

26 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.

Production of primary copper based on indigenous ore is characterised by high energy consumption because of low-scale operation and minimal automation. The low-grade quality of Indian copper ores and nature of ore bodies (narrow width and flatter inclinations), do not make large-scale mechanisation in underground mines a viable proposition. 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.

A substantial quantity of copper metal is also produced through indigenous and imported scrap. 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 domestic production of copper ore as well as concentrates in 2009-10 decreased by 7% and 9%, respectively, over the previous year. There was also a decrease of 39% in the production of copper (blister) and 1% in the production of continuous cast wire rods (CCWR). However, production of copper cathodes increased by 4% during the same period.

RESOURCES

The total resources of copper ore as on 1.4.2005 as per UNFC system are estimated at 1.39 billion tonnes. Of these, 369.49 million tonnes (26.5%) fall under 'reserves' (proved and probable categories) while the balance 1.02 billion tonnes (73.5%) are 'remaining resources' (under feasibility, pre-feasibility, measured, indicated and inferred categories). Of the total ore resources, 28.03 million tonnes (2.0%) comprise ore containing 1.85% Cu or more and 622 million tonnes (44.61%) of 1% to below 1.85% Cu grade. With regard to reserves, about 7.3 million tonnes (2%) and 346.7 million tonnes (93.8%) relate to above 1.85% Cu grade and 1% to below 1.85% Cu grade, respectively.

The total copper metal content in the resources is 11.4 million tonnes of which 4.38 million tonnes constitute reserves.

Largest resources of copper ore to a tune of 668.5 million tonnes (47.9%) are in the state of Rajasthan followed by Madhya Pradesh with 404.3 million tonnes (29%) and Jharkhand with 226.08 million tonnes (16.2%). 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, MECL, DMG Rajasthan, DGM Nagaland & Madhya Pradesh were engaged in the exploration of base metals in 2009-10. DMG Rajasthan carried out exploration in the districts of Ajmer, Bhilwara, Jhunjhunu, Pali, Rajsamand, Sikar, Sirohi and Udaipur. DGM Nagaland carried out exploration in Phek district. MECL carried out exploration in the Ajmer and Chittorgarh districts of Rajasthan. GSI carried out exploration in the states of Gujarat, Haryana, Maharashtra, Meghalaya and Rajasthan. Details of exploration activities conducted for copper in 2009-10 are given in Table-2.

**Table – 1 : Reserves/Resources of Copper as on 1.4.2005
(By Grades/States)**

(In '000 tonnes)

Grade/State	Reserves			Remaining resources					Total resources (A+B)			
	Proved STD111	Probable		Feasibility STD 211	Pre-feasibility STD221	Measured STD331	Indicated STD332	Inferred STD333		Total (B)		
		STD121	STD 122								Total (A)	
All India : Total												
Ore	135461	48178	185854	369493	3375	2230	13995	112019	158678	734637	1024934	1394427
Metal	1643.93	494.39	2245.65	4383.97	3.37	11.82	60.43	1052.47	1396.27	4509.39	7033.75	11417.72
By Grades												
Ore with 1.85 % & above Cu	2370	-	4952	7322	-	-	508	430	305	19466	20709	28031
Ore with 1.00 % to below 1.85 % Cu	124911	48178	173565	346654	-	-	3234	40083	45319	186695	275331	621985
Ore with (+)0.5% to below 1.00% Cu	636	-	2795	3431	-	2230	-	23366	78239	497228	601063	604494
Ore with (-)0.5% Cu	7544	-	4542	12086	3375	-	10253	48140	34815	31248	127831	139917
Metal	1643.93	494.39	2245.65	4383.97	3.37	11.82	60.43	1052.47	1396.27	4509.39	7033.75	11417.72
By States												
Andhra Pradesh												
Ore	686	338	433	1457	-	-	395	-	5396	1000	6791	8248
Metal	6.88	4.33	5.84	17.05	-	-	7.54	-	89.91	8.32	105.77	122.82
Gujarat												
Ore	-	4955	845	5800	-	-	-	129	-	7131	7260	13060
Metal	-	80.75	13.78	94.53	-	-	-	0.69	-	113.38	114.07	208.6
Haryana												
Ore	-	-	-	-	-	2230	-	-	-	15000	17230	17230
Metal	-	-	-	-	-	11.82	-	-	-	45	56.82	56.82
Jharkhand												
Ore	4464	42356	29075	75895	-	-	-	40307	66188	43692	150187	226082
Metal	39.2	400.45	278.82	718.47	-	-	-	490.55	631.85	562.7	1685.10	2403.57

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Table-1 (Concltd.)

