

Mining India

sustainably for growth



Member of IFCI Group



Foreword



The global economy, emerging from a global financial crisis, is witnessing a fragile recovery. Strength of recovery varies from region to region with a persisting tinge of caution. While few economies particularly in Asia are experiencing healthy rates of growth, though muted, others mainly the European countries, are still recovering. In many countries, the mining and metals sector has in fact led the economy into recovery out of the global financial crisis.

Mineral and metal prices have been volatile, with the prices for a few soaring beyond their earlier peaks on the back of buoyant demand from the emerging markets. Across the board, the need for resource security has led to organizations focusing on resource ownership. The global capacity overhang for metals limits the headroom for their price adjustments and as a result, margins have shifted upstream into mining. The emerging markets specifically are keen to lock up access to future supply and the spotlight is again back on mining.

India with its vast minerals resource potential, has however, leveraged this strength only marginally. Exploration has lagged significantly behind the growth in domestic demand for minerals. Subsequent value addition to minerals has also been limited. Mining can be a significant contributor to the socio-economic development of vast mineral-rich districts across India. Concerted effort from all stakeholders - governments, planners, policy makers, mining industry, technology and service providers and the host communities is required with good governance & responsible leadership. Mining has to adopt sustainability as a core agenda in true spirit for long term value creation for the economy and all stakeholders.

Ernst and Young India works closely with all key stakeholders in the Metal & Mining sector. The organization's professionals have developed deep insights on the sector and provide a wide spectrum of services including strategy, sustainability, Taxation, M&A, supply chain advisory, risk management, process improvement, human capital and capital raising etc.

We hope this report gives insights into mining sector in India and issues around capital raising, policy framework, efficiency and sustainability as relate to the sector as well as some potential way forward for strategic acceleration of the benefits. We express our deep gratitude to ASSOCHAM for giving the opportunity to present this report at the conference.

Anjani K. Agrawal
National Leader - Mining & Metals sector
Partner - Advisory Services, Ernst & Young India



As one of the world's leading mineral producers, India is endowed with a rich resource base of several metallic, non-metallic and fuel mineral that offers huge opportunities to both domestic and global players for investment. The Mines and Mineral (Development & Regulation) Act (MMDR), 1957 which is the fundamental law governing the mining sector has been amended in 1994 with a view to accelerate the inflow of private capital, both domestic and foreign, as also state-of-the-art technology.

The opening up of the sector to private investment has, however presented major challenges to absorption of investment through development in a disruption free and sustainable manner. While sustainable development and technology infusion are key priorities for this sector, it is essential that adequate emphasis be given to survey and exploration activities.

I sincerely hope that the conference would serve as an ideal platform to discuss the issues to evolve creative strategies for realizing the vision of the country.

A handwritten signature in black ink, appearing to read 'D.S. Rawat', with a horizontal line extending to the right.

(D.S. Rawat)
Secretary General
ASSOCHAM



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Indian mining sector overview



Iron ore, bauxite, dolomite, gypsum, limestone, mica, chromite, manganese, zinc and graphite –endowed with vast and abundant reserves of key minerals, India presents significant opportunities in the metals and mining space. The country produces 87 minerals, including 4 fuel minerals, 10 metallic minerals, 47 non-metallic minerals, 3 atomic minerals and 23 minor minerals. In fact, the country is a leading producer of certain key minerals such as iron ore and bauxite. The country's mining industry is, thus, a key segment of the national economy. Currently, mining contributes 2.3% (advanced estimates at 2004-05 prices), to the country's GDP.

Traditionally, iron ore and coal received the highest focus among minerals, as they have for long represented the primary basic material used in most industries. However, over the past few years, the focus has been increasingly shifting toward other minerals such as lignite, petroleum and natural gas, copper, lead-zinc, silver, diamond and rock phosphate.

Currently, the industry is largely fragmented, comprising several small-scale operational mines.

The public sector, which has accounted for 74.5% of total mineral production in India in FY11, continues to dominate the sector. The total value of mineral production (excluding atomic minerals) during 2010-11 has been estimated at INR2,006 billion, reflecting an increase of around 11.83% y-o-y.

While the sector's share in the total GDP has remained flat at approximately 2% over the last 15 years, its base has grown in sync with the national GDP. Financially, the Indian mining sector has performed reasonably well in the last few years, as reflected in the volume and profit growth of some of large mining companies listed on the Indian bourses, namely Coal India, the National Mineral Development Corporation (NMDC), MOIL and Sesa Goa.

India's reserve-to-production (R/P) ratio for several items and the reserves-to-resources ratios remain very low in comparison to those in other mining countries, indicating an opportunity for stakeholders to significantly enhance their engagement with the sector in India.

Exhibit 1: India-R/P ratio of minerals in India

Mineral	Production*	Proven reserves*	R/P ratio	Total resources*	Proven reserves/ Total resource ratio
Iron ore (million tonnes)	213	4960	23.3	25,250	0.20
Coal (million tonnes)	537	113,408	211.2	284,370	0.40
Bauxite (million tonnes)	13.4	539	40.2	3,290	0.16
Gold (kg)	2,214	66,920	30.23	490,810	0.14
Diamond (carats)	71,381	605,577	8.48		0.13
Silver metal (tonnes)	95**	2,283	24.03	10,213	0.22
Zinc and lead metal ('000 tonnes)	794	6,766	8.52	31,467	0.22
Copper metal ('000 tonnes)	721**	1,644	2.28	11,418	0.14

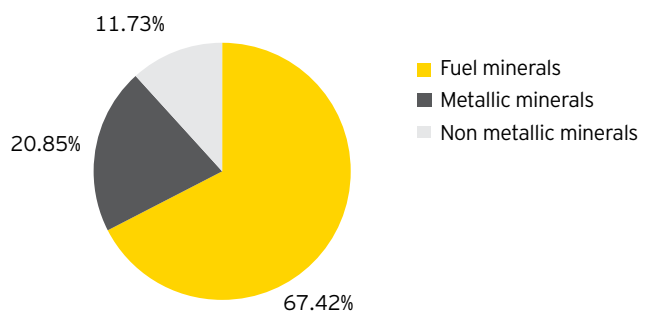
Source: Ministry of Mines FY11 annual report; Indian Minerals Year Book (Advance release) 2009, "The Indian Copper Industry," ICRA Management Consultancy Services Limited, August 2010, via Thomson Research, Ministry of Coal website, Ernst & Young analysis

* Production numbers are estimated of 2010-11; Reserves and resources are as on April 2005, in accordance with the National Mineral Inventory

**Silver and copper production numbers are those of 2009

Mineral production in India was reported at 2,628 mines in FY11, as compared to 2,999 mines a year ago. Of these, 574 are involved in coal and lignite extraction, 608 in metallic minerals and 1,446 in non-metallic minerals. Currently, Andhra Pradesh and Gujarat account for the highest number of mines in the country (377 and 372 mines, respectively).

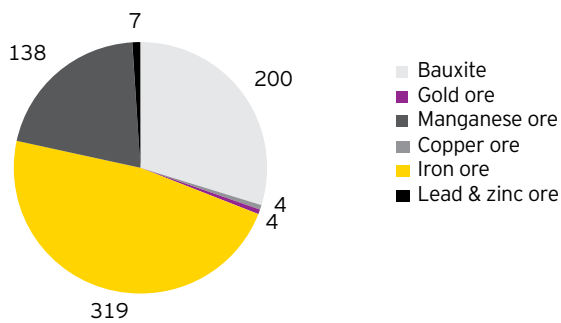
Exhibit 2. Value by types of minerals (FY11)



Source: Ministry of mines 2010-11 annual report



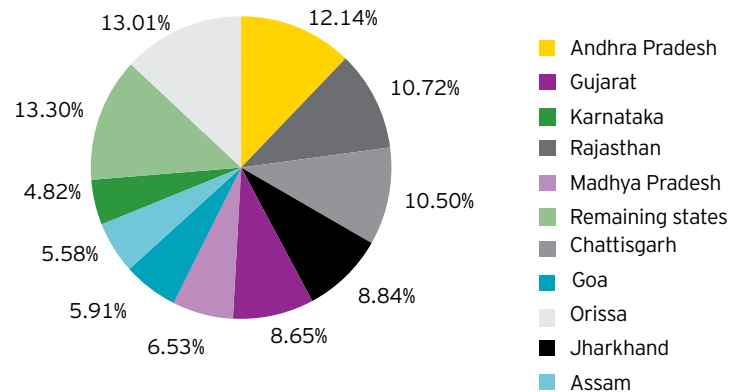
Exhibit 3. Minerals by number of mines (FY10P)



Source: Ministry of mines 2010-11 annual report

Mineral production in India is primarily concentrated in Andhra Pradesh, Chhattisgarh, Jharkhand, Rajasthan and Orissa. In fact, these five states cumulatively contributed more than 40% of national mineral production in FY11 in terms of value.

