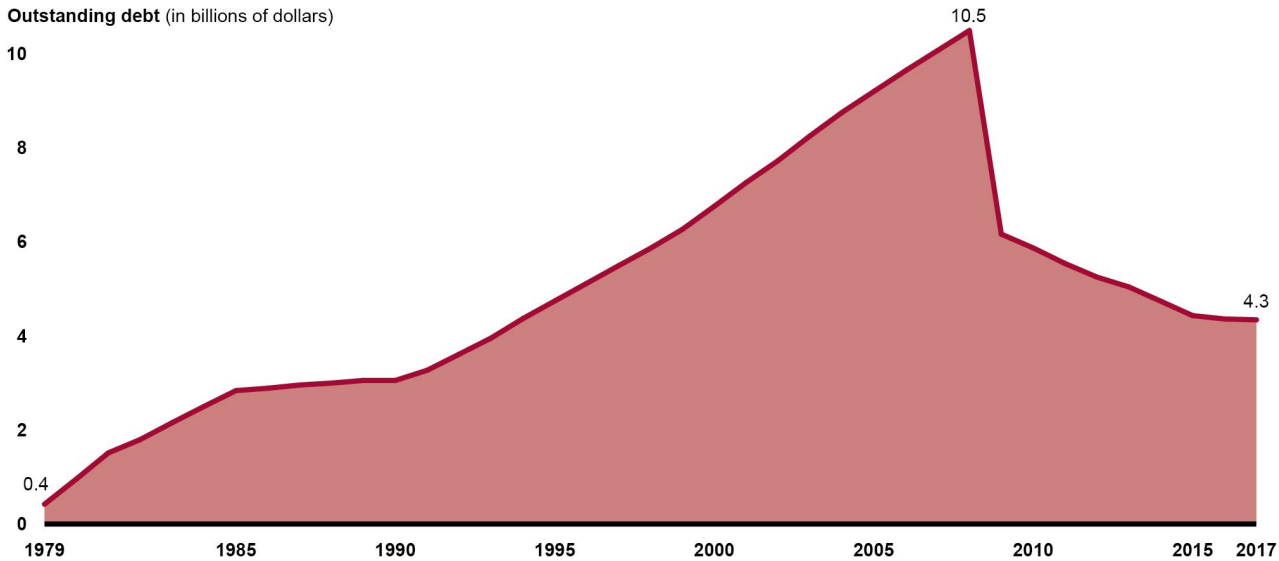
¹⁹Since fiscal year 1990, Trust Fund revenue has exceeded combined benefit payments and administrative costs in each year except fiscal year 1994, when these costs exceeded revenue by about \$29 million.

²⁰This is equivalent to about \$12.2 billion in 2018 after adjusting for inflation.

- In 2008, the EIEA included provisions that were expected to eliminate the Trust Fund's debt. Specifically, EIEA (1) generally extended the coal tax rates at their current rates until December 31, 2018 (after which they are scheduled to decrease to their original levels of \$0.50 per ton of underground-mined coal, and \$0.25 per ton of surface-mined coal, up to 2 percent of the sales price); (2) provided for a one-time federal appropriation toward Trust Fund debt forgiveness (about \$6.5 billion, according to DOL data); and (3) provided for the refinancing of the Trust Fund's debt that was not forgiven as a result of EIEA (which we refer to as the Trust Fund's legacy debt). Specifically, the Trust Fund's legacy debt was refinanced with more favorable interest rates, according to DOL data. Interest rates on the refinanced legacy debt range from about 1.4 percent to about 4.5 percent.

The forgiveness and refinancing of Trust Fund debt along with extending the current coal tax rates through 2018 were expected to result in annual tax revenue that could be used to pay down interest and principal on the Trust Fund's legacy debt, according to DOL and Treasury officials. These officials said that models showed that debt would be eliminated by fiscal year 2040; however, they noted that coal tax revenue has been less than originally projected due, in part, to the 2008 recession and increased market competition from other energy sources. As a result, the Trust Fund's total expenditures continued to exceed revenue and the Trust Fund borrowed from Treasury's general fund each year from fiscal years 2010 through 2017 to cover debt repayments expenditures. In fiscal year 2017, the Trust Fund's total principal amount of outstanding debt, which includes its legacy debt and the amount borrowed from Treasury's general fund that year, was about \$4.3 billion (see fig. 3).

Figure 3: Black Lung Disability Trust Fund Principal Amount of Outstanding Debt to Treasury’s General Fund, Fiscal Years 1979 to 2017



Source: GAO review of data from the Department of Labor and the Department of Treasury. | GAO-18-351

Note: Amounts are presented in nominal dollars and do not include accrued interest.

Trust Fund Borrowing Will Likely Continue to Increase through 2050, and Multiple Options Could Reduce Future Debt

Trust Fund Borrowing Will Likely Continue to Increase through 2050

Trust Fund borrowing will likely continue to increase from fiscal years 2019 through 2050 due, in part, to the scheduled coal tax rate decrease of about 55 percent that will take effect in 2019 and declining coal production, according to our moderate simulation. We simulated the effects of the scheduled 2019 tax rate decrease on Trust Fund finances through 2050, and in this report, we generally present the results of a

moderate case set of assumptions (see table 1).²¹ These simulations are not predictions of what will happen, but rather models of what could happen given certain assumptions. For more information on our simulation methodology see appendix I. In addition to the moderate case assumptions, we also simulated how Trust Fund debt could change through 2050 given various other assumptions, and the full range of results for all of our simulations are presented in appendix II.

²¹Our simulations began in fiscal year 2016 because fiscal year 2015 was the last complete fiscal year for which DOL data were available when we began our review. Our simulations extend through fiscal year 2050 because that is as far as the EIA produces coal production forecasts which we relied on in developing our simulations relative to future coal tax revenue.

Table 1: Black Lung Disability Trust Fund Simulations

Our simulations of future Trust Fund revenues and expenditures are based on various assumptions including those related to future coal production and future black lung beneficiaries. Given the complexities of estimating future coal production and prices and new black lung beneficiaries, our simulations are subject to considerable uncertainty and simulated values with regards to coal tax revenue and Trust Fund expenditures in future years are unlikely to be precise. For more information on our simulation methodology and the full range of results, see appendixes I and II.

Revenue	Expenditures
<p>Future coal production and prices are key determinants of future Trust Fund revenue because they affect the amount that is collected pursuant to the coal tax, but they cannot be known with any certainty. Therefore, to develop our simulation, we analyzed nine alternative cases that all incorporate various assumptions about how coal production and prices may evolve through 2050. These nine cases are produced by the Energy Information Administration (EIA) and reflect alternative assumptions about economic growth, oil prices, technological innovation, and energy policy.</p>	<p>The number of new black lung disability beneficiaries for whom the Trust Fund will fund benefits in the future is a key determinant of future Trust Fund expenditures, but cannot be known with any certainty. Therefore, to develop our simulation, we analyzed four alternative sets of assumptions about how the number of future beneficiaries may evolve over time. These assumptions were based on (1) the average growth rate of new beneficiaries for fiscal years 2003 through 2015, (2) the median growth rate of new beneficiaries for fiscal years 2003 through 2016, (3) DOL’s projection of new beneficiaries, and (4) no new beneficiaries.</p>
Moderate Case Simulation (Revenue)	Moderate Case Simulation (Expenditures)
<p>Our moderate case simulation estimates Trust Fund revenue using EIA’s reference coal case which generally assumes trend improvement in known technologies, a view of economic and demographic trends reflecting the current central views of economic forecasters and demographers, and that current laws and regulations affecting the energy sector are unchanged throughout the projection period. We also simulated Trust Fund revenue using EIA coal production and price projections that reflect alternative assumptions about economic growth, oil prices, oil and gas supply, and the Clean Power Plan,^a and thus allow for higher and lower future coal production and prices than the reference coal case.</p>	<p>Our moderate case simulation estimates Trust Fund expenditures using the average growth rate of new beneficiaries for fiscal years 2003 through 2015 (-5.8%). We believe this reflects a moderate case based on historical experience, and it covers a period of time in which some coal operator bankruptcies have resulted in new beneficiaries for whom the Trust Fund will fund benefits. Other cases we analyzed resulted in higher or lower growth rates. For instance, our fourth set of assumptions assumed zero new beneficiaries each year, so using the average growth rate (-5.8%) generates more new entrants than 0, but fewer new entrants than using the median growth rate of new beneficiaries for fiscal years 2003 through 2016, which was -1.9%, making it a middle or moderate case.</p>

Source: GAO analysis based on review of data from the Department of Labor (DOL), Department of the Treasury, EIA, and the Office of Management and Budget. | GAO-18-351

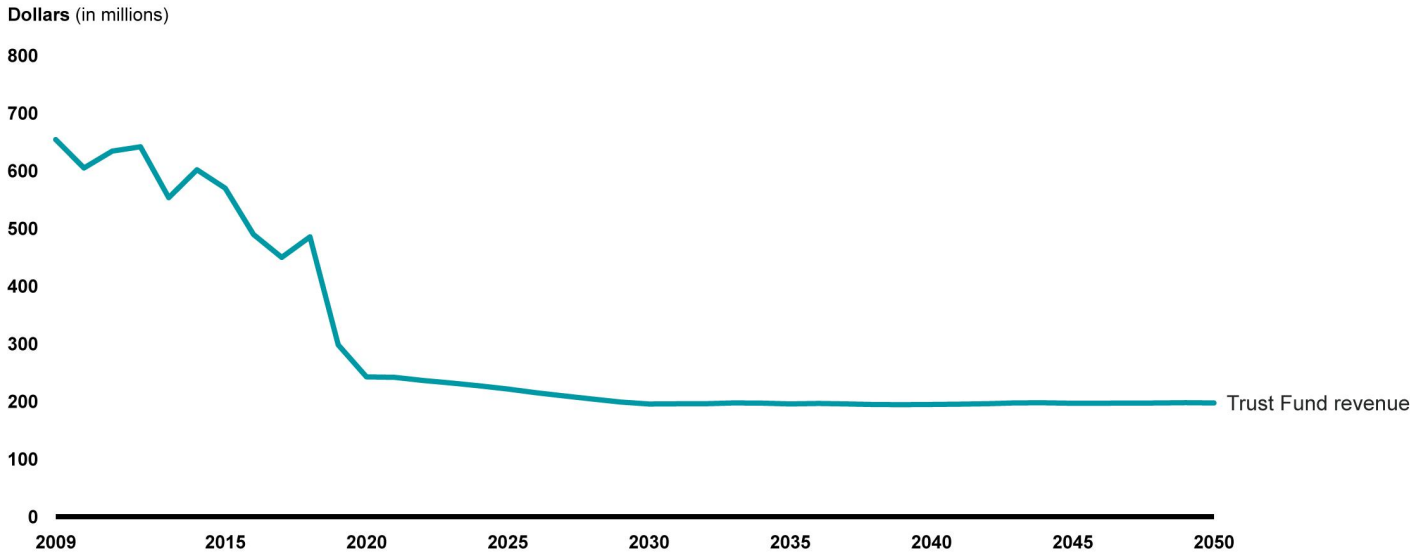
^aUnder the Clean Power Plan the Environmental Protection Agency established guidelines for CO₂ emissions from existing power plants.

Our moderate case simulation suggests that Trust Fund revenue may decrease, from about \$485 million in fiscal year 2018 to about \$298 million in fiscal year 2019, due, in part, to the scheduled approximate 55 percent decrease in the coal tax.²² Our simulation, which incorporates EIA

²²The simulated values for Trust Fund revenue and expenditures through 2050 are presented in nominal dollars, meaning they are not adjusted for inflation.

data on future expected coal production, also shows that annual Trust Fund revenue will likely continue to decrease beyond fiscal year 2019 due, in part, to declining coal production. Domestic coal production has declined from about 1.2 billion tons in 2008 to about 728 million tons in 2016, according to EIA.²³ Based on these projections, our moderate simulation shows that Trust Fund annual revenue may continue to decrease from about \$298 million in fiscal year 2019 to about \$197 million in fiscal year 2050 (see fig. 4).²⁴

Figure 4: Black Lung Disability Trust Fund Actual and Simulated Revenue Based on Moderate Case Assumptions, Fiscal Years 2009 through 2050



Source: GAO analysis of data from the Department of Labor and the Department of Treasury (actual data) and GAO simulation. | GAO-18-351

Notes: Trust Fund revenue includes coal tax revenue and other miscellaneous revenue, such as interest payments and various fines and penalties paid by mine operators. Trust Fund revenue is simulated for fiscal years 2018 through 2050 and presented in nominal dollars. Moderate case simulations assume that future coal production is consistent with the Energy Information Administration's reference case, which generally assumes trend improvement in known technologies, a view of economic and demographic trends that reflects the current central views of economic forecasters and demographers, and that current laws and regulations affecting the energy sector are unchanged through 2050. Given the complexities of estimating future coal production and prices and new black lung beneficiaries, our simulations are subject to considerable uncertainty and simulated Trust Fund revenues are unlikely to be precise. For more information on our simulation methodology and the full range of results, see appendixes I and II.

