Comments Submitted to the Department of the Interior Listening Sessions on Reform of the Federal Coal Lease Program:

The Federal Government Owns the Nation's Largest Coal Deposits – and Must Act Accordingly

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August 2015

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Executive Summary

The U.S. government is the owner of the country's largest remaining domestic coal reserve, in the Powder River Basin. However, over the past 30 years, the government has acted as a passive owner, turning the reins of the program over to the private coal companies that lease the coal for mining.

Now, coal markets in the U.S. and across the globe are in a state of fundamental structural decline. U.S. coal companies are in dire financial stress. The changes are not reversible. Coal's market share for electricity in the U.S, which was 51% in 2007, has shrunk to 39%, and is likely to shrink further, to 30% or even 20%, given the growth of renewables, efficiency and investments.

The Institute for Energy Economics and Financial Analysis (IEEFA) has done extensive analysis of the federal coal lease program in the past, most notably in the 2012 report "The Great Giveaway."[1] That report revealed that the program had not been audited in 30 years, and that reforms of the program that had been promised as a result of earlier scandals had never been enacted. Audits done by the General Accounting Office and the Inspector General of the Department of Interior (DOI) have since confirmed the report's findings.

IEEFA's[2] prescriptions for change stem from this premise: There has never been a fair-market coal-leasing program. The idea that coal is sold by the Department of Interior to coal companies at a price that can meet any standard of a fair market, either a competitive standard or a reasonable alternative, is a pretense. It is essential to acknowledge this in order to understand what changes are needed in program administration and fiscal decision-making and what is possible.

IEEFA's analysis is built on two basic assumptions: 1) The U.S. government can no longer act as a passive owner (DOI must become active, and it already has many of the powers under the law to do so). 2) The coal industry has no plan to bring discipline and rationality to U.S. coal markets in this time of monumental change, and cannot be relied upon to provide financial leadership or acceptable economic-development policy.

IEEFA recommends that DOI take the following actions:

- Enact a moratorium on all coal leasing.
- Use the planning tools in the statutes to address the need for market stability.
- Take back leases on existing mines that produce low-quality coal and assess higher-quality mines for financial solvency and overall landscape of potential for distressed sales and bankruptcies.
- Ban all coal exports from the Powder River Basin (PRB).
- Reduce royalty payments by half over the next 10 years in exchange for industry acceptance of the administration's regulatory program on climate, environment, mine safety and coal transition.
- Establish a research unit at DOI on the coal lease program.

[1] http://ieefa.org/study-almost-30-billion-in-revenues-lost-to-taxpayers-by-giveaway-of-federally-owned-coal-in-powder-river-basin/
[2] See Appendix I: IEEFA Selected Publications

- Appeal to the GAO for high-risk status for regular audits and/or integrate into the comprehensive climate initiative.
- Replace all staff in state offices of the BLM related to the coal-leasing program and change the culture of the agency.
- Actively pursue the federal government's interest in coal company bankruptcy proceedings.
- Spearhead transition opportunities to assist workers and communities.

The Bureau of Land Management and other bureaus within the Department of Interior with operational and oversight responsibility have been mired in a failed business and policy model that looks backward and fears the future. The DOI must make fundamental changes in how it addresses the current and future market, and must live up to its public-interest mission.

What Has Caused the Recent Dramatic Changes in the Coal Industry's Financial Fortunes?

The industry-dominated partnership in the federal coal lease program worked well for the coal companies for many years, providing them with a steady stream of cheap coal, which they sold to the utility industry to fuel coal-fired power plants. State governments endorsed new coal plants, banks financed them, and electricity rates remained relatively low. In the mid-2000s, the industry was planning to ramp up construction of coal-fired power plants in the U.S. with over 150 plants on the drawing board. However, that plan fell apart in the face of public opposition and changing markets, as natural gas and renewable energy became more competitive. It was also becoming apparent at the time that the nation's aging and financially troubled existing fleet of coal plants suffered from weak capacity, revenue performance and diminished future prospects

The many market changes that have occurred since 2007 have turned the once-stable situation on its head. Coal is no longer the least-cost option at state regulatory boards. Its future viability is mostly dependent on political support from state regulators or, in the merchant fleet, on must-run orders and/or favorable capacity payments. Capacity-payment decisions are generally based on strategic location with almost no independent, stand-alone financial rationale.

As a result of these massive market changes, the federal government, as owner of the coal in the single largest remaining active coal region in the U.S. faces unprecedented challenges.

PRB Production Will Stop Growing, and is Likely to Shrink

First, although coal production in the PRB has grown for the past three decades, the next three decades will be different. Although the PRB will still be the go-to region for the nation's coal, growth—if growth occurs—will be much slower. In 2014, actual production levels from the PRB totaled 418 million tons. The Energy Information Administration's Annual Energy Overview in 2011 estimated PRB production would reach 700 million tons per year (mtpa) in 2030. But by the time it issued its 2014 outlook, the EIA had lowered it 2030 outlook to 500 mtpa. Ongoing discussions in the coal trade press, and in U.S. EPA scenarios for the new Clean Power Plan, project total annual U.S. production levels shrinking to 600 million tons. This would likely mean a level of 275 mtpa from the Powder River Basin.

The Coal Industry's Financial Woes Will Lead to Further Instability in the PRB

The coal industry is seeing a cascade of dismal production performance and the federal government's partner coal companies are in a state of major financial distress. Most of the major coal producers in the country have lost more than 90% of their value. Coal demand, prices, production, consumption, profits, stock prices, liquidity levels, and dividends are all down. Unmanageable debt loads, layoffs, mine closings, liability concerns, distressed sales, and bankruptcies are on the rise.

The PRB coal companies' various formulations and reformulations of management strategies in the last few years have failed. Those strategies have emphasized various keys to success, including maintaining a low cost of production, the importance of low-sulfur coal, defeating environmental and climate regulation, frustrating investment in renewable energy, and demonstrating competitive coal quality against international competition. These active efforts are occurring at a time of low natural gas prices, a major driver of coal's lost market share. ***Although the PRB is likely to remain a lead producer of coal, the business model currently being used by companies under federal lease is not capable of producing that coal at prevailing and expected market prices.***

PRB Producers Are Losing Money on Low-Quality Coal, and Often On Higher-Quality Coal Too

PRB producers Alpha Natural Resources, Cloud Peak Energy and Peabody Energy—in decisions that represent immediate fallout from the current industry downturn—have recently, though grudgingly, declared that lower-quality PRB mines under federal lease effectively no longer constitute economically minable reserves. Lower-quality mines are those that produce coal of 8400 Btu or lower. Some companies are cutting production, some are also writing down the assets and some are deploying accounting techniques and corporate spin that still try to deflect and minimize balance-sheet realities.

