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Indian Minerals Yearbook 2012

(Part- II : Metals & Alloys)

51st Edition

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(FINAL RELEASE)

**GOVERNMENT OF INDIA
MINISTRY OF MINES
INDIAN BUREAU OF MINES**

Indira Bhavan, Civil Lines,
NAGPUR – 440 001

PHONE/FAX NO. (0712) 2565471
PBX : (0712) 2562649, 2560544, 2560648
E-MAIL : cme@ibm.gov.in
Website: www.ibm.gov.in

January, 2014

5 Copper

Copper is an important non-ferrous base metal having wide industrial applications, ranging from defence, space programme, railways, power cables, mint, telecommunication cables, etc. India is not self-sufficient in the resources of copper ore. In addition to domestic production of ore and concentrates, India imports copper concentrates for its smelters. The domestic demand of copper and its alloys is met through domestic production, recycling of scrap and by imports.

HCL, a Public Sector undertaking, is the only integrated producer of primary refined copper in India that utilises both indigenous and imported concentrates as well as imported and indigenous scrap.

Hindalco (unit of Birla Copper) and Sterlite Industries (India) Ltd, the major copper producers in the Private Sector rely on imported copper concentrates. These companies own copper mines in other countries as well. Another Private Sector company, Jhagadia Copper Ltd, also produces copper based on secondary route.

RESOURCES

The total resources of copper ore as on 1.4.2010 as per UNFC system are estimated at 1.55 billion tonnes. Of these, 394.37 million tonnes (25.31%) fall under 'reserves' (proved(STD111) and probable(STD121 & 122) categories) while the balance 1.16 billion tonnes (74.69%) are 'remaining resources' (under feasibility (STD211), pre-feasibility (STD221 & STD222), measured

(STD331), indicated (STD332) and inferred (STD333) categories). Of the total ore resources, 2.64 million tonnes (0.16 %) comprise ore containing 1.85% Cu or more and 676 million tonnes (43.38%) of 1% to below 1.85% Cu grade. With regard to reserves, there were no reserves above 1.85% Cu grade. However, 381.69 million tonnes fall under 1% to below 1.85% Cu grade.

The total copper metal content in the resources is 12.28 million tonnes of which 4.76 million tonnes constitute reserves.

Largest resources of copper ore to a tune of 777.17 million tonnes (49.86%) are in the state of Rajasthan followed by Madhya Pradesh with 377.19 million tonnes (24.2%) and Jharkhand with 288.12 million tonnes (18.48%). Copper resources in Andhra Pradesh, Gujarat, Haryana, Karnataka, Maharashtra, Meghalaya, Odisha, Sikkim, Tamil Nadu, Uttarakhand and West Bengal accounted for about 7% of the total all India resources (Table-1).

EXPLORATION & DEVELOPMENT

GSI and MECL, were engaged in the exploration of base metals in 2011-12. MECL carried out exploration in Bhilwara and Jhunjhunu districts of Rajasthan and GSI carried out exploration in the states of Gujarat, Haryana, Maharashtra, Meghalaya, Rajasthan and Sikkim. Details of exploration activities conducted for copper in 2011-12 are given in Table-2.

Table - 1 : Reserves/Resources of Copper as on 1.4.2010 (P)
(By Grades/States)

(In '000 tonnes)

Grade/State	Reserves				Remaining resources						Total resources (A+B)		
	Proved STD111	Probable		Total A	Feasibility STD221	Pre-feasibility		Measured STD331	Indicated STD332	Inferred STD333		Reconnaissance STD334	Total B
		STD121	STD122			STD221	STD222						
All India : Total													
Ore	133388	127100	133884	394372	15781	21323	12429	147989	224976	741588	-	1164086	
Metal	1604.73	1508.36	1655.24	4768.33	213.01	223.01	23.45	1453.04	1686.84	3918.99	-	7518.34	
By Grades													
Ore with 1.85 % & above Cu	-	-	-	-	-	62	-	430	813	1336	-	2641	
Ore with 1.00 % to below 1.85 % Cu	125287	127100	129311	381698	12406	19031	168	76053	46391	140398	-	294447	
Ore with (+) 0.50% to below 1.00% Cu	557	-	31	588	-	2230	2008	23366	85012	504366	-	616982	
Ore with (-) 0.50% Cu	7544	-	4542	12086	3375	-	10253	48140	92760	95488	-	250016	
By States													
Andhra Pradesh													
Ore	-	-	-	-	686	666	105	-	5791	1000	-	8248	
Metal	-	-	-	-	6.88	9.12	1.05	-	97.45	8.32	-	122.82	
Gujarat													
Ore	-	4955	845	5800	-	-	-	129	-	7131	-	7260	
Metal	-	80.75	13.78	94.53	-	-	-	0.69	-	113.38	-	114.07	
Haryana													
Ore	-	-	-	-	-	2230	-	-	-	30678	-	32908	
Metal	-	-	-	-	-	11.82	-	-	-	101.80	-	113.62	
Jharkhand													
Ore	16540	49127	21151	86818	11720	17990	-	74857	64488	32252	-	201307	
Metal	163.04	448.83	196.91	808.78	202.76	194.30	-	869.43	606.35	412.65	-	2285.49	
Karnataka													
Ore	836	1301	373	2510	-	-	2008	1750	6833	20434	-	31025	
Metal	8.78	17.56	4.31	30.65	-	-	11.24	22.00	65.77	99.61	-	198.62	
Madhya Pradesh													
Ore	90909	71481	35929	198319	-	-	-	49650	33700	95519	-	178869	
Metal	1218.18	957.84	467.08	2643.10	-	-	-	155.75	104.70	916.02	-	1176.47	

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Table - 1 : (Concl.d.)

Grade/State	Reserves				Remaining resources						Total resources (A+B)		
	Proved STD111	Probable		Total (A)	Feasibility STD211	Pre-feasibility		Measured STD331	Indicated STD332	Inferred STD333		Reconnaissance STD334	Total (B)
		STD121	STD122			STD221	STD222						
Maharashtra													
Ore	-	-	-	-	-	-	-	-	9399	3811	-	13210	
Metal	-	-	-	-	-	-	-	-	89.65	43.05	-	132.70	
Meghalaya													
Ore	-	-	-	-	-	-	-	-	880	-	-	880	
Metal	-	-	-	-	-	-	-	-	9.00	-	-	9.00	
Nagaland													
Ore	-	-	-	-	-	-	-	-	-	2000	-	2000	
Metal	-	-	-	-	-	-	-	-	-	15.00	-	15.00	
Odisha													
Ore	-	-	-	-	-	-	-	1420	2536	2095	-	6051	
Metal	-	-	-	-	-	-	-	21.69	21.06	20.69	-	63.44	
Rajasthan													
Ore	25103	228	75585	100916	3375	-	10253	16513	100256	545858	-	676255	
Metal	214.73	3.29	973.16	1191.18	3.37	-	10.25	320.48	686.60	2179.09	-	3199.79	
Sikkim													
Ore	-	8	-	8	-	437	63	300	-	150	-	950	
Metal	-	0.09	-	0.09	-	7.77	0.91	8.47	-	4.23	-	21.38	
Tamil Nadu													
Ore	-	-	-	-	-	-	-	200	590	-	-	790	
Metal	-	-	-	-	-	-	-	1.08	2.73	-	-	3.81	
Uttarakhand													
Ore	-	-	-	-	-	-	-	3170	390	660	-	4220	
Metal	-	-	-	-	-	-	-	53.45	1.44	5.15	-	60.04	
West Bengal													
Ore	-	-	-	-	-	-	-	-	113	-	-	113	
Metal	-	-	-	-	-	-	-	-	2.09	-	-	2.09	

Figures rounded off.

