De-risking mining in Africa

Overcoming the infrastructure deficit for mining in Africa

A presentation by Anne-Cecile Souhaid
MineAfrica London
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About Eunomix

Eunomix specialises in de-risking resource and commodities projects in Africa, a destination of ever greater global strategic value.

It helps clients achieve and sustain success in the face of political, regulatory, economic, social, infrastructure and security uncertainty, instability and incidents.

Registered in London, it has been advising business and governments since 2009. It has been featured in leading media like the BBC, Bloomberg, Business Day, Business Week, CNBC Africa, Financial Mail, Mineweb, MiningMX, Mining Weekly, Reuters and The Sowetan.

Eunomix is a fast growing provider of insight and advice that are thoughtful, unequivocal and progressive.

The Eunomix offering

Eunomix assists clients develop African resource investments and projects intelligently, operate them successfully and responsibly, and exit profitably.

It works to achieve security of tenure – the ability to gain and retain one’s political, legal and social licence to operate – and ensure the integrity of key values: employees, partners, assets, reputation and strategic goals.

The Eunomix offering is optimised around the life-cycles of investment and project. It delivers essential value at each critical stage to generate visibility, guide decisions, facilitate planning and minimise exposure: scoping, exploration, development, operation and exit.

"Eunomix is a "strategic partner" to our exploration and mining projects, particularly in high risk geopolitics, infrastructure and security. Their depth of understanding and analysis is of the highest level. The value they have added to our projects is significant.

Anton Mauve, Managing Director, West African Minerals Corp."
Risk or opportunity? Leveraging infrastructure

- Infrastructure investment is a way for mining companies to mitigate political risk in Africa: focus on economic development in its many forms is the best strategy to mitigate political risk and demands of local communities which are raising in Africa - violent labour disputes, uncertainties over licences, taxation, resource nationalism etc -.

“Africa’s infrastructure is both a potential bottleneck for mining development and a development challenge. There is increasingly an overlay between the geography of mining deposits and where there is lack of available transport, power and water. Multi-use infrastructure can be an opportunity for mining to enhance its development impacts on countries and regions for the long term as they serve as critical anchors for road, rail, port, water, power and even telecommunications investments”

Bernard Sheahan, Director of Infrastructure and Natural Resources for Africa and Latin America, IFC (February, 2013)
The problem: Why is infrastructure so important?

Resource Development in the 21st Century

“All the easy projects have been done”

- The more accessible resources get developed first
- The world’s continued appetite for resources means that new frontiers have to be conquered
- More “challenging” mining techniques (e.g. deeper and more remote mines), and more “challenging” export logistics chains
  - Logistics chains are getting longer
  - The terrain over which the transport corridor is to be built is becoming harsher

“There’s little we can do about markets, there’s little we can do about pricing. However, for the markets that are available, cost will be the major contributing factor in survival.”
The problem:
Why is infrastructure so important?

- Infrastructure costs are generally two-thirds of total project cost—on some greenfield mining projects can be even higher
- Transport logistics solutions are key for bulk commodities—iron ore, coal, manganese—
- The negative impact of deficient infrastructure is at least as large as that associated with corruption, crime, financial market and red tape constraints (World Bank)

<table>
<thead>
<tr>
<th>Mineral</th>
<th>2010 World Prod. (mn metric ton)</th>
<th>Av. Price per ton (2010 US$)</th>
<th>Rail transport cost in % of price per ton</th>
<th>Truck transport cost in % of price per ton</th>
<th>Price sensitivity to transport cost</th>
<th>Africa’s Potential</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bauxite, Alum</td>
<td>211</td>
<td>27</td>
<td>03%</td>
<td>463%</td>
<td>High</td>
<td>++</td>
</tr>
<tr>
<td>Phosphate</td>
<td>176</td>
<td>50</td>
<td>50%</td>
<td>250%</td>
<td>High</td>
<td>++</td>
</tr>
<tr>
<td>Iron Ore</td>
<td>2,400</td>
<td>90</td>
<td>29%</td>
<td>139%</td>
<td>Medium</td>
<td>+++</td>
</tr>
<tr>
<td>Coal</td>
<td>7,200</td>
<td>165</td>
<td>15%</td>
<td>76%</td>
<td>Medium</td>
<td>+++</td>
</tr>
<tr>
<td>Copper</td>
<td>16.2</td>
<td>7,694</td>
<td>0.3%</td>
<td>1.6%</td>
<td>Low</td>
<td>++</td>
</tr>
<tr>
<td>Cobalt</td>
<td>0.088</td>
<td>46,297</td>
<td>0.1%</td>
<td>0.3%</td>
<td>Low</td>
<td>++</td>
</tr>
<tr>
<td>Gold</td>
<td>0.0025</td>
<td>38.5 mn</td>
<td>0%</td>
<td>0%</td>
<td>Low</td>
<td>++</td>
</tr>
<tr>
<td>Platinum</td>
<td>0.000183</td>
<td>51.4 mn</td>
<td>0%</td>
<td>0%</td>
<td>Low</td>
<td>++</td>
</tr>
</tbody>
</table>
The problem: Why is infrastructure so important?

