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The Honorable Sherrod Brown
Chairman
Committee on Banking, Housing, and Urban Affairs
United States Senate

The Honorable Elizabeth Warren
Chair
Subcommittee on Fiscal Responsibility and Economic Growth
Committee on Finance
United States Senate

The Honorable Sheldon Whitehouse
Chair
Subcommittee on Taxation and IRS Oversight
Committee on Finance
United States Senate

Refined Coal Production Tax Credit: Coordinated Agency Review Could Help Ensure the Credit Achieves Its Intended Purpose

Coal is a key domestic fuel source and an important contributor to the U.S. economy. In the U.S. power sector, burning coal accounts for most of the sector's emissions of nitrogen oxides (NO_x), sulfur dioxide (SO₂), and mercury. According to the Environmental Protection Agency (EPA), these pollutants can harm human health by contributing to neurological impairment, serious respiratory illness, and premature death. These pollutants can also harm the environment. For example, NO_x can kill marine life, deplete soil nutrients, and reduce animal habitats through soil and water acidification.

Since 2004, the federal government has offered tax credits that support the production of refined coal, which could help to reduce these emissions.¹ The refining process involves mixing chemical and other additives with conventional coal, a technique meant to reduce the amount of NO_x, SO₂, and mercury emitted when power plants burn the coal. Producers claiming the tax credit are generally required to certify to the Internal Revenue Service (IRS) that burning the

¹The tax credit for refined coal was established under the American Jobs Creation Act of 2004. Pub. L. No. 108-357, § 710(a), (b)(1), (b)(2), 118 Stat. 1418, 1552 (codified as amended at 26 U.S.C. § 45(c)(7), (d)(8), (e)(8)). A recent study estimated that burning refined coal achieved negligible reductions in SO₂ emissions rates and that reductions in NO_x and mercury rates fell "far short" of the credit's required levels. The study also raised concerns about the testing methods that refined coal producers typically used to demonstrate the reductions. See Brian C. Prest and Alan Krupnick, "How clean is 'refined coal'? An empirical assessment of a billion-dollar tax credit," *Energy Economics*, vol. 97 (2021): 105023, <https://doi.org/10.1016/j.eneco.2020.105023>.

refined coal reduced NO_x emissions by at least 20 percent and either SO₂ or mercury emissions by at least 40 percent.²

You asked us to review the federal government's implementation of the refined coal production tax credit. This report examines (1) the extent to which producers have claimed the refined coal production tax credit since tax year 2010; (2) what the federal government knows about the extent to which producers have demonstrated the emissions reductions required to claim the credit; and (3) the extent to which the federal government's implementation of the credit aligned with selected criteria for assessing tax expenditure performance.

To determine the extent to which producers have claimed the credit since tax year 2010, we reviewed IRS summary data on the annual aggregate dollar amount claimed by producers on their tax return, specifically Form 8835, on which producers typically claim the credit. We reviewed the reliability of these data by interviewing agency officials and reviewing related documentation and found the data to be sufficiently reliable for our reporting purposes.

To understand IRS's summary data (e.g., any changes in the annual amount claimed), we interviewed officials from IRS and the U.S. Department of the Treasury, as well as representatives from four producers that claimed the credit and eight power plants that burned refined coal.³ To identify these four producers, we reviewed publicly available annual Form 10-K reports that corporations filed with the Securities and Exchange Commission since 2010 for references to the credit.⁴ To select the eight power plants, we reviewed information from the U.S. Department of Energy's (DOE) Energy Information Administration (EIA), randomly sorted the power plants, and selected the first eight available for interviews.⁵ Although the results of these interviews are not generalizable to all producers or power plants, they are designed to represent a range of perspectives on and experiences with claiming the credit since tax year 2010.

To determine what the federal government knows about the extent to which producers have demonstrated the emissions reductions required to claim the credit, we reviewed IRS

²Emissions reductions are as compared to the emissions released when burning the feedstock coal or comparable coal predominantly available in the marketplace as of January 1, 2003. See 26 U.S.C. § 45(c)(7)(B). For the purposes of this report, we generally refer to taxpayers claiming the credit as "producer(s)." According to IRS instructions for claiming the credit, the owner, lessee, or operator of the refined coal facility can be eligible, depending on the circumstances. We discuss the common structure of the refined coal industry later in this report. IRS last updated its guidance relating to the refined coal production tax credit in 2010. See IRS Notice 2010-54, available at https://www.irs.gov/irb/2010-40_IRB.

³IRS administers tax credits by, for example, publishing regulations and issuing guidance—which includes responding to taxpayer inquires with private letter rulings (PLR)—and conducting audits to ensure producers correctly report information related to the credit. PLRs interpret and apply tax laws in response to taxpayers' written requests (for a fee). Treasury supports these efforts by reviewing and approving regulations and guidance, assessing major congressional tax proposals, and analyzing the effects of existing laws, among other activities.

⁴We identified six other producers in addition to those we interviewed. Of these, one provided a written response and five either did not respond to our interview request or chose not to meet with us. Information about all producers claiming the credit since tax year 2010 is not available because producers may not publicly disclose their claim or include specific references to the credit in their Form 10-K reports.

