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# Fostering the Development of Greenfield Mining-Related Transport Infrastructure Through Project Financing



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<b>AUD</b>	Australian Dollar
<b>BOO</b>	Build-Own-Operate
<b>BOT</b>	Build-Operate-Transfer
<b>BOOT</b>	Build-Own-Operate-Transfer
<b>BRL</b>	Brazilian real, the official currency of Brazil
<b>IBRD</b>	International Bank for Reconstruction and Development
<b>IDA</b>	International Development Association
<b>IFC</b>	International Finance Corporation
<b>IFI</b>	International financial institution
<b>IMF</b>	International Monetary Fund
<b>Investment Grade Rating</b>	BBB- or above for S&P, Baa3 or above for Moody's, and BBB- for Fitch
<b>DSCR</b>	Debt service coverage ratio
<b>ECA</b>	Export credit agency
<b>EPC</b>	Engineering, Procurement and Construction
<b>EUR</b>	Euro, the official currency of the Euro zone
<b>Greenfield</b>	A facility/project in an area where no previous facilities (of similar nature) exist
<b>Mtpa</b>	Million tons per annum (metric tons)
<b>O&amp;M</b>	Operations and maintenance
<b>PPP</b>	Public-Private Partnership
<b>Project Company</b>	In project finance, the entity that actually owns all of the project assets and is responsible for its liabilities
<b>SOE</b>	State-Owned Enterprise
<b>SPV</b>	Special Purpose Vehicle
<b>Sponsor</b>	The investor who provides equity financing and leads the development and operation of the project; owner of the Project Company
<b>SSA</b>	Sub-Saharan Africa
<b>Substantial Completion</b>	The completion of construction to the point where the facility can be used as originally intended
<b>USD</b>	U.S. Dollar



## Executive Summary

The last ten years have seen an unprecedented rise in the price of mineral commodities worldwide. This “super cycle” has created a new set of challenges and opportunities for mining firms engaged in a race to secure higher output of the minerals needed by expanding emerging economies. One of the consequences of this “race to riches” has been to improve the financial viability of mineral deposits which, until then, were thought to be either too distant to market and/or located in countries too risky to be developed.

From the mid 2000s through the early 2010s, the world’s largest mining companies embarked in the planning of numerous and often very large mining projects to satisfy what was seen as an ever-growing double digit demand for minerals (iron ore, coal, bauxite, copper, etc.). The advent of the 2008/2009 crisis and the subsequent economic slowdown, including that of China, has exposed serious flaws in the commercial viability of many of the planned mining projects and new supply is now thought to significantly exceed short and medium-term demand (e.g., Africa’s known iron ore projects alone would represent an expansion of nearly 60% of iron exports). It now seems inevitable that the development of these projects will be stretched over many years, and that only the most profitable ones will be implemented in the short term.

A number of these mining projects are located in frontier countries<sup>1</sup> (e.g., Mongolia, Guinea, Afghanistan, Sierra Leone and Mozambique). These “first movers” projects present mining firms with specific and often unfamiliar obstacles, including the need to build Greenfield multi-billion dollar logistics transport solutions using private capital due to the lack of existing adequate transport infrastructure. Frontier markets are often also characterized by:

- Sub-investment grade environments
- A weak rule of law and regulatory systems
- A limited Public-Private Partnership (PPP) track record
- Strong tendencies towards resource nationalism
- Constrained pools of skilled labor

This report explores the challenges and solutions associated with the development of Greenfield mining-related transport infrastructure through project financing in frontier countries, including as shared-use assets.

Various design requirements and management models for mining-related port and rail facilities can be considered. Broadly, allowing usage of the rail infrastructure by third-party clients (non-owners) can be achieved either through a haulage regime, whereby the infrastructure owner provides transportation using its own rolling stock, or an access regime, whereby the third-party client uses its own trains for transportation. Today, though the access regime is the preferred method of achieving open access globally, a number of specific factors present in most of the new mining projects in Sub-Saharan Africa (SSA) point towards the possibility of the haulage regime becoming the regime of choice for shared-use facilities.

A similar set of options exists for Greenfield mining port facilities. In either case, the usage regime selection process should reflect the business and financial needs of the project’s stakeholders at the time of project conception while acknowledging that changes in future business environment might require modifying the selected initial operational regime. This pragmatic approach can carefully be translated into a concession agreement’s terms by leaving some room for future renegotiations on a few key issues (i.e., tariff structure, transport capacity allocation, etc.) without diminishing project bankability.

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<sup>1</sup> For the purpose of this report, frontier countries are defined as countries with GDP per capita of less USD 1,200 and/or conflict or post conflict low or middle-income countries.

Legal and regulatory considerations are also paramount to investors, and can be classified into two categories: some are “systemic” issues (i.e., pre-existing legal and institutional conditions that will determine if and how a PPP can be put in place in a given host country); others are more “project specific” (i.e., particular arrangements that will be negotiated among the parties for the implementation of the PPP). The role of governments in the project specific considerations is crucial, and can vary widely from low to high involvement (i.e., public authorities as enablers versus as investors and/or co-operators). Options for structuring and regulating complex PPP Greenfield shared-use arrangements are virtually unlimited and have to be addressed through a specific contractual framework (i.e., the concession agreement and the contract between the owner, operator and third-party clients) and associated dispute-resolution mechanisms (i.e., independent regulation and arbitration). It remains that the enactment and consistent enforcement of a legal and regulatory framework in the PPP host country is a prerequisite for not only lenders to extend credit, but also sponsors to provide the equity for a particular project.

From an ownership and financing structure perspective, there are three traditional forms of ownership models: public sector led, mining company-led or third-party investment. Given that most frontier host governments simply do not have the ability to fund these infrastructure projects on a purely public basis (including with the assistance of multilateral development banks), this report focuses on the latter two ownership arrangements. In terms of financing models, the size of such investments often rules out corporate financing as a viable option for external investors. Thus project financing is the most feasible and most adapted form of debt financing for Greenfield multi-user/multi-client mining-related infrastructure, assuming project bankability can be demonstrated to lenders.

Within a project finance setting, debt and equity providers will have a number of requirements to make a project bankable. Equity investors will choose how to allocate their capital based on expected returns for risks taken (including political) to meet certain thresholds or “hurdle rates”. Commercial lenders, on the other hand, will focus on analyzing the cash flows they will rely on for debt repayment in order to ensure that risks are appropriately allocated to the various project finance parties through contractual arrangements. In addition, lenders will request a security package and set certain financial covenants as protective measures against the project they will be financing.

In terms of project financing of shared-use arrangements, many theoretical set-ups can be considered but there are very few examples of successful Greenfield multi-client/multi-user mining-related infrastructure PPPs in the world—and none of them are in SSA. This dearth of examples suggests there are limited options with respect to commercial structures that will result in successful project financing and execution. Given commercial lenders risk appetite and reliance on project cash flow for repayment, the higher the complexity of the shared-use structure, the less bankable it will be. Financial viability is even more unlikely if other users or clients are not known at the time of Financial Close, or, at the extreme lower end of bankability, when other uses of the infrastructure (e.g., passenger and freight) are considered at the time of Financial Close or thereafter.

This assessment infers that small mines may not be suitable clients for developing Greenfield mining infrastructure, either on a stand-alone or syndicated basis. Yet it also means that larger mining companies will most likely have to serve as anchor clients to these projects. Effectively, the presence of a large anchor client (a mine upon which the entire infrastructure project can be underwritten) does appear to be a sine qua non condition to successfully raising limited recourse financing for Greenfield mining infrastructure-related PPPs.

Mining projects that can be tied to the least cost Greenfield logistics solution in terms of “per ton transported” will be first movers. Since economies of scale play a crucial role in lowering per ton transported cost, the larger projects will have the best chance to achieve competitive “pit to port” transport tariffs. In turn, these projects should be able to deliver a mining transport infrastructure backbone that will be usable by smaller mines assuming an adequate infrastructure access and tariff regime has been embedded in the concession contract that regulates these transport assets.



The bankability of known mining projects in SSA could ultimately hinge on the ability of project's sponsors to deliver a shared-use transport facilities model, using a haulage operational regime, underpinned by a single and large anchor client/user. Haulage regime might be preferable to an access regime when operating rail infrastructure since it will provide the greatest control of maintenance and track movements (i.e., one single operator provide transport services to all clients) while minimizing higher operational risks implied by different operators using the same infrastructure. Under an access regime model, there would be a need for costly penalties to be paid out by third-party train operators in the event of rolling stock failure.

Anchor users can be expected to demand "foundations rights" that would cover both secured access to the rail/port transport capacity and preferential tariffs for both. Likewise, because most SSA countries are not investment grade, most projects even if backed by a credit worthy anchor user will not be able to rely on the customary 80/20 or 70/30 debt to equity ratio for their funding. Rather, lenders are expected to require more substantial equity participation (i.e., up to 50 percent) from project sponsors in order to finance transport asset investments. This approach will imply that even under a third-party infrastructure ownership framework, anchor-mining clients will have significant shareholding in the mining transport company(ies).

The project structure should be as simple as possible and based upon a strong contractual framework with clear tariff-setting and arbitration provisions. Project bankability could also depend on host governments' willingness to allow mining companies to share cross border transport infrastructures wherever iron ore or coal deposits are located within geographical clusters spanning the territories of several countries.

Lastly, public authorities might have to accept that multi-usage demands made to transport mining infrastructure operators might have to be initially or permanently restricted to secure, first and foremost, the delivery of an efficient mining transport system at the lowest possible cost to its anchor user/client.

## Introduction

### 2.1. STUDY SCOPE

The purpose of this study is to serve as a guide on developing Greenfield transport infrastructure (rail and port) primarily used to support mining operations (“mining-related infrastructure”), through Public-Private Partnership schemes and on a project finance basis. The focus is on key financing issues and considerations, as well as recommendations for governments and private-sector participants, specifically in the context of Sub-Saharan Africa and similar regions.

For the purpose of this study the so-called “Resources for Infrastructure Deals” signed between Chinese, Korean or other countries’ SOEs with select SSA Governments (e.g., DRC, Gabon, Zimbabwe, Angola or Nigeria) are not being looked at. These deals usually do not involve the specific financing of mining transport infrastructure. Rather, they tend to fund a host of social, power and/or transport infrastructure not directly linked to mining or petroleum resources.

### 2.2. MINERALS SUPER CYCLE

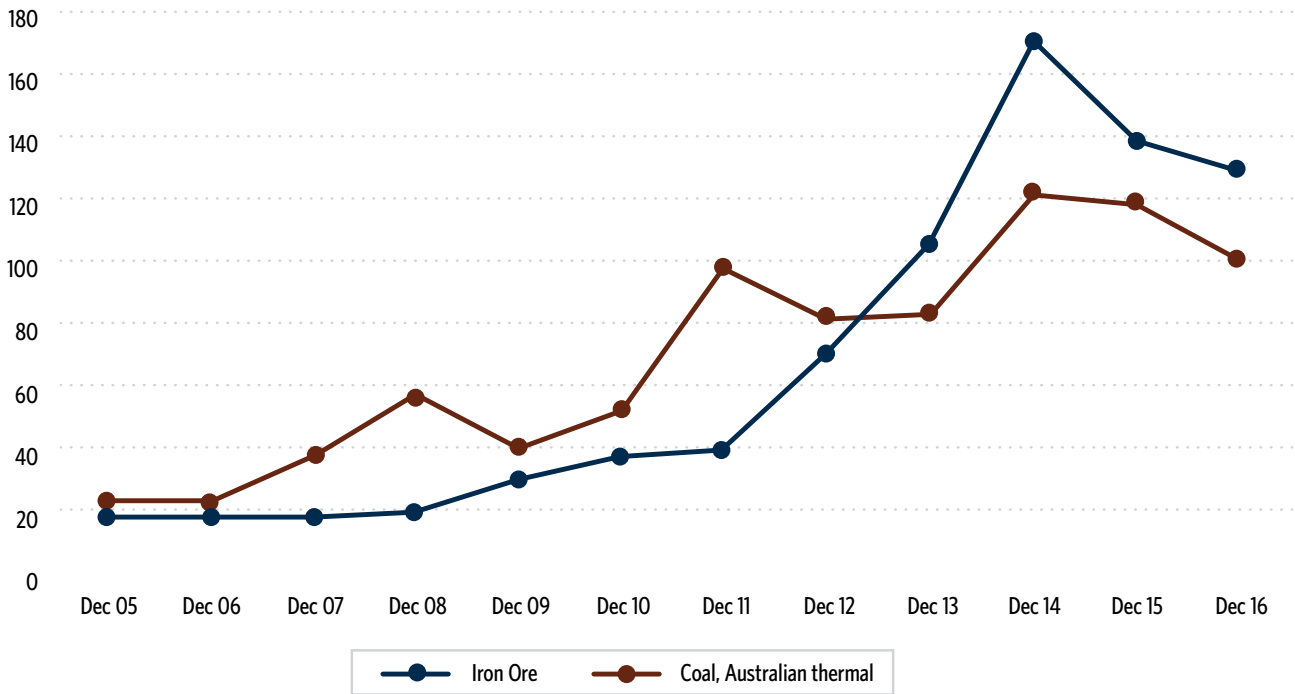
Over the past decade, the rapid economic growth in newly industrialized markets has fueled a strong demand for various commodities (such as iron, coal, bauxite and copper), with significant impact on their prices. In fact, it is widely accepted that the world has been in the midst of a commodity “super cycle”—a “prolonged (decades) trend rise in real commodity prices, driven by urbanization and industrialization of a major economy.”<sup>1</sup> This super cycle has been driven by the intensive economic growth in China, which has included massive infrastructure construction, urbanization projects and use of raw materials for production of metal-intensive white goods.

Iron ore, used in steel production and one of the most mined metals globally at around 2.4 billion tons per year, has experienced an unprecedented boom in demand, with prices moving from USD 13/ton in December 2001 to USD 129/ton in December 2012, with a peak of USD 187/ton in February 2011. Prices for coal, the most mined commodity on the planet at around 7.2 billion tons per year, and primarily used for power generation, have similarly soared from USD 27/ton in December 2001 to USD 99/ton in December 2012, with a recent peak of USD 132/ton in September 2011 (see Table 1 and Figure 1). As shown in Table 1, the large difference in the scale of iron ore and coal volumes mined worldwide compared to other mineral products at 12 and 35 times more than bauxite, respectively, imposes transport logistics solutions for these two minerals which are unique to both in terms of scale and costs.

Mining companies are extremely price sensitive. They are price takers in the world commodity markets and therefore have virtually no ability to pass their operating costs on to the market. Infrastructure costs (tariffs) for transporting ores and/or coal are part of their cost structure, and one that the mining companies seek to minimize. Table 1 illustrates clearly the price sensitivity associated with transport costs that affects mine operators’ choice in terms of the transport mode they use as well as their desire to obtain the lowest possible transport cost for the mode chosen, especially when exporting phosphate, bauxite, iron ore and/or coal.

<sup>1</sup> Citigroup China—the Engine of a Commodities Super Cycle (2005).

Figure 1: Coal and Iron Ore International Price Trends (2001-2012)



Source: Index Mundi<sup>3</sup>.

Table 1: Mining Commodities Key Facts and Transport Surface Costs for 500km

Mineral	2010 world prod. (mn metric ton)	Average price per ton (2010 US\$)	Rail transport cost in % of price per ton*	Truck transport cost in % of price per ton**	Price sensitivity to transport cost	Africa's potential
Bauxite, Alum	211	27	93%	463%	High	++
Phosphate	176	50	50%	250%	High	++
Iron Ore	2,400	90	29%	139%	Medium	+++
Coal	7,200	165	15%	76%	Medium	+++
Copper	16.2	7,694	0.3%	1.6%	Low	++
Cobalt	0.088	46,297	0.1%	0.3%	Low	++
Gold	0.0025	38.5 mn	0%	0%	Low	++
Platinum	0.000183	51.4 mn	0%	0%	Low	++

\*For 500km and at 5cts/t/km. \*\*For 500km and at 25cts/t/km.

Source: IFC.

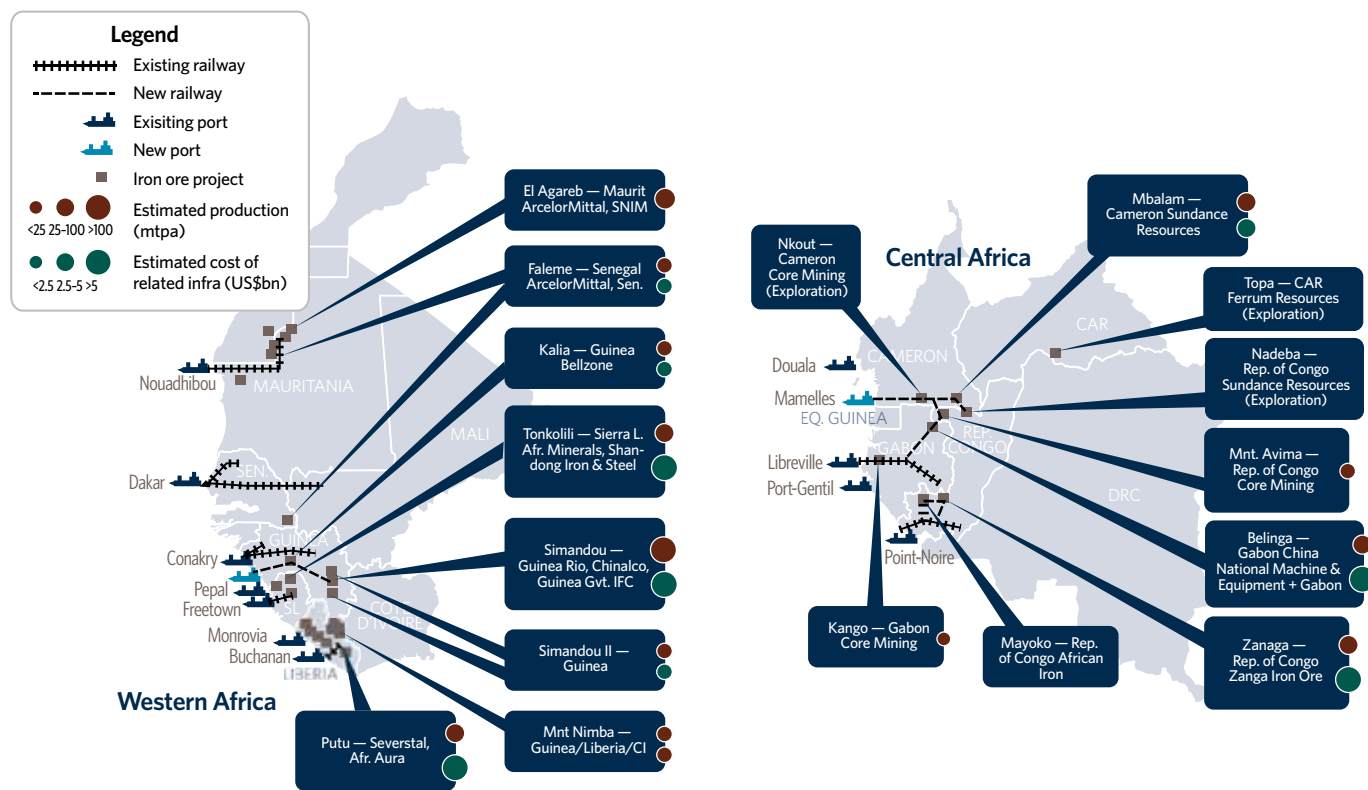
<sup>3</sup> <http://www.indexmundi.com/commodities/>; Figure only considers December prices for each year.

2.3. NEW OPPORTUNITIES FROM PREVIOUSLY UNECONOMIC AND/OR UNDEVELOPED MINERAL DEPOSITS

Until the advent of the commodity super cycle, certain mineral deposits were deemed uneconomic to develop due to low commodity prices and/or host governments' inability to support the construction of capital-intensive export transport infrastructures. In today's high commodity price environment, a large number of existing and new deposits have become, in theory, all at once commercially viable. However, the exploitation of most small and medium deposits remains elusive, as they cannot individually support the capital cost of the Greenfield transport infrastructure usually needed to connect "pit to port". In such cases, there is an opportunity to develop the required infrastructure on a multi-client "shared" basis, defraying the capital costs across multiple deposits.

Unlocking previously undeveloped mineral deposits provides a clear opportunity for the countries in which they are located. Host governments have embraced these new opportunities, eager to take advantage of the economic benefits of monetizing their countries' mineral base through royalties and taxes, as well as potential increases in direct and indirect employment. In the cases where these newly viable mining resources are located in geographically remote regions, this development has led to the need for construction of transportation infrastructure, such as roads, railways and ports, to facilitate the delivery of the commodities to the market. In SSA alone, according to Deutsche Bank, it is estimated that 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 (see Figure 2).

