

# UnderMining the Climate



## THE POWDER RIVER BASIN OF THE WEST: KEY TO SOLVING GLOBAL WARMING



A report from WildEarth Guardians  
By Jeremy Nichols  
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## MISSION STATEMENT

WildEarth Guardians protects and restores the wildlife, wild places, and wild rivers of the American West.

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Front image, coal mining in Powder River Basin, by BLM.  
Back image, Powder River Basin, by EcoFlight.

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## EXECUTIVE SUMMARY

Coal mining in the Powder River Basin is responsible for releasing more carbon dioxide than any other activity in the United States, making it a root contributor to global warming. Worse, a sham federal coal leasing program and a lack of attention from the federal government is hindering progress toward safeguarding the climate.

Located in northeastern Wyoming and southeastern Montana, hundreds of millions of tons of coal are mined from the Powder River Basin every year and burned in coal-fired power plants throughout the country. In 2007, the region produced 42% of all coal in the U.S.—more than any other region of the country—and was the source of 40% of all carbon dioxide emitted by the nation’s coal-fired power plants. **Coal-fired power plants are the largest source of greenhouse gases in the U.S.; coal mining in the Powder River Basin is the primary source of coal to America’s coal-fired power plants.**

Global warming is being fueled by carbon dioxide and other heat-trapping greenhouse gases released by human activities. Already, global warming is changing the climate, stressing water supplies, challenging agriculture, threatening the coasts, increasing public health risks, and undermining our economy. There is an urgent need to curb greenhouse gases in the U.S and address the impacts of coal mining in the Powder River Basin to the climate. Unfortunately, little progress is being made.

All coal produced in the Powder River Basin is owned and leased by the federal government. Yet the Bureau of Land Management, the agency within the Department of Interior that oversees the coal leasing program, has declared the Powder River Basin to not be a “coal production region.” This sham designation has given coal companies more control over leasing, diminished competition and shortchanged the American public, and hindered the Bureau’s ability to address global warming.

The impact of coal mining in the Powder River Basin is likely to intensify as massive new mining proposals are pending. 12 new coal leases have been proposed, which would collectively mine up to 5.8 billion tons of coal—as much coal as has been mined from the region in the last 20 years. Together, these proposals threaten to lead to the release of more than 10.6 billion tons (9.63 billion metric tons) of carbon dioxide—more than the amount released by 1.7 billion passenger vehicles annually.

**Solutions are at hand.** To effectively respond to the climate crisis, the Bureau of Land Management needs to immediately focus on reforming coal mining in the Powder River Basin. To that end, it is imperative that the agency:

- Call a time-out on all new coal leasing in the Powder River Basin.
- Re-designate the Powder River Basin a “coal production region” to restore true competitiveness to the coal leasing process.

- Prepare a regional environmental analysis that fully addresses the global warming impacts of coal mining in the Powder River Basin, and sets lease standards based on the need to reduce greenhouse gases.
- Address the impacts of any new coal leases by requiring coal companies to pay a carbon fee for new leases. Carbon fees should be used to create a Global Warming Impact Fund to support renewable energy development, habitat restoration, and other efforts to address the impacts of global warming.
- Fully transition away from coal and toward clean, renewable energy in the Powder River Basin. The State of Wyoming alone has enough renewable energy potential to more than meet the electricity needs of all 11 western states.

Already, the groundwork for solutions has been laid. On September 14, 2009, Interior Secretary Ken Salazar proclaimed, "The realities of climate change require us to change how we manage the land, water, fish and wildlife, and cultural heritage and tribal lands and resources we oversee." Secretary Salazar called for the development of a "unified greenhouse gas emission reduction program" among Department of Interior agencies. Secretary Salazar's Order was bolstered by President Obama, who on October 5, 2009 called on all federal agencies to "measure, report, and reduce their greenhouse gas emissions from direct and indirect activities."

**Time is of the essence.** The foundation for solutions has been set, but with the climate crisis projected to worsen, the Bureau of Land Management needs to act boldly and swiftly. The agency must meet the challenge of global warming and fulfill both President Obama's call for greenhouse gas reductions and Secretary Salazar's promise of change.

**The agency's leadership can ultimately transform the Powder River Basin from a key root of global warming to a key source of clean, renewable, and affordable energy.**

## INTRODUCTION

The Powder River Basin is located in northeastern Wyoming and southeastern Montana in the Western United States, and covers an area of roughly 24,000 square miles. See Figure 1. The region is named because it is drained primarily by the Powder River, although other rivers—including the Big Horn, Tongue, Little Missouri, Belle Fourche, and Cheyenne—also drain the area. The region is characterized by broad plains, rolling hills, and tablelands that vary in elevation from 2,500-6,000 feet above sea level.<sup>1</sup> See Figure 2. Mixed grass prairie and sagebrush dominate the landscape, providing habitat for a diversity of wildlife including sage grouse, black-tailed prairie dog, ferruginous hawk, mountain plover, burrowing owl, golden eagle, deer, and elk.<sup>2</sup>



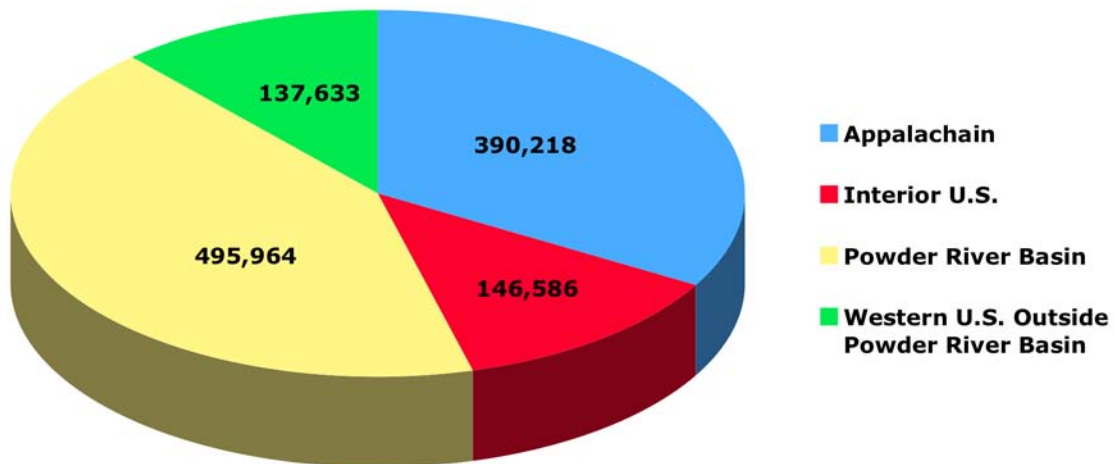
**Figure 1. The Powder River Basin of Northeastern Wyoming and Southeastern Montana.<sup>3</sup>**

Some of the largest deposits of subbituminous coal in the world underlie the Powder River Basin.<sup>4</sup> Subbituminous coal from the region is low in sulfur, although it is also low in energy content.<sup>5</sup> On average, coal from the Powder River Basin contains 38% less energy than coal from the Appalachian region of the eastern U.S.<sup>6</sup>

These large coal deposits make the Powder River Basin the single largest source of coal in the U.S. In 2008 alone, a record 495,964,000 tons of coal were mined from the region—42% of all coal produced in the U.S. and more than any other region of the country.<sup>7</sup> The Powder River Basin produces 1.25 times more coal than the entire Appalachian Region of the U.S. and more than three times the amount produced by the rest of the Western U.S. , including Colorado, New Mexico, and Utah.<sup>9</sup> See Figure 2.



