WHAT WOULD IT TAKE FOR ZAMBIA’S COPPER MINING INDUSTRY TO ACHIEVE ITS POTENTIAL?

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INTRODUCTION

This note explores the prospects for growth in Zambia’s copper mining industry, the potential contribution that a larger, more competitive copper mining industry could make to jobs and prosperity, and what it would take for the industry to achieve its potential.¹

1.1 Background

Zambia plays an important role in the global copper mining industry. The country contains the largest known reserves of copper in Africa, holding 6 percent of known copper reserves in the world.² The history of Zambia’s copper mining industry is one of decline followed by revival. From around 700,000 tonnes in the 1970s, copper production fell to just 255,000 tonnes in 1998 as nationalization of the mines proved counter-productive. However, since the mines were privatized in the 2000s, investment and output have revived, and Zambia is regaining its world market share.³ In addition, the industry is expanding geographically from its traditional base in the Copperbelt to other parts of the country, where geological surveys suggest significant deposits of copper. With existing and expected investment commitments, Zambia is on course to achieve the Government’s target of 1 million tonnes of copper output per year (from 820,000 tonnes in 2010), though it is unlikely to be attained by 2011 as targeted. If Zambia could reach this target, however, it could become the 3rd largest copper producer in the world.⁴

Copper plays a critical role in Zambia’s economy. Historically, the performance of the Zambian economy has followed the fortunes of copper mining closely. Although the economy is diversifying, copper mining continues to account for a sizeable part of GDP (see below) and is one of the lead industries for economic growth.⁵

However, Zambia—as a country—could benefit more from the mining industry. All countries that depend on natural resources face the shared challenge of taxation: determining tax levels and administering tax revenues in an effective manner that balances the needs of Government and investors. Mining depletes a valuable natural asset and taxing the mining companies is a way of generating savings that can be redeployed to increase the productive capacity of the rest of the economy, and thereby help sustain the country over the long-term. Despite the revival of the industry post-privatization, the mining industry’s contribution to government revenues in Zambia has remained low. The industry accounts for 15-18 percent of GDP and exports over US$3 billion worth of copper per year, but contributes just 8 percent of total tax revenue.⁶
The reason for the low tax-take lies in the Development Agreements that were signed by Government and the mines at the time of privatization and that gave away generous tax concessions. By early 2007, concerns about ‘resource robbery’ caused by the low tax-take were creating a public outcry, which led the Government to impose, in 2008, a new tax regime consisting of higher royalties and taxes, including a windfall tax. Many aspects of the new regime, including the windfall tax, were ultimately reversed in response to the fall in copper prices during the global financial crisis. In 2009, the Government instituted another new tax regime with an effective tax rate (47 percent) within the international range (40‐50 percent). This regime was designed to increase the level of government revenues, as mines that were rehabilitated after privatization began to generate strong, positive cash flows. The new tax regime, however, was challenged by the mining industry, which argued that the invariability clauses in the original Development Agreements precluded such changes.

It is worth noting that a country’s legal/regulatory environment is a key determinant for investors when they compare the attributes of different destination countries. Exploration and mining companies seek a stable, predictable and transparent regulatory environment in which the rules of the game are clearly set out and administered on an equitable basis. These characteristics are particularly important in the case of the mining industry, given the high upfront capital investment and long payback periods involved (see below).

In late-2010 the Government reached an agreement with a number of mines, and these mines have already started paying in accordance with the new regime. Negotiations continue with a few remaining mines in order to bring them into the fold of the new regime. Due to its significant footprint and the debate over its tax contributions to the country, the mining industry has remained the focus of economic and political attention in Zambia.

1.2 Industry Structure

Many of the firms involved in Zambia’s copper mining are the subsidiaries of small- to medium-sized firms (by international standards of mining companies). However, there are notable exceptions (such as Vedanta, Glencore, and the China Non-Ferrous Metal Mining Group) that are major global players. Reports suggest that these are also likely to be joined by BHP Billiton, the world’s largest mining house. Though Zambian copper mining essentially is a private industry, the Government has retained a sizeable holding of the shares of the privatized mines.

