

ISSUE BRIEF:

ACCOUNTING FOR CARBON POLLUTION FROM COAL MINING ON FEDERAL LANDS



COAL'S CLIMATE LEGACY AT HOME AND ABROAD

Combustion of coal is one of the leading drivers of climate change. Primarily burned as a source for electricity generation, coal is up to two times more carbon pollution intensive than other fossil fuels used for power generation. Due to changes in the domestic market and policies aimed at cleaning up coal-fired power generation, the number of power plants in the United States that burn coal has dropped, and there are virtually no new coal fired power plants slated for construction. Well-designed and properly implemented, new power plant rules will continue to drive down domestic demand for coal and spur more renewable energy development.

The decrease in domestic demand and policies to reduce carbon pollution at home are not deterring coal producers from seeking new markets to sell their product – particularly in energy-hungry Asia. The U.S. government has a leading role to play in domestic coal production. Perhaps most significantly, about **40 percent of annual coal production comes from publicly owned minerals**. Companies lease the coal from the federal Department of Interior's Bureau of Land Management (BLM).¹

Despite policies that are intended to drive down U.S. carbon pollution, the federal government continues to lease coal rights at rock bottom prices without adequately or consistently accounting for the significant carbon impacts of these decisions. **Continued leasing of public lands for coal production is undermining other efforts to cut carbon pollution** by allowing our coal to be strip-mined, loaded on trains, shipped from ports and burned overseas.

Indeed, the federal government has approved coal leases that would add the equivalent carbon pollution of about 280 power plants², effectively wiping out reductions from the Administration's chief carbon pollution reduction plan.*

This issue brief examines the carbon implications of U.S. coal leasing policies on federal lands and coal exports, and offers policy recommendations on how we can ensure that our public lands are not being used to undercut critical carbon pollution reduction efforts.

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* U.S. Energy Information Agency. 27 gigawatts of coal-fired capacity to retire over next five years. Today in Energy (July 27, 2012). <http://www.eia.gov/todayinenergy/detail.cfm?id=7290> (stating that approximately 175 coal fired power plants could decline in the next five years due to declining demand and changing policies), see also, Bastasch, M. 2013. Report: EPA rules to shut down more than 280 coal-fired units. The Daily Caller. <http://dailycaller.com/2013/05/03/report-epa-rules-to-shut-down-more-than-280-coal-fired-units/> (finding that even more coal fired plants may retire).

POLICY RECOMMENDATIONS

1. The administration must fully account for the carbon impacts of coal leases to ensure they don't undermine its broader carbon-emission reduction goals.

2. Consistent with the Administration and the Department of Interior (DOI)'s commitment to address climate change, BLM must consider the full climate impacts of continued U.S. coal leasing and exports. To do so:

- a. BLM must conduct a Programmatic Environmental Impact Statement to examine the life-cycle carbon pollution impacts of current coal leasing policies.
 - b. For all new coal leases, BLM must conduct a comprehensive assessment of the life-cycle carbon impacts of the lease, which must include a consideration of the downstream carbon emissions from burning the coal - even if it is exported overseas.
 - c. BLM should not approve coal leases that undermine the carbon pollution reductions targets set forth by the Administration.
 - d. For all new coal leases, BLM must include a thorough market analysis, indicating if the coal is slated for export.
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3. The Administration should incorporate the cost of climate-related impacts when setting royalty rates for coal leases

CLIMATE POLLUTION AND COAL COMBUSTION

The combustion of coal for electricity production is one of the greatest sources of carbon pollution in the U.S. In order to avert serious harm to our climate from carbon pollution, it is imperative that global carbon emissions from coal be substantially reduced. At home, policies are being promoted to do just that, but these efforts will be undermined if coal emissions elsewhere continue to rise.

