

Why the Coal Industry Should Embrace a Carbon Tax

BY DAVID BOOKBINDER AND DAVID BAILEY

EXECUTIVE SUMMARY

The coal industry is in an economic free-fall due to low-cost natural gas and an incoming wave of steep environmental regulatory costs. Evidence of coal's trouble can be found in its declining share of the electricity market, plant and mine shutdowns, corporate earnings, debt-to-equity ratios, an impending federal leasing moratorium, and dramatic declines in stock prices. Corporate asset values are premised upon implausible assumptions about future coal demand in a carbon-constrained world. Claims that exports will save the industry are highly dubious. Political campaigns to slow down the regulatory onslaught have some prospect for success, but at best, they only borrow time. Reversing environmental regulatory activity holds a near-zero chance of success.

The only hope the industry has to meaningfully prolong its economic life is to support a carbon tax that would, as part of the deal, end EPA regulation of greenhouse gases. A carbon tax designed to achieve the same emission reductions sought under the Clean Power Plan (CPP) would be less punishing to the coal industry than current regulation. While a carbon tax designed to produce substantially greater emission reductions than

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the CPP could be costlier to the coal industry than existing regulation, the industry could likely secure a host of valuable aid and assistance in return for supporting a carbon tax bill. Such a package would, on balance, leave them better off economically than under the status quo.

There are compelling reasons for liberals and conservatives to embrace a deal along these lines. Liberals would avoid the risks of administrative, legal, and political delays that threaten to critically undermine the imperative to act now to reduce climate risks. Moreover, they will likely achieve more emission reductions than will be achieved under current policy. Conservatives would secure a less regulatory, more efficient, and less costly policy of climate action. And both the Left and the Right have a stated interest in minimizing the damage to communities that will be negatively affected by a collapse of the coal sector.

Introduction

The U.S. coal market is in economic free-fall after a century as the fuel of choice in the electric power sector. The primary challenges to the coal industry include:

- The low price of natural gas driven by the surge in unconventional gas production;
- New regulations addressing coal plant emissions, such as the Mercury and Air Toxics Standard (MATS) and the Clean Power Plan (CPP);
- New regulation of coal extraction practices, such as the stream buffer rule;
- New regulations regarding coal production, such as the 2006 Mine Improvement and New Emergency Response (MINER) Act;
- New requirements for public (SEC) disclosure of mine safety violations via Dodd-Frank;
- A 3-year moratorium on new federal coal leases, and a review of leasing policies;
- Structural challenges in the market that limit suppliers' ability to close mines; and
- The ongoing local legal battles that make up the real "war on coal."

This paper explores the latest and perhaps greatest challenge to the coal industry—the EPA's Clean Power Plan (CPP)—and whether the industry would be better off accepting a federal carbon tax in return for a suspension (or elimination) of those rules, rather than continuing to pursue its current strategy of naked opposition.

While the coal industry is committed to fighting the CPP, its leaders admit that it will be a tough fight. National Mining Association (NMA) CEO Hal Quinn, for instance, said in June:¹

¹ <http://nma.org/index.php/speeches-op-eds-and-letters-to-the-editor/2202-coal-the-changing-political-and-policy-landscape>

The fact remains that whatever influence we can bring to bear from Washington cannot alone change all of the bad policies bringing bad consequences for our mining communities We have to look beyond Washington as well. We are going back to the states with a renewed sense of urgency. Nothing illustrates this effort more than our Count on Coal campaign in states to persuade governors to reject EPA's Clean Power Plan.

Even if the NMA's hopes are fulfilled, states that refuse to submit a plan under the CPP will have a Federal plan imposed on them that meets EPA's requirements, but with very limited opportunity for the state to tailor it to its particular needs. It is also unrealistic to expect the present round of EPA regulation to be completely reversed, even with a pro-coal administration and Congress.² It is plausible to expect that the regulatory process might be delayed, or that the regulations themselves might be amended by the courts or by future administrations. It is not plausible to believe that CO₂ regulation will cease absent a credible alternative policy to address the climate issue. Moreover, state regulation of CO₂ will continue to expand, and will likely do so even more quickly if Federal action is stymied by coals' allies in Congress.

The alternative for the industry would be to recognize that a penalized future is better than no future at all, and embrace a reasonable carbon tax in lieu of the CPP. There are several reasons to consider this, apart from the likely impossibility of otherwise avoiding the CPP.

- First, most major companies in the U.S. electricity industry already apply a shadow carbon price in making significant investment decisions.³ Thus the coal industry's future is *already* subject to the price on carbon, even though it is not a legal requirement.
- Second, such an approach would allow the industry to seek support for (1) financial relief from obligations that are a substantial drag on their balance sheets, (2) assistance to the affected communities and workers, (3) a clear regulatory and implementation plan for carbon capture and storage technologies (CCS) and (4) potentially other beneficial regulatory and financial concessions.

Section 1 of this paper examines the present economic condition of the U.S. coal sector. While coal industry executives tell a cautiously optimistic story about coal's future, we believe (as do market actors, who express their opinions in the stock market) that such narratives are premised on extremely unrealistic assumptions about market and political trends. Recent bankruptcies in the industry tend to support our perspective. Section 2

² David Bailey and David Bookbinder, "The Cold, Hard Truth about EPA & Greenhouse Gas Regulation, *Climate Unplugged*, July 16, 2005, <https://climateunplugged.com/blogpost/?postid=1449>.

³ "Use of Internal Carbon Price by Companies as Incentive and Strategic Planning Tool," CDP North America, December, 2013, <https://www.cdp.net/CDPResults/companies-carbon-pricing-2013.pdf>.

reviews the economic impact of the CPP on the coal industry and asks whether a carbon tax designed to achieve the same emission reductions would be better or worse for the industry. We find that coal-fired generation, coal prices, and coal production would be *higher* under a carbon tax if that tax were designed to achieve the same emissions reductions as the CPP. Section 3 examines the possible assistance for the coal sector in the course of instituting a carbon tax, and identifies a number of concessions that Congress might provide the coal industry in the course of carbon taxation. Section 4 concludes with thoughts about why conservatives, liberals, and of course, the industry itself might embrace suspending or eliminating the CPP in return for a carbon tax.

At the Death Bed of the Coal Industry

Adverse market and regulatory dynamics have reduced coal production and consumption by 15% and 18%, respectively, from 2008 to 2014.⁴ EIA indicated that 2015 U.S. coal production was likely to be down a further 10%, to the lowest level since 1986.⁵ Reductions in coal consumption were driven in part by the shut-down of coal-fired power plants. From 2008–2013, 80 of the oldest coal-fired power plants (14% of the total coal-fired fleet) were retired prematurely.⁶ Another 13,000 megawatts of coal-fired generating capacity was expected to retire in 2015 due to the MATS rule.⁷

Generation has declined even more, losing share to natural gas and wind. From 2002–2012, coal-fired electricity capacity fell by 1%, while net generation from coal declined by 22%. This, despite overall electricity generating capacity and net generation increasing by 19% and 5%, respectively. Accordingly, coal-fired electricity, which once constituted 50% of the electricity on the grid, now constitutes 37%.⁸

These trends are expected to continue, and if the projections in the CPP prove accurate, to accelerate.

⁴ U.S. Energy Information Administration, Monthly Energy Review, July, 2015, Table 6.1.

⁵ U.S. Energy Information Agency, Today in Energy, January 8, 2016, <http://www.eia.gov/todayinenergy/detail.cfm?id=24472>.

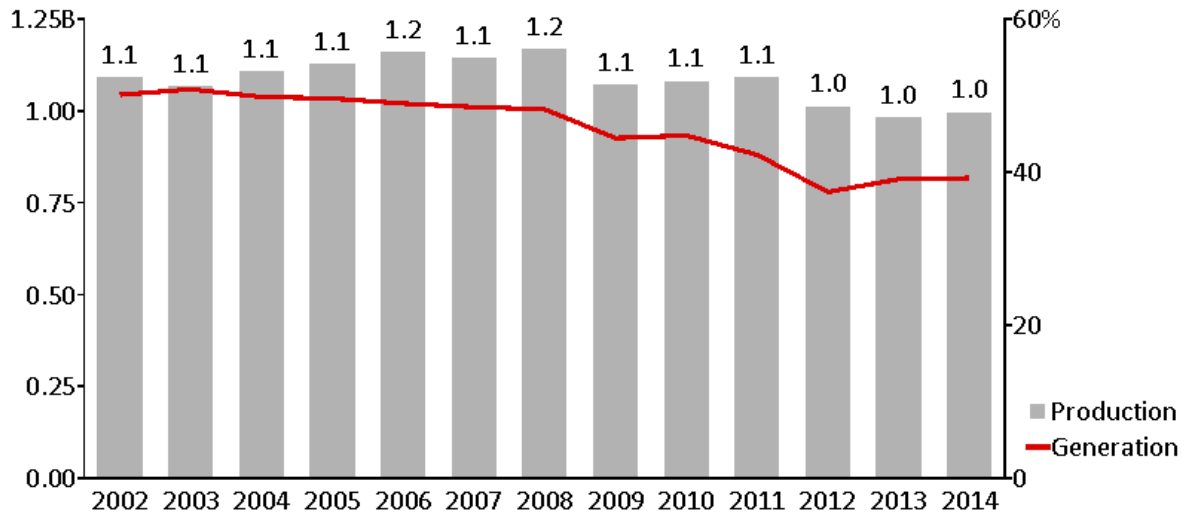
⁶ Erica Martinson, “The Fall of Coal,” *Politico*, June 16, 2015, <http://www.politico.com/story/2015/04/coal-power-plants-epa-regulations-117011>, U.S. Energy Information Administration, Monthly Energy Review, July, 2015, Table 4.1.

⁷ Housley Carr, “Torn Between Two Fossil Fuels—Coal vs. Gas in the U.S. Power Sector,” RBN Energy, September 9, 2015, <https://rbnenergy.com/torn-between-two-fossil-fuels-coal-vs-gas-in-the-us-power-sectoris>.

⁸ U.S. Energy Information Administration, Monthly Energy Review, multiple months.