⁵Specifically, we analyzed EIA-923 Monthly Generation and Fuel Consumption Time Series File for calendar year 2019, the most recent information available at the time of our analysis. This file includes a field in which power plants report the fuel types they burned, including refined coal specifically. Our analysis identified 57 power plants that reported burning refined coal in calendar year 2019. One of the eight power plants we selected provided written responses in lieu of representatives making themselves available for an interview.

documents that described the testing methods producers used to demonstrate the reductions. We also interviewed officials from IRS, Treasury, and EPA—which establishes emissions standards, including for power plants—to understand the agencies’ efforts to monitor the extent to which producers have demonstrated the required emissions reductions. We also interviewed officials from these agencies and representatives from producers, a pollution control industry organization, and a facility that conducted testing for producers about the testing methods used and any associated strengths and limitations.⁶

To determine the extent to which the federal government’s implementation of the credit aligned with selected criteria for assessing tax expenditure performance, we reviewed IRS and Treasury documents and conducted interviews with knowledgeable IRS, Treasury, EPA, and DOE officials. We then compared the implementation activities we identified through these steps against criteria that we selected by analyzing our guide to assessing the performance of tax expenditures: provisions, such as tax credits, that reduce taxpayers’ tax liability.⁷ Specifically, three analysts independently categorized and then discussed the selected criteria to identify those most relevant to our researchable questions: coordinating across federal agencies, identifying and addressing potential duplication and overlap, and achieving intended purpose. In addition, we reviewed relevant laws and IRS guidance that discuss eligibility for claiming the credit, including IRS Notice 2010-54.

We conducted this performance audit from November 2020 to December 2021 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.

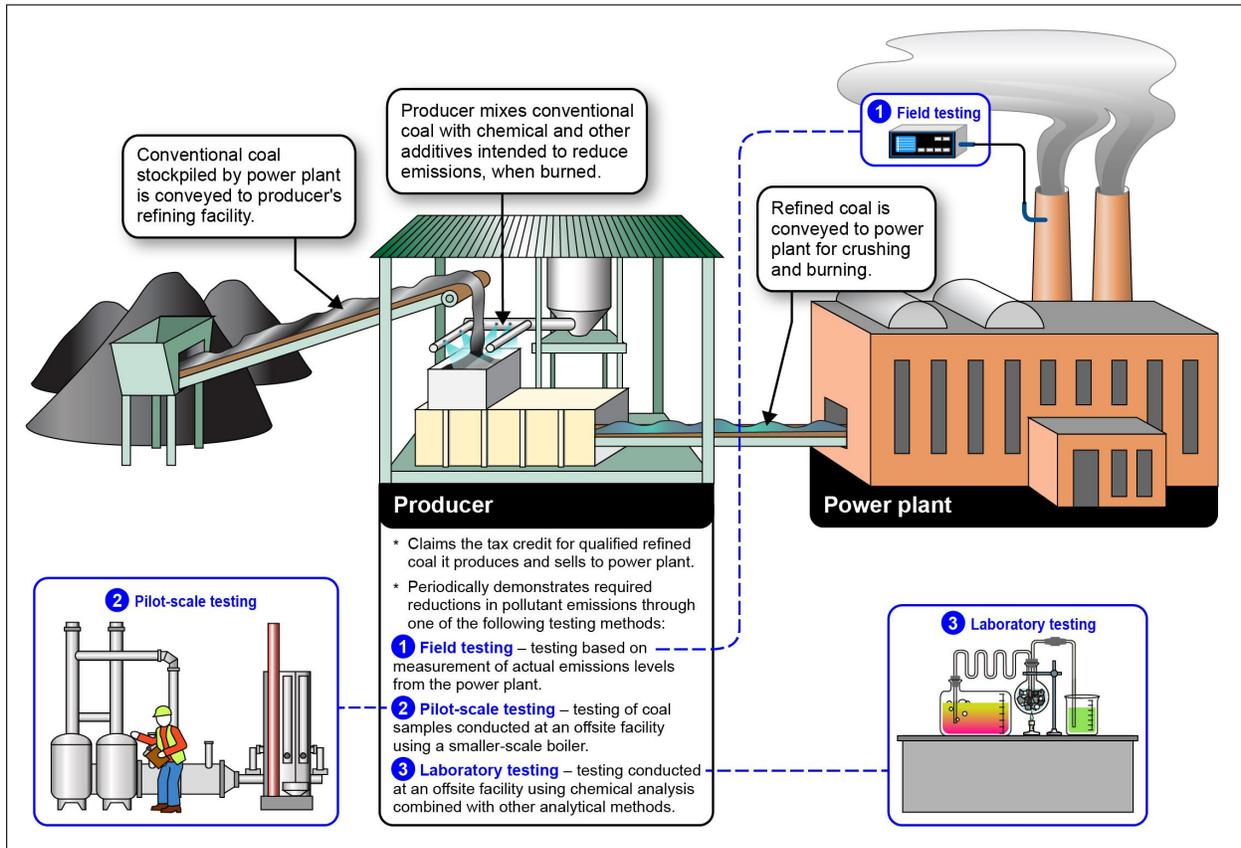
Background

Producers typically make refined coal by mixing chemical and other additives with conventional coal (see fig. 1).

⁶When asked, representatives from the testing facility we interviewed told us they were not aware of other facilities that conducted pilot-scale tests for the credit.

⁷See GAO, *Tax Expenditures: Background and Evaluation Criteria and Questions*, [GAO-13-167SP](#) (Washington, D.C.: Nov. 29, 2012). This guide presents criteria for evaluating tax expenditures, such as the refined coal production tax credit. To develop the guide, we reviewed our prior work on tax expenditures, tax reform, results-oriented government, collaboration practices, and program evaluation. We also interviewed experts in tax policy and program evaluation.

Figure 1: Typical Refined Coal Production Process and Testing Methods



Source: GAO. | GAO-22-104637

For example, additives may increase the production of mercury oxides that pollution control technologies can capture, if such technologies are installed at the power plant.⁸ The credit is allowed for refined coal produced at a refined coal production facility during the 10-year period beginning on the date the facility was originally placed in service, and sold during the same 10-year period. Congress has extended the credit several times, but unless it is extended again, the 10-year credit period for facilities placed in service before January 1, 2012, expires on December 31, 2021.⁹ Per IRS guidance, producers are also to periodically demonstrate that

⁸These technologies include: (1) fabric filters or electrostatic precipitators to control particulate matter; (2) flue gas desulfurization units—also known as scrubbers—or dry sorbent injection units to control SO₂ and acid gas emissions; (3) selective catalytic reduction or selective noncatalytic reduction units in addition to low-NO_x burners with overfire air and computer control systems to control NO_x; and (4) activated carbon injection units to reduce mercury emissions. For additional information, see GAO, *EPA Regulations and Electricity: Update on Agencies' Monitoring Efforts and Coal-Fueled Generating Unit Retirements*, GAO-14-672 (Washington, D.C.: Aug. 15, 2014).