²³U.S. Department of Energy, Energy Information Administration, *Annual Coal Report 2016* (Washington, D.C.: November 2017).

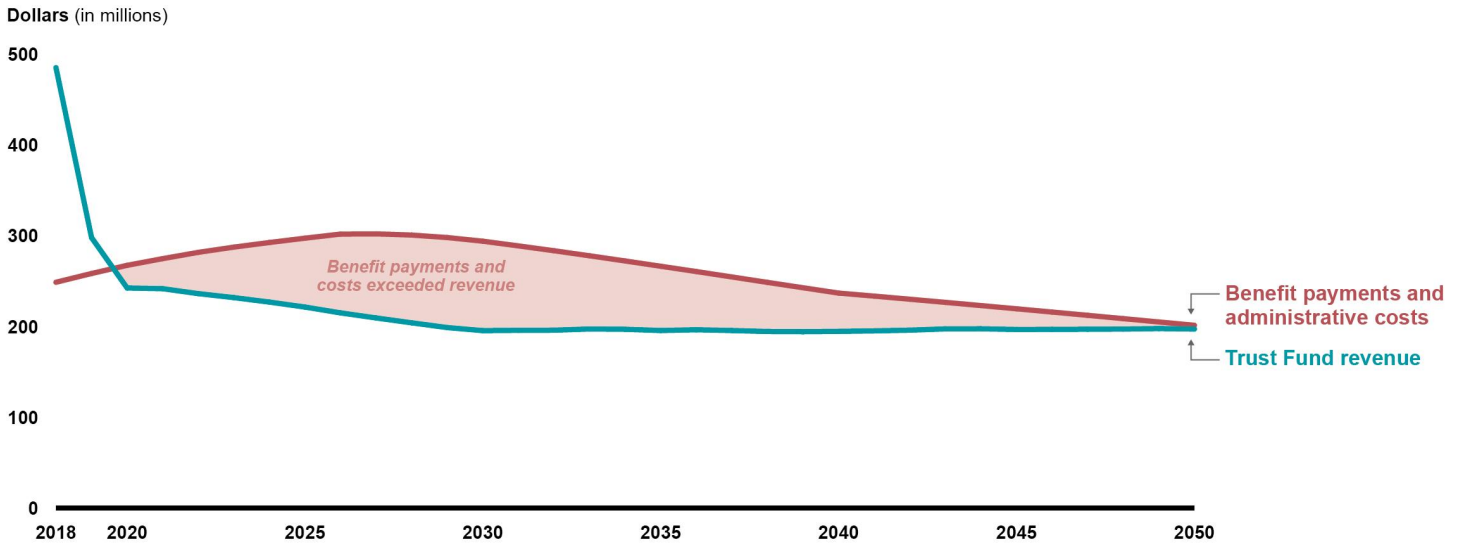
²⁴This is equivalent to about \$290 million and \$100 million in 2018 after adjusting for inflation.

With the scheduled 2019 tax rate decrease, our moderate case simulation suggests that expected revenue will likely be insufficient to cover combined black lung benefit payments and administrative costs, as well as debt repayment expenditures. Specifically, our moderate case simulation suggests that revenue may not be sufficient to cover beneficiary payments and administrative costs from fiscal years 2020 through 2050 (see fig. 5). For instance, in fiscal year 2029, simulated benefit payments and administrative costs will likely exceed simulated revenue by about \$99 million.²⁵ These annual deficits will likely decrease over time to about \$4 million by fiscal year 2050 due, in part, to the assumed continued net decline in total black lung beneficiaries.²⁶ Our simulation also therefore suggests that Trust Fund revenue may not be enough to also cover the debt repayment expenditures it must continue to make through fiscal year 2040, per the payment schedule established following the 2008 EIEA.

²⁵This is equivalent to about \$78 million in 2018 after adjusting for inflation.

²⁶This is equivalent to about \$2 million in 2018 after adjusting for inflation.

Figure 5: Black Lung Disability Trust Fund Simulated Revenue and Black Lung Benefit Payments and Administrative Costs Based on Moderate Case Assumptions, Fiscal Years 2018 through 2050



Source: GAO simulation based on data from the Departments of Labor and Treasury, the Energy Information Administration, and the Office of Management and Budget. | GAO-18-351

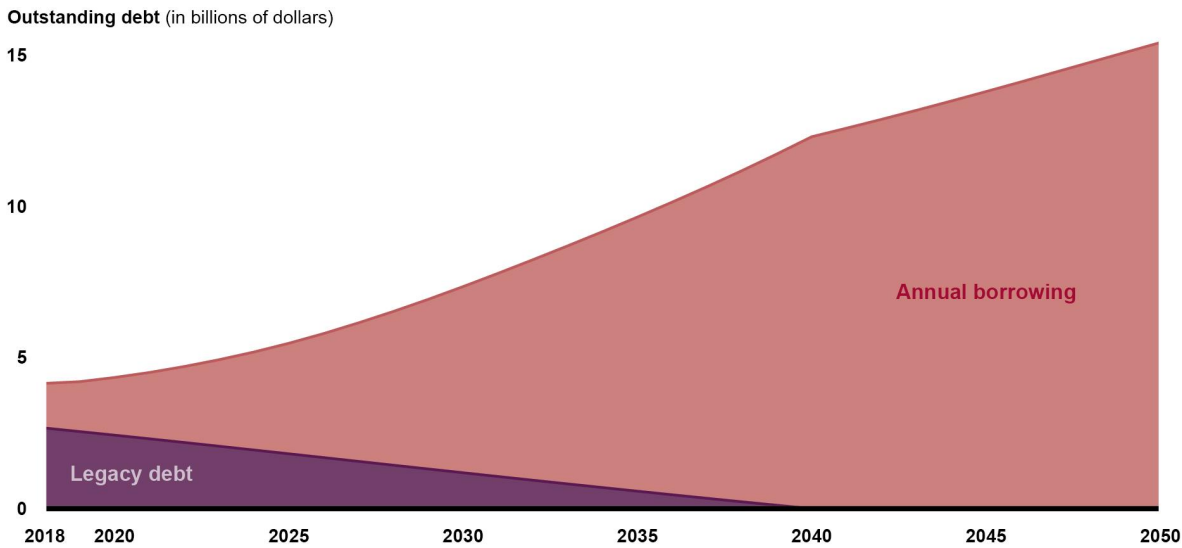
Notes: Trust Fund revenue and black lung benefit payments and administrative costs are simulated from fiscal years 2018 through 2050 and presented in nominal dollars. Moderate case simulations assume that future coal production is consistent with the Energy Information Administration's reference case, which generally assumes trend improvement in known technologies, a view of economic and demographic trends that reflects the current central views of economic forecasters and demographers, and that current laws and regulations affecting the energy sector are unchanged through 2050. Moderate case simulations also assume that future numbers of new black lung beneficiaries evolve over time based on the average growth rate for the period from fiscal years 2003 to 2015. Given the complexities of estimating future coal production and prices and new black lung beneficiaries, our simulations are subject to considerable uncertainty and simulated Trust Fund revenues and expenditures are unlikely to be precise. For more information on our simulation methodology and the full range of results, see appendixes I and II.

Our moderate simulation suggests that the amount borrowed by the Trust Fund will likely increase from about \$1.6 billion in fiscal year 2019 to about \$15.4 billion in fiscal year 2050 (see fig. 6).²⁷ Although the Trust Fund's legacy debt decreases through fiscal year 2040, total Trust Fund expenditures—including combined benefit payments and administrative costs as well as debt repayments—will likely continue to exceed revenue which will require continued annual borrowing from Treasury's general fund. However, the amount borrowed by the Trust Fund could vary depending, in part, on future coal production and the number of new

²⁷This is equivalent to about \$1.6 billion and \$7.9 billion in 2018 after adjusting for inflation.

beneficiaries and could range between about \$6 billion and about \$27 billion in 2050, according to our simulations (see appendix II).

Figure 6: Black Lung Disability Trust Fund Simulated Principal Amount of Outstanding Debt to Treasury’s General Fund Based on Moderate Case Assumptions, Fiscal Years 2018 through 2050



Source: GAO simulation based on data from the Departments of Labor and Treasury, the Energy Information Administration, and the Office of Management and Budget. | GAO-18-351

Notes: The principal amount of the Trust Fund’s outstanding debt includes the principal amount of the Trust Fund’s legacy debt—which was refinanced following the Energy Improvement and Extension Act of 2008 with repayment to be complete by fiscal year 2040—and the Trust Fund’s annual borrowing from Treasury’s general fund through 2050, which is simulated from fiscal years 2018 through 2050 and presented in nominal dollars. Moderate case simulations assume that future coal production is consistent with the Energy Information Administration’s reference case, which generally assumes trend improvement in known technologies, a view of economic and demographic trends that reflects the current central views of economic forecasters and demographers, and that current laws and regulations affecting the energy sector are unchanged through 2050. Moderate case simulations also assume that future numbers of new black lung beneficiaries evolve over time based on the average growth rate for the period from fiscal years 2003 to 2015. Given the complexities of estimating future coal production and prices and new black lung beneficiaries, our simulations are subject to considerable uncertainty and simulated annual borrowing is unlikely to be precise. For more information on our simulations methodology and the full range of results, see appendixes I and II.

Adjusting Coal Tax Rates, Forgiving Interest, and Forgiving Debt Are Options That Could Improve the Trust Fund’s Future Financial Position

We simulated three options that can affect Trust Fund finances through fiscal year 2050. Specifically, we simulated the effects of (1) adjusting the coal tax, (2) forgiving interest, and (3) forgiving debt. In each of the simulations, we compared the results of the option to a baseline in which

the coal tax rates will decrease by about 55 percent, which we refer to as the scheduled 2019 tax rate decrease. We compare interest and debt forgiveness options to a baseline which assumes the scheduled 2019 tax rate decrease has taken effect, and that there is no interest or debt forgiveness. The simulated options are not intended to be exhaustive and we are not endorsing any particular option or combination of options.

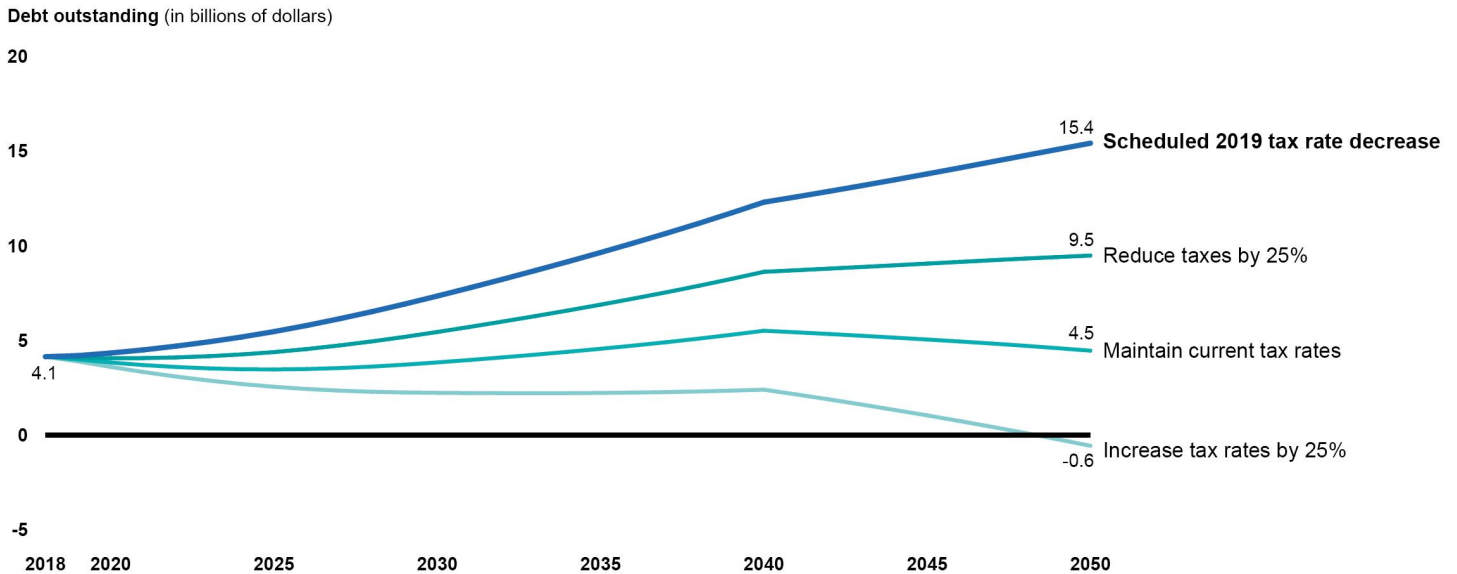
Adjust Coal Tax Rates

Using the moderate case, we simulated four options: (1) implementing the 2019 coal tax rate reduction to \$0.50 per ton of underground-mined coal and \$0.25 per ton of surface-mined coal; (2) maintaining the current coal tax rates of \$1.10 per ton for underground-mined coal and \$0.55 per ton of surface-mined coal; (3) reducing the tax rates by 25 percent (from \$1.10 and \$0.55); and (4) increasing these tax rates by 25 percent (see fig. 7).²⁸ Increasing the tax rates by 25 percent was the only option that eliminated simulated Trust Fund debt by fiscal year 2050, according to our moderate case simulation.²⁹

²⁸The coal tax is subject to a maximum tax rate of 4.4 percent of the coal's sales price. Therefore, in developing our simulations, we increased, maintained, or decreased the cap by the amount we altered the tax rates. For example, in simulating a 25 percent coal tax increase we also increased the cap by 25 percent, to 5.5 percent.