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Table – 2 : Details of Exploration Activities for Copper, 2011-12

Agency/ State/ District	Location Area/ Block	Mapping		Drilling		Sampling (No.)	Remarks
		Scale	Area (sq km)	No. of boreholes	Meterage		
GSI							
Gujarat Banaskantha	Amliamal area (South Delhi Belt)	G-4 Stage (reconn. Stage)	-	-	-	-	The copper values range from <15 ppm to 2.38 % with 7 samples having values more than 0.1%. The Cu values are high in old pit samples of quartz mica schist (Block-A) and calc-silicates of Block-C. The lead values range from <25 ppm to 0.41% with 5 samples of gossan rock of Block-B and calc-silicate of Block-C having values more than 0.1%. Concentration of zinc, in the analyzed samples ranges from <10 ppm to 0.12%. Only one sample is showing Zn value more than 0.1%, which is from gossan sample of Block-B. The nickel values range from <15 ppm to 92 ppm and that of cobalt values range from <15 ppm to 580 ppm, which are comparatively higher in amphibolite samples. The silver values are <5 ppm and gold values are <0.05 ppm for all the samples from the three blocks. On the basis of sum of the geological, geochemical and geophysical data, it is recommended that test exploration drilling should be done in all the three blocks, along the shear zones, to reveal potentiality of the occurrence at depth.
Haryana Mahendragarh	West of Bakrija	G-3 Stage (Prospecting Stage)	-	-	-	-	To assess the potentiality of copper mineralisation to the west of Bakrija. Analysis of core samples has not indicated encouraging values of copper.
Maharashtra Chandrapur	Nai Dilli- Dighori and Lal Heti Dugula (Archaean gneissic terrain)	-	-	-	-	186	Analytical results of 26 bedrock samples from Dugala and Nai Dilli blocks show copper values from 10 ppm to 1500 ppm. 22 nos. of PTS samples from Dugala block show Cu values from 10 ppm to 80 ppm and 44 nos. of PTS samples from Nai Dilli block show Cu values from 10 ppm to 2200 ppm. Cu values in 94 soil samples from Dugala and Nai Dilli areas range between 10 ppm to 1975 ppm. Ore microscopic study reveals the presence of chalcopyrite, pyrite and covellite in quartz-chlorite veins and also inclusion of chalcopyrite found within magnetite. Different Cu ore phases like chalcopyrite, bornite, chalcocite as well as Au and Ag phases have been identified in SEM-EDX study.

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Table - 2 (Contd.)

Agency/ State/ District	Location Area/ Block	Mapping		Drilling		Sampling (No.)	Remarks
		Scale	Area (sq km)	No. of boreholes	Meterage		
Meghalaya							
East Garo Hills	Simsang Diwa village (Archaean geissic complex	G-4 Stage (Reconn. Stage)	-	-	-	-	Three major dioritic intrusions are recorded in the area between Simsang Diwa and Gambil. Near Simsang Diwa a shear quartz vein trending North-South with about 3 m width is exposed which contains Pyrite grains. No significant sulphide mineralised zone could be delineated in the area so far.
Rajasthan							
Alwar	Mundiyawas- Khera area (North Delhi Fold Belt). Five km SSW of Thanaghazi.	G-4 stage (Reconn.Stage)		4	-	-	Surface indications of mineralisation are manifested by malachite stains, presence of old workings and occasionally fresh specks of sulphides like bornite, chalcocopyrite and pyrite are observed. On the basis of mapping and sampling three such zones of mineralisation, which extend for about 300 m with an average width of 10-30 m on the surface has been delineated. Channel sampling indicated encouraging basemetal and associated precious metals. Four scout boreholes intersected sulphide mineralisation, over a strike length of over 600 m in KBH - 1 to KBH- 4. Mineralisation is mostly in the form of disseminations, streaks, stringers, veinlets and fractured filled chalcocopyrite, pyrrhotite, pyrite and rare specks of bornite and covellite, besides veins and specks within thin quartz and carbonate veins. KBH-I intersected a 108.10 m thick mineralised zone with 0.29% Cu and associated silver and gold (77.65 m) of 0.35% Cu (at 0.2% cut-off) and 33.8 m of 0.65% Cu (at 0.5% cut-off). KBH-2 intersected sulphide mineralisation (190m) with 0.2-0.5 % Cu (V.E.). (Lodes of 110.60 m x 0.36% Cu (at 0.2% cut-off) and 41.50 m x 0.57% Cu (at 0.5% cut-off). KBH-3 and KBH-4 intersected similar type of sulphide mineralisation. However, the concentration of mineralisation is less as compared to borehole KBH-1 & KBH-2.
Bhilwara	Karoi Rajpura Pur-Banera belt	G-4 stage (Reconn. Stage)	-	-	-	144	Investigation continued chemical analysis of bedrock samples indicates copper content varying from 19 ppm to 0.57%. It reveals extension of the Cu zone for further 150 m in continuation of delineated Cu anomaly during field season 2009-10 Channels/groove samples along

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Table - 2 (Contd.)

Agency/ State/ District	Location Area/ Block	Mapping		Drilling		Sampling (No.)	Remarks
		Scale	Area (sq km)	No. of boreholes	Meterage		
Bhilwara (Contd.)							lines KR-5 indicated copper content varying from 0.22% to 0.67% with an average of 0.45 Electron Probe Micro Analysis (EPMA) studies indicate that the dominant sulphide phases are bornite and chalcopyrite with rare galena.
-do-	Kamalपुरा and Devपुरा Blocks, Pur-Banera Belt	G-4 stage (Reconn. Stage)	-	-	-	-	Detailed geological mapping has revealed two bands of BIF. The first BIF band having a strike length of 200 m with varying width from 0.5 to 4.0 m occurs within garnetiferous mica schist and second BIF band having a strike length of 70 m and 3.5 m width at the contact of garnetiferous mica schist and impure marble. The minerals identified under EPMA study of BIF samples are:Galena, Chalcocite, Bornite, Bismuth, Monazite [(Ce, La, Y,Th) PO4] and Zircon. Geochemical samples results have indicated the Cu values for soil samples ranging from 44 to 523 ppm and for bedrock samples from <5 to 0.28%. On the basis of bedrock samples, a mineralised zone over a strike length of 350 m has been established in the garnetiferous mica schist. Some geochemical samples were also taken from BIF bands and the result shows Zn value up to 950 ppm. Significant concentration of Tungsten value has also been reported from soil samples (ranging upto 152 ppm) for the first time in Pur-Banera Belt and a zone of 200m x 100m has been delineated.
-do-	Between Rampuriya and Gaderiyakhera Pur-Banera Belt						Aerogeophysical anomaly map shows a chain of AEM anomalies ranging from 1-6 channel. The base metal mineralisation is restricted to the BIF band. Assay results of soil samples indicates lead in the ranges from 25 ppm to 791 ppm and line in the range from 60 ppm to 3636 ppm while concentration of other elements like Cu, Ni, Co, As, Mo, Ag is insignificant. Gold values are noticed in 14 soil samples, which range from 0.1 ppm to 0.24 ppm. Analytical result of few trench sample indicated Zn value ranging from 0.03% to 1.31% and Pb value from 0.02% to 0.79% over a width ranging from 5 to 12 m. A single value of gold (0.1 ppm) has also been recorded in one sample of 1m width in Trench-12. On the basis of analytical result two significant anomalous zones for

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Table - 2 (Contd.)

