

# WORC

*Western Organization of Resource Councils*

## ***Exporting Powder River Basin Coal: Risks and Costs***

January 2011

### **Introduction**

Coal extraction in the Powder River Basin is detrimental to land, water, air and public health for the communities and people that live in and around coal production areas, and leaves behind a legacy of reduced productivity and waste.

U.S. domestic coal production has encountered major uncertainties in recent years with proposals to regulate or abolish the destructive practice of mountain top removal and efforts to control greenhouse gas pollution. Proposals for new coal plants have been put on hold or shelved. New regulations and concerns about global warming have led to calls to retrofit or retire the oldest and dirtiest coal plants, and utilities are increasingly replacing coal-fired power plants with power from natural gas, wind and other sources.

This combination of factors has the coal industry looking overseas at a more robust global export market, specifically in Asian-Pacific markets, to the tune of 140 million tons per year. Much of this export market would be met by opening new mines and expanding existing operations and infrastructure in the Powder River Basin of Montana and Wyoming.

Coal mining already threatens the health and productivity of agricultural land in the West. Increasing coal mining would compound these problems. Coal mining displaces farmers and ranchers who depend on the land to make a living by eliminating land used for crops or grazing. Coal seams also serve as an aquifer in most of the West and mining disrupts and degrades the water resources of the area, further damaging the long-term productivity of the land.

The jury is still out on whether companies will be able to meet reclamation standards for final bond release on most of the land disturbed by coal mining. Final bond release for coal mined land is the best measure of reclamation success. 162,249 acres of land in Wyoming have been disturbed by mining, and only 6,517 acres—4%—have been sufficiently reclaimed to warrant final bond release.<sup>1</sup> The record of coal mines in Montana is even worse on this measure with only 50 of the 37,484 acres disturbed by strip-mining—0.1%—have attained final bond release.<sup>2</sup>

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<sup>1</sup> Office of Surface Mining Reclamation and Enforcement, Annual Evaluation Summary Report for the Wyoming Regulatory Program, Evaluation Year 2010

<sup>2</sup> Office of Surface Mining Reclamation and Enforcement, Annual Evaluation Summary Report for the Montana Regulatory Program, Evaluation Year 2010

Expanded coal mining for export would have other impacts on western communities and the environment that have not been examined. New and expanded railroads would need to be built to accommodate increased coal shipments to the West Coast. New railroad lines would be built in pristine river valleys, across farms and ranches and prime hunting grounds, causing immeasurable harm to the beauty and economic value of this land.

Communities from Sheridan to Spokane and beyond will experience increased rail traffic through their communities. Up to 60 unit trains a day would be required to transport 140 million tons of coal a year to the West Coast. In communities split by rail lines, this could significantly delay traffic, causing delays for emergency vehicles, increased noise pollution in those communities, and a higher likelihood of train-auto collisions.

Increasing coal train traffic will leave large amounts of coal dust in communities across the West. Each coal rail car loses roughly 500 lbs of coal and coal dust per railcar—over 30 tons per unit train—during each trip. Increased coal train traffic will cause more air and water pollution along the rail lines. Coal dust can also have a detrimental effect on the rail track beds, which can lead to an increased need for repair and more derailments.

Exporting Powder River Basin coal from West Coast ports means rail and port capacity will not be available for other commodities. Coal export terminals will occupy valuable real estate at ports, limiting the choices communities at the coast can make to use this real estate for their own economic prosperity. Increased coal trains may also impact available capacity and quality of service for 48 and 52-car grain shipments. Instead of addressing our trade deficit by promoting 21<sup>st</sup> century technology, like wind and solar manufacturing, we are locking ourselves into exporting a dirty 19<sup>th</sup> century fuel.

Expanded coal mining and coal exports subvert the goal of the United States and countries around the world to reduce global warming pollution. Whether coal is burned in the United States or abroad, it will have the same impact on global climate change. While relatively low-sulfur coal from the Powder River Basin coal will produce less of some kinds of air pollution in China than burning high-sulfur Chinese coal, emissions of greenhouse gases are nearly identical, and the global warming impacts of burning Powder River Basin coal will impact the U.S. no matter where the coal is burned.

## **Background**

The Powder River Basin of Wyoming and Montana is the single largest source of coal in the United States. The country's biggest coal companies are eyeing the remaining reserves in order to expand their share of Asian export markets. To meet the export goals of Arch, Peabody, and other companies with western reserves—upwards of 140 million tons of coal per year—current railroad and port infrastructure in the United States would need to be significantly expanded and upgraded.

Amendments to the Clean Air Act in 1990 drastically increased the domestic demand for low-sulfur Western coal, which accounted for 54.5% of the total coal produced in the United States in 2009,<sup>3</sup> compared to just 32% in 1990.<sup>4</sup>

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<sup>3</sup> <http://eia.gov/cneaf/coal/page/acr/table1.html>

A depressed domestic market and increased foreign demand, especially from the Pacific Rim, have piqued the interest of the largest U.S. coal producers in potential export markets. Western coal production and exports increased between 2009 and 2010,<sup>5</sup> despite the global recession.

Combustion of coal from the Powder River Basin was the primary source of 877.1 million tons of carbon dioxide (CO<sub>2</sub>) emissions in the United States in 2007, 13% of all U.S. emissions. With each ton of coal contributing about two tons of CO<sub>2</sub> to the atmosphere, a 140 million ton production increase in overseas exports to Asia would contribute an additional 280 million tons of CO<sub>2</sub> annually.