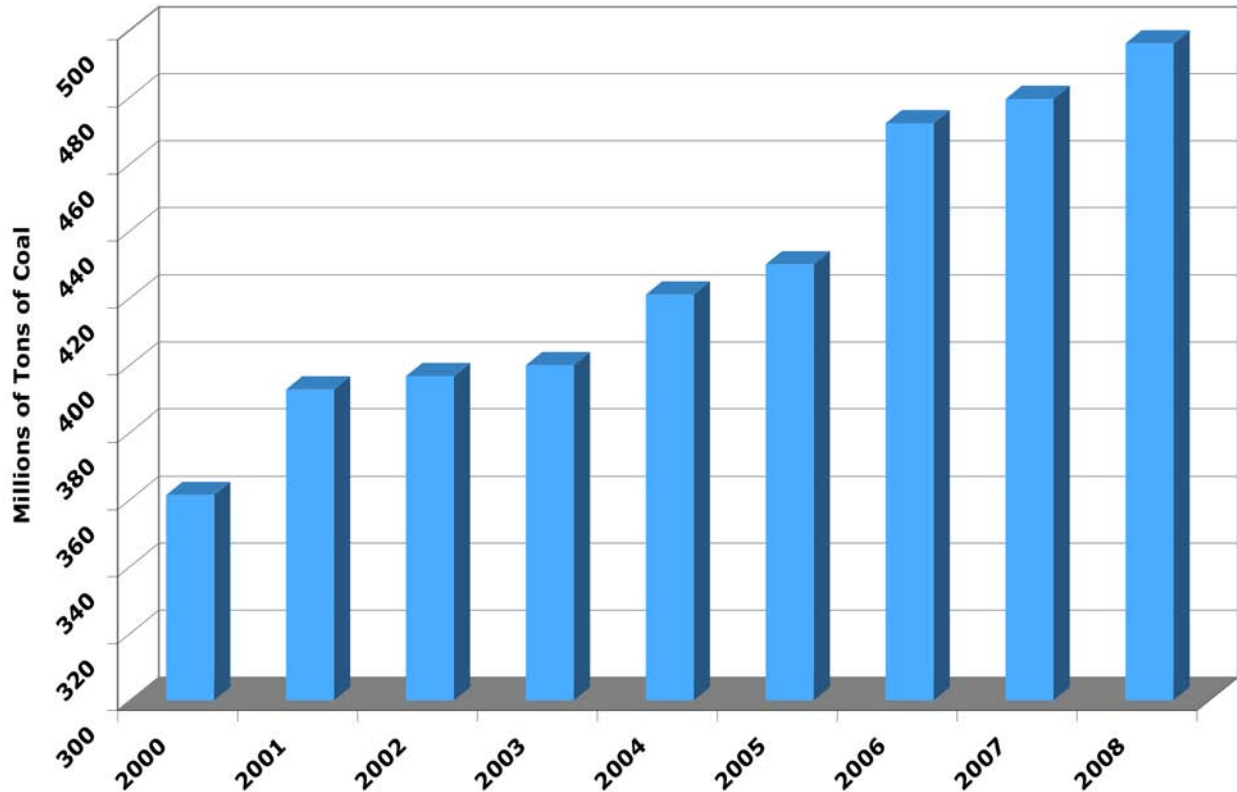
**Figure 2. Rolling hills and sagebrush, Powder River Basin.<sup>8</sup>**



**Figure 3. Coal produced in the United States by region (in thousands of tons).<sup>10</sup>**



Over the years, coal production has steadily increased in the Powder River Basin. Just since 2000, coal production has increased by nearly 40%, from 360 million tons to a record of 494 million tons annually. See Figure 4. In 2008, production levels approached a record 500 million tons.<sup>11</sup>



**Figure 4. Coal production in the Powder River Basin, 2000-2008.<sup>12</sup>**

The Wyoming portion of the Powder River Basin produces the vast majority of coal in the Powder River Basin. In 2008, 451,701,585 tons of coal were mined from a total of 13 mines in the Wyoming portion of the Powder River Basin, all located near the town of Gillette.<sup>13</sup> See Table 1. These mines are primarily operated by large, often multinational, mining companies including the Australian-based Rio Tinto Energy and Peabody, the world's largest private-sector coal company. In 2008, the top 10 producing coal mines in the U.S. were all located in the Powder River Basin.<sup>14</sup>



**Table 1. Coal Mine Production in the Wyoming Portion of the Powder River Basin, 2008.<sup>15</sup>**

Mine Name	Owner	Tons of Coal
North Antelope/Rochelle	Peabody	97,578,499
Black Thunder	Arch	88,584,704
Jacobs Ranch	Arch	42,145,705
Cordero	Rio Tinto Energy America	40,033,283
Antelope	Rio Tinto Energy America	35,777,489
Caballo	Peabody	31,205,381
Belle Ayr	Foundation Coal West	28,707,982
Buckskin	Kiewit Mining Properties LLC	26,076,355
Eagle Butte	Foundation Coal West	20,442,963
Rawhide	Peabody	18,418,546
Coal Creek	Arch	11,453,546
Wyodak	Wyodak	6,015,890
Dry Fork	Western Fuels	5,261,242
<b>TOTAL</b>		<b>451,701,585</b>

Surface strip mining is the preferred method in the Powder River Basin. More than 400 feet of overburden may be blasted and stripped away by gigantic electric shovels and draglines to exploit coal seams underlying the surface.<sup>16</sup> See Figures 5, 6, and 7. The process has created huge open pit mines thousands of acres in size. According to the U.S. Bureau of Land Management ("BLM"), the North Antelope/Rochelle mine, which is the largest coal producer in the Powder River Basin, has disturbed an area of 14,342 acres, or 22 square miles, of which 6,200 acres are being actively mined.<sup>17</sup> See Figure 7. The mine is one of the largest in the U.S.<sup>18</sup>



**Figure 5. Mining coal from pit in Powder River Basin.<sup>19</sup>**



**Figure 6. Electric shovel loading truck in strip mine.<sup>20</sup>**



**Figure 7. Aerial view of Jacobs Ranch coal mine.<sup>21</sup>**





**Figure 8. Satellite View of North Antelope/Rochelle Coal Mine.<sup>22</sup>**

Almost all coal mined from the Powder River Basin is shipped by rail and “used to generate electricity by coal-fired power plants” throughout the U.S.<sup>23</sup> In 2006, the BLM reported 8.4 million rail-carloads of coal were shipped from the region. According to the agency, “The largest rail coal movements are from the PRB [Powder River Basin] to generating power plants in Illinois, Missouri, and Texas.”<sup>24</sup> By 2012, the BLM expects rail capacity to approach 500 million tons of coal, or roughly 100 mile-long trains each day.<sup>25</sup>



**Figure 9. Coal train in Powder River Basin.<sup>26</sup>**

## GREENHOUSE GASES, GLOBAL WARMING, AND THE IMPACT OF THE POWDER RIVER BASIN

Coal mined from the Powder River Basin is burned in coal-fired power plants to generate electricity.<sup>27</sup> Hundreds of plants of all generating capacities and of various ownerships burn coal from the region in 28 states from New Jersey to Oregon.<sup>28</sup> The vast majority of coal from the region is burned in the Midwest, with Missouri burning most, followed by Texas, Kansas, Iowa, and Wisconsin.<sup>29</sup>

Burning this coal has released massive amounts of the greenhouse gas, carbon dioxide. Greenhouse gases, or heat-trapping gases, are a vital component of the Earth's atmosphere. Key greenhouse gases, including water vapor, carbon dioxide, ozone, methane, and nitrous oxide, absorb heat radiated from the Earth's surface and lower atmosphere and radiate much of the energy back to the surface. Without this "greenhouse effect," it is estimated that the Earth's surface would be 60° F cooler.<sup>30</sup>

Yet dramatic increases in the release of greenhouse gases by human activities have intensified the greenhouse effect, leading to global warming. According to the U.S. Global Change Research Program:

Observations show that warming of the climate is unequivocal. The global warming observed over the past 50 years is due primarily to human-induced emissions of heat-trapping gases. These emissions come mainly from the burning of fossil fuels (coal, oil, and gas) with important contributions from the clearing of forests, agricultural practices, and other activities.<sup>31</sup>

It is reported that since 1900, global average temperatures have increased by 1.5 degrees Fahrenheit and that by 2100, temperatures will rise another 2 to 11.5 degrees Fahrenheit. The U.S. Global Change Research Program reports that, "The U.S. average temperature has risen by a comparable amount and is very likely to rise more than the global average over this century[.]"<sup>32</sup>



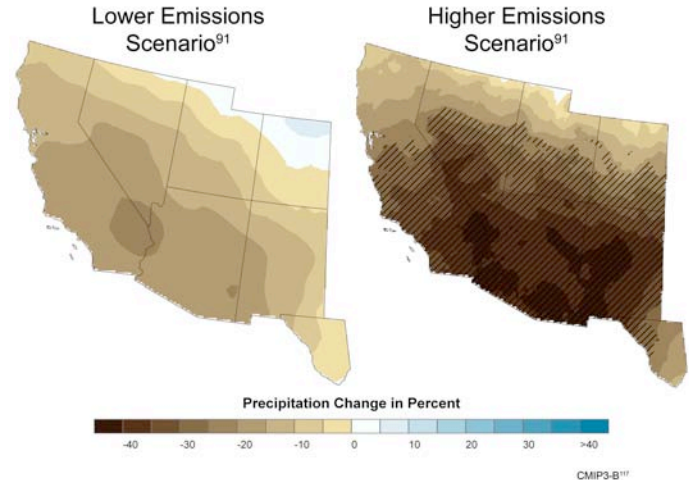
**Figure 10. Kansas' Jeffrey Energy Center burns 1,000,000 tons of Powder River coal monthly—more than any other U.S. power plant.**

The release of carbon dioxide in particular has been "the principal factor causing warming over the last 50 years."<sup>33</sup> Since the start of the industrial revolution, the concentration of carbon dioxide in the atmosphere has increased by 35%. Over the past several decades, 80% of all human-related carbon dioxide emissions came from the burning of fossil fuels.<sup>34</sup>

## The Impacts of Global Warming in the U.S.

Global warming poses myriad impacts that are occurring now, that are projected to occur, and that are projected to increase over time. In the U.S., these impacts include:

- Water resources will be stressed.
- Agricultural production will be “increasingly challenged.”
- Increased fire risk and insect infestations in western forests.
- The coasts, particularly along the Atlantic and Gulf Coasts, Pacific Islands, and parts of Alaska, are at “increasing risk from sea-level rise and storm surge.”