Agency/ State/ District	Location Area/ Block	Mapping		Drilling		Sampling (No.)	Remarks
		Scale	Area (sq km)	No. of boreholes	Meterage		
Bhilwara(Contd.)							Pb and Zn has been indicated. Anomalous value of Tungsten (W) ranging from 56.88 ppm to 106 ppm was recorded. The high values of W are recorded for the first time in Pur - Banera Belt.
Jaipur	Dholpura area (North Delhi Fold Belt)	G-4 stage - (Reconn. Stage)	-	-	-	-	Analytical results of bedrock samples collected from the lithounits of the mapped area indicated Cu value ranging from 5 ppm to 1202 ppm, Zn <5 ppm to 755 ppm, Pb <25 ppm to 133 ppm, Ni <15 ppm to 140 ppm, Co <15 ppm to 255 ppm to Ag<5 ppm and Au <0.05 ppm. Higher concentration of copper (>200 ppm) is found associated with brecciated BHQ and only three samples from the pit with sporadic malachite stains in the dolomite rock noticed near Dholpura village has indicated >1000 ppm Cu. The bedrock samples from the brecciated BHQ and ferruginised zones have indicated Fe content upto 33.30%. The analytical results of the channel samples carried out across the general strike of the litho-sequence in Dholpura and Shyampura area have indicated Cu values ranging from 29 ppm to 1766 ppm, Zn 7 ppm to 250 ppm, Pb <25 ppm to 54 ppm, Ni <15 ppm to 54 ppm, Co <15 ppm to 66 ppm, Ag <5 ppm and Au <0.05 ppm with Fe content varying from 0.3% to maximum 36.92 % Fe. It is inferred based on the geochemical results and geological set up that the area around Dholpura-Shyampura is not encouraging for base metal mineralisation.
Sikar	West of Nanagwas area (North Block Delhi Fold Belt)	G-4 Stage - (Reconn. Stage)	-	-	-	151	Two mineralised zones (MZ-I & MZ-II) have been delineated on surface indications in sepiolite bearing amphibole marble. The strike length of mineralised zones is about 550 m and 900 m with the average width of about 25 m and 10 m respectively. The chemical analytical results of channel samples indicated copper values ranging from 31 ppm to 0.68% Cu. Out of 151 channel samples, 85 channel samples give >0.20% Cu value.
-do-	Dariba North Block Dariba-Toda area	G-4 stage - (Reconn. stage)	-	-	-	-	Out of 150 channel samples collected analytical results of 75 nos. are received so far indicate Cu values between 9 ppm and

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Table - 2 (Contd.)

Agency/ State/ District	Location Area/ Block	Mapping		Drilling		Sampling (No.)	Remarks
		Scale	Area (sq km)	No. of boreholes	Meterage		
Sikar (Contd.)							7700 ppm. Two mineralised zones have been delineated on surface. Zone - 1 is exposed in east of Palaswala ki Dhani and extends towards south in the western part of the study area. It is about 850 m in strike length with average width of 30 to 35 m. Zone-II is exposed in the eastern part of the study area demarcated around Kalpala ki Dhani and is about 350 m in strike length with an average width of 10 to 15 m. 103 numbers of channel samples and 50 nos. of bed rock samples were collected across the mineralised zones the chemical analytical results of these samples are awaited.
-do-	Mahawa East Block Kundla ki Dhani Dolan Belt	G-4 stage - (Reconn. Stage)	-	-	-	150	Five channels MECH-1 to MECH-5 were selected for sampling. 50 samples from MECH-1 indicated poor values for copper. Results of rest of the channel samples are awaited. Channel samples were collected from the malachite stained amphibole bearing dolomite and banded semipelite. Analytical results for the same are awaited.
Tonk Danota in Agucha- Malpura- Chaksu Belt. n/vRajwas 9 km SW of Newai	Janula	G-4 stage - (Reconn. Stage)	-	-	-	-	Ground evaluation of airborne geophysical anomalies by detailed geological mapping and systematic geochemical sampling to identify target areas for basemetal mineralisation. The geochemical assay results (Cu, Pb, Zn, Ni, Co, and Ag only) of soil samples received so far has not indicated encouraging values. The assay values of Cu ranges from 7 to 21 ppm and Zn from 26 to 48 ppm whereas Pb values are <50 ppm.
Sikkim West District (Part)	Chakung- Jugdum area	G-4 stage - (Reconn. Stage)	-	-	-	-	The groove samples from Arubote West road section indicated copper values from 95 ppm to 25000 ppm. Three samples out of thirty samples show copper values of 1500 ppm. The Pb, Zn and Co show positive correlation with copper. The Pb values vary from 49 to 530 ppm, Zn values from 24 to 880 ppm. One sample collected from Jugdum old adit shows a value of 90 ppb gold.

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Table - 2 (Concl'd.)

Agency/ State/ District	Location Area/ Block	Mapping		Drilling		Sampling (No.)	Remarks
		Scale	Area (sq km)	No. of boreholes	Meterage		
MECL							
Rajasthan							
Bhilwara	Banera Copper Block	-	-	11	1855	-	Mineralised zones intersected in all boreholes except MBE-6. The v/e shows Cu -0.82 to 1.2% at 60 m level and copper values 0.2 to 0.88% at 120 m level.
Bhilwara	Gurla (North) Copper-Lead-Zinc Block	-	-	23	3941	-	The result of samples shows 3 to 5.09% Pb -Zn values, and copper values between 0.59 to 1.36%.
Jhunjhunu	Muradpur Copper Block	-	-	4	996.2	-	The v/e in mineralised zone shows Cu upto 0.5%.

PRODUCTION & PRICES

Copper Ore and Concentrates

The production of copper ore at 3.48 million tonnes in 2011-12 decreased by 3.6% as compared to that in the previous year.

The metal content in the ore produced in 2011-12 works out to 33,726 tonnes as against 35,214 tonnes in 2010-11. During the year under review, 3.59 million tonnes of ore was treated for obtaining copper concentrates as against 3.61 million tonnes in 2010-11.

Production of copper concentrates at 130,458 tonnes in 2011-12 decreased by about 5% as compared to that in the previous year. Madhya Pradesh was the leading producer of copper concentrates, accounting for about 58% of the production during 2011-12, followed by Rajasthan with 32% and Jharkhand with 11% production. The number of reporting mines were 4 in 2011-12. (Tables - 3 to 7).

Grade Analysis

Copper content in the ore produced during 2011-12 was 0.97% Cu as against 0.98% in the previous year 2010-11. All India average metal content of ore treated in 2011-12 works out to 0.96% Cu as against 0.97% in the preceding year.

The copper content in the ore treated varied from state to state. It was 0.99% Cu in Madhya Pradesh, 0.95% Cu in Jharkhand and 0.87% Cu in Rajasthan. The average metal content in the

concentrate produced works out to 24.16% Cu in 2011-12 as against 23.22% Cu in the previous year. The grade of copper concentrate produced in Madhya Pradesh in 2011-12 was of the highest grade at 27.36% Cu while that of Jharkhand was 25.25% Cu and Rajasthan 18.01 % Cu (Tables - 4 to 7).

The average daily employment of labour in copper mines in 2011-12 was 3,471 as against 2,611 in the preceding year.

Copper Metal

Hindustan Copper Ltd produces copper metal from the ore produced in their captive mines. Sterlite Industries (India) Ltd and Hindalco Industries Ltd produce copper metal from imported copper concentrates. Copper metal producers are indicated in Table-8.