⁹IRS is required to adjust the credit annually for inflation, and the credit has increased from \$6.27 per ton of refined coal produced in 2010 to \$7.38 per ton in 2021. According to EIA quarterly reports, refined coal represents a growing percentage of total coal production in the United States (see enclosure I).

burning refined coal reduced NO_x emissions at least 20 percent and either SO₂ or mercury emissions generally at least 40 percent through field, pilot-scale, or laboratory testing.¹⁰

According to an IRS memorandum that established general guidelines for analyzing refined coal credit business transactions, the refined coal industry commonly involves investors purchasing an interest in a partnership that claims eligibility for the credit at a single facility.¹¹ The partnership lasts for the duration of the facility's 10-year credit period, with producers typically claiming the credit on IRS Form 8835. The memorandum notes that power plants may have little incentive to pay a premium for refined coal, since they can generally meet current federal and state pollution standards with current technology. As a result, according to the memorandum, producers may sell the refined coal to the power plant at a reduced price or by paying the plant some sort of fee to induce the plant to use refined coal in its operations.

IRS is the federal agency responsible for administering tax credits, but it is not responsible for the program areas targeted by many of them. For example, EPA promulgates standards for field testing equipment and has expertise in controlling air pollution from coal-fired power plants. Similarly, DOE's EIA collects data on refined coal production, and the department's National Energy Technology Laboratory (NETL) is available to provide energy-related technological and engineering expertise.

Our previous work found that the federal government reviews tax expenditures—including tax credits—less systematically than other federal programs, and in 2012, we issued a guide that includes criteria to assess tax expenditure performance.¹² We found that periodic review could help determine the extent to which tax credits are achieving their intended purpose and how their benefits and costs relate to similar activities. In addition, the GPRA Modernization Act of 2010 (GPRAMA), which amended the Government Performance and Results Act of 1993, and the Office of Management and Budget's (OMB) related implementation guidance set the expectation that agencies should consider tax expenditures in measuring and communicating progress in achieving their missions and goals.¹³

¹⁰In 2010, IRS last updated its guidance for the refined coal production tax credit. See IRS Notice 2010-54, available at https://www.irs.gov/irb/2010-40_IRB. For all testing methods, the producer must attach a certification to their tax return that includes certain items, such as a statement that the emissions reduction was determined or redetermined within the 6 months preceding the production of the fuel. When producers use field testing, the guidance also requires an unrelated (i.e., would not be treated as a single employer under IRS regulations) and licensed engineer to verify that the testing satisfied the credit's emissions reduction requirements. For pilot-scale or laboratory testing, the guidance states that IRS may require the producer to provide additional proof that the emission reduction has been achieved.

¹¹See Internal Revenue Service, Office of Chief Counsel, *Memorandum Number: AM2018-002* (Mar. 9, 2018).

¹²[GAO-13-167SP](#). See also, GAO, *Government Performance and Accountability: Tax Expenditures Represent a Substantial Federal Commitment and Need to Be Examined*, [GAO-05-690](#) (Washington, D.C.: Sept. 23, 2005) and *Tax Policy: Tax Expenditures Deserve More Scrutiny*, [GAO/GGD/AIMD-94-122](#) (Washington, D.C.: June 3, 1994).

¹³See Pub. L. No. 111-352, 124 Stat. 3866 (2011); see also Office of Management and Budget, *Preparation, Submission, and Execution of the Budget*, Circular No. A-11, pt. 6 (Aug. 6, 2021). OMB assists the President in, among other things, developing the budget and overseeing agency performance.

Producers Have Claimed Approximately \$8.9 Billion in Refined Coal Production Tax Credits Since Tax Year 2010

According to IRS’s analysis of electronically filed tax returns, producers have claimed approximately \$8.9 billion in refined coal production tax credits since tax year 2010, ranging from \$9 million in 2010 to \$1.6 billion in 2019 (see table 1).¹⁴

Table 1: Amount Claimed on Electronically Filed Tax Returns for the Refined Coal Production Tax Credit, Tax Years 2010-2020

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020 ^a
Number of tax returns (Forms 8835)	15	23	20	24	28	28	31	30	35	40	15
Amount claimed (in millions of dollars)	9	123	470	582	1,017	1,175	1,185	1,203	1,405	1,553	224

Source: Internal Revenue Service. | GAO-22-104637

^aAccording to IRS officials, the number of Forms 8835 and amount claimed summary data for tax year 2020 are likely incomplete because some corporations may have filed for an extension to their 2020 tax filings and therefore would not be reflected in the data for that year.

Notes: The number of Forms 8835 and amount claimed summary data reflect a snapshot in July 2021 from Forms 8835 with electronically filed Forms 1120, 1120F, 1120S, and 1065. When more than one return was filed for the same employer identification number and tax period, only data from the most recent filing is included. Summary data do not include all taxpayers who may ultimately benefit from the credit, such as those that use paper filings, non-business filers that use Form 4200, or shareholders in an S corporation or partners in a partnership that report their share of the credit directly on Form 3800 (general business credit). For credits claimed as part of a general business credit, the total credit can reduce current-year tax liability but is not refundable and, therefore, requires sufficient taxable income to be used in the current year; however, unused general business credits may be carried back 1 year and forward 20 years.