Percentage change in March-April-May precipitation for 2080-2099 compared to 1961-1979 for a lower emissions scenario<sup>91</sup> (left) and a higher emissions scenario<sup>91</sup> (right). Confidence in the simulated response is highest in the

### Projected change in spring precipitation in the Southwest.<sup>37</sup>

- Increased human health risks, including health impacts related to heat stress, waterborne diseases, polluted air, and extreme weather.
- Exacerbate existing environmental and public health impacts resulting from pollution, population growth, urbanization, unsustainable use of resources, and other social, economic, and environmental stresses.
- Will push ecological systems beyond the thresholds needed to sustain populations and habitat of wildlife, fish, and plants, particularly those dependent upon Arctic and alpine ecosystems.
- Decreased economic stability, including impacts to ski, recreation, and tourism sectors, agriculture, the transportation infrastructure that support the U.S. economy, among other industries.<sup>35</sup>

In the American West, the impacts of global warming are projected to be more pronounced. The U.S. Global Change Research Program reports:

Human-induced climate change appears to be well underway in the Southwest. Recent warming in the Southwest has been among the most rapid in the nation, significantly more than the global average in some areas. This is driving declines in spring snowpack and Colorado River flow. Projections of future climate change indicate continued strong warming in the region[.]<sup>36</sup>

Coal mining releases greenhouse gases directly, including methane releases from coal seams and carbon dioxide from combustion of fuel for mining equipment.<sup>38</sup> However, most greenhouse gases are released indirectly when the mined coal is burned. When burned, coal releases primarily carbon dioxide, along with lesser amounts of nitrous oxide and other greenhouse gases.<sup>39</sup> Coal releases more carbon dioxide when burned than any other fossil fuel.<sup>40</sup> Coal emits on average more than 200 pounds of carbon dioxide for every million Btus consumed.<sup>41</sup> This amounts to an average of around two tons of carbon dioxide for every one ton of coal burned.<sup>42</sup> Among coal types, anthracite releases the most carbon dioxide when burned, followed by lignite, subbituminous, and bituminous.<sup>43</sup> Subbituminous and bituminous coals are the most commonly burned coal types.

Annually, the U.S. emits 7,881.6 million tons (7,150.1 million metric tons) of greenhouse gases, based on carbon dioxide equivalency, making up 18.7% percent of human created greenhouse gases released globally.<sup>44</sup> Of this total, carbon dioxide comprises more than 85% of total U.S. greenhouse gas emissions.<sup>45</sup>

The electricity generation sector is the largest source of greenhouse gases in the U.S., largely due to carbon dioxide emissions.<sup>46</sup> The EPA reports, "The process of generating electricity is the single largest source of CO<sub>2</sub> [carbon dioxide] emissions in the United States, representing 39 percent of total CO<sub>2</sub> emissions from all CO<sub>2</sub> emissions sources in the United States."<sup>47</sup> Coal-fired power plants release 80% of all greenhouse gases from the electricity generation sector, including more than 2.17 billion tons (1.96 billion metric tons) of carbon dioxide—nearly 30% of the nation's total greenhouse gas inventory and 32% of all carbon dioxide released in the U.S.<sup>48</sup> This makes coal-fired power plants the largest single source of carbon dioxide in the country.

As the largest producer of coal in the U.S., coal mining in the Powder River Basin is therefore responsible for more greenhouse gas emissions than any other direct activity. Based on 2007 data, coal mining in the region led to the release of 877,103,673 tons (795,695,068 metric tons) of carbon dioxide, 13% of the U.S. total and 40% of all carbon dioxide released by coal-fired power plants in the country.<sup>49</sup>

Although 2008 greenhouse gas inventory data for the U.S. is not available at this time, we expect that the contribution of the Powder River Basin to U.S. carbon dioxide emissions will continue to increase. Since 2000, the contribution of Powder River Basin coal to overall carbon dioxide emissions has increased from 10.07% to nearly 14%.<sup>50</sup> Given that in 2008, a record 494,964,000 tons of coal were mined from the Powder River Basin, leading to the release of 907,227,268 tons (823,022,733 metric tons) of carbon dioxide, it appears the region is on track to continue growing as the largest contributor of carbon dioxide emissions in the U.S.<sup>51</sup> See Table 2.



**Table 2. Carbon dioxide emissions from Powder River Basin coal and contribution to U.S. carbon dioxide emissions, 2000-2008.<sup>52</sup>**

Year	Coal production in tons	Tons of CO2 emissions	Metric tons of CO2 emissions	Metric tons of total U.S. CO2 emissions	Percent contribution
2000	361,294,000	660,886,211	599,545,885	5,955,200,000	10.07%
2001	392,693,000	718,321,890	651,650,657	5,860,000,000	11.12%
2002	396,663,000	725,583,893	658,238,635	5,908,200,000	11.14%
2003	399,953,000	731,602,027	663,698,194	5,963,200,000	11.13%
2004	420,992,000	770,086,986	698,611,162	6,048,100,000	11.55%
2005	429,996,000	786,557,283	713,552,764	6,090,800,000	11.72%
2006	472,202,000	863,761,342	783,591,109	6,014,900,000	13.03%
2007	479,496,000	877,103,673	795,695,068	6,103,400,000	13.04%
2008	495,964,000	907,227,268	823,022,733	Data unavailable	To be determined

The role of the Powder River Basin as the largest contributor to U.S. carbon dioxide emissions is intensified by the fact that subbituminous coal from the region inherently releases more carbon dioxide on a per Btu basis than most coal mined elsewhere in the U.S. Subbituminous coal from the Powder River Basin of Wyoming and Montana releases 212.7 pounds per million Btus and 213.4 pounds per million Btus, respectively, which is higher than the U.S. average for subbituminous coal and higher than all but one other subbituminous coal producing state—Alaska.<sup>53</sup> See Table 3. Subbituminous coal from the Powder River Basin also releases more carbon dioxide than any bituminous coal mined in the U.S. Bituminous coal, which is mined primarily in the eastern U.S., is the next most widely used coal type and emits on average 205.3 pounds of carbon dioxide per million Btus.<sup>54</sup>



**Table 3. Carbon dioxide emission factors for subbituminous coal in the U.S.<sup>55</sup>**

<b>State</b>	<b>Pounds of CO2 per million Btu</b>
Alaska	214.0
Colorado	212.7
Iowa	207.2
Montana	213.4
New Mexico	208.8
Oregon	210.4
Utah	207.1
Washington	208.7
Wyoming	212.7
<b>U.S. Average</b>	<b>211.9</b>

Carbon dioxide is the leading cause of global warming and the most emitted greenhouse gas in the U.S., with coal-fired power plants representing the largest single source of carbon dioxide. As the leading coal producing region in the U.S., the Powder River Basin is the leading contributor to global warming in the U.S., a distinction that is on track to continue.

## SHAM COAL LEASING PROGRAM HAS SHORTCHANGED THE PUBLIC, UNDERMINED THE CLIMATE

Coal in the Powder River Basin is almost entirely owned by the federal government and leased by the BLM to private companies to mine and sell. Federal regulations provide that coal must be leased in coal production regions through a competitive process whereby the BLM establishes regional leasing levels and delineates lease boundaries based on an assessment of regional environmental impacts and public input.<sup>56</sup> The BLM then auctions off leases to the highest bidder, ensuring adequate protection of the environment while recovering at least the fair market value for the U.S. Treasury.

This does not occur in the Powder River Basin. This is due to the fact that the BLM has determined the Powder River Basin is not a coal production region, a determination that has both diminished competition for coal leases and undermined the agency's ability to address the global warming impacts of coal leasing.