The production of copper blister increased by 37% from 14,245 tonnes in 2010-11 to 19,473 tonnes in 2011-12 and copper continuous cast wire rods (CCWR) registered a decrease of 5% from 300,416 tonnes in 2010-11 to 287,550 tonnes in 2011-12. Similarly, in the production of copper cathodes a marginal decrease of 2% from 512,124 tonnes in 2010-11 to 504,677 tonnes in 2011-12. Production of copper electrolytic wire bars was not reported during last six years (Tables -9 to 12).

Prices of copper are furnished in the General Review on 'Prices'.

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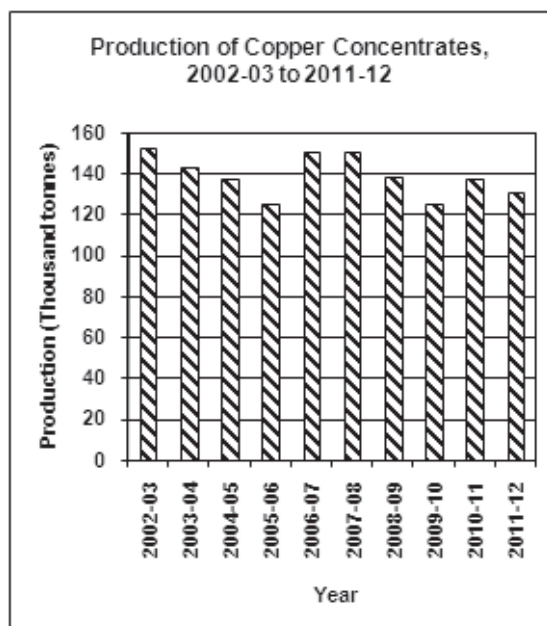


Table – 3 : Principal Producer of Copper Concentrates, 2011-12

Name and address of the producer	Location of mine	
	State	District
M/s Hindustan Copper Ltd, Tamra Bhavan, 1, Ashutosh Chowdhury Avenue, Post Box No. 10224, Kolkata – 700 019.	Madhya Pradesh	Balaghat
	Rajasthan	Jhunjhunu
	Jharkhand	Singbhum (East)

Table – 4 : Production of Copper Ore, 2010-11 and 2011-12 (By States)

(In tonnes)

State	2010-11			2011-12(P)		
	Ore produced	Cu%	Metal content	Ore produced	Cu%	Metal content
India	3601984	0.98	35214	3478189	0.97	33726
Jharkhand	396841	0.88	3492	395745	0.95	3759
Madhya Pradesh	2233523	1.00	22358	2081959	1.02	21201
Rajasthan	971620	0.96	9364	1000485	0.88	8766

Table – 5 : Copper Ore Treated, 2010-11 and 2011-12 (By States)

(In tonnes)

State	2010-11			2011-12(P)		
	Ore treated	Cu%	Metal content	Ore treated	Cu%	Metal content
India	3605960	0.97	35147	3588861	0.96	34291
Jharkhand	390248	0.88	3434	390543	0.95	3708
Madhya Pradesh	2249831	1.00	22566	2223753	0.99	22105
Rajasthan	965881	0.95	9147	974565	0.87	8478

Table – 6 : Production of Copper Concentrates, 2009-10 to 2011-12 (By States)

(Quantity in tonnes; value in ₹'000)

State	2009-10		2010-11		2011-12(P)	
	Quantity	Value	Quantity	Value	Quantity	value
India	124577	3809462	136856	4733515	130458	6167138
Jharkhand	13080	402092	12904	445678	13768	460321
Madhya Pradesh	64613	1926362	78778	2477950	75240	2959609
Rajasthan	46584	1481008	45174	1809887	41450	2747208

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**Table – 7 : Production of Copper Concentrates, 2010-11 and 2011-12
(By Sector/States/Districts)**

(Quantity in tonnes; value in ₹'000)

State/District	No. of mines	2010-11			No. of mines	2011-12(P)		
		Quantity	Cu %	Value		Quantity	Cu %	Value
India/Public sector	4	136856	23.22	4733515	4	130458	24.16	6167138
Jharkhand/								
Singhbhum (East)	1	12904	25.79	445678	1	13768	25.25	460321
Madhya Pradesh/								
Balaghat	1	78778	25.89	2477950	1	75240	27.36	2959609
Rajasthan/								
Jhunjhunu	2	45174	17.84	1809887	2	41450	18.01	2747208

Table – 8 : Producers of Copper, 2011-12

Name and address of the producer	Location	
	State	District
M/s. Hindustan Copper Ltd, Tamra Bhavan, 1, Ashutosh Chowdhury Avenue, Post Box No. 10224, Kolkata – 700 019.	Rajasthan Maharashtra	Jhunjhunu Raigad
M/s. Hindalco Industries Ltd, Century Bhawan, Dr. Annie Besant Road, Mumbai – 400 025, Maharashtra.	Jharkhand Gujarat	Singhbhum (East) Bharuch
M/s. Sterlite Industries (India) Ltd,Copper Division, 1/1/2,Chinchpada, Silvassa-396 830, Dadra & Nagar Haveli (U.T.).	Tamil Nadu Dadra & Nagar Haveli (U.T.)	Thoothukudi Chinchpada (Silvassa)
M/s. Jhagadia Copper Ltd,* 747, GIDC Industrial Estate, Post Box No. 14, P.O. Jhagadia – 393 110, Dist. Bharuch, Gujarat.	Gujarat	Bharuch

* Production of copper from secondary route.

Table – 9 : Production of Copper, 2009-10 to 2011-12

(In tonnes)

Year	Copper blister	Copper cathodes	Copper electrolytic wire bars	Copper CCWR*
2009-10	17864	532865	-	312447
2010-11	14245	512124	-	300416
2011-12(P)	19473	504677	-	287550

* CCWR - Continuous Cast Wire Rods.

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**Table – 10 : Production of Copper (Blister), 2010-11 and 2011-12
(By State/Plant)**

(Quantity in tonnes)

State	Plant	2010-11		2011-12	
		Quantity	Value	Quantity	Value
India		14245	N.A.	19473	N.A.
Jharkhand	Surda ICC	14245	N.A.	19473	N.A.

**Table – 11 : Production of Copper (CCWR), 2010-11 and 2011-12
(By States/Plants)**

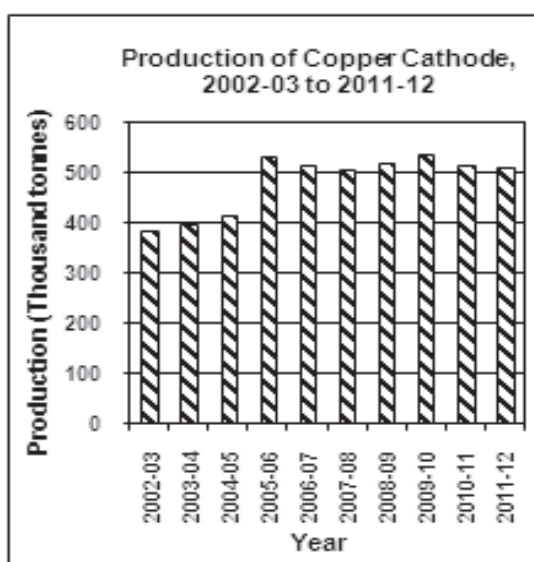
(Quantity in tonnes; value in ₹'000)

State	Plant	2010-11		2011-12(P)	
		Quantity	Value	Quantity	Value
India		300416	120434292	287550	127010980
Gujarat	Hindalco	143529	57223062	144781	63839580
Maharashtra	HCL Taloja	23003	13163500	26308	15980900
Tamil Nadu	Sterlite	133884	50047730	116461	47190500

