

## Mining in India

Mining of copper concentrate is confined only to the government owned companies i.e. Hindustan Copper Ltd which owns all mines. But, due to the lack of resources and poor quality, the company has been unable to mine concentrates to its full capacity. India is not very lucky regarding reserves and production of copper. Its total reserves in situ are estimated at about 712.5 million tonnes equivalent to 9.4 million tonnes of metal content. Major copper ore deposits are located in Singhbhum district (Jharkhand), Balghat district (Madhya Pradesh) and Jhunjhunu and Alwar districts (Rajasthan). In addition, there are small deposits in Gujarat, Karnataka, Andhra Pradesh, Uttar Pradesh, Sikkim, Meghalaya, Maharashtra and West Bengal.

There had been gradual increase in production for two decades between 1950-51 and 1970-71. A steep rise in production was recorded after 1970-71 and it stood at a record high of 5,255 thousand tonnes in 1990-91. Thereafter, a downward trend was observed and the production fell to 3,896 thousand tonnes in 1996-97. A landslide fall in production was recorded after 1996-97 and there was a drastic fall in production in 1997-98 when it was 223 thousand tonnes only. Since 1997-98, the production remained at a very low level and stood at 153 thousand tonnes only in 2002-03. Thereafter, the fall in copper concentrate production continues with least interest of private miners like Hindalco Industries and Sterlite Industries to participate in mining locally. Global mining giants have also shown no interest in copper mining activities in India.

### Distribution of Mines

Madhya Pradesh has become the largest producer of copper in India surpassing Karnataka, Rajasthan and Jharkhand in succession. In the year 2002-03 the state

# Steady Growth in Indian Copper Industry with Riders

- Metalworld Research Team

The size of Indian copper industry (consumption of refined copper per annum) is around half a million tonnes which constitutes only 3 percent of the world copper market. Sterlite Industries, Hindalco Industries and Hindustan Copper are major producers of refined copper in India. India as emerged as net exporter of copper from the status of net importer on account of rise in production.

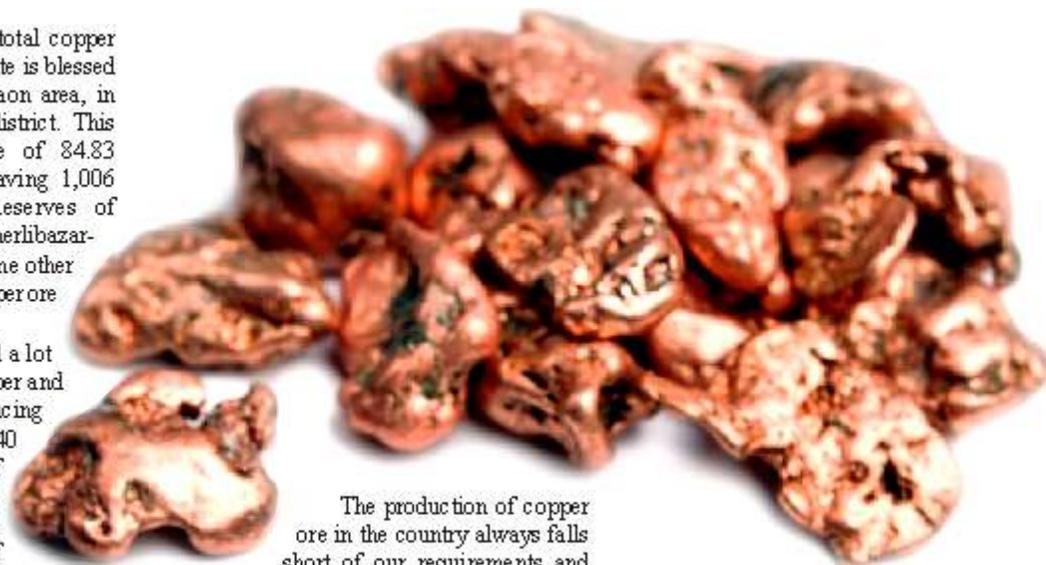
In fact, copper as a metal came in use of man much earlier than iron. Copper has been used for making utensils and coins since long. Being a good conductor of electricity and ductile, it is extensively used in a vast variety of electrical machinery, wires and cables. It is also an important metal used by automobile and defence industries. Further, it is alloyed with iron and nickel to make stainless steel, with nickel to make 'morel metal' and with aluminium to make 'duralumin'. When alloyed with zinc it is known as 'brass' and with tin 'bronze'. Copper ore is found in ancient as well as in younger rock formations and occurs as veins, as dissemination and as bedded deposits. Mining for copper is a costly and a tedious affair because most of the copper ores contain a small percentage of the metal. Against the international average of metal content (in the ore) of 2.5 per cent, Indian ore grade averages less than one per cent.