Peabody Energy has cut production at its low-coal-quality Caballo mine by 50 percent. The Caballo mine, along with Peabody's Rawhide mine, remains profitable on paper but lags tprofit margins on higher-quality North Antelope PRB property. Cloud Peak is reducing its production at its Cordero operations, a mine that produced 34 million of its 87 million ton total enterprise-wide production in 2014. It also wrote down the asset recently by $33 million. Alpha Natural Resources' Eagle Butte and Belle Ayre mines are both posting negative margins.

Given the changed market conditions, this coal is not economically recoverable in any sustainable way and there is little evidence to suggest a market recovery anytime soon. Peabody's CEO, Glenn Kellow, commented last month on the difficulty of mines coming back from closures and reductions in this environment. [3] Kevin Crutchfield, the CEO of Alphas, a company now in bankruptcy, has stated that the current market is not a typical market downturn. IEEFA has calculated the amount of coal under lease with the federal government by four major PRB producers (see Table I). Of the 6.103 billion tons of coal under lease to these four producers, IEEFA finds that 1.957 billion tons—or 32% of the total currently under lease— is low-quality coal and is not economically recoverable. Several of the troubled

[3] http://seekingalpha.com/article/3365625-peabody-energy-btu-glenn-l-kellow-on-q2-2015-results-earnings-call-transcript?page=6&p=qanda&l=last

mines identified below were granted coal leases since 2008, when the downturn in the coal markets began.

Table I: Lower-Quality Coal Holdings Under Federal Coal Lease In Powder River Basin: Selected Companies (in billions of tons of assigned tons of coal reserves)

Company and Mine	Assigned Reserves Below 8400 Btu	Assigned Reserves Above 8400 Btu	Total Assigned Reserves
Alpha Natural Resources			
Eagle Butte & Belle Ayre	0.7		0.7
Arch Coal			
Black Thunder		1.154	1.154
Coal Creek	0.152		0.152
Peabody			
N. Antelope Rochelle		2.136	2.136
Rawhide	0.238		0.238
Caballo	0.603		0.603
Cloud Peak			
Cordero	0.267		1.12
Spring Creek & Antelope		0.853	0.853
Total	**1.957**	**4.143**	**6.103**

The combined annual coal production of the lower-quality mines was approximately 90 million tons in 2014. For the most part, this coal was mined and sold at a loss, a condition that is not sustainable. While coal producers can abide by the technical, legal requirements of their lease as long as they meet minimal production levels and/or payments to the federal government, the market reality is that these assets have substantially diminished, if any, value.

New dynamics are now affecting the BLM leasing process. In fact, the BLM has recently found it a commonplace occurrence to receive no bids at all on its lease auctions. This means that, after years of preparation to secure a new coal mine, companies have decided to take a pass come the day of actual bid submission. The lease sale is ultimately canceled because no company appears to place a bid. A few active leases still remain.

The U.S. Coal Industry's "Export or Die" Strategy Is Dead

The coal industry's plans to revive their operations by exporting coal from the PRB to Asia have collapsed in the face of the structural decline in the global coal markets.

Up until about 2008, the U.S. coal industry had almost no interest in exporting. On the West Coast in particular, the industry had a legacy of failure at the Los Angeles terminal. When demand for coal from China and Asia began to spike around 2008 —just as the coal market in the U.S. began its downturn—the coal industry pinned its hopes for expansion on the export market—a strategy that Platt's called "export or die."

Some companies in the PRB, notably Cloud Peak and First Energy/Gunvor, managed to improve their balance sheets with modest tonnage growth and impressive revenue increases. Most of the remaining PRB producers signed on for new Asia-bound coal ventures, while some were benefiting from other export interests off the East Coast and Gulf of Mexico based on overseas holdings. The industry made plans for new and expanded leases through the BLM, half a dozen new export terminals in Washington and Oregon, additional capacity contracts through Canadian ports, and new rail proposals. The market even attracted a few new PRB entrants to mining, port, and rail opportunities.

U.S. coal producers used their profitability, secured in part with cheap coal from below fair-market leases granted by BLM, to capitalize export platforms. These capital expenditure plans were based on the premise that robust demand from China and other Asian countries would continue. The coal producers were also counting on competing supplier nations not ramping up production and on no new countries entering the market.

However, in reality, few, if any of these scenarios broke in favor of U.S. coal producers. Existing supplier countries (like Indonesia and Australia) began announcing massive coal projects, and countries that previously had small or no export capacity (like Russia and Mongolia) ramped up and offered more regional competition. World market prices have collapsed in the past few years and will remain unsustainable for the foreseeable future.

Therefore, U.S. coal exports, especially those off the West Coast of the U.S., will not expand to the levels that formed the basis of most of the coal companies' capital-expenditure programs, which are now draining rapidly-diminishing company liquidity.

In the face of these many changes, the BLM apparently still remains wedded to the policy that the coal producers know best. But the track record shows that this policy is flat-out wrong. The passive management style of the federal government does not work in the current environment. The problems in the relationship between the federal government and the coal industry go well beyond anything that can be solved with a few technical changes or tweaks to the coal-lease program. The federal government needs to start acknowledging that it, not the private coal companies, is the owner of the coal—and it needs to behave accordingly.

How Has the Coal Industry Controlled the Federal Coal Lease Program for the Past Thirty Years?

A. The Department Does Not Administer a Fair-Market Value Program to Lease Coal, and It Never Has

The federal government has a mandate to charge a fair-market value for the coal that it leases to private coal producers, which then mine and sell the coal to electric utilities in the U.S. Some of the coal is exported to other countries.

The last major review of the federal coal-leasing program occurred in the 1980s. It grew out of a scandal in which federal officials were found to have been fixing the price of coal at below fair market value, giving private coal producers an advantage—and cheating taxpayers.

However, despite that scandal, and despite DOI's subsequent promises to reform the program, the unfair leases were never nullified. The base prices of coal established in the 1980s became the reference prices for all future coal leases. Prices for coal from the PRB remained low and program methods did not change.