Figure 2: Iron Ore Projects and Related Infrastructure Needs in SSA



Sources: IFC, RBC Capital Markets.

Practically, the development of the mines associated with these deposits will be staggered over time because: (i) their total output of 475 to 5,757 mpta would represent in an increase of nearly 60 percent of today's world's export supply in an environment where global consumption is projected to grow at less than 5 percent per annum, (ii) only the largest deposits would be able to deliver competitive pit to port transport cost, and (iii) all but a few of these deposits are located in frontier countries that do not have fiscal resources to subsidize the cost of building associated transport infrastructures. Accordingly, shared use of Greenfield mining transport infrastructures could help strengthen mining projects' bankability assuming the private sector and host governments can agree on how to best finance, develop, own and operate them.

#### 2.4. HOST GOVERNMENT CHALLENGES IN FINANCING NEW MINES AND INFRASTRUCTURE

For most countries in SSA, public sector ownership (understood in this context as both ownership and/or full control) and financing does not appear to be a viable option. Theoretically, from the host government's perspective, the biggest benefit of public ownership and control of mining-related infrastructure is that it offers the greatest degree of flexibility for the government to implement any economic development plan it chooses. However, public sector ownership also means that the responsibility for financing rests entirely on the host governments' shoulders. While creditworthy countries are able to raise financing from the capital markets, frontier countries cannot easily do so on reasonable terms. The financing aspect is particularly challenging, given that much of the new mining projects worldwide are in SSA, where few countries are considered investment grade (see Table 2).

**Table 2: Sovereign Credit Ratings and Investment Climate in Mineral Resources Rich Countries**

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

Overall level of risk



Source: IFC.

While a country may apply for concessional financing from multilateral institutions, such as the World Bank, the use of sovereign lending increases a country's financial liabilities and diverts much needed sovereign debt capacity away from non-commercial sectors such as health and education, among others. 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.

As an example of the mismatch between budgetary resources and size of the capital requirements, Deutsche Bank estimated the total capital cost of the Simandou iron ore mine and rail and port infrastructure project in Guinea at USD 15 billion, of which USD 9 billion would need to be spent on a Greenfield port and railway system. This compares to Guinea's 2011 GDP of USD 5.1 billion, and total 2011 budgetary expenditures of USD 1.2 billion with only a tiny fraction of that sum dedicated to investment financing. Even considering the multi-year nature of the capital expenditures for the project, it is clearly far too big for the Government of Guinea to be able to finance and execute on its own.

Even though the infrastructure requirements in Simandou are large in comparison to other projects, the capital requirements of many of the new mining-related infrastructure projects being planned in SSA remain disproportionate with respect to the host country's resources and debt capacity. Such a severe mismatch renders the option of public ownership and financing of mining infrastructure virtually impossible during the initial phase of mining development (see Table 3). Therefore, involving the private sector seems the only viable way of sourcing the necessary funding and expertise, for now. In a second development phase, however, once royalty payments are being generated by initial mining projects, it is conceivable that SSA host governments could participate or even lead in the financing of additional mining infrastructure. Until then, however, the key role of governments in SSA could be restricted to availing unencumbered land to private infrastructure developers as well as regulating the relationship between infrastructure owners and their users and/or clients efficiently.

**Table 3: Iron Ore Projects Transport Infrastructure Estimated Costs in SSA**

Country	# of iron ore mines	# of railways	# of new ports	Est. cost of infra US \$bn	%GDP	% National budget	Iron ore projects
Guinea	2	2	1	10.4-13.6	181-236%	850-1100%	← Simandou, Kalia
Cameroon	2	2	1	6.6-8.5	27-35%	120-160%	← Nkout, Mbalam
Mauritania	3	2	0	3.8-4.9	92-119%	260-340%	← Lebtheinia, Askaf, Guelb el Aouj
Senegal	1	1	0	3.8-4.9	27-35%	90-120%	← Faleme
Rep. of Congo	3	3	0	3.3 -4.2	24-31%	90-110%	← Mayoko, Avima, Zanaga
Gabon	2	2	0	2.9 -3.8	17-22%	65-85%	← Kango, Belinga
Liberia	2	2	0	1.9 -2.5	110-142%	440-570%	← Putu, Liberia Mines
Sierra Leone	3	3	0	1.6 -2.1	42-54%	250-330%	← Tonkolili, Marampa (2)

Source: IFC, RBC Capital Markets, CIAWorld Factbook.

## 2.5. THE USE OF PUBLIC-PRIVATE PARTNERSHIPS TO FINANCE GREENFIELD MINING TRANSPORT INFRASTRUCTURE

In a traditional PPP, the private sector is granted a concession by the public sector to build, finance and operate an asset in return for financial compensation. The use of PPPs for the development of mining-related infrastructure, however, can generate tensions between the public sector and the private sector parties. The tension often revolves around how this infrastructure will be used. Governments frequently see new infrastructure development as a catalyst for broader economic growth since their financial support to the PPP, even when limited to in kind contributions (e.g., availing land for free), is perceived as granted them certain rights to influence the technical design of the infrastructure and/or its usage. The private sector has a more narrow view and is driven by the potential to generate positive financial returns, commensurate with the risks assumed through the development of this infrastructure. Successful infrastructure PPPs across the world have, however, been able to effectively align public sector and private sector goals.

A successful PPP framework not only unlocks capital and delivers technical and operational expertise to a mining-related infrastructure project and its host government, but it also provides a mechanism for sharing the responsibilities, risks and rewards of the project between the public and the private sector.

There are very few examples of successful Greenfield, multi-client/multi-user, mining-related infrastructure PPPs in the world and none of them are in SSA (see Table 4). This does not mean, however, that it is impossible to develop such Greenfield infrastructure through PPPs or concessions. Rather, it demonstrates the magnitude of the challenges that stakeholders face in structuring and financing such schemes. In this report, Brownfield examples are mostly used to describe potential resolutions (both successful and unsuccessful) to the variety of challenges faced.

**Table 4: Global Examples of Shared-Use Mining-Related Transport PPPs**

Name	Country	Date	Model	Rail owner	Rail operator	Port owner	Port operator	Greenfield/Brownfield	Is shared-use realized?
<b>West Australia Iron Ore (Pilbara)</b>	Australia	Late 2000s	Fully Integrated	Mining Co.	Mining Co.	Mining Co.	Mining Co.	Brownfield	No — competing miner built it's own railway + port for US \$2.5 bln
<b>Hunter Valley Coal</b>	Australia	2005	Partially Integrated	Govt.	Third-party operator	Mining Co. + customers	Mining Co.	Brownfield	Yes — port owner and rail operator created a common logistics company
<b>SETRAG</b>	Gabon	2003/2008	Partially Integrated	Govt.	Mining Co.	Govt.	Third-party operator	Brownfield	Partial — clear bias as miner favors its own goods
<b>Marampa-Pepel</b>	Sierra Leone	2008	Partially Integrated	Govt.	Mining Co.	Govt.	Mining Co.	Brownfield	Yes
<b>Richards Bay</b>	South Africa	70s-2000s	Partially Integrated	Govt.	Govt.	Mining Co. + Govt.	Mining Co.	Brownfield	Yes
<b>Vitoria Minas Rail</b>	Brazil	1997	Fully Integrated	Mining Co.	Mining Co.	Mining Co.	Mining Co.	Brownfield	Yes — general freight and minerals
<b>Fort Dauphin (Ehoala)</b>	Madagascar	2009	Partially Integrated	n/a	n/a	Mining Co. + Govt.	Mining Co.	Greenfield	Designed for multi-purpose but hardly and in practice

Source: Columbia University, 2012.

The dearth of examples of successful, relevant, Greenfield transport mining PPPs suggests that there are limited options with respect to commercial structures that will result in successful project financing and execution. It also reflects the fact that, historically, there has been limited interest among mining companies to share infrastructure. Host governments that will choose to have Greenfield mining infrastructure projects develop as PPPs will therefore need to understand the unique sets of challenges generated by them as well as chose what their involvement level in each project will be (see Section 4).

## Transport Infrastructure Design Requirements and Management Models

### 3.1. PORT FACILITIES

Seaports designed for the export of mining minerals are rarely built in remote areas where no maritime services are available. Both the private port developer, being a mining company or a third-party operator and the host government tend to prefer to locate a new port in the vicinity of an existing one. Each has its own distinct reasons for this choice, but they usually revolve around the fact that the new port can share the maritime and other services available from the existing port. This results in considerable cost savings for the port developer(s), operator(s) and shipper(s). An example of this approach is the planned location of the port linked to the export coal port adjacent to the existing Nacala port in Mozambique for which a study has recently been commissioned.

This approach, however, does not always apply in deciding the best port location, especially when planning for a port that can accommodate high export volumes (i.e., tens of millions of tons). For such projects, aside from considering geotechnical conditions, distance of deep water to shore, sea currents and wave patterns, port developers will consider key issues such as CPAEX and OPEX of both port and rail facilities, social and environmental issues raised by the choice of a location and associated construction timeline.

Many emerging countries, and amongst them most SSA countries, are still lacking modern and efficient seaports. They continue to rely on the operations of their city-ports for their international trade, which often have outdated facilities and lack water-depth and storage space. Meanwhile, the efficiency of their operations tends to be negatively impacted by burdensome customs, harbor master and towage procedures, albeit the concessioning over the past decade of most port cargo operations in SSA has resulted in significant productivity improvements. Within this challenging context, mining projects present host governments with an opportunity to develop new maritime and port infrastructures that could, over time, be used in support of non mining activities to the greater benefit of national economies and surrounding communities. For these projects to be implemented in the least amount of time and at the lowest possible cost, host governments must, however, be able to provide a favorable investment climate that must include streamlined customs clearance procedures.

#### 3.1.1. PORT AND TERMINAL MANAGEMENT FRAMEWORKS

All port terminals use the same basic maritime infrastructure, but have their own operational infrastructure, superstructure and handling equipment. Basically a port consists of two main components, the port infrastructure (dredged access channel, breakwaters, basins, access roads, etc.) and the terminals (superstructure) at which the cargo is handled. A terminal is the facility in the port where the ship is moored and the cargo is handled and stored. A terminal consists of the berth(s) (quay, jetty, etc.), storage areas and buildings, handling equipment, offices, gates, etc.

Different management frameworks can be envisaged when building port facilities dedicated to mining activities. These various frameworks usually depend on the combination of the following operational variables: 1) whether a port serves one or several clients, 2) whether, in the case of multiple clients, they are served at the same or at separate port terminals, and 3) whether the port infrastructure and superstructures (i.e., terminals) are operated by one or several and different operators (see Table 5).



**Table 5: Greenfield Mining Port Management Frameworks**

	Single Client		Multiple Clients	
<b>Port Infrastructure</b>	Single operator	Single operator	Single operator	Single operator
<b>Superstructure - Mining terminal (s)</b>		Single operator		Single or multiple operators

Source: IFC.

The majority of existing mining dedicated ports were built as single client and single operator facilities. In most cases, the port client was itself directly or indirectly through a Special Purpose Vehicle company, the operator of this dedicated facility (vertical integration). Since most of these ports were originally designed for a limited throughput linked to a single client, not exceeding 15 to 20 mtpa, the need to expand their capacity to meet rising mining export demand often led to their sale to third-party investors, which in turn translated into a loss of their single client and terminal operator functions. Additionally, the ability to use this maritime infrastructure for other purposes led to the build up of other type of cargo terminals in the vicinity of the original export mining terminal. Single operator and client ports and terminals have, therefore, often developed into multi-client and operator ports.

In the SSA context, the lack of alternate port/transport facilities in support of planned mining activities should, more often than not, translate into a multi-usage design of Greenfield ports to address the logistics needs of mining and mining-related infrastructure construction and operations (i.e., railways, power plant, water plant, etc.).

Because of the large variations in output size of potential mining projects in SSA, it is unclear which Greenfield port management framework is likely to be preferred by investors and governments. Nevertheless, since it seems that Greenfield transport infrastructure projects underwritten by a single, large, anchor mining client will have a higher degree of probability of reaching financial close, one should assume that port infrastructure relying on single operator/single client framework will be built first.

In order to reap the benefits of this “first mover” operational structure, host governments will have strong incentives to ensure that new port maritime infrastructure can be used by additional future client/operator (i.e., shared use). This requirement will bolster the chances of seeing additional mining projects develop; yet it will present Greenfield port investors and/or operators with a unique set of risks and rewards. This likely situation will further raise the question of what port management model will be most appropriate to make each mining port project bankable.

### 3.1.2. PORT MANAGEMENT MODELS

Port management structures used worldwide can be classified into four main models: 1) (Public) Service Port; 2) Tool Port; 3) Landlord Port; and 4) Fully Privatized Port or Private Service Port. The distinction between these models is mainly characterized by:

- Public, private or mixed character
- Local, regional or global orientation
- Ownership of infrastructure (including port land)
- Ownership of superstructure and equipment (buildings, ship-loading/unloading equipment, yard handling equipment and open and closed storage areas including warehouses)
- Operations and management (see Table 6)

Table 6: Port Management Models

Model	Port Land	Basic Infrastructure	Port Operational Structure	Cargo Terminal	System and Marine Services
<b>Service Port</b>	Public	Public	Public	Public	Public
<b>Tool Port</b>	Public	Public	Public	Public/Private	Public
<b>Landlord Port</b>	Public	Public/Private	Private	Private	Public/Private
<b>Private Port</b>	Private	Private	Private	Private	Private

Source: IFC.

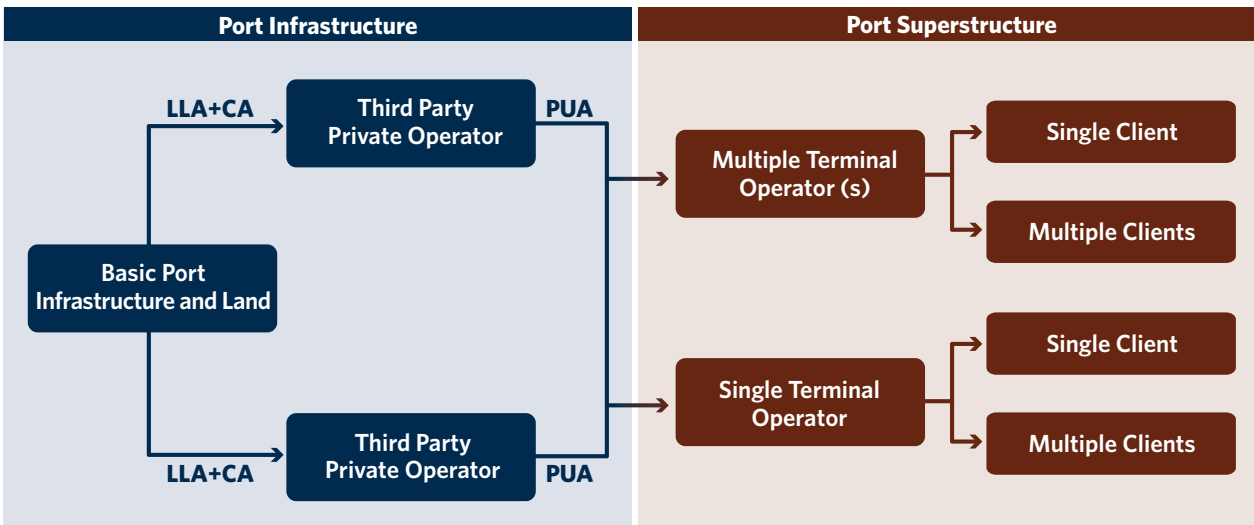
The Landlord Port is, globally, the favored model. It is used in the majority of large and medium sized ports, including for the development of port facilities in SSA. In the case of Greenfield mining port projects, however, the Private Port model is likely to be the model of choice, at least initially for the following reasons:

- SSA host governments will not be able and/or willing to participate in the financing of the new port infrastructure
- SSA host governments will need to recognize that any attempt to extract a significant sum of money from the sale of public land associated with the port project will affect negatively the feasibility of related mining project(s)
- These governments will have to take into account the demand by the port's anchor client to obtain all the necessary guarantees from the port operator(s) regarding the port's capacity to meet its mining operations needs. These guarantees will be backed either directly through majority ownership of the port assets by the anchor client or indirectly through the terms of the contract that will be signed between the anchor client and the port operator(s). This contract will likely need to recognize the "foundations rights" of the anchor client both in terms of operational control over the port key infrastructure, notably the access (dredged) channel, as well as preferential treatment in terms of port dedicated handling capacity and tariffs.

The level of control sought by the mining anchor client will raise the issue of "accessibility" to the port infrastructures by any new client and user. In the event that the port superstructure is not controlled by the parent company of the anchor mining project, the ability of a third private-party operator to seize additional business from existing port infrastructure will be an important factor in securing lenders' support, as well as benefiting from the project upside traffic potential. It will be crucial for the host government and/or the project Sponsor that a proper plan be developed at the time of the selection of the new port location, including future terminals and potential expansions, in order to anticipate the needs of additional clients. Such requirement will exist regardless of the port usage by a single or multiple clients. However, since a port majority owned by a single anchor client will likely set its tariffs to only cover its costs, including debt, it will be important for a host government to understand that additional tariffs will be applied to other clients in order for the port operators to achieve normal equity returns.

To a certain extent, the above multi-user/multi client dilemma could be mitigated by host governments through the introduction of special conditions in Land Lease (LLA) and Concession Agreements (CA) that will tie the port developer with the State (see Figure 3). These conditions could stipulate that either the port terminals (mining, general cargo, petroleum) are to be operated and managed by one or several operators not affiliated with the port maritime infrastructure owner through a Port User Agreement (PUA), or that these terminals, if operated by the anchor client himself, be obligated to provide access to additional clients on a non discriminatory basis (assuming spare capacity is available). Alternatively, these clients could be permitted to use separate terminals to be built by independent third-party operators with an obligation for the port infrastructure developer, which might be owned by the anchor mining company, to provide ships services (i.e., piloting, mooring, etc.) on a non-discriminatory basis as well.

Figure 3: Potential Ownership and Usage Structures for Rail Mining Infrastructure



Source: IFC.

A final key issue that the private port model will need to address relates to the identity and role of the “Port Authority.” The anchor client will typically expect its operational control over the port infrastructure and terminal to extend to the seaward end of the port access channel, as well as to any offshore dredge spoil dumping grounds (if the port channel requires constant dredging). This requirement could conflict with the mandate of the national maritime authority, irrespective of its actual capacity to efficiently regulate maritime traffic. Regardless, the anchor client will seek to obtain legally binding assurances from the host government that unseaworthy vessels will not be allowed to use the port access channel in order to minimize any possibility of sunken vessels blocking port access.

### 3.2. RAILWAY FACILITIES

There is no technical reason why passenger and general freight services cannot use the same infrastructure as heavy-haul mining services, and many well-known lines currently do so.<sup>4</sup> For example, the purpose-built Carajas line in Brazil, which carries over 100 million tons of iron ore annually, also carries general freight and operates a thrice-weekly passenger service. Other examples of mixed-use, albeit on conventional lines which have been upgraded, include the Vale line from Vitoria to Minas in Brazil, the Richards Bay line in South Africa and parts of the Queensland coal network (see Table 4). In addition, many dedicated mining lines operate general freight services for their own purposes, such as delivering fuel and other mining supplies to mine sites.

However, any non-heavy-haul services operating over such lines do so within the constraints imposed by its alignment and detailed engineering characteristics, which are designed to optimize the predominant user of the line, the heavy-haul mining traffic. The key design variables are maximum speed, grade, gauge, traction type (electric or diesel) and axle load. These all have direct and measurable impacts on operating practices and, for new mining lines, are invariably chosen to allow the mining traffic to be carried as economically as possible (taking into account both capital cost and operating cost). These parameters generally create few constraints for typical general freight services but passenger services will normally be limited to maximum speeds of 70-100 km/hr.

<sup>4</sup>Operational and logistic challenges associated with adding general freight to a mining railway can however be greater in the case of agricultural and/or forestry products scattered along the railway.

General freight services usually require few additional facilities over and above those provided for rail mining services. Traffic volumes are unlikely to ever require major terminal facilities, such as marshaling yards although each location that dispatches or receives freight will require one or two turnouts. These cost money and have to be maintained.