Exhibit 4. Share of states in value of mineral production 2010-11 (estimated) excluding offshore areas

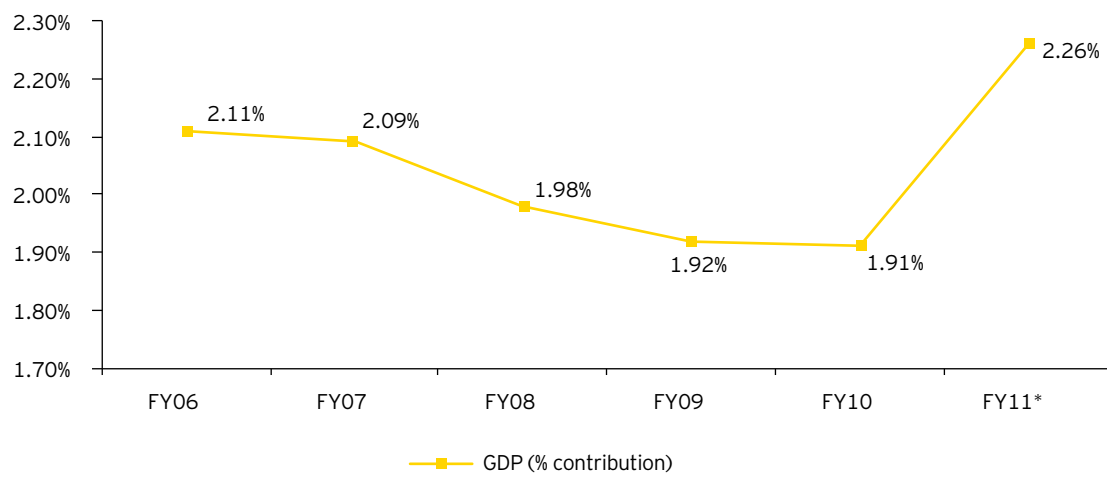


Source: Ministry of mines annual report 2010 -11

The mining industry's contribution to India's GDP has increased from 1.9% in FY10 to 2.3% (advanced estimates at 2004-05 prices) in FY11. The industry's contribution to the GDP has been estimated at INR1,105 billion during the same period. However, industry growth lags behind overall economic growth in the country, primarily as a result of infrastructure bottlenecks, policy and other challenges.



Exhibit 5. Mining industry's contribution to GDP (in %)



Source: Ministry of Mines annual report FY11

* In FY11, the base year was changed from 1999-2000 to 2004-05.



Exploration and development in India

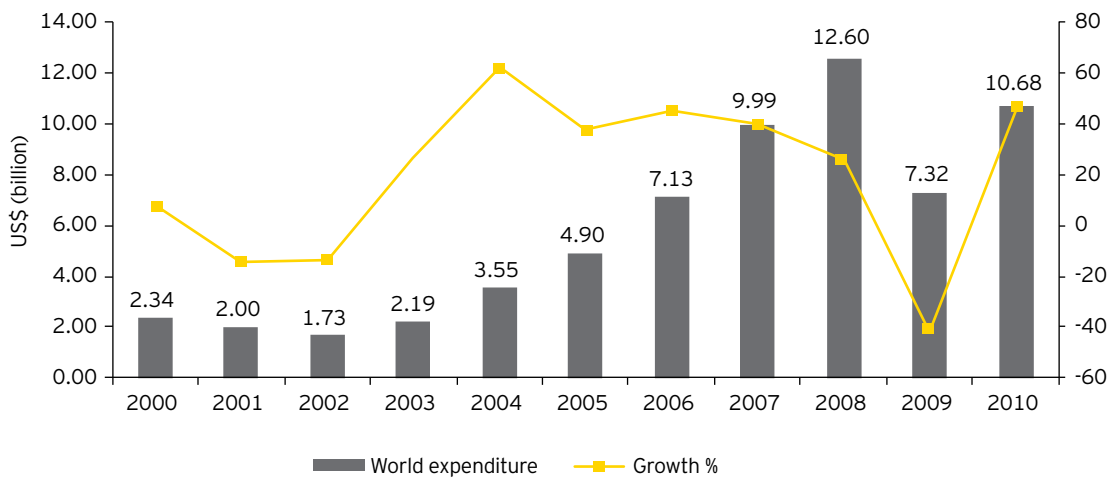


While the overall growth of the Indian mining sector may appear to have been satisfactory during the past decade, upstream exploration activities need a major boost. To date, the lack of funds committed for exploration, along with relatively in-coherent mining policies, has restricted the growth of mineral exploration in India.

2.1 Exploration expenditure

Improved commodity prices and robust market dynamics for minerals have prompted most global mining companies to increase their exploration budgets, resulting in a 45% y-o-y increase in the global exploration budget to US\$10.7 billion in 2010.

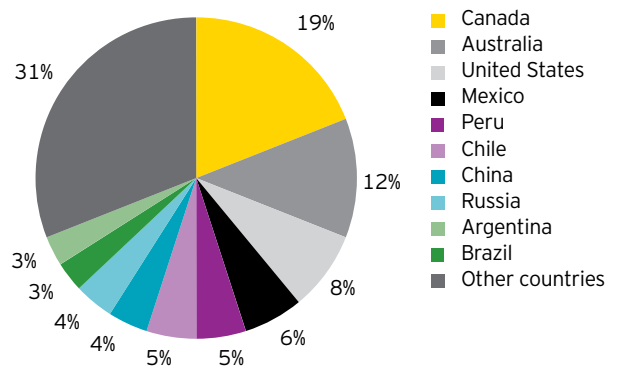
Exhibit 6. World exploration expenditure



Source: Metals Economic Group website

Globally, the top 10 countries accounted for 69% of the global exploration budget. In 2010, Canada and Australia were the two leading countries in terms of their share in the global exploration expenditure, with Canada's lead over Australia increasing from about US\$220 million in 2009 to US\$770 million in 2010. Emerging economies such as China, Brazil and Russia also featured among the leading 10 countries in the global exploration budget, with shares of 4%, 3% and 4%, respectively. Recent trends indicate that China's exploration spend is continuously increasing, with allocation to exploration outside the country rising rapidly. In 2010, Africa attracted even more exploration funds than Australia.

Exhibit 7. Exploration budget for the top ten countries, 2010



Source: Metals Economic Group website

India's share in the global exploration budget continues to be negligible at less than 0.5%. Government entity, the Geological Survey of India (GSI), along with a few other organizations that have limited budgetary support, conduct major regional prospecting and grass root-level field exploration in the country. As a result, based on various reports, suitable regional exploration has taken place at only 8%-13% of areas, way below that of mining majors such as Australia. Most areas in India are yet to undergo geophysical mapping and geo-chemical surveys.

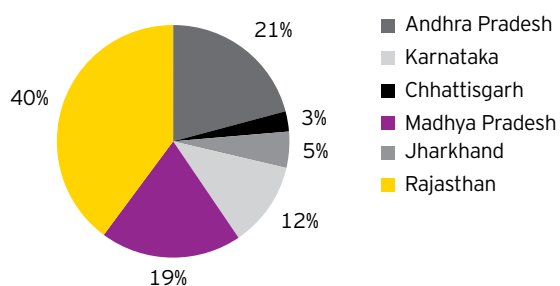
2.2 Status of reconnaissance permits, prospecting licenses and mining leases in India

The Indian Bureau of Mines' *Indian Minerals Year Book 2009*, released during FY11, provides the status of various mining concessions in the country. The following section encapsulates the status.