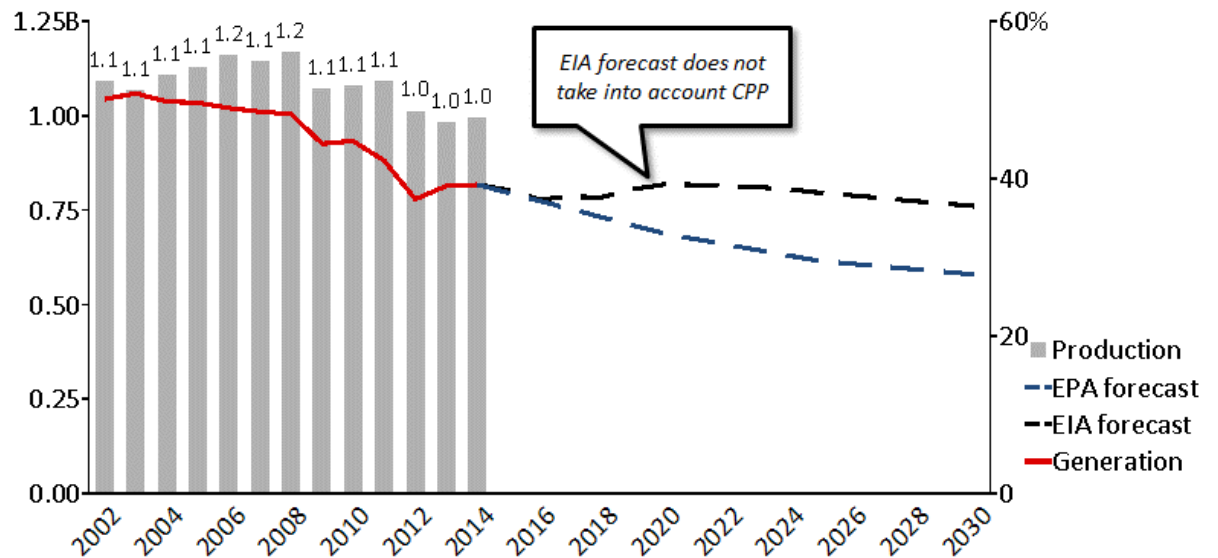
US coal production in tons,
2002 - 2014

Share of US electricity generation from coal,
2002 - 2014



US coal production in tons,
2002 - 2014

Share of US electricity generation from coal,
2002 - 2014



EIA July 2015 Monthly Energy Review, Table 6.1 Coal Overview (Production); EIA's Annual Energy Outlook 2015, Figure 31 (Generation); EPA CPP RIA, Table 3-11.
Note: CPP percent generation is only given for 2020, 2025 and 2030. This analysis assumes a linear decline.

These dynamics—especially the low price of natural gas and coal producers' unwillingness to shutter mines to cut volume—have impacted coal prices as well, which

increased a modest 0.1% per year within the electric power sector, and 0.4% real overall, during the same time period.⁹ In part, this reflects long-term contracts between electric utility companies and coal companies, which have smoothed the decline in price. The average also masks the differing impact of competition from shale gas in different regions. The eastern United States, for instance, is an attractive market for shale gas consumers, with existing gas infrastructure and most production sited nearby. Accordingly, natural gas prices are often significantly below even low Henry Hub benchmarks.

In September 2015, for example, Tennessee spot gas prices were \$1.08 per million cubic feet, compared to \$2.53 at Henry Hub.¹⁰ In contrast, west of the Rockies there is almost no shale gas production, and much less gas infrastructure, so prices there are higher. EIA's Annual Coal Reports show that Mid-Atlantic coal prices—the coal that is most exposed to cheap shale gas and costliest to produce—fell by 20% in constant dollars between 2010 and 2015.

Mine closures and job losses have followed suit, although not enough to reduce supply and apply upward price pressure. The number of mines in operation declined from a peak of 1,934 in 2008 to 1,450 in 2013.¹¹ Closures were concentrated, however, on smaller mines. The number of mines with over 100 employees increased slightly, from 181 to 184, while the total number of mines with fewer than 100 employees declined considerably, from 1,753 to 1,266 (28%).¹²

Some coal producing regions have fared worse than others. Appalachian coal—in particular, Eastern Kentucky coal—experienced the brunt of mine closures given their high share of underground thermal coal, which is expensive to mine and thus is priced at \$60-\$70 per ton compared to the world market price of \$43 per ton.¹³ The number of mines in Kentucky has declined by 38% (from 601 in 2009 to 372 in 2013) while the number of West Virginia mines has declined by 25% over the same period (from 438 to 328).¹⁴ Job losses were also starkest in Kentucky, which lost 6,000 employees (32% of their coal-related employment) from 2008 to 2013. Overall, total employment in the coal sector has declined by 11,200 (12% of the workforce).¹⁵

⁹ U.S. Energy Information Administration, *Annual Coal Report 2013*, April 2015, Table 34, <http://www.eia.gov/coal/annual/pdf/acr.pdf>.

¹⁰ Richard Zeits, "U.S. Natural Gas: Rumors of Production Rolling Are Strongly Exaggerated," Seeking Alpha, October 1, 2015, <http://seekingalpha.com/article/3545246-u-s-natural-gas-rumors-of-production-rolling-over-are-strongly-exaggerated?ifp=0>.

¹¹ U.S. Energy Information Administration, Coal Data, <http://www.eia.gov/coal/data.cfm>.

¹² *Ibid.*

¹³ Kris Maher and Tom McGinty, "Coal's Decline Hits Hardest in the Mines of Kentucky," Wall Street Journal, November 26, 2013, <http://www.wsj.com/articles/SB10001424052702304337404579212262280342336>, and Five Year Coal Prices and Price Charts, InfoMine, <http://www.infomine.com/investment/metal-prices/coal/5-year/>.

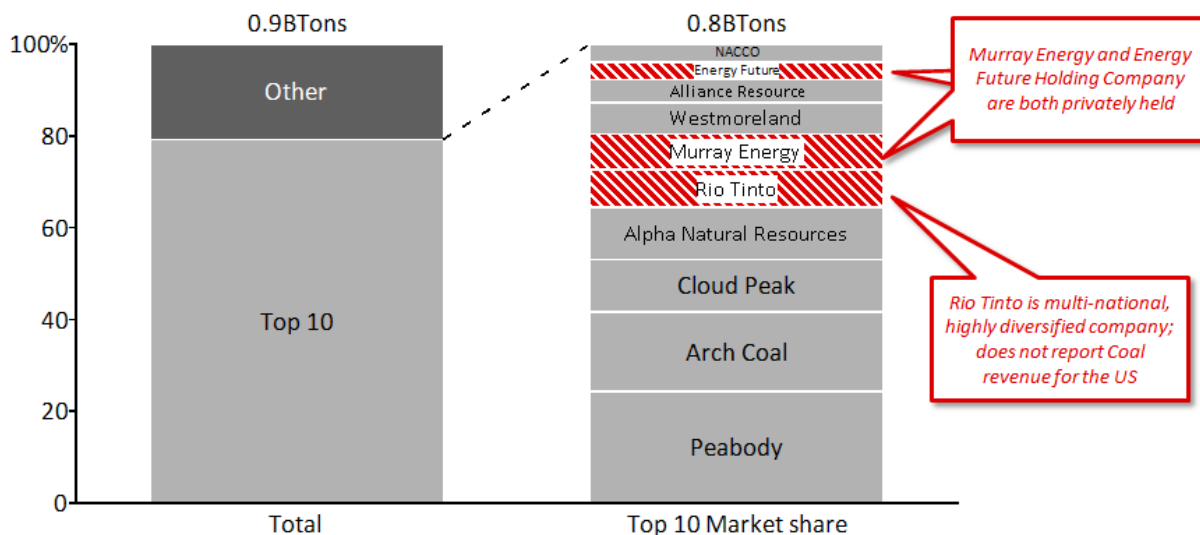
¹⁴ U.S. Energy Information Administration, Coal Data, <http://www.eia.gov/coal/data.cfm>.

¹⁵ *Ibid.*

Stock Price Declines, But Industry Optimism Persists

Top producers' stock prices reflect the decline of the U.S. coal industry's markets. U.S. coal production is heavily concentrated, with the top 10 companies producing 80% of domestic volume. This analysis is focused on the industry's top four players, who account for 50% of total production: Peabody Energy (which produced 18% of the U.S. 2013 volume), followed by Arch Coal (13%), Cloud Peak Energy, and Alpha Natural Resources (9% each).¹⁶ We do not include the next two largest producers overall by volume—Rio Tinto and Murray Energy Corp.—because Rio Tinto does not break out its U.S. coal data, and Murray is privately held, which limits our ability to examine their balance sheets.

Domestic market share of coal production by volume, 2013



All four companies' stock prices have fallen substantially in the past five years. The two largest—Peabody and Arch—are down more than 85% despite a recent uptick in Peabody's stock after an announcement that it was talking with creditors.¹⁷ Arch began talking openly about seeking Chapter 11 bankruptcy—and its potential consequences—after a \$2 billion loss in the 3rd quarter of 2015.¹⁸ It then filed for

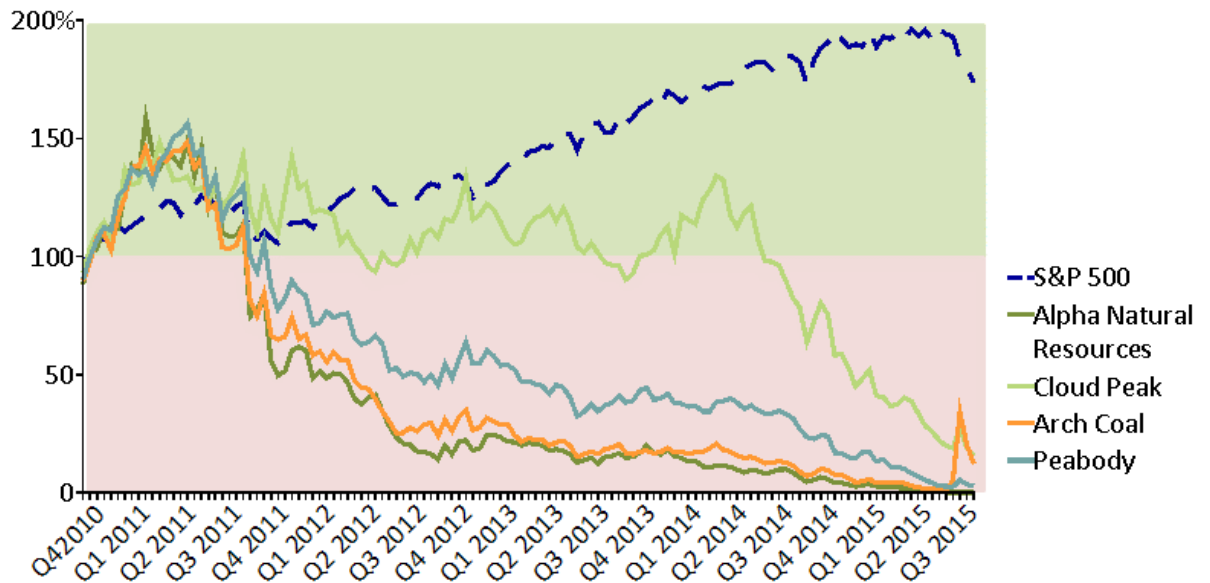
¹⁶ U.S. Energy Information Administration, *Annual Coal Report 2013*, April 2015, Table 10, <http://www.eia.gov/coal/annual/pdf/acr.pdf>.

