

# US Coal Exports and Uncertainty in Asian Markets

What the complex future of the Pacific Rim coal trade means for the Northwest.

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With US demand for coal dropping, coal interests are now looking to Asia to shore up sagging coal sales. Since 2011, several companies have launched ambitious plans to mine low-grade coal on public lands in the Powder River Basin of Montana and Wyoming, transport it by rail to ports in Oregon and Washington, and then ship it overseas to Asian markets—particularly China, consumer of half the world’s annual coal use. At full capacity, the five export terminals proposed in the Northwest would export roughly 140 million tons annually—more than the entire United States has ever exported in a single year.<sup>1</sup>

The coal industry claims that Asia offers stable and lucrative markets for American coal exports. Yet much of the available evidence is cautionary, at best. There are good reasons to believe that Asia’s major coal markets have highly uncertain demand and that US coal will meet with stiff competition from other coal-exporting nations.

For example, recent news accounts depict a China awash in coal, with falling prices and purchasers breaking contracts to avoid buying unwanted coal.<sup>2</sup> As the *New York Times* reported in June 2012:

Record-setting mountains of excess coal have accumulated at [China’s] biggest storage areas because power plants are burning less coal in the face of tumbling electricity demand. But local and provincial government officials have forced plant managers not to report to Beijing the full extent of the slowdown, power sector executives said.<sup>3</sup>

Which of these two views—an Asia with an insatiable appetite for US coal or an Asia with unstable coal markets that already show signs of glut—will hold true for the future?

To help answer that question, this memo summarizes some of the key dynamics in the Pacific Rim coal trade. It focuses on the two key coal importers, China and India, as well as the countries competing with US interests to supply lower-value “thermal” coal to Asian electricity generators. It touches on many factors that affect the viability of a nation’s coal exports, including: the magnitude and quality of coal reserves; the cost of extracting coal; the quality of freight transportation and port infrastructure; the costs of transport from mine to market; the local investment climate; and government regulations and taxes of the coal industry.<sup>4</sup> The evidence suggests that Asian markets may prove far more uncertain and less hospitable to US coal than industry boosters hope.

We cannot claim to capture in this memo all of the complex dynamics that may result from the interplay of trends that are themselves uncertain. Rather, our intent is to provide a summary of the thermal coal trade and to call attention to some of the major market drivers for importers and exporters of coal in the Pacific Rim region.

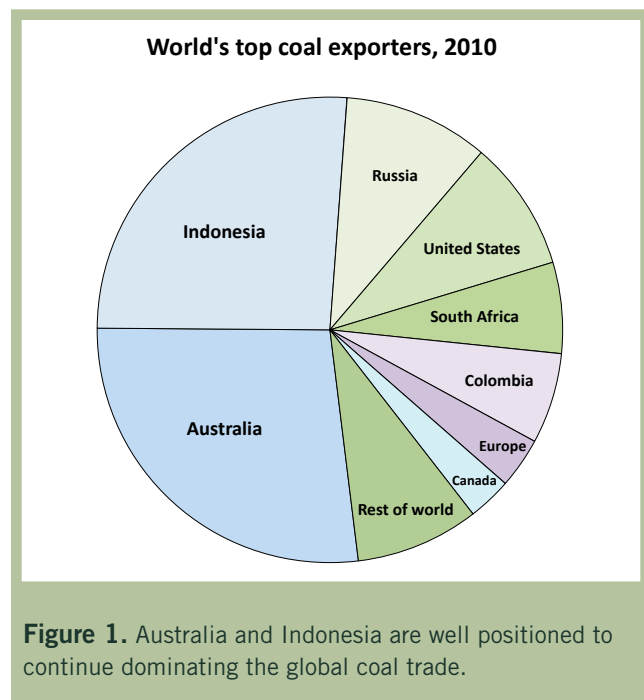
## US thermal coal exports face stiff international competition

North American coal interests will face stiff international competition in selling coal to Asian markets.

Australia and Indonesia both enjoy abundant coal reserves, together accounting for over half of global coal exports. (See Figure 1.) And both nations’ proximity to the biggest thermal coal markets in Asia give them a market advantage in selling a commodity whose price is largely driven by transportation costs.

Several other nations, including Russia, South Africa, and Colombia, are already well-established in the global coal trade, and may already be positioned to boost exports to Asia.