- Large “world-class” mineral deposits in Sub-Saharan Africa identified but remain undeveloped

- The single biggest impediment to the extraction of the deposits: TRANSPORTATION INFRASTRUCTURE (Rail/Road and Port)
The problem:
The strategic infrastructure gap

- Existing infrastructure in SAA is often limited. Infrastructure deficit estimated at **USD 93 bn gap** (AICD, January 2013)
- Available infrastructure is often in need of upgrading
- Functioning infrastructure (e.g. ports) tends to be over utilised
The problem:
The strategic infrastructure gap

- Rail infrastructure distance involved
- Cross-border issues that prevent more efficient transportation solutions from being realised
- Political imperative
- Country stability

Source: RBC Capital Markets.
The problem: The strategic infrastructure gap

- In SSA more than 4,000 km of Greenfield railway, costing in excess of USD 50 billion would have to be financed and constructed to unlock all known iron ore deposits (Deutsche Bank)
The problem: Conflicting goals?

Various stakeholders:

• Governments see new infrastructure development as a catalyst for broader economic growth, hence seek to ensure that new infrastructure supports planned “transportation corridors,” is accessible to other industries (agri-businesses, forestry etc) and supports the efficient development of other viable mineral deposits.

• The private sector is driven by the potential to generate positive financial returns, commensurate with the risks assumed through the development of this infrastructure.
  ▶ Major mining companies, are often reluctant or unable to underwrite the entire infrastructure cost (which can vastly exceed the mine construction cost) but would prefer to control such infrastructure for reasons of operational efficiency and flexibility.
  ▶ Sponsors of small-to-intermediate mining projects are seeking long-term access to any existing or future infrastructure on fair and non-discriminatory terms.
The problem: Government challenges

- **Fragile states syndrome** (lack of technical and political capacity, clientelism, corruption, lack of trust, multiple agendas, conflicts of interest, etc)
- In SSA, public sector ownership and financing is not a viable option
- Mismatch between budgetary resources and size of the capital requirements: Given the large size of infrastructure needs relative to SSA countries’ GDP and public budget, the financial commitment of one project could overwhelm a country’s entire budget equilibrium

<table>
<thead>
<tr>
<th>Country</th>
<th># of iron ore mines</th>
<th># of railways</th>
<th># new ports</th>
<th>Est. Cost of Infra USSbn</th>
<th>% GDP</th>
<th>% Ntl. Budget</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guinea</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>10.4-13.6</td>
<td>181-236%</td>
<td>850-1100%</td>
</tr>
<tr>
<td>Cameroon</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>6.6-8.5</td>
<td>27-35%</td>
<td>120-160%</td>
</tr>
<tr>
<td>Mauritania</td>
<td>3</td>
<td>2</td>
<td>0</td>
<td>3.8-4.9</td>
<td>92-119%</td>
<td>260-340%</td>
</tr>
<tr>
<td>Senegal</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>3.8-4.9</td>
<td>27-35%</td>
<td>90-120%</td>
</tr>
<tr>
<td>Rep. of Congo</td>
<td>3</td>
<td>3</td>
<td>0</td>
<td>3.3-4.2</td>
<td>24-31%</td>
<td>90-110%</td>
</tr>
<tr>
<td>Gabon</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>2.9-3.8</td>
<td>17-22%</td>
<td>65-85%</td>
</tr>
<tr>
<td>Liberia</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>1.9-2.5</td>
<td>110-142%</td>
<td>440-570%</td>
</tr>
<tr>
<td>Sierra Leone</td>
<td>3</td>
<td>3</td>
<td>0</td>
<td>1.6-2.1</td>
<td>42-54%</td>
<td>250-330%</td>
</tr>
</tbody>
</table>

Source: IFC, RBC Capital Markets, CIA World Factbook
The problem: Government challenges

- Countries are not able to raise financing from the capital markets on reasonable terms.
- Countries may apply for concessional financing from multilateral institutions, such as the World Bank, but the use of sovereign lending increases countries' financial liabilities and diverts much needed sovereign debt capacity away from sectors such as health and education.