Reconnaissance permits (RPs)

In 2008-09, the Government of India (GoI) approved 19 RPs covering an area of more than 40,000 sq. km. The maximum number of RPs has been granted to Rajasthan (7), followed by Madhya Pradesh (4), Andhra Pradesh (3), Karnataka (3), Chhattisgarh (1) and Jharkhand (1). The maximum concessions provided during the year were in precious minerals and base metals.

Exhibit 8. Area granted under RPs in 2008-09 (40,052 square kilometers)

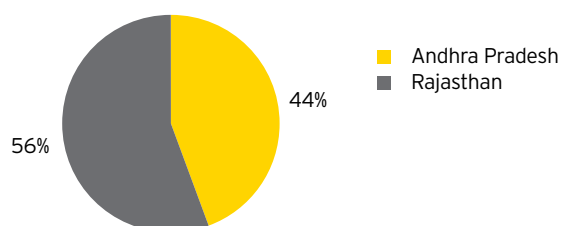


Source: "Advance release- *Indian minerals year book 2009*," Indian Bureau of Mines website

Prospecting licenses (PLs)

During 2008-09, PLs were executed only in two states – Rajasthan and Andhra Pradesh. Of the 8 PLs executed, Rajasthan accounted for 7, while Andhra Pradesh accounted for 1. The area covered under PLs witnessed major fluctuations, starting from 1,347 hectares (ha) in FY07 to 6,036 ha in FY08 to 426 ha during 2008-09. All PLs executed were in the private sector. The minerals covered included limestone, wollastonite, china clay, soapstone and associated minerals.

Exhibit 9. Area granted under PLs in 2008-09 (426 ha)

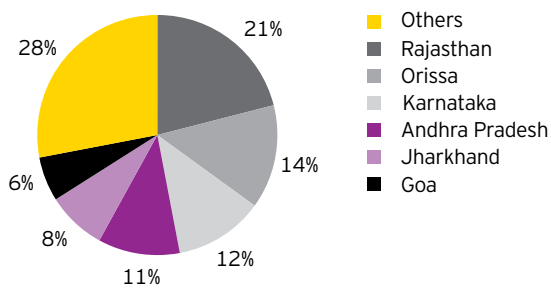


Source: "Advance release- *Indian minerals year book 2009*," Indian Bureau of Mines website

Mining leases (MLs)

By the end of FY09, 9,415 MLs were in force across 23 Indian states, spanning 491,445 ha. Of the total, 8,915 (95%) MLs, accounting for an area of 3,46,111 ha (70%), belonged to the private sector, while the remaining 500 (5%) leases, with an area of 1,45,334 ha (30%), were in the public sector. These leases covered 59 metallic and non-metallic minerals (excluding lignite, coal, petroleum, natural gas, atomic minerals and minor minerals). The maximum mining lease area was covered by Rajasthan (21%), followed by Orissa (14%) and Karnataka (12%). While 10 states accounted for around 92% of the total mining lease area, the other 13 states accounted for the remaining 8%.

Exhibit 10. Number of mining leases till 31 March 2009 (9,415)



Source: "Advance release- Indian minerals year book 2009," Indian Bureau of Mines website

In metallic minerals, some leases were awarded for copper, gold, lead and zinc, but there were no leases for the silver and platinum group of metals during 2008-09.

Almost 95% of the MLs are awarded to private sector players and the remaining 5% went to the public sector, with central government undertakings and state government undertakings receiving 2% and 3%, respectively. However, in terms of production value, the private and public sector account for 25% and 75%, respectively.

The Gol's focus on mining has revived and, accordingly, between April and November 2010, 72 mining projects received environmental clearance and 152 projects received "terms of reference" clearance.





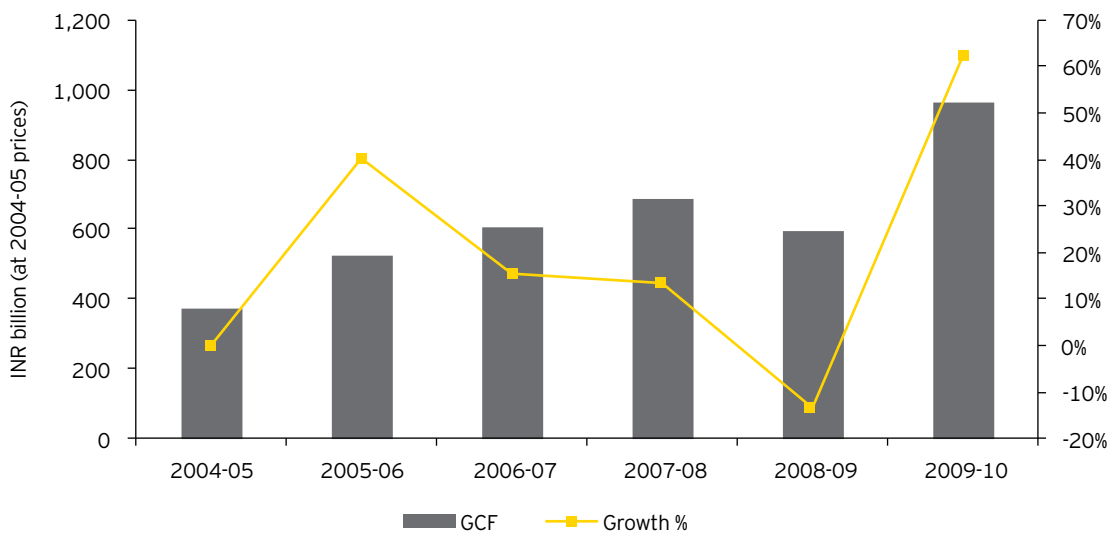
Financing options and strategies



3.1 Indian scenario

Over the past few years, all industry sectors in the country have attracted large amounts of capital. According to national accounts, between FY05 and FY10, average annual growth of new investments was 11.3% as against average GDP growth of 8.6%. In terms of gross capital formation (GCF), the mining sector registered the highest CAGR of 20.82% during the same period. Although the contribution in FY09 declined due to the global economic meltdown affecting investments, it should be considered as an exceptional year where investor sentiment was at its lowest. On the back of global recovery, GCF in the mining industry registered 62 % growth y-o-y during FY10 as against a 43.8% revival in aggregate.

Exhibit 11. Gross capital formation (GCF) in mining industry



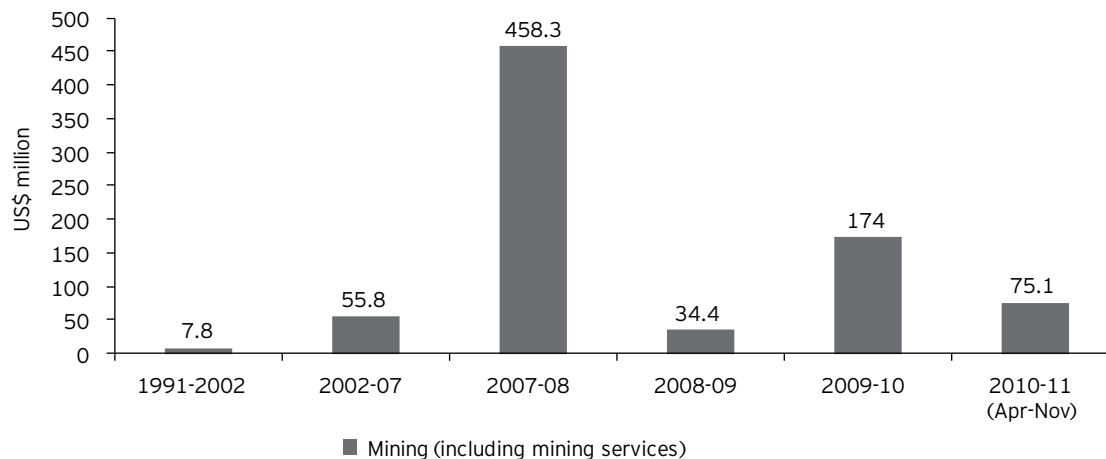
Source: Economic survey 2010-11

FDI flow

During the last decade, FDI played a crucial role in the growth of the country's industrial sectors. Equity flow grew from US\$2.23 billion in FY04 to US\$25.89 billion in FY10.

FDI inflow to the mining industry increased significantly after FY07, as Exhibit 12 illustrates. During FY08, in a single year, the Indian mining industry attracted more FDI capital than it received in the last 20 years.