Passenger trains require more specialized facilities. Stations will be needed at each stopping place, together with arrangements for selling tickets, dealing with passenger enquiries, baggage handling and so on. The construction of these stations will imply the construction of expensive crossing loops to ensure that passenger service does not constrain single mining rail line transport capacity. It will also demand that the stations be located away from the main line to reduce the risk of passenger trespass. More importantly, passenger rail service is disproportionately demanding in terms of its usage of train paths/slots because of the frequency of its stops. An industrial rail system designed to handle mining trains will typically be optimized so as to limit the number of spare paths/slots available. Host governments' demand for a comprehensive passenger service could thus reduce the rail line capacity available for mining transport, unless costly additional crossing loops are built. Mining anchor client, as well as infrastructure lenders will typically expect to have passenger service parameters defined from the outset in the concession agreement that will regulate train operations.

In addition, safety requirements for a passenger railway are more stringent than for a freight-only railway. This is especially the case if the rail line used has any tunnels, which will generally be single-bore for most mineral lines and normally require safe refuges and independent escape routes in the case of fire. Passenger trains do not necessarily require any more sophisticated signaling systems than those used by mining trains. However, it means that their operational performance will be limited to that of mining trains. Once the line has been built, passenger services will often require a higher track quality than that needed by freight operations; heavy freight inevitably imposes a greater degree of wear and tear on the track, which generally translates into a lower ride quality. Passenger services are more sensitive to the track conditions than freight. Poorer track will give passengers a rougher ride and railway management will then face the choice of either doing track maintenance earlier than it otherwise would have without the presence of passenger trains, or of imposing a speed restriction on passenger service.

Finally, operating passenger services will inevitably require greater and more senior management involvement than a freight-only operation would. The typical mining railway, carrying only its own traffic or possibly that of adjacent mines through commercial agreement, has relatively few general responsibilities or involvement with the general public. The railway can be operated as a component of an overall industrial process and managed by a foreman or superintendent. However, as soon as third-party passenger traffic becomes involved, the railway has much greater responsibility to supply services of an appropriate quality and safety with obvious consequences on its management time allocation and its operational costs.

### 3.2.1. RAILWAY MANAGEMENT FRAMEWORKS

Like port facilities, rail infrastructure can be divided into two categories. The "below rail" infrastructure includes all track facilities (i.e., rail, sleepers, ballast and platform), including tunnels, bridges and train control, while the "above rail" infrastructure covers all rolling stock, and rolling stock-related infrastructure, such as maintenance yards and train stations. Ownership of the below and above rail infrastructure is a primary determinant of the management framework that is applicable to railway operations. In combination with the presence of a single or multiple users (i.e., train operator) and client(s), it produces the same number of management framework options as presented in Table 6 for ports.

In the case of any railways, below rail infrastructure is always treated as a natural monopoly. It is operated, and usually financed, by a single public or private entity. This entity provides track access to a single or multiple users (i.e., train operators) based on track capacity, but also based on terms outlined in specific commercial agreements either under an access or a haulage type regime (see Table 7). The key thing about access and haulage regimes is that they enable third-party train operators to access what would be otherwise a private, vertically integrated, infrastructure from which they, as well as their clients, could be excluded on that basis alone.

**Table 7: Shared Rail Management Models**

Ownership of the “below rail” Infrastructure	Train operations—“above rail”	Regime
<b>Concessionaire</b>	Concessionaires’ locomotives	Haulage regime
	Mining companies’/clients’ locomotives	Access regime
<b>Mining Operation</b>	Mining operator’s own locomotives	Haulage regime
	Other clients’ locomotives	Access regime

Source: IFC.

Access problems rarely arose in the past because railways in most countries were public railways, which were operating under a “common carrier” obligation with published rates (i.e., they had to carry the goods of any client at a standard price). Moreover, these public operators were generally independent of the cargos they were carrying and, hence, were keen to get new traffic, rather than worrying about keeping competitors out of their end-market. The advent of dedicated, private, mining railways has changed this status quo. In the case of Greenfield mining railways, it implies a host of possible management frameworks as succinctly presented below.

The basic rail management framework option for a company (e.g., Company A), in addition to owning the below rail infrastructure, is to transport its minerals in its own trains to a port. In such cases, the line is merely part of an industrial process—an alternative to a long conveyor belt or slurry pipeline. As such, it may be subject to technical oversight by a public rail agency. In several countries, the Company’s factory inspectorate carries out the technical oversight. Company A may elect to operate the railway with its own staff, or it may contract in an operator, much as mining companies might contract earthmoving and/or mining itself. Essentially, it is an operation over which Company A has more or less complete control and which is an integral part of the mining production process.

The next alternative for Company A is to haul minerals from another mine belonging to a different company (e.g., Company B). This generally means that the other mining operator acquires its own wagons (and probably a shunting locomotive or two), which it loads at its own mine site. These wagons are then transported to an interchange location where Company A picks them up for delivery to a given port. This haulage regime can be defined as part of a commercial agreement between both companies or as a result of a host government’s requirements included in the mining concession agreement. Such agreement does not always work as shown in the case of the Pilbara in Australia. However, when this framework does work, there are generally few issues as long as the wagons from Company B can comply with some relatively simple technical requirements, and the commercial arrangements (i.e., haulage tariffs) between Company A and Company B are straightforward.

A more complicated arrangement is when neither Company A nor Company B are the owner of the below rail. In this case, problems that arise are: a) the timing of when either company decides to request access for their trains to the tracks (i.e., before or after the track is built) and, b) the track capacity each company requires. In a Greenfield PPP environment, this situation can create huge uncertainties, as well as opportunities in terms of project bankability as further explained in Section 7.

In SSA, it is obvious that the realm of management frameworks linked to Greenfield PPP railways will be drastically limited by the financial ability of mining sponsors to underwrite directly as investors or, indirectly, as clients (i.e., take or pay contracts) of the proposed infrastructure investments. As further explained in Section 6, the large size of investment involved in the building of new rail and port infrastructure will require substantial initial mining output (i.e., between 12 and 30 mpta) to translate into the kind of tariffs (e.g., <4 USD cents per ton kilometer for rail) that will not impair the competitiveness of either iron ore or coal producers. Realistically, this means that any Greenfield below rail infrastructure will be either under the direct ownership or backed by a take or pay contract for one, or at most two, large anchor mining sponsors. The question that remains to be answered, therefore, will be under what kind of access regime the above rail infrastructure (i.e., train, yards, and stations) will be financed and operated. The answer to that question will mostly depend on: a) lenders' bankability requirements, b) mining sponsors' financial capacity, c) host government's requirements, and d) initial versus future demand for the infrastructure.

### 3.2.2. RAILWAY ACCESS REGIMES

The level of details provided in rail infrastructure legal and regulatory framework can vary widely. A key decision when tendering as part of a Greenfield project the below rail infrastructure is whether access to the track is intended to be voluntary (i.e., can be determined by the infrastructure owner) or construed as a right. A second key decision is whether that access, if as of a right, is intended to be for haulage (i.e., where the principal operator can haul third-party wagons with his own locomotives for a fee) or for third-party operation (i.e., where the third-party is entitled to operate his own services subject to an access charge). In general, a haulage regime is intended to secure the role of the owner of that railway as both infrastructure and transport service provider. Where the owner of a railway owns and operates the above-rail assets, either directly or indirectly, third-party rail access can be provided under either a haulage or track access regime.

Whilst there are many access regimes currently in existence,<sup>5</sup> there are no examples of haulage regimes for now with the exception of the one being currently envisioned in Mongolia for transport infrastructure associated with coal export to China. A haulage regime principally differs from a track access regime in the following respects:<sup>6</sup>

- A haulage regime gives the rail operator full control over its operational and safety standards, including flexibility in the arrangements it uses on its rail system for transporting iron ore and/or coal from pit to port. In addition, all rolling stock used for third party transport has to technically be compatible with that used by the rail operator.<sup>7</sup> Under a track access regime, third parties operating their trains over the rail infrastructure could affect the primary rail operator's control of the rail network, thus potentially impacting overall system efficiency.
- Under a haulage regime, the regulator (and in the case of a dispute, an arbitrator) would have the power to determine both above and below rail charges (including the provision of locomotives and/or wagons). Under a track access regime, the regulator and arbitrator have the power to determine the below rail (track) access charge only as there is no above rail charge.

<sup>5</sup> Most of the EU, Russia (to an extent), most of Australia and Brazil (planned for new lines under development). Most of the earliest UK public railways also effectively had an access regime.

<sup>6</sup> Adapted from Pilbara Railways (Third-Party Haulage) Regime, Report to Government on the Public Consultation Process, September 2009.

<sup>7</sup> This was a major issue raised by BHP arguing against third-party access. It claimed third-party rolling stock might not be maintained to the same standards as its own and, hence, does more damage to the track infrastructure.

- Under a haulage regime, the vertically integrated nature of this arrangement might result in rail capacity being a function of the wider requirements of the logistics chain from pit to port. It can thus impact the rail capacity made available to third-party access seekers, even though such capacity might be available. Under a track access regime, the availability of rail capacity to access seekers is based solely on an assessment of the below rail infrastructure capacity. This can result in an optimized allocation of available capacity assuming there is indeed unused capacity to assign, but can also prove detrimental to the overall efficiency of operations as coordination among users may prove tricky.
- Under either regime, third-party users and/or clients are responsible for loading and unloading of their product, as well as for shipping that product from port facilities to end markets.

Whichever approach is adopted, any rail access regime agreement would need careful wording. In 1963, the first iron ore mining development in the Australia Pilbara was agreed between the West Australian government and Hamersley Iron Pty Ltd (a subsidiary of what was then ConZinc Rio Tinto). The agreement<sup>8</sup> included a requirement that the company haul both third-party freight and passengers, if required:

*"...(O)perate its railway in a safe and proper manner and where and to the extent that it can do so without unduly prejudicing or interfering with its operations hereunder allow crossing places for roads stock and other railways and transport the passengers and carry the freight of the State and of third parties on the railway subject to and in accordance with by-laws (which shall include provision for reasonable charges)<sup>9</sup> from time to time to be made altered and repealed as provided in sub clause (3)<sup>10</sup> of this clause and subject thereto or if no such by-laws are made or in force then upon reasonable terms and at reasonable charges (having regard to the cost of the railway to the Company) provided that in relation to its use of the said railway the Company shall not be deemed to be a common carrier at common law or otherwise."*

This clause was not invoked for several years, but when it was, it turned out to be ineffective as the infrastructure owner argued in various tribunals and courts that haulage of third-party freight (and this was invariably iron ore for junior miners) would "unduly prejudice or interfere with its operations". It was argued that the railway was part of a vertically-integrated logistics chain rather than a stand-alone rail operation, and thus involved many complex technical issues. No fully independent third-party/non-joint-venture party has ever successfully negotiated access under these provisions.

In recent years, Western Australia worked to develop a Rail Haulage Regime specifically for the Pilbara but has also developed a more general Rail Access Regime. Both of these are described below. They are both heavily influenced by government policy of ensuring third-party access to mining railways.

Fortescue was one of the main applicants for access to the existing Pilbara networks but eventually built its own line. However, unlike other mining companies, it completed an access agreement with the state regulator. This agreement provides an example of the issues, which need to be addressed in a formal regulatory framework when third-parties access is allowed. In summary, the Rail Access Regime<sup>11</sup>:

- Defines the rail network and infrastructure subject to the Code
- Establishes the rights and obligations of the railway users and owners of railway infrastructure in relation to third-party access to the railway system

<sup>8</sup> Iron Ore (Hamersley Range) Agreement Act 1963—First Schedule. An identical clause was included in the Act agreeing the development of the BHP Mount Newman deposit.

<sup>9</sup> No emphasis in original.

<sup>10</sup> A sub clause allowing for the alteration or repeal of various bylaws as required, subject to government approval.

<sup>11</sup> See, for example, [www.erawa.com.au/access/rail-access/](http://www.erawa.com.au/access/rail-access/)

- Requires the below rail owner to enter into negotiations and follow a prescribed process to establish an Access Arrangement with the access seeker
- Specifies what shall be included in an Access Arrangement—the terms of which are negotiated
- Specifies the information to be made available to access seekers
- Establishes an independent regulator, which has responsibility for making determinations on key access issues (including the instruments given under Part 5 of the Code and the Weighted Average Cost of Capital)
- Provides for certain approval functions of the regulator
- Establishes an arbitration process, to be used when the below rail infrastructure owner and access seeker cannot agree on access conditions and terms

Under this regime, the owners of the below rail infrastructure are required to provide a formal document known as an Access Arrangement. In this case, PIL (Pilbara Infrastructure Limited, the Fortescue subsidiary responsible for the management of the railway and port) submitted the following documents to the Regulator:

- Train Path Policy (how will PIL deal with applications for train paths and how will capacity be allocated)
- Train Management Guidelines (how will PIL manage trains on a day-to-day basis, including incidents, delays, breakdowns, etc.)
- Costing principles (how will PIL derive the floor and ceiling prices used as a basis for negotiation of access charges)
- Overpayments (how will payments in excess of the ceiling prices be returned to third-party users)
- Segregation Arrangements (how will PIL ensure that commercial and operational matters concerning third-party user are not disclosed to Fortescue mining division)

Third-party access regime can prove very complicated to manage and regulate, albeit on paper it may seem more attractive than a haulage regime because of the non monopolistic dimension it introduces in terms of transport services availability and capacity. Within SSA context, this complexity may significantly affect the bankability of Greenfield railway projects. Additionally, since rail and port infrastructure have a shelf life of at least 50 years, conditions underpinning their operations are bound to change over time. As such, host governments should not view the selection of one access regime over another at the beginning of a Greenfield infrastructure project, as inflexible. Rather, the selection process should reflect the business and financial needs of the project's stakeholders at the time of project conception while acknowledging that changes in future business environment might require tweaking of the operational regime originally selected. This pragmatic approach can carefully be translated into a concession agreement's terms by leaving opened some room for future renegotiations on a couple of key issues (tariff structure, transport capacity allocation, etc.) without diminishing the bankability of the project in the eyes of potential lenders. It is certain, nevertheless, that an anchor client would likely want to retain a haulage regime until such time that its obligation to underwrite the investment cost of the rail infrastructure under a take or pay contract has fallen away.



## Legal & Regulatory Considerations

### 4.1. OVERVIEW

The establishment of unbiased and clear regulatory and legislative framework for concessioning is a critical factor for attracting equity investors and lenders as well as for allowing for the release of investment funds associated with PPP projects. This is because the magnitude of potential losses from discriminatory, unjust legal and regulatory action is so large that the presence of risk can overwhelm all other considerations and make the project non-bankable.

The following issues are typically looked at when considering developing a Greenfield mining infrastructure PPP:

- Sharing responsibilities between public and private parties (including mining and transport operators)
- Contractual form for PPP, scope of contract, mode of conclusion
- Contractual arrangements in case of multiple private parties
- Status and ownership of assets—including upon termination of the PPP
- Securities
- Tax and customs; setting and revision of fees, royalties, and tariffs
- Service and performance obligations
- Rules pertaining to termination of the PPP and dispute resolution
- Authorizations, licenses and rules pertaining to competition
- Rules pertaining to labor, safety and environment
- Nature and role of institutions involved at inception, at conclusion/negotiation and at supervision stage of the PPP

From an investor's perspective, these issues can be classified into two categories: (i) some are "systemic" issues (i.e., pre-existing legal and institutional conditions that will determine if—and how—a projected PPP can be put in place into a given host country); (ii) others are more "project specific" (i.e., particular arrangements that will be negotiated among the parties for the implementation of the PPP).

### 4.2. SYSTEMIC ISSUES

As mentioned above, a solid legal framework is often a prerequisite to any participant to a projected PPP. In short, investors will ask themselves the question of—and carry out diligence on—whether there is a clear, stable and secure legal and institutional framework in place, adapted to the proposed operation. This can translate into three sets of issues:

**1. Legal framework:** developing a mining-related transport infrastructure PPP makes it necessary to look into various aspects of the host country's legal framework<sup>12</sup>, particularly in connection with:

- *Corporate and securities:* as the implementation of a PPP will generally rest on a corporation (the project company) established in the host country, as well as sureties established over its assets
- *Sector regulations:* as most countries have adopted rules regulating specific sectors, in particular transport and extractive industries
- *PPP regulations:* as a number of countries have adopted specific rules pertaining to the conclusion of PPP contracts
- *Lease and real estate:* as infrastructure PPPs are generally "real estate intensive" (and require looking into general or specific rules pertaining to cadastre, leases, etc.)

<sup>12</sup> It should be noted that even if it is possible to refer to foreign laws in international transactions, a number of issues relevant to a PPP depends, to a large extent, on local laws. This is due to the fact that both assets and operation will be located in the host country.

- *Procurement*: as implementing a PPP will depend on hiring a number of subcontractors for the provision of goods and services
- *Labor*: as employment will be a major consideration for both private parties (rules pertaining to hiring, termination and social security protection) and national and local public authorities (employment considerations)<sup>13</sup>
- *Safety and environment*: as both mining and transport incur safety and environmental risks, and can, as a result, generate major liabilities
- *Competition*: as the financial viability of a PPP will, to a large extent, depend on whether other competitors are allowed to operate in the same sector, and under which conditions
- *Tax, customs and foreign investment regulations*: as, here again, the financial liability of the investment will depend on the tax and customs regime applicable to the project, as well as on the ability to repatriate income (that might also serve as securities for the investment)

Where no clear legal framework exists on issues, investors might consider the environment too risky and be deterred from engaging into a heavy investment. In some cases, the lack of a secure legal framework can be compensated by a contractual approach: the legal and institutional regime applicable to the PPP will be defined in detail in the PPP contract. Typically, private parties would then seek confirmation that the validity of this contract cannot be challenged (by obtaining confirmation that the contract has a value equivalent to a law through an endorsement by the Parliament or through a legal opinion).

This approach of “regulation by contract” is a common practice in some countries (in particular in common law systems or in countries that have no laws pertaining to PPPs). However, regulating through a contract will only work if the legal environment of the host country supports it. This means that a contract is considered legally acceptable, valid and an enforceable way to conclude a PPP and takes precedent over other conflicting laws and that other laws, regulations and institutions (e.g., taxes and customs) provide a clear enough, non-conflicting framework.

Where there is an unclear legal environment, defining a legal regime through a contract can be considered too long and risky by some investors. The possible downside of this approach is that only less reputable investors will be attracted who will rely more heavily on political interference. In addition, this approach will generally be very challenging for the host by the Company’s factory inspectorate., as it requires capacity to negotiate and implement a very complex contract. Finally, this ad hoc contractual approach (i.e., one where a PPP is designed exclusively on the basis of bilateral negotiations with private sector parties) can represent an obstacle to improving transparency and leveraging more PPPs. Host countries engaged in developing such projects and whose legal framework might not be up to date are, therefore, often counseled in conducting a review and/or modernization of their laws in support of infrastructure and mining PPPs.

**2. Institutional framework:** because of many sectors being involved in Greenfield mining infrastructure (e.g., power, water, and transport), establishing a PPP will require consulting with a number of public authorities, whether at inception, negotiation or implementation stage. This painstaking process can involve authorities, at the local and/or national level, in charge of: (i) finances (taxes, customs); (ii) sectors (transport, mining, public works); (iii) labor and social security; (iv) safety and environment; as well as (v) other authorities (where the PPP may have an impact on issues that fall within their jurisdiction, e.g., commercial fishing for ports; agriculture for mining or railway, etc.). In some instances, the Parliament may also need to be consulted, for example where an endorsement of the PPP is deemed necessary or where exemptions to the existing laws are sought under a particular PPP.

<sup>13</sup> For both investors and public authorities, social acceptance of a PPP and local people expectations are typically one of the most sensitive and complex aspects to manage. This touches upon legal considerations, although the solution to manage these expectations is more often than not a matter of communication strategy before and during project implementation.

It is important to keep in mind that from an investor's point of view, stability and predictability are key. In institutional terms, this means that ideally the private sector stakeholders to a PPP will have one interlocutor only (or as few as possible), with the assumption that this public authority has carried the necessary consultations with other public institutions concerned, which will then be bound by any undertakings of the latter.

In countries perceived as having an unstable institutional framework, such as many of the SSA countries where iron ore or coal projects are being envisioned, a common concern among private sector stakeholders is that new institutions may appear—in particular at implementation—and claim to have some rights to intervene (or seek benefits, e.g., taxes) under the PPP. To avoid this perceived risk, Government of host countries should be encouraged as early as possible in the project cycle in identifying all public institutions that should be consulted: at inception, at negotiation, and at implementation stage. Where an ambiguity exists in the applicable laws and regulations (i.e., risk of overlapping or conflicting attributions), adopting a text of sufficient value to clarify each party's role under the PPP—and/or to establish a single venue/entity where all relevant parties are represented—will be critical. On the other hand, it is also the responsibility of the private sector stakeholders to ensure that proper, inclusive consultations have been carried out (including, where necessary, with local institutions or population).