Producers Typically Used Pilot-Scale Testing, but This Method Limits Understanding of Actual Emissions Reductions

Producers typically used pilot-scale testing—one of the three methods allowed by IRS guidance—to demonstrate their required emissions reductions for the refined coal production tax credit. According to IRS officials, the agency could not readily quantify how frequently producers used pilot-scale testing because any information included in tax return attachments—typically image files of unstructured text—is not captured in a searchable format. However, they stated that the private letter rulings (PLR) some producers requested offer insights into their methods. Specifically, producers requested 82 PLRs related to the credit. We analyzed these PLRs and found that the producer in 65 of the PLRs asked IRS to rule that the producer’s pilot-scale testing would satisfy IRS’s guidance for claiming the credit.¹⁵ In addition, representatives

¹⁴IRS officials told us their analysis included data from electronically filed Forms 8835 but not data from forms filed on paper because IRS did not transcribe the forms for electronic computation.

¹⁵Officials from IRS’s Office of Chief Counsel—the office responsible for issuing PLRs—told us that PLR requests related to the credit typically included documents with technical information on the pilot-scale testing performed. However, according to these officials, the office did not consistently have engineers available that could help PLR reviewers understand and verify the information. As a result, a senior official told us that reviewers largely had to accept representations included in the PLR without additional corroboration or analysis. The official noted, however, that the party that requests the PLR must, under penalties of perjury, declare that, to the best of their knowledge and belief, all the relevant facts contained in the request and any accompanying documents are true, correct, and complete.

from nearly all of the producers and power plants we interviewed told us pilot-scale testing was used.

Producers described several reasons they used pilot-scale testing to demonstrate emissions reductions. Representatives from three of the producers we interviewed told us they used pilot-scale testing to control variables that can affect emissions levels, thereby helping them to attribute any observed emissions reductions directly to burning refined coal. For example, representatives from one producer stated that power plant systems are complex, with numerous variables that are hard to hold constant, and that using pilot-scale testing allowed the producer to determine emissions reductions in a more controlled environment. They noted that field testing was not a viable option because they could not ensure power plants were capable of holding operating conditions constant during the test—a step they believed was critical to ensure accurate test results. Representatives from another producer told us that some power plants would not allow field tests because the plant operators believed they could not “turn off” their mercury controls to conduct the test because of EPA requirements for continuous mercury emissions monitoring.¹⁶

Representatives from the pilot-test facility told us they measured emissions reductions that could be achieved in the field by following testing protocols established under contract by the producer. According to the representatives, for each test, the producer specified, for example, how to refine the coal (e.g., additive application rates) and how to burn it. The representatives stated that although the facility’s testing equipment is less complex than full-scale boilers, the protocols could attempt to replicate field conditions by modifying burning conditions during tests. For example, the facility could modify the test boiler’s operating conditions to match the conditions at individual power plants. Similarly, the facility could use the same pollution control devices used in the field, when available.¹⁷ Representatives noted, however, that they did not independently verify that producer-specified testing conditions matched actual field conditions.

Based on our interviews with federal officials and industry representatives, producers’ use of pilot-scale testing limits the federal government’s understanding of actual emissions reductions achieved at full scale in the field. IRS guidance states that pilot-scale testing should accurately measure the emissions reduction that would be achieved in a boiler meeting certain specifications, including being of a size and type commonly used in commercial operations.¹⁸ Nonetheless, according to officials from NETL and representatives from a pollution control industry organization, it is difficult to conduct pilot-scale tests that accurately reflect emissions that would result from burning refined coal at full scale. This is because coal properties, treatment processes, and boiler conditions all can affect actual emissions. For example:

- NETL officials stated that coal properties—such as moisture content and other coal constituents—could affect power plants’ ability to capture mercury emissions after refined

¹⁶EPA officials noted that the Mercury and Air Toxics Standards rule does not require power plants to keep mercury controls on continuously. Rather, the rule requires plants subject to it to meet a mercury emission standard and to demonstrate continuous compliance with that standard, generally by reporting a 30-day rolling average emissions rate. See 40 C.F.R. pt. 63, subpt. UUUUU.

¹⁷Representatives told us the facility had an electrostatic precipitator, baghouse, and wet flue gas desulfurization unit available. The precipitator removes particles from flue gas by inducing an electrical charge. The baghouse filters out pollutants using tightly woven fabric filter “bags.” The desulfurization unit injects a liquid sorbent slurry, such as a limestone slurry, into the flue gas to form a wet solid that can be disposed of or sold.

¹⁸IRS Notice 2010-54.

coal is burned. They said that NETL had not conducted any research on mercury emissions reductions that result from burning refined coal specifically as part of their mercury control research and development program. They also said that the full effect of refined coal on mercury emissions capture is not well understood, particularly for tests with a pilot-to-field scale that exceeds 1:10. According to the testing facility representatives we interviewed, pilot-scale tests they conducted for the credit typically ranged from 1:10,000 to greater than 1:100,000.¹⁹

- Representatives from the industry organization stated that differences in boiler conditions—such as the lack of the rapid cooling of the post-combustion flue gas through a full-scale power generator air preheater and the configuration of pollution control systems—can make it very difficult to accurately reproduce the conditions of a full-scale boiler using a pilot-scale test.

IRS officials have also taken steps to examine issues related to the accuracy of pilot-scale testing results through ongoing audit activities. Specifically, since 2010, IRS has selected 26 returns that claimed the refined coal production tax credit for audit consideration. According to IRS officials, some of these audits examine, in part, whether the results of producers' pilot-scale tests accurately reflect emissions reductions achieved at full scale in power plants. To inform these audits, examiners collected documents from third parties, such as reports from the pilot-scale testing facility and emissions data from power plants that burned the refined coal in the field.²⁰ According to IRS officials, for some audits, examiners work with an engineer in IRS's Energy and Investment Tax Credit Practice Network and other IRS engineer specialists to analyze the documents and assess risks.²¹

Agencies Coordinated on Developing the Credit's Guidance but Have Not Coordinated to Review the Credit's Effectiveness

Based on our analysis of our tax expenditure guide, we selected three criteria for assessing tax expenditure performance that were most relevant to the federal government's implementation of the refined coal production tax credit:²²

1. **Coordinating across federal agencies.** Is the credit being coordinated with other federal activities?
2. **Identifying and addressing potential duplication or overlap.** Does the credit duplicate or overlap with other federal activities?