Grade/State	Reserves				Remaining resources				Total resources (A+B)
	Proved STD111	Probable		Total (A)	Feasibility STD 211	Pre-feasibility		Inferred STD333	
		STD121	STD 122			STD221	STD222		
Karnataka									
Ore	963	2595	3558	-	-	-	7148	21948	30846
Metal	5.99	20.34	26.33	-	-	-	66.9	111.33	200.23
Madhya Pradesh									
Ore	101813	125336	227149	-	-	-	33150	94399	177199
Metal	1343.93	1641.9	2985.83	-	-	-	100.57	913.11	1169.43
Maharashtra									
Ore	-	2180	2180	-	-	-	1419	5982	7401
Metal	-	17.44	17.44	-	-	-	21.3	62.51	83.81
Meghalaya									
Ore	-	-	-	-	-	-	880	-	880
Metal	-	-	-	-	-	-	9	-	9
Odisha									
Ore	-	-	-	-	-	3234	722	2095	6051
Metal	-	-	-	-	-	40.55	3.2	20.69	64.44
Rajasthan									
Ore	27535	25327	52942	3375	-	10253	42794	542580	615515
Metal	247.93	266.62	515.64	3.37	-	10.25	469.37	2662.97	3466.44
Sikkim									
Ore	-	63	511	-	-	-	-	150	450
Metal	-	0.91	8.68	-	-	-	-	4.23	12.7
Tamil Nadu									
Ore	-	-	-	-	-	-	590	-	790
Metal	-	-	-	-	-	-	2.73	-	3.81
Uttarakhand									
Ore	-	-	-	-	-	-	390	660	4220
Metal	-	-	-	-	-	-	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, 2009-10

Agency/ State/ District	Location Area/ Block	Mapping		Drilling		Sampling (No.)	Remarks
		Scale	Area (sq km)	No. of boreholes	Meterage		
GSI							
Gujarat							
Banaskantha	Southeast of Ambamata and Data-Bhanpur	-	-	-	-	-	A limonitised calc silicate band of dimension about 400m x 60m was identified to the west of Godha. It contains specks of pyrite, chalcopyrite and magnetite. Well dumps from Khokhariya show pyrite & chalcopyrite in calc-silicate rocks.
Haryana							
Mahendragarh	North of Gangutana	-	-	2	-	-	Two boreholes (GGBH-11 and GGBH-12) were drilled at 200m strike interval to intersect the mineralised zone at 60m vertical depth. GGBH-11 intersected two mineralised zones having average copper content of 0.27% x 4.0m and 0.24% x 4.0m along the borehole. Borehole GGBH-10 which was drilled last year to intersect the mineralised zone (0.38% Cu x 4.00 m) delineated in borehole GGBH-3 at deeper level (at 200m vertical depth) intersected the copper mineralised zone having average copper content of 0.32% over an average width of 6.5 m .
-do-	South of Faizabad ki-Dhani	-	-	-	-	-	A 100 m long and 12m wide zone of sulphide mineralisation having mostly pyrrhotite and pyrite with specks of chalcopyrite in graphite-biotite-amphibolite schist and associated calc silicate rocks was identified in a quarry section of Faizabad-Ki-Dhani Hill. The channel samples indicated copper values in the range of 200 ppm to 660 ppm. A borehole (FDBH-1) has been commenced in the western part of the main Faizabad-ki-Dhani hill to confirm the extension of mineralisation in the soil covered area by intersecting the geophysical anomaly due to suspected sulphide mineralisation zone at 60m vertical depth.
Maharashtra							
Gadchiroli	Ghanpur-Mudholi	-	-	-	-	-	Surface analytical results of 10 samples of this area indicated Cu values from 20 ppm to 1.9% Pb varies from 10 ppm to 30 ppm. Zn varies from 10 ppm to 75 ppm. Co varies from <10 ppm to 20 ppm. Ni varies from <10 ppm to 100 ppm and Cr varies from 10 ppm to 0.1%. First borehole was under progress.

