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POLICY BRIEF 2016-07

Federal Minerals Leasing Reform and Climate Policy

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Aligning Federal Minerals Leasing Policy and Climate Policy

Nearly half of U.S. coal is mined from U.S. federal government lands. As such, the federal government has an unusual degree of control over the domestic production and consumption of this fossil fuel. Given that the use of federal coal generates 13 percent of U.S. energy-related carbon dioxide (CO_2) emissions, federal coal policy has important climate change implications.

In a new Hamilton Project policy proposal, Kenneth T. Gillingham of Yale University and James H. Stock of Harvard University discuss reforms to the federal minerals leasing program that would substantially mitigate CO_2 emissions and reduce, but not eliminate, federal coal production. They propose that a royalty adder be placed on federal coal in an amount linked to the climate damages from its combustion. In addition to climate damages, the amount of the royalty adder should be set to take into account the substitution of nonfederal for federal coal and existing climate policies. Gillingham and Stock project that a royalty adder set to 20 percent of estimated climate damages would reduce carbon emissions, raise government revenues that could be used to assist coal-mining communities, and increase coal-mining employment on private lands. Their proposal strikes a middle ground between absolute prohibition of federal coal extraction and relying entirely on imperfect downstream regulation.

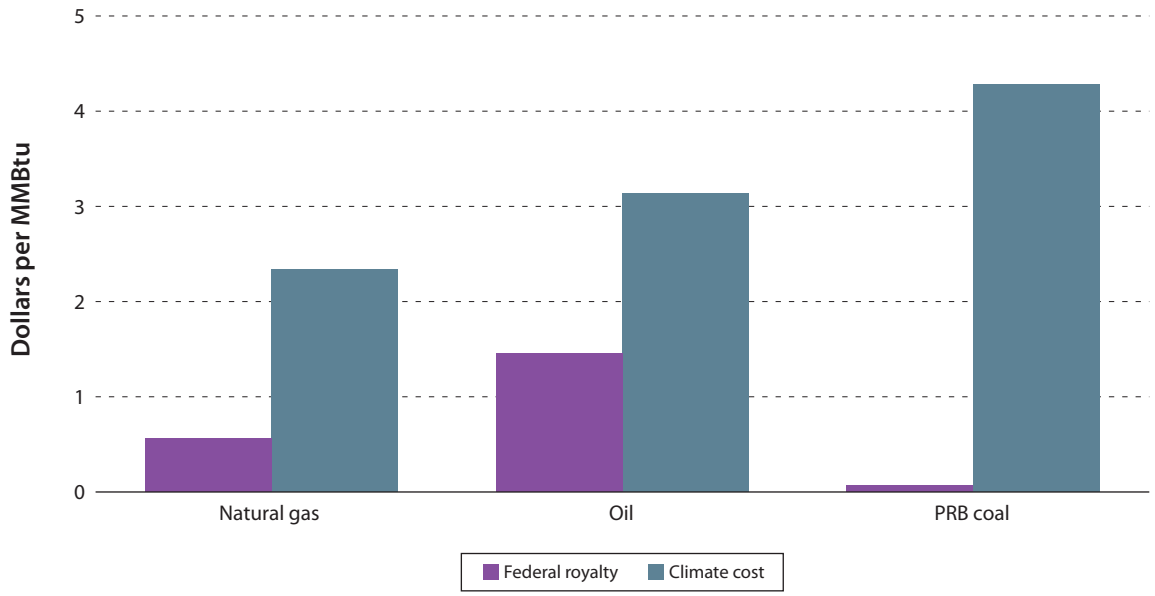
The Challenge

Over the past two decades, Democratic and Republican administrations have taken steps to reduce U.S. CO_2 emissions by reducing use of fossil fuels, through policies such as fuel efficiency standards, the Clean Power Plan (CPP) regulating CO_2 emissions by the power sector, federal and state financial incentives for investing in renewable power, and programs to promote low-GHG (greenhouse gas) biofuels.

Despite growing public attention to the climate consequences of fossil fuel extraction, U.S. climate policy so far has not extended to the government's role as a major source of fossil fuels. According to the authors, addressing this tension requires the development and implementation of upstream policies (e.g., federal minerals leasing policy) that work alongside downstream policies (e.g., the Clean Power Plan) to achieve broader climate policy goals.

FIGURE 1.

Federal Royalty Compared to Monetized Climate Cost



Source: Authors' calculations based on data from the Energy Information Administration (EIA).

Note: MMBtu = 1 million British thermal units. Assumed market prices: gas, $3/MMBtu; crude oil, $45/barrel; coal, $9/short ton. Oil and gas royalties are computed at the offshore rate of 18.75%, coal royalty is computed at the surface mining rate of 12.5%. Assumed value of the SCC is $44 per metric ton CO_2. Source for energy conversion factors and CO_2 emissions per MMBtu: EIA.