¹⁷ Jodi Zu Klein and Tim Loh, "Peabody Said to Hire Lazard to Advise on Debt Restructuring," *Bloomberg Business*, August 26, 2015, <http://www.bloomberg.com/news/articles/2015-08-26/peabody-said-to-hire-lazard-as-adviser-for-debt-restructuring>, Yahoo Finance.

¹⁸ Tracy Ruzinski, "Arch Coal Expects to File for Bankruptcy Protection Within Months," *Reuters*, November 9, 2015, <http://www.reuters.com/article/2015/11/09/arch-coal-bankruptcy-idUSL8N1315FF20151109#4CDGQLYLB7ixHUWj.97>.

Chapter 11 in January 2016. Alpha filed for bankruptcy in August 2015, with nearly \$7 billion in liabilities against assets of \$10 billion.¹⁹ Cloud Peak—solely focused on Powder River Basin coal, and so less exposed to the most severe shale gas competition—has fared the best of the top four, yet even its stock is down over 80% since 2010.²⁰

Stock price of major coal companies indexed to closing price on 8/12/2010



Yahoo Finance (as of 9/29/2015)

The immediate driver of the decline in coal sector stock prices is fear that producers will not be able to service their debt.²¹ The top four companies saw total revenue decline by 18% (from \$15.1 billion in 2010 to \$12.4 billion in 2014).²² Three—Arch, Cloud Peak, and Alpha—saw total revenue decline by 8%, 17%, and 35% respectively. Peabody fared slightly better, with total revenue up 2% over the same time.

Earnings fared even worse than revenue. Total net income for the top four players went from -\$1.2 billion in 2010 to -\$2.5 billion in 2014. Cloud Peak alone generated positive net income for 2014, a modest \$79 million on \$1.1 billion in revenue. The other top three producers all suffered considerable losses: \$1.1 billion for Peabody on revenue of \$4.0

¹⁹ Nathan Vardi, "U.S. Coal Company Alpha Natural Resources Files For Bankruptcy," *Forbes*, August 3, 2015, <http://www.forbes.com/sites/nathanvardi/2015/08/03/u-s-coal-company-alpha-natural-resources-files-for-bankruptcy/>.

²⁰ Yahoo Finance.

²¹ Carl Pope, "Why You Should Short Coal," Bloomberg View, July 6, 2015, <http://www.bloombergview.com/articles/2015-07-06/why-you-should-short-coal>.

²² Only North American coal revenue is included for Peabody. Alpha Natural Resources 2010 revenue is calculated by including estimated revenue of Massey, which was acquired in 2010 (\$2.7B revenue).

billion in North America, \$900 million for Alpha on revenue of \$4.3 billion, and \$500 million for Arch on revenue of \$2.9 billion.²³ Declining cash flow increased leverage, especially for Peabody and Arch, whose debt to equity ratios are both greater than 350%, much higher than the energy industry average of 40%.²⁴

Coal company asset values appear to reflect a generally unrealistic view of the future production. For example, Alpha claims 4 billion tons of reserves²⁵ with a book value of \$7 billion,²⁶ or 64% of Alpha's assets. Those 4 billion tons represent 48 years of 2014 production (84 million tons).²⁷ In 2014, Peabody had 7.6 billion tons of reserves,²⁸ which is approximately 31 times annual production (227 million tons), listed as assets worth \$6.2 billion,²⁹ or 47% of its total assets.³⁰ (For comparison, the oil and gas companies' reserves, which have been targeted by carbon disinvestment activists on the grounds that they are "unburnable", are equivalent to about 15 years' production.) Moreover, of Peabody's 6.6 billion tons of U.S. reserves, at least 1.5 billion tons is leasehold coal on federal land³¹ and it is unclear how much longer the government will allow that to be mined. The Interior Department's January 2016 announcement of a 3-year moratorium (and possibly much longer) on new leases to allow for an in-depth review of the economic and environmental cost of coal production on Federal lands (where most Western U.S. production takes place) is a clear signal of which way the wind is blowing.

²³ All data from Yahoo Finance/ CSI Market

²⁴ Yahoo Finance and CSI Market,

http://csimarket.com/Industry/industry_Financial_Strength_Ratios.php?s=600.

²⁵ Alpha Natural Resources, 2014 10-K, p. 6.

²⁶ *Ibid.*, p. 95, including land value independent of the coal reserves.

²⁷ *Ibid.*, p. 5

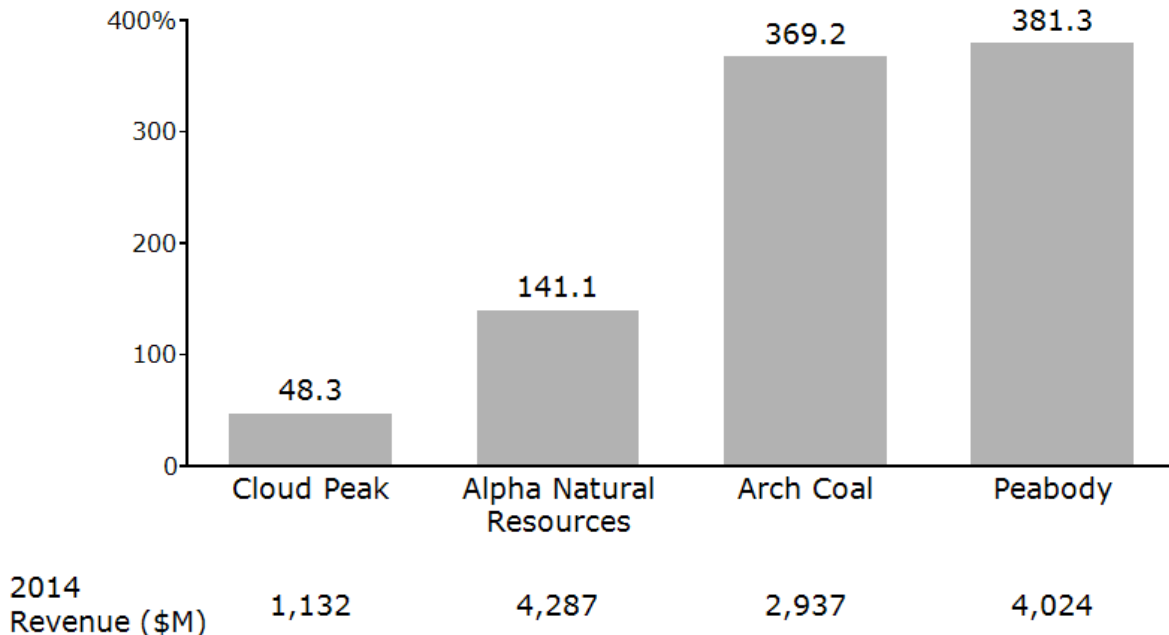
²⁸ *Ibid.*, p. 6

²⁹ *Ibid.*, p. F-33

³⁰ *Ibid.*, p. 43

³¹ *Ibid.*, p. F-66

Debt to equity ratio, 2014



Source: Yahoo Finance, 2014 10-Ks

Despite the decline in stock prices, industry leaders remain publicly optimistic. For example, Peabody CEO Gregory Boyce recently argued that “thermal coal consumption from the low-cost U.S. regions ... is likely to increase 50 to 70 million tons over the next three years as natural gas prices recover, demand from other regions is displaced, and expected coal plant retirements are offset by higher plant utilization rates.”³² EIA disagrees. It sees thermal coal demand growing by only 0.5% (859 million tons to 863 million tons) between 2012 and 2018 (it does, however, likewise see long-term growth in coal use).³³

EPA’s CPP regulatory impact analysis is even less optimistic. In 2025, EPA’s base case (before implementing the CPP) envisages coal demand 22% lower than EIA’s 2025 reference case projection, and 15% below 2013’s actual output.

As discussed below, coal industry CEOs frequently identify the export market as a likely source of future industry growth. But there is reason to doubt that this is likely. This divergence, particularly in regard to use of the IEA’s scenarios for global coal

³² Peabody Energy, 2014 *Annual Report*, <https://mscusppegrs01.blob.core.windows.net/mmfiles/files/investors/2014%20peabody%20annual%20report.pdf>.

³³ U.S. Energy Information Administration, *Annual Energy Outlook 2015*, April, 205, [http://www.eia.gov/forecasts/aeo/pdf/0383\(2015\).pdf](http://www.eia.gov/forecasts/aeo/pdf/0383(2015).pdf).

consumption, was at the heart of the recent settlement between Peabody and the N.Y. State Attorney General, which will force the company to acknowledge a wider range of potential future scenarios—and accompanying shareholder risks—in its reporting.³⁴

The contradiction between the pessimism shared by investors and government agencies regarding coal's future, and the optimism preached by industry, raises the question of whether the recent U.S. market downturn is just a hiccup, or the beginning of a long-term decline in the market. We consider those issues in the next section.

Are Coal's Current Environmental Challenges Different from Past Challenges?