The Powder River Basin of Montana and Wyoming is the single largest source of coal in the United States. Wyoming produces the most coal in the nation, and Montana ranks fifth.<sup>6</sup> Each state would see an increase in production to meet export demands. Total production in the Powder River Basin was over 455 million short tons of coal in 2009.<sup>7</sup>

In addition to large levels of production, Montana and Wyoming lead the nation in estimated recoverable reserves of coal. Montana has 74.81 billion tons of estimated recoverable reserves, the most in the U.S., and Wyoming has 39.19 billion tons of estimated recoverable reserves, second highest reserves in the U.S.

Unless strict limits on greenhouse gas emissions are put in place, growth in Asian coal demand is expected to lead to an increase in world coal consumption by 2030. The U.S. Energy Information Administration predicts that nearly 90% of that increased consumption will be attributed to China.<sup>8</sup>

Today, over 99% of the coal mined in the Powder River Basin is consumed in domestic coal markets. However, if sufficient port and rail capacity can be built, Arch, Peabody and others are eager to sell more coal to Asian markets. Arch, for example, expects half the global trade for coal will go to China and India by 2012.

Arch Coal has made significant consolidation and expansions in its western operations over the past two years. In 2009, Arch acquired the Jacobs Ranch Mine in the southern Powder River Basin in Wyoming which, when integrated with the nearby Black Thunder Mine, created the largest coal mining complex in the world. In 2008, Black Thunder was the second most productive mine in the United States, producing 88.6 million short tons, and Jacob's Ranch was the third most productive mine in the United States producing 42.1 million short tons. Arch also acquired the rights to 1.2 billion tons of coal at the

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<sup>4</sup> Coal Industry Annual 1994, Energy Information Administration, accessed electronically 9/9/2010

<sup>5</sup> <http://tonto.eia.doe.gov/FTP/ROOT/coal/058494.pdf>

<sup>6</sup> <http://www.eia.doe.gov/cneaf/coal/quarterly/html/t13p01p1.pdf>

<sup>7</sup> <http://www.eia.doe.gov/cneaf/coal/page/acr/table1.pdf>

<sup>8</sup> Mining Companies Aim To Export to China Through Northwest Ports, *The Oregonian*, Wednesday, September 8, 2010. Scott Learn

Otter Creek Tracts in the Northern Powder River Basin in Montana. These actions increased the coal reserves under Arch's control by 25%.<sup>9</sup>

The largest coal producer in the United States, Peabody Energy, is investigating expansions of its Powder River Basin coal production for export to Asian-Pacific markets. Peabody announced its interest in a new West Coast port space for shipping coal by the end of 2010. Industry analysts say this could mean an investment of as much as \$500 million in new terminals.<sup>10</sup> Citing increasing international demand for coal coupled with decreasing domestic demand, Peabody has stated that global coal shipments to the Asia-Pacific region could reach 140 million metric tons per year, by 2015.<sup>11</sup> Peabody plans to expand production throughout the world in order to bring coal to China, India, Japan and South Korea.

These efforts to export coal coincide with the idea that the world is near "peak coal" – that is, the period of all-time high coal production, after which some geologists and economists predict that production will begin an irreversible decline. In a study published in the peer-reviewed journal *Energy, The International Journal*, two researchers say the world will hit peak coal production in 2011, or shortly thereafter.

Hitting "peak coal" production does not mean we are about to run out of coal entirely; instead, it means that we have mined all the coal that is easiest and cheapest to produce. Remaining deposits of coal are lower quality and becoming increasingly difficult, dangerous, environmentally destructive, and expensive to mine. Exporting coal will make domestic coal mining more dangerous, dirtier, more difficult, and increasingly more expensive to mine at a faster pace. Increasing coal exports will, among other things, accelerate the rate at which the cost of electricity produced from coal increases.

## **Making moves to expand**

In order to meet the export goals of Arch, Peabody, and other companies with western reserves, current railroad and port infrastructure in the United States would need to be significantly expanded and upgraded. In the meantime, major coal companies are touting their intentions of expanding the market to their stakeholders and the public at large.

In 2006, Peabody expanded into Australia, currently the world's largest coal exporter, by acquiring Excel Coal Ltd. Peabody is also pursuing opportunities in Mongolia. In 2008, Peabody began sending coal from Wyoming to Europe, first by rail to the Mississippi River, then by vessel through the Gulf of Mexico. Now the company is shipping coal to Japan from the California coast. Further demonstrating its desires to increase production, Peabody has indicated that it could open the leased and permitted School Creek Mine just

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<sup>9</sup> Arch Coal 2009 Annual Investor Report, *The Power Within* accessed 8/29/2010 available online at <http://investor.archcoal.com/phoenix.zhtml?c=107109&p=irol-irlhome>

<sup>10</sup> Mining Companies Aim To Export to China Through Northwest Ports, *The Oregonian*, Wednesday, September 8, 2010. Scott Learn

<sup>11</sup> Navarre, Rick. Peabody Energy. June 17, 2010 Expanding Markets and Peabody Growth Opportunities. 2010 Analyst and Investor Forum, Slide 42

north of its North Antelope Rochelle Mine in Wyoming.<sup>12</sup> This mine was scheduled to open in 2008, but has not yet started operations, due to economic conditions.