¹⁹There are several variables to consider when scaling up from a pilot test to full scale, since many variables react differently at different scales. To characterize the relationships between different variables (such as moisture content in the coal or boiler temperature), sophisticated computer models can be used to draw conclusions on whether the test results on the pilot scale could be applied to a full-scale boiler.

²⁰IRS officials noted that it can be challenging to validate pilot-scale testing reports through field data due, in part, to the limited availability of emissions data upstream of pollution control devices. IRS guidance generally requires producers that demonstrate emissions reductions using field testing to determine the reductions by measuring SO₂, NO_x, and mercury emissions upstream of any scrubber or control device.

²¹We are not reporting some information related to IRS's audit activities, such as associated audit findings, due to restrictions on reporting federal tax information. Specifically, the disclosure of federal tax information is generally prohibited by law. 26 U.S.C. § 6103. In some circumstances, statistical information can be disclosed as long as it is not associated with or otherwise identify, directly or indirectly, a particular taxpayer. See, e.g., 26 U.S.C. § 6108.

²²[GAO-13-167SP](#).

3. **Achieving intended purpose.** What is the credit's intended purpose and is it being achieved?

IRS, Treasury, DOE, and EPA coordinated on some implementation steps, such as sharing expertise for developing the credit's guidance. However, these agencies have not taken steps to identify or address potential overlap with some other federal programs related to emissions reduction. Moreover, the agencies have not coordinated to review the extent to which the credit has achieved its intended purpose.

Coordinating across Federal Agencies

IRS officials said they coordinated with Treasury, DOE, and EPA to leverage technical expertise for developing the refined coal production tax credit's guidance and to conduct some audit examination activities, which is consistent with our tax expenditure guide. Specifically, IRS officials told us they worked with Treasury to update the guidance in 2010. IRS officials told us the agency also had informal discussions with EPA and DOE to inform sections of the guidance related to emissions reduction data and testing methods. In addition, IRS officials stated they sought technical assistance (e.g., engineering expertise) from DOE and EPA to help examine producers' emissions reductions.

IRS officials stated that Congress has directed the agency to consult with other federal agencies in the implementation of some other tax credits. For example, by law IRS is to consult with other agencies on several aspects of implementation of the Tax Credit for Carbon Oxide Sequestration. Specifically, IRS was required to, in consultation with DOE, EPA, and the Department of the Interior, establish regulations for determining adequate security measures for geological storage of qualified carbon oxide.²³

Similarly, IRS was required by law to, in consultation with DOE, establish a Qualifying Advanced Coal Project Credit program for the deployment of advanced coal-based generation technologies.²⁴ Officials from DOE's NETL told us they also helped IRS administer this credit by certifying whether taxpayer applications met IRS eligibility criteria. IRS officials told us that such consultation can be particularly useful for credits that involve complex technical and scientific concepts, but they noted that Congress did not require such consultation for the refined coal production tax credit.

Our tax expenditure guide states that interagency coordination can help maximize the performance and results of federal programs.²⁵ Additionally, in 2012, we reported on

²³Emergency Economic Stabilization Act of 2008, Pub. L. No. 110-343, div. B, tit. I, § 115, 122 Stat. 3765, 3829 (codified as amended at 26 U.S.C. § 45Q). IRS issued final regulations implementing the provision in January 2021. 86 Fed. Reg. 4728 (Jan. 15, 2021).

²⁴Energy Policy Act of 2005, Pub. L. No. 109-58, tit. XIII, § 1307, 119 Stat. 594, 999 (codified as amended at 26 U.S.C. § 48A).

²⁵[GAO-13-167SP](#). Our tax expenditure guide builds on other reports that discuss the importance of interagency coordination. See GAO, *Managing for Results: Key Considerations for Implementing Interagency Collaborative Mechanisms*, [GAO-12-1022](#) (Washington, D.C.: Sept. 27, 2012), and *Results-Oriented Government: Practices That Can Help Enhance and Sustain Collaboration among Federal Agencies*, [GAO-06-15](#) (Washington, D.C.: Oct. 21, 2005).

mechanisms and leading collaboration practices that can help federal agencies address complex implementation issues by sharing appropriate knowledge and skills.²⁶

Identifying and Addressing Potential Duplication or Overlap

IRS and Treasury officials told us that they take steps to identify and address potential duplication or overlap among federal tax provisions.²⁷ For example, IRS officials told us they assessed whether a taxpayer could “double benefit” by claiming the refined coal production tax credit and other energy-related credits for similar activities. By statute, and per IRS’s guidance for the credit, the credit amount is to be reduced if the refined coal production project also received grants, tax-exempt bonds, subsidized energy financing, and other credits.²⁸

However, based on our review of some EPA emissions reduction programs and interviews with power plant representatives, we determined that the refined coal production tax credit potentially overlaps with other federal programs that share similar goals. Specifically, representatives from all of the power plants we interviewed told us that burning refined coal was one tool among other available technologies they used to comply with EPA emissions reduction requirements, including the Mercury and Air Toxics Standards, Acid Rain Program, and Cross-State Air Pollution Rule, as applicable.²⁹ For example, representatives from a power plant told us they consider the overall economics and effectiveness of regulatory compliance to determine the most appropriate mix of emission-reduction tools, including refined coal, to use in such a way that maximizes effectiveness and minimizes power plant cost. However, IRS, Treasury, EPA, and DOE officials told us they did not work together to identify or address potential overlap or duplication between the refined coal production tax credit and other federal programs.