²⁹Our model does not consider how adjusting the coal tax rates could affect coal production and prices. For example, increasing coal tax rates could result in energy consumers purchasing less coal in favor of alternative energy sources.

Figure 7: Simulated Effects of Adjusting the Coal Tax on Black Lung Disability Trust Fund Principal Amount of Outstanding Debt to Treasury’s General Fund Based on Moderate Case Assumptions, Fiscal Years 2018 through 2050



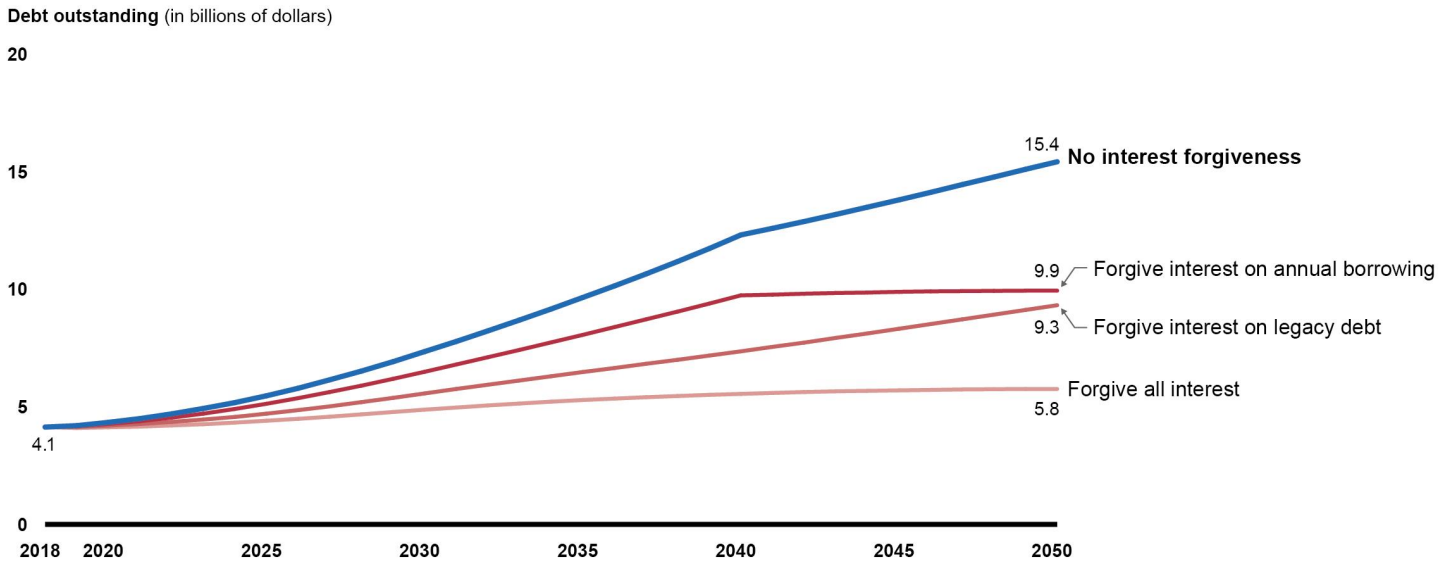
Source: GAO simulation based on data from the Departments of Labor and Treasury, the Energy Information Administration, and the Office of Management and Budget. | GAO-18-351

Notes: The principal amount of the Trust Fund’s outstanding debt includes the principal amount of the Trust Fund’s legacy debt—which was refinanced following the Energy Improvement and Extension Act of 2008 with repayment to be complete by fiscal year 2040—and the Trust Fund’s annual borrowing from Treasury’s general fund through 2050, which is simulated from fiscal years 2018 through 2050 and presented in nominal dollars. Moderate case simulations assume that future coal production is consistent with the Energy Information Administration’s reference case, which generally assumes trend improvement in known technologies, a view of economic and demographic trends that reflects the current central views of economic forecasters and demographers, and that current laws and regulations affecting the energy sector are unchanged through 2050. Moderate case simulations also assume that future numbers of new black lung beneficiaries evolve over time based on the average growth rate for the period from fiscal years 2003 to 2015. Given the complexities of estimating future coal production and prices and new black lung beneficiaries, our simulations are subject to considerable uncertainty and simulated annual borrowing from Treasury’s general fund is unlikely to be precise. For more information on our simulation methodology and the full range of results, see appendixes I and II. Specifically, for the range of simulated annual borrowing in 2050 associated with each tax rate change, see table 7 in appendix II.

Forgive Interest on Debt

We simulated three interest forgiveness options including forgiving interest on (1) legacy debt, (2) annual borrowing, and (3) all debt. Our moderate case simulation suggests that forgiving interest will not eliminate simulated debt by fiscal year 2050 (see fig. 8).

Figure 8: Simulated Effects of Forgiving Interest on Black Lung Disability Trust Fund Principal Amount of Outstanding Debt to Treasury’s General Fund Based on Moderate Case Assumptions, Fiscal Years 2018 through 2050



Source: GAO simulation based on data from the Departments of Labor and Treasury, the Energy Information Administration, and the Office of Management and Budget. | GAO-18-351

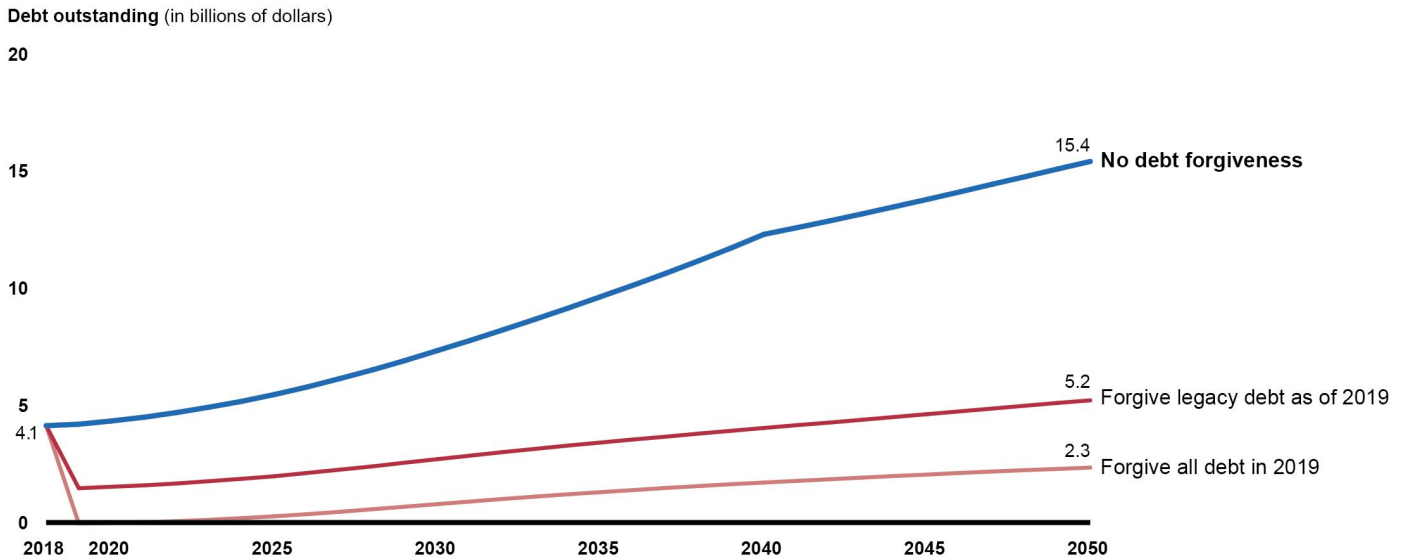
Notes: Options shown assume forgiveness of interest as of fiscal year 2019. We compare the results of each of these options to a baseline in which no interest is forgiven. The principal amount of the Trust Fund’s outstanding debt includes the principal amount of the Trust Fund’s legacy debt—which was refinanced following the Energy Improvement and Extension Act of 2008 with repayment to be complete by fiscal year 2040—and the Trust Fund’s annual borrowing from Treasury’s general fund through 2050, which is simulated from fiscal years 2018 through 2050 and presented in nominal dollars. Moderate case simulations assume that future coal production is consistent with the Energy Information Administration’s reference case, which generally assumes trend improvement in known technologies, a view of economic and demographic trends that reflects the current central views of economic forecasters and demographers, and that current laws and regulations affecting the energy sector are unchanged through 2050. Moderate case simulations also assume that future numbers of new black lung beneficiaries evolve over time based on the average growth rate for the period from fiscal years 2003 to 2015. Given the complexities of estimating future coal production and prices and new black lung beneficiaries, our simulations are subject to considerable uncertainty and simulated annual borrowing from Treasury’s general fund is unlikely to be precise. For more information on our simulation methodology and full range of results, see appendices I and II. Specifically, for the range of simulated borrowing in 2050 associated with each interest forgiveness option, see table 7 in appendix II.

Forgive Debt (Principal and Interest)

We simulated two debt forgiveness options by forgiving principal and interest on (1) legacy debt and (2) all debt. Our moderate case simulation suggests that both debt forgiveness options would reduce simulated Trust Fund borrowing by fiscal year 2050, but these options would not eliminate debt altogether as simulated revenue will likely not be enough to cover simulated expenditures (see fig. 9). In these cases, the Trust Fund will

need to continue borrowing from Treasury’s general fund to cover annual deficits, and thus accumulate debt.

Figure 9: Simulated Effects of Forgiving Debt (Principal and Interest) on Black Lung Disability Trust Fund Principal Amount of Outstanding Debt to Treasury’s General Fund Based on Moderate Case Assumptions, Fiscal Years 2018 through 2050



Source: GAO simulation based on data from the Departments of Labor and Treasury, the Energy Information Administration, and the Office of Management and Budget. | GAO-18-351

Notes: Each option shown assumes forgiveness of debt as of fiscal year 2019. We compare the results of each of these options to a baseline in which no debt is forgiven. The principal amount of the Trust Fund’s outstanding debt includes the principal amount of the Trust Fund’s legacy debt—which was refinanced following the Energy Improvement and Extension Act of 2008 with repayment to be complete by fiscal year 2040—and the Trust Fund’s annual borrowing from Treasury’s general fund through 2050, which is simulated from fiscal years 2018 through 2050 and presented in nominal dollars. Moderate case simulations assume that future coal production is consistent with the Energy Information Administration’s reference case, which generally assumes trend improvement in known technologies, a view of economic and demographic trends that reflects the current central views of economic forecasters and demographers, and that current laws and regulations affecting the energy sector are unchanged through 2050. Moderate case simulations also assume that future numbers of new black lung beneficiaries evolve over time based on the average growth rate for the period from fiscal years 2003 to 2015. Given the complexities of estimating future coal production and prices and new black lung beneficiaries, our simulations are subject to considerable uncertainty and simulated annual borrowing from Treasury’s general fund is unlikely to be precise. For more information on our simulation methodology and the full range of results, see appendixes I and II. Specifically, for the range of simulated borrowing in 2050 associated with each debt forgiveness option, see table 7 in appendix II.