The global copper mining industry operates with a long-term perspective, and production costs and risk are critical issues. The nature of the industry requires high upfront investment, high risk and long payback periods, and this has a number of implications (see below). Production costs can differ significantly between mines, depending on the type of mine and nature of the deposit. In the mining and refining industries, with prices determined by international markets, the key determinants of competitiveness are the costs of production and transporting product to market. A mine’s cost of production is a function of the nature of the resource (the quality of the ore, its depth, etc.) and the extent to which the most accessible resources have been exploited. The depletion of resources at the older mines means that they now need to mine at considerable depth and distance from the mine head, leading to high costs. Younger mines can save on operating costs, but they have to bear the upfront investment in capital and equipment, which can be significant. In addition, the cost and productivity of inputs influence the cost of production at all mines, irrespective of the nature of the resource. If prices are reasonably attractive, the cost of inputs low and the productivity of inputs high, even older mines can earn profits. For transport costs, location relative to processing and refining facilities is the key driver of costs. The overall business environment in which the mine operates also affects costs.
WHAT IS THE POTENTIAL FOR INDUSTRY GROWTH?

Zambia is recognized internationally as having good mineral potential. The Fraser Institute’s highly respected survey of mining and exploration companies ranks Zambia 26th out of 79 jurisdictions worldwide for mineral potential. In Africa, only the Democratic Republic of the Congo and Burkina Faso have an appreciably higher score for mineral potential. The resources available to existing mines in Zambia are estimated at 2.8 billion tonnes of ore ranging between 0.6 percent and 4 percent copper. This, together with recent successful exploration, should be sufficient to sustain even an expanded industry well into the middle of the twenty-first century.

Global demand for copper is expected to remain strong. Long-term forecasts are by nature uncertain, but global demand for copper is expected to grow at around 3 percent annually, reaching 25 million tonnes by 2020. Much of the increase in demand will be driven by economic growth and urbanization in emerging economies, especially China and India.

Limited global supply should support high (but volatile) prices and continued investment. Global supply of copper from known sources is expected to peak at 20 million tonnes by 2013/14 and decline thereafter, resulting in a shortfall in supply. As a result, copper prices are expected to remain high in real terms, though they will be subject to cyclical fluctuations and periodic, short-term volatility. To meet the shortfall in supply and to take advantage of high prices, the global mining industry is looking to increase investment in copper mining and refining.

Good mineral potential, combined with strong demand in the global market, provide an excellent opportunity for growth in Zambia’s copper mining industry. Assuming other conditions are right (e.g. Zambia’s mines are competitive in terms of costs and productivity levels), Zambia can capitalize on its mineral potential as well as the strong demand for copper in the global market.
A larger, more competitive copper mining industry could increase employment and prosperity. Zambia’s sizable deposits could, if managed well, drive increased production, exports and government revenue, with the benefits spreading more widely. In addition, while formal employment in the mines is likely to remain quite small, there is potential for improved linkages between the mines and local companies. The two scenarios in Table 1 (‘business as usual’ versus ‘Zambia’s potential’) illustrate the scale of the opportunity.

Table 1: A More Competitive Copper Industry Offers Substantial Rewards 10

<table>
<thead>
<tr>
<th></th>
<th>Business as Usual</th>
<th>Zambia’s Potential</th>
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<tbody>
<tr>
<td><strong>Output</strong></td>
<td>800-850,000 tonnes a year</td>
<td>1.3-1.5 million tonnes a year (2020)</td>
</tr>
<tr>
<td><strong>Export earnings</strong></td>
<td>US$4.5-6.8 billion a year</td>
<td>US$8-12 billion a year (based on output of 1.5 million tonnes and a price of US$6,000 to US$8,000 a tonne)</td>
</tr>
<tr>
<td><strong>Government revenue</strong></td>
<td>Approaching US$1 billion (or less) a year</td>
<td>US$2.2-4.0 billion a year (based on output of 1.5 million tonnes)</td>
</tr>
<tr>
<td><strong>Employment</strong></td>
<td>Modest increases and periodic layoffs</td>
<td>Better quality jobs</td>
</tr>
<tr>
<td><strong>Linkages</strong></td>
<td>Limited</td>
<td>Greater linkages involving more local suppliers</td>
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Progress on achieving the industry’s potential is constrained by the following:

**Production costs are high, driven by high (and rising) input costs and low productivity.** The Zambian mining industry has a high cost base. Nearly all operations in Zambia are in the top half of the international cost curve (see Figure 1). Many of the older mines, which account for the majority of output, are in the upper quartile of the cost curve. The newer mines have lower costs but are still in the middle of the curve. The major input cost of concern is labor, which has risen dramatically in recent years and the productivity of which is well below international standards. The cost of other inputs, such as equipment, spares, fuel and other consumables is also high.