It is also relevant, given the extended time frame of mining infrastructure PPP projects, to provide investors with strong guarantee against institutional changes over time—and to anticipate the effects over the PPP of planned institutional changes (for example a modification of attributions among ministries).

**3. Enforcement framework:** the ability to obtain enforcement of existing laws and contracts is fundamental. In fact, this might be even more of a concern to investors in developing countries with limited PPP expertise, such as in SSA, than the quality of the laws themselves (examples are not rare of countries adopting a set of excellent laws—although capacity to enforce those is limited, or nonexistent). Legal enforcement is a complex issue that touches upon both legal/regulatory (existence of appropriate laws pertaining to enforcement) and institutional issues (existence of a reliable, independent and operating judiciary, capable of understanding the operation at stake and its legal implications).

Clearly, relying on the local judiciary in most SSA countries will require a very high level of trust in its capacity and independence. In addition, the complexity of PPP operations (whether from a financing, engineering or legal point of view) generally results in a strong preference by parties for arbitration—a method of dispute resolution that is generally perceived to be more adapted to the specifics of large projects such as Greenfield mining infrastructure ones. As a result of those various factors (insufficient confidence in local jurisdictions and preference for arbitration), it is common to provide that disputes arising in connection with a PPP contract be submitted to arbitration, generally before a reputable arbitration center outside of the host country. It is, therefore, important that arbitration be recognized as a valid method of dispute resolution in the host country—and that foreign arbitration awards be recognized as enforceable. An important requirement for this would be that the host country is a party to the 1958 Convention on the Recognition and Enforcement of Foreign Arbitral Awards.

#### 4.3. PROJECT SPECIFIC CONSIDERATIONS

Once the pre-existing conditions listed above have been assessed, the structuring of a Greenfield mining infrastructure PPP will primarily be a question of how the various parties involved want to legally arrange their relationship under this framework. As described earlier in this report, the primary concern of private sector parties will be to secure return over their investment and the smooth operation of their business. This will depend on arrangements among private parties (whether lenders or business stakeholders, in particular the mining companies and the companies involved in providing transportation services).

On the other hand, public authorities of the host country will be an integral component of the project (e.g., the very idea of a PPP). They will be expected to contribute to the successful implementation of the project and, therefore, to the financial sustainability of the investment. Likewise, they will be expected to try gaining from the project and pushing for their own interests, generally based on public policy and political considerations.

In practice, the role of the public authorities can vary greatly. They often can simply expect that the investment will promote economic growth—directly through fiscal revenues, and indirectly through spillover effects (e.g., supply chain, employment, etc.). Here, they will primarily act as enabling authorities. They can also expect, in addition to general benefits, that the PPP will be a tool for economic development beyond the original scope of the project. In this case, they may try using their enabling and regulatory power to negotiate that the project be used to serve those objectives. Finally, they may consider that the infrastructure is a “public good”—and that it is to serve various objectives, as they see fit, a private sector project (here mining) being one among them. There, they will take a more active role in the development or operation of the project regardless of the level of their direct financial stake in the project.

In SSA, host governments’ expectations relative to mining project infrastructure benefits will vary based on the dependency ratio that each country’s overall infrastructure system will have on a given project. It is obvious that for countries with limited fiscal resources and transport assets like Guinea, Sierra Leone or Liberia (see Table 3), mining transport infrastructure will be looked at as an opportunity to develop growth corridors to stimulate the overall national economy. Similar expectations will likely not apply to countries like Gabon, Congo or Angola which are far more capable of financing through their fiscal resources the required national transport, water and power infrastructure.

The level of implication in Greenfield transport infrastructure project by host governments under those various scenarios will have legal consequences. These can be summarized as follows:

- *The low involvement scenario—public authorities as enabling authorities:* under this scenario, public authorities are simply enabling a private sector project. As described above, putting a PPP in place will require the involvement of many public authorities (in particular those in charge of sectoral planning, authorizations and licenses, taxes and customs, safety and environment, labor, etc.). In addition, private sector parties may want to obtain specific guarantees from the public authorities with respect to the regime under which they will operate—possibly some exemptions, too (e.g., a favorable tax and customs regime). Those issues will generally be discussed upfront and set in writing in the PPP agreement that will describe the conditions under which the privately owned infrastructure should operate. Public oversight would then be limited to ensuring compliance with the agreed norms, as any other business, albeit with due consideration to the specifics of the project.
- *The intermediary involvement scenario—public authorities using regulatory power to impose specific obligations:* under this scenario, the infrastructure would still be privately owned and operated, but the public authorities would impose some conditions over its operation that would go beyond the rationale for private sector intervention. This can apply to the nature of the infrastructure to be built and/or to its use. A common example would be a claim by the public authorities that the infrastructure should be open to multiple users, to whom equal access should be guaranteed (including through tariffs). Such conditions are sometimes included in the host country’s laws and regulations and will generally also be set forth in details of the PPP agreement (e.g., conditions for the setting and revision of fees and tariffs). It should be noted that where conditions imposed by the public party are not considered justified from a business and profitability point of view, private sector stakeholders will typically request a compensation by the State (in cash or in kind). This would also be reflected in the PPP agreement.

- *The high involvement scenario*—public authorities acting as investors and/or operators: under this scenario, public authorities play an active role in the development and/or operation of the infrastructure. This can be justified based on a public policy decision, or because of the specifics of the project (e.g., there is no or insufficient private funding available for the project, or because no private sector party is interested in operating it). This can mean that public authorities will be responsible for the financing or maintenance of all or part of the infrastructure, and also possibly involved in its operation. Even under this “high involvement scenario,” the level of implication by public authorities can vary greatly and translate into a variety of legal arrangements, like the ownership of the infrastructure (ownership by public authorities of all or part of the infrastructure; total or partial equity ownership in—or control of—the company that owns the infrastructure, golden share, etc.) and in relation to its operation (e.g., total or partial control by public authorities of the company operating the infrastructure). Such arrangements will also affect the type of PPP agreement concluded for the project.

In practice, the sharing of responsibilities between the public authorities and the private sector stakeholders under a given project will depend on a multitude of factors. In the case of a mining-related infrastructure project in SSA, these would include: (i) nature of the infrastructure needed (e.g., roads, ports, railways) and expected returns from the mining project; (ii) country context (e.g., political risk, geographic environment, economic environment, including existing or projected local demand); (iii) regional backdrop (e.g., including access to transport infrastructure); and (iv) amount of financing required for the project and access to finance by each of the parties involved (e.g., private, IFIs). All of those questions will affect the bankability and financial structuring of the project, and in turn, underpin the negotiating power of the parties involved.

Options to structure a complex PPP infrastructure project are virtually unlimited. In the vast majority of cases, legal arrangements under a PPP will be the reflection of what is financially doable, more than the other way around. The investment needed in most SSA Greenfield mining transport infrastructure is considerable—and the conditions under which financing may become available will determine the nature of the relationships among the parties and the legal structuring of the transaction. As discussed in prior sections of the report, this is often a complex, subtle balance of the respective interests and contributions of the parties to the project.

## Mining-Related Infrastructure Projects: Ownership Models and Financing Modes

### 5.1. OVERVIEW

The concept of mining-related infrastructure refers to roads, rail, and port infrastructures that are developed to primarily accommodate mining operations. In frontier countries, new infrastructure is often seen as critical new capital stock that can serve multiple users for various usages rather than the sole mining sector. This section presents the different type of associated ownership models and their financing modes.

### 5.2. SELECT OWNERSHIP MODELS

Ownership of mining-related infrastructure projects may follow one of three different models (see Table 8):

- Public sector ownership
- Wholly integrated with a private sector mining operation
- Third-party private sector ownership as part of a concession agreement

**Table 8: Summary and Comparison of the Various Ownership Models**

	Public Sector	Mining Company(ies)	Third-Party
<b>Decision Maker</b>	Government	Mining company(ies) – private sector)	Operational and/or financial investors (private sector)
<b>Country Financial Exposure</b>	Maximum	Limited	Limited
<b>Key Attributes</b>	<ul style="list-style-type: none"> <li>• Maximum govt. flexibility in deciding usage</li> <li>• O&amp;M performed by SOE or contractor(s)</li> </ul>	<ul style="list-style-type: none"> <li>• Infrastructure evaluated as a consolidated project with mine(s)</li> <li>• Limited govt. ability to influence usage</li> <li>• O&amp;M performed by concessionaire or contracted out</li> <li>• Lower risk of product transport = lower risk premium (for mining co.)</li> </ul>	<ul style="list-style-type: none"> <li>• Suitable for serving multiple small mines</li> <li>• Evaluated on stand-alone basis</li> <li>• Limited govt. ability to influence usage</li> <li>• O&amp;M performed by concessionaire or contracted out</li> <li>• Greater mining co. comfort with mine deposit delivery outlook</li> </ul>
<b>Critical Risks</b>	<ul style="list-style-type: none"> <li>• Operational inefficiency</li> <li>• Mismanagement</li> <li>• Potentially higher operating costs</li> <li>• Funding risk</li> </ul>	<ul style="list-style-type: none"> <li>• Political risk</li> <li>• Regulatory risk</li> </ul>	<ul style="list-style-type: none"> <li>• Political risk</li> <li>• Potentially higher operating costs</li> <li>• Potentially higher tariffs</li> <li>• Regulatory risk</li> <li>• Operating risk</li> </ul>
<b>Likelihood of Limited Recourse Financing</b>	Low	High	High – yet lower than the mining company model

Source: TDJ.

### 5.2.1. PUBLIC SECTOR OWNERSHIP

Under public sector ownership, the project company is majority-owned by the public sector. Operation and maintenance are either performed by SOEs, or contracted to an operator and/or maintenance contractor.

Theoretically, from the host government's perspective, the biggest benefit of this ownership model is that it offers the greatest degree of flexibility for the public sector to implement any development plans it chooses. Since this model frees host governments from considering equity investors and lenders' financial expectations, it allows them to maximize the use of the infrastructure to benefit the greatest number of users (multi-user) in the greatest number of sectors (multi-purpose), in an effort to spur economic development.

There are two serious weaknesses to this model. For one, governments and SOEs have generally an overall weak record regarding operational functionality and efficiency, especially for large-scale infrastructure projects, compared to the private sector. The second serious weakness of this ownership model is that responsibility for financing rests entirely on the host government's shoulders, where the price tag of this important "capital stock" may be enormous, compared to the host country's GDP (as already indicated in Section 1 when it comes to SSA).

As discussed in more detail in Section 5.3, a country may borrow at a sovereign level to finance the new construction. Given the large size of the project compared to country GDP and public budget, this may imply "eating up" its budget resources entirely. Alternatively, an SOE could borrow on a limited recourse basis, but it is questionable whether a lender would be comfortable in doing so.

From the perspective of private sector users/clients, the primary benefit of this model is the transfer of the responsibility to finance the capital costs to the public sector. However, this model also gives rise to serious concerns about delivery of the project and other operational risks, such as infrastructure crowding, mismanagement and inefficient operations, or a combination of these.

Mining companies will have to entrust the public sector with delivering the infrastructure on time, so that the mining operation may start production and generate cash flows as planned. For this, they will want to see a track record of delivering similar projects on time, in countries where there are no comparable projects. Also mining companies will need to entrust the public sector with operating this infrastructure efficiently. Again, for this they will want to see a track record of operating similar projects efficiently.

Mismanagement of infrastructure operation may have dire consequences on the viability of a mining operation. The use of a contracted operator does partially mitigate this risk, from the perspective of the mining companies, but it does not offer the same degree of mitigation that a private sector ownership (either by mining companies or third-parties) provides.

### 5.2.2. MINING COMPANY(IES) OWNERSHIP

The dearth of public sector capital, especially in SSA, coupled with fear of mismanagement on the part of a state-owned operation in less developed markets, has historically led to mining companies owning their own infrastructure. Integrated mine-rail-port projects where the mining company owns the mine and the related infrastructure have been, in many instances, the ownership model of choice.

For the public sector, this ownership model involves the lowest degree of financial exposure, enabling the host government to preserve its balance sheet for other projects and development opportunities. In emerging markets, in particular, there often are urgent and competing demands on government budgets and country balance sheets. Governments will often balance which sectors to open to private sector

participation and which to fund with public spending. Allowing mining companies to fund the mining-related infrastructure allows governments to spend their budgets on areas where private sector investment is unlikely to materialize (e.g., health and education).

One drawback of this model for host governments is that it provides them with the lowest degree of control on the infrastructure. Governments can still obtain multi-client and/or multi-usage access to the infrastructure (assuming these are permitted by project economics) by including such conditions in the concession agreement; this means that mining company will have a contractual obligation to permit other clients and/or users (other than the mine) to access the infrastructure on a pre-determined basis (volume, tariffs and other). However, governments will be bound by the concession contract's terms and will, therefore, lose the flexibility to change or modify any usage plans once the contract is in place. If, for example, governments want to increase non-mining traffic once the project becomes operational, under this ownership model they will have to negotiate a change in the contract, as well as lender consent, as discussed in Section 7 below.

For mining companies, this ownership model maximizes the total cost exposure to the overall mining project, as they are responsible for sourcing all of the funding for both the mine and its associated infrastructure. Mining companies will typically treat the infrastructure as a cost center, and focus on the sale of the mining product as the only source of income.

The primary benefit of this ownership structure for mining companies relates to the control over the use of the infrastructure (under the contractual basis) it provides and, thus, the certainty of delivering the mine deposits to markets. Having full operational control will lower the perceived risks associated with product transportation, and gives mining companies the comfort to engage in more precise delivery contracts with potential additional clients. This is a significant benefit, especially in emerging markets where public transportation infrastructure operators have mixed operational track records.

### 5.2.3. THIRD-PARTY OWNERSHIP

Undeveloped mining deposits may fail to become viable if they need to absorb the entire costs of building a dedicated infrastructure. Some mining projects are simply located too far from import markets to generate sufficient profits to pay for USD billions in infrastructure costs. While some projects under development in SSA, such as Simandou in Guinea, yield on paper a production large enough (and of the highest quality) to pay directly or indirectly for a Greenfield 700 km rail line and its associated deep sea port facilities, most iron ore and coal mining projects in SSA cannot bear on their own the substantial capital costs associated with transport infrastructure even under the most optimistic commodity price assumptions.

For these reasons, consideration may be given to a project structure where the mining-related infrastructure is owned and operated by a third-party private sector investor other than one or several mining companies. This infrastructure may serve more than one client and/or user such that the capital cost of the infrastructure is amortized across more than one client and/or user, making each mining operation viable.

The critical difference from a mining company ownership is that under this model, the transport infrastructure is evaluated on a stand-alone basis, and must generate profits. This means that the revenue from the infrastructure users and/or clients' fees linked to mining operations needs to cover the operating and maintenance expenses, taxes and debt service, as well as provide the required rate of return on the equity investment made by a third-party. In addition, the infrastructure owner has the incentive to seek additional sources of revenues and to serve other users and/or clients different from mining operations.



Of course, a multi-client/multi-usage operation involves understanding the credit profile of the different customers, who may or may not be creditworthy. In addition, accommodating for certain usage, such as passenger transport, can have an important impact on the capital costs themselves (see Section 3).

For the host government, third-party ownership is more likely to facilitate open access regime to non-mine infrastructure clients and/or users, as the infrastructure owner will seek to maximize revenue. Moreover, the government's financial outlay and exposure is limited, and it can preserve its balance sheet for other projects (as is the case with mining company ownership).

For the government, one of the major disadvantages of this ownership model is that, as with the integrated mining company ownership, its flexibility in determining infrastructure usage is constrained by the concession agreement. In addition, as the project is likely to be financed through limited recourse project financing, the lenders will play an important role in limiting flexibility of all parties. Another issue for the host country is the high cost of access to infrastructure since, in opposition to the mining ownership model; the infrastructure becomes a profit center.

Mining operators may prefer third-party private sector ownership of the infrastructure over government ownership due to efficiency and functionality issues. In some cases, if the concession agreement between the Public and the Private parties is strong enough, and the third-party owner is an established firm with a strong reputation and track record, the mining companies could actually prefer third-party ownership of the infrastructure to their own, as it will enable them to focus their efforts and their capital on their core business. In the SSA context, the pool of third-party operators with the required operational and technical expertise and financial wherewithal to assume without an anchor mining operator the burden of the infrastructure development is for now rather small.

A more negative aspect of third-party ownership of infrastructure, from mining companies' perspective, is that their control over the transportation of their own product is restricted. Furthermore, their mining output is subjected to higher transportation costs since the third-party infrastructure owner needs to cover the return on the equity component of its investment.

Albeit higher tariffs under this model can prove problematic, mining companies are more likely to have a negative perception of tariffs issues if a tariff regime is not contractually agreed upfront. They will tend to fear far more the consequences of disruptive tariff disputes in the absence of such a regime rather than the higher tariff implied by the third-party ownership model.

### 5.3. SELECT FINANCING MODES

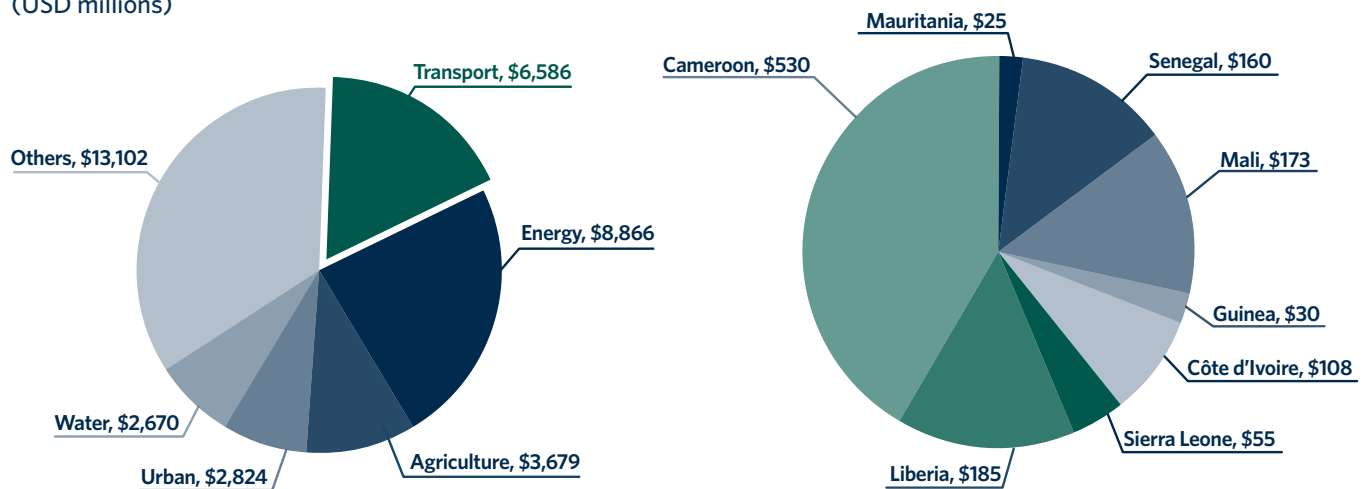
Large-scale infrastructure projects, as any other capital-intensive project, may be financed either through sovereign borrowing or through private sector borrowing (either on corporate basis or on limited recourse basis). While the focus of this study is on PPPs and on limited recourse project finance transactions, the following section attempts to put these into a broader context.

#### 5.3.1. SOVEREIGN FINANCING

In a typical sovereign lending transaction, the Ministry of Finance is either the borrower or the guarantor of the loan. The responsibility for timely debt repayment of the loan would be entirely assumed by the Ministry of Finance on behalf of the host government. The lenders expect to be repaid irrespective of the projects' success or its commercial viability.

While creditworthy countries have been able to raise capital from the capital markets, less developed countries lacking favorable credit rating (see Section 2.4) have relied on concessional funding from multilateral agencies such as the World Bank, the African Development Bank and other institutions to fund their projects (through direct lending or credit enhancement). The concessional loan route has been the one used by most SSA countries, as very few of them have investment grade credit ratings and, therefore, most cannot access the capital markets on reasonable terms. This solution is, nevertheless, not a workable one considering the limited pool of concessional funding made available by multilaterals for transport infrastructure in SSA countries where these projects are to take place (see Figure 4). For instance, World Bank net commitments in Sub-Saharan Africa and across all sectors totaled USD 37.7 billion as of January 2012. However, for iron-ore rich countries, World Bank net commitments for transport projects were USD 1.3 billion as of January 2012 versus an estimated need of more than USD 50 billion for iron ore projects alone.

**Figure 4: Total World Bank Net Commitments in SSA (left) and in the Transport Sector in West Africa (right) January 2012 (USD millions)**



Source: World Bank.