Exhibit 12. FDI inflow in Indian mining industry

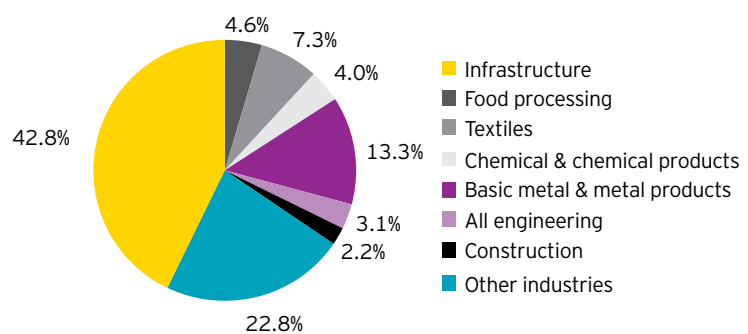


Source: Economic survey 2010-11

Credit flow

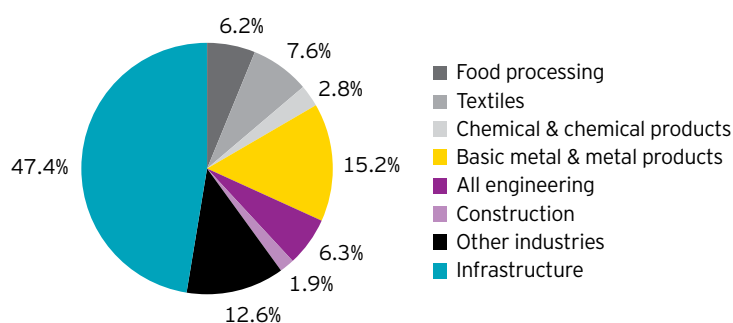
During FY11, credit flow to the industry remained strong. While infrastructure continues to occupy the largest share of incremental industrial credit, the share of other industry groups such as basic metal and metal products and engineering increased over the previous year. During 1Q12, the basic metal and metal products, petroleum and mining, and quarrying sectors collectively accounted for one-third of incremental credit flow.

Exhibit 13. Incremental industrial credit flow (FY10)



Source: Reserve Bank of India annual report FY11

Exhibit 14. Incremental industrial credit flow (FY11)



Source: Reserve Bank of India annual report FY11

Although India is able to attract additional flows in the domestic mining industry, it should explore other financing options and strategies to attract and sustain these investments. In the world of globalized capital markets and investment liberalization, it is imperative for any resource-based country to reflect and address the expectations of global investors.

3.2 Global capital raising

Globally, the mining and metals industry raised a record US\$329 billion during 2010, a 54% increase over 2009. Loans and bonds, followed by IPOs/FPOs, lead in raising capital for the industry. Supported by restored investor confidence and a bullish bond market, 2010 saw record levels of financing and the revival of IPOs. The mining and metals industry held the highest market share of IPOs and equity-related issues of all industries globally (by volume).

However, raising capital reflects diverging fortunes of mining industry players. Majors, now stronger with deleveraging achieved over the last few years focused on organic growth, were largely funded by cash flow from current operations, supported by favorable debt market conditions for refinancing. However, juniors continued to face difficulties in accessing debt markets and, thus, relied on equity for growth and unlocking value, with sentiment in the equity capital market improving.

The share of equity (including IPOs) declined from 42% of proceeds in 2009 to about 25% during 2010 at US\$73 billion. This was not due to the absence of capital but due to decreased demand from under-g geared majors (the gearing of majors was at historically low levels) IPO activity centered around junior mining companies raising small amounts of development capital. Traditional mining exchanges such as Australia and Toronto, followed by London, saw the largest IPO proceeds. Meanwhile, exchanges such as Hong Kong and Mongolia (in collaboration

with the London Stock Exchange) are also emerging successfully.

The Indian mining sector also saw some of the largest equity offerings driven by government initiatives to raise finance. These included IPOs of state-owned mineral companies such as Coal India and MOIL and an FPO by the NMDC. These offerings were immensely successful, attracting significant investor interest due to the reserves bases and pricing power of companies. Rising commodity prices have helped sustain investor confidence in the equity of such companies.

Bond proceeds reached US\$75 billion in 2010, exceeding the record US\$61 billion achieved in 2009. Companies capitalized on historically low coupons to refinance existing debt on more favorable terms. The share of high yield (below the investment grade) proceeds increased to 21% vis-à-vis 11% in 2009. Investment grade issuers, in the face of strong demand from investors, took back pricing power from investors, reducing the cost of debt on average to 4.8% from 5.3% in 2009. The average bond tenor also increased from 8-9.2 years, while loans with a shorter tenor increased at 3.5 years average. Emerging markets dominated bond issuance, with China, Brazil, South Korea and Russia accounting for two-thirds of volume (half of the proceeds).

Bank lending jumped by 195% to US\$184 billion in 2010, thereby representing more than 50% of

financing activity in the mining and metals sector. The steel, coal and iron ore sectors were most active. Bank loans offered flexibility amid a volatile environment, also with short-term bridging loans. However, lenders were selective only to companies with strong balance sheets. The pricing of investment-grade lending globally averaged 122 basis points above LIBOR, as compared to 344 points in 2009. However, development lending to pre-production companies remain scarce and expensive.

In future, capital raising among majors is expected to be increasingly allocated to growth rather than financial restructuring - raised either through equity or project finance for the financing of acquisitions. Project development is expected to be financed through a combination of internal cash generation (as long as cash flows remain strong), bonds and loans. Recent facilities for transactions reflect the onset of banks becoming progressively willing to lend for M&A.

Given the traditional barriers to debt markets for juniors, equity is expected to continue to move into juniors and mid-tier through IPOs, spin-outs, placements or off-take arrangements. Juniors need to be increasingly innovative in their approach to financing by including majors, off-take partners, and multi-lateral development agencies. Investors' appetite for exposure to emerging markets is expected to boost globalization and cross-border investments.

3.3 Capital raising for exploration companies

Capital raising for exploration companies:

The Gol intends to allow several mining companies to list on stock exchanges along the lines of Australian and Canadian stock exchanges. It has also proposed venture capital (VC) investment in the sector. The Gol intends to encourage VC financing by flow through shares and allowing Indian exploration companies to issue global depositary receipts (GDRs) without prior testing in the Indian market.

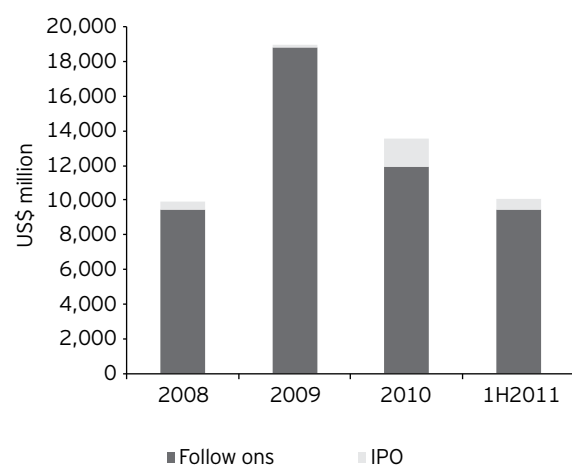
The establishment of a local risk capital market in India to fund greenfield mining and exploration projects

could be the key to unlock the untapped potential of the country's vast natural resources. The move will encourage global mining companies to enter India's resource mining sector, as it will improve access to capital and also spread the risk involved in exploration and mining undertakings.

Drawing a parallel from the oil and gas industry, some junior players from India have had successful equity offerings and listings in overseas markets, particularly the AIM. Even an Indian mining company, Kolar Gold, successfully raised capital on AIM.

In a nutshell, some of these overseas jurisdictions have increased understanding and appreciation and increasingly in-depth and stable pools of capital for natural resources companies. Therefore, they can provide improved fundraising opportunities for junior mining exploration companies from India. Some of these jurisdictions, including London, are also global financial hubs and, therefore, have significant debt pools as well. These tend to be very attractive for companies with global aspirations.

Exhibit 15. Proceeds from equity issues by junior mining companies on AIM, TSX, TSX-V and ASX



Source: Thomson Financial, Ernst & Young

4

Enhancing operational efficiency and managing costs



During the financial crisis, the decline in demand forced some mining companies to undertake production cuts, which resulted in operations at some mines becoming uneconomical, which, in turn, led to the closure of a few mining operations. With the volatility of commodity prices, companies are increasingly focused on increasing profitability primarily by maximizing output from operations and reducing the unit cost of production.