In November of 2010, Millennium Bulk Logistics, a subsidiary of an Australian energy company, received initial approval for an export terminal near Longview, Washington. This terminal would be the first U.S.-based West Coast terminal for coal exports with capacity to ship 5.7 million tons of coal per year. The initial approval, a shoreline development permit, for this facility is being challenged by Earthjustice on behalf of Climate Solutions, Sierra Club, Washington Environmental Council and Columbia Riverkeeper.<sup>13</sup> These groups allege the Cowlitz County Commissioners, who initially approved the project, did not fully consider the environmental impacts of the project before approving the permit.

In early 2011, Arch Coal Inc. acquired stakes in two potential export facilities. First, Arch acquired a 38% stake in Millennium Bulk Terminals-Longview LLC. Then Arch signed an agreement to export more coal from British Columbia, Canada.<sup>14</sup> It is clear that Arch is looking to develop its new coal holdings to meet Asian demand.

## **Coal Company Statements Indicate Increased Coal Export Plans**

A number of Powder River Basin coal companies have publicly stated their intentions to ramp up coal exports to Asian markets. Investors are aware that China relies on coal for most of its energy needs, but is burning more than it can produce. According to the Beijing-based General Administration of Customs, China's 2009 coal imports more than tripled from the previous year's to 125.8 million tons.

Peabody and others in the coal industry are relying on this demand to continue.

In a presentation at an analyst and investor forum in early 2010, Rick Navarre, Peabody President and Chief Commercial Officer, estimated current Asia-Pacific market demand for imported coal to reach 140 million metric tons per year, and that annual demand in that region could increase to 220-260 million metric tons, by 2015.<sup>15</sup>

“The real goal here is to see if we can't get large volumes of Powder River Basin coal to Asia,”<sup>16</sup> said Peabody Coal CEO Gregory Boyce, “obviously it's a longer-term project. Our goal is to get large volumes of Powder River Basin [western U.S. Powder River Basin] coal to the Pacific Rim. We know we can sell it in China and Korea.” The

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<sup>12</sup> <http://gillettenewsrecord.com/articles/2010/08/02/news/yesterday/news08.txt>

<sup>13</sup> [http://www.oregonlive.com/environment/index.ssf/2010/12/environmental\\_groups\\_appeal\\_ap.html](http://www.oregonlive.com/environment/index.ssf/2010/12/environmental_groups_appeal_ap.html)

<sup>14</sup> <http://www.reuters.com/article/idUSN1817071720110118>

<sup>15</sup> Navarre, Rick. Peabody Energy. June 17, 2010 Expanding Markets and Peabody Growth Opportunities. 2010 Analyst and Investor Forum, Slide 42

<sup>16</sup> <http://www.bloomberg.com/news/2010-06-24/peabody-energy-sees-global-demand-at-the-beginning-of-a-super-cycle.html>

challenge, he said, was to get the needed volumes into the marketplace through a custom-built port, although there was no time frame for such a project.<sup>17</sup>

Steven Leer, Arch Coal Chairman and CEO, described his company's second move in a week to acquire export terminals in January 2011, in a media statement: "This transaction is another important step in accomplishing our strategic objective of expanding Powder River Basin coal sales into the Asia-Pacific region."<sup>18</sup>

Chris Ruppel, an energy analyst at Execution, a brokerage and research firm, recently predicted, "As U.S. coal demand is constrained because of increasing environmental regulation, coal production in the United States will increasingly go toward overseas buyers."<sup>19</sup>

Over the last several years, operators planning new mines in the Powder River Basin have made public statements about beginning their operations with the export markets as the direct target. In a Billings Gazette article in March 2010, Nick Shakesby, COO of Maple Carpenter Creek, a proposed mining mine 50 miles northeast of Billings, Montana, said a new mine could be running by 2014. "We're not interested in sitting on it. We're interested in developing it and putting in a mine," he added. "We're marketing it offshore — Asia and India."<sup>20</sup>

These moves and statements have not gone unnoticed in the railroad sector, which also sees opportunities for expansion.

In 2008, Matt Rose, CEO of Burlington Northern Santa Fe Corp (BNSF) stated, "We're in the talking stages right now [with East Coast utilities] and we'd like to move to the shipping stages soon." Rose said BNSF is also talking to potential customers abroad about exporting Powder River Basin coal and looking at the logistical challenges of exporting large quantities. The mining companies are also talking to customers abroad, and both sides say they have enough capacity to handle increased demand.<sup>21</sup>

## **Current U.S. Exports from Powder River Basin**

According to the U.S. Energy Information Administration, total U.S. exports of coal to Asia grew from just under two million in 2009 to 9.5 million tons in the first half of 2010.<sup>22</sup>

As shown in Figure One, over the past decade, coal production from the Powder River Basin has increased steadily. In 2008, production approached record levels at nearly 500

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<sup>17</sup> "Peabody Energy Still Looking At Australian, Mongolian Opportunities," Steve James, *Reuters*, Friday June 25, 2010

<sup>18</sup> <http://news.archcoal.com/phoenix.zhtml?c=107109&p=irol-newsArticle&ID=1517028&highlight=>

<sup>19</sup> <http://www.nytimes.com/2008/03/19/business/19coal.html?pagewanted=2>