In contrast, North America is a newcomer to Asia’s thermal coal markets. With essentially no current coal export capacity on the Pacific coast, the US in recent years has mostly provided Asia with high-grade coal suitable for steelmaking, rather than the lower-grade coal used for electricity.<sup>5</sup> Canada does have three large coal ports on the Pacific, but like the US, it mostly exports high-value metallurgical coal that does not directly compete with the thermal coal planned for export from the Northwest.<sup>6</sup>



A review of the major competitors to US coal exports finds that, while each nation faces unique constraints to export growth, several major exporters may have an edge over the US in selling thermal coal to Asia.

## **Australia**

Since 2010 Australia has been moving huge quantities of coal—well over 300 million tons annually—making it the world leader in coal exports.<sup>7</sup>

Recent developments have created some uncertainty for Australia's coal industry. Two taxes introduced in 2012—the Mineral Resource Rent Tax and the Carbon Tax—will increase the cost of coal mining, making it more difficult for Australia to compete with low-cost coal exporters such as Indonesia.<sup>8</sup> At the same time, public concern about the environment is raising headwinds for the nation's coal industry. The United Nations has formed an environmental team to study the impacts of coal shipments that travel over the Great Barrier Reef.<sup>9</sup> A number of communities are also raising concerns about dust and pollution from coal trains, and actions likely to significantly impact the environment are subject to the Environmental Protection and Biodiversity Conservation Act.<sup>10</sup>

Nonetheless, Australia's proximity to Indian and Chinese coal markets confers a big advantage to its coal export industry because transportation costs represent a very large share of the expense of bringing coal to market in East Asia. Compared with the proposed export terminals in the US Northwest, Australia's export centers are roughly a thousand nautical miles, or 20 percent, closer to China's big eastern ports—and they have an even greater location advantage for Indian markets.<sup>11</sup> Shorter trips mean lower transportation costs, and a potentially decisive price advantage over coal exported from the Pacific Northwest.

These factors may allow Australia to substantially boost exports of low-cost coal to Asian markets in the short-to-medium term. In fact, several new projects to increase port and rail capacity are already underway, and these are expected to enable Australia to export even more coal.<sup>12</sup>

## **Indonesia**

As the world's second largest coal exporter, Indonesia has large reserves available. Indonesia's coal reserves consist mainly of lower-quality sub-bituminous coal, like the Powder River Basin coal planned for export from the Northwest, and lignite-grade coal, though uncertainties in reporting cloud the estimates of the size of its reserves.<sup>13</sup>

Difficulties in land transport, as well as an uncertain regulatory environment, may inhibit growth in Indonesian coal exports. For example, much of Indonesia's coal is currently moved by coastal and river barges<sup>14</sup> and challenging terrain in many areas

will require substantial investments in new roads to deliver additional coal to export markets.<sup>15</sup> (Slurry pipelines may offer an alternative means of transporting coal.<sup>16</sup>)

Indonesia's regulatory environment has created both obstacles and opportunities for the nation's coal exporters. Environmental restrictions, such as laws to protect rainforests, may add costs to Indonesian coal production, and new regulations and taxes on coal mining may limit expansion of coal mining.<sup>17</sup> A new domestic market obligation, which sets the percentage of total production each coal producer must make available to domestic customers, may limit the amount of coal available for export.<sup>18</sup> On the other hand, a 2009 mining law reduced the number of licenses and authorizations required to open a mine, potentially boosting the Indonesian coal industry, although regulatory processes reportedly remain slow.<sup>19</sup>

Yet despite potential regulatory and transportation barriers to increased exports, Indonesian coal has a major advantage over its competitors: it is even better positioned geographically than Australia to serve both Indian and Chinese coal markets. Ports in the coal producing region of Kalimantan, for example, are less than half the distance from China as the Pacific Northwest, and far closer to India than the coal currently buried in Montana and Wyoming.<sup>20</sup>

## **Russia**

Home to huge coal reserves—behind only the US and perhaps China—Russia ranks as the world's third largest exporter of coal.<sup>21</sup> As its traditional customers in Europe look to reduce coal consumption, Russia is turning to Asian markets, aiming to boost its coal exports to Asia to an annual 85 million tons by 2030.<sup>22</sup>