produced 56.86 per cent of the total copper production of the country. The state is blessed with a fairly large belt in Taregaon area, in Malanjkhanda belt of Balaghat district. This district has recoverable reserve of 84.83 million tonnes of copper ore having 1,006 thousand tonnes of metal. Reserves of moderate size are also found in Kherlibazar-Bargaon area of Betul district. Some other areas are also reported to have copper ore reserves.

Rajasthan has also progressed a lot with respect to production of copper and is now the second largest producing state in India accounting for over 40 per cent of the total production of the country. Most of the copper reserves are found along the Aravali range. A total of recoverable reserve in the state, spread over the districts of Ajmer, Alwar, Bhilwara, Chittaurgarh, Dungarpur, Jaipur, Jhunjhunu, Pali, Sikar, Sirohi and Udaipur are estimated at 65.08 million tonnes from which 613.55 thousand tonnes of metal is expected to be obtained. The Khetri-Singhana belt in Jhunjhunu district is the most important copper producing area. This belt runs in north-east to south-west direction over a distance of 80 km from Singhana to Raghunathgarh with average width varying from 3 to 5 km.

The annual output of copper ore at Khetri is 1.8 million tonnes yielding around 16,000 tonnes of metal. The Kho-Dariba area about 48 km to the south-west of the Alwar city and Delwara-Kirovli area about 30 km from Udaipur are other important producers. In Kishangarh area of Ajmer district, 2.5 million tonnes of copper ore, having 0.60 per cent copper, have tentatively been estimated.

Jharkhand, earlier a part of Bihar used to be the largest producer of copper till early 1980s but it has lost much importance and has slipped to third position, partly due to fall in its own production and mainly due to increased production of other states. The states share of copper ore production has fallen from 62 per cent of the nation's total production in 1977-78 to a desperate 23 per cent in 2002-03. The main copper belt extends over a distance of 130 km. Singhbhum is the most important copper producing district where Rakha, Kendadih, Surda, Dhobani, Mosabani and some other areas have proved reserves of 58.044 million tonnes from which 1,480.12 thousand tonnes of metal may be recovered. Hasatu, Baraganda, Jaradih, Parasnath, Barkanath, etc. in Hazaribagh district; Bairakhi in Santhal Parganas area and some parts of Palamu and Gaya districts are also reported to have some deposits of copper ore.



The production of copper ore in the country always falls short of our requirements and

India has to import copper from other countries. The major part of supply comes from the USA, Canada, Zimbabwe, Japan and Mexico. The quantity of import varies from year to year depending upon demand and supply.

#### Metal Production on the Rise

The production of copper metal (cathode) by HCL during August 2015 stood at 639 tonnes including 279 tonnes production through job work. The production of copper metal (cathode) by HCL including production through job work during the corresponding period in the previous year was 2045 tonnes. Decrease in August 2015 is due to mini shutdown of ICC smelter.