**Table – 12 : Production of Copper (Cathodes), 2010-11 and 2011-12
(By States/Plants)**

(Quantity in tonnes; value in ₹'000)

State	Plant	2010-11		2011-12(P)	
		Quantity	Value	Quantity	Value
India		512124	190516536	504677	206308438
Gujarat	Hindalco	335762	124964580	330047	136099235
Jharkhand	Surda ICC	13653	5078385	18203	7982303
Tamil Nadu	Sterlite	162709	60473571	156427	62226900



MINING & MILLING

HCL operates the Indian Copper Complex (ICC) in Jharkhand, the Khetri Copper Complex (KCC) in Rajasthan, Malanjkhand Copper Project (MCP) at Malanjkhand in Balaghat district, Madhya Pradesh and Taloja Copper Project (TCP) in Maharashtra. Copper ore is being treated by froth flotation process to produce more than 16% copper in concentrate. The concentrate is then smelted by flash-smelting technique of Outokumpu of Finland at Khetri to produce 99.9% copper.

Hindustan Copper Ltd

Mining methods adopted in Khetri and Kolihan underground mines of HCL are sub-level open stoping and blasthole stoping. In sub-level open stoping, sub-levels are developed at vertical intervals of 18 to 20 m and a crown level is developed 9 m below upper main level. Width of the stope across the ore body is governed by its thickness. Stope drilling is done by 57 mm dia. BBC 120F drifter machine. A slot raise is prepared within the stope limit connecting crown level to extraction level. Slot raise is then widened to full width of the stope. Stope rings are blasted using the free face of the slot. When blasting of stope rings is completed, stope pillar rings are blasted. After completion of the stope and pillar rings, rib and crown pillars are blasted at a time. After recovery of rib pillar and crown pillar ore, the sill pillar is blasted from hanging wall to foot wall.

Another mining method is blasthole stoping method, wherein, a drill level is prepared between two main levels leaving a crown pillar of 9 to 15 m. Slot raise, slot, stope and rib pillar are drilled by Cubex 165 mm dia. machine. Trough, sill and crown pillar drilling are done by BBC120F drifter machine. Sequence of blasting remains the same as in the sub-level open stoping method.

HCL has a total of 3.8 million tpy ore capacity, that includes 1.4 million tpy at KCC, 2.0 million tpy at MCP and 0.4 million tpy at ICC. The company operates concentrator plants in Khetri, Rajasthan with a capacity of 2.02 million tpy, Ghatsila, Jharkhand with 1.55 million tpy capacity and Malanjkhand, Madhya Pradesh with 2.00 million tpy capacity. It also operates two smelters at KCC 31,000 tpy capacity and at ICC 20,500 tpy capacity. The smelter at KCC is not operating since December 2008 due to economic reasons. The company has prepared a road map for enhancing its mine production from current level of 3.4 MT to 12.4 MT per annum in the next 5 years with an estimated capital requirement of ₹ 3435 crores through expansion of existing mines and reopening of closed mines.

Khetri Copper Complex (KCC), Khetrinagar, Jhunjhunu District, Rajasthan

KCC has four projects under the complex at Khetri, Kolihan and Chandmari in Jhunjhunu district and Dariba in Alwar district, all

commissioned between 1973 and 1975 of which presently the former two are in operation. Chandmari copper project is not in operation since 2002. It operates two underground mines namely, Khetri and Kolihan with combined capacity of 1.4 million tpy. KCC has also a concentrator plant having a capacity of 2.02 million tonnes per year and a smelter with capacity of 31 thousand tonnes per year at Khetri in Jhunjhunu district, Rajasthan. It has facilities to recover gold, silver, nickel and sulphuric acid. However, HCL is contemplating suspension of operation at Precious Metal Recovery (PMR) plant, as export of anode slimes containing gold and silver directly is found to be economically advantageous. HCL is considering opening a new copper mine at Banwas in Rajasthan through contract mining with foreign partners.

Indian Copper Complex (ICC), Ghatsila, East Singhbhum District, Jharkhand

India Resources Limited of Monarch Gold Company Ltd, Australia, through its alliance with Hindustan Copper Ltd (HCL) has undertaken the mine development of Surda Copper Mine and Mosabani Concentrator Plant and has introduced modern mining and processing equipment. The mine has started production of copper ore and concentrates from January 2008. Mining is currently underway in eight stopes with initial production target of 450,000 tpy at a forecast average grade of 1% Cu. All mines at Indian Copper Complex (ICC), Jharkhand were earlier closed on economic considerations. Out of the closed mines at ICC, Company has since reopened the mine at Surda in association with an Australian Mining Company, viz. M/s. Monarch Gold Co.Ltd/IRL. The mine has started production of Copper Ore and its beneficiation into Copper concentrate from January, 2008.

Malanjkhand Copper Project (MCP), Malanjkhand, Balaghat District, Madhya Pradesh

MCP has the largest hard rock open-pit mechanised mine in the country at Malanjkhand, Balaghat district, Madhya Pradesh, having an annual capacity to produce 2 million tonnes ore with a matching concentrator plant. It is the single largest copper deposit in the country contributing 80% to the HCL's total copper ore production. Prominent deposits in MCP are Malanjkhand,

Shitalpani, Gidhri Dhorli, Jatta and Garhi Dongri. The concentrates produced by this plant are sent to KCC and ICC for smelting. The CCEA had approved the investment of ₹ 1856.36 crore for the expansion of MCP from 2.0 million tpy to 5.0 million tpy underground mine.

INDUSTRY

HCL, a public sector company, was the only producer of primary refined copper till 1997. The installed capacity for refined copper production at its two integrated smelters was around 51,500 tpy. Now, the other two producers of primary copper from imported concentrates are M/s. Hindalco Industries Ltd and Sterlite Industries of Vedanta Group, having annual capacities of 500,000 tonnes and 400,000 tonnes of refined copper, respectively. Jhagadia Copper Ltd (formerly SWIL Ltd) has become operational with 50,000 tpy capacity of copper cathodes and additional capacity of 20 thousand tpy of copper anode. The total installed capacity is thus 1,001,500 tpy. Besides, continuous cast wire rod plants are operated by HCL, Sterlite and Hindalco. In addition, M/s. TDT presently Alchemist Metals Ltd, Rewari, Haryana and M/s. Finolex also have continuous cast wire rod plants based on imported copper. Details regarding smelter capacity of copper cathode are given in Table - 13.

Table – 13 : Capacity of Copper Smelters

(In '000 tonnes)	
Smelter/Location	Annual Capacity
TOTAL	1001.5
1. Hindustan Copper Ltd	51.5
i) Khetri Copper Complex, Dist. Jhunjhunu, Rajasthan.	31
ii) Indian Copper Complex Dist. East Singhbhum, Jharkhand.	20.5
2. M/s. Sterlite Industries (India) Ltd., Thoothukudi, Tamil Nadu.	400
3. M/s. Hindalco Industries Ltd, Dahej, Dist. Bharuch, Gujarat.	500
4. M/s. Jhagadia Copper Ltd, (Formerly SWIL Ltd), Dist. Bharuch, Gujarat.	50

Hindustan Copper Ltd

i) Khetri Copper Complex (KCC)

This smelter with a capacity of 31,000 tpy is located at Khetri in Jhunjhunu district, Rajasthan. HCL has taken up technological upgradation and debottlenecking scheme at its KCC smelter and refinery that led to enhancement of capacity from 31,000 to 45,000 tpy. Though, clearance from the Government was acquired for this proposal, continuous losses suffered by HCL, have impeded due allocation of funds.

