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CHINA

Subsector Focus: base metals and coal

9.1 Overview

China has large hydrological resources with up to 7% of world freshwater resources. The majority of water resources lie in the south of the country. The north has approximately 22% of freshwater resources and 64% of arable land, with which it produces close to 45% of industrial output. Many of China's water resources emanate from glaciers, which are measured to be in retreat. As a result of rapid industrial development, a number of river basins have come under significant stress creating a number of risk factors.

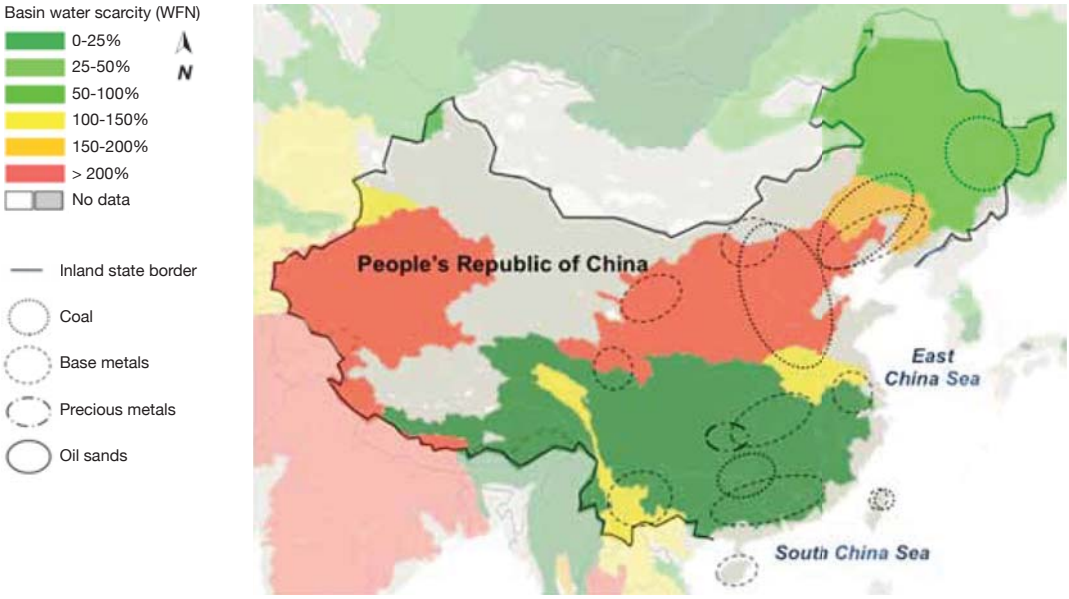
Institutionally, China has an increasingly robust water regulatory regime. The Chinese government has historically favored industrial development over water resource protection over the past several decades. However, as water resources continue to be stretched and increasing water risks emerge, the government has focused on creating more stringent regulations to ensure more sustainable long-term growth. They have effectively shifted the focus in water development from expansion to improvement in efficiency, productivity and quality.

Over the last 30 years, China has begun to intensively mine base metals and coal. Furthermore, China opened new mining activities (some in other countries) following the recent increase of demand for high value specialty metals. China is the global market leader in this highly intensive form of mining.

Geographical distribution of mining activities in China in the context of water scarcity.

Figure 11:

Average annual blue water scarcity for China

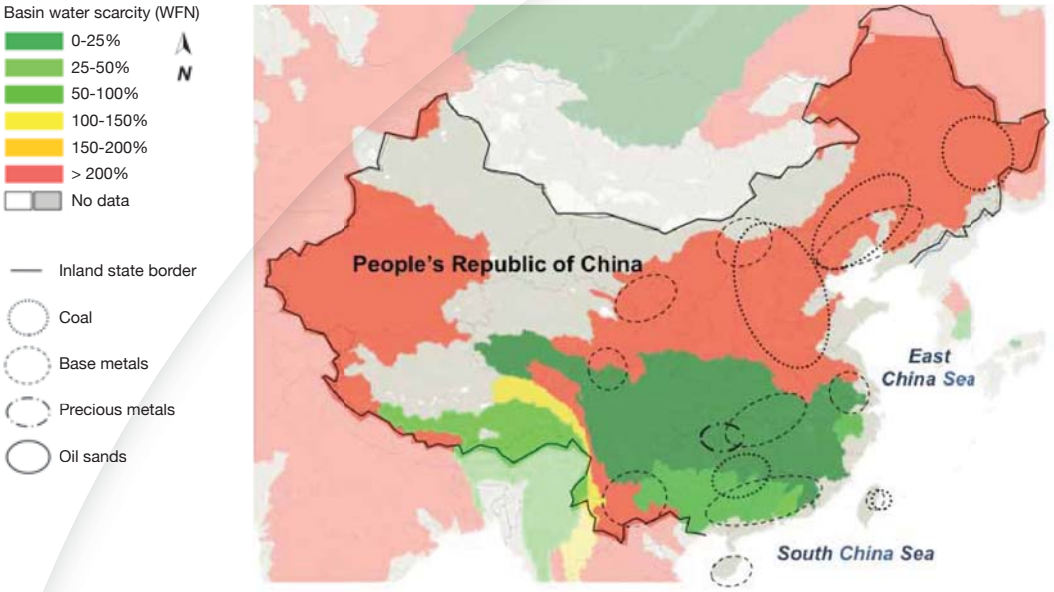


Description: Annual average of the twelve monthly blue water scarcity values per basin, equally weighted. Blue water scarcity is defined as the ratio of blue water footprint (based on consumption rather than withdrawal) to blue water availability – where the latter is taken as natural runoff minus environmental flow. Blue water resources are surface water and ground water on the basis of data from 1996-2005

Source: Hoekstra, A.Y., Mekonnen, M.M., Chapagain, A.K., Mathews, R.E. and Richter, B.D. (2012) Global monthly water scarcity: Blue water footprints versus blue water availability, PLoS ONE 7(2)

Figure 12:

Maximum monthly blue water scarcity - China



Description: Blue water scarcity in the month with the highest scarcity level - defined as the ratio of blue water footprint to blue water availability – where the latter is taken as natural runoff minus environmental flow. >100% means that consumption is higher than availability in that particular month Blue water resources are surface water and ground water on the basis of data from 1996-2005

Source: Hoekstra, A.Y., Mekonnen, M.M., Chapagain, A.K., Mathews, R.E. and Richter, B.D. (2012) Global monthly water scarcity: Blue water footprints versus blue water availability, PLoS ONE 7(2)

The intensity of mining in China has increasingly caused environmental challenges around water quality and quantity and the economic and political need for resources has pushed a number of these systems to tipping points. China's particular water risks are around acid rain, which results from air pollution as a result of China's reliance on coal) as well as pollution from industrial effluents, and water shortages in the north.

Particular to China is the sudden change in regulatory approaches. The Government has taken an increasingly aggressive stance towards mines that create large environmental damage. Large fines and clean-up costs are being imposed. In addition to these costs, companies can sustain significant reputational damage. Compounding the risks associated with this increased regulatory activity is the limited information on environmental infractions by Chinese miners in the past. This will mean investors cannot accurately assess the regulatory risk associated with historical activity that may be realized in the future.

9.2 Case Study 8: Coal and Acid Rain in China

Acid Rain caused by coal mining has long-term environmental impacts. China has adopted legislation to limit sulfur dioxide pollution. But coal mining catalyses the Chinese economy. Hence, the intersection of environmental concerns and economic development needs leads to uncertainty and risk.