For 30 years after that, no one in Washington conducted a review to see whether DOI made any of the changes it had promised in the 1980s. Finally, in 2012, then-Congressman Edward Markey started to ask questions. IEEFA released its report the "Great Giveaway" shortly thereafter and media coverage ensued. In response to Congressman Markey's inquiries, the GAO noted that the same uncompetitive environment that existed in the 1980s exists today.

Because there was no program oversight for 30 years, there were no attempts to document any violations of internal control procedures, program irregularities or any revenue losses. During those 30 years, PRB coal, largely owned by the federal government, became the dominant form of coal use for U.S. electricity. In the late 1970s, PRB coal accounted for 17% of coal used for electric generation in the U.S., and by the 2000s, that number had risen to approximately 47%.

A "Market of One" Is No Market at All

As a result of requests by Congressman Markey and others, several reviews of DOI/BLM's compliance with its fair-market mandate have been conducted over the past three years. This is critically important, because competitive bidding is the principal method by which the federal government is supposed to determine a fair-market price. In other words, a "market of one" is no market at all. The GAO, in an audit issued in 2014, concluded that 90% of the federal leases had not been competitively bid.

In the absence of a competitive bid process, the BLM derived its own price for the coal. The creation of a bid price that acts as a market proxy is a second-best alternative to a competitive bidding process, and is valid if it is objectively verifiable. However, both the GAO and the IG found that the BLM's price-setting process was highly questionable. The process lacked various internal control practices, engineering data was not independently verified, staff practices on key valuation decisions were unaccountable, and any attempts at intervention from either the secretary of the Interior or observers from outside of the department were rebuffed.

Because BLM's management of the coal lease program did not produce a fair-market value for the coal, the price was in effect determined not by a market but by negotiation. The result has been an unofficially sanctioned, industry-controlled partnership between the Department of Interior and the coal industry. The parcels and timing for leasing bids were not selected by market criteria but by corporate strategic decisions.

One way to look at this is as an abuse of the fair-market value concept. Another way to look at is as a choice made by the U.S. government to supply cheap coal and provide producers with a monopoly. [4]

Incredibly, BLM's official policy on almost all matters that it does not substitute its judgment for that of the coal producers. The fair-market value price, consequently, was based on a flaw and a fraud. It was then left uncorrected and flowed through each lease transaction as a repetitive distortion, shielded by the cloak of proprietary rulings, somnolent auditors, a distracted inspector general, bipartisan amnesia in Congress, and watchdogs off on the scent of other scandals. Apparently the only ones with the phone number and address of the BLM state offices were the coal companies.

In its report, the "Great Giveaway," IEEFA estimated that taxpayers had lost over $30 billion due to the lack of fair-market value for the coal. To make this determination, IEEFA relied heavily on the methods used by the GAO and the 1984 report by the Linowes Commission (formerly known as the Commission on Fair Market Value for Federal Coal Leasing) because they were, sadly, the last publicly available reviews of the program. IEEFA also found contemporary data that fleshed out the historical pattern.

IEEFA cited four major types of evidence to support its research:

- The original distortion to the market price of coal created in 1980 and documented and substantiated by the GAO and the Linowes Commission, as well as indirectly by the Department of Interior Inspector General;
- subsequent statements by BLM staff to the GAO that the Department of Interior policy was to flood the U.S. market with cheap coal for economic-development purposes;
- a leading coal company presentation to its investors in 2010 that demonstrated that the company's in-house valuation of PRB coal far exceeded the current market price of coal, and that the gap was likely to widen (the depressed PRB market price placed PRB coal at a significant, long-term competitive advantage over Central Appalachian coal);
- red flags suggesting apparent coal company gaming on one 2012 single-bid lease transaction.

The 2014 reports by the GAO and the DOI inspector general found many of the same internal control weaknesses that Linowes had found three decades earlier. The GAO noted there had been no improvement in the competitive environment in 30 years. The GAO, the organization that did seminal work during the 1980s, barely mentioned the fact that it had conducted 25 audits of the program during the 197's and early 1980s —and then none at all for almost 30 years. It never mentioned that its audit in the 1980s found that the DOI/BLM had cost taxpayers millions when it fixed the bids. However, neither report delved substantively into the long-term market distortions caused by a failure to develop a program of robust market competition for the coal. And neither report addressed the structural flaws in the coal pricing that IEEFA found in its 2012 report.

The reports nevertheless had solid findings. What emerged was a consensus that BLM's system for setting royalties on coal sold for export was flawed and needed to be reformed to take into account

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[4] This broad policy choice is the type of decision referenced by Daniel Yergin in his book *The Quest.* Although he doesn't explicitly address the monopoly giveaway in the PRB, IEEFA sees it as a strong analogy.

the value of planned export sales into the (secret) fair-market valuation of the coal leases.

Coal Industry Benefited by BLM's Decision to Turn a Blind Eye to Their Exports Strategy

Over the past six years, the coal industry has launched one of its most important initiatives: selling coal from the PRB for export. This initiative was manifested in the individual declarations of every coal company doing business in the PRB, many of their multi-million dollar investments in West Coast port projects, plans by national coal organizations to build new export terminals on the West coast, and lobbying efforts by Wyoming and Montana officials to obtain support from State of Washington officials and to attract Asian investments.

But, as auditors and investigators found in 2014, BLM ignored this exports agenda, and its accompanying market signals, when valuing the coal it was leasing to coal companies. During this period, all of the major coal producers in the region were bidding for new mines, all with the stated intent to use the reserves for export purposes. BLM, however, did not base the fair-market value on the price of coal sold for export, which was considerably higher than the price of coal sold for the domestic market.

The GAO, the inspector general, several U.S. senators, the secretary of the Interior, several Washington watchdog organizations and business trade publications have all questioned this decision, which was quite costly to U.S. taxpayers. BLM held firm until recently and the coal industry still denies any issue of fairness or substantial reason to change policy.

DOI should acknowledge, without equivocation, that the fair-market value program as it stands now no longer works for either the agency or the industry. Unless DOI takes leadership, the current state of coal markets and financial distress of the coal companies in the PRB means that an orderly administration of the program is at risk.