The copper & copper products industry's sales rose by 7.7 per cent y-o-y in the March 2015 quarter. Major producers reported a rise in sales which was driven by Hindalco Industries. Hindalco's sales grew by 11.1 per cent y-o-y during the quarter. This was aided by higher revenues from the company's aluminium division. Though copper cathode volumes increased by 4.1 per cent, copper revenues, declined by 3.4 per cent. Weak realisations impacted the segment's sales.

Meanwhile, refined copper production of the Country during the year 2014-15 has increased by 18 per cent at 7.6 lakh tonnes, as compared to 6.5 lakh tonne in FY 2013-14. During 2014-15, the consumption has

increased by 5 per cent at around 6.0 lakh tonne. The consumption growth during 2015-16 is expected to be around 7 per cent.

During current fiscal, sectors like cables, transformer has shown impressive growth of around 8 to 10 per cent. Going forward, further softening of interest rate by RBI will ease the liquidity crunch currently faced by the Industry and drive investment in the infrastructure sectors. This will further increase the domestic consumption of copper.

On the price front, the Industry is witnessing a gradual decline of LME copper price in FY 2014-15. Compared to FY 13-14, the average copper price has declined by 8% during FY 2014-15. China accounts for 40% of the global demand and any change in their economic factors, considerably impacts the international prices. Recent developments in the financial market at China has plunged the LME price and is hovering at six year low. However, the industry is optimistic that the price will again rebound on the backdrop of Chinese Government economic programme for near term that comprise around 36 billion euro targeting infrastructure improvement. A major structural change in investment across emerging countries which is directed towards sustainable models based on consumption.

#### Challenging Year

FY 2014-15 has been extremely challenging year for Indian companies. The

### COPPER PRODUCTION IN INDIA (TONNES)

| Producers | Hindustan Copper | Hindalco | Sterlite Inds | Total  |
|-----------|------------------|----------|---------------|--------|
| 2015-16*  | 5360             | 169477   | 159830        | 334667 |
| 2014-15   | 15243            | 387953   | 362373        | 765569 |
| 2013-14   | 17005            | 332842   | 294433        | 644280 |

Source : Ministry of Mines, Govt. of India, \* April – August period

copper ore production in India during the fiscal 2014-15 was 3.5 million tonnes as compared to 3.8 million tonnes in 2013-14. Metal-in-Concentrate (MIC) was 24,878 metric tonne as compared to 32,276 metric tonne. Mine production after attaining a peak in 2013-14 has witness a sharp decline in FY 2014-15. Though, ore production declined by 8%, the MIC production has declined by 23% compared to last year.

Most of the factors contributing to the decline were external to operations, key reasons were :

- Stoppage of Surda mine operations from 8th September'2014 complying with the order of Jharkhand Government in view of the Judgement of the Apex Court.
- Decline in ore grade at Malanjkhanda mine and unseasonal rains due to cyclone "Hudhud" around 165mm of rain fall in day, leading to submergence of lower benches of the mine for additional three months.
- Extreme Water shortage at our Rajasthan Unit at Khetri.

Since then, all the issues have been addressed, Surda mine production has recommenced from 17.6.2015, at Malanjkhanda mine, adequate facilities has been installed to address such mine flooding situation and water crisis at Khetri Copper Complex has been addressed for the near term. This has led to the improvement in mineral in concentrate (MIC) production by 12% in the current year. Copper cathode production during 2014-15 was 21,205 metric tonnes as against 22,825 metric tonnes in the previous year, the production suffered due to less production from the mine.

Given the fact that HCL has huge natural resource of copper, the company is implementing the mine expansion projects to increase the mine production capacity by four times. The start up of these projects at site has been considerably delayed due to delay in obtaining statutory clearance like environment and forest clearances. However, with close follow up with the concerned agencies and the state governments, during the year we have obtained environment clearances for Rakha, Kendadih Khetri & Koliha expansion projects. Also, long pending clearances from Standing Committee of National Wildlife Board has been obtained for Malanjkhanda underground mine which is the flagship project of your company. The foundation stone laying ceremony was held on 12th April 2015 at Malanjkhanda in the gracious presence of Hon'ble Union Minister for Steel & Mines and the Chief Minister of MP.