The combustion of coal releases more carbon dioxide (CO₂) – the chief source of carbon pollution – than other fossil fuels like oil or natural gas. The total emissions from coal in the U.S. are equivalent to the annual emissions of over 318 million passenger vehicles on the road.³ In addition to combustion-related emissions, coal mining also releases methane and other greenhouse gasses to the atmosphere. In 2012, methane from coal mining added 55.8 million tons of CO₂ equivalent.⁴

Overall, coal combustion is a major contributor to the country's total net CO₂, accounting for over 20 percent of all emissions in 2012.⁵ The White House's Climate Action Plan recognized that significant carbon pollution occurs from power generation and directed the Environmental Protection Agency (EPA) to place limits on emissions from new and existing

power plants. Proposed rules for new power plants would limit emissions to 1,000-1,100lbs of CO₂ per megawatt hour.⁶ **If similar rules are placed on existing power plants, domestic CO₂ emissions from coal could be reduced by about 680 million tons, equivalent to avoiding all the carbon emissions from about 180 coal-fired power plants.**

These rules come at a time when there is a decreasing domestic demand for coal caused in part by low natural gas prices and the growth of renewable sources of energy, such as solar and wind. The Energy Information Administration (EIA) additionally estimated that 175 coal-fired power plants could be retired due to declining demand.⁷ The result has been an overall downward trend in domestic CO₂ emissions from coal.

With the domestic market shrinking, the coal industry is seeking to expand mining operations and export terminals to export U.S. coal –and the carbon pollution that comes with it. The coal industry is attracted to the growing international market, namely in Asia, where cheap U.S. coal can outcompete domestically produced coal. **If the proposed export terminals in the Pacific Northwest are approved and the upward trend in exports continues, over 150 million tons⁸ of coal could be shipped and burned abroad. This will contribute over 280 million tons of CO₂⁹ to the atmosphere. Burning U.S. coal abroad will ultimately undo the Administration’s progress to combat climate change.**

CLIMATE IMPACTS OF COAL LEASES

Coal use in the United States has been in a steady decline since 2005 and is approaching historic lows.¹⁰ While coal use has risen and fallen over the last 60 years, cheaper oil and gas, as well as Clean Air Act regulations placing protective standards on smog, soot and air toxics, and pending power plant rules on CO₂ emissions, have made it uneconomical to build new plants.¹¹ Political and local opposition to coal production and power plants have also helped shutter old plants and prevent the construction of new ones.

While U.S. demand for coal has fallen with the decline in coal-fired power generation, coal mining and production has not decreased. About 37 percent of U.S. energy came from coal in 2013, a decline of nearly 9 percent since 2005. Meanwhile, coal exports from the U.S. reached 117.6 million short tons in 2013, nearly doubling the amount of coal exported in 2009. Overall global seaborne trade in coal has also increased each year, and this trend is expected to continue.¹²

Coal mined from Federal lands makes up 40 percent¹³ of total U.S. coal production. As of 2012, 308 leases have been approved since 1990.¹⁴ While the BLM is also responsible for some projects in Appalachia, Alaska, and other western states, the Powder River Basin (PRB) produces a majority of federal coal, accounting for about 88 percent¹⁵ of production under federal leases in 2012.

The BLM owns mineral rights for most of the PRB land. Several proposed expansions in the PRB, and in other regions, as well as the growth in export terminals, would allow coal production to continue despite the decline in domestic coal consumption.

The climate impact of these mines is substantial. While annual production from each mine is difficult to predict, life-cycle carbon pollution emissions can be estimated from the total production expected from a mine over the course of its life, which is measured in advance of a lease sale.

The carbon pollution impacts of proposed leases

- The CO₂ emissions from burning the coal leased under nine leases in the Powder River Basin would be equivalent to about 250 coal-fired power plants working non-stop for ten years.¹⁶

- Additional proposals in Colorado, Utah, West Virginia, and Alaska would add an additional one billion tons of CO₂ to the atmosphere, equivalent to bringing 31 coal-fired power plants online.¹⁷
- The total impact of burning leased coal would be the addition of over 10.5 billion tons of CO₂ released. This is about 60 percent more CO₂ than the U.S. released in 2012, and is equivalent to the emissions released from coal mining and consumption in the U.S. over the last 7 years.¹⁸

Projected CO₂ emissions from proposed leases and number of coal-fired power plant equivalents¹⁹