In addition, KCC has sulphuric acid and phosphatic fertilizer plants that are in operation.

ii) Indian Copper Complex (ICC)

A 20,500 tpy capacity smelter is located at Ghatsila, East Singhbhum district, Jharkhand. In addition, the Complex consists of 8,400 tpy wire bar casting plant, 54,000 tpy sulphuric acid plant and a brass rolling mill. There is also a precious metal recovery plant for recovery of gold, silver, selenium, tellurium, nickel sulphate, copper sulphate, etc. A pilot plant with a capacity to produce one tonne nickel cathodes per month was also set up at ICC. The plant is currently being scaled up to a production capacity of 5 tonnes per month of nickel cathodes.

iii) Taloja Copper Project (TCP)

The plant with a capacity of 60,000 tpy continuous cast wire rods (CCWR) is located at Taloja in Maharashtra. It uses the SCR 2000 system of the world renowned South Wire Co. USA. It produces rods of 8 mm, 11 mm, 12.5 mm and 16 mm diameters and meets most precise standards conforming to ASTM B 49/98 & /or IS 12444/1988. The Plant commenced commercial production in April 1991. The installed capacity could further be increased to 80,000 tpy in the future. The unit also undertakes tolling of cathodes.

The status of private sector smelter plants is as follows :

i) Sterlite Industries (India) Ltd

The Sterlite Industries (India) Ltd having an installed smelter capacity of 400,000 tpy copper anodes is located at Thoothukudi in coastal Tamil Nadu. It is based on 'Isasmelt' technology using imported concentrates. A new cathode refinery of 120,000 tpy and 90,000 tpy rod plant has also been built at Thoothukudi for exports from nearby ports. The company has set up a copper refinery of 180,000 tpy copper cathodes capacity and 150,000 tpy rod mill at Chinchpada, Silvassa in the Union Territory

COPPER

of Dadra & Nagar Haveli. Anode from Thoothukudi are refined at Silvassa for domestic market. Besides copper, the company also manufactures sulphuric acid, phosphoric acid, gold and silver as by-products.

ii) Hindalco Industries Ltd (Birla Copper)

The company's smelter located at Dahej, Bharuch district, Gujarat, has a capacity of 500,000 tpy. The smelter is based on Outokumpu technology. The part of production of cathodes is used for production of continuous cast wire rods. In the process of extraction of copper metal, sulphuric acid, phosphoric acid, gold and silver were recovered as by-products. The entire requirement of copper concentrates was met through imports from many countries namely Australia, Indonesia, Papua New Guinea, Chile, Argentina and Canada.

iii) Jhagadia Copper Ltd (formerly SWIL Ltd)

SWIL Ltd has been renamed Jhagadia Copper Ltd w.e.f. 5-1-2006 and its smelter has been installed at Jhagadia in Bharuch district of Gujarat. This scrap-based electrolytic smelter for production of cathodes has a capacity of 50,000 tonnes per year along with additional 20,000 tpy capacity for production of copper anodes. About 6,000 tonnes output are used by the Company in its processing units for manufacturing wires, strips, etc., about 20,000 tonnes get exported and the remaining 24,000 tonnes are sold in domestic markets. The plant has been set up in technical collaboration with Boliden Contech AB of Sweden.

iv) Metdist

This Company was in the process of setting up a smelter with a capacity of 150,000 tpy copper cathodes at Rampara-Rajula in Amreli district, Gujarat, in technological collaboration with Mitsubishi, Japan. The project has been withheld.

RECYCLING OF COPPER

Copper scrap is traded in the form of new scrap generated from copper smelters, copper workings as well as old scrap recovered from electrical motors, electronic equipment, cables, wires, utensils, etc.

The recycling of copper scrap is gaining importance worldwide simply because of the fact the recovery of copper metal from scrap requires much less energy than the recovery from primary

source and secondly it saves the natural resources.

As per ICSG (International Copper Study Group) the recovery of secondary copper in the entire world was 3.32 million tonnes in 2009 as compared to 2.79 million tonnes in the previous year.

In Indian condition, however, the collection of scrap is in unorganised sector and there is paucity of factual data. Still as per the licences granted by Central Pollution Control Board as on 13.5.2010, there were 35 units operating in different states with a combined capacity of 2.42 lakh tpy for handling different types of scrap.

In addition to this, there are 132 units with combined capacity of 5.17 lakh tpy which recover copper along with other metals. As per the estimates made in the recently published Market Survey on Copper by IBM, there was a production of 1.07 lakh tpy of secondary copper, all in organised sector, in the country.

USES

The per capita consumption of copper in India is currently at 0.5 kg as compared to Russia 3.3 kg, China's 5.4 kg per annum, USA 5.5 kg, Italy 8.9 kg, Germany 13.6 kg and to that of 10 kg of developed nations. India's per capita consumption is likely to be moderate and has many strides to cover so as to match that of China. Electrical/Electronic Industry is by far the largest consumer of copper, where it is used in the form of cables, winding wires as it is the best non-precious metal conductor of electricity as it encounters much less resistance and is safe for electrical distribution system from high voltage transmission cables to micro-circuits. Copper also has relatively high creep strength as compared to other commonly used materials. In Electronic Industry, semi-conductor manufacturers have launched a revolutionary 'copper chip'. By using copper for circuitry in silicon chips, microprocessors are able to operate at higher speeds, using less energy. Copper heat sinks help remove heat from transistors and enable computer processors operate at peak efficiency. Copper is used in Construction Industry as plumbing, taps, valves and fittings components. In Transportation Industry copper is used in various components. According to an estimate by ICSG most cars contain an average of 20 kg copper and luxury &

COPPER

hybrid vehicles contain about 45 kg copper. Copper is extensively used in industrial machinery and equipment. It is used in a number of consumer products, such as, coinage, utensils, fixtures, etc. Large quantities of copper are consumed in making copper-based alloys, such as, brass and bronze.

CONSUMPTION

As per the estimate of ICSG, the share of electrical and telecommunication industry in total consumption is 56%, followed by Transport(8%) , consumer durables (7%), Building and Construction (7%), General Engineering goods (6%) and other industries including Process Industries (16%). The apparent availability of copper for internal consumption in various industries have been computed on the basis of production of refined copper (cathodes), imports and exports of copper (refined). Copper is also traded in the form of alloys but have not been considered for arriving at apparent availability of copper. During 2010-11 due to sharp decline in exports of refined copper and slight increase in imports, the availability of refined copper increased from 97791 tonnes in 2010-11 to 285,063 tonnes in 2011-12 (Table-14).

**Table – 14 : Apparent Availability of Copper for Domestic Consumption
(Based on Production of Refined Copper, Imports and Exports)**

	(In tonnes)	
Item	2010-11	2011-12
I) Total Production* (Cathodes)	512124	504677
II) Total Imports (copper refined)	8055	18524
III) Total Exports (copper refined)	422388	238138
IV) Apparent Availability	97791	285063

* Primary

SUBSTITUTES

Copper is vulnerable for substitution on grounds of price, technical superiority or weight. Aluminium is used as substitute for copper in various products, such as, electrical power cables, electrical equipment, automobile radiators and cooling/refrigeration tubing. Optical fiber has substituted copper in some telecommunication applications and plastics too is used as substitute

for copper in water pipe, plumbing, fixtures and many structural applications.