B. The Royalty Program Allowed Coal Companies to Evade Paying for Coal Sold for Export

During the past three years, as members of Congress, the GAO, the inspector general and the secretary of DOI were reviewing the questions of fair-market valuations in the federal coal-leasing program, and the Thomson Reuters news organization reviewed the question of royalty collections. Like the fair-market value issue, royalty collections and policy had not been the subject of an audit in 30y years. A Thomson Reuters expose published in 2012[5] found that the Office of Natural Resources Revenue (ONRR) of the Department of the Interior was effectively allowing an exemption of royalty revenue for coal sold for export. ONRR allowed the coal industry to set up a scheme in which it paid royalties to the federal government based on the price of domestic coal, even though the coal was sold for export at much higher prices. The federal government as the owner of the coal agreed not to collect royalties on revenue generated by the sale of coal in what had been more lucrative markets.

The investigation prompted inquiries by Senators Ron Wyden (D-OR) and Lisa Murkowski (R-AK) and then Congressman Ed Markey (D-MA). Then- Secretary of the Interior Ken Salazar agreed to investigate. In January 2015, current Secretary of the Interior Sally Jewell proposed regulations to alter the practice. [6]

[5] http://www.reuters.com/article/2012/12/20/us-usa-coal-royalty-idUSBRE8BJ0LA20121220
[6] http://www.noticeandcomment.com/ONRR-2012-0004-fdt-59252.aspx

Although the current global market for coal is in structural decline, meaning that exports will diminish in importance over time, regulatory efforts to close the existing loophole on coal sold for export are still needed and relevant.

ONRR Allowed, and Endorsed, Coal industry Schemes

Contrary to rhetoric frequently used by the coal industry, the royalty payment is not a tax. The royalty is a payment made by the lessee to the federal government as the owner of the coal resource.

IEEFA has provided extensive comment to the Department of the Interior on the royalty issues, which can be summarized as follows:

- IEEFA pointed out in its "Great Giveaway" report in 2012 the link between fair-market value and royalties paid, and estimated that royalty collections over the past 30 years would have increased by $20.5 million if the BLM had collected the true fair-market value of the coal.
- IEEFA noted that, for some companies, the royalty waiver on exports resulted in negligible benefits (and therefore negligible losses to U.S. taxpayers), the benefit to certain companies was substantial (and therefore the losses to taxpayers were also substantial). One company, Cloud Peak Energy, received 18 percent of annual revenue from export sales even though those sales represented only 4 percent of its production.
- In comments on the recently proposed regulations,[7] IEEFA noted that, in the current down market, the ONRR changes might actually eliminate the royalty payments to the U.S. government. Although the changes proposed by ONRR are generally positive and constructive, this circumstance would actually widen the loophole the regulations seek to close. IEEFA offered options to correct this deficit and several other suggestions.

The existing exemption on income from exports is an indefensible compromise of the rights of the owner of the coal—the federal government. Unfortunately, the integrity of the ownership model was breached in favor of the unofficially sanctioned, industry-controlled partnership between the Department of Interior and the coal industry. The federal government's decision to waive revenue that it should have received in a lucrative market shows that it subsumed its fiduciary obligation for political purposes.

IEEFA has found no policy documents that articulate the rationale as to how this waiver of revenue to the federal and state government serves the interest of the federal and state government. Neither the recently published regulations, other background documents not even the coal industry itself provide substantive institutional history supporting the idea of the revenue exemption on exports.

[7] http://ieefa.org/wp-content/uploads/2015/05/IEEFA-royalty-reform-comments-May-2015.pdf

The Royalties Issue Has Morphed Into the Debate Over Climate Policy and Domestic Coal Sales

IEEFA has focused on the question of royalty payments in relation to export sales in order to remain consistent with the overall fair-market concepts of the program and the base payment and royalty models of revenue.

However, in large measure due to the inability of the Washington policy process to bring order to the myriad issues of environment, climate, finance and politics, the royalty issue has now been captured by these much larger concerns. Various policy-makers are asking how the future size of the royalty payment for both domestic and international sales can be used to achieve the administration's climate goals.

On Climate and Royalties:

Many Washington officials, particularly in Congress, have officially rejected constructive responses to the climate issue. This has left the executive branch alone to cobble together a series of climate initiatives through regulation and program.

The Government Accountability Office, which is in the business of identifying and managing risks faced by the federal government (as well as to police fraud, waste and abuse), has highlighted this problem. The GAO has concluded that the lack of a comprehensive, coordinated governmental response at the highest levels has left the federal government and the people of the U.S. exposed to significant risks.

However, the federal coal lease program has been largely left out of the administration's climate deliberations and is not a part of the GAO's comprehensive climate risk formulations. It should be part of both.

What Size Should the Royalty Be?

Answering the question of whether the size of the royalty should go up and by how much is a complex proposition. Unfortunately, to date neither ONRR now DOI appear to be equipped or interested in conducting a comprehensive evaluation process. It is clear that the DOI needs to develop that capability by creating a research unit to focus on coal issues for the long term. The amount of public information available to those interested in commenting on the recently proposed regulations is almost non-existent.

In the absence of such leadership from the DOI, here is a cursory look at how the appropriate size of the federal royalty could be determined:

1. The current royalty payment level is set at 12.5% of gross revenue received from the sale of coal. This royalty is paid to the federal government by coal providers under the coal-lease program. As the owner of the coal, the federal government should evaluate whether it is satisfied with collections at this level. If not, why not? Are the revenue levels commensurate with expectations? Are coal company profits too high? Or, as is the case with the climate discussion, do other interests take precedent when the owner has complex and competing missions? And, if so, how should they be factored into the equation?

2. What are comparable business models for royalty collections and how would one assess the differences in them? For example, Senator Wyden produced a fact sheet that showed PRB royalties out of Wyoming, the largest coal state, generating $1.70 per ton in 2012. In the first quarter of 2015, Natural Resources Partners, a private-sector owner of coal reserves in the Northern Powder River Basin that leases its reserves, generated royalties of $2.69 per ton.[8] Applying this admittedly cursory comparison to the current 12.5% shows there is an upward potential of a 20% royalty rate when compared with private-sector payments being made in the western coal region. This comparison needs to be explored and a clear standard for setting the royalty rate established. One measure is obviously a comparison with royalties paid to coal companies in the private sector. As stated elsewhere in this paper, a research unit in DOI/BLM dedicated to addressing ongoing policy and market information would keep the agency on top of most trends needed to make informed and timely decisions on these types of technical issues.

C. Agency Culture and Staff Have Become Captive to the Industry They are Supposed to Regulate

The problems in the coal-leasing program stem, in part, from an ingrained culture, along with serious questions about who is really in charge—the Secretary of the Interior or the personnel in the various offices of the Bureau of Land Management.