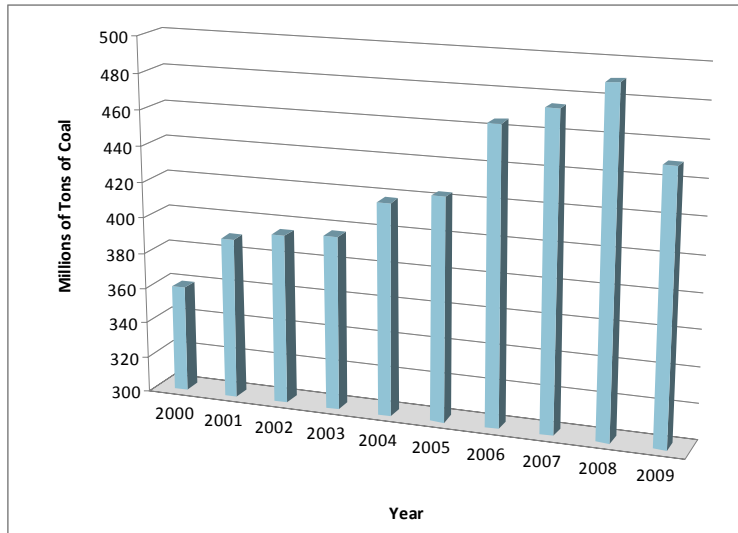
<sup>20</sup> [http://billingsgazette.com/news/state-and-regional/montana/article\\_627cd1ac-257e-11df-a999-001cc4c002e0.html](http://billingsgazette.com/news/state-and-regional/montana/article_627cd1ac-257e-11df-a999-001cc4c002e0.html)

<sup>21</sup> <http://www.mineweb.com/view/mineweb/en/page38?oid=54526&sn=Detail>

<sup>22</sup> <http://www.eia.doe.gov/cneaf/coal/quarterly/html/t7p01p1.html>

million tons, followed by a drop in 2009. Production rebounded in the Powder River Basin increasing 1.3% in the first quarter of 2010.<sup>23 24</sup>

Figure 1: Coal Production in the Powder River Basin, 2000-2009<sup>25</sup>



## Western Railroads

Union Pacific (UP) and Burlington Northern Santa Fe (BNSF) are the two major Class I railways that operate in the Powder River Basin. Union Pacific is the largest railroad network in the U.S., with revenues at more than \$13 billion, and employs 50,000 people. BNSF is owned by Berkshire Hathaway and has one of the largest freight railroad networks in North America, second only to UP, with revenues totaling more than \$14 billion and employing nearly 40,000 people. Both companies are on the Fortune 500 list, with UP ranked at number 164 and BNSF at 167.

Montana Rail Link is a Class II railroad that operates over 900 miles of line from just east of Billings, Montana to Sandpoint, Idaho. The black section of rail line on Figure 2 is owned by Montana Rail Link, an important section of rail to any export market.

Only two railroads – the BNSF and Union Pacific – transport Powder River Basin coal westward. Coal trains typically employ 100-125 cars to haul Powder River Basin coal to electric utilities. The rail cars do not carry other commodities and return back to the mines empty. Coal from Powder River Basin mines in Wyoming and Montana is transported through Montana on the BNSF main line from both mines in Wyoming and Montana to Laurel, Montana. Once at Laurel a train could either:

<sup>23</sup> [http://www.eia.doe.gov/cneaf/coal/quarterly/qcr\\_sum.html](http://www.eia.doe.gov/cneaf/coal/quarterly/qcr_sum.html). Total coal production for 2010 is not available as of January 20, 2011.

<sup>24</sup> Total coal production for 2010 is not available as of January 20, 2011.

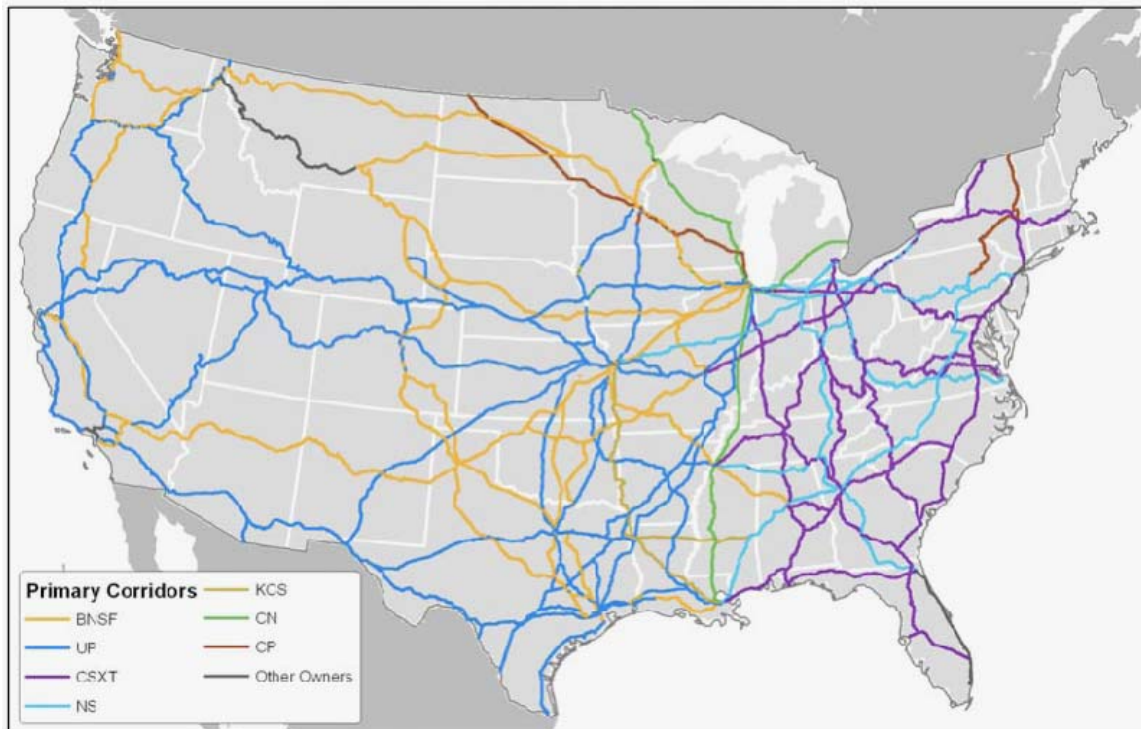
<sup>25</sup> Nichols, Jeremy. "UnderMining the Climate" November 23, 2009.