In 1998, China adopted national legislation to limit ambient sulfur dioxide (SO2) pollution and to stem the growing incidence of acid rain. There are many reports that detail the ill effects of acid rain on cities and agriculture, including manmade structures, forests and other ecosystems, water bodies, and especially agricultural productivity. Major environmental challenges include water quality as well as air pollution and land degradation.[119]

One of the challenges of controlling sulfur pollution in China is that the economy is dependent upon coal for both power and iron ore processing in steel production and the demand for coal is expected to grow over the next 20 years. With the passage of the TCZ legislation, the Chinese government took an unprecedented step to control sulfur emissions. These concerns are most profound in provinces in the northeast. It is predicted that acid mine drainage (AMD) will increasingly become a concern in these locations as freshwater resources are continually stressed. Yet controlling sulfur pollution in China is more difficult than in North America or Europe for several reasons:

- China's economy is extremely dependent upon coal, and the demand is expected to grow over the next 20 years. The environmental costs will be part of economic development and there will be imbalances in how China manages these costs.
- Capital is not always allocated towards environmental mitigation strategies, given competing demands from competing infrastructure interests.
- Institutional capacity for managing pollution in China is underdeveloped, and most local environment agencies do not have sufficient capacity to monitor and regulate sulfur emissions effectively.

The regulation of SO_2 emissions can be expected to become a significant cost to companies as the effectiveness of the regulation increases. Yet acid rain impacts on water resources will also increase while SO2 emissions are not successfully mitigated despite the legislation.

The problems stemming from coal mining and coal to power combustion present a complex set of water-related risks in the rapidly growing Chinese economy. AMD and acid rain present significant environmental and health concerns from contaminated water supplies and degraded land. These negative environmental impacts impede agricultural development and worker productivity. Competing interests of power generation, infrastructure, agricultural production, and community health could cause severe friction points, which may cause operational disruption or closure in extreme cases.

9.3 Case Study 9: Mining Spills and Company Fines in China

The Chinese government has taken an increasingly aggressive stance towards mines that create large environmental damage. Large fines and clean costs may be imposed. Companies can sustain significant reputational damage from such situations.

China has embarked on a rapid industrial expansion, which has sought to prioritize industrial development or environmental protection. However as a result of increasing limitations posed by environmental damage, the Chinese government has begun to take more aggressive action against polluters. One such case is the Zijin Mining Group, one of the largest gold, copper, and non-ferrous metal producers in China.[120]

In July 2010, 2.4 million gallon toxic spill contaminated the Ting River from a copper mine in the Fujian Province operated by Zijin. The extent of the spill is still being investigated but it is estimated that the environmental damage is comparable or greater than the BP deepwater oil spill. At present the Chinese government has detained three senior personnel from the facility for failing to disclose the incident for 9 days. Zijin may have to pay up to $120 million in fines, remediation, and water treatment costs as a result of the spill. In addition the Zijin stock price lost 12% of its value during the time of the spill.[121]

While shocking to many investors, Zijin has had a history of environmental infractions. Since 2005, the company has been cited every year for poor environmental management or pollution in many provinces including Fujian. However Zijin failed to disclose its infractions although a law passed in 2008 required it to do so. As a result of its failure to disclose environmental information, investors were unable to accurately assess the water risk in the Zijin portfolio and price the value of the company accordingly.[122]

Based on these case studies financial institutions should take into account the following key considerations:

1. **Tightening environmental controls:** As the Chinese government pursues a more environmentally conscious path; this is expected to lead to higher regulatory risks for mining companies.
2. **Wastewater and acid mind drainage (AMD):** Water quality has increasingly become an issue. Given the changing government position, heavy penalties and new regulations may occur.
3. **Environmental control vs. economic development:** China is beginning to balance economic growth with environmental imperatives. These changes will have lasting impacts on mine development and operations.

	Asset management	Corporate finance	Project finance
Tightening of environmental controls	Portfolios in country may significantly change based on resetting of national regulatory priorities	Risk profile changes as a result of inability to permit new mines undermining profitability	Projects may be delayed or become much more costly jeopardizing repayment periods and debt service ability
Waste water drainage	Change in share price as a result of a large environmental event	Inability to have projects approved as a result of past performance	Permitting delay or failed acquisition as a result of poor behavior which impacts cash flow
Economic development vs. environmental protection	Share price fluctuates a result of resetting of national/ regional priorities	Overall risk profile changes due to inability to secure new projects	Environmental concerns may shut down or significantly curtail current mines or new developments affecting cash flow