### 5.3.2. CORPORATE FINANCING

In general, the private sector project sponsor may decide to finance the project on-balance sheet (corporate finance) or off-balance sheet (project financing). In corporate financing, lenders make a loan to the project sponsor, which uses the proceeds to fund the project, typically through a local subsidiary. The sponsor is the borrower, and lenders (or bondholders) make their lending decision based on the creditworthiness of the sponsor. This is regardless of the financial success of the project that is being funded with the proceeds of the loan. Corporate finance is therefore said to have full recourse to the sponsor's balance sheet. The lenders' assessment includes a review of the sponsor's operations, its management and its financial statements (balance sheet, income statement, and cash flow statement), as well as a review of the sponsor's future plans, in order to determine its ability to repay the loan.

The benefit of corporate financing is that it often is extended on better terms than limited recourse debt, as the sponsor's entire operation, not just the particular project, is the source of repayment. This is especially relevant in emerging markets, as major project-specific considerations, such as political risk or a country's track record, are diluted across the sponsor's balance sheet, and thus have limited impact on the credit's interest rate.

The balance sheet exposure, however, is also the biggest disadvantage, from the borrower's perspective. The balance sheet debt constrains the sponsor's ability to borrow in the future (to fund other projects) and could lead to an increase in the cost of borrowing (if creditors deem the company over-leveraged).

### 5.3.3. PROJECT FINANCE

In an effort to insulate their corporate balance sheets from the risks of a particular project, preserve debt capacity at the corporate level, and limit their exposure to the amount of equity contributed to the project, project sponsors may find it preferable to finance the project through the use of limited recourse project financing.

Project finance is a commonly used debt financing technique selected to raise funds to build large capital-intensive infrastructure and energy projects. In 2011 alone, over USD 200 billion of project finance debt was raised to support projects worldwide. In project finance, lenders look at the cash flows of the project itself—in this case, the mining-related infrastructure—as the source of the repayment of debt, rather than a corporate or sovereign entity. It is also described as a “contractually based” financing technique, because the obligations of the different project participants are outlined in numerous contracts. Lenders make their funding decision based on their assessment of the project company's technical and financial ability to perform under these contracts.

A number of key general requirements must be met in order to successfully raise debt on a project finance basis (see Section 6). The primary advantage of project finance for the sponsor is that its balance sheet is protected from the non-performance of the project. As the sponsor's balance sheet is not exposed, if the project does not perform according to expectations and cannot meet debt service, lenders would have no recourse to the project sponsor's balance sheet. The no recourse threshold is only reached, however, once certain completion targets have been met (typically these targets are triggered by the project's ability to operate and, hence, generate income to service debt). Before this point, the project sponsor has to provide completion support to the lenders—which in effect means that the sponsor is carrying project failure risk, including usually cost over-run risk.

Because lenders have to evaluate the project contracts much more closely, and because it is typically more time consuming to underwrite a yet-to-be-constructed project than an existing corporate balance sheet, project finance loans typically take longer to close.

#### Case Study Summary: Maputo Port PPP (Mozambique)

Some of the serious challenges of un-bundling various infrastructure components are illustrated by the case study of the Maputo Port PPP in Mozambique (the “Port”). This was a multi-client/multi-usage project that was part of a wider infrastructure development that included a railway development that was supposed to feed traffic to the port (the “Rail”). The two infrastructure components—the Port and the Rail—were developed separately, on an un-bundled basis. This led to extensive delays, with the Port development essentially on hold until an O&M contractor was identified for the Rail. Even so, after financial close was achieved for the Port, the Rail negotiations collapsed, and that PPP was cancelled. Fortunately, this did not result in the Port failure, as truck freight replaced the projected Rail freight in delivering to goods to the Port. Nevertheless, it did expose the Port to significant traffic risk. This is probably one of the reasons why the Port was financed mainly on a concessional basis, with the only commercial debt tranche employing strong risk mitigation strategies.

The full Maputo Port PPP case study is provided in Annex I.

## Project Financing Transportation Infrastructure: Attracting Debt and Equity Providers

### 6.1. THE EQUITY INVESTOR'S PERSPECTIVE

Like all private sector investors, infrastructure investors will analyze a project's risk/reward proposition. Every investor has a "hurdle rate"—the minimum rate of return that needs to be met as compensation for his or her cost of capital. Return thresholds will also be driven by the risks of the project, as well as the perceived country risk. Equity investors will undoubtedly attach a risk premium depending on the political/country risk.<sup>14</sup>

Investors do not have unlimited financial capacity and have finite managerial resources. They need to make decisions on how to allocate their limited capital and managerial efforts. Consequently, while they theoretically look at opportunities and adjust their return requirements given the risk profile of the proposed investment (including the country risk), in reality they may not even consider investing in a country if certain pre-conditions are not met. These pre-conditions include, among others, a well-defined legal and regulatory framework, and an investment framework to support foreign investments. It is common to read in the press of international companies re-focusing efforts in certain markets (where they have experience) and abandoning pursuits of others (where the potential rewards are higher, but there is significantly greater uncertainty). Causes of project abandonment can include frustration in the lack of progress regarding host country deliverables, perceived or actual regulatory and legislative instability, as well as a constrained capital environment (as is the current case).

Most importantly, equity investors will need to ensure that the project they are investing in is bankable, meaning that it can attract limited recourse project financing. This is because few equity investors have the ability to finance a project with 100% equity (both due to the potential size, as well as return prospects of a project). As such, the equity investor's requirements necessarily have to take into account the requirements of project finance lenders.

### 6.2. INTRODUCING LENDERS INTO THE PROJECT: BANKABILITY REQUIREMENTS

#### 6.2.1. THE LENDER'S PERSPECTIVE

Limited recourse project finance lenders generally provide the bulk of the financing for capital-intensive projects, such as a rail/port infrastructure projects. Lenders to these projects (on a limited recourse basis) are relying on only one cash flow stream to repay their debt—the one generated by operations of the project that is financed. Investors typically establish a special purpose vehicle ("SPV") or project company to develop, finance, construct, and operate a project. It is the SPV or project company that raises the financing, with the investors exposure limited to the amount of equity being contributed to the project. In the event of non-performance of the project they are financing, lenders may find their debt not being serviced and without any recourse to the equity investors, regardless of the size and health of the investor's balance sheet once the no recourse point has been reached (i.e., project has become operational—see Section 5).

Practically, the amount of project finance available is limited due to: (i) project debt capacity; (ii) lenders project limits; and (iii) lenders country exposure limits. In most cases, it seems unlikely that project finance can account for significantly more than 50% of the capital cost

<sup>14</sup> Political risk is defined as certain potential events which may harm a project's cash flow generation, including the risk of war, civil unrest, expropriation, nationalization, currency inconvertibility, breach of contract by a sovereign government or government agency, or change in law and regulation. Additionally, it includes selective or biased enforcement, or lack of enforcement, of laws and regulation.

of a major Greenfield infrastructure project, especially in SSA. Accordingly, project sponsors, including anchor mining client(s) will tend to retain significant funding obligations even under an SPV no recourse project development model.

The perspective and tolerance for risk of a lender differs from that of an equity investor in that a lender's return is capped at the interest rate it charges except in the cases of non delivery (i.e., completion support guarantee) and cost overrun (sponsor over run guarantee). While equity investors may have more tolerance for risk given the potential return upside, limited recourse lenders do not have the same upside potential, therefore their appetite for risk is also lower.

The simple facts of a project lender's capped return and inability to have recourse to the investor in the event of the project non-performance guides the way lenders view bankability of projects, their due diligence requirements, and the lengthy and tight documentation and security package they require. When considering financing a project, lenders assess all the factors and risks that may impact the project's ability to repay the debt and ensure that risks are adequately mitigated. The five key areas of focus in terms of assessing the bankability of a project include:

1. Project sponsor
2. Project economics
3. Risk allocation and mitigation
4. Compliance with IFC Performance Standards on social and environmental sustainability for both project infrastructure and associated infrastructure
5. Other project parties

#### **Project sponsor**

Quality of the project sponsor is generally the first aspect lenders assess. Lenders focus their review and analysis on the experience, reliability and creditworthiness of the company or consortium of companies responsible for developing, building, owning and (potentially) operating the project. In particular, lenders will likely require completion guarantees. They will therefore assess the financial ability of the company or individual shareholders in a consortium to stand behind their guarantees.

#### **Project economics**

In project finance, projects are analyzed on a stand-alone basis. Project finance lenders focus their analysis on the project's cash flow, as they are lending against this single cash flow stream from the project. Lenders to a project will make an assessment to determining that cash flows, in any and every period, are sufficient to:

- Pay the ongoing operating costs
- Pay maintenance costs
- Pay taxes
- Service the debt (i.e., pay interest and principal due), with some "wriggle room" to allow for downside

All of the financial analysis of a project's economics is completed prior to funding and lenders require that all the assumptions underlying the financial analysis be independently verified. During the due diligence process, lenders conduct extensive financial analysis to ensure that the cash flow available for repayment of the debt in any period is greater, by a sufficient margin, than the amount of interest and principal due in the same period. A project needs to be commercially sustainable based on the loans and investments committed prior to beginning construction.

The main “output” of a financial analysis is thus the debt service coverage ratio (“DSCR”)—the cash available for debt service (for the period being covered) divided by the debt service (payment of principal and interest) due in that period. Depending on the source of revenue (whether this is contractual—based on a contract that establishes certain payments—or market-based), lenders require base case economics to meet a minimum debt service coverage ratio. For projects with contracted revenues, such as an infrastructure project with users under a long-term transportation contract, base case minimum debt service coverage ratios in the 1.4x-1.8x would be customary. Lenders will also need to get comfortable that the project is able to service the debt even when deviating from the base case.

### Risk allocation and mitigation

Project finance lenders, having limited recourse to the balance sheet of the equity investor in the project, want to ensure that if the project experiences any, they will still be repaid. Lenders analyze closely the cash flow of the project they are funding to ensure that the cash flow of the project will not be disrupted for any reason. A number of things can potentially “go wrong” in a project. The responsibility of a project finance lender is to identify these potential events that may disrupt cash flow generation, and ensure that in the event that those events do happen, the servicing of debt will not be materially impacted. This is done through a careful process of risk allocation. Risk, in essence, is the negative impact on cash flows resulting from a certain event. This process of project risk analysis and mitigation strategy development is an important part of the lenders’ assessment of the project.

Risks can be categorized into commercial (project-specific) and non-commercial risks (see Table 9 below). Lenders will only lend to a project if, and only if, both commercial and non-commercial risks are adequately mitigated.

**Table 9: Project Risks**

	Construction Stage	Operational Stage
<b>Commercial Risks</b>	Delays or inadequate completion	Payment default by off-taker
	Cost overruns	Increase in O&M costs
	Default by contractor	Reduction in operation efficiency
	Environmental and social risks	Degradation of property
	Site acquisition and access (right-of-way)	Quantity and quality of resource
	Interdependence on other projects	Commodity price
<b>Non-Commercial Risks</b>	War and civil unrest	War and civil unrest
	Expropriation and nationalization	Expropriation and nationalization
	Force majeure	Force majeure
	Change in law	Change in law
	Foreign exchange volatility	Foreign exchange volatility
	Breach of contract	Breach of contract
	Inflation	Inconvertibility/foreign exchange availability
	Government interference and demands	Government interference and demands

Source: TDJ.

Risks are generally allocated through contractual arrangements (or the project contracts) that obligate a specific party to take responsibility for managing the risk. Another way to mitigate a risk is by purchasing insurance, which will cover the responsible party in the event the risk occurs. The purpose of having contractual arrangements between the different project participants is to assign clear responsibilities to each participant. In essence, project agreement contracts provide mechanisms by which risks are identified, allocated and mitigated and are linked through the project company to create interdependent contractual relationships.

Lenders will also closely scrutinize how completion risks are allocated. In many capital intensive projects like transport infrastructure, completion risks may be transferred to the EPC contractor, via a lump sum, date certain, turnkey EPC contract, with provision for liquidated damages whose value will need to be sized to cover debt service. For very large projects in less than creditworthy environments (i.e., most SSA countries), EPC contractors will generally be reluctant to enter into such arrangements. As a result, completion risks will rest on the shoulder of the project sponsors. Against this backdrop, the project completion milestone will be crucial since the project will no longer be able to rely on the sponsor’s financial backing once completion is achieved.

**Project parties**

Finally, project finance lenders focus their attention on understanding and analyzing project participants, to ensure that they are technically and financially capable of honoring their contractual obligations. In particular, the lenders will need to get comfortable with each counterparty experience, credibility and creditworthiness. Lenders will especially scrutinize the counterparty’s track record in similar projects.

Even if a project demonstrates solid economics and satisfactory risk allocation through the contractual structure, lenders need to be comfortable with the entities that enter into these contracts (see Figure 5).

Figure 5: Web of Contractual Relationships



Source: TDJ.

### 6.2.2. TYPICAL SECURITY PACKAGE AND LENDER COVENANTS

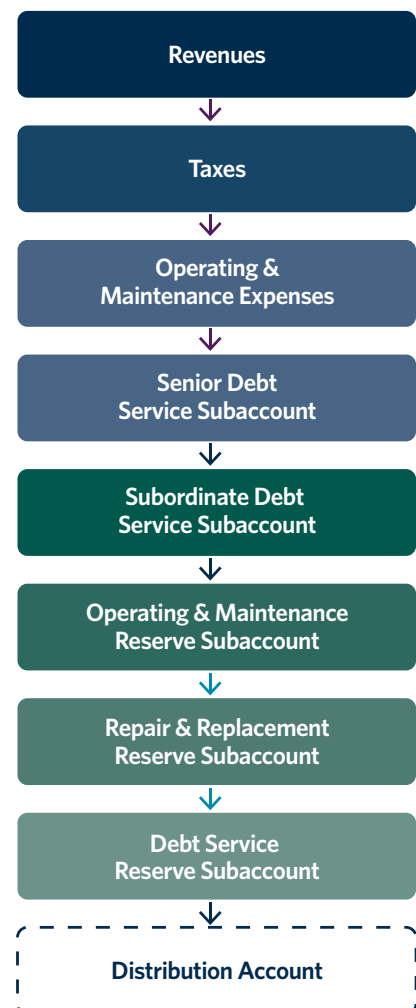
Lenders typically require certain rights and protective measures to provide security against the financing they are providing. Financing documents are the mechanism that creates the relationship between lenders and the project company, and establishes the conditions under which the financing is extended.

It would be customary for a lender in a limited recourse financing of an infrastructure project to have first priority security interest in all assets of the borrower, to the extent that such security can be created under the laws of the host jurisdiction. These assets would include all real property (including fixtures) and tangible and intangible personal property such as documents, inventory, contractual rights, insurance policies and claims, vehicles, intellectual property, bank accounts and any proceeds of the foregoing.

With the exception for funds necessary for budgeted local operating costs and requirements under local currency laws, lenders expect the borrower's bank accounts to be denominated in hard currency and maintained offshore and the lenders to have a security interest over all of the borrower's bank accounts. A security agent or trustee of the lenders would control both onshore and offshore bank accounts, and the borrower would have access to the funds in the accounts only for budgeted expenditures and for distributing dividends once conditions under the financing agreements have been fulfilled. A "waterfall" account structure (see Figure 6) generally provides for priority of application of project revenues to project obligations. Reserve accounts, such as a debt service reserve account, repair and maintenance reserve, operation and maintenance reserve are also usual credit enhancements required by lenders. It is customary for lenders to require a debt service reserve account fully funded at completion, equal to at least six months of debt service.

In addition, it is customary for lenders to request a pledge in their favor of all the borrower's shares by its shareholders. In jurisdictions where the enforcement of a share pledge is difficult or time consuming, lenders often require a "second level" pledge of shares in the parent companies that are shareholders in the borrower. This second level pledge is intended to allow the lenders to enforce it outside of the host country in order to gain control, indirectly, of the borrower's company. Lenders would also expect to have the ability to "step in" to the project, and attempt to take corrective actions, in the event the project can no longer perform under its financing agreements.

**Figure 6: Typical Cash Waterfall**



Source: TDJ.



Further, lenders generally expect some form of completion guarantee. Sponsor completion guarantees are paramount for projects that may be too large to find contractors willing to enter into a lump-sum turnkey engineering procurement and construction project. The definition of “project completion” is most often a heavily negotiated topic in a limited recourse project financing, and generally involves meeting certain physical, operational, environmental, legal and financial tests. Project completion demarcates the time at which the project debt becomes de-facto non-recourse to the project sponsors.

The financing documents typical of a limited recourse project financing include a number of covenants limiting what the borrower can and cannot do. Covenants have the goal of restricting the operational and financial flexibility of the project company/borrower, therefore providing an additional layer of security and comfort to the lender. These covenants relate to some of the following:

- Limitation on creating subsidiaries
- Limitation on incurring capital expenditures
- Strictly defined business purpose
- Restrictions on incurring additional debt. Lenders are generally very reluctant to allow a project company to re-lever. Incurrence of additional debt is usually linked to future cash flow generation.
- Restrictions on dividend distributions (subject to tests). Lenders customarily require the project company to meet both backward—(six to twelve months) and forward-looking (six to twelve months) minimum DSCR of 1.4x to allow distributions (potentially lower in more developed markets).

Last, lenders need to be comfortable with dispute resolution mechanisms, the choice of law, arbitrating bodies, arbitration rules and venue for arbitrations (generally outside of the host country) under internationally recognized rules such as those of, among others, London Court of International Arbitration or the United Nations Commission on International Trade Law.

## Designing Bankable Greenfield Mining-Related Infrastructure PPPs

### 7.1. OVERVIEW OF VARIOUS OWNERSHIP AND USAGE PERMUTATIONS

Limited recourse project finance lenders to a rail/port infrastructure project serving mining operations will conduct detailed due diligence and demand a security package, as described in Section 5. The bankability issues that will arise depend on several factors, including:

- Whether all the infrastructure users/clients will be identified prior to financial close
- Whether there will be uncertainty regarding the identity of new users/clients
- Whether the infrastructure will be meant to accommodate users/clients serving one industry or serving different industries
- Whether the modus operandi of the infrastructure will be governed by an access or haulage regime for its railways tracks and a single versus multiple operators regime for its port facilities
- Whether tariff adjustment regime of both type of transport facilities will be pre-determined
- Whether ownership of the port and rail infrastructures will be combined or separated
- Whether existing and/or future users/clients will be subjected to take or pay contracts or spot contracts
- Whether additional users/clients that will seek to use the infrastructure after its initial completion date will have to bear alone the financing cost linked of any required transport capacity expansion

A number of scenarios, starting from the simplest one and building up in complexity, are described below. There is an obvious, inverse correlation between complexity and bankability (see Figure 7). In SSA planned mining projects, it is likely that the most common situation at financial close will be that of unknown users/clients outside of the anchor mining.

Figure 7: Lenders Consideration Linked to Mining Infrastructure Project Financing



Source: IFC.

#### Bankability of a rail/port infrastructure serving one mine

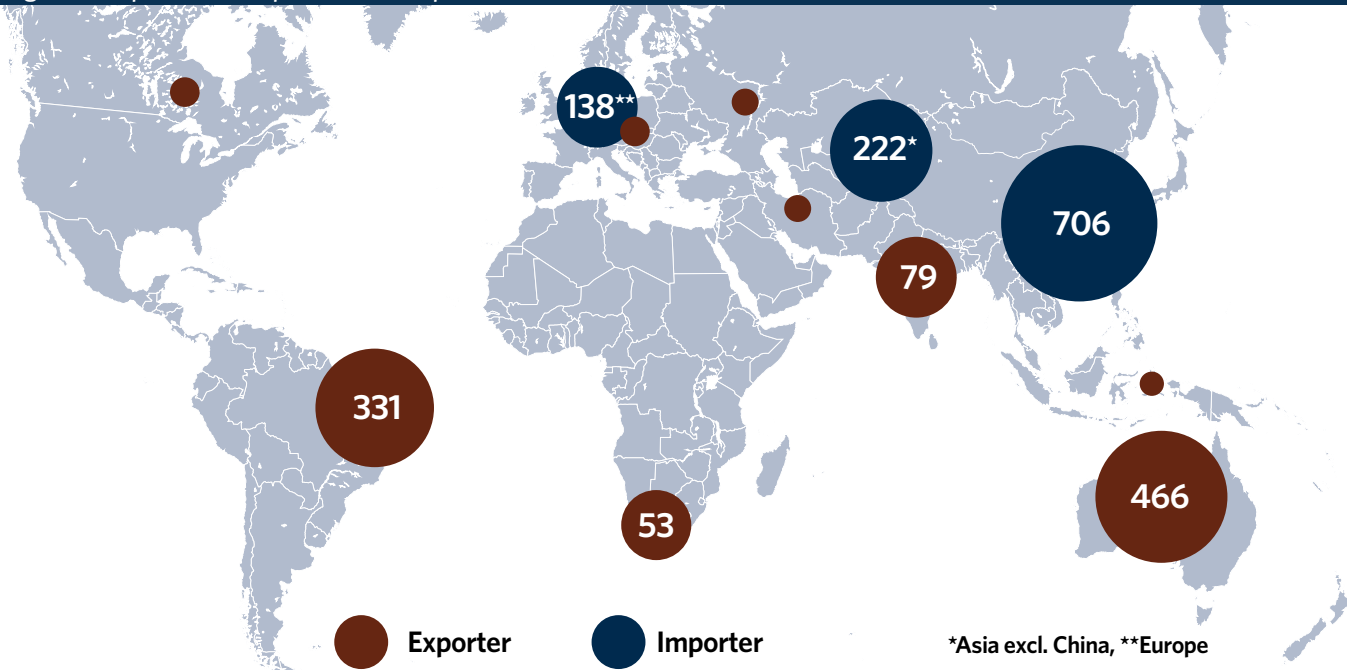
Bankability requirements for an infrastructure project serving one mine are not dissimilar from many other capital-intensive projects where the credit is underpinned by a “captive user and/or client.”