[http://www.wildearthguardians.org/portals/0/support\\_docs/report\\_powder\\_river\\_11-23-09.pdf](http://www.wildearthguardians.org/portals/0/support_docs/report_powder_river_11-23-09.pdf)

- Head north towards Lewistown, Montana, on the BNSF mainline, through Great Falls, Montana; link up with the “hi-line” in Shelby, Montana; then head toward Sandpoint, Idaho or,
- Take either of two MRL lines from Laurel, Montana through either Butte, Montana or Helena, Montana, and go through Missoula, Montana; then head toward Sandpoint, Idaho.

The rail lines meet near Sandpoint, Idaho and continue to travel through Spokane, Washington, where the train can head either southwest through Washington or Oregon or continue west toward Everett, Washington—depending on the location of a Port Facility

Figure 2: Primary Rail Freight Corridors



Source: Cambridge Systematics, Inc.

## Current volume of coal shipped on rail lines to the West Coast

In the first six months of 2010, 3.5 million tons of coal was shipped from Powder River Basin Coal mines to Oregon and Washington for use in electrical generation and combined heat and power applications.<sup>26</sup> If we assume that the vast majority of the U.S. coal to Asia came from the Powder River Basin in the first half of 2010, an average of 10 unit trains traveled to and from the West Coast every day.<sup>27</sup>

<sup>26</sup> <http://www.eia.doe.gov/cneaf/electricity/page/eia423.html>

<sup>27</sup> This is based on 125 car trains carrying an average of 115 tons of coal per car and 181 days between January 1<sup>st</sup> and June 30<sup>th</sup>.

## Railroad Capacity

An export market of 140 million tons a year would require around 60 unit trains traveling to or from the West Coast and the Powder River Basin every day. Again, for comparison, current volume of traffic is no more than 10 unit trains per day. Nearly all of the rail line from the Powder River Basin to the West Coast would eventually need upgrades to carry additional weight or expand additional tracks to accommodate an export market of this size.

Rail capacity is measured in the number of trains a segment of rail can handle in one day. The freight rail industry can suffer from capacity constraints that affect the entire system, and an increase in demand would worsen these constraints. According to the Congressional Budget Office, the “capacity” of a transportation sector describes a level of service and how it can be handled effectively by a facility or network in a given amount of time. Capacity can be constrained by a shortage of infrastructure somewhere along the route; because transportation industries are networks, capacity constraints at one corridor or junction can cause delays throughout the system.<sup>28</sup>

According to a study by Cambridge Systematics, Inc, determining capacity is “as much art as it is science.”<sup>29</sup> Among the factors considered when determining capacity are the number of tracks, the frequency and length of sidings, the capacity of the yards and terminals along a corridor to receive the traffic, the type of control system, the terrain, the mix of train types, the power of the locomotives, track speed, and individual railroad operating practices.

As a result, measurements of railroad capacity are less often a solid number and more often a range. Even in capacity studies, the terminology is not completely consistent. Most often capacity is referred to as “practical capacity” or “theoretical capacity.” On rail lines operating at practical capacity, minor disruptions can be absorbed with only temporary deterioration in performance. The system can continue to operate at levels up to 80% of theoretical capacity, but any minor disruptions will result in severe disruptions system wide. Through national aggregation, Cambridge Systematics determined the average capacity of a single track rail to be between 16 trains per day and 30 trains per day for multiple train types.<sup>30</sup> Each additional track does not add capacity in a linear fashion. For example, depending on the type of signaling, adding a track to go from one to two tracks could increase capacity from 16 trains per day to 28 trains per day or from 30 trains per day to 75 trains per day.