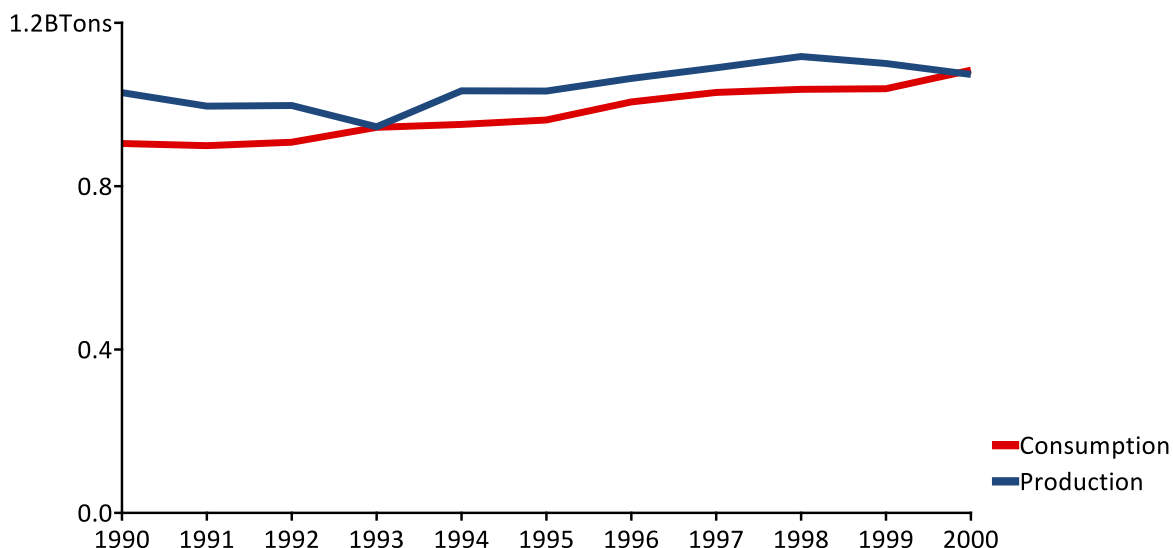
At least initially, coal state legislators saw the 1990 Clean Air Act Amendments as a potentially severe blow to the industry. But it didn't work out that way: by 2000, U.S. coal demand was almost 20% higher than in 1990, and domestic production was up 5%.

Why did the expected hit on the coal sector fail to materialize? First, the proposed Amendments changed significantly in favor of coal during the course of the legislative process. Second, while the Amendments required generators to reduce emissions incidental to the combustion process (SOX, NOX, PM), they were readily addressable with existing technologies (scrubbers) and/or by switching to lower sulfur coal (a switch facilitated for much of the country by railroad deregulation). Third, a cap and trade system smoothed the entire process. The pollution reduction equipment cost, while high in absolute terms (\$700 million or so per power plant³⁵) was low relative to overall power generation costs. Fourth, the Amendments "grandfathered" (that is, exempted) many existing power plants.

³⁴ "A.G. Schneiderman Secures Unprecedented Agreement with Peabody Energy to End Misleading Statements and Disclose Risks Arising From Climate Change," Press Release, November 9, 2015, <http://ag.ny.gov/press-release/ag-schneiderman-secures-unprecedented-agreement-peabody-energy-end-misleading>.

³⁵ "Scrubber Myths and Realities," Wet and Dry Gaseous Scrubber Divisions of the Institute of Clean Air Companies Inc. (ICAC), *Power Engineering*, <http://www.power-eng.com/articles/print/volume-99/issue-1/features/scrubber-myths-and-realities.html>.

US Coal production and consumption in tons, 1990 - 2000



US EIA July 2015 Monthly Energy Review, Table 6.1 Coal Overview.

The avenues by which the coal sector dodged the economic bullets fired in the 1990 Amendments are not generally open to them today. The fundamental problem is that CO₂ emissions are inherent to the fuel itself and there is no readily available, affordable technology to eliminate—or even substantially reduce—such emissions.

Carbon Capture and Storage (CCS) is the most promising such technology, but it is energy inefficient. Up to 30% of the plant's power is diverted to the recovery process,³⁶ it is extremely expensive,³⁷ and requires certain, centuries-long storage. Environmental activists and communities alike, moreover, are suspicious about storing massive volumes of CO₂ in underground aquifers.³⁸ The United States has no clear regulatory framework to offset these concerns, or any means by which to provide regulatory certainty for those interested in investing in that technology.³⁹

³⁶ Doug Carter, "Parasitic Power for Carbon Capture," Undated Presentation, <http://www.publicpower.org/files/PDFs/CarterParasiticower.pdf>.

³⁷ U.S. Energy Information Administration, "Updated Capital Cost Estimates for Utility Scale Electricity Generating Plants," April, 2013, http://www.eia.gov/forecasts/capitalcost/pdf/updated_capcost.pdf.

³⁸ Suzanne Brunsting, et. al., "Stakeholder Participation Practices and Onshore CCS: Lessons from the Dutch CCS Case Barendrecht," *Energy Procedia* 4, 2011, pp. 6376-6383, <http://www.sciencedirect.com/science/article/pii/S1876610211009349>.

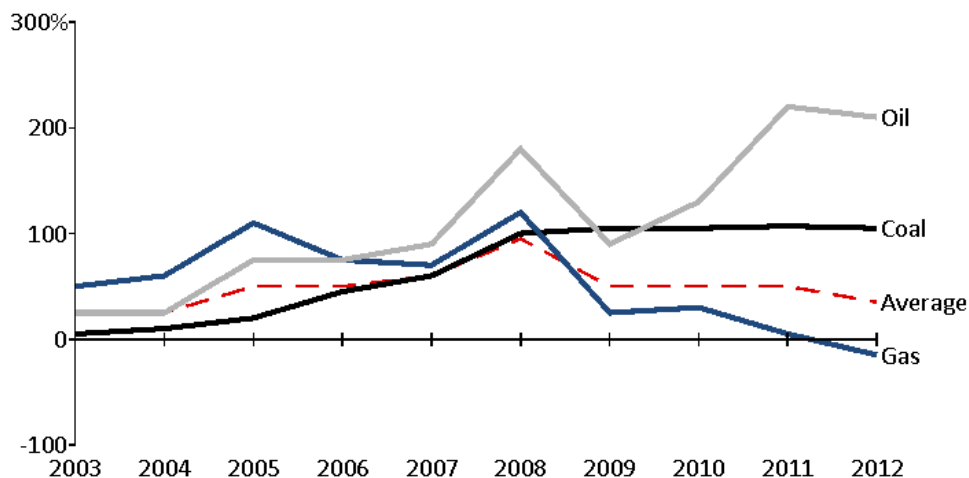
³⁹ Sallie Greenberg, "The U.S. Regulatory Framework for CCS," Presentation, July, 2011, http://www.ieaghg.org/docs/General_Docs/Summer_School/2011/Presentations/17_2011NATIONALREG_S-GREENBERG.pdf.

How Much of Today's Problem is Cheap Natural Gas?

The most significant problem for coal recently has been natural gas, but the problem going forward is likely to be a combination of both continuing low natural gas prices and new CO2 restrictions or penalties. Natural gas prices are almost universally expected to stay near historic lows, even with increased industrial use and exports.⁴⁰ Indeed, some speculate that prices may fall even further in the short term as horizontal drilling and fracking technologies are improved.⁴¹

As we have seen, the trend in gas prices has pushed down not only coal's market share, but also the price it receives in major parts of the electricity market. The difference in the next decade is that the regulatory pressures from the CPP will affect the entire country, not just those parts hitherto most exposed to the gas alternative.

Relative real prices of fossil fuels for electricity generation and change in national average real price per MMBtu delivered to EGU



EPA CPP RIA, Figure 2-9

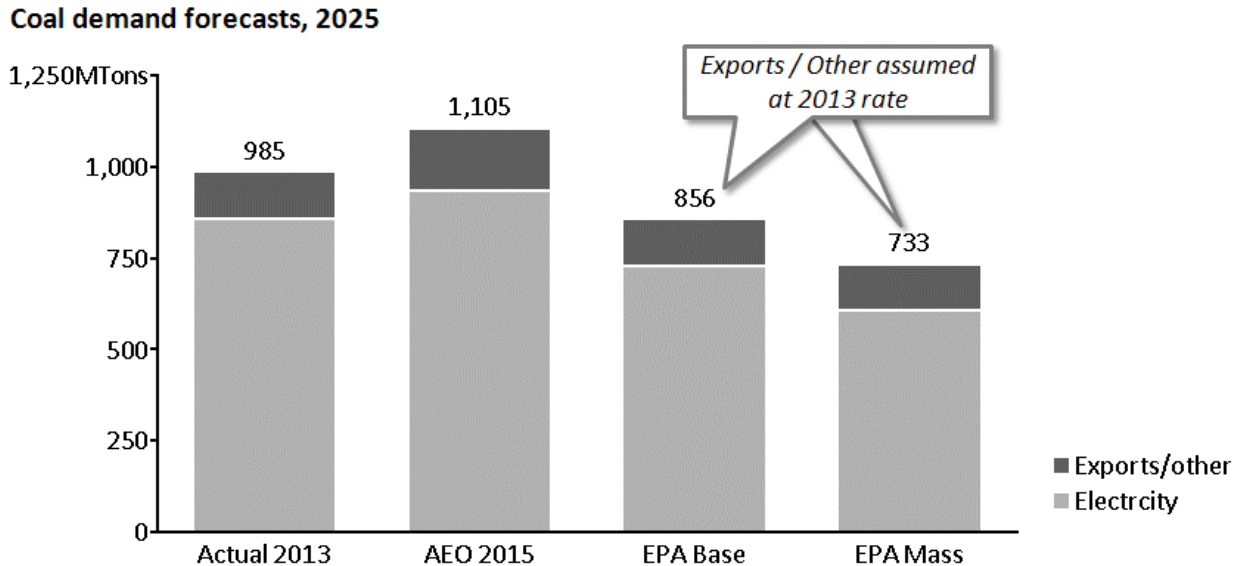
Despite this, EIA's 2015 Energy Outlook (AEO) continues to forecast rising coal production, at least in the West and Interior.⁴² We believe this is unlikely. The AEO

⁴⁰ "Macroeconomic Impacts of LNG Exports from the United States," NERA Consulting, December, 2012, http://energy.gov/sites/prod/files/2013/04/f0/nera_lng_report.pdf.