The Powder River Basin was initially designated a federal coal production region on November 9, 1979.<sup>57</sup> This designation was followed by the 1982 promulgation of federal coal leasing regulations by President Reagan.<sup>58</sup> On a basic level, these regulations require extensive analysis and consideration of the regional environmental impacts of coal leasing, consultation with the public, the development of a regional plan for leasing, and a competitive bidding process. The regulations specifically require:<sup>59</sup>

- The establishment of regional leasing levels, which are to be based upon the "economic, social and environmental effects of coal leasing" and public comments, among other factors.<sup>60</sup>
- That potential lease tracts be delineated by the BLM and the ranked in order of prioritization for leasing. Tract ranking is to be based on three considerations: "coal economics, impacts on the natural environment, and socioeconomic impacts." Tract delineation and ranking is also subject to public comment.<sup>61</sup>
- That a regional lease sale environmental analysis be prepared disclosing the impacts of "all tract combinations...for the various leasing levels."<sup>62</sup>
- That a regional lease sale schedule based on the regional environmental analysis and BLM lease rankings be established, published, adhered to, and, if necessary, revised over time.<sup>63</sup>
- And that a competitive bidding process be used to sell coal leases set forth in the regional lease sale schedule.<sup>64</sup>

However, these standard leasing requirements have been sidestepped. In 1990, the BLM "decertified" the Powder River Basin coal production region, in essence

declaring the Basin was no longer a coal production region.<sup>65</sup> The “decertification” has had a profound and deliberate impact: it has enabled the BLM to avoid complying with standard leasing procedures and instead rely on the “Lease by Application” process. The “Lease by Application” process is a streamlined form of leasing where an interested coal company submits an application for a coal lease and the BLM offers the lease for sale. It differs from standard leasing procedures in two major ways. First, coal companies delineate lease tracts and propose them for leasing, not the BLM.<sup>66</sup> And second, lease proposals are not based on regional leasing levels or any regional environmental impact analysis.<sup>67</sup>

This drastic shift in leasing procedure was, in fact, the driving force behind the “decertification” of the Powder River Basin.<sup>68</sup> The rationale for the “decertification” had nothing to do with production capacity or demand for coal; at the time, the region produced 15% of all coal in the U.S. and demand was increasing.<sup>69</sup> According to the BLM, the “Lease by Application” process was simply “deemed more appropriate” in order to facilitate expansion of existing coal mines.<sup>70</sup>

Yet the “Lease by Application” process is only to be used where there is an “emergency need for unleased coal” or in areas “outside coal production regions.”<sup>71</sup> It is a streamlined process meant to facilitate leasing in areas that are not producing coal, or where a genuine emergency need for unleased coal exists. Federal regulations do not allow the process to be used to facilitate expansion of existing mines. The BLM nevertheless pushed ahead with “decertification” of the Powder River Basin, enabling the agency to utilize the streamlined “Lease by Application” process to facilitate expansion of existing mines.

In the Powder River Basin, the “decertification” and use of the “Lease by Application” process has severely diminished competition for coal. In the last 20 years, the BLM has offered 21 “Leases by Application” for sale in the Powder River Basin totaling nearly 50,000 acres and more than 5.8 billion tons of coal.<sup>72</sup> **During this time, there have been only three sales where more than one company has bid on a coal lease.** See Table 4. The reason is that the “Lease by Application” process has allowed each major coal producer in the region to submit applications for federal coal leases based on tracts that they have designed. In all but one case, it appears that mine companies have designed tracts to facilitate expansion of their existing mines and preclude competition, thereby reducing the price of coal and the undermining the BLM’s ability to ensure recovery of fair market value for the U.S. Treasury.<sup>73</sup>

**Table 4. "Leases by Application" issued by the BLM in the Powder River Basin.<sup>74</sup> There have been only three competitive leases, highlighted in red, since the "Lease by Application" process began in 1990.**

<b>Coal Lease</b>	<b>Sale Date</b>	<b>Acreage</b>	<b>Tons of Coal</b>	<b>No. of Bidders</b>	<b>Winning Bid</b>
Jacobs Ranch	9/26/91	1,708.62	147,423,560	1	\$.136/ton
West Black Thunder	8/12/92	3,492.50	429,000,000	1	\$.168/ton
North Antelope and Rochelle Mine	9/28/92	3,064.04	403,500,000	1	\$.216/ton
West Rocky Butte Mine	1/7/93	463.205	56,700,000	1	\$.291/ton
Eagle Butte	4/5/95	1,059.18	166,400,000	1	\$.111/ton
Antelope	12/4/96	462	60,364,000	1	\$.15/ton
North Rochelle	9/25/97	1,481.93	157,610,000	1	\$.194/ton
Powder River	6/30/98	4,224.23	532,000,000	1	\$.206/ton
<b>Thundercloud</b>	<b>10/1/98</b>	<b>3,545.50</b>	<b>412,000,000</b>	<b>2</b>	<b>\$.3835/ton</b>
Horse Creek	9/7/00	2,818.70	275,577,000	1	\$.33/ton
Belle Ayr 2000	10/11/01	243.61	31,400,000	1	\$.205/ton
<b>North Jacobs Ranch</b>	<b>1/16/02</b>	<b>4,982.24</b>	<b>537,542,000</b>	<b>2</b>	<b>\$.706/ton</b>
NARO South	6/29/04	2,956.70	297,469,000	1	\$.92/ton
Little Thunder	9/22/04	5,083.50	718,719,000	1	\$.85/ton
Hay Creek	11/17/04	921	142,698,000	1	\$.30/ton
West Antelope	12/15/04	2,809.13	194,961,000	1	\$.75/ton
NARO North	12/29/04	2,369.40	324,627,000	1	\$.92/ton
<b>West Roundup</b>	<b>2/16/05</b>	<b>2,802.51</b>	<b>327,186,000</b>	<b>2</b>	<b>\$.97/ton</b>
Eagle Butte West	2/20/08	1,427	255,000,000	1	\$.708/ton
South Maysdorf	4/22/08	2,900	288,081,000	1	\$.8706/ton
North Maysdorf	1/29/09	445.89	54,657,000	1	\$.88/ton
<b>TOTALS</b>		<b>49,260.87</b>	<b>5,812,914,560</b>		

In fact, for nearly every "Lease by Application" issued by the BLM in the last 20 years, the leases have been awarded to companies seeking to expand their existing mines. There has been only one instance where a lease was awarded to a company

that did not apply for the lease and that was not seeking to expand an existing mine under its ownership. This occurred on October 1, 1998, when Arch outbid Kennecott Energy, a subsidiary of Rio Tinto Energy, for the Thundercloud lease, which sought to expand the Jacobs Ranch Mine.<sup>75</sup> Ultimately, the lease was awarded to Arch. In 2009 however, Arch bought the Jacobs Ranch Mine from Kennecott Energy.<sup>76</sup>

Although the BLM is required to ensure that any coal sold through the “Lease by Application” process meets fair market value standards, with little actual competition it is questionable whether this is occurring.<sup>77</sup>

According to the BLM’s “Economic Evaluation of Coal Properties Manual,” competition is a key component of ensuring fair market value. For example, the “salient features” of fair market value include, among other things:

- Fair market value is determined by reference to a competitive market rather than to the personal or inherent value of the property.
- And the property must be exposed to a competitive market for a reasonable time.<sup>78</sup>

Additionally, the BLM’s preferred process for appraising coal properties, the comparable sales approach, relies on comparable prices being determined in a competitive market.<sup>79</sup> At the least,

with only three truly competitive leases sales in the last 20 years, it is difficult to see how any assessment of fair market value could be based on valid comparable data.

When there has been actual competition for a “Lease by Application” in the Powder River Basin, the BLM has received a greater return. For example, in the case of the 1998 Thundercloud Lease by Application, the low bid was \$0.3012/ton and the high bid was \$0.3835/ton—an ultimate difference of more than \$33 million.<sup>81</sup> Additionally, according to the BLM, competition for the 2005 West Roundup coal lease brought a record bid of 97 cents per ton.<sup>82</sup> The lack of competition for “Leases by Application” indicates that the BLM could be recovering more value for the U.S. Treasury.

This diminished competition has also undermined the ability of the BLM to address global warming. Because the “Lease by Application” process does not require a regional analysis of environmental impacts or that leasing levels be established based on a full consideration of environmental impacts, it prevents the BLM from addressing the global warming impacts of coal leasing in the Powder River Basin.

“[Market value] is the most probable price in cash, terms equivalent to cash, or in other precisely revealed terms, for which the specified property rights should sell after **reasonable exposure in a competitive market** under all conditions requisite to a fair sale[.]”