<table>
<thead>
<tr>
<th>Country</th>
<th>Sovereign Credit Rating (S&amp;P)</th>
<th>Political risk (EIU)</th>
<th>% of natural resource rents in GDP (2010, World Bank)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Namibia</td>
<td>BBB</td>
<td>BBB</td>
<td>1%</td>
</tr>
<tr>
<td>Gabon</td>
<td>BB-</td>
<td>B</td>
<td>50%</td>
</tr>
<tr>
<td>Mozambique</td>
<td>B+</td>
<td>BB</td>
<td>9%</td>
</tr>
<tr>
<td>Cameroon</td>
<td>B</td>
<td>CCC</td>
<td>9%</td>
</tr>
<tr>
<td>DRC</td>
<td>Non rated</td>
<td>Non rated</td>
<td>30%</td>
</tr>
<tr>
<td>Guinea</td>
<td>Non rated</td>
<td>Non rated</td>
<td>21%</td>
</tr>
<tr>
<td>Liberia</td>
<td>Non rated</td>
<td>Non rated</td>
<td>15%</td>
</tr>
<tr>
<td>Mauritania</td>
<td>Non rated</td>
<td>Non rated</td>
<td>54%</td>
</tr>
<tr>
<td>Congo</td>
<td>Non rated</td>
<td>Non rated</td>
<td>64%</td>
</tr>
<tr>
<td><strong>Existing mining powerhouses</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>South Africa</td>
<td>BBB</td>
<td>BBB</td>
<td>5%</td>
</tr>
<tr>
<td>Brazil</td>
<td>BBB</td>
<td>BBB</td>
<td>5%</td>
</tr>
<tr>
<td>Australia</td>
<td>AAA</td>
<td>AA</td>
<td>8%</td>
</tr>
<tr>
<td>Chile</td>
<td>AA-</td>
<td>A</td>
<td>19%</td>
</tr>
</tbody>
</table>

Source: IFC.
The problem: Mining companies perspectives

- Investors don’t like risks and the mining project maybe at risk unless there is an efficient export logistics chain and that enables the project to be profitable \(\Rightarrow\) Market and volume imperatives
- Mining companies are seeking the lowest cost export chain
- Mining companies usually don’t like sharing infrastructure:
  - Don’t like other users on their line, because they are seen as interfering with scheduling
  - Where third-party access is built in, excessively high tariffs are imposed to keep outside users at bay
  - When anti-price-discrimination clauses are built in, third-party users are kept off the line on the grounds that the line’s capacity is fully taken up, which means that a percentage has to be reserved for third parties in advance
The problem: Financing key issues

• Distinguish between majors and juniors in the mining sector:
  ▶ The major miners – BHP, Vale, Rio and Anglo – have the capacity to fund projects on balance sheet
  ▶ The junior miners are unlikely to have the balance sheet to fund all their infrastructure requirements - they need to take more of a project finance approach to their projects

• PPPs:
  ▶ Involving the private sector is the only viable way of sourcing the necessary funding and expertise; the key role of governments could be restricted to availing unencumbered land to private infrastructure developers and regulating the relationship between infrastructure owners and users
  ▶ PPPs for the development of mining-related infrastructure generate tensions between the public and private sectors around how the infrastructure will be used

• Banks and investors need to understand the complex risk dynamic between: quality and quantity of resource, distance to market, topography, port requirements, capabilities of individual miners to develop projects, whether Governments are enablers or hinderers to project success etc

• Engineering, procurement and construction (EPC) contracts have become a crucial means of funding infrastructure projects and reducing risk. Influence on how to shape infrastructure development may be minimised but risk is outsourced to an external party

• The China dynamic will frequently be present. “resource-for-infrastructure” deals
Implications: How to develop solutions

Exploration/pre-feasibility
- Early engagement with the Government and service providers
- Understand the context - how the project will work and fit in locally
- Identify needs and impacts (positive and negative)
- Assess viability
- Determine operating philosophy: concept development and master planning

Feasibility
- Strategic planning
- Business case + Estimating
- Operational simulation + Capacity modelling
- Negotiate access
- Design, Civil engineering
- Competition/regulation advice

Operation
- On-going management
- Gain local buy in: Engage local communities, Employ local personnel for construction and operation
Implications: How to develop solutions

• Design challenges: Africa is a continent of contrasts (desert, tropical rain forest, natural parks, mountains, volcanoes, swamps, political diversity, cultural diversity) so one transport infrastructure solution does not fit all: the solution must be designed for the specific project environment (selection of key standards for the design and construction).