Enhancing efficiency and productivity

Companies are focusing on three key areas to improve efficiency and productivity:

- ▶ Improve operational performance
- ▶ Manage capacity utilization
- ▶ Undertake strategic joint ventures (JVs)

1.1. Improve operational performance

Mining companies are undertaking multiple measures to improve operational performance:

a. Asset management

The focus of companies on improving asset reliability is on the incline. As part of asset reliability programs, companies are focusing on adopting proactive maintenance strategies, e.g., predictive and reliability-centered maintenance.

b. Asset utilization and optimization

Mining companies have begun to adopt automation e.g., mine-management systems, with the objective of improving asset utilization inside mine areas. Capacity planning is largely based on maximizing the use of existing assets.

A case in point is that of an Indian metals and mining major, which has focused extensively on asset optimization and reduced production costs. The company is in the lowest cost quartile in terms of production costs in its Indian copper smelting and refining business and zinc mining operations. It intends to continue improving its production processes and methods to enhance operational efficiency.

c. Shared services approach

Mining companies, too, are starting to evaluate ways in which to improve operations, standardize processes

and reduce costs by implementing a shared service approach to capture the benefits of economies of scale for common initiatives. Common processes that have been transitioned to a shared services model include procurement, information technology, communication and pay roll. Some operators are now considering other activities that could be centralized, including operational planning and maintenance scheduling. This approach, apart from rationalizing costs, drives considerable process quality improvement.

d. Yield, quality and value addition

Improved operating practices in a bid to reduce possible waste is the first step toward improving yield improvement. With improved technologies available for enhanced measurement and control over product quality and consistency, yield enhancements can be achieved.

For most minerals, there is scope for downstream value addition through further processing. Although margins in the mining business have recently moved upstream, mining players have much room for significant value addition to address commodity price volatility, expand their addressable market, and enhance control over supply chains.

1.2. Manage capacity utilization

Companies in the mining industry are increasingly facing volatile demand. In such a scenario, players





are being very careful not to resume idle capacity and instead maximize value from their current output; any oversupply could pose a risk to prices, particularly in the wake of a drastic decline in demand.

For instance, due to a volatile LME and the unavailability of coal an aluminum company kept its overall volume of both alumina and aluminum more or less steady during 1Q12 and produced more value-added products from the same raw material. Thus, it earned more revenue per tonne and was able to maximize profit in a scenario characterized by capacity constraints.

1.3. Undertake strategic JVs

While contract mining as a concept is still embryonic in India, players are evaluating the possibility of contracting to specialized agencies. The key objectives behind contracting to third-party agencies are to improve mining efficiency and share capital risks.

One of the world's largest contract-mining companies, based in Australia, has entered a

contract-mining project with an India-based power utility major to develop and operate a greenfield coal mine in Jharkhand.

Another case in point is a state-owned listed mining company that owns iron ore reserves. The company is currently in talks with several other public sector mining companies for the contract mining of its reserves of iron ore, manganese and dolomite.

Managing costs

Key production costs for mining companies comprise stores and consumables; repairs and maintenance; power costs; manpower; and mine development. Stores and consumables, repairs and maintenance, power, and manpower costs contribute 90%-95% of mining companies' production costs.

Managing costs enables companies, to secure favorable returns on investment in order to grow their businesses. Companies face risk in terms of financial health if they fail to manage the costs that a downturn





forces on them. Many companies have responded by cutting costs and reducing borrowings to stabilize their operations. This trend tends to accelerate in the course of a downturn, with businesses putting cost management at the top of their agendas.

The following are the key areas that mining companies focus on to optimize costs:

- ▶ Overall equipment effectiveness (OEE) improvement
- ▶ Energy efficiency
- ▶ Manpower efficiency
- ▶ Logistics costs
- ▶ Working capital management

Companies have learned many lessons from the recent downturn, but continuous improvements in processes and the adaptability to an ever-changing global environment will remain key focus in the near future.

Skill development

Beyond these productivity enhancement measures, the Indian mining industry needs to focus on developing mining professionals and a skilled resource base. According to a Confederation of Indian Industry (CII) study on mapping human resources and skills for the mining industry in India, the lack of skilled workers is likely to impact industry productivity. There is a significant shortage of trained operators such as blasters, short firers, drillers, heavy machine operators and surveyors. Further, infrastructure to train people at this level is also absent. The industry, which currently lacks appeal among the majority of the country's educated youth, must work cohesively toward creating a resource pool with requisite skill sets to address the skills shortage in India, which has also been a key risk for the industry globally.



Policy, regulatory and taxation framework



The policy uses certain mining legislations such as the MMDRA, 1957, and the Mines Act, 1952, together with their respective rules and regulations. The MMDR Act contains two sets of rules – Mineral Concession Rules, 1960 (MCR) and Mineral Conservation and Development Rules, 1988 (MCDR) – to deal with major minerals (state governments are free to deal with mineral concessions related to minor minerals) and enable the Indian Bureau of Mines (IBM) to monitor and regulate mining activity in the country, respectively.

In the Mines and Minerals (Regulation and Development) Act (MMRDA) Amendment 1999, RPs were introduced, and the FDI cap was increased from 50% to 100% for all minerals, except for diamonds.

Subsequently, FDI in the diamond industry also increased to 100%.

The National Mineral Policy of 2003 paved the way for foreign companies to invest in the Indian mining industry.

However, the industry faced various challenges under the NMP 2003 policy:

- ▶ Small size of PLs and MLs: The sizes of PLs and MLs were too small, at only 25 sq. km. and 10 sq. km., respectively.
- ▶ No adherence to time limits: The time taken between the application and the grant of permission ranged from six months to three years or more.

- ▶ No level playing field: In India, public sector companies were given priority in the allocation of licenses. The 1993 NMP did not succeed in creating a level playing field for private companies.
- ▶ No significant government concession: The policy neither offered any tax incentives on exploration expenditure, nor did it encourage companies to get listed to raise funds for exploration.
- ▶ Lack of exploration: The GSI was stretched due to its scarce resources and, therefore, barring coal and iron ore, minerals remained largely underexplored.
- ▶ Ambiguity in laws: There is a considerable overlap between the relative roles of the States vis-à-vis the Centre.
- ▶ Procedural complexities: Before an ML can be executed, a large number of clearances (not available at a single window) at both the central and state levels needs to be taken under the MMDR Act, MCR, MCDR and the Forest (Conservation) Act, Environment (Protection) Act.
- ▶ Security of tenure: No security of tenure existed between the RP and PL stages. Moreover, a preferential right for conversion from one form of concession to the next did not guarantee an exclusive or absolute right to prospect or mine any mineral deposit found within the area covered by the RP or PL.

To make the mining industry increasingly efficient and transparent, the GoI formed the Hoda Committee, which made several recommendations, which are summarized below:

- ▶ “Open sky” policy at initial stages, i.e., at the stage of RPs, thereby removing exclusivity
- ▶ Seamless transition from RP to PL without any discretion by government bodies
- ▶ Flexibility in interim tenures
- ▶ Increase in the area for each type of concession
- ▶ Security of tenure to be ensured rather than preferential treatment
- ▶ Timely clearance of mineral concessions
- ▶ Value addition requirement to be given preference, but not an absolute requirement
- ▶ Changes in royalty structure to ad valorem
- ▶ Simplification of the environmental clearance requirement
- ▶ Setting up a mineral development fund (MDF)

The recommendations of the Hoda Committee and the National Mineral Policy are in the process of being implemented. The GoI is finalizing a draft act to replace existing legislations for the effective implementation of these recommendations.