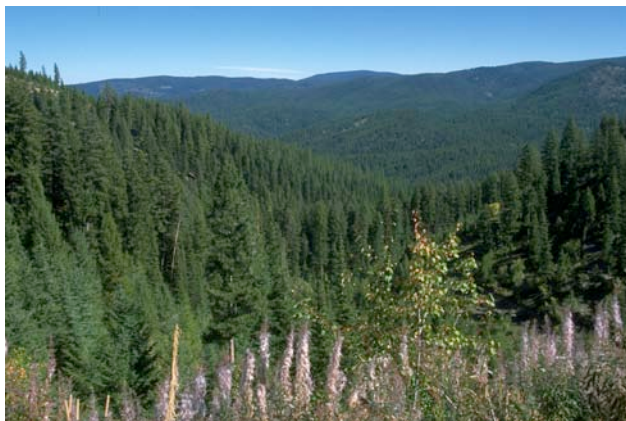
—BLM Economic Evaluation of Coal Properties<sup>80</sup>

Under standard leasing procedures, the BLM would be required to rigorously analyze and fully take into account the global warming impacts of coal leasing.<sup>83</sup> The agency would be required to adhere to a three phase process:

1. First, regional leasing levels must be established based on consideration of environmental impacts, among other factors.<sup>84</sup> This first phase establishes a ceiling for coal leasing and ensures that environmental impacts are taken into account well before leasing occurs.
2. Second, lease tracts must be delineated and scheduled for sale according to a ranking based on consideration of environmental impacts, among other factors.<sup>85</sup> This second phase ensures that impacts are taken into account in determining the priority and timing in which any leases should be offered for sale.
3. And third, the "site-specific" and "intraregional cumulative" environmental impacts of each individual lease tract offered for sale must be analyzed and taken into account before being sold.<sup>86</sup> This final phase ensures that the impacts of leases are addressed individually and cumulatively before being sold.

This three-phase process of analyzing and addressing the environmental impacts of leasing does not apply in "decertified" coal production regions. Instead, the BLM is simply required to offer leases delineated by coal companies, regardless of environmental considerations. The agency is not required to prepare a regional analysis of the impacts of coal leasing, nor required to limit leasing based on any consideration of regional impacts. **Put simply, there is no ceiling on coal leasing.**

Although the BLM is required to prepare an environmental analysis for each individual "Lease by Application," the agency is not required to consider or address regional impacts, or otherwise limit leasing based on regional environmental concerns.<sup>87</sup>



**Figure 11. The amount of carbon dioxide released by Powder River coal equals the amount stored annually by 2.1 billion acres of pine forest.**

In other words, while the current "Lease by Application" process requires a narrow analysis of the impacts of individual leases, it prevents the BLM from setting limits on leasing according to regional impacts.

This is problematic as over the years, the global warming impacts of coal leasing in the Powder River Basin have been staggering. Since 1991, the BLM has awarded 21 "Leases by Application" totaling more than 5.8 billion tons of coal.<sup>88</sup> Cumulatively, this coal will have released more than 10.63 billion tons (9.64 billion metric tons) of carbon dioxide after being burned.<sup>89</sup> See Table 5.

**Table 5. "Leases by Application" issued by the BLM in the Powder River Basin and total carbon dioxide emissions in tons and metric tons from burning leased coal.<sup>90</sup>**

<b>Coal Lease</b>	<b>Sale Date</b>	<b>Tons of Coal</b>	<b>Tons of Carbon Dioxide</b>	<b>Metric Tons of Carbon Dioxide</b>
Jacobs Ranch	9/26/91	147,423,560	269,670,124.42	244,640,621.71
West Black Thunder	8/12/92	429,000,000	784,735,380.00	711,899,961.67
North Antelope and Rochelle Mines	9/28/92	403,500,000	738,090,270.00	669,584,229.69
West Rocky Butte Mine	1/7/93	56,700,000	103,716,774.00	94,090,274.65
Eagle Butte	4/5/95	166,400,000	304,382,208.00	276,130,894.23
Antelope	12/4/96	60,364,000	110,419,036.08	100,170,464.54
North Rochelle	9/25/97	157,610,000	288,303,364.20	261,544,412.49
Powder River	6/30/98	532,000,000	973,145,040.00	882,822,330.09
Thundercloud	10/1/98	412,000,000	753,638,640.00	683,689,473.68
Horse Creek	9/7/00	275,577,000	504,090,959.94	457,303,626.43
Belle Ayr 2000	10/11/01	31,400,000	57,437,508.00	52,106,430.76
North Jacobs Ranch	1/16/02	537,542,000	983,282,577.24	892,018,949.18
NARO South	6/29/04	297,469,000	544,136,244.18	493,632,097.20
Little Thunder	9/22/04	718,719,000	1,314,695,169.18	1,192,671,395.23
Hay Creek	11/17/04	142,698,000	261,026,035.56	236,798,836.20
West Antelope	12/15/04	194,961,000	356,626,560.42	323,526,173.49
NARO North	12/29/04	324,627,000	593,814,200.94	438,699,181.49
West Roundup	2/16/05	327,186,000	598,495,174.92	542,945,689.65
Eagle Butte West	2/20/08	255,000,000	466,451,100.00	423,157,319.88
South Maysdorf	4/22/08	288,081,000	526,963,526.82	478,053,270.07
North Maysdorf	1/29/09	54,657,000	99,979,677.54	90,700,037.77
<b>TOTALS</b>		<b>5,812,914,560</b>	<b>10,633,099,571.44</b>	<b>9,646,185,60.11</b>



This is the direct result of the “decertification” of the Powder River Basin and reliance on the “Lease by Application” process. Because the BLM is not required to adhere to standard leasing procedures, the agency has never prepared a regional analysis addressing the global warming impacts of coal leasing in the Powder River Basin. Consequently, the agency has not established regional leasing levels that take into account global warming impacts. Furthermore, the BLM has not delineated, ranked, or scheduled for sale any coal lease based on any consideration of associated carbon dioxide emissions and global warming impacts.

While unsupported in the first place, the 1990 “decertification” of the Powder River Basin as a coal production region appears to have served the BLM’s intent to facilitate expansion of existing mines. Unfortunately, this decision has worsened global warming impacts while simultaneously denying revenue to the U.S. Treasury. The “Lease by Application” process has favored the demands of coal companies, leading to much diminished competition for coal and an inadequate system of environmental oversight.

## NEW COAL LEASING PROPOSALS THREATEN TO FUEL GLOBAL WARMING

Despite the global warming impacts of coal leasing in the Powder River Basin and obvious problems with the leasing program, the BLM has recently proposed to offer 12 new “Leases by Application.” See Table 6. Collectively, these leases propose to mine as much as 5.8 billion tons of coal from more than 34,571 acres.<sup>91</sup> This is almost as much coal as has been mined from the Powder River Basin in the last 20 years. Together, these proposed coal leases represent one of the most significant U.S. sources of greenhouse gases that may be authorized in the near future.

**Table 6. “Leases by Application” that have been proposed by the BLM in the Powder River Basin and estimated coal tonnage and carbon dioxide emissions, based on high and low estimates in BLM analyses.<sup>92</sup>**

Proposed Coal Lease	Tons of Coal-low	Tons of Coal-high	Tons of Carbon Dioxide Emissions-low (metric tons)	Tons of Carbon Dioxide Emissions-high (metric tons)
West Antelope II	377,800,000	453,900,000	683,043,510 (619,646,649)	830,282,958 (753,220,029)
Belle Ayr North	154,800,000	204,600,000	279,870,660 (253,894,391)	374,258,412 (339,521,520)
West Coal Creek	57,000,000	57,000,000	103,053,150 (93,488,245)	104,265,540 (94,588,107)
West Caballo	81,800,000	98,600,000	147,890,310 (134,163,832)	180,361,092 (163,620,830)
Maysdorf II	169,100,000	474,500,000	305,724,345 (277,348,460)	867,964,890 (787,404,503)
North Hilight Field	263,400,000	669,300,000	476,214,030 (432,014,101)	1,224,296,946 (1,110,663,507)
South Hilight Field	213,600,000	320,000,000	386,178,120 (350,334,897)	585,350,400 (531,020,950)
West Hilight Field	377,900,000	1,056,100,000	683,224,305 (619,810,663)	1,931,839,242 (1,752,535,080)
West Jacobs Ranch	669,600,000	1,142,100,000	1,210,603,320 (1,098,240,858)	2,089,152,162 (1,895,246,960)
North Porcupine	601,200,000	777,400,000	1,086,939,540 (986,054,964)	1,422,035,628 (1,290,049,021)
South Porcupine	309,700,000	405,400,000	559,922,115 (507,952,798)	741,565,788 (672,737,167)
Hay Creek II	148,000,000	148,000,000	267,576,600 (242,741,408)	270,724,560 (245,597,190)
<b>TOTALS</b>	<b>3,423,900,000</b>	<b>5,806,900,000</b>	<b>6,190,240,005</b> <b>(5,615,691,269)</b>	<b>10,622,097,618</b> <b>(9,636,204,866)</b>

These proposals promise to entrench the role of the Powder River Basin as the leading contributor to global warming in the U.S. On the low end, the coal from these proposals would release 6.19 billion tons (5.61 billion metric tons) of carbon dioxide.<sup>93</sup> This is a staggering amount of carbon dioxide—nearly three times the amount of carbon dioxide released by all U.S. coal-fired power plants in 2007.<sup>94</sup> However, these proposals may release as much as 10.6 billion tons (9.64 billion metric tons) of carbon dioxide.<sup>95</sup> This is more than was released by all fossil fuel combustion in the U.S. in 2007.<sup>96</sup>

Importantly, these proposals highlight the failings of the current leasing program in the Powder River Basin. Indeed, every proposed “Lease by Application” is the result of a coal company seeking to expand an existing mine in the region.<sup>97</sup> Even the BLM itself describes every one of these proposed leases as “maintenance tracts,” or leases meant to “maintain production at an existing mine.”<sup>98</sup> For instance, Arch Coal applied for the North Highlight Field, South Highlight Field, and West Highlight Field “Leases by Application” for the sole purpose of maintaining production at the Black Thunder coal mine, the second largest mine in the Powder River Basin.<sup>99</sup> These proposals will continue to inhibit competition and depress coal prices in the Powder River Basin.