During the year, it is heartening to inform that HCL has acquired secured assets including

land and plant & machinery of Jhagadia Copper Limited located at District Bharuch, Gujarat from Arcil, Mumbai through SARFAESI Act at cost of Rs 210.0 crore. The plant is having State-of-the-Art technology to produce 50,000 metric tonne of copper cathode. The possession of the site has taken place on 30th April 2015 and refurbishment work has started. The plant has been named as Gujarat copper project. The acquisition will significantly complement our existing smelting operations and provide an opportunity to venture into profitable business of recycling of e-scrap in an environment friendly manner.

Bench scale study of "Hydro-Metallurgy" technology for sulphide copper ore has been successful and thereafter pilot test has been commissioned at M/s Outotec, Finland. Initial results of the test have been encouraging.

### Global Markets

While talking about copper markets, discussing Indian market in isolation does not



give a clear picture. Data compiled by the Lisbon-based International Copper Study Group showed, in developing its global market balance, ICSG uses an apparent demand calculation for China, the leading global consumer of copper, accounting for about 45% of world demand. Apparent copper demand for China is based only on reported data (production + net trade +/- SHFE stock changes) and does not take into account changes in unreported stocks [State Reserve Bureau (SRB), producer, consumer and merchant/trader], which can be significant during periods of stocking or de-stocking and which can markedly alter global supply-demand balances. ICSG projections for 2015 indicate that the market should essentially remain balanced, while in 2016 ICSG forecasts a small deficit of around 130,000 metric tonnes (t) as demand growth outpaces production growth. This compares with a surplus of 360,000 t and 230,000 t for 2015 and 2016, respectively, forecast at our April 2015 meeting. The revisions reflect substantial changes in market conditions since April 2015.

Although a downward revision has been made to global usage in view of lower than anticipated growth in China, larger downward adjustments have been made to production as a result of recent announcements of production cuts.

In developing its projections, ICSG recognizes that global market balances can vary from those projected owing to numerous factors that could alter projections for both production and usage. In this context it can be noted that actual market balance outcomes have on recent occasions deviated significantly from ICSG market balance forecasts due to unforeseen developments. World mine production after adjusting for historical disruption factors is expected to increase by around 1.2% in 2015 (a similar growth to 2014) to reach 18.8 Mt (million tonnes). Despite announced production cuts, higher growth of around 4% is expected in 2016 as additional supply is expected to arise from expansions at existing operations, ramp-up in production from mines that have recently come on stream and output from a few new mine projects. Growth in 2015 and 2016 is expected to be in the form of copper in concentrate as SX-EW production is envisaged to decline mainly due to the announced production cuts being almost entirely at SX-EW mines.

After increasing by almost 7% in 2014, world refined copper production in 2015 is expected to increase by only 1% year-on-year to 22.7 Mt. Growth of around 7% in China will be partially offset by a decline in production in Chile, Japan and the United States, the second, third and fourth leading refined copper producers. Primary refined production (excluding SX-EW) and secondary production are expected to grow by around 2% each, while SX-EW output is anticipated to decline by 4%. In 2016, world refined copper production is expected to grow by around 2.5% to 23.2 Mt, as larger growth of 4% in primary electrolytic production will be partially offset by a further 4% decline in SX-EW production.

Following growth of around 7% in 2014, ICSG expects world apparent refined usage in 2015 to decline by 1.2%. This is mainly because apparent demand in China is expected to remain essentially flat, although underlying "real" demand growth in China is estimated by others at around 3-4% (lower than the 4.5-5% anticipated growth in April). On the other hand, usage in the rest of the world is expected to decline by 1.5%. For 2016, the growth in world apparent refined usage is expected at around 3% with underlying Chinese industrial demand growth expected at around 4%. Usage in the rest of the world is expected to increase by about 2%.