Russia's Pacific ports can, in theory, provide nearby access to most of Asia's large coal-consuming countries. Expanding rail and port capacities will be key to bringing Russian coal to these markets.<sup>23</sup>

## **South Africa**

Home to the world's largest coal export terminal at Richards Bay,<sup>24</sup> South Africa has routinely moved well over 70 million tons of coal per year, but the future of the country's coal export industry is somewhat uncertain.<sup>25</sup> Rail bottlenecks limit transportation of coal, environmental legislation may lead to increased costs, and work stoppages and strikes by miners may lead to increased costs. In particular, South Africa's aging and inefficient state-owned rail infrastructure is a major constraint on moving coal from mines to port. Moreover, investment has been slowed by bureaucratic delays, uncertainties around mining rights, and implementation of new royalties.<sup>26</sup>

Like Russia, South Africa is expected to shift its export strategy away from European consumers and toward Asian consumers.

## Colombia

Colombia has ramped up its coal exports in recent years to roughly 75 million tons annually.<sup>27</sup> The country needs major investments in transportation and port facilities if its coal export industry is to continue growing,<sup>28</sup> yet foreign investment may avoid Colombia because of political instability and security concerns (from armed conflict, social unrest, and the drug trade), which are a significant concern to investors.<sup>29</sup>

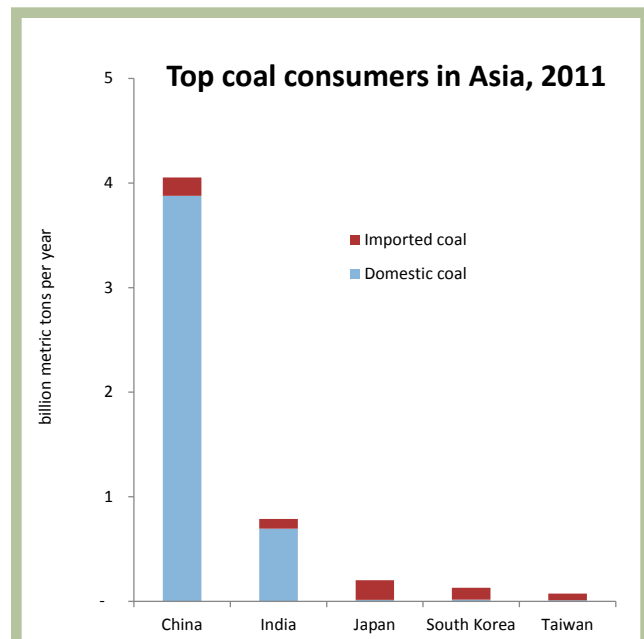
Colombia's coal production costs may be set to increase as new forms of government oversight may increase mining costs and add pressure to raise the price of coal. Mining accidents, especially in underground coal mines, have been a continuing problem and the government has acknowledged that it does not have a reliable count of the mining firms operating in the country.<sup>30</sup> The Colombian government plans to increase mine-safety inspections in response to criticism over its lax approach. Moreover, the Colombian Environment Minister said the government will increase sanctions against oil and mining companies that abuse the environment.<sup>31</sup>

Colombia is also even more remote from Asian coal markets than the Pacific Northwest. It is perhaps the only major coal-exporting country that is not likely to offer serious competition to the Powder River Basin coal planned for export from the US.

## Major importers face uncertainties, have significant coal reserves

As Asia's dominant coal consumers, China and India will determine the future of the Pacific thermal coal markets. (See Figure 2.)

Three other countries—Japan, South Korea, and Taiwan—also import large quantities of coal and have historically dominated the Pacific Rim coal trade. But these countries will have a comparatively minor impact on future changes to the Pacific Rim coal trade. Each of these countries has a well-developed economy and well-established relationships with coal importers. And their coal imports—particularly thermal coal imports—have grown more slowly than India's and China's, in part because these better-developed countries are pursuing an array of clean energy and carbon reduction strategies.<sup>32</sup>



**Figure 2.** Trends in China and India will drive the future of the Pacific coal trade.

Indian and Chinese coal sectors are alike in at least two important respects. First, in both countries, growth in coal demand—particularly demand for thermal coal—will likely be dictated to a large extent by the country’s demand for electricity. A rising demand for power would suggest increased coal use. Yet the electricity markets in both countries are subject to a range of policies that heavily distort normal market operations and make predictions fraught with uncertainty.

