Base Paper for Copper Lead & Zinc Mineral Sector

1. Overview:

India produces 87 minerals, which include 4 fuel minerals, 10 metallic, 47 non–metallic, 3 atomic and 23 minor minerals. The country has abundant reserves of key minerals such as iron ore, bauxite, dolomite, gypsum, limestone, mica and adequate reserves of chromite, manganese, zinc and graphite. In fact, India is a leading producer of key minerals such as iron ore and bauxite. Though the industry is largely fragmented, comprising several small scale operational mines, it is still dominated by the public sector, which accounted for 74.5% of the total mineral production in India in FY11. The total value of mineral production (excluding atomic minerals) during 2010–11 is estimated at INR 2,006 billion, an increase of around 11.83% y-o-y.

The contribution of the mining industry to India’s GDP increased from 1.9% in FY10 to 2.3% (advanced estimates at 2004–05 prices) in FY11. The industry’s contribution to GDP is estimated at INR1,105 billion during FY11. However, the growth in this industry lags behind the country’s overall economic growth, primarily on account of infrastructure bottlenecks and the use of obsolete technology.

2. Industry Profile: Major Players, Production Capacity & Demand:

2.1 Copper:

A) Mine: Major Player
a) Hindustan Copper Ltd.
i) Capacity:-
Current: 3.4 million tonne per annum (32000 T copper metal)
Projected: 12.4 million tonne per annum (1, 25,000 T copper metal) by 2017.

B) Smelting & Refining: Major Players
a) Hindalco
b) Sterlite Industries Ltd.
c) Hindustan Copper Limited
i) Installed Capacity:
Current - 9,995,000 MT
Projected : 1,449,500 T by 2015.
ii) Demand:
Current - 5,70,000 MT
Projected - 1,227,900 MT by 2015 considering 8% growth rate
2.2 Zinc & Lead:

A) Zinc
i) Mining: Major Player
1. Hindustan Zinc Ltd
ii) Capacity
   Current - 9.75 million tpa
   Projected – 1.07 million tpa
iii) Smelting & Refining: Major Player
   a) Hindustan Zinc Ltd
   b) Binani Zinc Ltd.
iv) Capacity:
   Current - 9, 17,000 MT
   Projected – 9,79,000 MT by 2017
v) Demand:
   Current – 5,50,000 MT
   Projected – 880000 MT by 2017

B) Lead:
   i) Mining & Refining
   a) Hindustan Zinc Ltd
   ii) Capacity: - Metal content
   Current – 1,20,000 MT
   Projected –1,60,000 MT by 2017
   iii) Demand:
   Current – 410000MT
   Projected – 568000 MT by 2017

3.0 Raw Material Securitization – Reserves and Resource Scenario:

3.1 Copper:

As on 1.4.2010, total reserves of copper are estimated (in metal terms) at 4.8 million
tones and resources at 12.3 million tones. Therefore, the current level of reserves is
equivalent to just five year of copper production in India. India share of world reserve &
resource is 1.9% only. Total known reserves and resource of copper (in metal terms) are
estimated to be around 630 million metric tonne. Globally, Chile has the largest reserves
of copper accounting for about 24% of the total world reserves followed by Peru 14% ,
Australia 13% , 6% USA Indonesia & Russia 5% each and other countries 33%. Nearly
one-third of global mine production of copper comes from Chile (5520 thousand tones in
the year 2010) followed by Peru (1285 thousand tones in the year 2010).

HCL is the lone producer of copper in India. It is producing 3.4 million tonnes of ore and
around 32,000 tonnes of metal every year, which is less than 5% of the country’s
requirement of copper concentrate. Sterlite and Birla are the leading producers of refined
copper in India. Jhagadia copper on the other hand is producing refined copper through
secondary route i.e. by mostly using scrap as raw material.
As of now, there is a high level of deficit in the mining capacity and surplus in the refining capacity. Domestic production of concentrate accounts for only 4% of the total domestic requirement. India has very limited known reserves of copper ore exploitable for copper production.

All the operating mining leases are presently held by Hindustan Copper Limited (HCL). The Company has access to over two-thirds of the copper ore reserves in India. Thus, HCL has adequate opportunity to augment its mining capacity by increasing production from the existing mines and by developing new ore reserves, besides re-opening closed mines.