The key to the bankability of an infrastructure project serving one mining operation is the credit quality of the user and/or client, who is the sole source of the revenue for the project and therefore the source of debt repayment for the limited recourse loan. Lenders will spend considerable time studying the credit quality of the user and/or client, and its ability to pay. This may require a large multi-national company having to guarantee the obligations of its local subsidiary.

Most importantly, lenders will assess the viability of the mining operation supplying iron ore and/or coal to be transported via the infrastructure being financed. In particular, lenders will want to ensure that the mining operation is competitive and sits in the lower quartiles of the global production cost curve of a particular commodity. This will ensure continuing operations even at times of depressed commodity prices. In the case of SSA, achieving the lower end production cost curve will mean not only delivering the lowest possible extraction cost, but also the lowest possible transportation cost both for iron ore and coal projects.

In the case of iron ore projects, with most of them located in West and Central Africa (see Figure 2), sea distances from primary import market (China) will translate into a price handicap compared to traditional export centers of Australia, India, South Africa and, even, Brazil (see Figure 8). Accordingly, it will be of utmost importance that surface transport cost (i.e., railway cost) be kept as low as possible to avoid further increase in the transport cost penalties incurred by West and Central Africa iron ore projects. Additionally, iron projects in these two regions of Africa will compete one against another as their potential output of up to 575 mtpa far exceeds what the import market seems capable of absorbing over the foreseeable future (current import market stands at around 1,100 mtpa).

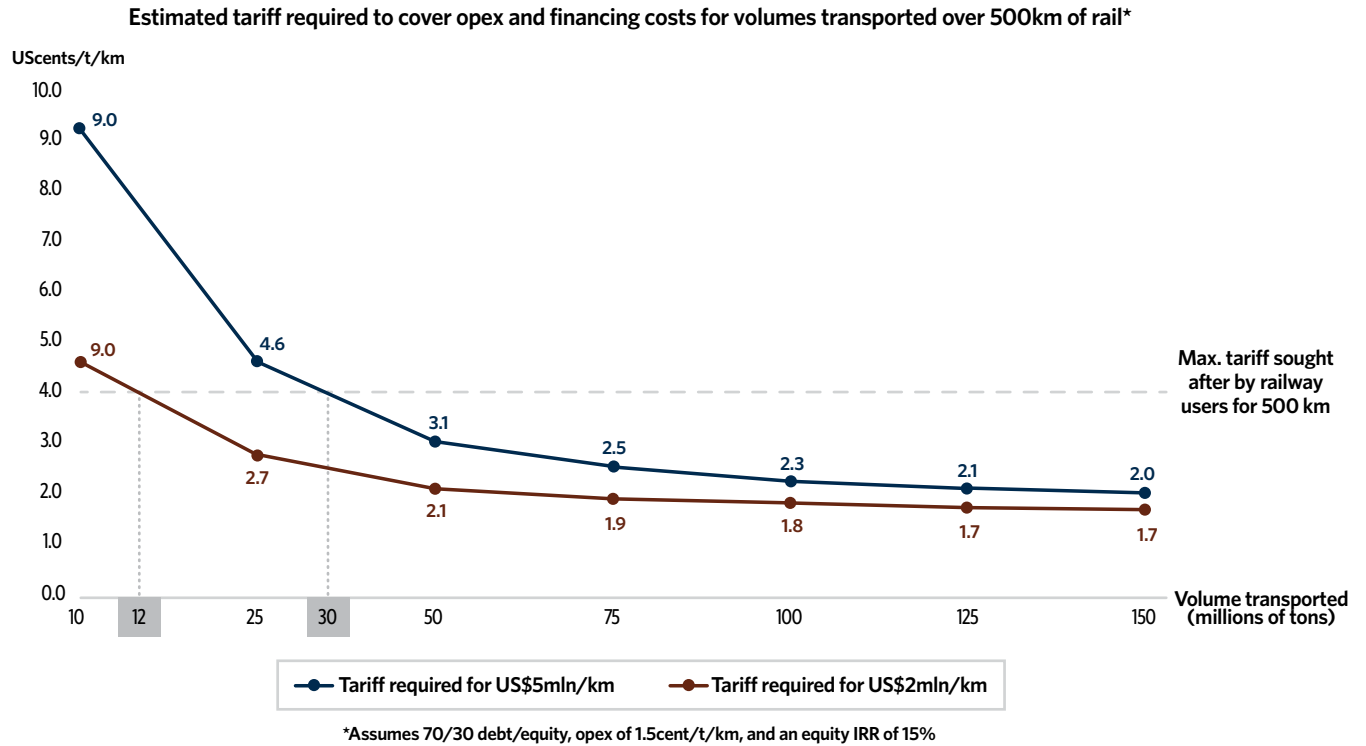
**Figure 8: Top Iron Ore Exporters and Importers in 2011 (Annual Metric Tons—In Millions)**



Source: ISSB.

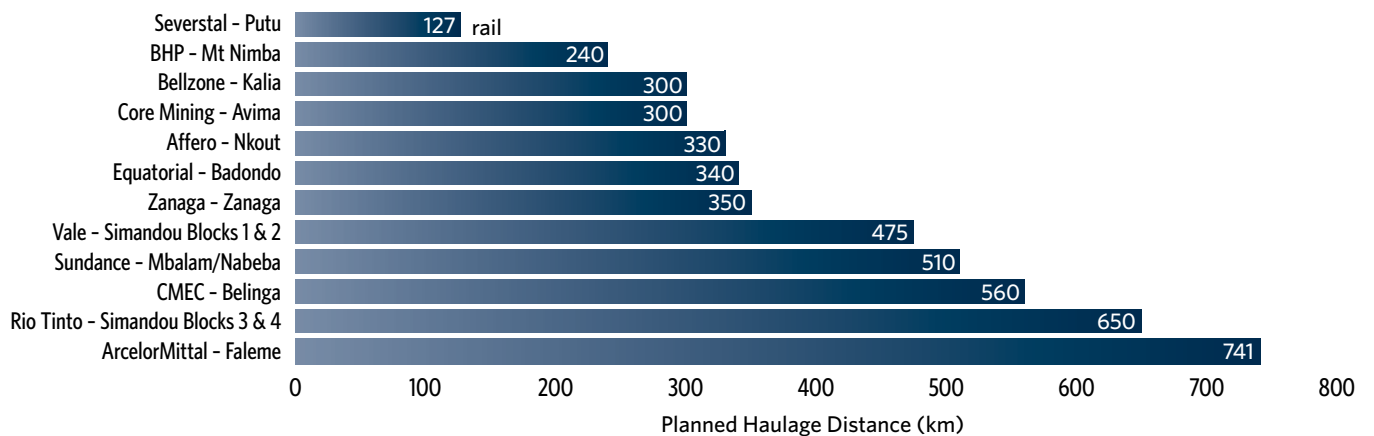
Based on the above consideration, it is likely that lenders will favor single anchor user projects that can deliver the lowest possible pit to port transportation cost. Figure 9 illustrates what this potentially means for Greenfield rail projects in support of iron ore projects in SSA. As shown, depending on the average construction cost per km of a rail line (i.e., between USD 2 and USD 5 million per km), target tariffs per ton kilometer that will need to be achieved based on known distances between pit and port will require at least that 12 to 30 mtpa of iron ore to be moved by rail annually (see Figures 9 and 10). With only 6 out of 20 existing iron ore projects exceeding the 30 mtpa per annum size category and only 2 projects >50 mtpa, it is highly likely that early movers will be larger projects resting on a single anchor client/user (see Figure 11).

**Figure 9: Estimated Transport Tariffs and Volumes Required to Cover Opex and Capex for Greenfield Rail Projects**



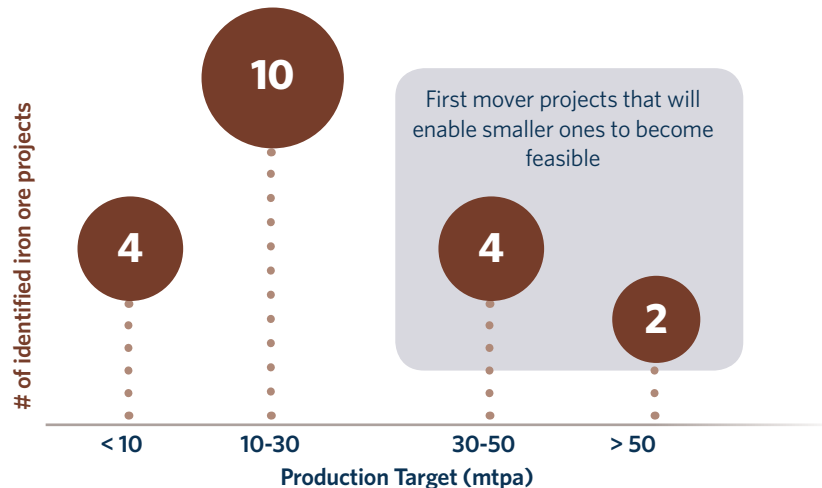
Source: IFC.

**Figure 10: Pit to Port Rail Transport Distances for West and Central Africa Main Iron Ore Projects**



Source: RBC Capital Markets.

Figure 11: West and Central Africa Iron Projects—Number by Production Size



Source: IFC.

Once the transport infrastructure for these projects has been built, it is expected that, market demand permitting, smaller projects could conceivably achieve bankability as well, by sharing the transport infrastructure already built. This will mean, however, that host governments where these smaller projects are located will have to give the necessary flexibility to mining companies of using existing export routes not necessarily located within their own borders. It will also imply that transport contractual arrangements in support of initial Greenfield railway/port concessions will need to anticipate access rights and conditions for additional clients/users down the road. This might prove particularly tricky, since it will require the regulator from “Country A” where the infrastructure will be built to anticipate the use of that infrastructure by mining pits located in “Country B” and/or “Country C.” Regional cooperation among governments sharing mining deposits cluster (Iron ore or coal) will thus be required to maximize the chances of these governments to see their mining resources developed, even though realistically their respective projects will be, to a large extent, competing one against another.

Moreover, lenders will likely require the project company/borrower to enter into a long-term transportation agreement with their user/client, with the tenor of the contract exceeding the tenor of the debt financing. This is because lenders will generally require a “tail” of at least one or two years. The transportation agreement will specify the tariff, which will need to be large enough to cover O&M costs, taxes, and debt service. Given a reasonable strong credit and the predictability of the tariff and the cash flows, lenders will typically require a minimum DSCR in the 1.4-1.8x range.

The debt tenors will not only be driven by the tenor of the transportation agreement. Also, as export credit agencies (or “ECAs”) may play a pivotal role in these financings (given their ability to underwrite large amounts of debt and appetite for these kinds of financings), loan tenors will be driven by the maximum tenors (14 years) allowed under OECD arrangements, which regulate export credit agencies.

The transportation agreement will need to be on a “put-or-pay” basis where the mining operation commits to pay for the infrastructure (at least the component that will cover the debt service) regardless of its use.

In addition to the bankability of the user (mining operation) and of the transportation agreement, lenders will ensure the bankability of all the other project components, including the concession agreement (providing the right to finance, build, own, and operate the project for a certain number of years), and the O&M agreement with a credible and creditworthy operator, incentivized to meet certain performance standards. Given the large size and the risks involved in constructing rail/port infrastructure projects, it is very likely that the construction risk will be borne by the project sponsor (infrastructure investor), who will select an engineering, procurement and construction management contractor performing the work on a cost-plus basis, with certain incentives built into the contract. The lenders will thus require the sponsor to provide an all-encompassing completion guarantee, which will fall away only after project completion (defined as the day as of which a series of physical, technical, environmental, legal and financial milestones have been met). The lender will also very likely require the standard security package and covenants, as described earlier.

#### **Rail/port infrastructure serving two or more mines (users and/or clients are identified at the time of financing)**

The bankability of an infrastructure project serving multiple mining operations will be heavily dependent on the credit quality of the different users and/or clients and the bankability of the contractual arrangements between these users and/or clients and the borrower. Bankability requirements for an infrastructure project servicing multiple mining operations are almost identical to those described above, in the event all users and clients are identified at the time of financing.

Lenders will have the opportunity to conduct extensive due diligence and assess the creditworthiness of all users and/or clients entering into transportation agreements during the financing process. The lenders will also need to get comfortable with the terms of use among the different users and/or clients to ensure no disruption will emerge. In the event one or more users and/or clients cannot meet certain creditworthiness thresholds, lenders may nonetheless close a financing based solely on the revenues of the creditworthy parties, as long as those cash flows are robust enough to cover debt service by a certain margin.

#### **Rail/port infrastructure serving two or more mines (not all users are identified at the time of financing)**

The bankability of an infrastructure project becomes more complicated when not all users and/or clients are identified at the time of the financing of the project, and the financing documents need to ensure the flexibility to accommodate a new user and/or client. This structure implies more than one user and/or client, and therefore the regulated use/open access arrangement will be a critical aspect for the sustainability and bankability of the project.

There are two main approaches limited recourse lenders take with regards to future expansions of the business or project they are financing. In many cases, lenders require consent rights for a borrower to incur additional capital expenditures, incur additional debt, or make changes to the business plan. This means that project sponsors need to make a case to the lenders that the loan is not materially adversely impacted when changes occur. In certain project financings, however, lenders have drafted the financing documentation to “build-in” certain flexibility. In practice, a number of covenants set forth the conditions under which capital expenditures may be authorized, additional debt can be incurred, etc.

Lenders may accept additional unidentified users and/or clients as long as the tariff paid by the anchor users and/or clients (deemed acceptable credits) can cover the debt service. Any tariff paid by additional users and/or clients would constitute an additional layer of cash flows which provide upside to the project company investor. Anchor users and/or clients, however, may expect a lowering of the tariff, when new users and/or clients are added (assuming the infrastructure has spare capacity), as the capital costs (and cost of capital) will now be covered by additional users and/or clients. It should also be kept in mind that adding new users and/or clients will, in turn, translate into higher O&M costs, a requirement for higher maintenance reserve budgets, and in general a greater operating risk.

**Rail/port infrastructure serving mines and other non-mining-related service (all users and/or clients are identified at financing)**

Greenfield transport infrastructure will be a significant addition to most countries' capital stock in SSA who will, theoretically, consider its use for other purposes than transporting mining products. From a lender's perspective financing multi-purpose infrastructure may constitute a challenge. While mining operations are often conducted by foreign companies and their creditworthiness may be easily assessed, other users and/or clients (e.g., passenger transport) are often carried out by state-owned companies. Even when the obligations of these companies benefit from unconditional government guarantees, in most cases these guarantees may not be deemed creditworthy by lenders. Only four of the 32 largest economies of Sub-Saharan Africa currently have an investment grade credit rating.

Lenders may not rely on streams of cash flows generated by many state-owned operations, unless strong credit enhancements are set into place. Among the credit enhancements that may be considered is a pledge, from the host government, of royalties levied on the mining operations themselves. Additionally, a pledge of tax receipts from mining operations may also be considered as a credit enhancement.

**Case Study: MRS Logistica PPP**

The case study of MRS Logistica (see Annex I) offers an illustration of a successful multi-user/multi-modal Brownfield railway PPP in an emerging market (Brazil). MRS Logistica S.A. ("MRS") is a consortium of several Brazilian mining companies that in 1996 won the concession to operate a railway corridor previously owned by the Brazilian state railway company. Even though this was a multi-client/multi-modal railway, it was successful, for several reasons. For one, the sponsors represented anchor clients, limiting the company's revenue risk exposure and thus making the project bankable. Further, the project debt levels were relatively conservative, with initial debt to capital of less than 68%. Finally, favorable economic conditions provided significant financial lift to the sponsors, with the concession coinciding with a domestic economic boom and international growth in demand for their products.

**Rail/port infrastructure serving mines and other non-mining-related service (not all users and/or clients are identified at financing)**

The bankability of an infrastructure project becomes even more complicated when the infrastructure is intended to serve a variety of users and/or clients and not all of them are identified at the time of the financing of the project while the financing documents need to ensure the flexibility to accommodate for new user and/or client. Lenders' will assess at the time of financing credit quality of the known users and/or clients. Lenders will run their financial model to ensure cash flows from the users and/or clients it deems reliable and creditworthy result in an acceptable debt service coverage ratio.

As discussed, lenders may require consent rights from project sponsors to incur additional capital expenditures, adding debt, or changing their business plan. This means that project sponsors will need to make a case to the lenders that the loan is not materially impacted when changes do occur. Adding new users and/or clients will imply changes to the way the infrastructure is operated and maintained and lenders' will need to be comfortable that the additional maintenance budget are adjusted to reflect the additional traffic that will be accommodated by the infrastructure.

**Case Study: Alice Springs to Darwin Railway PPP**

While MRS Logistica provides an example of a difficult, yet successful mining-related infrastructure project, the Alice Springs to Darwin Railway PPP (full case study in Annex I) illustrates how a similar multi-user project might fail. The PPP in question was a Greenfield development of a 1,420 km railway that completed the link between Australia's southern and northern coasts, providing an alternative route for Australian mining and other freight to the high growth Asian economies. Even though the project received full government support and significant government funding, it failed within three years of launch due to insufficient revenues rather than traffic as the operator could not secure from tariffs high enough from its clients mix. The project was financed on limited recourse basis and had significant commercial debt. In hindsight, the lenders clearly underestimated the risks and funded an un-bankable project.

**7.2. LIMITING FACTORS**

All of the usage/ownership structures discussed in the previous sections of this report are conceivably possible, and might even materialize in SSA as the region undergoes development and builds a track record of PPPs. In the current environment, however, many of the structures face significant limiting factors that would effectively prevent their financing.

**Public financing for large-scale mining-related infrastructure is unavailable in most of SSA**

Most countries in SSA do not appear to possess the sovereign borrowing capacity, or the budgetary capability, to provide meaningful financing for large-scale mining-related infrastructure projects. Thus, private financing (through PPPs or on strictly private basis) is the only viable source of capital for most of the SSA-based projects, at least initially and until such times that recipient countries earn sufficient royalties to become themselves credible investors/financiers of infrastructure projects (e.g., Angola and Gabon).

**Small mines lack the scale to develop the transportation infrastructure on their own**

A certain level of transportation volume is necessary to justify the development and operation of mining-related infrastructure. Many small mines, on their own, lack such scale, necessitating the sharing with other mines (see Figures 9 and 11).

**Timing and complexity issues may prevent the sharing of infrastructure between multiple small mines**

The sharing of infrastructure (including the cost to develop and operate it) between several small mines may appear to be a convenient way to mitigate the aforementioned constraining factor, in certain cases. In reality, such a solution is often restricted by the complexity of a debt financing.

For the mining-related infrastructure to be owned and developed by a syndicate of small miners, the concurrent development and financing of each one of the small mines is a prerequisite. Even if this is the case, the level of complexity necessary in a debt financing of such a structure might deter certain lenders from participating. The banks would have to underwrite multiple mines since they will need to evaluate the probability of each mine continuing production. Furthermore, solid contractual relationships would have to be established between all of the mines, the project company that would own the infrastructure, and the lenders themselves. And, cross-default provisions would likely have to be established between the mines and the infrastructure. The combination of these factors will make the debt financing so complex that it would be difficult to execute them even in developed markets, let alone in developing regions such as SSA.