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Production of Fossil Fuels under Federal Leases

Federal coal now makes up about 40 percent of domestic production. The overwhelming majority of federal production is concentrated in just four states: Wyoming, Montana, Utah, and Colorado. Coal extracted from the Powder River Basin (PRB) in Montana and Wyoming constitutes the bulk of this federal production.

Under existing rules, federal royalties on fossil fuels are assessed as a percent of the selling price of the fuel. However, this fuel price does not reflect the climate damages from burning that fuel. In climate economics, these climate damages are called the social cost of carbon (SCC). Estimates of the SCC differ depending on the type of model and assumptions made, but the authors note that one commonly used estimate produced by the U.S. Government is $44 per metric ton of CO_2.

Figure 1 shows the current federal royalty and monetized climate cost of natural gas, oil, and PRB coal. For all three fuels, the federal royalty received is less than climate costs from use of the fuel. However, this disparity is most pronounced for coal: the federal royalty (approximately $0.06/MMBtu [1 million British thermal units] for PRB coal) is much smaller than the climate costs (approximately $4.30/MMBtu).

Declining Consumption and Employment in Coal Markets

In 2015 U.S. coal production was 897 million short tons, down from an average of between 1.0 billion and 1.2 billion tons over the past decade. Since the late 2000s, more-abundant natural gas (and declining natural gas prices) have led to lower coal demand through lower utilization of existing coal-fired power plants, retirements of aging coal plants, and very few replacement coal plants being built. Figure 2 shows coal consumption for electricity and heat generation and the ratio of the natural gas price to the coal price over the past 15 years.

Looking ahead, the U.S. Energy Information Administration (EIA) projects that coal consumption and production will continue to decline slightly over the next decade. In the EIA forecasts, the decline in coal is steeper if the Clean Power Plan is in place, but even with the Clean Power Plan, there would be substantial coal production and consumption over the next decade.

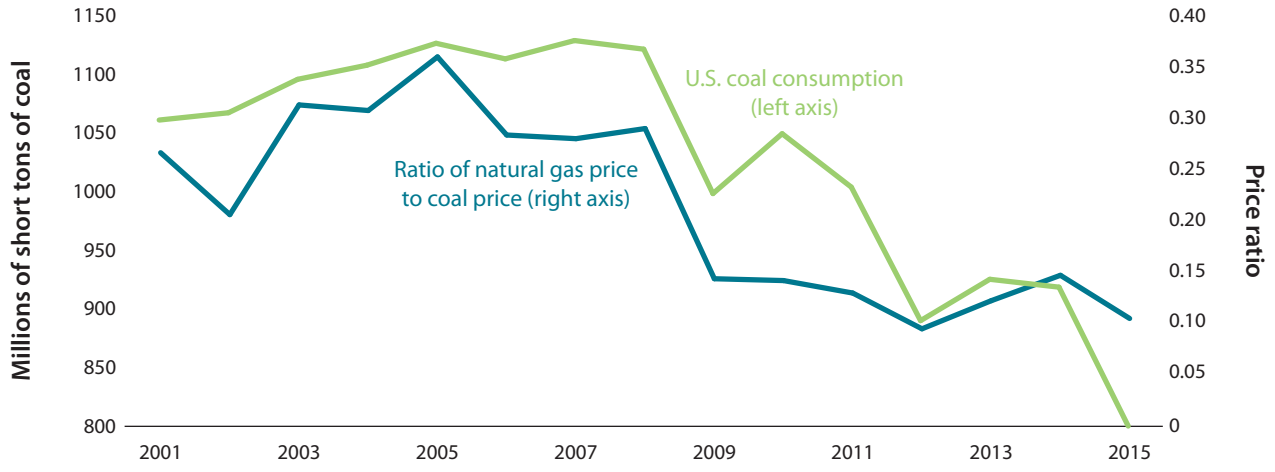
The authors note that with continuing low natural gas prices, coal employment is likely to continue falling even without the Clean Power Plan. This declining employment, along with reduced state revenues from coal production, presents challenges for states' budgets. Ongoing coal company bankruptcies suggest that states could also confront unfunded liabilities related to employee pensions. EIA projects that even without the Clean Power Plan, coal consumption would decline by 12 percent by 2025. With the Clean Power Plan, consumption would decline by twice that figure.

The Federal Coal Program and Calls for Reform

The large portion of U.S. coal production derived from federal lands is subject to three distinct types of fees: royalties assessed on production, so-called bonus bids paid to acquire the right

FIGURE 2.

Coal Consumption and Ratio of Gas to Coal Prices, 2001–15



Source: Authors' calculations based on data from the Energy Information Administration (EIA).