Stakeholder Views and Other Options

While adjusting coal tax rates and forgiving interest or debt could reduce the Trust Fund’s simulated borrowing by 2050, implementing them could affect the coal industry or general taxpayers, according to stakeholders we interviewed. For instance, a coal industry representative noted that

maintaining the coal tax at its current rate would continue to burden the coal industry and increasing the tax would exacerbate the burden at a time when coal production has been declining.³⁰ Treasury officials noted that the costs associated with forgiving Trust Fund interest or debt would be borne by the general taxpayer since Treasury borrows from taxpayers to lend to the Trust Fund as needed.³¹ These officials also said that making a one-time federal appropriation to forgive interest or debt would be the most transparent way to satisfy the Trust Fund's outstanding debt to Treasury's general fund.

In addition to the simulations, other options could affect the financial position of the Trust Fund including reducing black lung benefits, eliminating or adjusting the coal tax cap, or creating a variable coal tax. Our moderate case simulation suggests that completely eliminating black lung benefits as of fiscal year 2019 could reduce the Trust Fund's borrowing from Treasury's general fund in fiscal year 2050 from about \$15.4 billion to about \$6.4 billion.³² However, doing so would generally mean that coal tax revenue would be collected solely to fund the repayment of Trust Fund debt. Another option could be to eliminate or adjust the coal tax cap, which currently prevents mine operators from paying a coal tax of more than 4.4 percent of the price per ton of coal sold. If the coal tax cap were eliminated, for instance, mine operators would pay \$1.10 per ton of underground-mined coal and \$0.55 per ton of surface-mined coal regardless of price sold, which could increase

³⁰The burden of the coal tax is likely shared by all coal market participants, including coal companies, coal consumers, coal company employees, and other input suppliers, based on their responsiveness to changes in prices. For example, if coal consumers are less responsive to price changes than coal companies, then coal consumers will end up bearing more of the coal tax burden in the form of higher prices. However, if coal consumers are more responsive to price changes than coal companies, then coal companies will bear more of the burden through lower profits. Coal company employees and other input suppliers also share the burden depending on how responsive they are to changes in wages and other input prices relative to coal companies.

³¹The federal government borrows money from the public by issuing securities—bills, notes, and bonds—through the Treasury. Debt held by government accounts must be paid back when an account needs to redeem its securities to pay expenditures exceeding its annual receipts. From the standpoint of the government as a whole, debt held by government accounts represents amounts loaned from one part of the government to another—in other words, debt the government owes itself. For more information on federal debt, see GAO, *Federal Debt: Answers to Frequently Asked Questions: An Update*, [GAO-04-485SP](#) (Washington, D.C.: 2004).

³²This includes eliminating all cash assistance and medical benefits.

revenue.³³ As an additional option, changing the structure of the coal tax to flexible rates that change based on an annual actuarial assessment of the Trust Fund could help to ensure that coal mine operators pay the necessary amount of tax to cover Trust Fund expenditures, without resulting in a Trust Fund balance or deficit.

Multiple Options Could Reduce Future Trust Fund Debt and Would Distribute the Financial Burden Differently Among General Taxpayers and Industry

Multiple options could reduce the Trust Fund's future debt and distribute the financial burden among the coal industry and general taxpayers. We simulated whether various coal tax and debt forgiveness options could balance the Trust Fund by fiscal year 2050, whereby its simulated revenue would be sufficient to cover its simulated expenditures. These options were selected, in part, based on interviews with Trust Fund stakeholders and the availability of DOL and other data.³⁴ We approached these simulations from two perspectives. First, we simulated how much Trust Fund debt would need to be forgiven based on various coal tax rates. Second, we simulated the average tax collected per ton needed to balance the Trust Fund by 2050, based on certain debt forgiveness options. The simulated options are not intended to be exhaustive and we are not endorsing any particular combination of options.

Our first set of options using the moderate case simulations are based on the current coal tax rates of \$1.10 per ton of underground-mined coal and \$0.55 per ton of surface-mined coal, and show the amount of debt forgiveness in fiscal year 2019 needed to balance the Trust Fund by fiscal year 2050 based on certain tax rates (see fig. 10). Specifically, our moderate case simulations show the following:

- Increasing current coal tax rates by 25 percent could balance the Trust Fund by 2050 and would likely require no debt forgiveness. For this option, the simulated coal tax revenue would likely be sufficient to cover simulated Trust Fund expenditures, including combined benefit payments and administrative costs, as well as debt repayments.

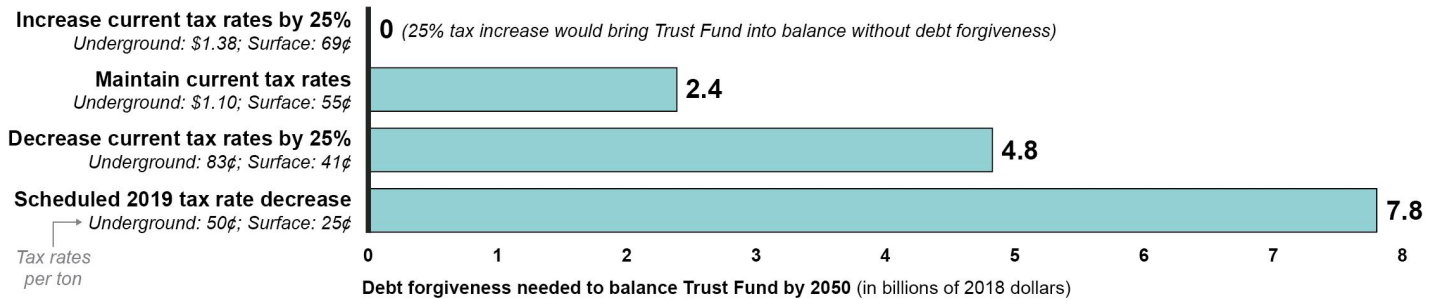
³³With the scheduled 2019 tax rate decrease, the tax cap will revert to 2 percent.

³⁴Trust Fund stakeholders that provided options to simulate include DOL, Treasury, HHS, the National Mining Association, and the United Mine Workers of America.

However, this option would place the burden solely on the coal industry that would be paying higher taxes at a time when coal production has been declining.

- Maintaining current coal tax rates could balance the Trust Fund by 2050 if coupled with about \$2.4 billion of debt forgiveness. This option would distribute the burden among the coal industry and general taxpayers.
- Decreasing current coal tax rates by 25 percent could balance the Trust Fund by 2050 if coupled with about \$4.8 billion in debt forgiveness. This option would burden the coal industry less than maintaining the current tax rates, but would increase the burden on general taxpayers.
- Decreasing current tax rates by 55 percent, which we refer to as the scheduled 2019 tax rate decrease, would balance the Trust Fund by 2050 if coupled with about \$7.8 billion in debt forgiveness. This figure comprises the Trust Fund's total simulated outstanding debt in fiscal year 2019 (\$6.6 billion), and an additional about \$1.2 billion that would be required because the Trust Fund will accrue additional debt from fiscal years 2020 through 2050, according to our moderate case simulations. The coal industry would bear some of the financial burden of this option, while also placing a financial burden on general taxpayers.

Figure 10: Simulated Debt Forgiveness Needed in 2019 to Balance the Black Lung Disability Trust Fund by 2050 Given Various Coal Tax Rates Based on Moderate Case Assumptions



Source: GAO simulation based on data from the Departments of Labor and Treasury, the Energy Information Administration, and the Office of Management and Budget. | GAO-18-351

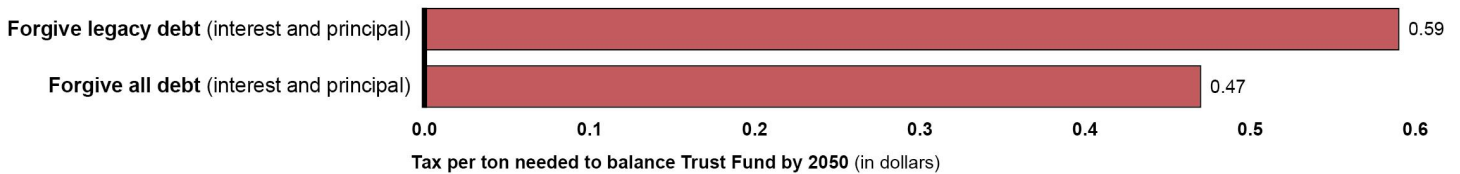
Notes: For reporting purposes, the Trust Fund is considered balanced when revenue is sufficient to cover expenditures. Moderate case simulations assume that future coal production is consistent with the Energy Information Administration’s reference case, which generally assumes trend improvement in known technologies, a view of economic and demographic trends that reflects the current central views of economic forecasters and demographers, and that current laws and regulations affecting the energy sector are unchanged through 2050. Moderate case simulations also assume that future numbers of new black lung beneficiaries evolve over time based on the average growth rate for the period from fiscal years 2003 to 2015. Given the complexities of estimating future coal production and prices and new black lung beneficiaries, our simulations are subject to considerable uncertainty and simulated amounts of debt forgiveness needed to balance the Trust Fund are unlikely to be precise. For more information on our simulation methodology and the full range of results, see appendixes I and II. Specifically, for the range of simulated amounts of debt forgiveness associated with each tax rate change, see table 8 in appendix II.

Our second set of options using moderate case simulations show the change in average coal tax revenue collected per ton to balance the Trust Fund by fiscal year 2050 based on certain debt forgiveness options (see fig. 11). Specifically, our moderate simulations show the following:

- Forgiving the Trust Fund’s legacy debt would allow for an average tax collected of about \$0.59 per ton to balance the Trust Fund by 2050. Based on certain assumptions, this could be accomplished with a tax of \$0.88 per ton on underground-mined coal and \$0.44 per ton on surface-mined coal.³⁵
- Forgiving all Trust Fund debt would allow for an average tax collected per ton of coal sold of \$0.47 per ton to balance the Trust Fund by 2050. Based on certain assumptions, this could be accomplished with a tax of \$0.70 per ton on underground-mined coal and a tax of \$0.35 per ton of surface-mined coal.

³⁵The assumptions are that (1) underground-mined and surface-mined coal make up the same fractions of total coal sold as they did in 2015, about 34 percent and 66 percent, respectively; (2) the cap on coal taxes is removed; and (3) the tax on surface-mined coal is half the tax on underground-mined coal.

Figure 11: Simulated Change in Tax Collection per Ton of Coal Sold That Could Balance the Black Lung Disability Trust Fund by 2050, Based on Various Debt Forgiveness Options and Moderate Case Assumptions



Source: GAO simulation based on data from the Departments of Labor and Treasury, the Energy Information Administration, and the Office of Management and Budget. | GAO-18-351

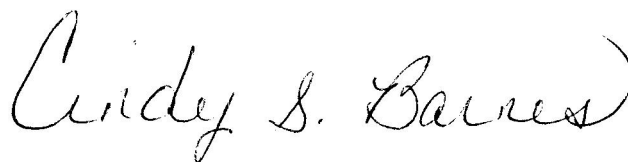
Notes: For reporting purposes, the Trust Fund is balanced when revenue is sufficient to cover expenditures. Legacy debt refers to Trust Fund debt that was refinanced following the Energy Improvement and Extension Act of 2008. All debt refers to the Trust Fund's legacy debt and any amount borrowed from Treasury's general fund. Moderate case simulations assume that future coal production is consistent with the Energy Information Administration's reference case, which generally assumes trend improvement in known technologies, a view of economic and demographic trends that reflects the current central views of economic forecasters and demographers, and that current laws and regulations affecting the energy sector are unchanged through 2050. Moderate case simulations also assume that future numbers of new black lung beneficiaries evolve over time based on the average growth rate for the period from fiscal years 2003 to 2015. Given the complexities of estimating future coal production and prices and new black lung beneficiaries, our simulations are subject to considerable uncertainty and simulated coal tax rates needed to balance the Trust Fund are unlikely to be precise. For more information on our simulation methodology and the full range of results, see appendixes I and II. Specifically, for the range of simulated average tax rates associated with each debt forgiveness option, see table 9 in appendix II.

Agency Comments

We provided a draft of this report to the Departments of Labor (DOL), Treasury, and Health and Human Services (HHS) for review and comment. DOL, Treasury, and HHS provided technical comments, which we incorporated as appropriate.

As agreed with your offices, unless you publicly announce the contents of this report earlier, we plan no further distribution until 30 days from the report date. At that time we will send copies of this report to the appropriate congressional committees, the Secretaries of Labor, Treasury, and Health and Human Services, and other interested parties. In addition, the report will be available at no charge on GAO's web site at <http://www.gao.gov>.