	State	Tons of Coal	Metric Tons of CO ₂ *	Tons CH ₄ (CO ₂ Equivalent)**	Total CO ₂	Coal-Fired Power Plants Fueled for 1 Year	Coal-Fired Power Plants Fueled for 10 Years
Proposed Leases in PRB							
MAYSDORF II SOUTH	WY	474,700,000	891,885,348	14,644,757	906,530,105	238	24
NORTH HILIGHT FIELD	WY	669,300,000	1,257,507,612	20,648,275	1,278,155,887	336	34
WEST HILIGHT FIELD	WY	1,056,100,000	1,984,242,924	32,581,269	2,016,824,193	530	53
WEST JACOBS RANCH	WY	1,142,100,000	2,145,823,164	35,234,416	2,181,057,580	573	57
HAY CREEK II	WY	149,700,000	281,262,348	4,618,328	285,880,676	75	8
ANTELOPE RIDGE (NORTH AND SOUTH)	WY	1,000,900,000	1,880,530,956	30,878,318	1,911,409,274	502	50
BELLE AYR WEST	WY	253,000,000	475,346,520	7,805,190	483,151,710	127	13
DECKER LEASE MODIFICATION	MT	198,200,000	372,386,088	6,114,580	378,500,668	99	10
SPRING CREEK II	MT	40,607,673	76,295,320	1,252,769	77,548,089	20	2
TOTAL PRB IMPACTS		4,984,607,673	9,365,280,280	153,777,902	9,519,058,183	2,500	250
Proposed Leases Outside PRB							
BOOK CLIFFS	CO	78,000,000	146,549,520	2,406,343	148,955,863	39	4
SPRUCE STOMP	CO	9,000,000	16,909,560	277,659	17,187,219	5	0
GREEN HOLLOWES	UT	56,600,000	106,342,344	1,746,141	108,088,485	28	3
ALTON COAL MINE	UT	46,000,000	86,426,640	1,419,125	87,845,765	23	2
WILLIAMS DRAW	UT	32,278,000	60,645,198	995,809	61,641,006	16	2
LONG CANYON COAL	UT	18,000,000	33,819,120	555,318	34,374,438	9	1
EAST LYNN LAKE	WV	75,978,177	142,750,838	2,343,969	145,094,807	38	4
CHUITNA	AK	300,000,000	563,652,000	9,255,166	572,907,166	150	15
TOTAL NON-PRB IMPACTS		615,856,177	1,157,095,220	18,999,530	1,176,094,750	308	31
TOTAL IMPACTS OF ALL PROPOSALS		5,600,463,850	10,522,375,500	172,777,432	10,695,152,932	2,808	281

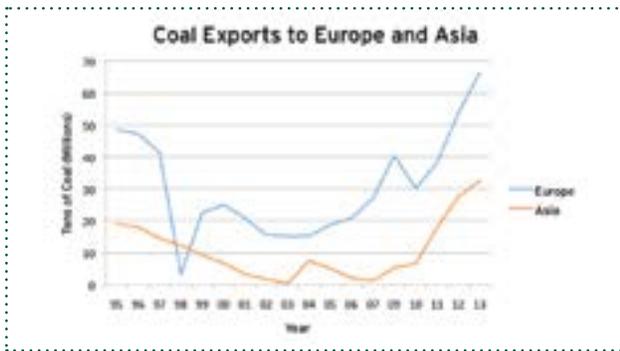
*Based on EIA estimate of 1.842 MWh per ton of coal and EPA estimate of 1.02 metric tons of CO₂ per MWh generated

**Based on average IPCC Emissions Factors for Surface Mines

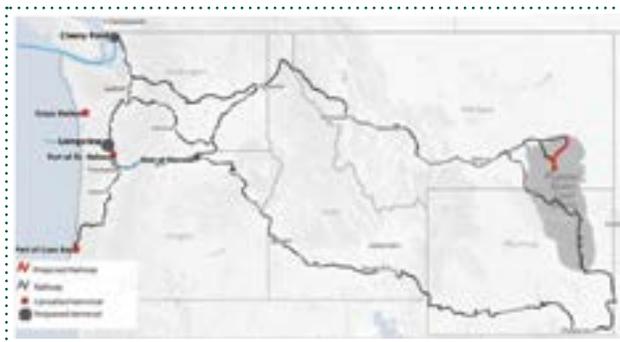
A CLOSER LOOK: EXPORTING POLLUTION

The direct link between BLM leases and carbon pollution is further evident in three proposed export terminals in the Pacific Northwest that, combined, could ship up to 122.8 million tons of coal annually. This is the equivalent to the emissions from over 90 coal-fired power plants emitting over 351.2 million tons of CO₂ each year.²⁰ Since 1995, exports to Europe and Asia have increased by 420 percent and 437 percent respectively.²¹