It is also important to note that railroads can operate for a short period above 100% of their theoretical capacity. Most studies say a rail is at capacity when it runs between 80 and 100% of theoretical capacity. As of 2007, less than 4% of the rail in the country was

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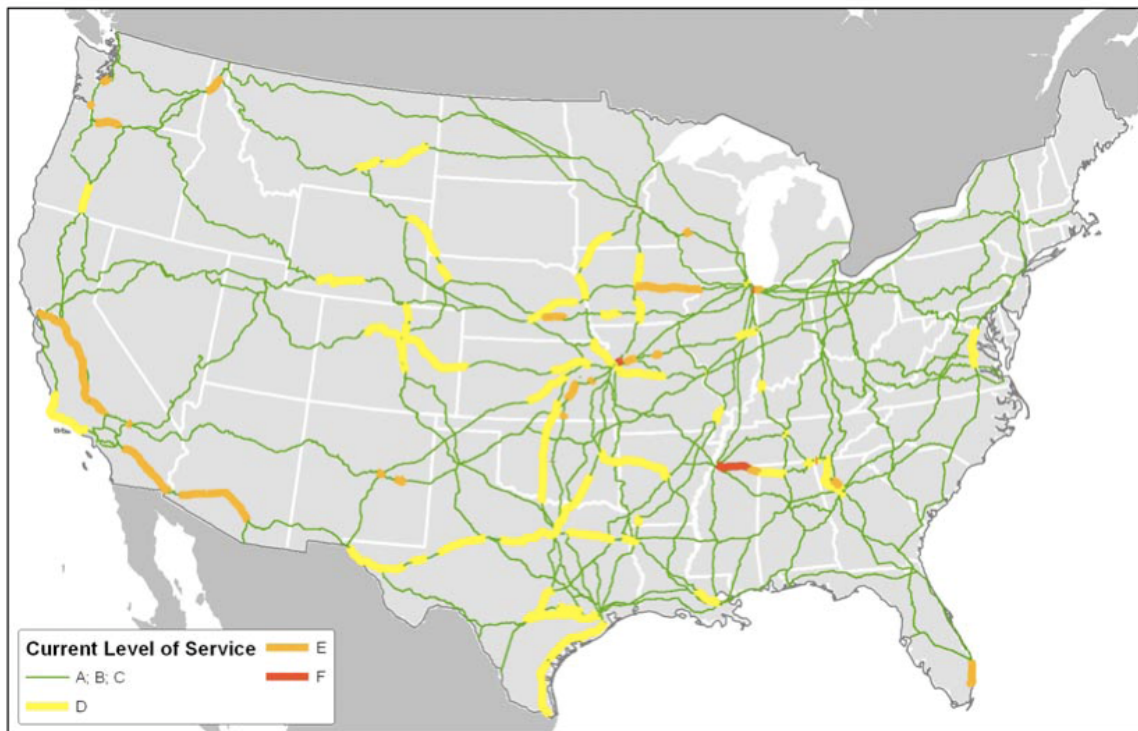
<sup>28</sup> <http://www.cbo.gov/doc.cfm?index=6350&type=0#pt1>

<sup>29</sup> HDR, Inc. Transit Safety Management. July, 2006. Statewide Capacity and System Needs Study. Prepared for Washington State Transportation Commission.

<sup>30</sup> National Rail Freight Infrastructure Capacity and Investment Study, September 2007, Prepared for Association of American Railroads by Cambridge Systematics, Inc. [http://www.aar.org/~/media/aar/Files/natl\\_freight\\_capacity\\_study.ashx](http://www.aar.org/~/media/aar/Files/natl_freight_capacity_study.ashx)

operating at or above capacity, and only an additional 9% was operating near capacity.<sup>31</sup> However, there are key segments of track between the Powder River Basin and West Coast ports that *are* operating at or near capacity.

Figure 3: Current Train Volumes Compared to Current Train Capacity



Source: Cambridge Systematics, Inc.

Key: Green-below capacity; Yellow-near capacity; Orange-at capacity; Red-above capacity

Figure 3 shows the current level of service on the major rail lines in the United States. Lines in green represent service with a volume less than 70% of capacity. Lines in yellow represent rail segments with volumes between 70% and 80% of capacity. Lines in orange represent rail segments with volumes between 80% and 100% of capacity. Lines in red represent rail segments with volumes over 100% of capacity.<sup>32</sup>

Railroads are aware of the capacity constraints that exist on their systems and are actively working to resolve them. Together, BNSF and UP invested more than \$4 billion to increase capacity in recent years.<sup>33</sup> BNSF laid nearly 3,000 miles of track from 2007 to 2009. UP has been less aggressive with its expansion, adding less than 100 miles of track in 2009, but it did replace or surface nearly 16,000 miles of track.

<sup>31</sup> National Rail Freight Infrastructure Capacity and Investment Study, September 2007, Prepared for Association of American Railroads by Cambridge Systematics, Inc. [http://www.aar.org/~/media/aar/Files/natl\\_freight\\_capacity\\_study.ashx](http://www.aar.org/~/media/aar/Files/natl_freight_capacity_study.ashx)

<sup>32</sup> National Rail Freight Infrastructure Capacity and Investment Study, September 2007, Prepared for Association of American Railroads by Cambridge Systematics, Inc.

<sup>33</sup> Four billion in investments was taken from the total capital expenditures that did not relate specifically to the acquisition of equipment such as freight cars or locomotives. Sourced from 2010 SEC-10K filings, page 20 BNSF <http://bnsf.com/about-bnsf/financial-information/sec-filings/10-k-filings/>, page 39 Union Pacific <http://www.up.com/investors/secfiling/index.shtml>.

To meet the coal industry's projected coal export demand of 140 million tons per year, railroads would need to build significant amounts of new rail in the coming years.