If you or your staff should have any questions about this report, please contact me at (202) 512-7215 or brownbarnesc@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made key contributions to this report are listed in appendix III.



Cindy Brown Barnes
Director, Education, Workforce,
and Income Security Issues

Appendix I: Black Lung Disability Trust Fund Simulation Methodology

We examined the extent to which (1) Black Lung Disability Trust Fund (Trust Fund) debt may change through 2050 and (2) selected options to improve its future financial position. We interviewed officials from the Departments of Labor (DOL), Treasury, and Health and Human Services (HHS), as well as representatives from the National Mining Association and the United Mine Workers of America. We then selected options to simulate based, in part, on these interviews and the availability of DOL and other data. These options included adjusting the coal tax, forgiving interest on some or all Trust Fund debt, forgiving some or all Trust Fund debt, or various combinations of these options. The options we simulated are not intended to be exhaustive and we are not endorsing any particular option or combination of options. Our simulations are based on various assumptions and simulate Trust Fund revenues and expenditures from fiscal years 2016 through 2050.¹ To develop these simulations, we used actual and projection data from (1) DOL for fiscal years 2015 through 2040; (2) Treasury's Office of Tax Analysis for fiscal years 2011 through 2015; (3) the Department of Energy's Energy Information Administration (EIA) for calendar years 2015 through 2050; and (4) the Office of Management and Budget for fiscal year 2017.

Black Lung Benefit Expenditures

To simulate future Trust Fund benefit expenditures, we simulated the number of beneficiaries each fiscal year, and the annual average amount of benefits received (cash assistance and medical benefits). To simulate the numbers of beneficiaries, we used DOL data on the (1) age distributions of miner and widow beneficiaries for fiscal year 2015; (2) mortality rates by age for miner and widow beneficiaries as of fiscal year 2015; and (3) numbers of beneficiaries—including married miners, single miners, widows, and miners receiving medical benefits only—in fiscal year 2015. We assumed—as DOL does in its Black Lung Budget and

¹Our simulations began in fiscal year 2016 because fiscal year 2015 was the last complete fiscal year for which DOL data were available when we began our review. Our simulations extend through fiscal year 2050 because that is as far as the Energy Information Administration produces coal production forecasts which we relied on in developing our simulations relative to future coal tax revenue.

Liability Model—that all miners are men, all widows are women, and all spouses are 3 years younger than the miner. We also assumed that the age distribution of single miners is the same as for married miners, and that the age distribution of new miner and widow beneficiaries is the same as for miner and widow beneficiaries during fiscal year 2015. We used DOL’s mortality rates to simulate the number of beneficiaries of each age and type in each year, and used those numbers to then simulate the total number of beneficiaries of each type each year (see table 2).² To simulate benefit amounts, we used DOL data on (1) average monthly cash assistance for married miners, single miners, and widow beneficiaries, and (2) average annual medical benefit amounts for married miners, single miners, and medical benefit-only beneficiaries for fiscal year 2015. We assumed that each beneficiary received the average amount of cash assistance each month, increasing each fiscal year with inflation, and that each miner received the same average annual amount of medical benefits received in fiscal year 2015, increasing in the future along with inflation.³

Table 2: Future Black Lung Beneficiaries Simulation Methodology

Black lung beneficiaries	Formula
Married miner	The number of married miner beneficiaries age a in fiscal year y is equal to the number of new married miner beneficiaries age a in fiscal year y plus the number of married miner beneficiaries age a-1 in fiscal year y-1 who survived and whose spouse survived. The total number of married miner beneficiaries in fiscal year y is then the sum of the number of married miner beneficiaries of all ages in fiscal year y. Finally, we averaged the number of married miner beneficiaries by averaging the prior fiscal year’s total and the current fiscal year’s total.
Single miner	The number of single miner beneficiaries age a in fiscal year y is equal to the number of new single miner beneficiaries age a in fiscal year y plus the number of single miner beneficiaries age a-1 in fiscal year y-1 who survived plus the number of married miner beneficiaries age a-1 in fiscal year y-1 who survived but whose spouse did not survive. The total number of single miner beneficiaries in fiscal year y is then the sum of the number of single miner beneficiaries of all ages in fiscal year y. Finally, we averaged the number of single miner beneficiaries by averaging the prior fiscal year’s total and the current fiscal year’s total.

²We also assumed that there will be no new medical-benefit-only recipients.

³Our inflation adjustments start on January 1, 3 months after the start of the fiscal year on October 1. Therefore, in our simulations, the total amount of benefits a beneficiary receives in a fiscal year is equal to 3 months of benefits adjusted for inflation in the next fiscal year plus 9 months of benefits adjusted for inflation.

**Appendix I: Black Lung Disability Trust Fund
Simulation Methodology**

Black lung beneficiaries	Formula
Widow beneficiaries	The number of widow beneficiaries age a in fiscal year y is equal to the number of new beneficiaries who are widows age a in fiscal year y plus the number of widow beneficiaries age a-1 in fiscal year y-1 who survived plus the number of married miner beneficiaries age a+2 in fiscal year y-1 who did not survive but whose spouse did survive. The total number of widow beneficiaries in fiscal year y is then the sum of the number of widow beneficiaries of all ages in fiscal year y. Finally, we averaged the number of widow beneficiaries by averaging the prior fiscal year's total and the current fiscal year's total.
Medical Benefit Only (MBO)	The number of MBO beneficiaries of age a in fiscal year y is equal to the number of MBO beneficiaries of age a-1 in fiscal year y-1 who survived. The total number of MBO beneficiaries only in fiscal year y is then the sum of the number of MBO beneficiaries of all ages in fiscal year y. Finally, we averaged the number of MBO beneficiaries by averaging the prior fiscal year's total and the current fiscal year's total.

Source: GAO simulation methodology. | GAO-18-351

Coal Tax Revenues

To simulate future coal tax revenue, we used Treasury and EIA data to calculate (1) the amounts of underground and surface-mined coal taxed at fixed dollar amounts of \$1.10 and \$0.55 per ton, respectively, in 2015; (2) the amounts of underground and surface-mined coal taxed at variable dollar amounts per ton equal to 4.4 percent of the price in 2015; and (3) average prices of underground and surface-mined coal taxed at 4.4 percent of the price in 2015. We then used EIA data on projected amounts of total coal production, underground-mined coal production, lignite coal production, and coal exports, as well as projected average coal prices, for the period from 2015 through 2050 to simulate future coal tax revenues (see table 3).⁴

⁴Lignite coal and exported coal are not subject to the coal tax. EIA coal production data are presented in calendar years. Therefore, we developed our simulation in calendar years and then adjusted total coal tax revenue to report in fiscal years.

Table 3: Future Coal Tax Revenue Simulation Methodology

Data component	Formulas and assumptions
Coal production	<p>We took the following steps to simulate the amount of underground- and surface-mined coal taxed at fixed and variable dollar amounts per ton for each year using data on projected coal production and coal prices for the period from 2015 to 2050:</p> <ol style="list-style-type: none"> 1. We simulated surface-mined coal production as the difference between total coal production and underground-mined coal production. 2. We simulated underground-mined coal sold domestically by assuming that underground-mined coal makes up the same fraction of exported coal as it makes of total production and then subtracting exported underground-mined coal from total underground-mined coal. 3. We simulated non-lignite surface-mined coal sold domestically by first assuming that surface-mined coal makes up the same fraction of exported coal as it makes of total production and then subtracting exported surface-mined coal and lignite coal from total surface-mined coal. 4. We simulated domestic underground-mined coal taxed at a fixed dollar amount per ton by assuming production grows at the same rate as domestic underground-mined coal. We simulated domestic underground-mined coal taxed at variable dollar amounts per ton as the remainder. We simulated domestic non-lignite surface-mined coal taxed at fixed and variable dollar amounts per ton similarly.
Coal prices	<p>We simulated the prices of underground-mined and surface-mined coal by assuming they grow at the same rate as average coal prices.</p>
Coal tax revenues	<p>We took the following steps to simulate coal tax revenues:</p> <ol style="list-style-type: none"> 1. We simulated tax revenue from underground-mined and surface-mined coal taxed at a fixed dollar amount per ton as the fixed dollar amount per ton times production of these types of coal. 2. We simulated tax revenues from underground-mined and surface-mined coal taxed at a variable dollar amount per ton based on a percentage of the price as the percentage of price per ton times the price times production. 3. We simulated total calendar year coal tax revenues as the sum of revenues for each type of coal. 4. We simulated total fiscal year coal tax revenues as 25 percent of the tax revenues for the previous calendar year plus 75 percent of the revenues for the current calendar year.

Source: GAO simulation methodology. | GAO-18-351

Other Expenditures and Revenue

We simulated other Trust Fund expenditures and revenues, including administrative costs and debt repayments (see table 4). For our simulations, total Trust Fund expenditures are the sum of black lung benefits (cash assistance and medical benefits), total administrative costs, repayment of interest and principal on outstanding debt to Treasury’s general fund, and other expenditures. Total Trust Fund revenues are the sum of coal tax revenue and other miscellaneous

revenue, and exclude annual borrowing from Treasury’s general fund.⁵ Annual borrowing from Treasury’s general fund is the difference between total Trust Fund expenditures and revenues and is assumed to be repaid with interest the following year. If total revenues are greater than total expenditures, then the Trust Fund has a balance and would not have to borrow that year. In this case, we assumed that the Trust Fund will earn interest on that balance at the same rate on which interest would accrue on annual borrowing.

Table 4: Definitions for Various Black Lung Disability Trust Fund Expenditures and Revenues (Excluding Black Lung Benefits and Coal Tax Revenue)

Expenditures and revenue	Simulation methodology
Administrative costs	Sum of various expenditures in the Department of Labor’s (DOL) Black Lung Liability Model, which include direct expenses, departmental management expenses, and Office of Inspector General and Treasury expenses.
Legacy debt repayments	Sum of principal and interest on the Trust Fund’s legacy debt (i.e. the debt refinanced after the Energy Improvement and Extension Act of 2008).
Other expenditures	Retroactive benefits (less collections from mine operators as included in DOL’s Black Lung Liability Model).
Repayment on annual borrowing	Amount borrowed from Treasury’s general fund in the previous fiscal year plus interest. ^a
Miscellaneous revenue	Other miscellaneous Trust Fund revenue such as interest payments, fines, and penalties paid by mine operators.

Source: GAO simulation methodology. | GAO-18-351.

^a When necessary for the Trust Fund to make relevant expenditures, funds are appropriated to the Trust Fund as “repayable advances,” and then those advances must be repaid with interest to the general fund of the U.S. Treasury. We refer to this process as borrowing from the Treasury’s general fund. According to the Department of the Treasury, the general fund includes assets and liabilities used to finance the daily and long-term operations of the U.S. government as a whole.

Options That May Affect Trust Fund Finances

We simulated how the scheduled 2019 tax rate decrease and various options including adjusting the coal tax, forgiving debt interest, and forgiving debt principal and interest may affect Trust Fund finances

⁵When necessary for the Trust Fund to make relevant expenditures, funds are appropriated to the Trust Fund as “repayable advances,” and then those advances must be repaid with interest to the general fund of the U.S. Treasury. We refer to this process as annual borrowing from Treasury’s general fund because, for reporting purposes, we often refer to the total amount of the repayable advances made during a particular fiscal year. According to the Department of the Treasury, the general fund includes assets and liabilities used to finance the daily and long-term operations of the U.S. government as a whole.

through fiscal year 2050 (see table 5). The options listed are not intended to be exhaustive and we are not endorsing any particular option or combination of options.

Table 5: Options That May Affect Black Lung Disability Trust Fund Finances

	Description of simulation (implemented in fiscal year 2019)
Scheduled coal tax rate decrease of about 55 percent	Tax on underground-mined coal decreases from \$1.10 to \$0.50 per ton up to the cap, which decreases from 4.4 percent of the price to 2 percent of the price. Tax on surface-mined coal decreases from \$0.55 to \$0.25 per ton up to the cap, which decreases from 4.4 percent of the price to 2 percent of the price.
Adjustments to the coal tax rates	Reduce coal tax rates by 25 percent. Coal tax rates decrease from \$1.10 to \$0.83 per ton of underground-mined coal and from \$0.55 to \$0.41 per ton of surface-mined coal, up to a cap of 3.3 percent of the price for both types of coal.
	Maintain current coal tax rates. Coal tax rates remain at \$1.10 per ton of underground-mined coal and \$0.55 per ton of surface-mined coal, up to 4.4 percent of the price for both types of coal.
	Increase coal tax rates by 25 percent. Coal tax rates increase by 25 percent from \$1.10 to \$1.38 per ton of underground-mined coal and from \$0.55 to \$0.69 per ton of surface-mined coal, up to 5.5 percent of the price of both types of coal.
Forgive interest on Trust Fund debt	Forgive interest on annual borrowing from Treasury's general fund.
	Forgive interest on legacy debt.
Forgive principal and interest on Trust Fund debt	Forgive interest on annual borrowing from Treasury's general fund and on legacy debt.
	Forgive principal and interest on legacy debt.
	Forgive principal and interest on legacy debt and annual borrowing from Treasury's general fund as of fiscal year 2019.