According to the law, the secretary of the interior, not the BLM, is responsible for the coal lease program:

> "The Secretary of the Interior is authorized to divide Any lands subject to this Act which have been classified for coal leasing into leasing tracts of such size as he finds appropriate and in the public interest and which will permit the mining of all coal which can be economically extracted in such tract and thereafter he shall, in his discretion, upon the request of any qualified applicant or on his own motion from time to time, offer such lands for leasing and shall award leases thereon by competitive bidding: Provided, That notwithstanding the competitive bidding requirement of this section, the Secretary may, subject to such conditions which he deems appropriate, negotiate the sale at fair market value of coal the removal of which is necessary and incidental to the exercise of a right-of-way permit issued pursuant to Title V of the Federal Land Policy and Management Act of 1976."[9]

According to the law, the Secretary of the Interior, not the BLM, makes the final determination of what is or is not appropriate with regard to fair market leasing.

> "No bid shall be accepted which is less than the fair market value, as determined by the Secretary, of the coal subject to the lease. Prior to his determination of the fair market value of the coal subject to the lease, the Secretary shall give opportunity for and consideration to public comments on the fair market value."

[8] http://phx.corporate-ir.net/phoenix.zhtml?c=135162&p=irol-SECText&TEXT=aHR0cDovL2FwaS50ZW5rd2l6YXJkLmNvbS9maWxpbmcueG1sP2lwYWdlPTEwMjYwNDYyJkRTRVE9MCZTRVE9MCZTUURFU0M9U0VDVElPTl9FTlRJUkUmc3Vic2lkPTU3.

[9] Add the citation

However, the audit released in 2014 by the inspector general of the Department of the Interior painted a very different picture of who is in charge. The IG stated that correcting deficiencies identified in the report would be a challenge because the BLM Washington Office did not have direct lines of authority for the coal program, and included this paragraph:

> "Specifically, although the Washington Office manages the coal program, it does not directly control the program in the many State and field offices that oversee coal leases. Without strong, centralized management, State and field office personnel may interpret official standards, processes and procedures inconsistently."

The apparent abdication of responsibility by the secretary (and perhaps even the agency inspector general) has implications far greater than simply BLM working with other bureaus and offices within DOI or even losing revenue (serious as that is).

The State Offices

The BLM state offices need to be held accountable to the secretary of the Interior. Here are several illustrations of their lack of accountability that have arisen during the course of IEEFA's research, as well as the findings of both the GAO and IG:

1. For decades the same individual in one of the state offices has performed the fair-market valuation calculation that applies to all leases. One person has been responsible for this calculation, and only one person. As one might expect, this process was cited by the IG as a risk.[10]
2. Throughout both the IG and GAO audits, BLM staff refused to acknowledge the need to include export sales in fair-market value calculations. ONRR summarily exempted revenue from export sales from royalty collection. These are institutional decisions and attitudes that constitute barriers to effective revenue collection.
3. The audits take note of the fact that, when the secretary of the interior requested that the Office of Valuation Services (an internal bureau of DOI) be included in its process of coal valuation, BLM demurred.
4. The IG takes note of the fact that no credentialed member of the BLM staff checks the geological data submitted with the coal lease application.[11] This geological data covering seam thickness, among other things, forms a significant basis of the valuation calculations.

How much more is needed to know at the professional management level that the staff is unprepared to handle the major changes taking place in the coal industry? When considering agency risk management, how much more information is needed to understand that a major, sweeping change of agency personnel must take place in these offices?

D. The New Handbook Makes It Easier for the Agency To Avoid External Reviews

In the wake of the IG and GAO reports and other external pressures, BLM issued a new agency handbook (known as version 3073-1). Language was changed from the earlier version of the

[10] https://www.doioig.gov/sites/doioig.gov/files/CR-EV-BLM-0001-2012Public.pdf, p. 11.
[11] http://www.eenews.net/assets/2013/06/11/document_pm_01.pdf, p. 12

handbook (known as version 3070-1), and directs staff to change some practices regarding FMV valuations. However, it is unlikely anyone will ever know whether these changes took place and whether or not they resulted in improvements. Here is why.

The earlier version identified the handbook as part of a Congressional directive (itself a reform that arose from the 1980's coal lease scandals) to make the "***program's integrity unassailable in fact and perception***." The original introduction suggested that the handbook is both a tool for better BLM internal controls and a better mechanism for external review. The handbook is a set of standards, a tool that creates a uniform system of internal controls against which external reviews can develop objective measures to assess compliance and performance. As discussed above, a program that must rely on a high degree of proprietary information requires some degree of outside review even if the review must be conducted under special, highly security-conscious protocols (such as the ways one would treat particularly sensitive national security issues).

The new handbook makes no reference to the need for this kind of external review. The current introductory language to the handbook simply discusses the need for technical accuracy in the derivation of the fair market valuation.

IEEFA recommends that the secretary of the interior and her senior staff compare the introductory language of BLM's recent Coal Evaluation Handbook 3073-1 with the prior version published in the early 1980s (version 3070-1). Given the importance of transparency of this program, a commitment to external review processes should be reinstated.

Senators Ron Wyden and Tom Udall have recently introduced the Coal Fairness Royalty Act. The act would reform coal lease royalty practices and also calls for a regular cycle of audits of the coal lease program. Both parts of the bill have merit. Without a mandate for regular audits, there is no commitment to ongoing external review. The elimination of the language on external review in the new handbook is not simply a matter of language—it undermines ongoing accountability to Congress and the public. It means the one, the only, mechanism for verification of objectivity of market pricing in the absence of competition is eliminated. It means business as usual.

What Should be Done to Enact Lasting Reform?

A Fundamental Shift in Perspective Is Needed

The problem for DOI and its management of federal coal reserves goes well beyond its administration of the dysfunctional state offices of the federal coal program. Hard questions must be answered at a time when coal markets are facing a whole new landscape including structural decline, coal industry shrinkage at home and abroad, shifts in public opinion, new science, technological competition and innovation, and capital market changes.

The coal industry—which has effectively been a partner in running the DOI programs—is financially weak and intransigent. The industry is probably incapable of bringing about the conditions it will require to produce healthy coal companies for the foreseeable future. The coal companies may choose to do the same thing repeatedly and expect a different result, but DOI does not have to participate in a similar folly.