⁴¹ Sheetal Nasta, "Hold Me Tight? Natural Gas Supply/Demand Balance Keeps Prices In A Tight Range," RBN Energy, August 30, 2015, <https://rbnenergy.com/hold-me-tight-natural-gas-supply-demand-balance-keeps-prices-in-a-tight-range>.

⁴² U.S. Energy Information Administration, *Annual Energy Outlook 2015*, April, 2015, <http://www.eia.gov/beta/aeo/#/?id=15-AEO2015®ion=0->

excludes the potential impacts of the CPP, and EIA itself acknowledged in a subsequent study that EPA’s then-proposed version of the CPP would impact production, especially in the West.⁴³



US EIA AEO 2015, EPA CPP RIA.

Exports to the Rescue?

With the domestic market in such decline, producers have looked to exports. As shown below, exports have grown by 64%--from 59 million tons to 97 million tons—from 2007-2014. Export growth was weighted toward higher value metallurgical coal, which increased 87%, while steam coal grew 38%.

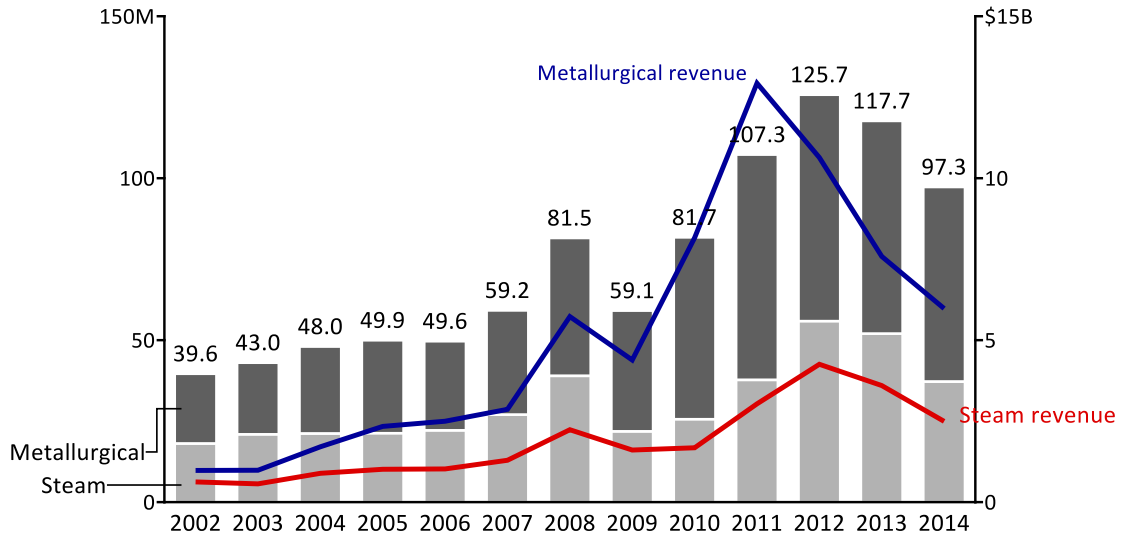
Despite this growth, exports were unable to completely offset declining U.S. consumption. Net exports increased by 63 million tons (reflecting lower imports) while domestic consumption declined by 211 million tons over the same period. The 148 million ton gap between the two explains the overall drop in annual U.S. production, from 1.15 billion tons down to 1 billion tons.⁴⁴

[0&cases=ref2015&start=2012&end=2040&f=A&linechart=~15-AEO2015.15.~15-AEO2015.26.~~~15-AEO2015.9.&map=&ctype=linechart.](#)

⁴³ U.S. Energy Information Administration, “Proposed Clean Power Plan Rule Would Reduce Coal Production, Especially in the West,” *Today in Energy*, June 10, 2015, <http://www.eia.gov/todayinenergy/detail.cfm?id=21592>.

⁴⁴ *Ibid.*

Coal exports from the United States in short tons by steam vs. metallurgical, 2002 - 2014
 Revenue from coal exports from the United States by steam vs. metallurgical, 2002 - 2014



Steam price/ton	\$35	\$27	\$42	\$48	\$46	\$48	\$57	\$74	\$66	\$80	\$76	\$69	\$67
Meta price/ton	\$45	\$45	\$64	\$82	\$91	\$89	\$135	\$118	\$145	\$186	\$152	\$115	\$99

EIA July 2015 Monthly Energy Review, Table 6.1; EIA, Department of Commerce, Bureau of the Census, 'Monthly Report EM 545'; price calculated using Revenue and Export data.

Industry leaders continue to argue that future export potential, and therefore the overall industry position, is more promising than today’s bleak picture. John Eaves, CEO of Arch Coal, articulated the industry’s optimism: “We expect coal demand to remain stable in the U.S. after 2015 and to grow markedly abroad as the world population increases, industrialization continues and urbanization advances.”⁴⁵ Other CEOs have made similar points. Cloud Peak CEO Colin Marshall said “We believe prices will recover as growing demand overcomes slowing supply growth. We are seeing continued strong demand growth in India, South Korea, and Japan.”⁴⁶

EIA, however, sees no export market growth in the medium term, with exports in 2025 at 112 million tons vs. 118 million tons in 2013.⁴⁷ Their short-term view is also markedly different:

⁴⁵ Arch Coal 2014 Annual Report, <http://nasdaqomx.mobular.net/nasdaqomx/7/3459/4950/index.html>.

⁴⁶ Cloud Peak Energy 2014 Annual Report, http://investor.cloudpeakenergy.com/sites/cldpk.investorhq.businesswire.com/files/doc_library/file/CLDPK-2014-annual-corporate-report.pdf.

⁴⁷ *Ibid.*

*Slower growth in world coal demand, lower international coal prices, and higher coal output in other coal-exporting countries have all led to a decline in U.S. coal exports. Lower mining costs, cheaper transportation costs, and favorable exchange rates will continue to provide an advantage to mines in other major coal-exporting countries compared with U.S. producers. Coal exports for the first half of 2015 are down 20% compared with the same period in 2014, and U.S. steam coal exports fell by 21%, or 4.1 million short tons (MT). The 5.8 MT of coal exports for June 2015 was the lowest monthly volume for coal exports since February 2010. EIA projects coal exports will fall by 18 MT, to 80 MT, in 2015, and then decrease by another 7 MT (9%) in 2016.*⁴⁸

The problem with industry optimism is that the coal export boom in recent years has been driven by sales to Europe. The remainder of export volumes are mainly to countries that are likely to impose climate policies that will reduce future coal demand.⁴⁹ Hence, for the industry to increase exports, it will need to maintain and expand sales to Europe despite its increasingly restrictive climate policies *and* beat off competition from other producers.

Country / Region	Steam Coal (M Tons)	Metallurgical (M Tons)	Total (M Tons)
Europe	31	22	53
China	2	7	9
South Korea	5	4	9
Brazil	--	8	8
Canada	3	4	7
Japan	2	4	6
Mexico	3	3	6
Turkey	1	5	6
India	1	3	4
Ukraine	--	3	3
Morocco	3	--	3
Chile	2	--	2

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Asia, and specifically India, is a sometimes portrayed as a potential “market savior” for many U.S. coal producers. But India has embraced a policy of increasing domestic coal production by 1.5 billion tons by 2020 (an increase of 150% over 2014 levels). While it faces many challenges (notably, very low productivity, transport bottlenecks, and

⁴⁸ U.S. Energy Information Administration, Short Term Energy Outlook, July, 2015, <http://www.eia.gov/forecasts/steo/archives/Jul15.pdf>.

⁴⁹ INDCs as Communicated by Parties, <http://www4.unfccc.int/submissions/INDC/Submission%20Pages/Submissions.aspx>

bureaucratic red tape⁵⁰) most industry observers believe that growth in the Indian coal market – if indeed it occurs at this scale—will mostly be met by Indian coal production.⁵¹ Additionally, production is expanding in many countries that can meet Asia’s demand with lower transportation costs.

The International Energy Agency (IEA) thus sees no overall growth in U.S. steam coal exports through 2040:

*.... Australian and Indonesian producers have increased output in recent years, to an extent which is expected to keep prices at levels over the next couple of years which will prove unsustainably low for some high-cost Appalachian mines. Consequently, steam coal exports from the east coast are expected to continue their recent fall, with the Appalachian mines reverting to their role as swing suppliers in the Atlantic Basin, while exports from the Illinois Basin increase moderately. In total, US steam coal exports are projected to drop to around 20 MT in 2020. After 2020, steam coal exports from the Powder River Basin into the Pacific market rise gradually, compensating for declining exports into the Atlantic market. As a result, total US steam coal exports increase slowly towards 30 MT in 2040.*⁵²

While there is plenty of export capacity on the East Coast, increased exports of low-priced western coal require the construction of significant new export capacity in the Northwest. Accordingly, two major export terminals, with shipping capacity of 48 and 36 million tons per year (relative to 6 million tons of current west coast capacity), are planned in Washington state. However, there is intense local and national opposition to these terminals and it is not clear how quickly they will be built – if ever.⁵³ Without such new shipping capacity, significant coal exports to Asia are implausible.

The CPP v. a Carbon Tax

A carbon tax designed to achieve emissions reductions comparable to the CPP might possibly do less harm to the coal industry than the CPP. We compare below the relative impacts of the CPP and a carbon tax on electricity generation and coal production.

⁵⁰ U.S. Energy Information Administration, “India’s Coal Industry in Flux as Government Sets Ambitious Coal Production Targets,” *Today in Energy*, August 25, 2015, <http://www.eia.gov/todayinenergy/detail.cfm?id=22652>.

⁵¹ Saqib Rahim, “Can India Fill ‘China-Shaped Hole’ in Global Markets?” *EnergyWire*, September 9, 2015, <http://www.eenews.net/login?r=%2Fenergywire%2F2015%2F09%2F09%2Fstories%2F1060024380>.

⁵² *World Energy Outlook 2014*, International Energy Agency, November 12, 2014, <http://www.worldenergyoutlook.org/weo2014/>.