Source: GAO simulation methodology. | GAO-18-351

Notes: GAO selected options to simulate based on interviews with officials from the Departments of Labor (DOL), Treasury, Health and Human Services, and representatives from coal industry and union groups, as well as the availability of DOL and other data. The options simulated are not intended to be exhaustive and GAO is not endorsing any particular option or combination of options. For our simulations, Trust Fund debt includes its legacy debt—the amount refinanced following the Energy Improvement and Extension Act of 2008 that has not yet been repaid—and annual borrowing, which is the amount borrowed in a given year from the U.S. Treasury's general fund. In developing our simulations for adjusting the coal tax rates, we increased, maintained, or decreased the maximum tax rate of 4.4 percent of the coal's sales price by the amount we altered the tax rates. For example, in simulating a 25 percent coal tax increase we also increased the cap by 25 percent, to 5.5 percent.

We simulated option combinations for coal tax rates, interest forgiveness, and debt forgiveness to demonstrate how potential financial adjustments could affect future Trust Fund borrowing from Treasury's general fund through fiscal year 2050. For options that involve adjusting coal tax rates, we estimated the amount of debt that would need to be forgiven in fiscal year 2019 for the Trust Fund's revenues to be sufficient to cover its expenditures through fiscal year 2050, assuming the Trust Fund does not borrow from Treasury's general fund after fiscal year 2018. To do so, we first calculated the real discounted present value of Trust Fund

expenditures for fiscal years 2019 through 2050, including benefit payments, administrative costs, legacy debt repayments, and repayment of annual borrowing from Treasury's general fund. Second, we calculated the real discounted present value of Trust Fund revenue for the same period, including coal tax revenue and other miscellaneous revenue. Third, we calculated debt forgiveness as the difference between the real discounted present value of Trust Fund expenditures from the first calculation and the real discounted present value of Trust Fund revenues from the second calculation. When the amount of debt forgiveness is greater than the amount of debt outstanding, the Trust Fund would need an additional cash inflow in addition to forgiveness of all outstanding debt. Amounts of debt forgiveness less than zero suggest that no debt forgiveness is required.

For options involving forgiving debt (interest or principal), we estimated the average tax per ton of coal that, if implemented in fiscal year 2019, would provide the Trust Fund sufficient revenue to cover its expenditures through fiscal year 2050, assuming the Trust Fund does not receive any advances from Treasury's general fund after fiscal year 2018. To do so, we first calculated the real discounted present value of Trust Fund expenditures for the period from fiscal year 2019 through fiscal year 2050, again including benefit payments, administrative costs, legacy debt repayments, and repayment of annual borrowing from Treasury's general fund, minus the real discounted present value of miscellaneous revenues for the same period. Second, we calculated the real discounted present value of coal production for the same period. Third, we calculated the average tax per ton of coal as the first amount divided by the second amount.⁶

To assess the sensitivity of each option, we ran each simulation 36 times using four different sets of assumptions about the numbers of future beneficiaries and nine different sets of assumptions about future coal

⁶If the average tax per ton of coal is t , then the real discounted present value of coal tax revenue in a year is the real discounted present value of t times the amount of coal produced that year. It follows that the real discounted present value of coal tax revenue for the period from 2019 through 2050 is the sum of the real discounted present values of t times the amount of coal produced in each of those years. Adjusting for inflation and discounting are multiplicative operations, so the average tax per ton can be factored out of each term in the sum. After factoring out t , the real discounted present value of coal tax revenue for the period from 2019 through 2050 is t times the sum of the real discounted present values of the amount of coal produced in each of those years. Applying the inflation and discounting adjustments to coal production in each year allows us to solve for the average tax per ton of coal, t .

production and prices (see table 6). Doing so provided a range of estimates about the Trust Fund’s future borrowing needs and provided insight on the sensitivity of its overall financial position relative to its various expenditures and revenues. The analysis also provided a range of estimates of the amount of debt forgiveness needed to bring the Trust Fund into balance by fiscal year 2050, assuming various coal tax rates, and the average tax collection per ton needed to do the same, and assuming various amounts of debt forgiveness.⁷

Table 6: Future Black Lung Beneficiaries and Coal Tax Revenue Sensitivity Analysis

	Methodology
New entrants	<p>The number of new black lung beneficiaries in the future is a key determinant of future Black Lung Disability Trust Fund (Trust Fund) expenditures, but cannot be known with any certainty. Therefore, to develop our simulations, we analyzed four alternative sets of assumptions about how the number of future beneficiaries may evolve over time. These assumptions were based on:</p> <ol style="list-style-type: none"> 1. the average growth rate of new beneficiaries for fiscal years 2003 through 2015, about -5.8 percent; 2. the median growth rate of new beneficiaries for fiscal years 2003 through 2016, about -1.9 percent; 3. the Department of Labor’s projection of new beneficiaries; and 4. no new beneficiaries.
Future coal tax revenue	<p>Future coal production and prices are key determinants of future Trust Fund revenue, but they cannot be known with any certainty. Therefore, to develop our simulations, we analyzed nine alternative cases that all incorporated various assumptions about how coal production and prices may evolve through 2050. These nine cases were produced by the Energy Information Administration (EIA) and reflect alternative assumptions about economic growth, oil prices, technological innovation, and energy policy.^a Specifically:</p> <ul style="list-style-type: none"> • The reference case generally assumes improvements in known technologies, a view of economic and demographic trends that reflects the current central views of economic forecasters and demographers, and that current laws and regulations affecting the energy sector are unchanged through 2050. • The high and low economic growth cases—two alternative cases—differ from the reference case in their assumptions about macroeconomic growth. • The high and low oil price cases differ from the reference case in their assumptions about oil prices. • The high and low oil and gas resource and technology cases consider alternative assumptions about oil and gas supply. • One case assumes that the Clean Power Plan is not implemented.^b • Another case considers alternative assumptions about oil and gas supply in combination with the absence of the Clean Power Plan.

⁷For reporting purposes, the Trust Fund is balanced when its revenue is sufficient to cover its expenditures.

**Appendix I: Black Lung Disability Trust Fund
Simulation Methodology**

Methodology

**Caveats and
limitations**

All simulations are subject to considerable uncertainty. Our results will likely be indicative of the relative effects of different options on the Trust Fund, but the simulated values of advances and other variables are unlikely to be precise.

Our simulations were developed with a set of underlying assumptions, both explicit and implicit. All such simulations implicitly assume that relationships exhibited in the past will generally continue to hold over the simulation period.

Our simulation model did not vary one set of assumptions based on the possible effects of other assumptions. For example, the future numbers of new beneficiaries in the model do not vary with different coal production cases. However, it seems likely that in cases where future coal production is strong, there will also be fewer coal mine operator bankruptcies and thus fewer new beneficiaries (although not all bankruptcies result in new beneficiaries to the Trust Fund). Additionally, the model does not consider how adjusting the coal tax rates could affect coal production. However, increasing coal tax rates could result in energy consumers purchasing less coal in favor of alternative energy sources.

Source: GAO simulation methodology. | GAO-18-351

^aFor more information on EIA coal production cases see Department of Energy, Energy Information Administration, *Annual Energy Outlook 2017* (Washington, D.C.: January 5, 2017); and Department of Energy, Energy Information Administration, *Assumptions to the Annual Energy Outlook for 2017* (Washington, D.C.: July 2017).

^bUnder the Clean Power Plan, the Environmental Protection Agency established guidelines for CO₂ emissions from existing power plants.

From the range of estimates that resulted from our sensitivity analysis, we selected cases with moderate expectations related to future Trust Fund expenditures and revenue. Specifically, for future expenditures, we assumed an average growth rate of new black lung beneficiaries for fiscal years 2003 through 2015 as a moderate case that reflects historical experience. For future revenue, we used a moderate coal production outlook based on EIA's reference case, which reflects moderate expectations about future coal production based on various assumptions about economic growth, oil prices, technological innovation, and energy policy.

Appendix II: Results of GAO's Black Lung Disability Trust Fund Simulations

We summarized the results of our simulations by showing the extent to which the Black Lung Disability Trust Fund's (Trust Fund) balance—the sum of tax revenue and miscellaneous revenue less expenditures—may change in fiscal year 2050 for each option simulated.¹ For example, with the scheduled 2019 tax rate decrease, our moderate case simulations suggest that the Trust Fund would likely have a deficit in fiscal year 2050 of about \$15.4 billion.² However, because in our model the Trust Fund's financial position depends on future coal production and numbers of new beneficiaries, the alternative assumptions we analyzed generated simulated Trust Fund deficits associated with the scheduled 2019 tax rate decrease that ranged from about \$6 billion to about \$27 billion (see table 7).³

¹We tracked the simulated Trust Fund balance in nominal dollars (not adjusted for inflation) to maintain consistency with historical data shown in DOL budget documents. We also tracked the Trust Fund's balance in 2018 dollars to show how it evolves over time after adjusting for inflation. Finally, we tracked the discounted present value of the Trust Fund balance in 2018 dollars, to show how it evolves after adjusting for inflation and fully accounting for the time value of money. Adjusting for inflation and accounting for the time value of money reduce the magnitude of the Trust Fund's balance each year, and both balances and deficits are smaller. However, the relative impact of alternative policies on the Trust Fund's balance is generally the same.

²This is equivalent to about \$7.9 billion in 2018 after adjusting for inflation.

³This is equivalent to about \$3.1 billion to about \$10.8 billion in 2018 after adjusting for inflation.

**Appendix II: Results of GAO's Black Lung
Disability Trust Fund Simulations**

Table 7: Summary of Black Lung Disability Trust Fund Balances in Fiscal Year 2050 Given Various Options and Assumptions Regarding Coal Production and New Beneficiaries

		Moderate coal and new beneficiary scenarios	Average for all coal and new beneficiary scenarios	Minimum for all coal and new beneficiary scenarios	Maximum for all coal and new beneficiary scenarios
Scheduled tax rate decrease in 2019	Nominal (dollars in billions)	-15.4	-13.6	-27.0	-6.0
	Adjusted for inflation (2018 dollars in billions)	-7.9	-6.7	-10.8	-3.1
	Discounted and adjusted for inflation (2018 dollars in billions)	-6.3	-5.4	-8.7	-2.5
Reduce coal tax rates by 25 percent in 2019	Nominal (dollars in billions)	-9.5	-7.2	-19.1	1.6
	Adjusted for inflation (2018 dollars in billions)	-4.9	-3.6	-8.2	0.8
	Discounted and adjusted for inflation (2018 dollars in billions)	-3.9	-2.8	-6.6	0.6
Maintain current coal tax rates	Nominal (dollars in billions)	-4.5	-1.8	-12.5	8.0
	Adjusted for inflation (2018 dollars in billions)	-2.3	-0.9	-6.1	4.1
	Discounted and adjusted for inflation (2018 dollars in billions)	-1.8	-0.7	-4.8	3.3
Increase coal tax rates by 25 percent in 2019	Nominal (dollars in billions)	0.6	3.5	-7.5	14.4
	Adjusted for inflation (2018 dollars in billions)	0.3	1.8	-3.9	7.4
	Discounted and adjusted for inflation (2018 dollars in billions)	0.2	1.4	-3.1	5.9
Forgive interest on annual borrowing starting in 2019	Nominal (dollars in billions)	-9.9	-8.3	-14.5	-2.9
	Adjusted for inflation (2018 dollars in billions)	-5.1	-4.2	-7.4	-1.5
	Discounted and adjusted for inflation (2018 dollars in billions)	-4.1	-3.3	-5.9	-1.2
Forgive interest on legacy debt starting in 2019	Nominal (dollars in billions)	-9.3	-7.3	-19.1	0.1
	Adjusted for inflation (2018 dollars in billions)	-4.8	-3.6	-7.7	0.1
	Discounted and adjusted for inflation (2018 dollars in billions)	-3.8	-2.9	-6.1	<0.1
Forgive all interest in 2019	Nominal (dollars in billions)	-5.8	-4.2	-10.3	1.3
	Adjusted for inflation (2018 dollars in billions)	-3.0	-2.1	-5.3	0.6
	Discounted and adjusted for inflation (2018 dollars in billions)	-2.4	-1.7	-4.2	0.5
Forgive all debt in 2019	Nominal (dollars in billions)	-5.2	-3.1	-13.7	4.2
	Adjusted for inflation (2018 dollars in billions)	-2.7	-1.5	-5.6	2.2
	Discounted and adjusted for inflation (2018 dollars in billions)	-2.1	-1.2	-4.5	1.7
Forgive all	Nominal (dollars in billions)	-2.3	-0.1	-9.4	6.9