**Lack of regulatory and legislative track record precludes strategic investor (third-party) ownership**

One potential solution to a number of the constraining factors described herein is the development of the infrastructure under third-party (non-government, non-mining company) ownership. One type of third-party owners is the strategic investor—mainly freight rail operators looking to expand their business. However, strategic investors in this sector are relatively risk-averse, due to the capital intensity of the projects and their investing history (while mining itself is also capital-intensive, mine companies are often more experienced investing in riskier environments, due to their long history of such endeavors). For many investors in this class (if not most), the lack of strong and stable regulatory and legislative frameworks might present an insurmountable risk that offsets all potential return and upside considerations. This might not be the case for nontraditional, state owned, rail and port operators who will be driven to invest under a global resources for financing deal (e.g., under negotiations for years between China and DRC).

**Limited appetite from traditional financial investors**

The pool of traditional financial investors willing to invest in large-scale infrastructure in SSA is relatively small. It would be wrong to completely rule out third-party ownership based on the constraints presented in this section. However, the scale of infrastructure demands associated with many of the mining projects presents a challenge to most infrastructure funds and financial investors. This is not to say that nontraditional financial investors, such as Chinese state-owned development or commercial banks might not be willing to finance Greenfield transport mining infrastructure. However, it would be expected that in this case, the financing would be tied to the award to a Chinese mining company of the mineral rights supporting the project.

**7.3. ANCHOR MINING SOLUTION**

Due to the limitations outlined in the previous section, many theoretical ownership and financing structures are not likely to be successful in SSA, leaving aside nontraditional financing, state-supported solutions. Public sector participation in the ownership of the mining infrastructure is severely limited by the significant public sector budgetary and borrowing restrictions present in SSA, as well as the significant share of the project financing that must come from equity (i.e., up to 50 percent or more). Individual small mine participation is, likewise, constrained by lack of scale to support large infrastructure, while timing and complexity factors limit the applicability of a syndicate (of small mines) structure. And lack of regulatory and legislative track record and small investor pool reduce the likelihood of third-party investors developing the Greenfield mining transport infrastructure.

These limitations result in the need to design a structure with significant (in the least dominant, often full) anchor mining company participation in the ownership of the infrastructure with its associated “foundations rights” as the primary infrastructure user. Anchor mining company refers to an owner of a mine (“anchor mine”) capable of supporting the development of the infrastructure based solely on its own mine.

The structure most likely to receive non-recourse financing in support of the development of a Greenfield mining-related infrastructure PPPs in SSA is one in which the mining company is partially or substantially owner of the infrastructure. This allows the project to be underwritten based on volume from the anchor mine itself. In this case, host governments will look to achieve their aim of open access through negotiated contractual arrangements (the concession agreement). Both parties will need to accept that they will not achieve all of their goals. Host governments will have to recognize that there has to be a limit to open access, and that certain types of usage (such as passenger transport) will increase investment and operational costs to a level that will make the infrastructure uneconomical. In addition, they will also need to recognize that the most efficient transport corridor servicing the mine might not located within their own borders. Meanwhile, mining companies will have to agree to some level of open access, under fair terms, especially for other mines that can utilize the infrastructure as

long as their take or pay obligations used to underwrite the project's debt are associated with the following customer foundations rights: (i) priority access to the transport mining infrastructure; (ii) priority to benefit from infrastructure expansion plans; and (iii) payment of preferential infrastructure tariffs.

Additionally, host governments will need to accept the fact that mining companies, who are owner, or partial owner of the infrastructure, may opt to divest some or all of the infrastructure ownership once their project has reached proper return on equity and subject to consent from lenders and/or public authorities as defined in relevant concession documents.

#### 7.4. CRITICAL FACTORS TO CONSIDER WHEN DESIGNING THIRD-PARTY FINANCED SHARED USE TRANSPORT MINING INFRASTRUCTURE SOLUTION

##### **Physical infrastructure design considerations**

Determining the size, capacity and location/route of the infrastructure is one of the most critical challenges facing the various project stakeholders. The magnitude of this issue is amplified in situations where there is considerable uncertainty around who will use the infrastructure and to what degree and, whether or not, the infrastructure footprint will be national or regional. Since infrastructure operations are characterized by very high fixed costs, the ability to use any infrastructure capacity to the highest possible degree will be essential to determine the competitiveness of transport tariffs that will be charged to users and/or clients by the infrastructure owners. In this respect, securing, from the start of operations, one large anchor client that can deliver a high level of infrastructure usage, or a pool of clients who can achieve a similar outcome, will be a key driver to the feasibility of overall mining project(s).

##### **Physical infrastructure construction timeframe**

Since larger infrastructure projects will take, at best, three to five years to be built, there are considerable risks that during the buildup timeline: 1) commodity prices that underpin the feasibility of the anchor off taker to pay a certain tariffs are volatile. This heightens the risk of a downward adjustment, especially if the concessionaire of the infrastructure is not majority owned by the anchor mining client; 2) host governments prove unable to stay the course in terms of regulatory and business conditions agreed upon at the time of project's financial close; and, 3) the anchor mining client decides to sell its stake in the mine to another mining company which might legitimately expect to re-open negotiations on the terms and conditions of the infrastructure access with the infrastructure concessionaire.

##### **Physical infrastructure monetization**

Unlike a mining license, physical infrastructure is not easily tradable/sellable. As a result, its value is predicated upon the level of usage that can be made of it multiplied by the applicable tariffs it can command from its clients/users. While in Greenfield projects one could argue that the price paid for the mining license(s) should be tied to the availability of a logistics solution to export the mine minerals, temporal misalignment between the time that the mining license is sold and the Greenfield transport infrastructure concession is signed has often resulted in a disconnect between these two approaches. As a result, physical transport infrastructure tends to be seen as "stranded" non-tradable assets, which further complicate their financing (see Table 10).

##### **Legal and regulatory issues**

A legal and regulatory framework is necessary for an infrastructure project to be financed, developed and operated. Virtually all business arrangements between all of the parties involved in an infrastructure project will have to be enacted through project contracts and/or codified and enforced through the host government's laws and regulations. Also, a contractual framework needs to be developed (and enforced) to provide additional clients (non-owners) with access to the infrastructure (see Sections 3 and 4).

**Table 10: Mining Projects Asset Type Characteristics**

	<b>Mine</b>	<b>Mine-Associated Rail</b>	<b>Conclusion</b>
<b>Liquidity</b>	High – Tradable asset	Low	✓ Mining assets are more tradable
<b>Co-Dependency</b>	Medium – The existence of the infrastructure increases the value of the mine, but the underlying value of the deposit depends on the quality and volume of the resource	High – The value of the rail is highly dependent on the volume the mine can produce	✓ Mining assets have higher intrinsic value
<b>Scalability</b>	High – Can be partially exploited	Low – Has to be built for highest expected demand	✓ Mining operations are highly scalable
<b>Physical Control</b>	Easily manageable and clearly defined mining area	Significant right-of-way over hundreds of km with little control over outside incursions	✓ Mining site is easier to secure/control

Source: IFC.

**Timing issues**

The timing of the negotiations for the infrastructure design and usage terms can have a significant impact on the success of the infrastructure as well as the mine(s). In general, it is preferable to negotiate all material issues related to a project (mining and infrastructure) concurrently. In the case of mining company ownership, the infrastructure and the mine are developed essentially as one integrated project, so negotiating the terms for both at the same time would be best practice. In reality, however, the mine development terms (such as royalties) are frequently negotiated prior to removing uncertainties regarding the infrastructure itself.

Another (related) timing issue that requires resolution is how to allow for additional client usage of the infrastructure at a later date. This can impact physical design of the infrastructure, the capital costs required and the allocation of investment costs between the anchor client and the other clients that begin using the infrastructure later on.

**Structuring off-take contracts and tariff considerations**

One of the basic challenges that third-party infrastructure owners will face is how to structure the off-taker agreements with necessary carve-outs for additional client use. The capacity allocation, performance guarantees, as well as tariff levels, will have to be determined and agreed upon between the host government, the concessionaire and the new clients. Alternatively, in instances of mine company ownership of the infrastructure, a fair and equitable tariff system will have to be designed. The mining company should be compensated for developing and operating the infrastructure; however, the host government needs to ensure that access to the infrastructure is provided to other clients/users at rates that are fair and non-discriminatory. This can be achieved by ensuring that off-take and tariff regimes (for both the mining anchor investor and third parties) are agreed up-front and stable over the life of the project, ideally via the project concession and related agreements. This approach provides certainty for investors, lenders, host governments, and future third-party users. The host government role as a “tariff regulator/arbitrator” is in such case manifested as: (i) participating in up-front agreement of a detailed off-take/tariff regime, subsequently incorporated in the project concession; and (ii) ensuring enforcement of this detailed regime further down the line (i.e., regulation by contract).

**Determining mining company's royalty payments to the government**

Any developments that add uncertainty to the integrated project's cost structure will impact mining company's consideration of other cost components. In cases where the infrastructure financial parameters (capital and operating costs, usage revenue from other clients) are uncertain, the mining company may insist on reducing other cost items of the project, one of which is the royalty payments to the government. The mining company might insist on royalty payments that are low enough to provide a sufficient "cushion" should the overall infrastructure costs prove higher than expected. One potential solution would be for a host government and the mining company to agree into a mechanism whereby the royalty payments would be adjusted if the infrastructure costs deviate from an agreed range up to a maximum amount.

**Infrastructure expansion considerations**

Infrastructure expansion considerations arise in third-party ownership cases where the infrastructure requires expansion and capacity upgrades to allow for additional clients/users. In such instances, it is necessary to determine who is responsible for the cost of the upgrade—the concessionaire or the new client. If the new client provides the capital, then they could demand an equity stake in the concessionaire,<sup>15</sup> in which case a mechanism would have to be developed to determine how the project revised equity would be allocated. In light of the complexity that such approach may entail, it could be easier for a new client to simply fund the infrastructure expansion cost through a take or pay contract against which a loan could be issued in exchange for a secured access to the additional transport capacity created by the expansion works.

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<sup>15</sup> This case applies to haulage regimes. For access regimes and equity stake would probably not be required.

## Designing Bankable PPP Structures: Best Practices and Recommendations

### 8.1. REVIEW OF BEST PRACTICES IN FINANCIAL STRUCTURE DESIGN

Greenfield mining transport infrastructure PPP schemes can be implemented through a number of structures and financing permutations. However, there are a number of fundamental principles that contribute to the success of a project, regardless of how the financing is structured.

#### **Simplicity is a virtue**

In general, a simple financial and commercial structure, commercial agreements, profit sharing formulae, etc. can lead to better terms for the borrowers and a greater possibility of success. As discussed earlier, such simplification can include bundling the various infrastructure components (road/rail and port), as well as bundling the infrastructure with the mine, where possible. In contrast, dividing or unbundling all of the major components of a mine and infrastructure project, multiplies the number of contracts, credit assessment and overall execution and financing risks.

A simple structure can also mean a shorter underwriting period for lenders and less ambiguity if issues arise once the project is operational. Complexity can often lead to more time being spent on structuring and execution (by the sponsors), as well as analysis by lenders. In addition, complexity can make it easier for lenders (as well as investors) to reject a proposition.

#### **Solid and stable legal and regulatory enforcement is a prerequisite for lenders as well as sponsors**

The enactment and consistent enforcement of a legal and regulatory framework in the host country is a prerequisite for not only lenders to extend credit, but also sponsors to provide the equity to a particular project. This is relevant not only for mining-related infrastructure but essentially all industries. The framework should address PPP structures and provide for the proper functioning of the various contractual relationships between project parties that are necessary for PPP structures to work. Ideally, it should also specifically address the mining and the transportation and logistical infrastructure industries. For developing countries, with a modest or non-existent track record of PPPs in similar sectors, it is probable that a stronger legal and regulatory framework (in the sense that it reduces uncertainty for the investors and creditors as much as possible) will lead to greater interest from investors and creditors.

Host governments also need to recognize that a regulatory and legislative track record is established over a long (multi-year and multi-project) period of time, but can be damaged with very few incidents. For that reason, stability—referring to the unbiased and non-selective enforcement of laws and regulation—is essential in attracting investors and securing credit financing for a project.

#### **Governments should have a long term focus**

Rail/port infrastructure projects, and the mines they are designed to serve, can be transformative for a host country, and boost its overall economic development. It can therefore be tempting for host governments to seek to extract as much value as possible from such projects. In certain situations and environments, such tendencies can have a detrimental impact on the actual project and the outlook for economic development of the host country. A host government must balance its desire for its people to receive the maximum benefit from a single project with the need to begin building a track record with international investors, which will benefit the long-term development of the country. Host governments must also have an awareness of the cyclical nature of commodities and current super cycle and understand that market conditions may change rapidly, impacting short-term investor appetite.

**The interests of the public and the private sector should be aligned**

The alignment of the public sector and the private sector interest is a critical factor for the success of the project. Due to their respective goals for the infrastructure project, the interests of a host government and the owner of the infrastructure can be contradictory at first. Through negotiations, the two sides must reach a compromise whereby each side's most critical aspirations are addressed. While many aspects of an infrastructure project can be a zero-sum game between the government and the private sector sponsor, the overall project need not. Once an agreement is reached, it should be codified in contract, and a strong legal and regulatory framework must be established to ensure that each side is meeting its obligations. To aid in the process of reaching an appropriate alignment between parties, it is critical that both sides engage experienced transaction advisers, both legal and financial, that can mediate negotiations, and provide market perspective to all parties.

**Transparency is critical**

Transparency is very important both during the negotiation phases between the different project participants, and once project development begins. Full transparency will help to establish trust between the various partners and prove that negotiations are being conducted in good faith. Establishing mechanisms within the project contracts that promote transparency will be critical for the overall success of a project. Obvious and verifiable transparency between the public sector and the private sector project sponsor will also give lenders greater comfort in the project's sustainability.

**Experienced and reputable engineering-procurement-construction (EPC) contactors should be selected**

While this best practice does not technically apply to the financing structure of a project, it can impact the financing structure. Project finance transactions are complex and carry significant and numerous risks that lenders need to analyze, mitigate and price. The selection of an experienced EPC contractor, with a long and successful track record of executing similar projects in similar environments, will significantly reduce the risk of the project not being developed on time and budget in the eyes of the lenders, which will enhance the project's bankability.

**Usage/transportation fees from the anchor user/client should meet the lender's DSCR test**

Lenders will seek assurances of sufficient revenue to cover all project expenses and debt service, as well as a safety margin, when underwriting a limited recourse loan. If usage fees (tariffs) from the anchor user and/or client (one or several) of the infrastructure are sufficient to cover the lender-desired DSCR, the project will have met one of the basic and most important lender requirements. Lenders may insist that the minimum DSCR test be met based on revenues from anchor user and/or client alone, even if other users/clients are planned. If the minimum DSCR is not met, the lenders might decline to finance the project, or decrease the amount of debt in the transaction to levels where the DSCR will be met.

Governments need to understand that transportation/traffic tariffs drive cash flow and therefore should service the debt for a transportation infrastructure project. If transport tariffs are set too low, the projected cash flows and DSCRs can appear unattractive for lenders. Thus, even though the natural desire of a government can often be to set tariffs as low as possible as a form of economic stimulus, the tariffs need to be high enough to make the project financially viable. These opposite goals are naturally regulated by the level of transport tariffs that a mining project needs to achieve to ensure that the infrastructure fixed and variable costs are fully paid for, while the set level of tariffs charged to users/clients must be competitive in relation to the tariffs charged for similar mining customers worldwide.

**Various project contract terms should match**

As much as possible it is desirable to have the durations of the major project contracts (usage/transportation agreements, O&M agreement, etc.) match. Lenders will typically require a transportation/usage agreement that will exceed the term of the loan. And the project sponsor

(as well as the mining company, if they are separate entities) might look for a long-term O&M contract from an operator to ensure that their long-term transportation/usage agreements can be honored through the provisioning of such services. Ultimately, the synchronization of contract durations results in a simpler financial structure, which is a best practice. Contracts should be back-to-back in nature and have sufficient liquidated damages provisions to ensure project risks are mitigated.

**Formal procedures for communication and dispute resolution must be established**

Having a formal mechanism for communication and dispute resolution between the public and various private sector participants is extremely important for the success of the project. Such a mechanism should be contractually established and the participants should develop the discipline to follow it. If any dispute arises during the development or operation of the project, having such a mechanism in place will improve the chances of successful resolution. In fact, lenders might consider the establishment of such a mechanism as a critical bankability factor. Notwithstanding this recommendation, a common sense best practice is to have frequent and honest communication between all parties involved.

**Where possible, the mining-related infrastructures should be considered when mining royalties are negotiated**

The mining company itself can often hold ownership and/or control of the mine-related infrastructure. In many cases, this ownership model provides certain distinct advantages, such as a simpler financial structure and potentially lower operating costs. In this case, it is preferable to negotiate the various issues concerning the infrastructure component (such as transportation tariffs, open access, physical facility specifications) when the mining royalties are negotiated.

The infrastructure will be seen as a necessary cost center in the supply chain for bringing the product to market. Royalties are another cost for the mining company. In general, all of these should be negotiated together—so that the mining company can evaluate the whole project's expected return—at the same time. If one part of the project is generally agreed on, but there is a serious disagreement on other parts, negotiating all significant issues concurrently will probably lead to quicker resolution. If the opposite happens, not only will the negotiation process take longer, but also it will jeopardize any preliminary financing plan (that the sponsor will likely have in active consideration), and can, in extreme cases, expose the project parties to accusations of bad faith.

## 8.2. MAIN CHALLENGES TO OVERCOME

As all large scale projects, mining-related infrastructure transactions present a unique set of challenges. When the complexities of both PPP and project finance factors are included, such challenges are magnified. Some of the most critical challenges are reviewed in this section.

**Host government misunderstanding of the nature of the private sector and their risk/reward concerns**

The rise in commodity prices of the past decade, the new commercial viability this trend brought to a number of stranded mining projects, and the need to develop infrastructure in order to exploit these mines has (rightly) been seen by host governments as a major development driver that is suddenly available for use. At the same time, the desire to extract as much value as possible without giving proper consideration to the concerns of the private sector has led to projects being delayed, and has increased the risk of projects being cancelled, especially at the higher end of the cost of production spectrum (and, in particular, if the current slump in commodity prices continues). The alignment of the interests of the private and the public sector parties is critical for the success of a project. For that alignment to be achieved, the public sector must understand how the private sector evaluates a project.

One common potential hurdle that arises from the host government's misunderstanding of the private sector's concerns is the belief that the private sector will always profit from a mine, and therefore cost considerations for the mine itself, and for the mining-related infrastructure, are moot. If a government believes that a mining operation will make positive income no matter what, there is little incentive for the government to accept limitations on open access (to the infrastructure), or a particular site/route proposed by the private sector, even if those elements are key to making the project financially viable.

Governments need to understand that mines and associated infrastructure projects compete for essentially the same pools of capital globally. Figures 2 and 10 show the various planned railways in SSA iron ore mining sector that will compete with other projects around the world for the same pools of capital. For potential concessionaires, if the cost of the infrastructure (whether the direct cost of development or the transportation cost, if the infrastructure is owned by a third-party) drives the projected return from a mine below the level required to compensate for the perceived risks, they will turn to other projects instead. And without the mine, there is not only no infrastructure, but also no royalties, taxes and employment. Governments have the right, and, in fact, the obligation, to negotiate the best deal they can for their people. However, they must consider the impact of all deal terms on their counterparty, and should agree to a deal structure that permits the counterparty to achieve its key goals. Importantly, governments must bear in mind that the alternative to a sub-optimal deal (from their perspective) may well be no deal at all, leaving everyone worse off.

#### **Making projects bankable in a constrained credit environment**

Designing a bankable financial structure for an infrastructure projects means proper alignment of interests for the all parties involved, and the allocation of risk to whichever party is most suitable to mitigate such risk. In a constrained credit environment, a reliable and predictable revenue stream, a sound security package, appropriate contracts, strong DSCR projections and open and transparent communication between the public and the private sector are especially critical.

#### **Private sector distrust of the public sector**

Just as a host government can have a skewed view of the goals and roles of the private sector, the private sector can have a skewed view of the host government. This could result in mistrust and concerns of insincerity, and ultimately delay or even cancel a project. This challenge can be overcome utilizing multiple approaches. For one, transparency and frequent communication will usually bring the parties closer. Further, a host government should demonstrate strong support for the project through legislative as well as promotional activities. Finally, by including external entities, that both the public and the private sector know and trust, into the transaction could improve the private sector's comfort level.

#### **Lack of track record of successful PPPs in a host country**

Notwithstanding the plethora of analytical tools lenders will employ to evaluate a project's risk profile, often what carries the most significance is the simple consideration of whether something similar has been done before. The lack of a track record of PPPs or large mining-related infrastructure projects (ideally, both) in a country will be seen as a risk in a project. The only real solution to this hurdle is to overcompensate with risk mitigation: very strong security package, substantial buffer in the projected DSCR, large reserve accounts, dispute resolution mechanism that are foreign-based, etc. The utilization of credit enhancement products offered by IFIs would complement such a strategy.