⁵³ Laura Beans, “Coal Exports Face Unprecedented Opposition in the Pacific Northwest,” *EcoWatch*, September 20, 2013, <http://ecowatch.com/2013/09/20/coal-exports-face-unprecedented-opposition/>.

Where independent data was lacking, we reviewed estimates from the peer-reviewed literature and industry studies. For the CPP, we used EPA’s preferred mass case as described in their Regulatory Impact Analysis (RIA).⁵⁴ For perspective in the following discussion, the implied “national” average carbon price under the CPP is \$23 per ton of CO₂ in 2012\$⁵⁵.

Coal could maintain a higher share of generation under a comparably-effective carbon tax than under the CPP. According to EPA, the CPP will reduce the share of coal-fired power generation from 37% in 2013 to 28% in 2030.⁵⁶ A recent study by Anthony Paul, Blair Beasley, and Karen Palmer for Resources for the Future (RFF), however, finds that a tax of \$18 per ton of CO₂ would reduce electricity sector emissions by 400 million tons, which is about the same as the non-demand-driven change from the CPP.⁵⁷ While the two studies are not directly comparable (EPA, for example, covers a smaller generating footprint by excluding Alaska), the tax examined by RFF would reduce coal’s share of generation to 31% by 2035 – 3% more than EPA’s 2030 estimate under the CPP.⁵⁸

⁵⁴ This is solely EPA’s estimate of the CPP’s impact on coal, and we do not have great confidence in it, as so many of EPA’s other assumptions and estimations are questionable. David Bailey and David Bookbinder, “The Clean Power Plan: Energy Efficiency Smoke & Mirrors,” *Climate Unplugged*, August 19, 2015, <https://climateunplugged.com/blogpost/?postid=1600>.

⁵⁵ Estimated using 2030 data from EPA’s CPP technical documents, which show the average marginal abatement cost by state. <http://www2.epa.gov/airmarkets>.

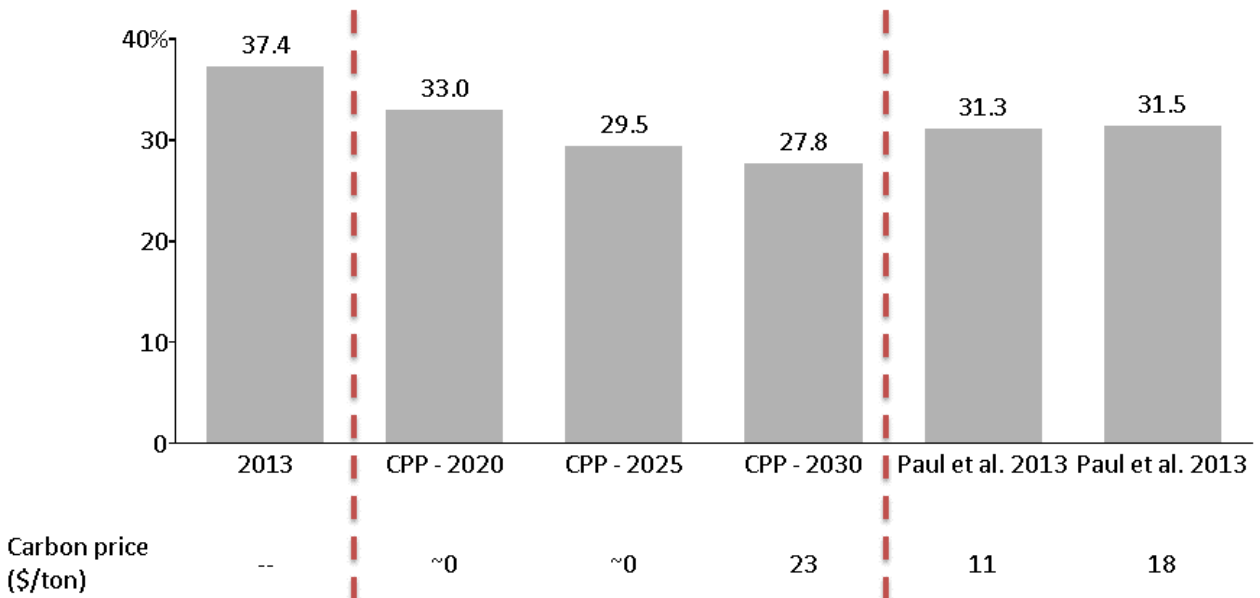
⁵⁶ U.S. Energy Information Administration, “Analysis of the Impacts of the Clean Power Plan,” May, 2015, Table 2-2 and Table 3-11,

<http://www.eia.gov/analysis/requests/powerplants/cleanplan/pdf/powerplant.pdf>.

⁵⁷ Anthony Paul, Blair Beasley, and Karen Palmer, “Taxing Electricity Sector Carbon Emissions at Social Cost,” Discussion Paper, Resources for the Future, October 2013, Revised November, 2013, <http://www.rff.org/files/sharepoint/WorkImages/Download/RFF-DP-13-23-REV.pdf>.

⁵⁸ *Id.*, Table A2.

Percent power generation from coal



Mass-case from EIA CPP RIA Table 2-2, Table 3-11; Paul, Beasley & Palmer 2013, Table A2

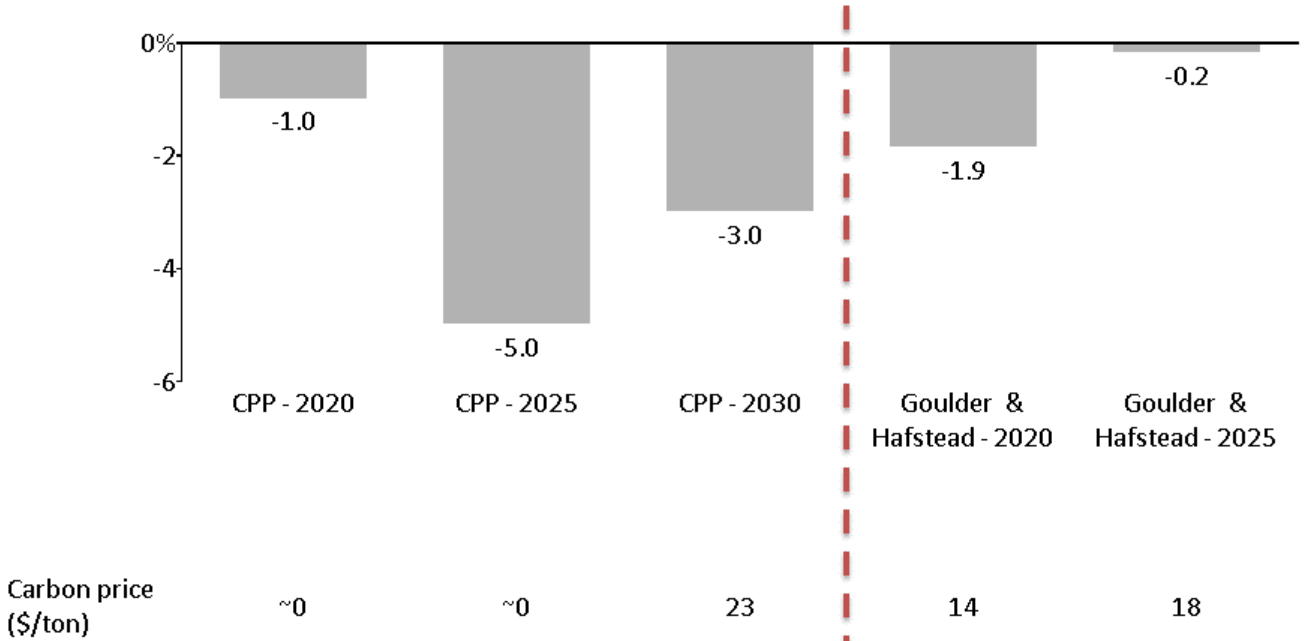
EPA estimates that the CPP will lead to a real price decline of coal at the mine mouth of 1%, 3%, and 5% by 2020, 2025 and 2030, respectively.⁵⁹ A recent RFF study by Larry Goulder and Marc Halfstead, however, found that a carbon tax of \$14 and \$18 per ton of CO₂ would lead to a decline of 2% and 0.2% in the mine mouth price by 2020 and 2025, respectively.⁶⁰

Precise comparison with the CPP is impossible, but it appears the tax examined in the above paper may also produce comparable emissions reductions to the CPP. It might do so, however, with a smaller decline in prices than the CPP.

⁵⁹ U.S. Environmental Protection Agency, “Regulatory Impact Analysis for the Proposed Carbon Pollution Guidelines for Existing Power Plants and Emission Standards for Modified and Reconstructed Power Plants,” June, 2014, Table ES-11, <http://www3.epa.gov/ttnecas1/regdata/RIAs/1111dproposalRIAfinaI0602.pdf>. We have some serious reservations, however, about these EPA forecasts. In Table 3-15 of the RIA, the EPA estimates that domestic coal production for the electric power sector in the mass scenario will decline 15% by 2025 compared to the base case. We believe that a 3% decline in real prices is likely understated given a further domestic production decline of nearly a sixth, and limited export prospects.

⁶⁰ Lawrence Goulder and Marc Hafstead, “Tax Reform and Environmental Policy: Options for Recycling Revenue from a Tax on Carbon Dioxide,” Discussion Paper, Resources for the Future, October, 2013, Table 7, <http://www.rff.org/files/sharepoint/WorkImages/Download/RFF-DP-13-31.pdf>.

Percent change in price of coal at the minemouth



EPA CPP RIA Table ES-11, Summary of Important Energy Market Impacts; Goulder & Hafstead 2013, Table 7.

EPA estimates that the CPP will cause domestic coal production for the electricity sector to fall by 15% and 21% by 2025 and 2030 respectively.⁶¹ However, we could not find an estimate on the impact on coal production of a carbon tax with a price below \$20 per ton.

This brings us to the next logical question: would a carbon tax with a higher “national” price than that implied by the CPP—at the least, above \$20 per ton—have any possible upside for the coal industry? Answering that requires assessing whether carbon capture and storage (CCS) can become an economically viable technology.