**Appendix II: Results of GAO's Black Lung
Disability Trust Fund Simulations**

		Moderate coal and new beneficiary scenarios	Average for all coal and new beneficiary scenarios	Minimum for all coal and new beneficiary scenarios	Maximum for all coal and new beneficiary scenarios
debt and annual borrowing outstanding in 2019	Adjusted for inflation (2018 dollars in billions)	-1.2	-0.1	-4.1	3.6
	Discounted and adjusted for inflation (2018 dollars in billions)	-1.0	-0.0	-3.3	2.9

Source: GAO simulation based on data from the Departments of Labor and Treasury, the Energy Information Administration, and the Office of Management and Budget. | GAO-18-351

Notes: Moderate case simulations assume that future coal production is consistent with the Energy Information Administration's reference case, which generally assumes trend improvement in known technologies, a view of economic and demographic trends that reflects the current central views of economic forecasters and demographers, and that current laws and regulations affecting the energy sector are unchanged through 2050. Moderate case simulations also assume that future numbers of new black lung beneficiaries evolve over time based on the average growth rate for the period from fiscal years 2003 through 2015. See table 6 in appendix I for a summary of alternative sets of assumptions about future coal production and prices and about future numbers of new beneficiaries.

Multiple Options

Multiple options could reduce the Trust Fund's future debt and distribute the financial burden among the coal industry and general taxpayers. We simulated how various coal tax and debt forgiveness options could balance the Trust Fund by fiscal year 2050, whereby its simulated revenue would be sufficient to cover its simulated expenditures. We approached these simulations from two perspectives. First, we simulated how much Trust Fund debt would need to be forgiven based on various coal tax rates. Second, we simulated the average tax collected per ton needed to balance the Trust Fund by 2050, based on certain debt forgiveness options.

For our first set of simulations, we calculated the amount of debt outstanding in fiscal year 2019 and the amount that would likely need to be forgiven in fiscal year 2019 for the Trust Fund to have sufficient revenues to cover its expenditures by fiscal year 2050, assuming that it does not borrow from Treasury's general fund after fiscal year 2018. For example, before any options are implemented, our moderate case simulations suggest that the Trust Fund's outstanding debt in fiscal year 2019—including both legacy debt and annual borrowing from Treasury's general fund—would likely be about \$6.6 billion (after discounting and adjusting for inflation). Therefore, with implementation of the coal tax rate decrease of about 55 percent as scheduled in calendar year 2019, about 117.7 percent of that debt would need to be forgiven to balance the Trust Fund. In other words, balancing the Trust Fund would require forgiveness of \$6.6 billion and an additional cash inflow of about \$1.2 billion because

the Trust Fund will accrue additional debt from fiscal years 2020 through 2050, according to our moderate case simulations (see table 8).

Table 8: Estimated Amount of Debt Forgiveness in Fiscal Year 2019 Needed to Balance the Black Lung Disability Trust Fund by 2050 Given Various Coal Tax Rates and Assumptions About Future Coal Production and Black Lung Beneficiaries

	Moderate coal and new beneficiary scenarios	Minimum for all coal and new beneficiary scenarios	Maximum for all coal and new beneficiary scenarios
Estimated discounted present value of real debt outstanding in fiscal year 2019 before implementation of any of the options listed below (2018 dollars in billions)	6.6	5.9	6.7
Estimated debt forgiveness in fiscal year 2019 to balance Trust Fund as a percent of debt outstanding (percentage) If coal tax rates decrease as scheduled by about 55 percent	117.7	69.0	145.6
Estimated debt forgiveness in fiscal year 2019 to balance Trust Fund as a percent of debt outstanding (percentage) If coal tax rates decrease by 25 percent	73.7	25.0	101.4
Estimated debt forgiveness in fiscal year 2019 to balance Trust Fund as a percent of debt outstanding (percentage) If current coal tax rates are maintained	36.4	0	63.9
Estimated debt forgiveness in fiscal year 2019 to balance Trust Fund as a percent of debt outstanding (percentage) If coal tax rates increase by 25 percent	0	0	26.5

Source: GAO simulation based on data from the Departments of Labor and Treasury, the Energy Information Administration, and the Office of Management and Budget. | GAO-18-351

Notes: For reporting purposes, the Trust Fund is balanced when revenue is sufficient to cover expenditures. Moderate case simulations assume that future coal production is consistent with the Energy Information Administration's reference case, which generally assumes trend improvement in known technologies, a view of economic and demographic trends that reflects the current central views of economic forecasters and demographers, and that current laws and regulations affecting the energy sector are unchanged through 2050. Moderate case simulations also assume that future numbers of new black lung beneficiaries evolve over time based on the average growth rate for the period from fiscal years 2003 through 2015. The coal tax is scheduled to decrease by about 55 percent beginning in calendar year 2019. The minimum estimated discounted present value of real debt outstanding in fiscal year 2019 is under the assumptions of the low economic growth coal case with no new beneficiaries. The maximum is under the assumptions of the high economic growth coal case and new entrant growth at the median for the period from fiscal years 2003 to 2016. Debt forgiveness in excess of 100 percent of debt outstanding implies that the Trust Fund would need an additional amount in addition to forgiveness of all outstanding debt in order to balance, whereby revenue is sufficient to cover expenditures.

For our second set of simulations, we estimated the average tax per ton of coal that, if implemented in fiscal year 2019, would likely provide the Trust Fund sufficient revenues to cover its expenditures in fiscal year 2050, assuming that it does not borrow from Treasury's general fund after fiscal year 2018. For example, if all principal and interest on Trust Fund legacy debt is forgiven, as of 2019, the estimated average tax that balances the Trust Fund is about \$0.59 per ton (see table 9). Based on

**Appendix II: Results of GAO's Black Lung
Disability Trust Fund Simulations**

certain assumptions, this could be accomplished with a tax of \$0.88 per ton on underground-mined coal and \$0.44 per ton on surface-mined coal.⁴

Table 9: Estimated Average Tax per Ton of Coal Starting in Fiscal Year 2019 Needed to Balance the Black Lung Disability Trust Fund by 2050 Given Various Debt Forgiveness Options and Assumptions About Future Coal Production and Black Lung Beneficiaries

Dollars per ton of coal

	Moderate coal and new beneficiary scenarios	Average for all coal and new beneficiary scenarios	Minimum for all coal and new beneficiary scenarios	Maximum for all coal and new beneficiary scenarios
No principal or interest on debt forgiven	1.01	0.91	0.58	1.37
Starting in fiscal year 2019, forgive interest on: Annual borrowing from Treasury's general fund	1.00	0.91	0.58	1.37
Starting in fiscal year 2019, forgive interest on: legacy debt	0.76	0.67	0.38	1.08
Starting in fiscal year 2019, forgive interest on: All debt (legacy debt and borrowing from Treasury's general fund)	0.76	0.67	0.38	1.08
In fiscal year 2019, forgive principal and interest on: legacy debt	0.59	0.50	0.25	0.88
In fiscal year 2019, forgive principal and interest on: All debt (legacy debt and borrowing from Treasury's general fund)	0.47	0.39	0.16	0.74

Source: GAO simulation based on data from the Departments of Labor and Treasury, the Energy Information Administration, and the Office of Management and Budget. | GAO-18-351

Notes: For reporting purposes, the Trust Fund is balanced when revenue is sufficient to cover expenditures. Moderate case simulations assume that future coal production is consistent with the Energy Information Administration's reference case, which generally assumes trend improvement in known technologies, a view of economic and demographic trends that reflects the current central views of economic forecasters and demographers, and that current laws and regulations affecting the energy sector are unchanged through 2050. Moderate case simulations also assume that future numbers of new black lung beneficiaries evolve over time based on the average growth rate for the period from fiscal years 2003 through 2015.

⁴The assumptions are that (1) underground-mined and surface-mined coal make up the same fractions of total coal sold as they did in 2015, about 34 percent and 66 percent, respectively; (2) the cap on coal taxes is removed; and (3) the tax on surface-mined coal is half the tax on underground-mined coal.

Appendix III: GAO Contact and Staff Acknowledgments

GAO Contact

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Staff Acknowledgments

In addition to the contact named above, Blake Ainsworth (Assistant Director), Justin Dunleavy (analyst-in-charge), Angeline Bickner, Courtney LaFountain, and Rosemary Torres Lerma made key contributions to this report. Also contributing to this report were James Bennett, Melinda Bowman, Lilia Chaidez, Caitlin Cusati, Holly Dye, Alex Galuten, Carol Henn, John Lack, Emei Li, Almeta Spencer, Kate van Gelder, and Shana Wallace.

Appendix IV: Accessible Data

Data Tables

Data Table for Highlights figure, Trust Fund Actual and Simulated Outstanding Debt, fiscal years 1979 through 2050

(in billions of dollars)

Year	Total outstanding debt
1979	0.42
1980	0.96
1981	1.51
1982	1.79
1983	2.15
1984	2.5
1985	2.83
1986	2.88
1987	2.95
1988	2.99
1989	3.05
1990	3.05
1991	3.27
1992	3.61
1993	3.95
1994	4.36
1995	4.74
1996	5.11
1997	5.49
1998	5.86
1999	6.26
2000	6.75
2001	7.25
2002	7.72
2003	8.24
2004	8.74
2005	9.19
2006	9.63

Appendix IV: Accessible Data

Year	Total outstanding debt
2007	10.06
2008	10.48
2009	6.16
2010	5.86
2011	5.53
2012	5.25
2013	5.04
2014	4.73
2015	4.43
2016	4.36
2017	4.18
2018	4.14
2019	4.2
2020	4.34
2021	4.5
2022	4.7
2023	4.93
2024	5.18
2025	5.47
2026	5.79
2027	6.15
2028	6.52
2029	6.92
2030	7.35
2031	7.78
2032	8.23
2033	8.69
2034	9.16
2035	9.65
2036	10.14
2037	10.65
2038	11.18
2039	11.73
2040	12.31
2041	12.59
2042	12.88
2043	13.18

Year	Total outstanding debt
2044	13.49
2045	13.8
2046	14.12
2047	14.45
2048	14.77
2049	15.1
2050	15.42

Data Table Figure 1: Black Lung Beneficiaries, Fiscal Years 1979 through 2017

Year	Number of primary beneficiaries (in thousands)	Number of dependent beneficiaries (in thousands)
1979	50.71	33.177
1980	80.85	58.223
1981	95.135	68.266
1982	95.234	78.738
1983	100.172	65.871
1984	100.134	62.982
1985	99.62	60.817
1986	99.172	57.378
1987	98.387	54.902
1988	97.294	51.862
1989	95.621	48.566
1990	93.858	45.996
1991	91.46	42.745
1992	88.915	39.846
1993	86.249	36.964
1994	83.375	34.194
1995	80.27	31.499
1996	77	28.923
1997	73.751	26.601
1998	70.401	24.087
1999	66.863	21.853
2000	63.118	19.792
2001	55.375	15.155
2002	51.852	13.895
2003	48.626	12.536

Year	Number of primary beneficiaries (in thousands)	Number of dependent beneficiaries (in thousands)
2004	45.455	11.264
2005	42.37	10.161
2006	39.481	9.108
2007	36.541	8.185
2008	33.574	7.351
2009	30.826	6.571
2010	28.671	5.996
2011	26.829	5.785
2012	25.106	5.638
2013	23.378	5.411
2014	21.86	5.314
2015	20.655	5.456
2016	19.981	5.817
2017	19.43	6.249

Data Table Figure 2: Black Lung Disability Trust Fund Revenue and Black Lung Benefit Payments and Administrative Costs, Fiscal Years 1979 to 2017

(in millions of dollars)