#### **Availability of skilled labor**

Railway operations are labor-intensive compared to mining or port operations. SSA countries' pool of qualified railway employees is limited to around 40,000 employees outside of South Africa. The average age of these employees hovers around 50 years and no capable railway



training school exists in SSA, outside of South Africa. Meanwhile, one can estimate that if all iron ore projects identified earlier in this document were put into production, railway systems that would underpin their operations would need to recruit anywhere between 25,000 and 40,000 workers. With potentially a similar figure for the coal industry, the prospects of the rail operators' ability to be able to recruit and train an adequate number of qualified railway workers will represent a significant challenge, especially in countries where rail activities do not already exist or have ceased.

### 8.3. RECOMMENDATIONS

The development of Greenfield mining-related infrastructure PPPs in emerging markets is a very challenging proposition. The size of capital investment needed, frequent lack of track record by host governments, and weak sovereign credit ratings are only some of the challenges for investors and lenders. Every project is different, and, in theory, there are multiple ownership and financial structure permutations of infrastructure/mine projects.

In SSA, it has been established that a set of factors considerably narrow the realm of PPP Greenfield models that can be used to finance mining transport assets. These are:

- The great variations in mining projects potential output
- The inherent high fixed costs nature of transport assets needed to develop landlocked mines
- The unique challenges related to creating, training and retaining a nonexistent rail and port labor force
- The often clustered, yet landlocked, location of the main iron ore and coal projects
- The fundamental difference in assets class between transport and mining assets
- The fierce price competition that Africa's mining projects face from existing or planned export mining projects located far closer to the most important import markets (i.e., China and South Asia)
- The inability of the public sector to contribute in a sizable manner in the financing of mining-related transport infrastructure
- The uniquely complex political economy that surround proposed projects

Accordingly, it is expected that the bankability of known mining projects in SSA will ultimately hinge on the ability of project's sponsors to deliver a shared used transport facilities model, using a haulage operational regime, underpinned by a single and large anchor client/user to which attractive incentives have been extended, including "foundations rights". Project bankability will also rely on host governments' willingness to allow mining companies to share cross border transport infrastructures. Additionally, they will need to accept that multi usage demands made to transport mining infrastructure operators might need to be restricted to secure, first and foremost, the delivery of an efficient transport system at the lowest possible cost to its anchor user/client, including one that will be exempt from unnecessary public taxes/royalties.

The above recommendations and conclusions mean, realistically, that iron ore and coal projects requiring Greenfield transport infrastructure PPPs in SSA will be developed over several decades, rather than years. Early mover projects will more than likely be the larger projects (>30 mtpa). These will, in turn, provide other medium to small size mining projects the means to achieve the required bankability through the shared used of their transport facilities as export markets become gradually capable to absorb the massive new production capacity that they represent. Figure 12 illustrates the basic institutional and financial structure of this likely solution while Figure 13 summarizes how the proposed solution would meet mining companies' requirements in terms of: 1) control over infrastructure, 2) tariff setting regime, 3) government's role in the project, and 4) project's financial exposure and risks.

Figure 12: Greenfield Mining Transport Assets Financing Scheme Structure Solution



Source: IFC.

Figure 13: Greenfield Share Used Mining Transport Project Alignment with Mining Companies Risk

	Risks and concerns of mining companies	Solutions brought by proposed regime	
<b>Control over infrastructure</b>	<ul style="list-style-type: none"> <li>Ore to be delivered on time to the market and infrastructure to be scalable depending on production and/or new users</li> <li>Minimize operating costs related to the infrastructure</li> </ul>	<ul style="list-style-type: none"> <li>Documentation to provide control over quality, capacity (take-or-pay) and security of the infrastructure</li> <li>Scalability of infrastructure to accommodate for changes in production and/or new users</li> </ul>	+++
<b>Tariff setting</b>	<ul style="list-style-type: none"> <li>Certainty/visibility over tariff level</li> <li>Tariff setting process to be fair, transparent and challengeable</li> </ul>	<ul style="list-style-type: none"> <li>Documentation to provide clear tariff settings framework</li> <li>Tariff to be equitable to both infrastructure operators and clients (both anchor and smaller mining companies) for the project to be successful</li> </ul>	+++
<b>Government role</b>	<ul style="list-style-type: none"> <li>Potential misalignment of interests between public and private sectors</li> <li>Government interference in infrastructure operations</li> </ul>	<ul style="list-style-type: none"> <li>Public and private sectors to reach a compromise under the proposed regime as government is party to the documentation (by awarding the concession)</li> <li>Shared use to mitigate risks related to monopolistic use of infrastructure</li> </ul>	+++
<b>Financial exposure and risk</b>	<ul style="list-style-type: none"> <li>Limit exposure to infrastructure investment</li> <li>Limit risk exposure to infrastructure operations</li> </ul>	<ul style="list-style-type: none"> <li>Infrastructure to be owned, financed, and operated by a third party, limiting mining co.s' financial exposure, albeit anchor mining co. is likely to be a key shareholder</li> <li>Delinking of mining operations' financial risk and infrastructure operations' financial risk</li> </ul>	+++

Source: IFC, Columbia University.

## Annex 1: Case Studies

### ALICE SPRINGS TO DARWIN RAILWAY PPP

**Project:** Alice Springs to Darwin Railway PPP

**Description:** The Greenfield development of a 1,420 km railway linking Alice Springs in central Australia to the port of Darwin, in northern Australia, under a 50-year BOOT concession. The railway completed the north-to-south continental railway linking Adelaide, on the southern Australian coast to Darwin, on the northern Australian coast (the rail link between Adelaide and Alice Springs had been completed in 1980).

**Financial close:** April 2001

**Total project cost:** AUD 1.32 billion<sup>16</sup>

**Concessionaire(s):** Halliburton, KBR, John Holland Group, Barclay Mowlem, McMahon Holdings, Australian Railway Group, PGA

**Lenders:** ABN AMRO, ANZ investment, RBS and SG were the lead arrangers on multiple syndicated loans.

#### Background

Darwin, in the Northern Territory ("NT") of Australia is closer to Singapore and Jakarta than to the Australian cities of Sydney or Melbourne. The purpose of the Alice-Spring Darwin railway project (the "Rail") was to provide a new transport corridor across the heart of Australia, linking the northern and the southern coasts, and offering an alternative route to markets in Asia for commodities and general freight from Australia's industrial heartland. The Rail was also intended to provide improved passenger transport and result in tourism benefits.

#### Project Structure and Financing

A north-south continental railway had been considered in Australia since the 1850s, but accelerated once the NT became a self-governing territory in 1979, and the Adelaide to Alice Springs railway was completed in 1980. In 1995, a memorandum of understanding was signed between NT and the State of South Australia ("SA") governments to establish the basis of the joint governmental approach to create this railway connection, and by 1996 the regional parliaments created AustralAsia Railway Corporation ("AARC"), an SOE tasked with awarding a BOOT concession and holding the titles to the land for railway construction.

APTC awarded the concession to Asia Pacific Transport Consortium ("APTC") in June 1999. APTC was led by Kellogg Brown & Root and included well-established companies such as John Holland Group, Barclay Mowlem, Macmahon Holdings and the Australian Railroad Group. The terms of the concession included the design, construction and operation of the railway for 50 years. Construction began in July 2001 and was completed in September 2003, with the rail traffic starting in 2004.

Total cost of the Rail was AUD 1.32 billion. APTC provided AUD 842 million and AARC provided AUD 478 million in government funding. The financing plan consisted of:

- Equity of AUD 238 million

<sup>16</sup> April 2001 exchange rate: 1 Australian dollar = 0.5158 US dollar.

- Senior debt of AUD 491 million, consisting of a AUD 150 million five-year bullet loan, a AUD 261 million 12-year loan, and a AUD 80 million 12-year rolling stock loan
- Subordinated debt of AUD 112 million, including tier one mezzanine loan of AUD 86 million and tier two mezzanine loan of AUD 26 million
- Government funding of AUD 478 million, including a loan of AUD 50 million and AUD 428 million in works contribution

Contractual structure was very complex, with over 300 documents and 112 separate signatories.

### Subsequent Developments

The Rail project won immediate praise and was named the Global Finance's Asia Pacific Infrastructure Deal of the Year in 2001 and Euromoney's PPP Deal of the Year in 2002. It was lauded for efficient and speedy construction, suitable and inclusive resolution to land and indigenous title challenges (through consultation, compensation and the establishment of a Local Industry and Aboriginal Participation Plan) and resolution of environmental concerns. It was projected to add billions of AUD to the GDPs of the federal and regional governments, and create numerous new jobs.

From an economic viability prospect, however, the Rail faced significant challenges from the beginning. There were concerns whether it would be able to attract shippers of lower value and/or less time sensitive cargoes to switch to the faster, but more costly rail alternative. The project did consider international freight flows and had a very positive view that even without a secured customer arrangement, it would be able to attract both domestic and international freights with mixed loads. The banks' financing model suggests that the Rail needed to capture approximately 45% market share to break even and be able to repay the senior debt within 12 years of operations.

Unfortunately, the Rail failed to secure enough customers. During the first three years of commercial operation, the Rail did not make an operating profit, and by October 2006 APTC was unable to meet the debt service on the senior debt. In December 2006, APTC entered into a Non Action (Standstill) Agreement with the senior debt holders in hope of restructuring the business or refinancing the senior loans. After several years of legal negotiations between APTC and the various classes of lenders, the assets and business were sold in December 2010 to Genesee & Wyoming Inc., the operator contractor. At the time of the sale, APTC had total liabilities close to AUD 900 million, the ratio of total debt to capital was at 256% (as shareholders had to write off their investment, total equity was negative, at AUD 478 million), and interest coverage was at 0.3x.

### Lessons Learned

The Alice Springs to Darwin Rail PPP is an example of a multi-user/multi-modal project and illustrates the level of complexity such projects have, as well as the multitude of risks and the relative lack of clarity on the magnitude of such risks at the beginning of the project. This was considered an "economically defensible, freight expansionary, tourism enhancing, defense enabling, greenhouse friendly, and culturally desirable" project by the government. It was completed on time and almost on budget and experienced no significant operational problems. Yet it failed, because revenues projections were significantly overestimated.

It should be noted that the Rail was developed in Australia, a country with an AAA sovereign credit rating, a long track record of large-scale infrastructure projects, and multiple well-established private sector entities capable of participating in the PPP. Also, the PPP was financed in 2001, at a time when the credit markets were substantially looser than today. It did receive commercial credit funding, although in hindsight it should not have. In the current credit environment, it would be almost impossible for a non-investment grade country to organize and execute such a project, as lenders would not consider taking on traffic risk (a form of demand risk).

**MAPUTO PORT PPP**

**Project:** Maputo Port PPP

**Description:** The rehabilitation of the two terminals of Maputo Port in Mozambique under a 15-year BOT concession. The concession was extended by a further 15 years in 2010, with an option to extend by another 10 years after 2033. The Port was to be developed in conjunction with an 88 km railway, as part of the broader Maputo Development Corridor.

**Financial close:** March 2003

**Total project cost:** USD 68 million

**Concessionaire(s):** 51% international investors initially consisting of Mersey Docks Group (UK), Skansa (Sweden), Liscont (Portugal); 33% Mozambique Ports and Railways (“CFM”), the Mozambique state railway company; 16% Government of Mozambique. Private sector’s 51% share currently held by DP World (UAE), Grindrod (South Africa), and local Mozambican investors.

**Lenders:** Standard Corporate and Merchant Bank (“Standard Bank”), Development Bank of South Africa (“DBSA”), Netherlands Development Finance Company (“FMO”), Finnish Fund for Industrial Co-operation (“FinnFund”), Nordic Development Fund (“NDF”).

**Background**

By the late 1990s, Mozambique was facing a severely degraded national transportation infrastructure, as a result of chronically low economic development and 15 years of civil war. Looking for ways to attract the investment necessary to improve and rebuild the infrastructure, the Government of Mozambique (“GOM”) decided on implementing a PPP program. An initial area of focus for the PPP program was the Maputo Corridor, which represents trade routes that connect Mozambique with its neighbors, and offers the potential to contribute significantly to domestic and regional economic development. The Maputo Corridor ends at the Port of Maputo (the “Port”), Mozambique’s second largest deep water port, which offers a choice for exporting cargo and bulk commodities from Mozambique’s neighbors Botswana, Swaziland, Zimbabwe and South Africa, as well as from developing domestic mines.

As part of the development of the Maputo Corridor, the GOM planned a PPP for the rehabilitation of the Port, as well as a PPP for the rehabilitation and development of an 88 km railway (the “Rail”) that would connect the Port with prospective domestic and foreign customers. Even though the Port and the Rail were structured and organized as separate projects, they were planned as an integrated part of the Maputo Development Corridor; their development was intended to occur simultaneously, as the Port intended to rely in large part on Rail traffic for revenue.

**The PPP Structure and Financing**

The concession for the rehabilitation and operation of the Port was signed in 2003 by Maputo Port Development Co. (“MPDC”). The concessionaire is a joint venture between the public sector, represented by CFM and the GOM (which owns 49% of the concessionaire), and a UK-led consortium with mining and development interests in Mozambique and South Africa, represented by Mersey Docks Group, Skansa and Liscont. MPDC agreed to finance, develop and rehabilitate two terminals of the Port, in exchange for the right to operate it for 15 years (in a classic BOT structure). In 2010, an additional 15 years were added to the concession, with the option for another 10 years to be added post-2033.

The concession includes fixed annual payments (rent) of USD 5 million, indexed to the U.S. Consumer Price Index (to hedge against a drop in the value of the USD). Further, MPDC is required to pay to the Public Port Authority 10% of gross income during the first five years, 12.5% during year five to 10, and 15.5% in years 11 to 15.

The rehabilitation of the Port, which was expected to last three years, was estimated to cost USD 67.5 million. The financing plan consisted of:

- Equity of USD 32 million
- Senior debt of USD 27 million in form of two term loans. A USD 14 million, 12-year term loan from Standard Bank included political and partial commercial guarantee from the Swedish International Development Agency (“SIDA”), a Swedish government agency focused on poverty reduction. A USD 13 million, 10-year loan was provided by DBSA and FMO, respectively the South African and the Dutch government development banks
- Subordinated debt of USD 8.5 million, consisting of a 10-year loan from FinnFund (a Finnish development finance agency) and Nordic Development Fund (a regional IFI)

### Subsequent Developments

As the Port was developed in conjunction with the Rail, the Port concession lasted nearly two years, and was delayed until an operator had been finalized for the planned Rail concession. That process, however, collapsed in 2005, after a decade of negotiations. The Rail PPP was re-launched in 2006, when CFM and Spoornet, a South Africa SOE, signed an agreement of co-operation to harmonize transit rates and border crossings, though not in the form of a new concession.

Fortunately, the initial Rail PPP failure did not have a critical detrimental impact on the Port, even though a significant portion of the projected growth in Port volume was expected to be delivered by the rehabilitated Rail. Instead, miners have been utilizing toll roads and heavy trucks to deliver their product to the Port. Volume has increased from 4.8 mtpa at the signing of the concession to 11.8 mtpa in 2011; it was expected to reach 14 mtpa in 2012, which would represent nearly full capacity. The bulk of the capacity is reserved for coal and magnetite from South Africa and domestic coal from Mozambique.

### Lessons Learned

The Maputo Port PPP is an example of a multi-client/multi-modal project that was designed on an un-bundled basis (whereby a key component of the infrastructure—the railway—was designed and executed as a separate project). It demonstrates the key challenges of un-bundling mining-related infrastructure—namely, that different components of the infrastructure are integral parts of the entire supply chain, and the organization and execution of each component on un-bundled basis adds complexity, takes longer, and could negatively impact the entire infrastructure plan. In this case, the Port had connections to alternative transportation facilities that supplied sufficient volume to replace the lack of Rail traffic.

This case also demonstrates the productive role IFIs and development finance agencies can play in bringing mining-related infrastructure PPPs to market. Without the funding and guarantees of the various unilateral and regional finance development institutions, it is difficult to imagine that commercial lenders would have deemed the project bankable, and without credit financing, it is very unlikely that the private sector sponsors would have been interested. The development financing agencies addressed a funding gap and helped develop what has turned out to be a successful project.

**MRS LOGISTICA—BRAZIL RAILWAY PRIVATIZATION**

**Project:** MRS Logistica PPP

**Description:** The privatization of a 1,674 km railway that connects Rio de Janeiro to Belo Horizonte and Sao Paulo in Brazil under a 30-year BOOT concession. The concessionaire is a consortium of Brazilian mining companies.

**Financial close:** September 1996

**Total project cost:** USD 872.5 million concession price plus multiple expansion investments

**Concessionaire(s):** Companhia Siderúrgica Nacional (“CSN”) 33.4%, Minerarcão Brasileiras Reunidas S.A. (“MBR”) 23.5%, Ferteco 9.5%, Usiminas 6.7%, Cosipa 4%, and others—Ultrafertil, Gerdau, Celato, ABS and Funca 22.9%

**Lenders:** Banker’s Trust

**Background**

Following decades of ineffective investments, financial problems and labor strife, in the 1990s the Brazilian government decided to privatize the railway industry. According to the National Decentralization Program’s premises, objectives of the privatization of the national rail company, Rede Ferroviária Federal S.A.’s (“RFFSA”), were the “...improvement of the rail transport efficiency, the stimulation for better supplied services and maintenance levels, and for a rational exploitation and expansion of the railroad network, equipment and facilities, allied to a feasible economic and financial balance.” The privatization occurred relatively rapidly and was largely completed between 1996 and 1998; the RFFSA was broken down in several components, which were then auctioned off separately. In September 1996, MRS Logistica S.A. (“MRS”), a consortium of several domestic mine (primarily iron ore and steel) companies, was the sole bidder for (and thus winner of) the Southeastern Federal Railroad Network (“SE Railway”) auction. The auction granted MRS a 30-year concession to utilize and lop the public service of rail cargo transportation on the SE Railway.

SE Railways connects Rio de Janeiro to Belo Horizonte and Sao Paulo, and serves as a critical freight transportation link to the region’s main ports of Rio, Sepetiba and Santos. It serves three of Brazil’s most economically important states (Minas Gerais, Sao Paulo and Rio de Janeiro), which are responsible for 65% percent of Brazil’s current GDP. SE Railways included a total of 1,674 km or rail tracks.

**Project Structure and Financing**

The concession was granted at a public auction on the Rio de Janeiro’s stock exchange. The winning bid totaled USD 872.2 million. MRS made a 30% cash down payment of USD 261.7 million, with the balance paid in quarterly installments of approximately USD 13 million to the federal government. The financing plan consisted of:

- Equity of USD 147.2 million. The company funded the 30 percent down payment and its initial working capital requirements through a USD 147.2 million equity infusion from its owners and a USD 150.1 million commercial paper issuance.
- Senior debt of USD 320 million, consisting of two eight-year Eurobonds: a USD 195 million facility and a USD 125 million facility. The senior debt refinanced an earlier commercial paper issue.

**Subsequent Developments**

The MRS concession proved successful almost from the beginning, as its new owners were also its main customers. With several captive clients and a rapidly growing national economy, MRS never faced the traffic and revenue problems that Asia Pacific Transport Consortium, the concessionaire of the Alice Springs to Darwin railway discussed in the previous case study, had. Actual traffic, which consisted primarily from transportation of mining deposits of the sponsors, tracked projections very closely during the first three years of operation; by year four, actual traffic began outperforming the initial projections. The company went through multiple rounds of expansion and, in 2005, began a five-year capital investment plan estimated at USD 890 million, financed partially by the IFC. The company continued expansion, and by 2009, planned to invest USD 1.8 billion to expand its iron ore transportation capacity from 180 million tons to 200 million tons.

**Lessons Learned**

MRS is an example of how a multi-client mining-related infrastructure PPP can be successful. By relying on several captive clients, MRS significantly reduced the revenue risk in the project. According to a credit rating agency, CSN and MBR, the two largest (and together dominant) shareholders in MRS, represented 72% of total tonnage transported and 63% of total revenue of MRS in the first quarter of 1997. Additionally, the relatively simple financial structure likely contributed to the company's ability to grow and expand beyond its initial scope. Of course, a booming national economy and the rapid growth in commodity prices following the 1996 privatization provided a significant boost to MRS' financial fortunes; however, this does not diminish the importance of the risk mitigation strategies that the sponsors implemented in the original financial structure.



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