Our prior work states that the federal government can reduce overlap and direct scarce resources to the most effective or least costly methods to deliver federal support through coordinated reviews of programs, such as the refined coal production tax credit, with related federal activities.³⁰ Further, since July 2016, we have designated as a priority recommendation to OMB that it, in collaboration with Treasury, work with agencies to determine which tax expenditures contribute to their agency goals and to develop guidance for agencies on contributions made by tax expenditures toward the achievement of agency priority goals.³¹

Achieving Intended Purpose

Treasury, IRS, DOE, and EPA have not coordinated to review the extent to which the credit has achieved its intended purpose, according to agency officials. According to Treasury’s Office of

²⁶[GAO-12-1022](#).

²⁷Overlap occurs when multiple agencies or programs have similar goals, engage in similar activities or strategies to achieve them, or target similar beneficiaries. Duplication occurs when two or more agencies or programs are engaged in the same activities or provide the same services to the same beneficiaries. See GAO, *Fragmentation, Overlap, and Duplication: An Evaluation and Management Guide*, [GAO-15-49SP](#) (Washington, D.C.: Apr. 14, 2015).

²⁸26 U.S.C. § 45(b)(3); IRS Notice 2010-54.

²⁹For example, the Mercury and Air Toxics Standards rule established emission limits for mercury and other air pollutants for certain coal-fired power plants.

³⁰[GAO-13-167SP](#).

³¹GAO, *Priority Open Recommendations: Office of Management and Budget*, [GAO-21-567PR](#) (Washington, D.C.: June 24, 2021).

Tax Analysis website, that office assesses major congressional tax proposals and analyzes the effects of existing laws to inform tax policy decisions. Treasury officials told us they had not reviewed the credit's performance and had no plans to do so. They said that Treasury made this decision in part because the department does not typically focus its resources on credits that Congress may not extend. Moreover, according to Treasury officials, the department does not propose extending the credit and the administration is seeking to eliminate fossil fuel tax preferences, such as the refined coal production tax credit.

Additionally IRS, DOE, and EPA officials told us their agencies had not initiated their own review activities or coordinated with Treasury to assess the extent to which the credit achieved its intended purpose. However, our tax expenditure guide states that greater scrutiny of tax expenditures, such as periodic coordinated reviews, could help Congress and federal agencies determine how well specific tax expenditures work to achieve their intended purpose.³² Also, consistent with GPRAMA requirements, coordinated reviews of tax credits with related federal spending programs could help policymakers reduce overlap and direct scarce resources to the most effective or least costly methods to deliver federal support.

Conclusions

Congress is considering whether to extend the tax credit period, which expires on December 31, 2021, for refined coal production facilities. However, federal agencies do not have a good understanding of the credit's effectiveness in reducing emissions of certain harmful pollutants. This limited understanding stems in part from producers' use of pilot-scale testing—one of the three methods allowed by IRS guidance—to demonstrate emissions reductions. If Congress extends the credit period, a coordinated review by Treasury, IRS, EPA, and DOE could help determine whether changes are warranted to improve the credit's performance.

Recommendations for Executive Action

We are making a total of four recommendations, one each to Treasury, IRS, EPA, and DOE.

If Congress extends the refined coal production tax credit, the Secretary of the Treasury should coordinate with IRS, EPA, and DOE to review the performance of the credit in achieving its intended purpose and identify and implement, as appropriate, any improvements towards achieving that intended purpose, such as adjustments to allowable emissions testing methods. (Recommendation 1)

If Congress extends the refined coal production tax credit, the Commissioner of the IRS should coordinate with Treasury, EPA, and DOE to review the performance of the credit in achieving its intended purpose and identify and implement, as appropriate, any improvements towards achieving that intended purpose, such as adjustments to allowable emissions testing methods. (Recommendation 2)

If Congress extends the refined coal production tax credit, the Administrator of the EPA should coordinate with Treasury, IRS, and DOE to review the performance of the credit in achieving its

³²[GAO-13-167SP](#). In September 2005, we recommended that OMB, in consultation with Treasury, develop and implement a framework for conducting performance reviews of tax expenditures, including tax credits. We have designated this recommendation as a priority recommendation to OMB and Treasury since 2015. Priority recommendations are those that we believe warrant priority attention from heads of key departments or agencies. See [GAO-05-690](#); [GAO-21-567PR](#); and GAO, *Priority Open Recommendations: Department of the Treasury*, [GAO-21-549PR](#) (Washington, D.C.: June 16, 2021).

intended purpose and identify and implement, as appropriate, any improvements towards achieving that intended purpose, such as adjustments to allowable emissions testing methods. (Recommendation 3)

If Congress extends the refined coal production tax credit, the Secretary of Energy should coordinate with Treasury, IRS, and EPA to review the performance of the credit in achieving its intended purpose and identify and implement, as appropriate, any improvements towards achieving that intended purpose, such as adjustments to allowable emissions testing methods. (Recommendation 4)

Agency Comments

We provided a draft of this report to EPA, IRS, DOE, and Treasury for review and comment. In its written comments, reproduced in enclosure II, EPA generally agreed with the report's findings and conclusions and agreed with our recommendation. In their written comments, reproduced in enclosures III and IV, respectively, IRS and DOE neither agreed nor disagreed with our recommendations to them. IRS stated that because our recommendation is conditional and predicated on the credit being extended, the agency will take our recommendation under advisement. DOE stated that the department will respond to our recommendation if the credit is extended. Treasury informed us that the department had no comments on the draft report. IRS, DOE, and EPA also provided technical comments, which we incorporated as appropriate.