Exhibit 16 : Focus in the new draft MMDR Bill

Issues	Hoda Committee recommendations	Position in draft law
Exploration licenses	Move from the two-tier (RP and PL) model to the three-tier systems of RL, LAPL* and PL.	The draft law includes a provision for a three-tier system.
Reconnaissance license	Adopt an “open sky” policy of granting non-exclusive RPs without any preferential or automatic right to a PL.	This is reportedly under debate.
Duration of concessions	The total period of exploration under RP/PL or RP/LAPL should be eight years.	The durations for LAPL and PL are in line with the committee’s recommendations.
Size of area	Maximum area: RL-10k sq. km.; PL-500 sq.km.; LAPL-10,000 sq.km., ML-100 sq. km.	The draft law adopts the size of area recommended.
Transferability of licenses	Increased transparency can be achieved by stating that an RL/PL/LAPL/ML has the right to transfer their license to a qualified entity. There should be a single license-approving authority.	The draft legislation has a separate section outlining the transfer of licenses with procedures and approving agencies.



Exhibit 16 : Focus in the new draft MMDR Bill

Value addition	In case there are multiple applicants for a license, preference should be given to an applicant who proposes to set up an industry based on the mineral.	Instead of giving direct preference, the draft legislation recommends a review of applicants based on weighted criteria, including value addition and the end-use of the mineral.
Royalties	Set up a study group to affix detailed rates of royalty, dead rent, and other levies on the basis of recommendations. Move to ad-valorem rates of royalties.	Set up the National Mineral Royalty Commission to review existing rates of royalties and guidelines for the calculation of ad-valorem rates and recommend revisions.

Sources: Planning Commission, Ministry of Mines
 * LAPL: Large Area Prospecting License

Security of tenure is a key hurdle that has resulted in the slow growth of exploration and mining in the country. Initially, no security of tenure existed between the RP and PL stages. Moreover, a preferential right for conversion from one form of concession to the next does not guarantee an exclusive or absolute right to prospect or mine any mineral deposit found within the

area covered by the RP or PL. The current draft of the proposed MMDR Bill deals with most of these issues.

Direct Tax Code

The proposed Direct Tax Code (DTC) provisions, expected to be applicable from 1 April 2012, do not provide any specific incentive for mining and exploration companies.

Exhibit 17: DTC in comparison to existing tax provisions

Relevant provisions	Existing tax provisions	Provisions under DTC
Deduction for expenditure	<p>Under the Income Tax Act, 1961 (Act), deductions for expenditure on prospecting or developing mines was permitted in the following manner:</p> <ul style="list-style-type: none"> ▶ Indian company to be engaged in prospecting for, or extraction or production of, any mineral ▶ Expenditure incurred wholly and exclusively in relation to prospecting for any mineral or development of mines or any other natural deposit ▶ Expenses incurred at any time during the year of commercial production or four years immediately preceding the year of commercial production ▶ Deduction allowed in 10 equal installments beginning with the year of commercial production 	<p>Expenditure incurred by a person resident in India wholly and exclusively on any operations relating to prospecting for any mineral or development of a mine or other natural deposit of any mineral shall be treated as deferred revenue expenditure. Amortization over a period of 10 years is permitted for such deferred revenue expenses.</p>
Depreciation rate	<p>Depreciation rate of 100% prescribed in respect of assets (tubs, winding ropes, haulage ropes, sand stowing pipes and safety lamps) used in mines and quarries</p> <p>Know-how – any industrial information or technique likely to assist in the working of the mine, oil well or other source of mineral deposits (including searching for discovery or testing of deposits for the winning of access thereto) eligible for depreciation as an intangible asset</p>	<p>Increased depreciation rates in respect of assets (tubs, winding ropes, haulage ropes, sand stowing pipes and safety lamps) used in mines and quarries retained at 100% as the act</p> <p>No such provision under the DTC</p>
Carry forward	<p>Business losses to be carried forward for a maximum period of eight years</p>	<p>No limit for the carry forward of losses prescribed under the DTC</p>

Exhibit 17: DTC in comparison to existing tax provisions

Tax collection at source	Provisions relating to "tax collection at source" apply to grant of lease or transfer of any right therein for mining or quarrying and applicable rate is 2%	Rate of "tax collection at source" for grant of lease or transfer of any right therein for mining or quarrying raised to 3%
Scientific research and development		Weighted deduction (equal to 200%) permitted under the DTC in respect of expenditure incurred on creating and maintaining, and carrying out scientific research and development at an in-house facility; however, expenditure incurred on prospecting, exploring or drilling for or producing minerals not included in definition of "scientific research and development," which effectively means weighted deduction not permitted for exploration and mining companies

Sources: Income Tax Act 1961; The Direct Tax Code, 2010

6

Sustainability in mining



Mining products are essential to contemporary societies and economies. Many basic needs cannot be met without such products. However, simply meeting market demand for mineral commodities falls far short of meeting society's expectations of industry. Internationally, it is widely recognized and acknowledged that the development and achievement of a society's economic goals are intricately intertwined with its social and environmental development. This has led to increased focus on sustainable development among governments and

businesses alike. In this context, one of the greatest challenges facing the world today is balancing economic goals with environmental and social concerns within the framework of effective governance systems. The mining and minerals sector has the potential to contribute to other societal goals and sustainable development, through direct and indirect job creation, economic development, and energy and resource efficiency targets, for example.

6.1 Key issues

Exhibit 18: Key sustainability issues in the mining industry

Contribution to GDP and wealth creation	Biodiversity loss	Bribery and corruption
Costs, sales and profits	Emissions to air	Creation of employment
Investments (capital, employees, pollution prevention and mine closure)	Energy usage	Labor/management relationships
Shareholder value	Land usage, management and rehabilitation	Relationship with local communities

Exhibit 18: Key sustainability issues in the mining industry

Value addition	Nuisance	Stakeholder involvement
Distribution of revenues and wealth	Product toxicity	Wealth distribution
	Resource usage and availability	
	Sold waste	Employee education and skills development
	Global warming and other environmental impacts	Equal opportunities
	Water usage, effluents and leachates (including acid mine drainage)	Health and safety
		Human rights and business ethics

Source: China Sustainable Development Study

► Economic issues

One of the major challenges for the Indian mining industry lies in ensuring long-term economic sustainability. Apart from traditional economic parameters such as sales and profits, other economic factors such as investments in social sectors and payments made to the government also need to be taken into account.

The mining industry needs to develop infrastructure and institutions to ensure the economic sustainability of communities. This goes well beyond the life cycle of mining operations. Additionally, the mining industry is strongly encouraged to transparently reflect all payments. As such, payments released to society should be based on stakeholders' needs and prioritized accordingly for effective fund utilization.

► Environmental issues

The depletion of non-renewable resources and environmental pollution as a result of air emissions, the discharge of liquid effluents, and the generation of large volumes of solid waste have affected the environment. In addition, extraction activities have a visual impact on the landscape and disrupt the

natural habitat, resulting in loss of biodiversity. The mining of some types of minerals may also contaminate waterways and, thus, negatively affect biodiversity.

► Social issues

Occupational health and safety (OHS) is among the major employee-related challenges facing the mining and minerals industry. The most common employment-related diseases in the industry are pneumoconiosis, silicosis, asbestosis and lung cancer.

Employee education and skill development are equally important priorities. Several studies suggest that the industry faces a challenge in attracting high-quality employees, due to the negative image it is associated with in terms of low job prospects and poor quality of life.

Further, unfairly low wages, child labor, the exploitation of women, and the violation of indigenous rights are among the issues associated with the industry. As such, the protection of human rights is another relevant social concern that needs addressing while considering the sustainability of the mining and minerals sector. Other associated issues include compensation and resettlement packages and support for those who have been displaced through mining activity.

Exhibit 19: Nine key challenges in sustainability

Substantial cost burden a threat to sustainable development

The biggest challenge for sustainable development in mineral companies is to attach the concept to financial success. Companies are increasingly facing issues of labor and health costs, post-closure, as well as other social costs.

Poor land-acquisition practices

Land, when acquired without the consent of local people, creates tremendous concern. Further, resettlement often leads to landlessness, increased unemployment, lack of access to basic housing, and unavailability of common resources for such groups of people.

Environmental hazards

Mining companies are often faced with the challenge of ensuring minimal impact on the environment. These companies have to think of waste minimization and build processes accordingly. The most commonly used tool, i.e., the Environmental Impact Assessment (EIA) has been made mandatory for most large-scale development projects.

Lack of transparency

Mining companies are often faced with the challenge of ensuring minimal impact on the environment. These companies require handling immense quantities of waste and need to develop ways to internalize the costs of acid drainage. The EIA has been made mandatory for most large-scale development projects.