HCL, a public sector undertaking, is the only integrated producer of primary refined copper in India. Hindalco (unit of Birla Copper) and Sterlite Industries (India) Ltd, the major copper producers in the private sector rely on imported copper concentrates. Another private sector company Jhagadia Copper Ltd also produces copper based on secondary.

3.2 Lead & Zinc:

It is estimated that the country’s identified zinc-lead resources as on 1st April 2011 are 671 million tonnes containing 37 million tonnes of zinc and 11 million tonnes of lead metal. India on the world zinc Reserve Base scale was at 7th position at the begining of 11th Five Year Plan. The country has now moved to a respectable 4th position mainly on account of significant exploration success reported by HZL.

Looking at the present scale of operations, zinc and lead resource position will become critical after some 10 years. Therefore, there is a strong need to focus on exploration activities in the country to find new economic resources for sustaining the present and planned expansions in zinc metal production, or to contemplate any increase in the primary lead metal production. This will require expeditious grant/clearances of RP, PL and ML for identification and establishment of newer resources and finally to mine development.

4.0 Exploration and Mining – Challenges and Opportunities:

Global spending on exploration in 2010 was $10.68 billion with major share of Canada (18%), Australia (11%), US (8%), Peru (7%), Mexico (6%). The exploration spending (including for oil and gas) in India is around $ 15 /sq. km. compared to $ 124/ sq. km. in Australia and $ 118 / sq. km. in Canada. Indian Government alone has proposed to spend an amount of US$ 1.25 billion for mineral exploration and related activities (other than coal & lignite) through its agencies/departments in next five years.
4.1 Copper:

Indian has about 182,000 sq. km area with geological conducive to base metal and copper mineralization out of which is 60,000 sq. km in potential area. Of this 20-25% area has been covered by regional exploration by GSI. Copper deposits in India are located Precambrian terrains of the Peninsular Shield and to small extent in the lesser Himalayas.

Consumption of refined copper is growing and at present ore reserves are limited, therefore, there is an urgent need to increase the resources base of copper within the country by increased investment in exploration as well as investment in other geographies to acquire mining assets

Looking at the long term international scenario, there could be restrictions in sourcing copper concentrates from the international market leading to difficulties on these fronts. Therefore, it is imperative that intensive/extensive exploration for copper is taken up in India either by existing copper producers or by inviting independent junior exploration companies for green field exploration.

4.2 Zinc & Lead:

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The use of modern technology to achieve goals of a financially viable, socially responsible, environmentally, technically and scientifically sound mining with long term view of development which uses mineral resources optimally and ensures sustainable post-closure land uses. For these conditions of Mining Leases regarding size, shape, disposition with reference to geological boundaries and other mining conditions should be such as to favorably predispose the leased areas to systematic and complete extraction of minerals.

5.0 Out look of Demand vis-a-vis Supply:

5.1 Copper:

Indian domestic refined copper consumption has grown at a CAGR of 9 % between 2000 and 2010. This has been supported by strong growth in end user segments such as winding wires, power cables and other user applications. India’s aggregate refined copper consumption in 2011-12 was around 570,000 tonnes. The consumption of refined copper
in India is expected to grow by 8-9% in coming years driven by Government of India increased expenditure in power & infrastructure sector and growth in auto sector. At present India is the net exporter of refined copper In FY 12 around 2.30 lakh tones of refined copper was exported. Electrical & power sectors account for nearly on-third (~35%) of the refined copper consumption, followed by 11% by the transport auto and railways) industry, 8% each by construction & consumer durables industry.

India’s per capita copper consumption was less than 0.5 kg in 2010 compared to 4.6 kg in China and a world average of 2.4 kg. If India’s per capita copper consumption moves towards the per capita copper consumption levels in the rest of the world, India’s copper market has the potential for significant growth.

5.2 Zinc:

Demand for zinc in India is expecting from 6,00,000 lakh tones in 2012-13 to 8,80,000 tonnes in 2016-17. Considering continuous supply of 20,000 tones from secondary route and 50,000 tones from imports in every year about 9 lakh tones production are projected with marginal increase from 2012-13 to 2015-16. This production projections are given in correlation with gradual reduction of exports with reference to domestic consumption. The current zinc production capacity of HZL is 9,17,000 tones.