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We are sending copies of this report to the appropriate congressional committees, the Commissioner of the IRS, the Secretary of the Treasury, the Administrator of the EPA, the Secretary of Energy, and other interested parties. In addition, the report is available at no charge on the GAO website at <https://www.gao.gov>.

If you or your staff have any questions about this report, please contact me at (202) 512-3841 or gomezj@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 were Chad M. Gorman (Assistant Director), William Colwell (Analyst in Charge), Jennifer Beddor, Chad Clady, Gina Hoover, Donna Morgan, Patricia Moye, Dan Royer, MaryLynn Sergent, and Jack Wang.

A handwritten signature in black ink that reads "Alfredo Gómez". The signature is written in a cursive style with a large, stylized "G" in the last name.

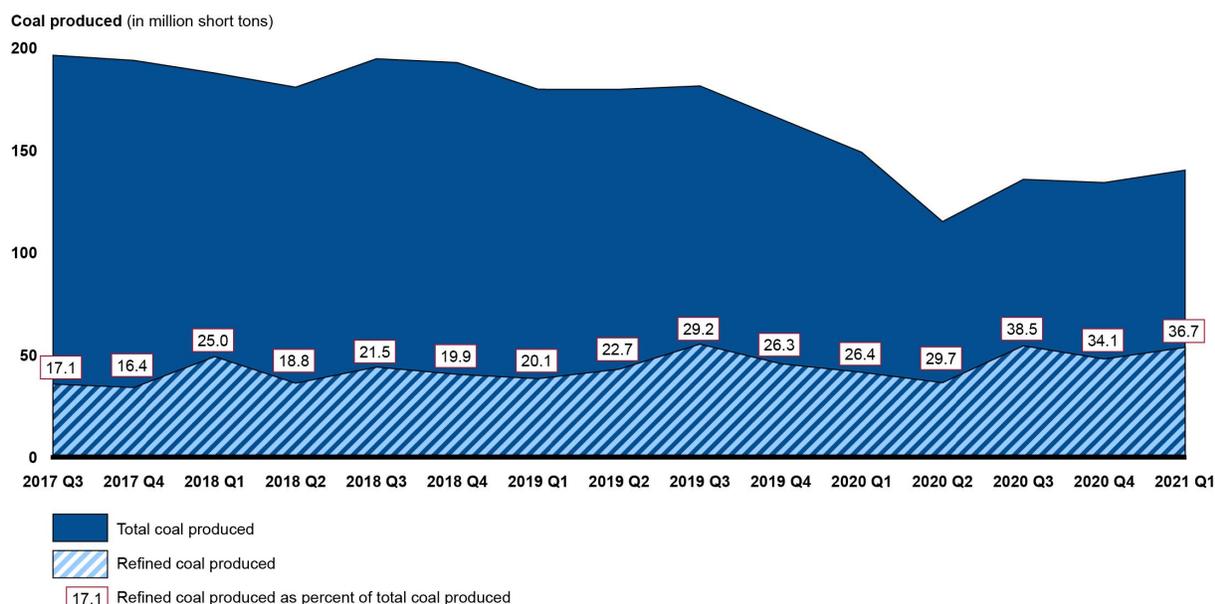
J. Alfredo Gómez
Director, Natural Resources and Environment

Enclosure(s) – 4

Enclosure I: Refined Coal Production in the United States

According to quarterly coal reports by the Department of Energy’s Energy Information Administration (EIA), refined coal has generally represented a growing percentage of total coal production in the United States since the third quarter of calendar year 2017 (see fig. 2). According to EIA officials, the quarterly coal reports from before this period did not include refined coal production data for all producers. These officials stated that EIA updated its relevant data collection surveys in September 2017 to better reflect refined coal production and ensure data consistency.

Figure 2: Refined Coal Production as Percent of Total Coal Production in the United States, Calendar Year 2017 Quarter 3 through Calendar Year 2021 Quarter 1



Source: GAO analysis of Energy Information Administration Quarterly Coal Reports. | GAO-22-104637

Data table for Figure 2: Refined Coal Production as Percent of Total Coal Production in the United States, Calendar Year 2017 Quarter 3 through Calendar Year 2021 Quarter 1

	Refined Coal Produced, in Million Short Tons	Difference between Refined Coal Produced and Total Coal Produced, in Million Short Tons	Refined Coal Production as Percent of Total Coal Production	Total Coal Produced, in Million Short Tons
2017 Q3	33.556	162.884	17.1	196.440
2017 Q4	31.894	162.039	16.4	193.933
2018 Q1	46.972	140.771	25.0	187.743
2018 Q2	33.989	146.840	18.8	180.829
2018 Q3	41.867	152.864	21.5	194.731
2018 Q4	38.320	154.543	19.9	192.863
2019 Q1	36.210	143.607	20.1	179.817
2019 Q2	40.809	138.972	22.7	179.781
2019 Q3	53.059	128.402	29.2	181.461

	Refined Coal Produced, in Million Short Tons	Difference between Refined Coal Produced and Total Coal Produced, in Million Short Tons	Refined Coal Production as Percent of Total Coal Production	Total Coal Produced, in Million Short Tons
2019 Q4	43.499	121.751	26.3	165.250
2020 Q1	39.303	109.749	26.4	149.052
2020 Q2	34.260	80.932	29.7	115.192
2020 Q3	52.264	83.550	38.5	135.814
2020 Q4	45.812	88.432	34.1	134.244
2021 Q1	51.466	88.840	36.7	140.306

Note: According to officials from the Department of Energy's Energy Information Administration, refined coal production data before calendar year 2017 quarter 3 did not include all refined coal producers, so we did not include earlier data.