## **Railroads Capacity Expansion Options**

Railroads have several options for increasing capacity including: running more trains, running trains faster, running trains closer together, running trains with more cars and installing new and upgrading existing track. Track can be upgraded by adding double-track, straightening curves to allow for increased speed, replacing light-duty rail with heavier track, and expanding or building new rail yards and terminals.

Upgrading tracks would require approvals from various levels of government. The federal Surface Transportation Board has broad regulatory oversight over railroads.

Other regulations for upgrading capacity vary by state. State authority on rail permitting is most often housed in the state Departments of Transportation, which have varying construction requirements and rules for establishing right-of-ways to build rail lines. Rail impacts related to noise, pollution and public safety are regulated at various levels within states, often with a Public Service or Utilities Commission and local governments.

## **Impacts of Increasing Coal Exports**

Coal is the second largest producer of energy-related CO<sub>2</sub> emissions in the country,<sup>34</sup> and the impacts of mining, processing, and transporting coal on the country's health, landscapes, and water are enormous. Ramping up exports of coal from the U.S. would subvert the nation's efforts to reduce reliance on coal, its impacts on global warming, and damages done by mining. Construction of new railroad lines and increased traffic on existing lines would create impacts to the environment and communities along the route.

### **Greenhouse Gas Emissions**

Exporting coal overseas subverts domestic efforts to reduce greenhouse gas emissions and weakens international efforts to combat global warming. A coal export facility with the capacity to ship 20-30 million tons per year of Peabody Powder River Basin coal would result in the export of 35-53 million tons of CO<sub>2</sub> per year.<sup>35</sup> Exporting 140 million tons a year would produce roughly 280 million tons of CO<sub>2</sub> per year.

### **Coal Mining**

Exporting coal would require expanding existing mines and opening new mines in the Powder River Basin. Coal mining has many detrimental impacts on the people and environment where it is developed.

### **Air Quality**

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<sup>34</sup> <http://www.eia.doe.gov/oiaf/1605/ggrpt/index.html>

<sup>35</sup> <http://www.sciencedaily.com/releases/2007/11/071114163448.htm>

Coal mining causes significant air pollution, mainly from fugitive emissions of particulate matter and gases including methane, sulfur dioxide and nitrogen oxides.<sup>36</sup> These emissions are largely created when blasting, drilling, collection, hauling and moving heavy machinery.

These air pollutants can contribute to serious health problems. Of particular concern is the pollution of particulate matter, or dust, less than 2.5 microns in diameter (PM2.5). Respiratory problems including asthma and bronchitis have been linked to PM2.5. These respiratory problems, as well as increased likelihood of heart attacks and strokes caused by particulate inhalation, can lead to premature death.<sup>37</sup>

Additional mining will increase these air pollutants in the coal fields. New mines will put more communities at risk and expanded mines will make problems worse for those already experiencing air pollution caused by mining. Several large coal mines in the Powder River Basin have already experienced air quality violations. New mines and mine expansions will be in areas with more overburden per ton of coal mined. This will make the coal more difficult to mine, producing more particulates and emissions from mining equipment, and may result in more air pollution and air quality violations.

### Land & Water Use

Exporting coal will mean the expansion of existing mines and development of new mines, requiring the industrialization of thousands of acres of agricultural land and wildlife habitat.

Coal mining can have a devastating effect on farms, ranches and prime hunting grounds. Ranchers whose families have been grazing cattle on Bureau of Land Management (BLM) and state land for generations can lose pasture land, sometimes requiring them to ship cattle to non-contiguous pastures or reduce the size of their operations. This can have a serious impact on the ability of ranches to prosper. Loss of wildlife habitat will mean increased hunting and fishing pressure and reduced quality of hunting and other outdoor recreation in the West.

Coal mining also has devastating effects on water. Coalbeds in the Powder River Basin serve as aquifers for the region. Strip mining severs and destroys these aquifers, which are critical sources of groundwater for agriculture and wildlife. These destroyed aquifers are not reconstructed by typical mine reclamation practices. Coal mining is already depleting and degrading the water in this region; more mines to expand coal production will compound this damage.

Despite federal and state laws requiring coal companies to reclaim mines after use, the jury is still out on whether companies will be able to meet reclamation

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<sup>36</sup> Sharma, Partha Das, "Coal Mining Pollution and its control measures"

<http://www.docstoc.com/docs/6608086/Coal-Mining-Pollution>

<sup>37</sup> [http://www.arb.ca.gov/research/health/pm-mort/pm-mort\\_fs.pdf](http://www.arb.ca.gov/research/health/pm-mort/pm-mort_fs.pdf)

standards. Using the best measure for reclamation success, final bond release, companies in the Powder River Basin have not been successful. 162,249 acres of land in Wyoming has been disturbed by coal mining, but companies have only attained final bond release for 6,517 acres—4 %. Montana mines have had even less success, having successfully reclaimed only 50 of the 37,484 acres—0.1%—disturbed by coal mining sufficiently to attain final bond release.

## New Rail Lines

Exporting coal would require construction of new rail lines that will sever prime farm or ranch land or take it out of production completely. Severing farm and ranch land with a rail line reduces productivity and property values. Ranching operations need to be able to move livestock from one side of the tracks to another, and even with proper construction of the rail this can be difficult. Access problems caused by severing ranches can also be a major problem when dealing with natural or train-caused fires.