![Figure 1: Mines in Zambia have High Costs of Production](image)

Poor infrastructure is a major constraint on competitiveness. Electric power shortages limit output and existing generating capacity is insufficient to keep pace with any significant expansion in the mining industry. The rail system is costly and unreliable. Clearing borders is slow and costly, and this compounds unnecessarily high transport costs.

**Zambia’s policy environment is not considered favorable.** The Fraser Institute’s 2010/11 survey ranked Zambia 57th out of 79 jurisdictions in terms of policy environment. This is confirmed by the influential mining consultant Behre Dolbear which, in its 2011 report, ranked Zambia 19th out of 25 countries in terms of attractiveness to mining investment. Given the significant upfront capital investments and the long payback period inherent in the industry, the stability of the regulatory environment—in relation to taxation in particular—is crucial, and Zambia scored only 3 out of 10 on the tax regime component of the Behre Dolbear Index.
WHAT WOULD IT TAKE FOR THE INDUSTRY TO ACHIEVE ITS POTENTIAL?

Progress towards a few key results could help the copper mining industry accelerate growth and achieve its potential. As Figure 2 highlights, a number of results—if achieved—could help address performance gaps and enhance the economic benefits for the copper mining industry and the country. These results address three phases of the mining cycle: (i) exploration, where prospective investors assess new deposits; (ii) mining operation, where three key inputs—electric power, labor, and manufactured goods—are employed in the extraction of ore; and (iii) product transport, where extracted ore is moved from the mine to the processor and, subsequently, cathode and blister copper transported to the customer. A few additional results focus on the regulatory environment, which has broader, cross-cutting implications for the industry. A short description of each result, organized according to these categories (rather than its relative priority) is provided in the figure.

Figure 2: Results Required for the Copper Mining Industry to Achieve its Potential

**Exploration 5.1**
Better availability and quality of geological survey information could facilitate new mining investment.

**Mining Operation 5.2**
Reliable electric power supply with sufficient generating capacity could support faster industry growth.

Greater labor productivity could improve cost competitiveness.

More competitive, locally produced goods and services could reduce mines’ supply costs.

**Product Transport 5.3**
More efficient rail and road transport could reduce the cost of moving copper to customers.

Streamlined border crossings could reduce delays and improve the reliability of supply for customers.

**Regulatory Environment 5.4**
A new regulatory and tax regime that balanced the interests of the industry and the country, could create a ‘win-win’ situation.

A more predictable regulatory environment could increase stability and reduce risks for investors.

Responsibility for the delivery of social services could be transferred to the government and supported by appropriate tax contributions from mines.
5.1 Exploration

**Better availability and quality of geological survey information could facilitate new mining investment.** With as much as 40 percent of the country remaining to be surveyed, it is impossible to state with precision the size and economic potential of additional copper reserves in Zambia. Without high-quality and detailed survey data upon which to base exploration decisions, potential investors face greater uncertainty and must proceed on a speculative basis. Investor uncertainty is ultimately reflected in the price they are willing to pay for a license, compromising Zambia’s ability to get appropriate value for money from exploration licenses. While some data are available, the quality and level of specificity is often not sufficient to support exploration. In addition, information is often not easy to access from abroad. Higher quality and more easily available survey data are likely to attract more investment and lead to development agreements that deliver better outcomes for the Government, the mines, and the Zambian people.

5.2 Mining Operation

**Reliable electric power supply with sufficient generating capacity could support faster industry growth.** The cost of electric power from the public grid in Zambia (US$0.04-0.06 per kWh) is among the lowest in the world. Periodic outages, however, are a concern for power-intensive industries like mining and refining due to the sometimes lengthy disruptions to production. Should the country again suffer frequent electric power outages as it did in 2008, mines would have to rely on a combination of grid power and costly standby diesel generation (US$0.32-0.40 per kWh), making the cost of electric power uncompetitive compared to countries with reliable supply from the grid. Even more important is the capacity of the grid to accommodate planned growth in production. Without a 40 percent or more increase in supply, availability of electricity may be the binding constraint on whether and when the industry reaches the 1 million tonne target. Assuming a constant intensity of electric power demand, the target of 1 million tonnes is likely to be achievable only when the Kafue Gorge Lower project comes on-stream in 2016. In addition, as the industry expands to new parts of the country, there is a need to extend the grid.