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to a given plot of land, and land rental fees. Royalties, as the authors discuss, are the largest among them: in fiscal year 2012, nearly $800 million was collected. By contrast, about $300 million was raised in bonus bid payments, and only $1 million was collected in rental fees. Currently, revenues from the federal leasing program are split evenly between the federal government and the state where the lease is located.

Leases are for an initial 20-year term, contingent on continued operations and production. Subsequently, leases can be renewed for additional 10-year terms, with the secretary of the interior authorized by law to change the terms of the leases at the time of lease renewal, or terminate the lease after 10 years if pre-specified conditions are not met.

The authors note serious concerns about whether the bonus bids and the production royalties set by the federal coal leasing program provide a fair return to the taxpayer. Bonus bids are determined by an auction in which the winning bidder pays the amount she bids, with a confidential minimum bid set by the Bureau of Land Management. According to the U.S. Government Accountability Office, 96 of the 107 coal tracts that the Department of the Interior leased between 1990 and 2013 had only a single bidder, and most of the remaining tracts had only two bidders. The vast majority of tracts put up for auction are adjacent to existing mines and are used either to extend the life of the mine or to expand an existing mine's production. This limits the usefulness of the tracts to all but the existing, adjacent producer. With very little competition, bidders typically bid as close as possible to the confidential minimum bid, which savvy bidders can learn through repeated interaction with the Department of the Interior. The authors believe that problems with bonus bids would be difficult to address under the current structure of the program.

Although the largest fraction of revenue from the federal coal leasing program comes from production royalties, the authors identify problems that limit their effectiveness. Currently, production royalties are paid as a percentage of the revenues at the first point of sale after the coal is extracted. However, if the first point of sale is after the coal has been processed and transported, firms are permitted to claim deductions that reduce the royalty payments; firms may also request royalty payment reductions when in financial distress. Moreover, firms can write contracts that structure their official sale price to minimize the royalty payment. The authors point out that firms have a strong incentive—and often the means—to lower the official price on which royalty percentages are assessed.

Reforms of federal coal leasing policy are therefore justified both by climate costs and by weaknesses in the current leasing system. After evaluating relevant climate policy—particularly the Clean Power Plan—and considerations like transportation costs and substitutability of nonfederal and federal coal, the authors propose reforms to the assessment of fees on federal coal that achieve both climate and economic goals.

Roadmap

- Using authority provided in the Mineral Leasing Act of 1920 (as amended), the Secretary of the Interior will place a royalty adder on federal coal equal to 20 percent of estimated climate damages. This royalty adder will apply to all new leases and lease renewals.
- Congress should enact legislation authorizing the use of the federal portion of additional revenues for transitional assistance to communities reliant on nonfederal coal mining.

A New Approach

Gillingham and Stock propose that a 20 percent royalty adder be placed on production of federal coal. Unlike current royalties, which are assessed as a percent of the sale price, this adder would be implemented as a percent of the climate damages from use of coal. As such, it would better align the private costs incurred by mining firms and consumers of coal with the social costs experienced by the broader community that faces climate risks. Importantly, this market-based solution would allow the most valuable federal mining activity to continue, while less-valuable (but still polluting) projects would not be pursued.The authors explain that the Department of the Interior possesses the authority to implement the royalty adder without additional legislation. Moreover, the department is already conducting a comprehensive review of the federal coal leasing program. As part of this review, it has indicated a desire to incorporate climate costs into its program, and specifically indicated that adjustments to royalties are one possible mechanism for doing so.

The authors discuss a number of economic considerations that play into the precise choice of royalty adder. First, the adder should be tied to a credible estimate of the climate damages associated with the use of coal: the social cost of carbon.

Second, it is necessary to model the interaction of the adder with other climate policies, particularly those so-called downstream regulations that affect carbon emissions closer to the point of emission. In particular, the authors evaluate their proposal in conjunction with electricity production regulations

Learn More about This Proposal

This policy brief is based on the Hamilton Project policy paper, "Aligning Federal Minerals Leasing Policy and Climate Policy," which was authored by

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resulting from the Clean Power Plan. The overall objective for policy is to better align the private and social costs of using coal. When multiple policies are in place to achieve CO_2 emissions reduction, it is important to ensure that their combined effect does not exceed what is warranted by the social cost of carbon.

Finally, the authors explain that it is important to consider the extent to which additional levies on federal coal production will cause substitution into nonfederal coal. In other markets, one might expect even a small increase in price to cause a high level of substitution, eroding any reductions in CO_2 emissions and increases in government revenue. However, because federal coal constitutes such a large fraction of total U.S. coal production and consumption, transportation costs for coal are quite large, and so much federal coal (particularly that in the PRB) would likely remain profitable to extract under the authors' proposal, the extent of substitution of nonfederal for federal coal is expected to be limited.