As the price of CO₂ increases, coal demand declines. The RFF study by Paul, Beasley, and Palmer estimated that a carbon tax of \$54 per ton of CO₂ would reduce coal-fired power generation to 7% of the power to the grid by 2035. A paper by the National Economic Research Associates (NERA) on behalf of the National Association of Manufacturers estimates that a carbon tax of \$20 (in 2012, rising by 4% per year in real terms, and so reaching \$39 in 2030) would reduce domestic coal production by 44% by

⁶¹ U.S. Environmental Protection Agency, “Regulatory Impact Analysis for the Proposed Carbon Pollution Guidelines for Existing Power Plants and Emission Standards for Modified and Reconstructed Power Plants,” June, 2014, Table 3A-2, <http://www3.epa.gov/ttnecas1/regdata/RIAs/1111dproposalRIAfina10602.pdf>.

2023, and 45% by 2033, respectively.⁶² It would require much higher carbon prices, however (probably on the order of \$75-\$100 per ton), to make CCS attractive without subsidies.

A 2012 study for RFF by Liwayay, Adkins et al. modeled the impact of Waxman-Markey and found that CCS, if proven to be viable, could salvage the coal industry.⁶³ They estimated that coal production would reach its nadir in the short run, declining 33%. However, assuming CCS' viability, production of coal would decline by only 14% and 17% below the baseline over the medium and long run.⁶⁴ These medium and long run estimates for the decline in coal production are much less than the declines EPA estimated for the CPP in 2025 and 2030.

While CCS has been marketed as a technology that could save the coal industry, two major obstacles remain. First, carbon prices must be high enough to justify the cost. CCS is expensive because the CO₂ separation process consumes about 25% of the plant's output. A real-life case—Mississippi Power's Kemper facility, the only coal plant with CCS being built in the U.S. — is years behind schedule and more than \$3 billion over budget.⁶⁵ Despite the huge amount of federal subsidies available, there is a long list of cancelled CCS coal projects. One of the other two U.S. projects still on the books—Summit Power's Texas Clean Energy Project—appears extremely vulnerable. Second, there is no regulatory framework regarding how long the CO₂ must remain underground, who is responsible for keeping it there, and what will happen—including tort liability—if the CO₂ escapes.

If the industry were to accept a carbon tax, it could reasonably ask for path to regulatory certainty for CCS, along with additional subsidies, as a quid pro quo. Ultimately, only CCS has much hope of saving the coal industry if CO₂ constraint continues along its current trajectory. Accordingly, even a carbon tax far higher than the implicit tax imposed by the CPP may work to the coal industry's favor, if economically deployable CCS technology were to emerge as a consequence.

Possible Assistance for the Coal Industry

⁶² "Economic Outcomes of a U.S. Carbon Tax: Full Report," NERA Economic Consulting for the National Association of Manufacturers, July 26, 2013, <http://www.nam.org/Issues/Tax-and-Budget/Carbon-Tax/CarbonTax-2-22-13/>.

⁶³ Liwayway Adkins, Richard Garbaccio, Mun Ho, Eric Moore, and Richard Morgenstern, "Carbon Pricing with Output-Based Subsidies: Impact on U.S. Industries over Multiple Time Frames," Discussion Paper, Resources for the Future, June, 2012, <http://www.rff.org/files/sharepoint/WorkImages/Download/RFF-DP-12-27.pdf>.

⁶⁴ Alas, no time frames were defined for "medium" and "long" run.

⁶⁵ "Kemper County IGCC Fact Sheet: Carbon Dioxide Capture and Storage Project," MIT Carbon Capture and Sequestration Program, August 6, 2015, <https://sequestration.mit.edu/tools/projects/kemper.html>.

Given the recent decline in stock prices, some could argue that it would be cost-effective for the government to buy out the entire coal industry and shut it down in an orderly manner. The current market valuation of the four public companies discussed above is only about \$1 billion in total - but there are tens of billions in debts and other obligations that any buyer would inherit. It might also be argued that in practice many of these may ultimately fall on the taxpayers anyway. But this would be a massive and highly controversial program that would be opposed by many on ideological grounds, not least of all because it would create a very large number of highly dependent communities. We believe the true lesson of the collapse in the market and the low valuation of the stocks is that the scale of the industry problem is manageable, and that more modest—but still costly—programs are likely to be more feasible.

Were a carbon tax enacted, Congress would likely consider programs to offset the impact of the tax on the coal sector. The industry already receives subsidies and grants under a relatively small number of federal programs, and Congress has provided ad hoc help under a number of programs in the past. In addition, the Federal government spends about \$350 million per year on coal-related R&D, (primarily for CCS),⁶⁶ and provides favorable depletion allowances and investment tax credits for integrated gasification combined cycle, and other advanced coal-based electricity generation technologies, including CCS.

Congress could offset the impact of a carbon tax by providing assistance to coal mining companies, mine workers, and states with significant coal mining activity. We consider some possibilities below.

Offsetting Impacts on Coal Mining Companies

There is precedent for action to address the impacts of regulation on coal companies. For example, Congress has previously recognized that smaller coal companies may be proportionally more affected by federal regulation. Accordingly, Congress charged the Small Business Administration with assisting small companies if the SBA determines that such regulation is likely to cause “substantial economic injury.”⁶⁷

Three federal measures impose significant costs on the coal industry that Congress could reduce in whole or in part. Two stem from the Surface Mining and Coal Reclamation Act (SMCRA), and one from the Black Lung Benefits Act of 1972 and its successor statutes. A bankrupt or terminally declining industry would find it impossible to support such programs, leaving a void that states or the federal government would be expected to fill.

⁶⁶ “President Requests \$842.1 Million for Fossil Energy Programs,” U.S. Department of Energy, February 2, 2015, <http://energy.gov/fe/articles/president-requests-8421-million-fossil-energy-programs>.

⁶⁷ Federal Coal Mine Health and Safety Act of 1969; P.L. 91-73, § 504.

SMCRA imposes a production excise tax of \$0.12 per ton of underground-mined coal, \$0.28 per ton on surface-mined coal, and the lower of 2% or \$0.09 on lignite coal. Those revenues fund SMCRA's Abandoned Mine Land Fund (AML Fund), which is designed to address legacy reclamation costs of mines that were abandoned before 1977 and "for which there is no continuing reclamation responsibility under State or other Federal laws."⁶⁸

In 2013, this tax yielded \$216 million. Congress could subsume this tax within a federal carbon tax, and separately provide for the AML Fund.

SMCRA also requires that coal mining companies post bond to ensure "faithful performance of all the requirements of this chapter and the [SMCRA] permit."⁶⁹ Chief among those requirements are reclamation obligations. SMCRA allows for self-bonding (without separate surety or collateral) for companies with "a history of financial solvency and continuous operation"⁷⁰ and SMCRA's implementing regulations provide that each state determines the required amount of the bond.⁷¹ In turn, state regulations require bonding in amounts required for full reclamation.

In addition to the actual cost of the bond, the bonded party is required to post 20% collateral. It appears that close to \$2 billion in coal company assets are tied up in this fashion, and this amount is expected to increase as more coal companies no longer qualify for self-bonding.

The federal government could greatly reduce the amount of such restricted assets by guaranteeing some or all of the companies' collateral obligations. Based on the top producers' bond exposure, this would be worth \$100 million per year in free cash to the industry, a value that would increase if interest rates rise.

The Black Lung Disability Trust Fund was established to compensate miners whose last employment terminated before January 1, 1970, or where individual liability cannot be assessed against a coal mine operator. It is funded by a tax of up to \$1.10 per ton for deep-mined coal, and up to \$0.55 per ton for surface-mined coal (lignite is exempted), neither amount to exceed 4.4% of the gross sales price.⁷² The Emergency Economic Stabilization Act of 2008 provides that, as of January 1, 2019, those rates will fall to \$0.50 on underground coal and \$0.25 on surface coal. The mining industry paid \$531 million into the Trust Fund in 2013.

⁶⁸ SMCRA §§ 402(a), 404.

⁶⁹ 30 U.S.C. § 1259(a).

⁷⁰ 30 U.S.C. § 1259(c).

⁷¹ 30 CFR § 800.14(a).

⁷² 26 U.S.C. § 4121.

Congress could subsume this tax to a carbon tax, and assume funding obligations to the Trust Fund. Congress regards the Trust Fund as a cooperative mechanism between companies and the federal government,⁷³ and has previously directly assisted the Fund: the Treasury lent the Fund more than \$1 billion a year for 2003-2008, and Congress then paid off the Fund's debt in 2009. Subsequently, the Treasury lent the Fund another \$1 billion. Paying that off could be part of a carbon tax package.

Offsetting Impacts on Coal Industry Workers

EPA has estimated that the CPP will cost 13,300 coal-mining jobs out of the existing 80,000. Most coal mining jobs are concentrated in just three states: West Virginia, Kentucky, and Pennsylvania. Ten other states, however—California, Florida, Georgia, Illinois, Michigan, Missouri, New York, North Carolina, Ohio, and Texas—have more than 1,000 such employees. EPA estimates that an additional 14,700 jobs (out of the 392,000 existing jobs⁷⁴) will be lost in the coal electricity sector.

There are many ways to assist those who become unemployed as a result of a carbon tax, but a dedicated program would seem appropriate. For example, the President's 2016 budget proposes funding for:

- Workers dislocated from coal mines and coal-fired power plants;
- Economic development planning and implementation activities for those communities most affected by coal economy transition;
- Brownfields redevelopment grants for communities affected by the retirement of coal-fired power plants, and
- Funding for several general rural development and assistance programs.

The industry scorns this program. The CEO of the National Mining Association, Hal Quinn, has said⁷⁵

The administration now promises federal assistance to stricken Appalachian coal communities. But it is these regulations that have so often left communities distressed in the first place. The administration may deny they are waging a "War on Coal," but this sure looks like war reparations.

⁷³ The federal government "shall assume all or part of the liability of such operator in return for the payment of premiums to the insurance fund" (Black Lung Benefits Reform Act of 1977, § 433(c)(1)).

⁷⁴ U.S. Department of Labor, BLS Data Viewer, subsector (NAICS 2211), http://beta.bls.gov/dataViewer/view/timeseries/IPUCN2211_W200.