**Greater labor productivity could improve cost competitiveness.** Low labor productivity is driven, on the one hand, by increasing labor costs and, on the other, by low output per worker. For example, at Mopani, labor costs increased almost fourfold between 2003 and 2008, and now comprise just over 40 percent of costs, compared with 22 percent at Indonesia’s Grasberg mine. This is despite the fact that mining is not a labor-intensive industry. Adversarial wage bargaining and Government and social pressure has encouraged large wage increases for “insiders” (trade union members) at the expense of restricting employment opportunities for the large number of unemployed Zambians (“outsiders”). Labor productivity is a larger concern, and in this regard Zambia lags well behind international standards. In Chile, annual production of copper per worker is almost seven times greater than in Zambia, and a difference of this magnitude cannot be explained solely by variables like scale, nature of resources and better equipment. Low productivity is in large part driven by gaps in workers’ skills that are rooted in weak technical and vocational training from industry and training institutions. Productivity is also undermined by a work ethic that favors entitlement over efficiency, which itself is derived from historical legacy, labor regulations (e.g. high allowances) and a lack of accountability (including pay having a limited relationship to productivity).
More competitive, locally-produced goods and services could reduce mines’ supply costs. Manufactured goods, equipment and consumables are expensive and/or difficult to obtain in Zambia; hence mines rely heavily on imports from South Africa and elsewhere. Due to the logistics costs, trade facilitation fees and markups associated with imports, equipment and spare parts in Zambia can cost more than twice what they would in other countries. Motivated by profit, mines are keen to source from the least-cost providers that can meet their standards of quality, quantity and reliability. The greater use of local manufacturers could theoretically reduce the import and logistics-related costs that mines currently incur. Local manufacturers, however, lack the capacity to deliver the more complex, high-value-added products that account for the majority of mines’ spending at a sufficient quality to meet the needs of the mines. International mine suppliers, who can produce the required quality, have thus far not located in Zambia due to its lack of attractiveness for manufacturing and, until recently, insufficient demand from mines. As a result, the industry buys only low-value items (such as food, clothing, and non-critical services) locally, often from traders rather than local manufacturers. Developing a high-quality, high-value-added manufacturing base in Zambia that is capable of supplying reliably a number of key products to the mines, will take time and will likely not be feasible for all types of mine supplies. Nevertheless, a more efficient local manufacturing industry could ultimately reduce input costs for the mines, improve industry competitiveness over the longer term, raise the incomes of local producers, and, potentially, help create markets for the copper fabrication industry (see separate note in this series: What is the Potential for More Copper Fabrication in Zambia?).

5.3 Product Transport

More efficient rail and road transport could reduce the cost of moving copper to customers. Almost all of Zambia’s copper is ultimately exported, exiting Zambia along the routes of the North-South Corridor which connects the Copperbelt province with the major ports of Durban in South Africa (2,600 km) and Dar es Salaam in Tanzania (1,800 km). Due to the weight and volume of copper and, in many cases, long transport distances to port, rail—which tends to be lower cost than road transport—is the preferred mode of transport in the copper industry worldwide. In Zambia, however, the railway that links the Copperbelt to Dar es Salaam and Durban commands a very limited market share. Privatization has not brought the investment and skills needed to revive a rail system that fell into disrepair under public ownership, and the system has not been extended to new mining areas. In contrast, the trucking companies that, in the absence of an effective rail system, carry the vast majority of Zambian copper to market, are relatively price competitive despite significant inefficiencies along the corridor. Trucking companies interviewed during the course of this study charge around 4.2 cents/tkm for southbound traffic from the Copperbelt to Durban and 6.7 cents/tkm for northbound traffic. The southbound price compares favorably with many other African transport corridors and countries such as China and France (5.0 cents/tkm). However, the trucking of copper does face a number of challenges that unnecessarily increase costs and transit times. Aside from inefficiencies related to border crossings (described below) the main inefficiencies in the logistics environment are related to high fuel prices, poor conditions on some road stretches, and the risk of theft of cargo.