Furthermore, these proposals underscore the inability of the BLM to address the global warming impacts of coal leasing in the Powder River Basin through the “Lease by Application” process. Although the agency has prepared or is preparing analyses of the environmental impacts of the proposed coal leases pursuant to the National Environmental Policy Act, these analyses fail to compensate for fundamental problems with the “Lease by Application” process.<sup>100</sup> For instance:

- The proposed leases have not been delineated, selected, or ranked based on any consideration of global warming impacts.<sup>101</sup> Instead, the proposed leases are merely a response to proposals from coal companies.
- No assessment of past, present, and foreseeable global warming impacts of coal leasing on a regional level has been completed.<sup>102</sup> Instead, the environmental analyses for the proposed “Leases by Application” only assess greenhouse gas emissions associated with individual leases.<sup>103</sup>
- No regional limits on coal leasing exist to address global warming.<sup>104</sup> Instead, coal companies can submit as many applications for coal leases as they want and the BLM is not required to limit approval of such applications, or otherwise keep coal leasing in check to address global warming impacts.
- While the BLM discloses that coal mining in the Powder River Basin is currently responsible for more than 13% of U.S. carbon dioxide emissions, the BLM proposes to do nothing to address this impact.<sup>105</sup> Under standard leasing procedures, the BLM would be required to limit leasing to address global warming impacts.

The BLM is scheduled to begin approving these proposed “Leases by Application.” According to the agency, the West Antelope II lease is slated to be imminently approved and offered for sale, followed by the Belle Ayr North, West Coal Creek, West Caballo, and Maysdorf II leases.<sup>106</sup> The BLM is also preparing a final environmental impact statement for the North Hilight Field, South Highlight Field, West Highlight Field, West Jacobs Ranch, North Porcupine, and South Porcupine leases and a draft environmental impact statement for the Hay Creek II lease.<sup>107</sup> If approved, these leases promise to perpetuate the BLM’s deeply flawed decision to “decertify” the Powder River Basin as a coal production region, threatening to exacerbate global warming impacts at the expense of the U.S. Treasury.

## SOLUTIONS AT HAND

Solving global warming means reducing greenhouse gas emissions. To effectively reduce greenhouse gas emissions in the U.S., efforts must focus on reducing the global warming impacts of coal leasing in the Powder River Basin.

Fortunately, the groundwork for has already been laid. On September 14, 2009, Interior Secretary Ken Salazar called for the development of a “unified greenhouse gas emission reduction program” among Department of Interior agencies.<sup>108</sup> Secretary Salazar’s Order was bolstered by President Obama, who on October 5, 2009 called on all federal agencies to “measure, report, and reduce their greenhouse gas emissions from direct and indirect activities.”<sup>109</sup> President

**“Federal agencies shall... reduce their greenhouse gas emissions from all direct and indirect activities[.]”**

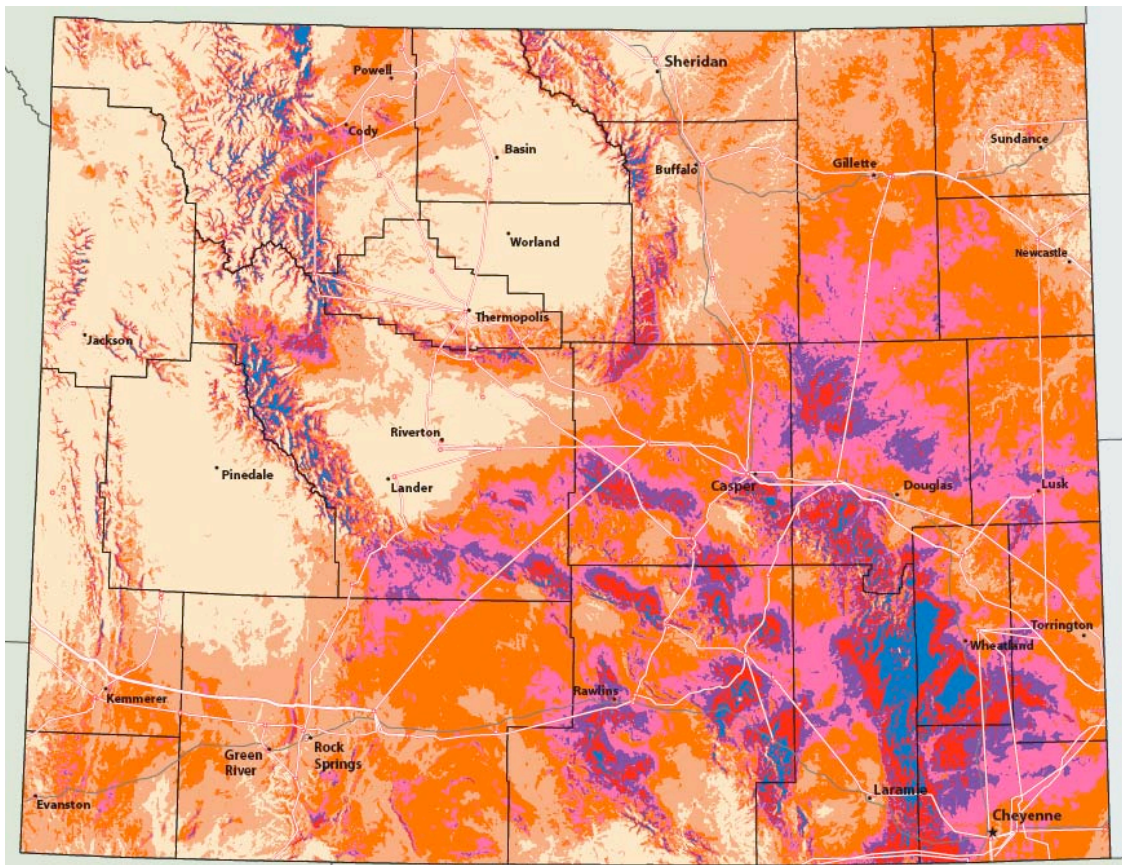
—President Barack Obama

Obama’s Executive Order directed federal agencies to establish a “percentage reduction target” for reducing direct and indirect greenhouse gas emissions by June 2010.<sup>110</sup> These orders provide a solid foundation for the BLM to address the global warming impacts of federal coal leasing in the Powder River Basin and reduce greenhouse gases.

However, reform of the coal leasing program in the Powder River Basin must become an immediate priority of the BLM to effectively build upon this foundation. The agency must begin to take steps that both address the global warming impacts of coal leasing in the Powder River Basin and seize on clean energy solutions. To this end, we recommend the agency undertake the following actions:

- **Call a time-out:** The BLM should place a moratorium on all new coal leasing in the Powder River Basin until the agency develops and implements a comprehensive plan to address global warming impacts. This moratorium should apply to all pending lease proposals.
- **Re-designate the Powder River Basin a “coal production region”:** The re-designation, or recertification, of the Powder River Basin as a “coal production region” will restore competition for coal leases and enable the BLM to fully address the global warming impacts of coal leasing.
- **Prepare a regional environmental analysis:** In re-designating the Powder River Basin as a coal production region, the BLM will be required to prepare an analysis addressing the regional impacts of leasing. The agency should immediately prepare this analysis, ensuring that global warming impacts are fully analyzed and assessed in order to inform future leasing decisions and ensure reductions in carbon dioxide emissions attributable to Powder River Basin coal.

- Establish a carbon fee for new leases:** The BLM should establish a carbon fee for new coal leases to create a Global Warming Impact Fund. The carbon fee should be established pursuant to the Federal Land Policy and Management Act (“FLPMA”) as a reasonable charge to reimburse the BLM for the costs of addressing the global warming impacts of coal leasing.<sup>111</sup> Funds from the Global Warming Impact Fund should reimburse the BLM for renewable energy development, habitat restoration, and other efforts to address the impacts of global warming stemming from coal leasing in the Powder River Basin.
- Transition to clean, renewable energy:** The BLM’s long-term goal should be to reduce greenhouse gases by promoting renewable energy. To this end, the agency, either alone or in collaboration with other agencies, should report on the renewable energy potential of the Powder River Basin. With the guidance of this report, the BLM should develop and implement a plan to promote the expeditious development of renewable energy in the Powder River Basin. The State of Wyoming alone has enough renewable energy potential to more than meet the electricity needs of all 11 western states.<sup>112</sup> Furthermore, a substantial amount of wind energy potential lies in northeastern Wyoming. See Figure 12.