The coal industry is already responding to the growing Asian market and is attempting to expand production and export capacity. In particular, China's increasing energy demand will likely further incentivize exports to the region.²² As such, coal companies are continuing to produce coal with the intent of reaching international markets. An analysis of coal supply and demand in Southeastern China suggests that the low cost of PRB coal would lower the cost of coal in China, increasing demand and, in turn, consumption.²³ The low cost of U.S. coal and growing international demand provides a lucrative export market for U.S. domestic producers.²⁴



Total coal exported to Europe and Asia since 1995

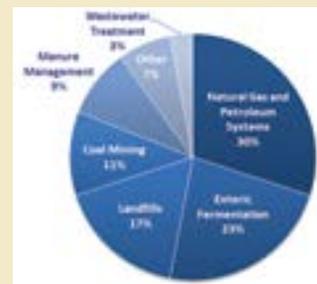


Map of proposed export terminals in the Pacific NW

Coal mines, methane pollution & climate impacts

Though not as common as carbon dioxide (CO₂), methane (CH₄) is a significant driver of climate change. Accounting for about 10 percent of greenhouse gas emissions in the U.S. in 2011, CH₄'s global warming potential is up to 20 times greater than CO₂ over the course of one hundred years. Coal mining represents about 11 percent of these emissions, according to the EPA. A 1995 study directly measuring methane emissions from coal mines, including abandoned mines and emissions from coal handling, suggests that total emissions from mines may be higher²⁵.

The President's Climate Action Plan acknowledges the serious risks of methane pollution. The Administration recently announced an inter-agency methane pollution strategy that, among other initiatives, seeks to begin rulemaking to regulate methane pollution from some coal mines and starts a process to assess the need for further regulation of methane pollution.



U.S. methane emissions by source, 1990-2011. Source: EPA 2012²⁶

China's emergence as a major importer of U.S. coal has peaked interest in the expansion of export terminals across the Pacific Northwest. Proposed export facilities in the Northwest, including Cherry Point, WA, Longview, WA, Port of Morrow, OR, and Cook Inlet, AK, as well as expansions to existing ports, would enable coal companies to increase the sale of coal overseas.

St. Louis-based Peabody Energy has already signed an agreement in 2011 to export 24 million tons through the proposed Millennium Facility in Longview. Arch Coal also signed an agreement in 2012 to ship up to 10 million tons annually through expanded ports in the Gulf Coast.²⁷ The company's proposed expansions to the Black Thunder Mine in the PRB would ensure this demand is met by providing access to over 2.8 billion tons of recoverable coal.²⁸ Arch is also proposing to build one of the largest new mines in the country in the pristine Otter Creek Valley of southeastern Montana.

PROPOSED MINES WILL EXPORT COAL AND POLLUTION

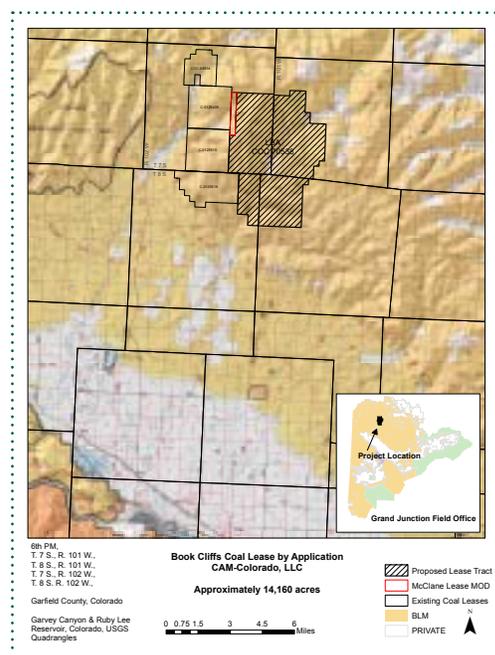
BLM continues to approve massive mining operations on public land without adequately or consistently accounting for the significance carbon pollution impacts of these projects. This is true not only of major mines in the Powder River Basin, where much of the federally controlled coal deposits exist, but also of mines elsewhere. For instance, in the Book Cliffs mountain range, 25 miles northwest of Grand Junction, CO, a proposed lease would cover over 14,000 acres and grant access to 78 million tons of coal.²⁹

Other coal projects where BLM controls leasing decisions across the west are aiming to expand coal production despite the lack of domestic demand. Currently, the Usibelli mine in Nenana Province, Alaska produces about 2 million tons of coal per year, approximately half of which is exported to Asian markets.³⁰ The proposed Chuitna Coal Project in Alaska would produce about 12 million tons of coal annually for 25 years, significantly increasing output capacity.³¹ A vast majority of this coal will likely be exported to Asian markets.³² To allow for this desired export, the current project proposal includes the construction of an export terminal on the Cook Inlet.³³