Streamlined border crossings could reduce delays and costs and improve the reliability of supply for customers. The opportunity cost of border crossing delays, both outbound (affecting exports of products to customers) and inbound (affecting imports of supplies) is a pressing concern for the copper mining industry. It is estimated that the standing cost for copper transporters at the Chirundu and Beitbridge border crossings is equivalent to a 25 percent surcharge on transport prices—or some 0.8-0.9 cents/tkm. In addition, there is potential to significantly reduce trade transaction costs associated with trade procedures (currently 0.7-1.1 cents/tkm from the Copperbelt to Durban and 1.0-1.6 cents/tkm from the Copperbelt to Dar es Salaam) by streamlining administrative requirements and procedures.
5.4 Regulatory Environment

A new regulatory and tax regime that balanced the interests of the industry and the country could create a ‘win-win’ situation. At the root of the disagreements over the tax regime (discussed in section 1.1) is the inability of the Government and industry to find an equitable balance between, on the one hand, the commercial interests of the industry and, on the other, the industry’s contribution to national prosperity. Such a regime needs to cover, in a clear and transparent fashion, taxation, as well as Government’s obligations to provide the macro stability, governance, infrastructure and social services that the industry needs to prosper. In exchange, the Government and public at large need assurances that the mines are in fact contributing sufficient tax revenues to support the communities within which they operate and at levels consistent with profits they receive from extracting Zambia’s natural resources. Unless such a regime is agreed upon, the industry will continue to dispute at least some aspects of the new tax regime and the growth of government revenues will be constrained. Moreover, the regime will remain unstable, thereby undermining investor confidence.

A more predictable regulatory environment could increase stability and reduce risks for investors. Given the large upfront investments, long-term commitments and long investment payback horizons inherent in the mining industry, stable and predictable policies are essential in evaluating a mining project’s perceived risks and economic viability. Frequent legal and regulatory changes create an air of uncertainty for investors. Zambia’s recent history of regulatory changes (such as has been seen in relation to taxation, as discussed earlier) is a severe constraint on both new investment as well as the continued operation of established mines.

Responsibility for the delivery of social services could be transferred to the Government and supported by appropriate tax contributions from mines. In Zambia, expectations for the social contribution of mines extend well beyond those typically borne by private industry. Zambian mining companies incur costs and responsibilities associated with operating schools, hospitals and clinics, and maintaining local road infrastructure. Mines serve these roles partly due to gaps in government provision but in large part due to legacy expectations of mines that developed prior to privatization. While in financial terms these costs are relatively minor, uncertainty and lack of clarity under the current arrangement is cited as a key deterrent to greater investment in the sector. Hence, there may be a need for a more explicit agreement with the Government and the public at large on an appropriate allocation of social provision responsibilities, with the Government taking greater responsibility for supplying the services and a shared understanding that the industry contributes its part through the tax revenues it provides to the Government. Such an understanding would have to be supported by mechanisms to ensure appropriate tax compliance and payment by industry.
SUMMARY

Zambia is recognized internationally as having strong mineral potential, and limited global supply should support high (but volatile) prices and continued investment in the future. This provides an excellent opportunity for growth in Zambia’s copper mining industry. A more productive mining industry could contribute income to the Government, as well as improve livelihoods and increase employment and backward linkages.

However, high production costs and relatively frequent changes in the legal and regulatory environment may deter investors, causing Zambia to lose out to other copper-producing countries. To overcome these competitiveness gaps and take the copper mining industry closer to reaching its potential, there are a number of results that Zambia should aim to achieve. These include:

- Better availability and quality of geological survey information;
- Reliable electric power supply with sufficient generating capacity to keep up with industry growth, including in new areas;
- Greater labor productivity;
- More competitive, locally-produced goods and services;
- More efficient rail and road transport;
- Streamlined border crossings;
- A new regulatory and tax regime that balances the interests of industry and the country;
- A more predictable regulatory environment; and
- Responsibility for the delivery of social services transferred to the Government and supported by appropriate tax contributions from mines.
Copper is booming, and there is potential for Zambia’s copper mining industry to grow faster and to become more productive, thereby generating much needed revenue for the country. Given the industry’s potential, and the strong commitment of Government, business, civil society and donors to improve industry performance, there is a real opportunity for stakeholders to chart an effective way forward and to monitor their progress over time. The Extractive Industries Transparency Initiative (EITI) can complement this work, by sharing information about the tax revenue generated by the industry and encouraging accountability for the effective use of the proceeds.