5.3 Lead:

HZL is the lone producer of lead in India. Its current primary lead capacity is 85,000 tonnes per annum. In addition a lead smelter of 1 lakh metric tones per annum is expected to be operational in 2011-12. Lead demand in 2012-13 and 2016-17 is estimated at 4,33,000 tonnes and 5,68,000 tonnes respectively. Part of this projected demand is met through domestic primary lead supplies i.e. 1,85,000 tonnes per annum. Further, 50,000 tonnes per annum imports are projected to be continued. The remaining demand projected is to be met through secondary (organized sector) assuming 250,000 tonnes in

6.0 Investment

FDI policy in the mining sector was further liberalised in January 1997 which opened up an “automatic approval” route for investments involving foreign equity participation upto 50% in mining projects, and upto 74% in services incidental to mining.

The Foreign Direct Investment (FDI) policy in the mining sector has been gradually liberalized over the last few years. FDI cap for exploration and mining of diamonds and precious stones have been increased to 100% under the automatic route with effect from 10th February, 2006.

With this, the Foreign Direct Investment in the mining sector (exploration, mining, mineral processing and metallurgy) for all non-atomic and non-fuel minerals have now been fully opened upto 100% through the automatic route including diamonds and precious stones.
7.0 Community and Sustainable Development

Considering the fact that minerals are valuable natural resources, being finite and non-renewable, country's mining sector is committed to promoting sustainable development of mining, mineral processing, metallurgy and other mineral-based industries. Conservation of minerals has to be construed not in the restrictive sense of abstinence from consumption or preservation for use in the distant future but as a positive concept leading to augmentation of reserve base through improvement in mining methods, beneficiation and utilization of low grade ore and rejects and recovery of associated minerals.

It is important that scientific and detailed prospecting is carried out in search of its mineral resources using state of art techniques in a time bound manner. The extraction of mineral resources located through exploration and prospecting have to be maximized through scientific methods of mining, beneficiation, and economic utilization while also addressing the issues related to environment and ecology.

Mining operations sometimes involve acquisition of land held by individuals including those belonging to the weaker sections. In all such cases a social impact assessment is undertaken to ensure that suitable Relief and Rehabilitation packages are evolved, and the new LARL Bill provides a comprehensive approach to the entire process, which hopefully will go a long way to solve the underlying problem, with long-term implication for the mining sector as well. Appropriate compensation will form an important aspect of the Sustainable Development Framework mainly from point of view of ensuring that the various sectoral policies have their intended impacts.

The MMDR Bill provides that the National Mining Regulatory Authority and State Mining Regulatory Authority will advise the Central and State Govts. on implementing and monitoring the operation of the sustainable development framework, and the District Mineral Foundation is tasked with facilitating the implementation of the SDF. Completing the roll out of the SDF upto mine level must therefore be a high priority during the XIIth Plan.

8.0 Challenges for India

India is dependent on imports to a large extent of nonferrous mineral and is thus vulnerable to supply/price fluctuations.

The reasons for their strategic importance and the recent enhanced risks & challenges have been summarized in the global context. In the context of India, these assume further importance due to the following additional reasons:

a. Growing industrialization of India would be increasingly dependent upon the use of technology.

b. India will move towards establishing and strengthening its own high-tech industry base.
c. Several important industries, critical to India’s national security, renewable energy mission, electronics, consumer durables, clean technology etc. are dependent on subject minerals / metals.

d. The current understanding and knowledge of these minerals is limited and thereby India remains exposed to sub-optimal responses to the strategic risk.

9.0 Potential approach for India

India should gear up for the challenges ahead. India should develop its own policy response from amongst the following options and should craft an integrated roadmap for mining, production and usage of these minerals.

1. Access to raw materials in world markets: Entering into bilateral agreements with countries, to secure supply for both the short term and long term. Moreover, India can create a national body which is responsible for the national sourcing of raw materials similar to Japan Oil, Gas and Metals National Corporation (JOGMEC).

2. The right framework to foster sustainable supply of raw materials from Indian sources: Creating an environment where the domestic producers are encouraged to produce these metals. Most of these metals can be produced as a by-product of the base metal production process, but it appears that the current quantities are low. Thus India should work to incentivize the production of these metals through fiscal measures.

3. Increase resource efficiency and promoting recycling: Investing in research so that substitutes can be found. Recycling is another important way to fulfill a part of the demand of these metals.

4. Build a national stockpile: Evaluating the option of building a national stockpile for identified materials. This will not only help to meet supply in case of exigencies but also keep prices under control.