**Figure 12. Wind energy potential in the State of Wyoming. Blue is “Superb,” red is “Outstanding,” purple is “Excellent,” pink is “Good,” and orange is “Fair.”<sup>113</sup>**

Solutions are at hand to address the global warming impacts of coal leasing in the Powder River Basin of northeastern Wyoming and southeastern Montana. The agency not only has broad authorities to address the global warming impacts, but is well poised to become a leader in transitioning the Powder River Basin away from coal and toward clean, renewable energy. The Powder River Basin is a leading contributor to global warming in the U.S., a distinction that promises to continue. For the sake of the welfare of the United States, the BLM must act and act fast to ensure progress is made to effectively confront global warming.



## END NOTES

### Introduction

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<http://www.blm.gov/wy/st/en/info/NEPA/HighPlains/Wright-Coal.html>.
2. *Id.* at 3-173—3-220.
3. Image from U.S. Geological Survey. [http://pubs.usgs.gov/fs/fs-146-02/Powder-River-Map\\_tmb.jpg](http://pubs.usgs.gov/fs/fs-146-02/Powder-River-Map_tmb.jpg).
4. Luppens, J.A., *et al.*, 2008. "Assessment of Coal Geology, Resources, and Reserves in the Gillette Coalfield, Powder River Basin, Wyoming." USGS Open-File Report 2008-1202, p. 5.  
<http://pubs.usgs.gov/of/2008/1202/pdf/ofr2008-1202.pdf>.
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6. Powder River Basin subbituminous coal averages 8,600 British thermal units ("Btus"), a measurement of energy content, per pound, whereas bituminous coal from the Appalachian Region averages 12,500 Btus/pound. [http://en.wikipedia.org/wiki/Powder\\_River\\_Basin](http://en.wikipedia.org/wiki/Powder_River_Basin).
7. Energy Information Administration, 2009. "Coal Production and Number of Mines by State and Mine Type." <http://www.eia.doe.gov/cneaf/coal/page/acr/table1.html>.
8. Image from Bureau of Land Management.
9. *Supra.* Note 7.
10. Coal production regions are defined by the Energy Information Administration as geographic classifications of areas where coal is produced. The Appalachian Region includes Alabama, Eastern Kentucky, Maryland, Ohio, Pennsylvania, Tennessee, Virginia, and West Virginia. The Interior Region includes Arkansas, Illinois, Indiana, Kansas, Louisiana, Mississippi, Missouri, Oklahoma, Texas, and Western Kentucky. The Western Region includes Alaska, Arizona, Colorado, Montana (outside of the Powder River Basin), New Mexico, North Dakota, Utah, Washington, and Wyoming (outside the Powder River Basin). <http://www.eia.doe.gov/cneaf/coal/page/acr/gloss.pdf>
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[http://www.eia.doe.gov/cneaf/coal/page/acr/acr\\_sum.html](http://www.eia.doe.gov/cneaf/coal/page/acr/acr_sum.html). Historical production data from 2000-2007 Annual Coal Reports. <http://www.eia.doe.gov/cneaf/coal/page/acr/backissues.html>.
13. Bureau of Land Management, 2009. "Powder River Basin Coal Production."  
[http://www.blm.gov/wy/st/en/programs/energy/Coal\\_Resources/PRB\\_Coal/production.html](http://www.blm.gov/wy/st/en/programs/energy/Coal_Resources/PRB_Coal/production.html).
14. Energy Information Administration, 2009. "Major U.S. Coal Mines, 2008."  
<http://www.eia.doe.gov/cneaf/coal/page/acr/table9.html>.
15. *Id.*
16. *Supra.* Note 1.

17. *Supra.* Note 1 at 3-9.
18. Peabody Energy, North Antelope-Rochelle Mine.  
<http://www.peabodyenergy.com/Media/factsheets/NARoch.asp>.
19. Image from Bureau of Land Management.
20. *Id.*
21. Image from <http://www.flickr.com/photos/docsearls>.
22. Image from NASA. <http://veimages.gsfc.nasa.gov//17330/ISS011-E-12863.jpg>.
23. *Supra.* Note 1 at 3-305.
24. *Supra.* Note 1 at 3-277.
25. *Supra.* Note 1 at 4-14.
26. Image from Bureau of Land Management.

## **Greenhouse Gases, Global Warming, and the Impact of the Powder River Basin**

27. *Supra.* Note 1 at 4-108—4-109.
28. The Federal Energy Regulatory Commission and Energy Information Administration maintain databases disclosing coal consumption, including origins and quantities, by power plants within the United States. See <http://www.eia.doe.gov/cneaf/electricity/page/eia423.html> and <http://www.eia.doe.gov/cneaf/electricity/page/ferc423.html>.
29. *Id.*
30. Karl, T.R., *et al.*, eds., 2009. "Global Climate Change Impacts in the United States." Cambridge University Press, pp. 14-15. <http://downloads.globalchange.gov/usimpacts/pdfs/climate-impacts-report.pdf>.
31. *Id.* at 9.
32. *Id.*
33. *Supra.* Note 30 at 14.
34. *Id.*
35. *Supra.* Note 30 at 12.
36. *Supra.* Note 30 at 129.
37. *Supra.* Note 30 at 83.

38. *Supra*. Note 1 at 3-307.
39. Coal combustion also releases a number of toxic air pollutants, including lead, mercury, selenium, soot, and sulfur dioxide, in addition to greenhouse gases.
40. U.S. EPA, 2009. "Inventory of U.S. Greenhouse Gas Emissions and Sinks, 1990-2007." EPA 430-R-09-004, p. 3-4. <http://www.epa.gov/climatechange/emissions/downloads09/InventoryUSGhG1990-2007.pdf>.
41. Hong, B.D. and E.R., Slatick, 1994. "Carbon Dioxide Emission Factors for Coal." Energy Information Administration, *Quarterly Coal Report, January-April 1994*, DOE/EIA-0121(94/Q1), pp. 1-8. [http://www.eia.doe.gov/cneaf/coal/quarterly/co2\\_article/co2.html](http://www.eia.doe.gov/cneaf/coal/quarterly/co2_article/co2.html). Btu is a unit of energy measurement. In 2006, the EIA reported global coal consumption to be 127.5 quadrillion Btus, or 127,500,000 million Btus, or 127,500,000,000,000,000 Btus. See <http://www.eia.doe.gov/pub/international/iealf/tablee4.xls>.
42. *Supra*. Note 40.
43. *Id.*
44. *Supra*. Note 40. Based on 2007 EPA inventory data. Carbon dioxide equivalency refers to the global warming potential of a greenhouse gas, where CO<sub>2</sub> has a potential of "1" and, for example, methane has a potential of "21." Therefore, one ton of methane equals 21 tons of CO<sub>2</sub> equivalent. We refer to both tons and metric tons of greenhouse gases in this report to both ensure consistency between greenhouse gas inventories and references regarding Powder River Basin coal mining. One ton equals approximately 0.907 metric tons.
45. *Id.*
46. *Id.* at 3-8—3-9.
47. *Id.* at 3-9.
48. *Id.* at 3-3.
49. *Supra*. Note 1 at 4-115 and 4-118. The BLM's methodology for calculating greenhouse gas emissions from Powder River Basin coal uses an emission factor of 212.7 pounds per million Btu and assumes an average Btu content of 8,600 per pound of Powder River Basin coal. Using this methodology, the BLM determined that Powder River Basin coal mines released 13.9% of the nation's carbon dioxide and 42% of all carbon dioxide from coal-fired power plants in 2006. Based on 2007 coal production data and 2007 U.S. greenhouse gas emission data, Powder River Basin coal contributed to 13.04% of the nation's carbon dioxide and 40% of all carbon dioxide released by coal-fired power plants.
50. Data from *Supra*. Note 12 and *Supra* Note 40.
51. *Id.*
52. *Id.* Carbon dioxide emissions for Powder River Basin coal were estimated using the BLM's methodology in Note 49.
53. *Supra*. Note 41.
54. *Id.*
55. *Supra*. Note 41. Subbituminous coal is not produced in the eastern United States.