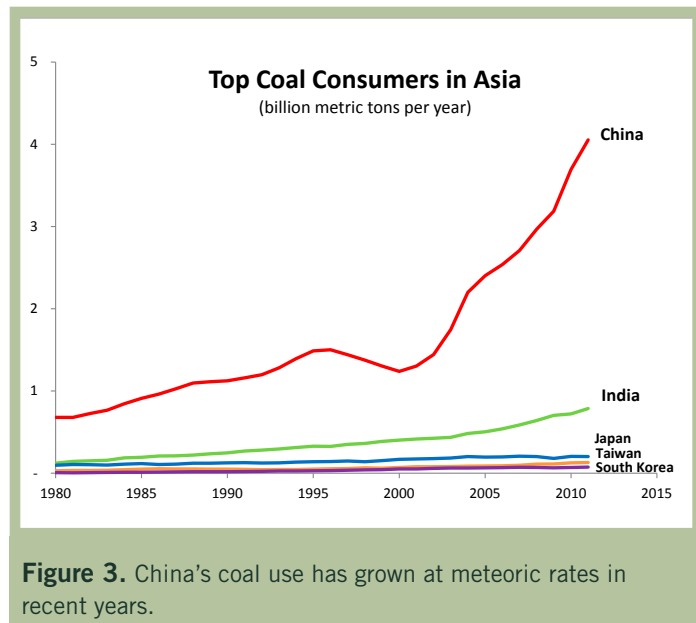
Second, both countries have ample reserves of coal, easily enough to supply their domestic demand. But poor transportation infrastructure currently hinders greater use of domestic coal reserves. Clouding matters, government policies in both India and China suppress domestic coal production.

## China

China is far and away the world’s largest consumer of coal, burning nearly half of all the coal used in the world each year. And the nation’s coal consumption has grown at more than 10 percent per year in recent years.<sup>33</sup> (See Figure 3.)

Boasting the second or third largest coal reserves in the world,<sup>34</sup> China historically has met the vast majority of its demand with domestic coal supplies. In fact, until recently, China typically exported more coal than it imported. But in 2009, as the cost of importing coal dropped, China became a net coal importer.<sup>35</sup>

Practical limits may put some of China’s coal reserves out of easy reach. About 30 percent of China’s coal reserves may be too deep to mine economically.<sup>36</sup> And in recent years, the Chinese government has shut down almost 10,000 small coal mines in an effort to restructure the mining industry, prevent deadly accidents, and reduce pollution.<sup>37</sup> Moreover, most of China’s coal reserves are located in the north and west of the country, at a considerable distance from the areas of greatest demand for electrical power,<sup>38</sup> and truck routes and railways in China for shipping coal are insufficient and costly. For example, the coal supply for southeast China is first shipped to eastern ports and then sent by ship to the southern part of the country. Even though this route is the most economical, transportation costs can comprise 50 to 60 percent of the price of domestic coal delivered to a southern province.<sup>39</sup>



Yet China's domestic coal industry has several options available to compete with low-cost imported coal. Increased investment in electricity transmission rather than coal transport may make it more economical for the Chinese to build power plants near coal mines rather than import coal for power plants located in the southern or eastern areas of the country. Moreover, new coal mines in western China could provide new sources of inexpensive coal, particularly if coupled with new infrastructure projects.<sup>40</sup>

In addition, some analysts foresee a marked increase in China's use of low-cost natural gas, perhaps imported from other countries in the region.<sup>41</sup>

Some of China's coal use may be offset by renewable energy generation, and the Chinese government has introduced a policy mandating that electricity suppliers meet some of their needs from renewable energy sources.<sup>42</sup> The government also set goals for using energy more efficiently, including an ambitious new plan to spend nearly \$372 billion reducing the nation's energy consumption by the equivalent of 300 million tons of coal by 2015.<sup>43</sup> However, as with China's coal industry, systematic problems with reported data often make it difficult for analysts to evaluate trends.<sup>44</sup>

It is important to remember that the Chinese government's pricing policies for electricity and coal are complex, market-distorting, and have changed many times over the last few decades. Producers of electricity incur losses when coal prices are high, producers of coal reduce production when prices are low, and consumers endure power shortages for a variety of reasons.<sup>45</sup>