Year	Trust Fund revenue	Benefit payments and administrative costs
1979	232.056	615.245
1980	251.288	760.709
1981	237.097	696.139
1982	500.454	623.488
1983	502.522	666.581
1984	526.645	639.421
1985	570.41	630.766
1986	579.136	629.075
1987	587.126	655.29
1988	616.273	657.077
1989	594.814	649.735
1990	686.546	625.076
1991	663.237	618.787
1992	635.754	631.165
1993	643.281	618.05

Year	Trust Fund revenue	Benefit payments and administrative costs
1994	577.926	606.899
1995	620.224	577.065
1996	623.922	546.936
1997	626.349	534.038
1998	644.915	505.096
1999	603.758	490.23
2000	525.917	472.476
2001	527.654	449.181
2002	569.858	438.507
2003	512.908	425.721
2004	569.592	402.668
2005	613.226	386.734
2006	612.35	365.042
2007	643.404	351.047
2008	658.194	331.489
2009	654.043	312.699
2010	604.857	297.041
2011	634.105	286.288
2012	641.601	269.364
2013	553.372	255.688
2014	601.745	240.333
2015	569.759	240.372
2016	489.557	239.228
2017	449.79	249.968

Data Table for Figure 3: Black Lung Disability Trust Fund Principal Amount of Outstanding Debt to Treasury's General Fund, Fiscal Years 1979 to 2017

Year	Outstanding debt (in billions of dollars)
1979	0.42
1980	0.956
1981	1.51
1982	1.793
1983	2.151
1984	2.497
1985	2.833
1986	2.884

Appendix IV: Accessible Data

Year	Outstanding debt (in billions of dollars)
1987	2.952
1988	2.993
1989	3.049
1990	3.049
1991	3.266
1992	3.606
1993	3.949
1994	4.363
1995	4.738
1996	5.112
1997	5.487
1998	5.857
1999	6.259
2000	6.749
2001	7.254
2002	7.719
2003	8.244
2004	8.741
2005	9.187
2006	9.632
2007	10.058
2008	10.484
2009	6.15825
2010	5.86482
2011	5.53328
2012	5.24525
2013	5.03584
2014	4.73346
2015	4.42669
2016	4.35548
2017	0.42

Data Table Figure 4: Black Lung Disability Trust Fund Actual and Simulated Revenue Based on Moderate Case Assumptions, Fiscal Years 2009 through 2050

Year	Trust Fund revenue (in millions of dollars)
2009	654.043
2010	604.857
2011	634.105
2012	641.601
2013	553.372
2014	601.745
2015	569.759
2016	489.557
2017	449.789
2018	485.406
2019	298.077
2020	242.574
2021	241.76
2022	236.325
2023	231.935
2024	227.014
2025	221.534
2026	215.086
2027	209.517
2028	204.137
2029	198.915
2030	195.536
2031	195.876
2032	196.002
2033	197.373
2034	197.02
2035	195.657
2036	196.488
2037	195.66
2038	194.607
2039	194.396
2040	194.747
2041	195.289
2042	196.048

Year	Trust Fund revenue (in millions of dollars)
2043	197.474
2044	197.568
2045	196.799
2046	196.906
2047	197.081
2048	197.269
2049	197.809
2050	197.306

Data Table Figure 5: Black Lung Disability Trust Fund Simulated Revenue and Black Lung Benefit Payments and Administrative Costs Based on Moderate Case Assumptions, Fiscal Years 2018 through 2050

Year	Benefit payments and administrative costs (in millions of dollars)	Trust Fund revenue (in millions of dollars)
2018	248.87	485.41
2019	258.52	298.08
2020	267.51	242.57
2021	274.89	241.76
2022	281.8	236.33
2023	287.58	231.94
2024	292.68	227.01
2025	297.45	221.53
2026	301.95	215.09
2027	302.2	209.52
2028	300.87	204.14
2029	298.13	198.91
2030	294.11	195.54
2031	288.93	195.88
2032	283.6	196
2033	278.02	197.37
2034	272.32	197.02
2035	266.5	195.66
2036	260.66	196.49
2037	254.69	195.66
2038	248.71	194.61
2039	242.8	194.4

Year	Benefit payments and administrative costs (in millions of dollars)	Trust Fund revenue (in millions of dollars)
2040	236.92	194.75
2041	233.59	195.29
2042	230.17	196.05
2043	226.69	197.47
2044	223.17	197.57
2045	219.61	196.8
2046	216.02	196.91
2047	212.42	197.08
2048	208.77	197.27
2049	205.09	197.81
2050	201.44	197.31

Data Table Figure 6: Black Lung Disability Trust Fund Simulated Principal Amount of Outstanding Debt to Treasury’s General Fund Based on Moderate Case Assumptions, Fiscal Years 2018 through 2050

Year	Outstanding legacy debt (in billions of dollars)	Outstanding debt from annual borrowing (in billions of dollars)
2018	2.666	1.478
2019	2.549	1.651
2020	2.43	1.908
2021	2.31	2.193
2022	2.188	2.513
2023	2.064	2.863
2024	1.939	3.242
2025	1.814	3.656
2026	1.688	4.104
2027	1.562	4.584
2028	1.436	5.087
2029	1.311	5.613
2030	1.186	6.16
2031	1.062	6.722
2032	0.939	7.295
2033	0.817	7.877
2034	0.696	8.468
2035	0.576	9.071
2036	0.457	9.686

Year	Outstanding legacy debt (in billions of dollars)	Outstanding debt from annual borrowing (in billions of dollars)
2037	0.34	10.314
2038	0.224	10.959
2039	0.111	11.623
2040	0	12.305
2041	0	12.589
2042	0	12.88
2043	0	13.179
2044	0	13.486
2045	0	13.8
2046	0	14.119
2047	0	14.446
2048	0	14.772
2049	0	15.098
2050	0	15.422

Data Table Figure 7: Simulated Effects of Adjusting the Coal Tax on Black Lung Disability Trust Fund Principal Amount of Outstanding Debt to Treasury’s General Fund Based on Moderate Case Assumptions, Fiscal Years 2018 through 2050

Year	Scheduled 2019 tax rate decrease	Reduce taxes by 25%	Maintain current tax rates	Increase tax rates by 25%
2018	4.14	4.14	4.14	4.14
2019	4.20	4.09	3.99	3.89
2020	4.34	4.07	3.83	3.60
2021	4.50	4.07	3.70	3.33
2022	4.70	4.10	3.60	3.09
2023	4.93	4.17	3.53	2.88
2024	5.18	4.26	3.48	2.70
2025	5.47	4.39	3.47	2.55
2026	5.79	4.55	3.49	2.44
2027	6.15	4.74	3.54	2.35
2028	6.52	4.95	3.62	2.29
2029	6.92	5.19	3.72	2.25
2030	7.35	5.45	3.84	2.23
2031	7.78	5.72	3.97	2.22
2032	8.23	6.00	4.11	2.22
2033	8.69	6.29	4.25	2.21

Year	Scheduled 2019 tax rate decrease	Reduce taxes by 25%	Maintain current tax rates	Increase tax rates by 25%
2034	9.16	6.58	4.40	2.22
2035	9.65	6.89	4.56	2.23
2036	10.14	7.21	4.73	2.25
2037	10.65	7.54	4.91	2.27
2038	11.18	7.89	5.10	2.31
2039	11.73	8.25	5.30	2.35
2040	12.31	8.63	5.51	2.40
2041	12.59	8.71	5.43	2.15
2042	12.88	8.80	5.34	1.89
2043	13.18	8.88	5.25	1.61
2044	13.49	8.97	5.15	1.33
2045	13.80	9.06	5.05	1.04
2046	14.12	9.15	4.95	0.74
2047	14.45	9.24	4.84	0.43
2048	14.77	9.33	4.72	0.11
2049	15.10	9.41	4.59	-0.22
2050	15.42	9.48	4.46	-0.56

Data Table Figure 8: Simulated Effects of Forgiving Interest on Black Lung Disability Trust Fund Principal Amount of Outstanding Debt to Treasury’s General Fund Based on Moderate Case Assumptions, Fiscal Years 2018 through 2050

Year	No interest forgiveness	Forgive interest on annual borrowing	Forgive interest on legacy debt	Forgive all interest
2018	4.14	4.14	4.14	4.14
2019	4.20	4.17	4.14	4.10
2020	4.34	4.27	4.20	4.13
2021	4.50	4.39	4.27	4.16
2022	4.70	4.54	4.36	4.21
2023	4.93	4.71	4.46	4.26
2024	5.18	4.91	4.57	4.33
2025	5.47	5.13	4.71	4.41
2026	5.79	5.37	4.86	4.49
2027	6.15	5.63	5.02	4.58
2028	6.52	5.90	5.20	4.68
2029	6.92	6.19	5.38	4.78
2030	7.35	6.49	5.57	4.88
2031	7.78	6.80	5.76	4.97

Year	No interest forgiveness	Forgive interest on annual borrowing	Forgive interest on legacy debt	Forgive all interest
2032	8.23	7.11	5.94	5.06
2033	8.69	7.42	6.12	5.14
2034	9.16	7.74	6.30	5.22
2035	9.65	8.06	6.48	5.29
2036	10.14	8.39	6.65	5.35
2037	10.65	8.72	6.83	5.41
2038	11.18	9.05	7.00	5.46
2039	11.73	9.39	7.18	5.51
2040	12.31	9.74	7.36	5.55
2041	12.59	9.77	7.55	5.59
2042	12.88	9.81	7.73	5.63
2043	13.18	9.84	7.93	5.66
2044	13.49	9.86	8.12	5.68
2045	13.80	9.89	8.32	5.70
2046	14.12	9.91	8.52	5.72
2047	14.45	9.92	8.72	5.74
2048	14.77	9.93	8.92	5.75
2049	15.10	9.94	9.12	5.76
2050	15.42	9.94	9.32	5.76

Data Table Figure 9: Simulated Effects of Forgiving Debt (Principal and Interest) on Black Lung Disability Trust Fund Principal Amount of Outstanding Debt to Treasury's General Fund Based on Moderate Case Assumptions, Fiscal Years 2018 through 2050

Year	No debt forgiveness	Forgive legacy debt as of 2019	Forgive all debt in 2019
2018	4.14	4.14	4.14
2019	4.2	1.469	-0.039
2020	4.34	1.53	-0.015
2021	4.5	1.59	0.02
2022	4.7	1.67	0.06
2023	4.93	1.77	0.12
2024	5.18	1.87	0.19
2025	5.47	1.98	0.27
2026	5.79	2.12	0.36
2027	6.15	2.26	0.46
2028	6.52	2.4	0.57

Year	No debt forgiveness	Forgive legacy debt as of 2019	Forgive all debt in 2019
2029	6.92	2.56	0.68
2030	7.35	2.71	0.79
2031	7.78	2.86	0.9
2032	8.23	3.01	1.01
2033	8.69	3.15	1.11
2034	9.16	3.29	1.21
2035	9.65	3.42	1.3
2036	10.14	3.55	1.39
2037	10.65	3.67	1.48
2038	11.18	3.8	1.56
2039	11.73	3.92	1.64
2040	12.31	4.04	1.71
2041	12.59	4.16	1.78
2042	12.88	4.27	1.85
2043	13.18	4.39	1.92
2044	13.49	4.51	1.99
2045	13.8	4.63	2.05
2046	14.12	4.75	2.12
2047	14.45	4.87	2.18
2048	14.77	4.99	2.24
2049	15.1	5.11	2.29
2050	15.42	5.22	2.35

Data Table Figure 10: Simulated Debt Forgiveness Needed in 2019 to Balance the Black Lung Disability Trust Fund by 2050 Given Various Coal Tax Rates Based on Moderate Case Assumptions

Potential action	Resulting underground tax rates per ton	Resulting surface tax rates per ton	Debt forgiveness needed to balance Trust Fund by 2050 (in billions of 2018 dollars)
Increase current tax rates by 25%	\$1.38	69¢	0 (25% tax increase would bring Trust Fund into balance without debt forgiveness)
Maintain current tax rates	\$1.10	55¢	2.386
Decrease current tax rates by 25%	83¢	41¢	4.827

Potential action	Resulting underground tax rates per ton	Resulting surface tax rates per ton	Debt forgiveness needed to balance Trust Fund by 2050 (in billions of 2018 dollars)
Scheduled 2019 tax rate decrease	50¢	25¢	7.8

Data Table Figure 11: Simulated Change in Tax Collection per Ton of Coal Sold That Could Balance the Black Lung Disability Trust Fund by 2050, Based on Various Debt Forgiveness Options and Moderate Case Assumptions

	Tax per ton needed to balance Trust Fund by 2050 (in dollars)
Forgive legacy debt (interest and principal)	0.59
Forgive all debt (interest and principal)	0.47

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