A Plan for Active Ownership

DOI should acknowledge, without equivocation, that the fair-market value program no longer works for either the agency or the industry. Unless DOI takes leadership, the current state of coal markets and financial distress of the coal companies in the PRB means an orderly administration of the program is at risk. Many of the existing rules of the program are actually impediments to change, and DOI has historically refused to use the existing rules that could help to bring about change. Change is needed, and it must occur despite the formal and informal terms of consensus about what is politically possible or politically acceptable in Washington.

The DOI's current Listening Sessions, the Secretary's recent promulgation of new regulations, the recent Wyden/Udall bill, the GAO audit, the inspector general's audit, and media exposes would not have occurred without questions having been raised, nor will the changes actually take place if that which is politically acceptable defines the problem and the options for change. The DOI has a significant problem, which has been created by market forces well beyond its control. If the agency responds with a tired consensus-based view of a worn-out program, all of the measures described above would have been for naught.

The largest coal companies in the Powder River Basin have lost over 95% of their value in the past five years, and no one has a plan to turn this around. The nation and its markets are moving to replace coal in significant ways with other energy sources. It will be up to the federal government, as the owner of the coal, to step in and take charge in the new landscape it now faces. The following actions should be taken:

A. Enact a Moratorium New Leases and Expansions

The federal government has declared three such moratoria in the past, under both Democratic and Republican presidents. The first two were enacted when it became clear that the

Department of the Interior was leasing out too much coal because private speculation, not national need, had become the motivation for leasing. The third was enacted after a scandal revealed that coal was being leased for below fair-market value. The current situation contains the same elements that led to the previous moratoria, and more. None of these moratoria were declared at a time when the nation's coal markets were in a state of decline and its coal industry in dire financial stress. DOI and Congress require a period to reassess basic direction and goals. Now is the time for this reassessment.

B. Use the Planning Functions in the Statutes

The policy direction of the DOI has granted complete discretion to the private sector over production planning in the PRB. This must change. Under certain economic conditions when stable, modest coal demand was occurring (the conditions of the last 30 years) this model was able to sustain itself. But those conditions have now changed fundamentally. The coal industry—that is, private market forces —cannot be relied upon to organize production in a structurally declining market. But although the planning tools exist to begin a process of change management, the political will to use them has appeared to be non-existent.

Remarkably, under official government rules, the Powder River Basin has never officially been certified as a coal production region.[12] DOI should correct this immediately, so that the existing planning tools, applied appropriately, can be used to allow the department to begin to manage what will be an extraordinarily difficult period of shrinkage of the coal production capacity of the region. Mines will need to be closed, reserve levels reassessed, and companies consolidated or eliminated in order for markets to return to balance at much smaller levels and at lower prices. Only in the context of a conscious effort to decrease production can investment take place and those communities and jobs that benefit can be called permanent.

C. Take Back Selected Leases

The coal industry has not yet, and does not seem either financially capable or vision-capable of offering a solution. Its leaders would like a price increase in coal but their methods of obtaining one miss the fundamental point, that when they wanted low prices the government created it for them. The same will have to take place for higher prices to occur. The higher prices, however, will have to come at a cost.

DOI should work with Congress and the president to take back the leases on all low-quality Btu mines in the PRB and shut them down. They should, consistent with the planning powers under the law, then conduct the appropriate review of the existing larger mines with better-quality Btu value and begin a process of mine closures. Only an aggressive measure of supply restriction by the mine owner, the U.S. government, is going to get the message to the markets right.

Left to the coal producers there will be a series of convoluted bankruptcies, distressed sales and other banking transactions that will have little to do with ensuring the continued supply of coal that is necessary for the U.S. to function during this period of energy transition. Littering the PRB with bankruptcies, distressed sales and more speculative debt will not create an environment

[12] We find the scholarship of Professor Mark Squillace https://lawweb.colorado.edu/files/vitae/squillace.pdf the most helpful source in the nation on these matters.

conducive to stabilizing the remaining production in the region. It is also unlikely to produce new and healthier coal companies.

1. Start with Existing Low-Quality Coal Mines

   As discussed above, low-quality coal in the PRB is in an exceedingly weak financial state. The price of the coal on the spot market hovers in the high $8- to low $9-per-ton range. This is below every major producer's cost of production. As longer-term contracts for low-quality PRB coal end and demand remains slack, prices can be expected to deteriorate further. Within the coal industry, speculation is commonplace that the only reason some PRB mines are kept open is to cut company losses on mine reclamation liabilities.

   Because these reserves are under lease, the U.S. government gets a false sense that it will receive future revenues from these assets and that a modicum of sound stewardship of the natural resource is preserved. However, the federal government must now recognize that changes in U.S. markets and global markets are not just a reflection of a minor dip, but constitute a permanent decline with long-term implications for the size and functioning of those markets. The obvious financial pressures on the lessees (the coal industry "partners" of the U.S. government) will likely result in further cutting of corners on items like reclamation bonds as the companies seek greater and greater breaks on taxes, fees, regulation and the like.

2. Examine a Broad Range of Market Scenarios for the Remaining Mines

   Much has been made of predictions that remaining coal demand in the U.S. will be supplied largely by the Powder River Basin and Illinois Basin. On paper, that makes sense. But it is possible that coal demand will shrink even further than is currently predicted. As discussed above, the Energy Information Administration has cut its predictions of how much coal will be mined in the PRB. Ongoing discussions in the coal trade press, and in U.S. EPA scenarios for the new Clean Power Plan, project annual U.S. production levels shrinking to 600 million tons.

   It is therefore both prudent and useful for the federal government, as owner of the coal reserve, to assess markets over a broad range of scenarios. At a 600-million-ton nationwide level, given existing production levels, approximately 275 million tons per year (mtpa) would likely come from the Powder River Basin. This is a substantial decrease from the 400-plus mtpa the region has come to expect.

   The federal government should consider other scenarios with factors including iaggressive goals for solar, wind and efficiency, low natural gas prices, and no technological improvements in the coal production and consumption chain. These scenarios would drive annual coal consumption in the U.S. down into the 400 million ton range by 2030. When some large PRB mines are posting quarterly margins under $1 per ton, and some under 50 cents per ton, there are questions as to the sustainability of those reserve assets.

D. Ban Exports of PRB Coal

Coal companies have a right to sell coal mined under existing federal leases outside the U.S. For years, the companies have profited from exports at the expense of taxpayers—and have squandered company dollars that could have been reinvested in the nation's energy needs or returned to shareholders.