Land management

Other issues that need to be managed in the context of mineral development are compensation, resettlement and land claims of indigenous people.

Challenges faced by small-scale and artisanal miners

Small-scale and artisanal miners constitute a section of poor people that use simple tools and equipment and often work in the harshest and most dangerous conditions. Such activities impact the environment in the form of mercury pollution; direct dumping of tailings and effluents into rivers; threats from improperly constructed tailings dams; river damage in alluvial areas; river siltation, erosion damage and deforestation; and landscape destruction.

Improper handling of minerals posing potential risk

Current patterns of mineral usage are facing a growing number of challenges. These range from concerns around efficiency and waste minimization to the risk associated with the use of minerals. Companies at different stages of the mineral chain can benefit from learning to collaborate, exploring further recycling, using and re-manufacturing products, and supply chain assurance.

Sector governance: role, responsibilities and instrument of change

Sustainable development requires new integrated systems of governance. Voluntary codes and guidelines are needed to promote improved practices in areas where the Gol is unable to effectively perform its role as a regulator.

Local communities and mines

The social upheaval and inequitable distribution of benefits and costs within communities can create social tension. Ensuring improved health and education after mine closure is a further challenge.

6.2 Evolving response of the GoI to sustainability

The Ministry of Corporate Affairs (MCA) has assumed the role of an enabler, facilitator and regulator for the effective functioning and growth of the corporate sector. A number of initiatives are underway on the legislative, service delivery and capacity building fronts in a bid to provide the corporate sector with an enabling regulatory environment conducive to growth. Simultaneously, the MCA is also focusing on various issues related to inclusive growth in relation to the development of the corporate sector. The subject of corporate social responsibility – also referred to as

sustainability – has evolved over the past few decades, from simple philanthropic activities to integrating the interest of business with that of communities, wider societies and the environment in which it operates. By exhibiting socially, environmentally and ethically responsible behavior in the governance of its operations, business can generate value and long-term sustainability for itself while making a positive contribution to society.

The MCA launched the *National Voluntary Guidelines on Social, Environmental and Economic Responsibilities of Business 2011*. The report cites nine principles for responsible business:



Source: Ministry of Corporate Affairs (MCA)

Recently, the Ministry of Environment & Forests drafted the Corporate Environmental Policy, which states that all PSUs and companies need to adhere to the following:

- (i) Adopt well laid-down corporate environmental policy.
- (ii) Ensure, as a part of the policy, adherence to environmental clearances wherever applicable, granted to the company.
- (iii) Ensure that, inter-alia, the company functions in conformity with the policy.
- (iv) Ensure that deviations, if any, from this policy and cases of violations of environmental and forestry clearances conditions found by the Ministry of Environment & Forests or other public authorities should be reported to its board of directors and desirably reflected thereafter on its website and annual report.
- (v) Identify and designate responsible person(s) at all levels of the hierarchy to ensure adherence to this policy and compliance with environmental laws and regulations.

Source: Office Memorandum dated 26.4.11, available on the MoEF website

6.3 Proposed measures

► **Revision of Companies Act**

The MCA accepts the Parliamentary Standing Committee's recommendation that on an average, 2% of a company's profits of the last three years needs to be spent on CSR. While a company's contribution to CSR is voluntary in nature, it needs to disclose the money spent on CSR annually as well as reasons for not doing so if the money is not utilized.

► **Revision of the MMDR Act**

The group of ministers has reportedly agreed on the profit-sharing formula for the project-affected people – 26% profit from coal mining and for other minerals, an amount equal to royalty paid in the previous year.

What this profit sharing means for the local communities?

The draft MMDR Bill, 2011, which is to be presented in Parliament, reportedly stipulates that a mining company must pay annually to the District Mineral Foundation (DMF), an amount stipulated as the share

of profit. The DMF will then distribute monetary benefits either directly or indirectly to the affected people. If this profit-sharing provision comes into effect, it will generate close to INR105 billion for local communities at the present level of mining in the country. This is about seven-fold that of the Union Ministry of Tribal Affairs Budget for 2011-12 and about the same as what the Ministry of Women and Child Development spent in 2010-11. A major portion of this will be available to the country's top 50 mining districts, which may collectively draw as much as INR90 billion.

Toward a sustainable industry

A focused approach is the need of the hour if sustainability issues for the mining and metals industry are to be addressed. Management has to play a key role in adopting sustainable practices for their operations and integrate sustainability into their overall business strategies. Additionally, with the Govt recommending the component of profit to be spent on CSR, an overall sustainability plan needs to be put in place to ensure that a company meets its sustainability objectives.

To achieve this objective, Indian mining and metals companies can also look toward international practices. In today's resource-constrained world, many companies in the mining and metals sector have begun to develop strategies to manage and measure the social, economic and environmental impact of their operations, products and services. In turn, they have been transparently disclosing their sustainable performance in the form of sustainability reports to communicate this performance and build trust with key stakeholders.

Many companies use a standardized framework to disclose and communicate their sustainability performance, so as to enable the benchmarking of company performance with competitors as well as internally over time. The Global Reporting Initiative (GRI) framework for sustainability reporting has emerged as the global standard in this regard, as it is developed through a multi-stakeholder, consensus-based approach, which ensures credibility among all stakeholder groups. The GRI has sector-specific reporting guidance tailored to the unique risks and affects of the mining and metals sector.

In 2010, as many as 124 GRI-based sustainability reports were published in the sector (including subsidiaries in various countries). This commitment to integrate sustainability strategies, including reporting

in line with the GRI guidelines, is not just driven by external stakeholders but also by the industry, as part of an effort toward self-regulation. The International Council on Mining & Metals (ICMM) was established to improve the sustainable development of the industry in 2001. This membership association has 10 principles that its members must adhere to, which constitute part of its sustainable development framework. This framework also requires public reporting by its members against these principles in line with the GRI guidelines, and, in turn, the reporting company is required to seek external assurance on its sustainability report.

In the context of these trends, it can be anticipated that integrated sustainability strategies – including focus on non-financial, sector-specific risks and opportunities for the mining and minerals sector – will become a common practice in the times to come. Therefore, companies should formulate comprehensive sustainability strategies that consider the identification and mitigation of community-related risks, among others. This is likely to ensure meeting mandatory compliance and also demonstrate companies' proactive vision toward sustainability, something that could also facilitate sound investments.



Other issues and challenges



Considering the vast potential the mining industry in India holds – and given the country's expected mineral resource base and robust domestic demand for minerals and metals – industry growth has been relatively slow. A number of challenges, including those previously discussed, continue to hamper sector growth.

► **Lack of adequate investments**

The mining sector has not attracted major investments despite liberalization initiatives for private and foreign investments. Although the sector is being keenly observed, a survey of global investors reflects a degree of disappointment. Apart from policy initiatives, the challenges associated with land acquisition, infrastructure

development and transportation systems serve as deterrents to investments in this sector. Another challenge is insufficient research on mining resources, primarily due to inadequate funds of agencies entrusted with exploration activity. In 2010, companies in Canada and Australia spent US\$2 billion and US\$1.3 billion, respectively, on exploration. Meanwhile, India, which has a similar geological setting, spends less than 0.5% of the global exploration budget. According to the GoI's Report of High Level Committee on National Mineral Policy, the majority of this amount is spent on coal. According to estimates, the total amount that the GSI has invested in mineral research in the last 50 years amounts to INR5 billion. Of this, INR3.5 billion has been spent on coal exploration alone.

▶ **Inadequate database on mineral concessions**

The availability of information has also been a key deterrent to building transparency in the mining sector and attracting potential investors into India. It is believed that information on the potential areas for different types of mineral resources and tenements in the country is lacking. While a provision does exist to maintain information or build a database of PLs, MLs, and RPs, among others, it is not usually available for public use, in a comprehensive and timely manner. The GoI, however, is implementing an initiative to address this concern.

▶ **Procedural bottlenecks**

The multi-level approval process under different statutes and rules acts as a major deterrent to new investments. Such procedural complexities involve statutory and non-statutory clearances, which apart from being time consuming, also breed uncertainty.

▶ **Inadequate support from taxation regime**

The current taxation regime applicable to the Indian mining sector is not supportive of private-sector participation, including FDI, particularly in upstream exploration. Particular challenges relate to tax holidays and accelerated depreciation for exploration expenditure, as well as the taxation of international mining service providers.