In the past, economic growth and increased electricity consumption have gone hand-in-hand in China, and academic studies focused on China indicate that electricity supply leads economic growth.<sup>46</sup> For a growing China, then, an increase in electricity supply will likely point to an increase in demand for thermal coal as roughly 80 percent of the country's power is currently generated at coal-fired plants.<sup>47</sup> Yet the corollary is that stalled economic growth could mean a reduction in demand, and there is mounting recent evidence to suggest that China's demand for coal and electricity is declining. For example, news accounts show Chinese ports glutted with coal, prices falling, and coal buyers abrogating contracts with dozens of importers.<sup>48</sup> In fact, there is increasingly widespread agreement that China's economic boom is drawing to a close and that the country is poised for a slowdown, at minimum or even economic decline, heralding diminishing demand for imported thermal coal.<sup>49</sup>

## **India**

India may try to boost coal imports in coming years.<sup>50</sup> Academic studies focused on India indicate that electricity consumption is a leading indicator of economic growth.<sup>51</sup> In other words, a growing economy in India is likely to be associated with an increase in electricity consumption, which may in turn be linked to an increase in demand for thermal coal.<sup>52</sup>

Yet predicting the future of India's thermal coal market is extremely difficult. India's idiosyncratic and heavily regulated electricity markets function poorly, which may inhibit new investments in power plants.<sup>53</sup> And recent electricity blackouts that affected substantial portions of the country have called into serious question the reliability of India's coal-based power system, leading to renewed calls for a transition to cleaner and more dependable energy sources.<sup>54</sup>

Complicating matters, India has huge coal reserves of its own—the world's fifth largest—but the coal is mined by a state-owned monopoly that has not significantly boosted output in recent years.<sup>55</sup> In fact, recent allegations of coal-related corruption on the part of government officials dominated India's domestic politics in the middle of 2012.<sup>56</sup> Furthermore, India's coal deposits are mostly in the east-central and southeastern regions of the country—areas far away from the centers of coal demand, and that have limited transportation infrastructure.<sup>57</sup> Finally, India's coal is generally of poor quality because of its high ash content that, if untreated, incurs higher transportation costs and can create problems in power plants.<sup>58</sup>

In short, India's coal sector has a mix of major constraints in both supply and in demand that make future coal trade trends very difficult to predict.

## Conclusion

Coal interests have twice before attempted to operate coal terminals on the US West Coast—first in Portland in the 1980s and later in Los Angeles in the 1990s—but both attempts were expensive busts. After investing millions of dollars in infrastructure and setting aside sizeable harbor acreage to coal export facilities, both Portland and Los Angeles watched their promised revenue from coal exports evaporate—leaving local communities stuck with the tab. The abandoned coal export facilities locked up millions of dollars in stranded investments and clean-up expenses, not to mention years-long missed opportunities for more durable economic development choices.<sup>59</sup>

Now, some industry analysts believe that international coal markets have changed dramatically, and that high prices and surging demand in Asia will make US coal exports profitable for many years to come. Yet our examination reveals a picture of the Pacific Rim coal trade that is clouded by a great deal of uncertainty.

To be sure, the two leading Asian prospects for US thermal coal exports, India and China, do show some indications of providing a growing market. But both countries have ample domestic supplies of coal and murky policies governing their coal industries. Moreover, the United States is poorly positioned in geographic terms to supply a commodity like coal where the price is determined largely by the costs of transportation. Major coal-exporting nations like Australia, Indonesia, and Russia enjoy much greater proximity to key markets, and are therefore likely to enjoy lower costs.



At least one news account suggests that China is uninterested in large-scale coal imports from the United States with experts citing “high transportation costs, political red tape and environmental regulations” as major barriers.<sup>60</sup> Even relatively small players in the global coal trade, such as Mongolia and Vietnam, already supply far more coal to China than the United States, largely owing to their advantageous geographic proximity to Chinese coal ports.<sup>61</sup> In fact, one Japanese coal-mining company aims to triple exports to China from Mongolia.<sup>62</sup>

Overall, we find that there is no clear trend governing the future of the Pacific Rim coal trade, but rather an array of countervailing and sometimes contradictory forces that defy accurate predictions. These major uncertainties in Asian global markets make investments in Northwest coal export terminals a gamble with precarious and unforeseeable outcomes.

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