The coal industry clearly does not have a real market for PRB coal in Asia that would be sufficient to warrant the kind of outlays it is making. The current EIA Annual Energy Outlook projects 24 million tons of coal being shipped to Asia from the U.S. by 2040. In recent years PRB companies' exports to Asia peaked at 12 million tons. An increase of only 12 million tons does not support the building of massive new coal export terminals. Consequently, half of the planned export terminals from the West Coast have been cancelled and the proponents of the remaining proposals are in in serious financial distress. The stock market has made its dim view of the coal industry's prospects extremely clear. But the owner of the coal leases —the federal government—has not reacted to this mounting evidence of a lack of an export market.

PRB exported coal offers an insignificant revenue benefit in the short and medium term and only the most speculative long-term potential for federal and state governments, serves no domestic energy purpose, no national security interest, has de minimis trade interest for the U.S., offers no value to port development in Washington and Oregon (states struggling to balance environmental and economic-development pressures from a host of more vibrant industries), and sends the wrong message to Wyoming and Montana about what will bring stability and order to coal industry for their states.

IEEFA argues that continuation of the effort on coal exports off the West Coast is a misuse of time and resources. The effort: 1) prevents the development of transition planning and discussion of new growth economic opportunities in coal mining regions; 2) diverts resources from any long-term energy research in future use of coal; 3) requires trade preferences, state economic-development and environmental decisions that are likely to displace more productive investments; 4) undermines federal climate objectives; 5) prevents the coal industry from finding the real balance of supply and demand by offering false infrastructure investments in the U.S. predicated on demand in Asia that does not exist.

If DOI cannot achieve the goal of banning coal exports under federal lease, then the president and the Congress should work together to do it. [13]

E. Reduce Royalties on Domestic Sales by Half for 10 Years in Exchange for Implementation of All Environmental Regulations on Coal

The coal industry has actively opposed pending regulations to control air and water pollution, arguing that it can't afford to make these changes. IEEFA recommends that the federal government cut royalties on domestic coal sales in return for agreements by the coal industry that it will comply with regulations on greenhouse gases, mercury, coal ash, and haze within the timeframes that are currently proposed by EPA and other agencies. The coal industry should also be required to agree to a host of transition-planning activities including support for the president's transition-planning investments.

The Government Accountability Office has added climate change to its list of high-risk categories facing the U.S. government and is telling official Washington that all institutions of government need to work together to mitigate climate risk. There is currently no comprehensive plan and the chief executive has no partner in Congress to solve a problem which cuts across agency jurisdiction, program categories, budget lines and, of course, ideological perspective.

[13] In the event DOI decides to continue to allow exports out of the PRB IEEFA has commented on the proposed export regulations in prior submissions to DOI, see Appendix I.

The federal government, as the owner of the nation's single largest coal reserve, needs to add the full range of federal coal-leasing issues to its comprehensive set of actions on climate change. The federal government can decide that, in order to achieve its own highest environmental and climate aspirations, it can use all tools available to it, including the bargaining power provided by the use of coal-royalty reductions. In short, a deal needs to be made.

Cutting the royalty on domestic coal sales for the next 10 years by fifty percent would save the coal industry $3 and $6 billion. In exchange, the coal industry, PRB producers and non-PRB producers would agree to accept the environmental, climate and public health regulations as promulgated by the Environmental Protection Agency and other federal agencies in the following areas:

- Clean Air Act: EPA MACT Boiler Rules, Airborne SO2, Nox, NaaQs, Mercury and Air Toxics, Clean Power Plan
- Coal Ash Regulation
- Power Plus Plan for Economic Transition
- Clean Water Act Regulation: Coal Mining Stream Rules, Power Plant Effluent Rules

Under this proposal, full royalties would continue to be collected on any exports that would continue to be allowed.

F. Conduct Research on Future Issues Facing the Coal Lease Program

In 1979, the GAO prepared a study on future issues facing the coal lease program. The 267-page report[14] was prepared at a time when the Powder River Basin provided 20% of the nation's coal. It is now providing well in excess of 45% and could, even with diminishing regional growth, actually rise in relevance domestically. Policy-makers at the time were making a choice to move the PRB and coal generally front and center on the national agenda. Today, it is likely that the coal industry will contract and the shrinkage will have important implications for the management of federal coal reserves and important parts of the national economy.

Even if the GAO no longer conducts this type of study, other institutions in and outside government can do so. The outgoing secretary of the interior, at minimum, could leave such a study for her predecessor and a subsequent Congress. IEEFA recommends that DOI and BLM create a new research unit specifically dedicated to federal coal leasing policy and the management of relevant important databases

G. Appeal to the GAO for High Risk Status for Regular Audits and/or Integrate Into Comprehensive Climate initiative

The GAO completed its audit of the federal coal lease program in 2014. However, IEEFA recommends that Congress direct the GAO to audit the program on a regular cycle, designating the program as "high risk." In IEEFA'S view, the Linowes Commission intended that a regular audit process be established, and this is plainly the best practice of a program with a secretive bid process.

[14] http://gao.gov/products/EMD-79-47

DOI should brief members of Congress on its findings at the close of the Listening Sessions, and should support a request by members of Congress for regular GAO audits and any request by members for thoughtful review of various program issues. Such a requirement has already been proposed by Senators Wyden and Udall in the "Coal Royalty Fairness Act of 2015."

The Secretary should also suggest that the GAO add the federal coal lease program to its list of vital climate programs that must be addressed in any federal comprehensive effort on climate change.

H. The DOI Should Make Sweeping Staff Changes and Should Change the Culture of BLM

Coal markets are changing. The industry is changing. Public perception is changing. The practices discussed in this paper and in other IEEFA documents and those of the Inspector General and GAO point to the need to a wholesale change in staff and culture. The broad objective of such an effort is to eliminate all vestiges of the legacy of a coal-industry-dominated state office program from the Department of Interior and create a professional operation.

I. Actively Pursue the Federal Government's Interest in Bankruptcy Proceedings

The federal government needs to aggressively establish its interests and its claims in coal company bankruptcies that occur in the PRB where coal leases are in effect. It must determine the answers to questions such as these: Should the federal government look to take back its lease rights in these proceedings? As a creditor, where are its interests? As a governmental owner, what opportunities exist within this process of change to begin charting the new course that is needed?