Enclosure II: Comments from the Environmental Protection Agency



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

November 23, 2021

OFFICE OF
AIR AND RADIATION

Mr. Alfredo Gomez
Director
Natural Resources and Environment
U.S. Government Accountability Office
Washington, D.C. 20548

Dear Mr. Gomez:

Thank you for the opportunity to review and comment on the Government Accountability Office's (GAO's) draft report, "Refined Coal Production Tax Credit: Coordinated Agency Review Could Help Ensure the Credit Achieves Its Intended Purpose"—GAO-22-104637. The purpose of this letter is to provide the U.S. Environmental Protection Agency's (EPA's) response to the draft reports findings, conclusions, and recommendation(s). The EPA generally agrees with the GAO's findings, conclusions, and recommendations.

The GAO draft report concludes that federal agencies do not have a good understanding of the tax credit's effectiveness in reducing certain harmful pollutant emissions. The report recommends that the Secretary of the Treasury, Commissioner of the Internal Revenue Service (IRS), Administrator of the EPA, and Secretary of the U.S. Department of Energy (DOE) should coordinate to review the performance of the tax credit in achieving its intended purpose and identify and implement, as appropriate, any improvements toward achieving the purpose.

EPA appreciates GAO work on this subject and does not have any significant comments and/or position on the findings or conclusion. EPA does have a technical comment and is providing it in the attached technical comments template.

The GAO report makes a total of four recommendations, including one each to the U.S. Department of Treasury, IRS, EPA, and DOE. Below is the recommendation for EPA, which mirrors the other three recommendations.

TGAO Recommendation:

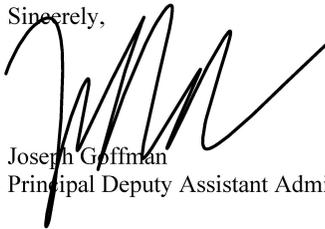
If Congress extends the refined coal production tax credit, the Administrator of the EPA should coordinate with Treasury, IRS, and DOE to review the performance of the credit in achieving its intended purpose and identify and implement, as appropriate, any improvements towards achieving that intended purpose, such as adjustments to allowable missions testing methods (Recommendation 3).

EPA Response:

EPA agrees with the recommendation. The agency will coordinate with other relevant federal agencies to evaluate the performance of the tax credit in achieving its intended purpose and identify and implement improvements towards achieving that purpose if Congress extends the refined coal production tax credit.

Thank you again for the opportunity to review the draft report. I appreciate the opportunity to be of service and trust the information provided is useful.

Sincerely,



Joseph Goffman
Principal Deputy Assistant Administrator

cc: EPA GAO Liaison Team
Christopher Grundler
Peter Tsirigotis
Betsy Shaw
Eunjee Koh
Marc Vincent
Daniel Hopkins
Sue Perkins
Kristien Knapp
JoLynn Collins
Tiffany Purifoy

Enclosure III: Comments from the Internal Revenue Service



OFFICE OF THE
CHIEF RISK OFFICER

DEPARTMENT OF THE TREASURY
INTERNAL REVENUE SERVICE
WASHINGTON, DC 20224

November 16, 2021

Mr. J. Alfredo Gómez
Director, Natural Resources and Environment
U.S. Government Accountability Office
441 G Street, N.W.
Washington, D.C. 20548

Dear Mr. Gómez:

On behalf of the Commissioner and Senior Leadership team at the Internal Revenue Service, thank you for the opportunity to review your draft report titled: **Refined Coal Production Tax Credit: Coordinated Agency Review Could Help Ensure the Credit Achieves Its Intended Purpose (GAO-22-104637)**.

As noted in your draft report, while the IRS is the federal agency responsible for administering tax credits, such as the one covered in your report, it is not responsible for the program areas targeted by many of the credits. The refined coal production tax credit applies to refined coal produced at a refined coal production facility. Unless extended again by Congress, the 10-year credit period for facilities placed in service before January 1, 2012, expires on December 31, 2021.

Because the recommendation is conditional and predicated on the credit being extended beyond this calendar year, we will take your recommendation under advisement.

If you have any questions, please contact me at Thomas.A.Brandt@irs.gov. Thank you.

Sincerely,

A handwritten signature in cursive script that reads "Thomas A. Brandt".

Thomas A. Brandt
IRS Chief Risk Officer

Enclosure

Enclosure

GAO Recommendations and IRS Responses to GAO Draft Report: Refined Coal Production Tax Credit: Coordinated Agency Review Could Help Ensure the Credit Achieves Its Intended Purpose (GAO-22-104637)

Recommendation 2:

If Congress extends the refined coal production tax credit, the Commissioner of the IRS should coordinate with Treasury, EPA, and DOE to review the performance of the credit in achieving its intended purpose and identify and implement, as appropriate, any improvement towards achieving that intended purpose, such as adjustments to allowable emissions testing methods.

Comments:

IRS will take this recommendation under advisement if the credit is extended.

Enclosure IV: Comments from the Department of Energy



Department of Energy

Washington, DC 20585

November 30, 2021

Mr. J. Alfredo Gomez
Director
Natural Resources and Environment
U.S. Government Accountability Office
441 G Street N.W.
Washington, DC 20548

Dear Mr. Gomez,

The U.S. Department of Energy (DOE) appreciates the efforts of the General Accountability Office (GAO) engagement team and the opportunity to provide comments on GAO Draft Report, entitled: *"Refined Coal Production Tax Credit: Coordinated Agency Review Could Help Ensure the Credit Achieves Its Intended Purpose (GAO-22-104637)"*.

GAO recommended that DOE, in coordination with the Treasury Department (including the Internal Revenue Service) and the Environmental Protection Agency, review the performance of the refined coal production tax credit, if the tax credit is extended by Congress. If the credit is extended, DOE will provide an appropriate response to the recommendation after receipt of GAO's final report, as required by 31 U.S.C. 720.

Sincerely,

A handwritten signature in blue ink that reads "Christopher S. Johns".

Christopher S. Johns
Deputy Chief Financial Officer

Enclosure