Book Cliffs Mine

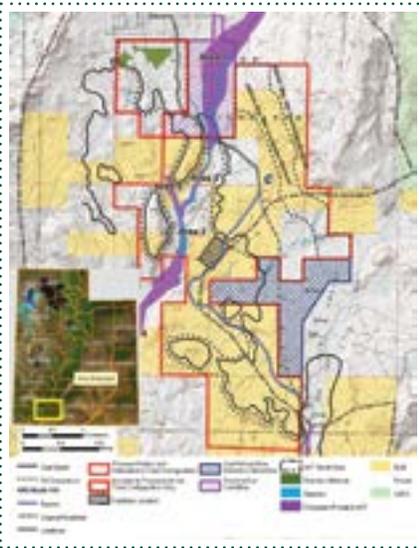
Located just 25 miles from Grand Junction, CO, the Book Cliffs surface mine would decimate over 14,000 acres of land, including the scenic cliffs for which the region is named. The Book Cliffs area supports wildlife such as elk, mule deer, coyotes, mountain lions, pronghorn antelope, and American bison. The proposed mine is located just a few miles from the Demaree Wilderness Study Area, a remote, undeveloped region that is home to diverse plant and wildlife.



Map of proposed Book Cliffs Mine

The Alton Coal Mine

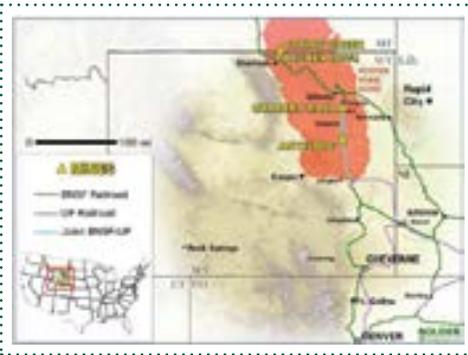
The proposed expansion to the Alton Mine in Southwestern Utah would significantly expand the impact area of coal production in the region. This project, if approved by BLM, would expand an existing mine and grant access to 46 million tons of recoverable coal.³⁵ The proposed lease area extends into potential flood plains and wetlands, habitat for fish and wildlife that cannot otherwise survive in the dry climate of southern Utah. The mine has also faced significant local opposition due to its proximity to Bryce Canyon National Park, 10 miles to the east, and Zion National Park, 20 miles to the southeast. Coal development in this region could impact tourism while deteriorating local water and air quality.



Map of proposed Alton coal mine expansion

Antelope Ridge in the Powder River Basin

The growth of existing mines in the Powder River Basin would undoubtedly impact wildlife in the region, such as the massive Antelope Ridge, which alone would add the emissions equivalent of 50 power plants over ten years. The Basin's plains, sagebrush flats, and pine covered ridges provide habitat for mule deer, elk, sage grouse, wild turkey, and antelope³⁶. Recent surveys in the region counted 239 bald eagles and 91 golden eagles along more than 1,400 miles of public roads³⁷. The threatened Greater Sage Grouse is known to migrate through the region, and a significant mule deer population attracts thousands of hunters to the region each year³⁸. The Basin is also interlaced with rivers and streams that eventually flow into iconic rivers like the Yellowstone and the Little Missouri. Should each of the proposed leases be approved, over 42,000 acres of prairie grassland will be lost and surrounding waterways will be negatively impacted.



Map of Antelope Ridge in the Powder River Basin





Otter Creek, Kestrel Air Services www.kestrlaerial.com

MOVING FORWARD ON CLIMATE

The Administration has made great strides in attempting to reduce the country's climate impact.

The White Houses' Climate Action Plan³⁹ released in June 2013 outlines how the federal government will take the lead in reducing carbon emissions, including cutting carbon from power plants, promoting renewable energy, and increasing fuel efficiency standards for cars in an effort to reduce emissions by at least 17 percent by 2020. The Action Plan also promises to lead international efforts to address climate change.