WORLD REVIEW

The world reserves of copper metal is assessed at 680 million tonnes of copper content. Chile has the largest share, accounting for about 27.94% of world reserves, followed by Australia(12.65%), Peru (11.18%), USA (5.73%), Mexico (5.59%) and China, Russia (4.41% each) (Table-15).

The world mine production of contained copper remained same at 16.20 million tonnes in 2010 and 2011. Chile continued to be the largest single producer of copper in 2011 with 32.49% share followed by China (8%) Peru (7.63%), USA (6.91%) and Australia(5.91%) (Table-16).

Although, major commodity derivatives markets are located in the western region, global market takes the price direction from the trend in demand - supply from Asia.

Australia

Production at the Olympic Dam Mine rose by 65 thousand tonnes owing to restoration of production following a conveyor failure in 2010.

Chile

In Chile, copper mine production declined by more than 150 thousand tonnes to its lowest level since 2003, principally due to an almost 300 thousand tonnes decline in production at Escondida Mine, the world's leading copper producing mine, owing to lower ore grades and labour strikes.

China

China is the largest consumer of copper in the world. In terms of production as well, it accounts about 22% of world's capacity which includes mine, refinery & smelting operations.

The greenfield Baiyin Electrolytic Refinery (Baiyin Nonferrous Metals) was constructed to match existing smelter capacity of 100,000 tpy. Its projected capacity of 300,000 tpy was expected to exceed the proposed expansion of Baiyin smelter to 200,000 tpy.

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**Table – 15 : World Reserves of Copper
(By Principal Countries)**

(In '000 tonnes of copper content)

Country	Reserves
World: Total (rounded)	680000
Australia	86000
Canada	10000
Chile	190000
China	30000
Congo (Kinshasa)	20000
Indonesia	28000
Kazakhstan	7000
Mexico	38000
Peru	76000
Poland	26000
Russia	30000
USA	39000
Zambia	20000
Other countries	80000

Source: Mineral Commodity Summaries, 2013.

**Table – 16 : World Mine Production of Copper
(By Principal Countries)**

(In '000 tonnes of metal content)

Country	2009	2010	2011
World: Total	15900	16200	16200
Australia	856	871	960
Brazil	217	213	224
Canada	485	525	566
Chile	5394	5419	5263
China	1062	1179	1299
Congo, Dem.P.R.	299	378	480
Indonesia	988	878	543
Iran	262	257	259
Kazakhstan	456	427	417
Mexico	241	270	444
Peru	1276	1247	1235
Poland	439	426	427
Russia	676	703	713
USA	1180	1110	1120
Zambia	601	732	740
Other countries	1468	1565	1510

Source: World Mineral Production, 2007-2011.

Congo (Kinshasa)

Production in Congo(Kinshasa) rose by about 90 thousand tonnes due to start up or expansion of several electro winning operations.

USA

In the United States, mine production was projected to increase by about 4% in 2012 as mine cut backs instituted at year end 2008 in Arizona, Nevada and New Mexico were restored. These increases were expected to be partially offset by lower ore grades and production at the second ranked US Copper Mine in Utah. Domestic consumption of refined copper was expected to increase slightly from that in 2011.

FOREIGN TRADE

Exports

The export of copper from India is in the forms of copper ore & concentrates, refined copper, copper & alloys, brass & bronzes, scrap, cement copper, mattes and powder & flakes.

Export of copper ores and concentrates decreased sharply to 20 tonnes in 2011-12 as against 19,701 tonnes in 2010-11. Exports were almost entirely to Liberia (98%). Export of refined copper decreased sharply to 238,138 tonnes in 2011-12 from 422,388 tonnes in 2010-11. China was the single largest importer of copper from India with a share of 95%. (Tables-17 to 24)

Imports

The imports of copper in the country are in the form of copper ore and concentrates, refined copper, copper & alloys, brass & bronzes, scrap, cement, copper, mattes, blister, worked (bars, rods & plates), etc.

COPPER

During the year 2011-12, imports of copper ores and concentrates were slightly higher at 2,124,501 tonnes as compared to 1,902,026 tonnes in 2010-11. Chile with a share of 36% was the leading supplier followed by Australia (24%), Indonesia (15%) and Brazil (7%). Imports of refined copper increased in 2011-12 at 18,524 tonnes as against 8055 tonnes in 2010-11. Bhutan with 20% share was the major supplier followed by Zambia (13%), Ukraine (12%) and Chile (8%) (Tables - 25 to 34).

Table – 17 : Exports of Copper Ores & Conc. (By Countries)

Country	2010-11		2011-12	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	19701	1390065	20	80
Liberia	-	-	20	78
Netherlands	++	3	++	1
UK	++	6	++	1
Other countries	19701	1390056	-	-

Table – 18 : Exports of Refined Copper (By Countries)

Country	2010-11		2011-12	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	422388	16081167	238138	100941506
China	315355	120564278	226288	95895520
UAE	58794	21701770	6392	2647683
Japan	200	71489	2100	880754
Egypt	3296	1553114	820	412254
Hong Kong	900	331257	547	221640
Oman	4942	1799389	401	183014
Chinese Taipei/ Taiwan	4347	1646591	375	163552
Thailand	19901	7454304	373	163412
Vietnam	975	381807	110	84098
Saudi Arabia	5456	2275999	131	58256
Other countries	8222	3031674	601	231323

Table – 19 : Exports of Copper & Alloys (Including Brass & Bronze) : Total (By Countries)

Country	2010-11		2011-12	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	564164	201100005	334913	136844498
China	316311	121080605	230683	97590132
UAE	64284	23755235	22692	9680635
USA	10645	2860655	12156	3999696
Malaysia	27614	11079138	8689	3416232
Germany	4680	1391059	6126	2284381
Saudi Arabia	12165	4659995	5548	1858376
Sri Lanka	7459	2787065	3692	1482084
UK	2750	836889	4761	1414912
Japan	511	167913	2701	1078549
Hong Kong	6992	2600402	2831	1076211
Other countries	110753	29881049	35034	12963290

Table – 20 : Exports of Copper (Scrap) (By Countries)

Country	2010-11		2011-12	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	2709	903167	7531	2749738
China	39	11038	3524	1313787
Germany	1486	501902	2376	844081
Korea, Rep. of	556	174896	485	174147
Japan	159	57447	376	137642
Philippines	88	30063	275	99470
Spain	240	81602	242	87730
UAE	17	3037	8	22791
France	6	1478	49	21751
Latvia	41	15234	47	17812
Hong Kong	-	-	88	8456
Other countries	77	26470	61	22071

COPPER

**Table – 21 : Exports of Copper & Alloys
(By Countries)**

Country	2010-11		2011-12	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	529962	191568150	287488	121138330
China	315888	120947877	226699	96081695
UAE	62205	23102572	18788	7864951
Malaysia	26615	10827733	7360	3015302
USA	4145	1470101	3339	1401336
Sri Lanka	6929	2633912	3143	1288313
Saudi Arabia	10765	4243443	3582	1256656
Hong Kong	6658	2521590	2438	1002025
Japan	229	81396	2132	892670
Germany	1185	400437	2016	778998
Thailand	26278	9703333	1535	644543
Other countries	69065	15635756	16456	6911841

**Table – 22 : Exports of Brass & Bronze
(By Countries)**

Country	2010-11		2011-12	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	31266	8589523	39216	12766019
USA	6495	1389484	8815	2597970
UAE	2053	647094	3879	1787654
UK	1894	543906	3503	989649
Germany	2008	488011	1734	661301
Saudi Arabia	1400	415892	1953	598951
Australia	1339	445226	1274	478449
Netherlands	795	203311	1478	420416
Malaysia	982	246380	1101	344014
Italy	585	244921	788	333114
Morocco	142	97674	442	330568
Other countries	13573	3867624	14249	4223933