This note and the detailed technical report that accompanies it are tools that can be used by stakeholders throughout this process. Specifically, by benchmarking productivity levels against other countries (and within Zambia), stakeholders can evaluate their performance and hold each other accountable for improving performance. Increased productivity is key to sustained industry competitiveness, and this, in turn, can generate revenue that can be used for the good of all Zambians.
The analytical work undertaken as part of the Jobs and Prosperity: Building Zambia’s Competitiveness Program covered two dimensions of Zambia’s copper industry: mining and fabrication. Although both sectors rely on the same natural resource, the drivers of and constraints to competitiveness differ between them, and they have different prospects for growth in Zambia. Therefore, copper mining and copper fabrication are dealt with in separate notes (meanwhile, many of the issues covered in this – copper mining – note are also relevant to refining activities).

2. 40 percent of the country has not been geologically surveyed, so actual reserves may exceed current known reserves.

3. Zambia was once the 4th largest producer of copper worldwide, before dropping to 11th, as output declined, but today it has recovered to 8th position.

4. It may even be possible to overtake Peru to become the 2nd biggest producer after Chile (which accounts for 34 percent of world output).

5. The mining industry’s rate of growth of almost 8 percent per year during the 2001-2008 period (before a temporary setback in early 2009) was second only to that of the transport, storage and communications sector.

6. Taxes represent 3-5 percent of export revenues in Zambia compared to 25-40 percent in the rest of the world.

7. Note that the actual tax rate paid by many of the companies may be lower, due to the existence of tax concessions that are set out in companies’ individual agreements with Government.

8. Mines typically start to generate strong cash flows and start to pay significant levels of taxes 7-9 years after major investment.

9. The mining companies also argued that they should be compensated, in the form of lower taxes, for the Government’s failure to provide adequate infrastructure and social services (which undermines the mines’ cost competitiveness).

10. The figures provided in this table represent World Bank estimates based on desk research and discussions with stakeholders. Even under the “business as usual” scenario, tax revenues are expected to increase significantly due to several factors, including: (i) the price of copper is likely to remain high; (ii) the expectation that the new tax regime introduced by the Government will raise the tax take; (iii) the expiration of some of the tax concessions in the Development Agreements, as many of the mines enter a post-investment stage when they are expected to generate large operating profits; and (iv) most of the mines are reconciled to paying the 3 percent royalty. There is considerable uncertainty as to the extent of the increase in tax revenues under the “business as usual” scenario, however, as a result of: (i) the possibility that, because of high capital investment and the carry forward of losses, the tax paid in cash to the Government will not increase even under the new regime; (ii) the refusal of some mines to adhere to the new regime, believing that it does not supersede their Development Agreements; and (iii) the possibility that new mines may obtain similar tax concessions as were incorporated in the Development Agreements of the past. However, even with these objections, the tax-take should increase.

11. Labor costs at Mopani increased by 396 percent between 2003 and 2008.


13. See 5.3.

14. F. McMahon and M. Cervantes for The Fraser Institute. April 2010. Survey of Mining Companies 2009/10. The Policy Potential Index developed by the Fraser Institute is a composite index that measures the effects, on exploration, of government policies. The Index covers a number of issues including uncertainty concerning the administration, interpretation, and enforcement of existing regulations; environmental regulations; taxation; infrastructure; socioeconomic agreements; political stability; labor issues; geological database; and security, among others.

15. The overall Behre Dolbear Index rates countries on economic system, political system, social issues, permitting delays, corruption, currency stability and tax regime.

16. During electric power outages, priority is given to ensuring the supply to mines is disrupted as little as possible.

17. In fact, the assumption of constant intensity may prove unrealistic as the older – and deeper – mines such as Konkola Copper Mines will need more electricity to pump away water.

18. A number of other electric power generation investments are planned and, if implemented on schedule, could help facilitate mining industry growth.