New rail lines can also split wildlife habitats and interrupt migratory patterns. This not only has an effect on the species but also on hunting in the region.

The spreading of noxious weeds is another impact of new rail lines. Railroads that cover great distances also can spread noxious weeds onto adjacent land. These weeds can have detrimental effects on farming or ranching operations in the area.

## Public Safety

Almost 60 percent of coal in the United States is transported at least in part by train, with coal transportation accounting for 44 percent of rail freight ton-miles. Coal trains, some of which reach more than two miles in length, cause railroad-crossing collisions and pedestrian accidents (there are approximately 3,000 such collisions and 900 pedestrian accidents every year) and interruption in traffic flow (including disruption to emergency responders such as police, ambulance services, and fire departments).<sup>38</sup>

## Diesel Pollution

Transporting coal produces significant quantities of air pollution and other environmental problems. Diesel trucks, trains, and barges which transport coal all emit toxic chemicals, such as nitrogen oxide and particulates, which pose serious public health risks. According to a National Resources Defense Council study, railroad engines and trucks hauling coal together release more than 600,000 tons of nitrogen oxide and 50,000 tons of particulate matter into the air every year, mostly in diesel exhaust.<sup>39</sup>

Though small compared with the emissions from burning the coal itself, burning diesel to move coal also emits global warming pollution. According to an analysis done by Earthworks, approximately 700,000 tons of carbon dioxide (CO<sub>2</sub>) could be emitted every year if 20 or 30 million tons of coal were shipped to China from the Powder River Basin. A shorter trip to Japan would still result in emissions of up to 500,000 tons of CO<sub>2</sub>.

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<sup>38</sup> <http://www.nrdc.org/globalwarming/coal/coalclimate.pdf>

<sup>39</sup> <http://www.nrdc.org/globalwarming/coal/coalclimate.pdf>

## Coal Dust

Increasing coal shipments would increase the amount of coal dust lost from coal trains. BNSF estimates that a single loaded car can lose 500 pounds of coal, lost primarily from blowing off the top of the car. Coal dust pollutes the communities that coal trains pass through. Coal dust can blow into rivers and streams. Coal dust has even caused fires in areas where coal dust blown from trains has built up near the tracks.<sup>40</sup>

Coal dust can also degrade track conditions. The dust can cause a weakened track structure leading to more derailments, inconveniencing all rail customers.

## Impacts to Electricity Consumers

Increasing coal exports will require coal companies to mine coal that is increasingly dirty, dangerous, difficult, and expensive to mine and reclaim. These increased costs will drive up utility rates more quickly, decreasing the benefit of coal as a relatively cheap fuel source.

## Impacts on other industries that ship commodities by rail

In 2005, 38 percent of the total freight shipped in the United States is shipped by rail. Many commodities depend heavily on rail for transportation; among the most dependent are coal, domestically produced automobiles and grain.<sup>41</sup> An increased volume of coal shipping on the rails would have adverse effects on these industries.

Grain growers are dependent on efficient, reliable, affordable service to get grain to market, and have fought to win fair service for smaller (48 to 52 car) train service to grain elevators. Historically, grain growers have complained about the timeliness and reliability of service to elevators, and about rail rates for grain shipping. Increased rail traffic, and dominance of coal among major commodities served by the railroad, could lead to an increase in problems for grain shippers and complaints about service.

## Conclusion

As the United States transitions away from dirty fuel, such as coal, to meet its electricity demand, the coal industry has begun to develop substitute markets by exporting coal, especially to China and other countries on the Pacific Rim.

Exporting coal subverts efforts by the U.S. and countries around the world to reduce global warming pollution. Whether coal is burned in the United States or abroad, the global warming impacts are the same. Exporting 140 million tons of coal per year would add nearly 280 million tons of carbon dioxide to the atmosphere.

Coal mining already threatens the health and productivity of agricultural land in the West. Additional coal exports would increase the number or size of mines, further displacing

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<sup>40</sup> <http://www.bnsf.com/customers/what-can-i-ship/coal/coal-dust.html>

<sup>41</sup> [http://www.lrc.com/railroadstudy/Volume\\_1.pdf](http://www.lrc.com/railroadstudy/Volume_1.pdf)

the farmers and ranchers who depend on the land for their livelihood. Coal mining has depleted or degraded aquifers across the West.

The jury is still out on whether formerly mined land can return to its pre-mining productivity. Despite federal and state laws requiring the reclamation of land after coal is mined, coal companies in Montana and Wyoming have not demonstrated complete reclamation on a vast majority of the land disturbed by coal mining. Only 4% of the 162,249 acres of land in Wyoming have been fully reclaimed to meet final bond release standards, and 0.1% of the 6,517 acres of disturbed land in Montana have received final bond release.

Increasing coal exports to upwards of 140 million tons per year would require significant additions and upgrades to rail lines in the West. These lines would cut through pristine areas, severing farms and ranches, reducing productivity and property values. Communities split by rail would face serious delays caused by the 60 trains a day needed to transport coal from the Powder River Basin to West Coast terminals.

Investments in rail lines, coal mines and export terminals would make coalfield and coastal communities dependent on a dirty, 19<sup>th</sup> century fuel, and prevent us from benefiting from foregone investments in 21<sup>st</sup> century, clean and renewable energy technologies.