The royalty adder would generate new revenues, half of which would flow to the states and half to the federal government. Gillingham and Stock recommend that the federal half of revenues be allocated to the support of communities that have historically relied on the mining of nonfederal coal. As the U.S. energy sector gradually becomes less reliant on carbon-intensive fuels, this transition support will minimize the economic impact suffered by workers in affected communities.

The authors construct detailed projections of the economic impacts of their proposal. As expected, the royalty adder would substantially mitigate CO_2 emissions, reducing them by at least 28 million metric tons in 2025, and possibly considerably more, depending on details of CPP implementation. Substantial additional revenue would be generated, at $3 billion annually by the mid-2020s.

Benefits and Costs

Gillingham and Stock's proposed carbon adder would reduce, but not eliminate, federal coal production and total power sector CO_2 emissions as it brings the private and social costs of coal use into better alignment. This would mitigate climate change, benefiting current and future generations.

While reduction of federal coal production would reduce coal-related employment on federally leased land, Stock and Gillingham project that employment would rise on private lands as some substitution to nonfederal coal occurs. The authors' proposal would slightly increase demand for nonfederal coal, easing financial pressures on these firms. Coal companies producing on federal lands would see continuing but declining production, and the most-efficient PRB mines would remain productive assets.

Conclusion

The federal coal program is in clear need of reform. Gillingham and Stock argue that in addition to providing a fair return to taxpayers, coal program reform should also take into account the additional climate change costs generated by the burning of federal coal. Doing so efficiently requires aligning federal coal management policies with existing regulations aimed at stemming CO_2 emissions. Furthermore, coal program reform must recognize that there will be some substitution of nonfederal production for federal production.

Incorporating a carbon adder into federal coal royalties would reduce but not eliminate federal coal production, would reduce total power sector CO_2 emissions, and would generate substantial additional royalties. These royalties can also be used to support those communities that have historically engaged in mining nonfederal coal as the U.S. economy develops a low-carbon power sector. This carbon adder can be implemented by the secretary of the interior under existing law.

Questions and Concerns

1. Why a royalty adder rather than auction reform?

In principle, changes to the bidding process could complement or substitute for an increase in the royalty adder. However, the authors argue that reforms to the bidding process are less effective than a royalty adder from the perspective of climate policy. While a bid provides the right to mine on particular federal land, the royalty adder applies to the amount of coal actually mined. Once a company pays its lease bid price, that is considered a sunk cost and the company will mine coal as long as the price exceeds the marginal cost of production—but the market price will still be understated because it will not reflect any climate costs. In addition, reforms to the bidding process must confront the fact that leases up for auction typically are adjacent to existing mines, which intrinsically limits competition. A royalty adder is thus more practical and more directly targeted than changing the bidding process to achieve climate policy goals.

2. Isn't it more direct just to stop issuing coal-mining leases on federal lands?

Simply stopping all new and renewed leases misses many of the benefits of a royalty adder. Using a 20 percent royalty adder recognizes that the CPP could provide a powerful downstream tool to limit emissions, while simply ceasing federal leases essentially places an infinite carbon price on federal coal. Using royalties allows markets to direct coal mining in the most economically efficient way. And simply halting federal mining would reduce economic activity in directly affected states without generating additional revenues to support their transition.

3. Won't this proposal exacerbate the squeeze on coal states and coal communities?

Coal employment has followed its historical downward trend under pressure from low natural gas prices, and this trend is projected to continue. The proposed carbon adder would provide revenue to fund the transition of communities that have historically mined federal coal. The proposal would increase the demand for nonfederal coal and therefore increase employment in Appalachian and Midwestern coal mining states and communities; in fact, total national mining employment would increase, relative to the current policy case, because of the lower productivity in those regions. Finally, the proposal would provide a new revenue stream that Congress could direct toward supporting the transition of communities and states that have historically mined nonfederal coal.

Highlights

Kenneth T. Gillingham of Yale University and James H. Stock of Harvard University propose reforms to the federal minerals leasing program that both tie it to negative climate effects associated with coal mining, and improve its efficiency and benefits to the taxpayer. Specifically, they propose applying a royalty adder of 20 percent of the social cost of carbon to new and renewed federal coal leases.

The Proposal

Include a carbon adder in coal royalties. Applying a carbon adder to federal coal royalties would reduce but not eliminate federal coal production, reduce total power sector CO_2 emissions, and generate substantial additional royalties. This royalty adder would be set to 20 percent of the U.S. government's estimate of the social cost of carbon. Revenues would then be used to support communities that have historically engaged in mining nonfederal coal.

Benefits

Implementation of this proposal would benefit current and future generations by mitigating climate change costs through reduced carbon emissions from the use of federal coal. Communities reliant on nonfederal coal mining would benefit from transition support funded by the increased revenues.

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