⁷⁵ Hal Quinn, "Coal: The Changing Political and Policy Landscape," speech before Longwall USA 2015, June 17, 2015, <http://nma.org/index.php/speeches-op-eds-and-letters-to-the-editor/2202-coal-the-changing-political-and-policy-landscape>

Hillary Clinton has proposed something quite similar though more far reaching: a \$30 billion potpourri of programs including a federal back-up for mineworkers' health and pension plans, reform of the Black Lung program, plus help to local communities through new schools, infrastructure, and investment tax credits.⁷⁶

It is worth noting that in the course of addressing the downsizing of the U.K. coal industry in the 1980s and 1990s, a somewhat similar program was run by a government-funded, industry-managed company (British Coal Enterprise Ltd., on behalf of the U.K. coal industry). That, plus a concerted effort by national and EU agencies, helped create over 100,000 new jobs.⁷⁷

Congress has traditionally supported mine workers via direct assistance to the United Mine Workers (UMW).⁷⁸ For example, the Energy Policy Act of 1992 authorized the transfer of up to \$70 million annually of interest income from the Black Lung Disability Trust Fund to the UMW to help pay the health benefits of retired miners.⁷⁹ And in the 2007 amendments to SMCRA, Congress provided that the AML Fund would transfer various amounts to the UMW's Combined Benefit Fund, 1992 Benefit Plan, and Multiemployer Health Benefit Plan.

The recent spate of bankruptcies call into question the viability of these multiemployer plans. Both Peabody and Arch have been sued by the UMW Pension Plan, and stand accused of trying to offload pension obligations in the creation of Patriot Coal (which is also in Chapter 11).⁸⁰ Arch cited the bankruptcy of Patriot as forcing it to take on \$149 million in additional financial obligations for the multi-employer plans in its recent 3Q filing,⁸¹ and Alpha has proposed to shed its pension and benefit obligations in the process of exiting Chapter 11.⁸²

The Administration's proposed 2016 budget contained a specific line item to "improve coal miner retiree health and pension benefits" (\$363 - \$411 million per year over ten

⁷⁶ "Hillary Clinton's Plan for Revitalizing Coal Communities," undated factsheet, <https://www.hillaryclinton.com/p/briefing/factsheets/2015/11/12/clinton-plan-to-revitalize-coal-communities/>

⁷⁷ Christina Beatty, Stephen Fothergill, and Ryan Powell, "Twenty Years On: Has the Economy of the UK Coalfields Recovered?" *Environment and Planning A*, 39, pp. 1654-1675, <http://www.channel4.com/media/c4-news/pdf/coalfields.pdf>

⁷⁸ The UMW currently has 73,000 members, two thirds of whom—47,000—are in West Virginia.

⁷⁹ P.L. 102-486.

⁸⁰ Matt Jarzemsky and John Miller, "Coal Pension Plan Sues Miners Peabody Energy and Arch Coal," *Wall Street Journal*, July 16, 2015, <http://www.wsj.com/articles/coal-pension-plan-sues-miners-peabody-energy-and-arch-coal-1437091478?alg=y&cb=logged0.856471044011414>.

⁸¹ SEC filings from Arch Coal, <http://investor.archcoal.com/phoenix.zhtml?c=107109&p=irol-sec>

⁸² "Bankrupt Coal Company Alpha Seeks to Drop Miner Benefits," *Reuters*, Nov. 5, 2015, <http://www.reuters.com/article/2015/11/06/alpha-ntrl-resc-pensions-idUSL1N13107E20151106#d6lsKwOJqysbQDgP.97>.

years for a total of \$3.9 billion), but this was not included in either the Republican budget resolution or the Democrats' budget proposal.

Offsetting Impacts on the States

Any federal carbon tax legislation would likely include payments to the states, and distributional formulas that would include factors based on generation of coal-fired power, consumption of same, and excise tax revenue.

When Congress has previously imposed new obligations on coal mining, it has establishing “institutions of higher education at which university coal research laboratories will be established and operated,” and located those institutions in states “with abundant coal reserves.”⁸³ It has also established fellowships “for graduate study and research in those areas of applied science and engineering that are related to the production, conservation, and utilization of fuels and energy.”⁸⁴

Further Support the Industry Might Seek

Just as the federal government has numerous programs that pay agricultural interests not to grow crops, it could pay coal companies not to mine coal. The payments (in the form of either direct transfer or tax credit) could be set at the marginal profit per ton of coal *not* mined from company reserves. The number of qualifying tons could be determined by the difference in current year production from a 5-year rolling average of previous production.

Legislation could also include immunity from federal (and possibly state) common law damage claims from global warming and the ocean acidification effects of CO₂.⁸⁵ Given the amounts at stake, even a small risk of any sort of judgment against the industry could easily drive further bankruptcies via depressed stock prices.

Carbon tax revenues could also be used to subsidize mine clean-up efforts. Currently, coal companies have full liability for mine reclamation efforts, which can be quite costly. High clean-up costs create a barrier to exit for the industry, providing a disincentive for producers to close mines and reduce supply. Greater supply, all else equal, puts downward pressure on price, which in turn reduces cash flow and the ability for large producers to meet their debt obligation. By using carbon tax revenues to subsidize mine clean-up efforts, coal companies could address one of the systemic issues weighing on price while still sharing some of the environmental costs with the federal government --a potential a win-win for the industry, as well as taxpayers.

⁸³ SMCRA § 801(a), (b)(1).

⁸⁴ *Ibid.*, § 901(a).

⁸⁵ David Bailey and David Bookbinder, “The Cold, Hard Truth about EPA & Greenhouse Gas Regulation,” *Climate Unplugged*, July 16, 2015, <https://climateunplugged.com/blogpost/?postid=1449>

As in 1990, Congress could grandfather a proportion of the existing coal-fired power plants from the tax, or could apply a lower tax rate for 10-15 years. A similar approach was taken in the EU ETS, where coal plants were given free allowances based on historical emissions levels.

Removing natural gas export limitations—widely regarded as outdated anyway—would also improve the investment outlook for retaining coal capacity by increasing forward natural gas price expectations.

Conclusion

The coal industry is facing a choice of two possible futures. One future (the one we're presently rushing towards) would have coal-fired electricity effectively—and perhaps rapidly—regulated out of existence. The other future would entail a political deal in which coal-fired electricity is allowed to survive, albeit with a penalty on carbon emissions to reflect—at least in part—the impact of its CO₂ emissions.

The actual level of cost penalty under the regulatory and tax options—within any plausible range of tax—is somewhat irrelevant. The key issue is that under one option—regulation—coal will cease to be viable in electricity markets no matter how much progress is made in reducing costs, encouraging CCS, or what happens to other fuel prices. The other option—carbon taxation—holds out the hope of easing some of its immediate financial and community woes, and remaining a viable (albeit somewhat smaller) part of the generation mix until CCS becomes a realistic and competitive technology.

The good news for the coal industry is that such an approach would find sympathetic ears in both parties. The coal industry, after all, plays an outsized role in isolated rural communities that have difficulty attracting other employment--communities often found in presidential battleground states. Both President Obama and Hillary Clinton have proposed robust assistance for the coal sector as we transition away from coal as a source of electricity. Republicans, for their part, speak even louder about the need to save the coal industry. Alas, their only plan to do so—end EPA regulation of greenhouse gas emissions—is politically implausible.

Why should conservatives support such a policy? Isn't it just creating yet more crony capitalism by putting the coal sector on the dole? In fact, the opposite is the case. The coal industry is facing terminal decline as a direct result of government policy, albeit combined with the market challenges brought about by shale gas. An unfettered, chaotic decline of the coal industry would create major social and economic issues such as deep regional unemployment and a multitude of unfunded liabilities, particularly for

coal-dependent states. Compensation for the losers from government policy action is an important conservative principle.

Compensation should reflect the actual damage inflicted while, if possible, avoiding any growth in government. Some of the possible industry concessions could potentially expand government's reach and would need to be carefully designed to avoid such growth. Most concessions, however, would be associated with matters related to past liabilities that would otherwise fall to the state. Regardless, government is on a growth path at present via the EPA's CPP, and similar rulemaking slated to follow to address other industries.

Why should environmentalists agree to this? The main reason is that Clean Air Act CO₂ regulation is fraught with uncertainty. EPA rulemakings, after all, rarely take place on a fixed schedule. Usually, EPA gets sued for missing a statutory deadline to "review, and if necessary revise" applicable regulations. Then comes either a finding that all is well—which is usually challenged by the parties who sued EPA in the first place—or a new rulemaking is ordered. In the first case, the court can agree with EPA (which provides certainty until the next lawsuit) or tell EPA to start a lengthy new rulemaking process. Once a rulemaking starts, it begins with a proposed rule (which may take several years), followed by a final rule which may bear little resemblance to the proposed one. Then come the inevitable legal challenges, which frequently leads to the rule, in or whole or in part, being sent back to the agency to begin all over again. Moreover, at any time, a change in Administration can start, stop, slow down or speed up a given rulemaking. A negotiated agreement about how best to go forward makes political and policy sense.

The history of the New Source Review (NSR)—a rule designed to govern when upgrades to power plants originally grandfathered under the Clean Air Act are substantial enough to make those plants "new sources" of emissions and, thus, subject to tighter regulation under the Act—highlights the risks (from an environmentalist perspective) associated with environmental rulemaking. The 1977 CAA amendments established the NSR regime, but determined industry opposition, lack of enforcement, unenergetic regulatory initiatives, legal challenges, and frequent leadership changes at EPA prevented the standards from being enforced as originally envisioned. It wasn't until 2007—30 years after Congress enacted the NSR—that the legal and political wrestling match was finally resolved in the environmentalists' favor via a unanimous Supreme Court decision in *Environmental Defense vs. Duke Energy Corp.*⁸⁶

A federal carbon tax would create regulatory certainty for industry and for environmentalists. Each category of sources subject to the tax would no longer be subject to the vagaries of EPA CO₂ regulation under the Clean Air Act.

⁸⁶ William Eubanks II, "The Clean Air Act's New Source Review Program: Beneficial to Public Health or Merely a Smoke & Mirrors Scheme?" *Journal of Land, Resources, and Environmental Law* 29:2, 2009, pp. 361-375, <http://epubs.utah.edu/index.php/jlrel/article/viewFile/158/138>.