• Comparative studies are essential to assess best solutions (e.g. rail road, pipeline): Selection of the basis of design criteria is often iterative.

• The project should be profitable:
  ► requiring lower initial Capex expenditure - enhancements can be made after operations have commenced, and upon cash returns. This may need to be done at the expense of higher initial operating costs in order to make the project both profitable and bankable.
  ► Standards should be selected and modified to enhance the viability of the project.
  ► Financial modelling is an integral aid – prior to commencement of engineering.
Implications: How to develop solutions

- The most important decision before commencing the design is to determine the future operating philosophy (Run when ready)

- Understand that risks go both ways

- The socio-economic impacts
  - Expropriation, loss of access to land and associated income, environmental damage, greater physical insecurity, diseases, political interference from the capital city, social change, corruption, and so on
  - Rail, road and their access roads will attract local populations to resettle near the facilities

- The environmental impacts

- Once the basis of design has been selected, modelling completed, and the project concept proved viable, detailed engineering design can be commenced
Implications: Possible solutions

- **Integration** across the entire logistics chain provides real benefits for a small investment: *Coordination of long term planning across mine, rail, bulk materials-handling, and port*

- **Staged development approach** to maximise client benefit at each stage of the development life-cycle of the project

- Although not a natural instinct, ‘*clustering’, ‘collaboration’, ‘commune approach’* to avoid balance sheets being overburdened by huge project and logistics costs at a time of poor commodity price outlook

- **SPV** owning mining infrastructure
In practice: de-risking exploration in Central Africa

• We have been acting as country risk and infrastructure advisors to an iron ore exploration company in Central Africa since early 2012

• The goals of our engagement have specifically been to:
  ▶ Assist management in rooting country risk management as a strategic commitment, and communicate this effectively, internally and externally
  ▶ Develop the knowledge and risk management system to effect greater country risk resiliency
  ▶ Leverage country risk management to improve the company’s political and social licence to operate
  ▶ Increase the company’s value through the effective de-risking of key exposures in a transparent, effectively communicated way
  ▶ Develop logistical solutions to export iron ore from potential mines and first order studies on the logistical solutions to validate the viability of the mines
In practice: scoping infrastructure risks

- Pre-concept analysis allows mining companies to make important decisions regarding the viability of the mine i.e. the dollar rate per tonne to export the ore. This may prompt further studies or stop the mine from spending unnecessary further capital on detailed studies.

- Early engagement allows avoiding the key issue of constrained access to infrastructure by first mover and limited options for product exports, with higher cost.

- Early understanding of the socio-economic and environmental issues (specifically in sensitive environmental areas) allows development of mitigation and management plans and improve the perception of the company within key ministries and international orgs.

- Rooting these issues into a broad understanding that:
  - risk is reciprocal
  - transparency, cooperation and shared benefits go a long way toward reducing risks
  - Many potential risks, if identified early, can be turned into opportunity.
In practice: developing an infrastructure strategy

The vision: a corridor approach

‘The Philosophy of getting the maximum operational benefit out of the infrastructure budget...

...not the maximum possible infrastructure’

- **Integration** across the entire logistics chain -mine, rail/road, bulk materials-handling, and port

- **Staged development approach** – extracting the higher grade iron ore, from the closest mine to the coast with the lowest capex (road) in order to assist the financing of the infrastructure

- **Clustering and collaboration**

- **Leveraging socio-economic benefits**
Methodology

- On site investigations and regular stakeholders consultations (Government, WB, NGO)
- Coordination and consolidation of experts pre-feasibility studies (port, road, rail, processing, environmental assessment)
- Multi-criteria assessment of alternative options (i) Life cycle cost comparison (CAPEX and OPEX, Present Value Evaluation) and (ii) socio-environmental impacts
- IRR and infrastructure pay-back estimates
In practice: key achievements so far

- Development of a sound infrastructure strategy in line with the Government requirements
- Greater clarity on financial viability of the mines and infrastructure and therefore on the investment opportunities
- Better understanding by the company of the connection between its activities and local social, economic and environmental outcomes
- Better understanding by stakeholders of goals and horizons and hence significantly improved relations with key ministries and international organisations
- Development and implementation of best practices in:
  - Community engagement
  - Access to sensitive forestry areas and lower negative local impact
- The company is now a formal participant in transport infrastructure development strategy and planning