19. Labor costs are higher at Mopani partly because it is an older mine. Labor costs for mines in less-developed countries can be as low as 20 percent, compared to 40 percent for North American mines.

20. According to consultations with trucking companies in the Copperbelt, approximately one-sixth of Zambia’s copper exports travel by rail (almost all to Dar es Salaam), with the rest by truck.

21. In 2009, a transport price of US$110/tonne on a southbound journey of copper ores/concentrates represented 5.6 percent of the total value of the cargo. For copper cathode, the transport price represented 1.6 percent of the total value of the cargo (Michael Engman. May 2010. The Role of Trade and Transport Issues in the Competitiveness of Zambia’s Copper Industry [draft]).
The quality of the major arterial roads has improved significantly in recent years and they are now largely in good condition. However, some roads have degenerated due to heavy truck traffic in the Copperbelt, and there are some challenging stretches on the 600-kilometer route between Serenje and Nakonde on the Tanzanian border. In addition, insufficient road capacity often results in heavy truck traffic and congestion delays, and poor road conditions on some stretches substantially increase truck maintenance costs (by 10-20 percent, according to one large Zambian trucking company consulted during the course of this study).

The transport companies consulted during the course of this study argued that the cost of diesel is 30-40 percent of their total cost, and that fuel in Zambia is more expensive than in other countries in the region. The trucking sector may save around US$18 million ($0.005 cents/km), or 12 percent of the overall income of the trucking business associated with copper transportation and return hauls, as truckers fill up large tanks in Botswana and Zimbabwe. The additional fuel storage containers translate into foregone income of US$230 for each return trip between Durban and the Copperbelt, or more than US$5 million in total annually.

Customers are impacted by border delays as it is difficult to forecast when shipments will arrive, and this can disrupt their own production.

According to trucking companies in Zambia, it takes around 4-6 days to truck copper from the Copperbelt to Johannes burg if the cargo is pre-cleared, all documents are in order, and there are no incidents along the way. Additional time is needed for the cargo to reach the port of Durban and if there are any delays during the journey. It takes an average of 7 days to reach Dar es Salaam – but it can vary from 5 days without delays at the border to 10-12 days.

Between 2002 and 2008, Mopani reportedly spent almost US$80 million on social costs, with US$21.5 million spent in 2008 (equivalent to 2.7 percent of revenue), up from US$6 million in 2002.
What would it take for Zambia’s copper mining industry to achieve its potential?

Historically, copper has played a major role in Zambia’s economy and, although the economy is diversifying, copper mining continues to account for a sizeable part of GDP and is one of the lead industries for economic growth. The largest known reserves of copper in Africa and 6 percent of known reserves of copper in the world, combined with strong prospects for copper on the international market, provide Zambia with an excellent opportunity to further expand its copper industry in the future. Zambia could produce up to 1.5 million tonnes a year by 2020, yielding up to US$12 billion a year in export earnings and up to US$4 billion a year in government revenue.

However, high production costs and low productivity constrain the industry’s growth, and aspects of the regulatory environment and differences in the mindset under which different stakeholders operate limit the industry’s potential to contribute – through tax revenues, employment and linkages with the wider economy – to national prosperity. In order for the industry to become more productive and internationally competitive, several actions are needed. These include improving infrastructure and the availability, cost and productivity of key inputs (including labor); creating a more-enabling regulatory environment and a shared understanding of the roles and responsibilities of the private sector vis-à-vis Government; and more effectively translating the industry’s success into meaningful benefits for the wider population.

This note explores the potential contribution that a larger, more competitive, copper mining industry could make to jobs and prosperity in Zambia and identifies what it would take for the industry to achieve its potential. The note provides a summary of the analysis contained in a forthcoming World Bank report: What Would it Take for Zambia’s Copper Mining Industry to Achieve its Potential?

This note and the detailed report from which it is drawn were produced under the Jobs and Prosperity: Building Zambia’s Competitiveness Program, a joint venture between the Government of Zambia, the Zambian private sector, civil society and cooperating partners. For more information on the issues raised in this note, or for a copy of the main report, please see www.worldbank.org/zambia or contact Mr. Jumbe Ngoma, Communications Officer, World Bank - Zambia Country Office, jngoma@worldbank.org.