Additionally, President Obama issued Executive Order 13514 in 2009 requiring federal agencies to set emission reduction targets for greenhouse gas emissions and to report on their emissions levels.⁴⁰ Specifically, it requires agencies to "measure, report, and reduce their greenhouse gas emissions from direct and indirect activities." While it doesn't explicitly apply to BLM in the context of leases, its spirit is plain – federal agencies should be making decisions that reduce, not increase, carbon pollution. Additionally, the White House Council on Environmental Quality also issued draft guidance in 2010 directing agencies to consider the carbon pollution impacts of projects in their environmental analysis.

Similarly, federal agencies have released Action Plans and Adaptation Plans of their own, detailing how they plan to reduce their carbon emissions and prepare for future climate impacts⁴¹. Despite this progress, however, agencies such as BLM continue to promote fossil fuel extraction from federal lands, in particular coal leasing. Though the Administration's actions may deter the burning of coal in the U.S., little is being done to address U.S. coal burned abroad. This coupled with lax federal review of export terminals will allow coal on public lands to be mined and burned in Asia or elsewhere.

Our public lands: carbon sink or carbon source?

Forests, grasslands, wetlands, and other ecosystems naturally absorb carbon as plant life grows. Protecting and conserving these lands can thus be an effective way of mitigating climate change. A report commissioned by The Wilderness Society in 2012, details the carbon emissions from fossil fuel extraction on federal lands, and how these emissions compare to the ability of federal lands to absorb carbon. The report found that CO₂ emissions in 2010 totaled over 1.1 billion tons, while public lands could only absorb about 259.2 million tons annually⁴².

According to the EPA greenhouse gas calculator, it would take over 764 million acres of U.S. forests to absorb the carbon from coal emissions alone (the U.S. federal government owns about 640 million acres)⁴³. For every acre the BLM allows to be developed for fossil fuel extraction, more carbon is released into the atmosphere, and less can be absorbed by these lands. We should be using our public lands to mitigate the impacts of carbon pollution, not make it worse.

Given that the U.S. has the most recoverable coal reserves in the world, real progress on climate can only occur if a significant drop in domestic carbon emissions from coal use is coupled with policies that keep our coal in the ground. To make progress towards this goal, NWF recommends that Bureau of Land Management (BLM), in concert with the Administration, take the following immediate actions:

1. The administration must fully account for the carbon impacts of coal leases to ensure they don't undermine its broader carbon-emission reduction goals.

2. Consistent with the Administration and the Department of Interior (DOI)'s commitment to address climate change, BLM must consider the full climate impacts of continued U.S. coal leasing and exports. To do so:

- a. BLM must conduct a Programmatic Environmental Impact Statement to examine the life-cycle carbon pollution impacts of current coal leasing policies.
- b. For all new coal leases, BLM must conduct a comprehensive assessment of the life-cycle carbon impacts of the lease, which must include a consideration of the downstream carbon emissions from burning the coal - even if it is exported overseas.
- c. BLM should not approve coal leases that fail to achieve the carbon pollution reductions targets set forth by the Administration.
- d. For all new coal leases, BLM must include a thorough market analysis, indicating if the coal is slated for export.

3. The Administration should incorporate the cost of climate-related impacts when setting royalty rates for coal leases

If we continue to allow for leasing policies that spur overall global carbon emissions, our significant efforts at home will be undermined, and we will fail to avoid the tragic impacts unchecked climate change will have on wildlife and our children's future. ←

1. Federal agencies have various important roles in approving and overseeing coal mining projects on both private and public land under other laws as well, including the Clean Water Act, Endangered Species Act, National Environmental Policy Act, and Surface Mining Control and Reclamation Act.
2. Based on total metric tons of CO₂ http://www.wildearthguardians.org/site/DocServer/report_powder_river_11-23-09.pdf?docID=590&AddInterest=1058 and the average CO₂ emissions of a power plant http://www.ucsusa.org/clean_energy/coalvswind/c02c.html.
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8. <http://www.nwf.org/news-and-magazines/media-center/reports/archive/2012/07-31-12-true-cost-of-coal.aspx>.
9. Based on EIA estimate of 1.842 MWh per ton of coal and EPA estimate of 1.02 metric tons of CO₂ per MWh generated.
10. http://www.eia.gov/totalenergy/data/monthly/pdf/sec1_7.pdf.
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15. Based on 388 million tons (http://www.blm.gov/wy/st/en/programs/energy/Coal_Resources/PRB_Coal/production.html) and total from all PRB land 442 million tons. (<http://www.eia.gov/analysis/requests/federallands/>).
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