## Sham Coal Leasing Program has Shortchanged the Public, Undermined the Climate

56. Coal leasing regulations are set forth at 43 C.F.R. § 3400, *et seq.*
57. 55 Federal Register 784 (January 9, 1990).
58. Interestingly, the 1982 coal leasing regulations were promulgated in response to corruption within the federal leasing program. According to the BLM and reports at the time, coal sale data was previously leaked to outside parties, compromising the ability of the federal government to achieve fair market value. The 1982 regulations supposedly addressed this problem. See BLM, 1999. "Powder River Basin Briefing." BLM Wyoming State Office, p. 1.
59. 43 C.F.R. §§ 3420-3422, 47 Federal Register 33114-33151 (July 30, 1982).
60. 43 C.F.R. § 3420.2(c).
61. 43 C.F.R. §§ 3420.3-4(a) and 3420.3-1.
62. 43 C.F.R. § 3420.3-4(c).
63. 43 C.F.R. § 3420.5.
64. 43 C.F.R. § 3422.
65. 55 Federal Register 784-785 (January 9, 1990). In the late 1980's, the BLM similarly decertified every other coal production region in the U.S.
66. The BLM may only add to or delete lands from lease tracts applied for by coal companies. 43 C.F.R. § 3425.1-9.
67. Although BLM is required to prepare an analysis of the impacts of any individual Lease by Application, there is no requirement that the agency establish lease boundaries based on consideration of environmental impacts, whether regional or local in nature. 43 C.F.R. § 3425.3.
68. BLM, 1999. "Powder River Basin Briefing." BLM Wyoming State Office, p. 1.
69. See Bureau of Land Management, 2009. "Percent Total U.S. Coal Production Mined from the Powder River Basin, Wyoming."  
<http://www.blm.gov/pgdata/etc/medialib/blm/wy/programs/energy/coal/prb.Par.5321.Image.-1.-1.1.gif>.
70. *Supra*. Note 67.
71. 43 C.F.R. § 3425.0-2.
72. Data on Lease by Applications is available at  
[http://www.blm.gov/wy/st/en/programs/energy/Coal\\_Resources/PRB\\_Coal/lba\\_title.html](http://www.blm.gov/wy/st/en/programs/energy/Coal_Resources/PRB_Coal/lba_title.html).
73. Only one "Lease by Application," the West Rocky Butte lease, issued in 1993, was specifically for a new mine start. *Supra*. Note 68 at 8. The lease was issued to Peabody and is currently held by the adjacent Caballo Mine.

74. *Supra.* Note 71.
75. Thundercloud Lease by Application.  
[http://www.blm.gov/wy/st/en/programs/energy/Coal\\_Resources/PRB\\_Coal/lba/thundercloud.html](http://www.blm.gov/wy/st/en/programs/energy/Coal_Resources/PRB_Coal/lba/thundercloud.html).
76. Rio Tinto, "Rio Tinto Completes Sale of Jacobs Ranch."  
[http://www.riotinto.com/media/5157\\_18548.asp](http://www.riotinto.com/media/5157_18548.asp).
77. The BLM is not allowed to accept any bid for a "Lease by Application" that is less than the fair market value. See 43 C.F.R. §§ 3422.1(c) and 3425.4(b).
78. BLM, "Economic Evaluation of Coal Properties," BLM Handbook, H-3070-1 (April 7, 1994) at I-3.
79. *Id.* at III-1.
80. *Id.* I-3.
81. *Supra.* Note 74.
82. Bleizeffer, D., "Company wins coal lease on second try," *Casper Star Tribune* (April 23, 2008).  
[http://www.trib.com/news/state-and-regional/article\\_af32e69c-3485-52fe-ba8f-9a3c6e205fc1.html](http://www.trib.com/news/state-and-regional/article_af32e69c-3485-52fe-ba8f-9a3c6e205fc1.html).
83. See *e.g.*, 43 C.F.R. § 3420.3-4(c).
84. *Supra.* Note 59.
85. *Supra.* Note 60.
86. *Supra.* Note 61.
87. 43 C.F.R. § 3425.3.
88. *Supra.* Note 71.
89. Carbon dioxide emissions were estimated using the BLM's methodology discussed in Note 49.
90. *Supra.* Note 88.

## **New Coal Leasing Proposals Threaten to Fuel Global Warming**

91. Data on the proposed coal leases was obtained from:

U.S. Bureau of Land Management, 2008. "Final Environmental Impact Statement for the West Antelope II Coal Lease Application." Wyoming BLM.  
[http://www.blm.gov/wy/st/en/info/NEPA/cfodocs/West\\_Antelope\\_II.html](http://www.blm.gov/wy/st/en/info/NEPA/cfodocs/West_Antelope_II.html).

U.S. Bureau of Land Management, 2009. "Final Environmental Impact Statement for the South Gillette Area Coal Lease Applications." Wyoming BLM.  
<http://www.blm.gov/pgdata/content/wy/en/info/NEPA/HighPlains/SouthGillette.html>.

U.S. Bureau of Land Management, 2009. "Draft Environmental Impact Statement for the Wright Area Coal Lease Applications." Wyoming BLM.  
<http://www.blm.gov/wy/st/en/info/NEPA/HighPlains/Wright-Coal.html>.

U.S. Bureau of Land Management, 2007. "Notice of Intent to Prepare [the Hay Creek II] Environmental Impact Statement and Notice of Public Meeting on a Federal Coal Lease-by-Application in the Decertified Powder River Federal Coal Production Region, Wyoming." Wyoming BLM. 72 Federal Register 72750-72751 (December 21, 2007).  
<http://www.blm.gov/wy/st/en/info/NEPA/cfodocs/HayCreekII.html>.

92. *Id.* High and low estimates for the West Antelope II, Belle Ayr North, West Coal Creek, West Caballo, Maysdorf II, North Highlight Field, South Highlight Field, West Highlight Field, West Jacobs Ranch, North Porcupine, and South Porcupine leases are based on recoverable coal estimates provided by BLM in draft and final environmental impact statements. Estimate for the Hay Creek II is based on tonnage applied for. Carbon dioxide emissions estimated using methodology discussed in Note 49. Coal lease terms are for 20 years. See 43 C.F.R. § 3475.2.
93. *Id.*
94. *Supra.* Note 40.
95. *Supra.* Note 92.
96. *Supra.* Note 40.
97. *Supra.* Note 91.
98. See *e.g.*, *Supra.* Note 91, BLM 2009, "Draft Environmental Impact Statement for the Wright Area Coal Lease Applications" at 1-1.
99. *Id.*
100. The BLM is required to prepare an analysis of the impacts of any "Lease by Application" pursuant to the National Environmental Policy Act, 42 U.S.C. § 4321, *et seq.*, in accordance with 43 C.F.R. § 3425.3. However, the National Environmental Policy Act only requires an analysis of environmental impacts. It does not actually impose any limits on coal leasing to address environmental impacts.
101. *Supra.* Note 91. No consideration of global warming impacts informed the delineation of the proposed leases or the BLM's decision to propose the leases.
102. *Id.* According to the BLM, the last time a regional coal leasing environmental analysis was completed was in 1984. See U.S. Bureau of Land Management, 1984. "Powder River Final Environmental Impact Statement, Coal."  
[http://www.blm.gov/wy/st/en/info/NEPA/cfodocs/PR\\_COAL\\_FEIS.html](http://www.blm.gov/wy/st/en/info/NEPA/cfodocs/PR_COAL_FEIS.html).
103. To the extent the BLM discloses carbon dioxide emissions associated with coal leasing regionwide, the BLM simply discloses such impacts without explaining the significance or assessing the magnitude of the impacts.
104. No regional limits on leasing exist at all in the Powder River Basin.
105. *Supra.* Note 91. The BLM proposes no measures that would limit, offset, or otherwise address carbon dioxide emissions associated with the proposed "Leases by Application."

106. Personal Communication with Shannon Anderson, Powder River Basin Resource Council (May 6, 2009).
107. Personal Communication with Shannon Anderson, Powder River Basin Resource Council (November 12, 2009).

## Solutions at Hand

108. Interior Secretary Ken Salazar, Secretarial Order No. 3289, "Addressing the Impacts of Climate Change on America's Water, Land, and Other Natural and Cultural Resources," Section 4(b) (September 14, 2009). <http://www.doi.gov/climatechange/SecOrder3289.pdf>.
109. President Obama, Executive Order No. 13514, "Federal Leadership in Environmental, Energy, and Economic Performance," Section 1 (October 5, 2009). <http://edocket.access.gpo.gov/2009/pdf/E9-24518.pdf>.
110. *Id.* at Sections 2(a) and (b)
111. FLPMA provides the Secretary of the Interior with authority to "require a deposit of any payments intended to reimburse the United States for reasonable costs with respect to applications," including coal lease application. See 43 U.S.C. § 1734(b). Such payments are "authorized to be appropriated and made available until expended" by FLPMA. *Id.*
112. Renewable Energy Atlas of the West. [http://www.energyatlas.org/PDFs/atlas\\_final.pdf](http://www.energyatlas.org/PDFs/atlas_final.pdf).
113. Renewable Energy Atlas of the West, "Wyoming." [http://www.energyatlas.org/PDFs/atlas\\_state\\_WY.pdf](http://www.energyatlas.org/PDFs/atlas_state_WY.pdf).