The DOI will need to explain its priorities in seeking to secure its interest and claims within these proceedings, and will need to offer strategic direction to its legal staff to ensure that policy objectives are achieved.

J. Spearhead Transition Opportunities to Assist Workers and Communities

The coal industry is responding to tough economic and financial downturns with distressed sales, buyouts, bankruptcies, layoffs and a whole lot of finger-pointing. In the South and Midwest, where much of the coal reserves are privately owned, these market mechanisms leave communities and workers bereft of resources. Communities lose industries and have no viable replacements or other economic opportunities. Financial distress on the labor side is simply an instrument for stripping mine workers of pensions and health benefits and reducing wages. Perhaps leaders in the coal industry can convince themselves that this is the way of the marketplace and can blame Washington, environmentalists, and the like.

In the PRB, where the owner of the coal is the U.S. government, the scenario must be different. For the federal government to allow the last remaining coal reserve in the nation to be financially and environmentally degraded, and to saddle the communities and the workforce with the costs, would only be a new and even more disturbing chapter in the mismanagement of this public resource.

There is a choice here.

Active Federal ownership can mitigate the risks from a prolonged period of private sector distressed sales and forced buying and selling.

On the broader level, the administration has offered its Power Plus plan to begin the process of assisting communities during this period of economic transition. The coal industry has made clear it is not interested in supporting this program. The plan is a modest start.

In the Southeast, the need for federal intervention is urgent. In the PRB, there is some time still to do better planning for the inevitable shrinkage in coal production. IEEFA recommends that the administration consider the model that has frequently been used when defense plants close. The model is based on a comprehensive approach to economic, fiscal and labor impacts of the plant closing, and then provides investments over a period of years to help people find other employment and to help the economy develop new markets. These measures should include a full package of benefits to assist mine workers who are losing their wages, health and pension benefits because of the structural changes taking place. They must also prevent a loss of environmental protections that could take place as bankruptcy processes move forward. The risk is that state governments will be saddled with ongoing environmental costs from mine closures at a time when their economies can ill afford additional cost burdens.

Conclusion

The federal government must assert its rights as the owner of the nation's largest remaining coal reserve and make sweeping changes in the federal coal lease program. As the program stands today, and has stood for the past 30 years, there is no competition, no oversight, no internal controls and a history of outright hostility to anything like it. Key steps for establishing the federal government rights as owner include enacting a moratorium on leasing, cancelling certain leases, overhauling the staff of the department, and enacting a series of planning and legal steps that will protect the interests of U.S. taxpayers.

Appendix I: IEEFA Selected Publications

U.S. publications

- Great Giveaway: Almost $30 Billion in Revenues Lost to Taxpayers by "Giveaway" of Federally Owned Coal in Powder River Basin, 2012
- Memo- Response to the Department of Interior, Office of Inspector General Audit on Federal Coal Leasing Program, July 2013
- Comments on Proposed Consolidated Federal Oil and Gas and Federal and Indian Coal Valuation Reform, ONRR 2012-0004-0024, May 2015
- A Bleak Future for Colstrip Units 1 and 2, June 2015
- For U.S. Coal, Market Realities Grow Increasingly Harsh, June 2015
- NYC and NYS Pension Funds Should Divest Coal Stocks: A Shrinking Industry, Weak Upside, and Wrong on Climate Change, May 2014
- Cost of Coal From Mine-Mouth Prairie State Plant Isn't the Bargain That Was Promised, April 2015
- Left in the Dark: How the Alabama Public Service Commission Makes Customers Pay Billions of Dollars for Alabama Power Investments without Any Meaningful Public Review or Involvement, February 2015
- Letter to the Alaska Department of Natural Resources regarding Chuitna Coal Mine, April 2015
- 2014 – Another Year of Unmet Promises for the Prairie State Energy Campus, February, 2015
- Corporate Strategy at D.C. Ratepayer Expense: Exelon's Proposed Acquisition of Pepco Holdings, January 2015
- No Need for New U.S. Coal Ports: Data Shows Oversupply in Capacity, November 2014
- 20 Fourth-Quarter Questions for Powder River Basin Coal Producers, November 2014
- FirstEnergy Seeks a Subsidized Turnaround, October 2014
- Report: No evidence of a turnaround at Prairie State, September 2014
- Duke Energy and Costs of Coal Ash Cleanup, June 2014
- Huntley Generating Station: Coal Plant's Weak Financial Outlook Calls For Corporate And Community Leadership, January 2014
- When, Not If: Bridgeport's Future and the Closing of PSEG's Coal Plant, January 2014
- Energy Future Holdings and Mining Reclamation Bonds in Texas, October 2013
- Dark Days Ahead: Financial Factors Cloud Future Profitability at Dominion's Brayton Point, March 2013

- Why a Forward Capacity Market Won't Solve Texas' Resource Adequacy Problem: The Case of Energy Future Holdings, February 2013
- A Texas Electric Capacity Market: The Wrong Tool for a Real Problem, February 2013
- The Prairie State Coal Plant: The Reality vs. the Promise, August 2012

International publications

- Teck Resources: Rough Road on Oil Sands Investments, April 2015
- Case for Divesting Coal from the Norwegian Pension Fund Global, May 2015
- Galilee Coal Basin: Carmichael – A Stranded Asset?,May 2015
- Cheyyur UMPP: Financial Plan Will Make Electricity Unaffordable, May 2015
- 'A Constellation of Risks': How Public Accountability Is Slowing Tar Sands Development, October 2014
- Remote Prospects: A financial Analysis of Adani's Coal Gamble in Australia's Galilee Basin, November 2013
- Coal India: Running on Empty?, September 2013
- Stranded: Alpha Coal Project in Australia's Galilee Basin, June 2013
- Briefing Note: An Overview of Adani Enterprises' Corporate Restructuring, May 2015
- Briefing Note: Global Energy Markets in Transition, January 2015
- Briefing Note: The Narrabri Coal Seam Gas Project, December 2014
- Briefing Note: The Outlook for Financing for Australia's Galilee Basin Coal Proposals, October 2014
- Briefing Note: Fossil Fuels, Energy Transition & Risk, July 2014
- Briefing Note: Fossil fuels, Energy Transition & Risk, June 2014
- Briefing Note: Thermal Coal Outlook, May 2014
- Briefing Note: India Power Prices, May 2014
- Briefing Note: WICET, May 2014
- Briefing Note: Fossil Fuels, Energy Transition & Risk, April 2014