**Table – 23 : Exports of Brass & Bronze
(Scrap)
(By Countries)**

Country	2010-11		2011-12	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	208	34194	625	129989
Malaysia	-	-	228	56914
Chinese Taipei/ Taiwan	++	4	176	40155
Hong Kong	138	18847	166	17653
China	22	745	24	5246
UAE	9	2532	17	5239
Nepal	-	-	9	3206
Seychelles	-	-	2	661
Japan	-	-	1	339
USA	5	1070	1	186
Qatar	-	-	++	183
Other countries	34	10996	1	207

**Table – 24 : Exports of Copper
(Cement Copper Precipitated)
(By Countries)**

Country	2010-11		2011-12	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	2	175	1	74
Nepal	-	-	1	74
Other countries	2	175	-	-

**Table – 25 : Imports of Copper Ores & Concentrates
(By Countries)**

Country	2010-11		2011-12	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	1902026	200234533	2124501	264510239
Chile	598173	58573179	758603	87833367
Australia	448977	49366539	510162	67693955
Indonesia	209671	24924438	322579	44774381
Brazil	165370	17475191	157986	18608244
Canada	21246	2215295	61027	7950636
Peru	50669	5629680	56176	6819649
Papua New Guinea	52995	7262161	42386	6645718
Thailand	52051	4639570	54523	5592697
Laos	-	-	41464	4384992
Sri Lanka	-	-	23939	3383847
Other countries	302874	30148480	95656	10822753

COPPER

**Table – 26 : Imports of Refined Copper
(By Countries)**

Country	2010-11		2011-12	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	8055	3029044	18524	7209464
Bhutan	-	-	3695	1091615
Ukraine	588	210153	2279	964878
Zambia	381	117352	2498	939049
Chile	50	16939	1421	606741
UK	741	315381	900	396727
UAE	312	94689	1025	394959
Malaysia	705	266205	827	343537
Sri Lanka	1154	417642	745	301398
Austria	496	189254	686	301236
Unspecified	13	4221	554	222352
Other countries	3615	1397208	3894	1646972

**Table – 27: Imports of Copper & Alloys
(Including Brass & Bronze) : Total
(By Countries)**

Country	2010-11		2011-12	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	260108	85717042	350290	128268204
UAE	34663	11964422	48230	17391491
Russia	10185	3730805	28205	12100142
China	26645	8968545	29736	11837828
Germany	19274	6896949	29754	10716039
Malaysia	16588	6234667	18066	7539550
Zambia	1050	279937	16866	6973915
UK	15003	3837570	22727	6540358
Australia	14401	5311554	11917	5042391
USA	8450	2661522	13163	4656391
Saudi Arabia	9986	2893325	12237	3594576
Other countries	103863	32937746	119389	41875523

**Table – 28 : Imports of Copper & Alloys
(By Countries)**

Country	2010-11		2011-12	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	140163	51176534	172084	74403982
Russia	9968	3651935	27721	11950938
China	22978	7805893	24413	9912129
UAE	16515	6079289	21825	9068976
Zambia	1026	273863	15661	6528013
Malaysia	12768	5135827	13752	6114184
Australia	13848	5149691	10541	4561077
Germany	6985	3191870	7512	4079943
Korea, Rep. of	8604	3266018	6018	2585603
Bhutan	5610	1508543	7870	2119716
Thailand	4281	1938612	3737	1662718
Other countries	37580	13174993	33034	15820685

**Table – 29 : Imports of Copper (Scrap)
(By Countries)**

Country	2010-11		2011-12	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	39651	14423261	57866	22347427
UAE	11887	4443835	14254	5440667
Germany	2149	795111	4199	1734177
Saudi Arabia	5015	1797102	4300	1695615
UK	1593	573246	3939	1543662
France	1340	547738	2648	1160049
USA	1119	355380	2768	1073463
Mexico	746	323764	2283	978664
Malaysia	1471	490058	1963	727460
Benin	1784	668947	1757	701215
Kuwait	1600	602069	1437	465003
Other countries	10947	3826011	18318	6827452

**Table – 30 : Imports of Copper & Alloys
(Scrap)
(By Countries)**

Country	2010-11		2011-12	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	-	-	6	2587
Singapore	-	-	6	2587

COPPER

**Table – 31 : Imports of Brass & Bronze
(By Countries)**

Country	2010-11		2011-12	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	16714	6022873	16271	6841230
China	3302	1085744	3181	1223936
Germany	3596	1510720	2419	1175447
Japan	849	396741	1798	886594
Nepal	1682	620440	1913	665626
Malaysia	1117	329020	1352	451453
USA	935	324290	809	366286
Chinese Taipei/Taiwan	1076	295736	912	351259
Korea Rep.of	225	82439	325	175648
Austria	99	55174	231	173890
Italy	251	129622	271	143387
Other countries	3582	1192947	3060	1227704

**Table – 32 : Imports of Brass & Bronze (Scrap)
(By Countries)**

Country	2010-11		2011-12	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	63580	14094374	104063	24672978
UK	11899	2572150	17036	4160379
Germany	6544	1399249	15624	3726473
UAE	5914	1314990	11817	2769116
Saudi Arabia	4879	1072130	7775	1826685
USA	3452	833606	6538	1573726
Bangladesh	2211	565330	2776	752831
Netherlands	2854	631304	2776	653230
Spain	1418	317836	2619	612406
Denmark	1818	395015	2515	604029
Sweden	1362	300106	2527	602307
Other countries	21229	4692658	32060	7391796

**Table – 33 : Imports of Copper (Cement Copper Precipitated)
(By Countries)**

Country	2010-11		2011-12	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	147	21437	30	5166
Congo (Kinshasa)	73	11681	27	2904
China	-	-	1	1652
Germany	-	-	1	350
USA	-	-	1	260
Other countries	74	9756	-	-

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**Table – 34 : Imports of Copper & Alloys
(Excluding Brass & Bronze and Scrap)
(By Items)**

Item	2010-11		2011-12	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Items	140163	51176534	172084	74403982
Blister & other unrefined copper	2034	768599	13144	5577771
Copper & alloys: worked (bars, rods, plates, etc.)	42580	16678942	39154	17958250
Copper & alloys: worked, NES	12054	3216671	5982	3401112
Copper & alloys: unwrought	1791	695372	1851	837993
Copper matte	30	12937	20	7727
Copper powder & flakes	697	425771	700	433985
Copper refined: copper worked	69530	25065630	91326	38506032
Electroplated anode of nickel	3310	1229305	993	438939
Master alloys of copper	82	54263	30	32709
Refined copper	8055	3029044	18524	7209464

FUTURE OUTLOOK

With the liberalised policies of the Government, the Indian Copper Sector registered a quantum rise in production. The present installed capacity of refined copper has reached at around ten lakh tonnes per year. India's position has shifted from being a net importer of copper to a net exporter. The main demand for refined copper is in the electrical and electronic sectors, construction sector, consumer durables and transport sector. The potential upcoming areas which are likely to boost the internal demand

for copper are infrastructure development and railways, power sector, especially rural electrification and information technology sector. At the same time there are potential export markets for refined copper in the Middle-East and South-East Asian countries which could be further explored. However, growth in the copper sector is heavily dependent on demand in China.

As per the market survey carried out by Indian Bureau of Mines, the demand of copper by 2016-17 is estimated at one million tonnes based on sectorial growth of copper consumption.