▶ **Social license**

In general, mining activity creates disruptions in social life, and the industry must work to alleviate such disruption to the maximum extent feasible. Mining firms face resistance from the host community when it comes to extracting minerals from mines in their vicinity, particularly in high-population density country as India. Often, lack of understanding and trust, responsible leadership and communication on the socio-economic impact of investments are the prime reasons for such conflicts. The GoI is taking

significant steps toward regulatory concessions to host communities on matters of land acquisition, forest rights and sustainable development.

▶ **Poor infrastructure**

Poor infrastructure also constrains industry growth. Mining operations require infrastructure development in and around remote locations where mineral reserves are located. Adequate infrastructure facilities are prerequisites to promoting mining market. Countries such as Australia and South Africa appear better-placed over India in terms of infrastructure availability.

▶ **Lack of local risk capital market**

Exploration is a capital-intensive and risky business. As such, new companies are always required to raise funds for ongoing and future exploration projects. Currently, India does not have a vibrant local capital market where start-up exploration companies can raise money for their needs.

▶ **Policy attractiveness and communication**

While the GoI has been engaged on its policy initiatives for several years to liberalize and grow the sector, the process has been rather slow. Clear policy framework and communication also need urgent attention.

The Fraser Institute, an independent Canadian research organization, conducts an annual survey of mining companies to assess how public policy affects exploration investment. They prepare a Policy Potential Index (PPI) – normalized to a maximum score of 100) – which is a report card on the attractiveness of governments' mining policies. In the institute's 2010-11 survey, Alberta in Canada topped the list with a PPI score of 90.4. India was ranked low at 74 (with a PPI score of only 10.6) of 79 provinces/countries, which reflects the need, as well as the significant opportunities that prevail, for immediate improvement.



Recommendations



Globally, the mining sector has been resilient despite the global financial crisis. In India as well, the industry is on a strong growth trajectory, driven by growing demand from domestic consumers and the opportunity for increased production due to a good resource base of various minerals. Global industry supply chains typically also begin with mining. Given that the per capita consumption of most metals in India is significantly below the global average, the potential demand for minerals is expected to be robust for

several years to come. The economic power also is shifting toward resource ownership and margins are moving upstream in the value chain. Thus, growth opportunities for the sector are immense.

The new MMDR Act, when enacted, is expected to facilitate the further development of the mining and exploration sector and help attract foreign flow to the industry. Some of the required focus areas for a mining industry in the present global competitive environment

are new financial strategies, aggressive exploration development programs, investment-friendly policies and regulatory framework, value addition of minerals and the use of productivity enhancing techniques are.

Apart from several specific recommendations dealt with in respective chapters, this report makes certain recommendations that could potentially accelerate investment in mining, thus achieving growth with sustainability and benefits for all concerned stakeholders.

Sustainable development

A focused approach is a prerequisite to addressing the sustainability issues critical to the mining and metals industry. Managements have to play a key role in adopting sustainable practices for their operations and integrate sustainability into their overall business strategies. Environmental protection is a fundamental component of sustainable development, and mining companies need to adopt constructive measures to work in a reduced-risk environment: e.g., monitoring emissions, integrating sustainability KPIs with productivity outcomes and adherence to mine closure norms.

Minerals taxation reform

Taxation reforms in the pipeline present an opportunity to align tax policies. A potential approach could include building incentives via offsets for miners to construct water, energy or social infrastructure, which is not only vital to business, but also beneficial for the community. Other recommendations include the following:

- ▶ International mining service providers should be taxed under a deemed basis to encourage technology flow to the sector.
- ▶ Tax holidays and accelerated depreciation should be given to the exploration industry.
- ▶ Taxation issues for M&A transactions should be simplified.

Thus, India has the opportunity to keep its mining policy relatively competitive amid the current environment such that the sector attracts differentially increased interest from global investors.

Increase collaboration with global mining equipment manufacturers

The mining equipment sector in India is at an intermediate stage of development. The industry has the requisite equipment but lags behind in technology. This is primarily due to the fact that these technologies are expensive. Indian companies can avail of these technologies by collaborating or forming JVs with global leaders in the technology space.

Develop infrastructure network

Mining infrastructure development requires long-term planning, with a special focus on logistics and services. India needs to enhance and optimize logistics configuration between mines, plants, railways and ports. High turnaround time in the network leads to poor operational efficiency, resulting in demurrages and detentions. High visibility of information along the supply chain and improved planning and collaboration between various service providers are expected to improve the efficiency of logistics operations.

Build strategic alliances

Mining activities are bound to progress further and deeper and become increasingly complex. It is an imperative to secure water, energy, technology input and build transportation and other infrastructure to get minerals to market. To optimize risk-reward equations and achieve economies of scale, mining companies should forge alliances with infrastructure players, technology and equipment suppliers and financiers (including infrastructure financing) in innovative ways, including the PPP model. .

Attract professionals to Indian mining services

To achieve sustainable growth in the Indian mining sector, the Gol needs to promote mining services in the region. Global mine operators are increasingly



seeking the assistance of consultants to manage their projects. Indian mining companies can also adopt such practices and obtain increased access to knowledge to become competitive in the global industry. It is essential to attract consulting geologists and exploration professionals as well as install assay laboratories. This is expected to not only accelerate mineral exploration in the country, but also help reach out to unexplored minerals. India can collaborate with companies in Australia and Canada to leverage their capabilities in mining services.

Collaborate to strengthen operations

Indian mining companies need to venture more into global markets to gain access to skill development, efficient management, improved exploration techniques, advanced technologies and new markets. There is a need to collaborate with global majors to explore potential investment opportunities, conduct exploration activity, obtain mining concessions and perform other related activities both in India and abroad. Companies need to consider a co-operative model, which could be in the form of a JV, acquisition, strategic tie-up or a technological association to strengthen their position in the global market.

Develop special mining regions and SPVs

Despite exhibiting significant potential, mining companies in India continue to battle challenges of land acquisition and forest and environmental clearances. In this context, major mining hubs can be identified following an integrated assessment of sustainable regional capacity. A nodal agency, in coordination with the GoI and state governments, can create a special-purpose vehicle (SPV) for each major project hub. This SPV can obtain all requisite clearances and link resources before inviting globally competitive bids to undertake projects. Resources raised can be partially used to develop social and physical infrastructure, thus enabling mining operations.

Judicious resource nationalism

A perceptible wave of resource nationalism across developed and emerging countries worldwide has surfaced. In the face of deficits, a continuing boom in commodity prices has induced many governments to target the mining and metals sector for increasing revenues. This has taken many forms. However, stakeholders in India should try and maximize value from natural resources by using only regimes that are predictable, prospective and sustainable in the long



term. Policy frameworks, solely tailored to leading class deposits, may not help develop marginal deposits.

Mineral-specific strategy

Long-term policy and other stakeholders' initiatives should be developed and fine-tuned to specific minerals based on an in-depth understanding of the relative positioning for such minerals. There are, for example, items that are strategic to the development of a modern industry, such as defence or renewable energy (e.g., rare earth, and other specific technology minerals), which will need differentiated attention. For some other minerals, it may be immensely advantageous to pursue a policy of value addition within the country.

Risk capital for exploration

It is imperative to boost exploration to achieve the long-term sustainable growth of the mining sector, which will need funds. Successful IPOs in the Indian mining sector were, however, by producing companies with proven reserves and resources. Being a high-risk business, exploration has not attracted much private-sector participation in absence of a risk capital market. Some recommended approaches should include the following:

- ▶ Launch of exploration bonds in line with infrastructure bonds to be used for mining exploration
- ▶ Relaxation in the listing of exploration companies on stock exchanges
- ▶ Facilitating environment for exit by an exploration company
- ▶ Capital raising in overseas exchanges that have a vibrant market for the exploration business

Recent policy developments indicate that the GoI is now more focused on the future growth prospects of the Indian mining industry. The draft MMDR bill is a step in this direction. The demand for minerals in India is expected to grow in direct correlation with the country's GDP growth. Therefore, overcoming the sector's challenges at the earliest becomes an imperative in the current globalized world. The opportunities for a mineral-rich nation to leverage robust global demand and pricing power are immense -India must tap this opportunity to its advantage.



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