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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 Khasi Hills	Umphyrnai - area	-	-	-	-	-	The channel samples from the adjoining area i.e. east of Pomlakral reveals that there is a segment with high value of copper i.e. 310 ppm to 950 ppm. Occurrence of secondary uranium-lead and high value of REE and thorium has also been reported. Specks of primary oxidised sulphides were noticed along thinly banded acid metavolcanics. Analytical results of the samples were awaited.
Rajasthan							
Alwar	Deota-Kishangarh Bas area	-	-	-	-	-	Evidences of mineralisation are manifested by old workings along with mine dumps and disseminations of primary sulphides and malachite stains confined to a prominent shear zone trending N 60° W-S 60° E and having a variable width of 5m to 65m. Geochemical samples were collected from three channels analytical results of samples from CH-1 indicated copper values ranging from 0.1% to 0.9% along a zone of 13m width.
Bhilwara	Kalalikhera block	-	1	235	-	-	Exploration by drilling was taken up to test the sub-surfacae persistence of the mineralisation in a zone of over 500m strike length delineated on the surface based on favourable geological milieu, interesting aerogeophysical anomaly signatures and encouraging analytical results of surfacae samples. The first borehole (KKR-1) drilled intersected intermittent zones of sulphide mineralisation with visual estimate of 2-10% total sulphide (pyrite, pyrrhotite, chalcopyrite). Second borehole (KKR-2) was under progress.
Bhilwara	Karoi-Rajpura area Pur-Banera Belt	1:2000	1	-	-	05	Random grab samples indicated copper values between 0.93% and 1.57%. About 700 km southwest of Rajpura village, where the primary copper minerals like chalcopyrite, bornite, covelite and chalcocite in calcareous biotite gneiss were noticed in the pit excavated for road materials under detailed mapping. Surface indication of mineralisation is manifested by malachite stains in biotite gneiss in different places. Bed rock samples have been collected from the area.

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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		
Churu	Birmasar-ki-Dungri	—	—	—	—	—	The indications of mineralisation in this area are malachite and azurite staining, box work, old working and slag dumps. Bed rock samples were collected from different pits made in ultramafic rocks for dimension stone and sent for analysis of PGE, Cr, Ni, Co and base metals. Samples have also been collected from well dumps, well section and from channels. In a well section massive sulphide mineralisation is recorded.
Dausa & Alwar	North of Dhani Basri Prospect	—	—	—	—	—	Geophysical surveys comprising IP, Magnetic (V.F). Self Potential and Resistivity methods were carried out in the area. IP survey has brought out three chargeability zones.
Jaipur	Dholpura area	—	—	—	—	—	Mineralisation is manifested in the form of malachite staining in old working and mine dumps. Occurrences of fresh sulphides including chalcopyrite were observed confining to quartz veins (SW of Dhula) and brecciated magnetite quartzite (west of Dholpura).
Jhunjhunu	Dhanota area	—	—	—	—	45	The analytical results of geochemical samples indicate Cu ranging from 14 ppm to 6700 ppm. Co < 25 ppm to 730 ppm, Zn 8 ppm to 47 ppm, Pb < 50 ppm to 95 ppm. Au content in two samples indicated 0.5 ppm and 0.12 ppm. A wide and persistent gossan zone trending in NE-SW direction dipping steeply towards NW can be traced for a distance of 700m with width varying up to 240m. Extensive old workings and huge slag dumps are present within gossan zone. The first borehole (DNBH-1) was under progress. Disseminations and clusters of coarse crystals of pyrite along with minor pyrrhotite, smears and occasional stringers of chalcopyrite have been noticed along the borehole cores, but the borehole was yet to intersect the expected zone of mineralisation.

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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	Mahawa Block	–	–	3	–	–	The analytical results of surface channel samples indicated Cu values ranging from 10 ppm to 6400 ppm. So far a strike length of 470 m mineralised zone has been explored by borehole drilling. First borehole has intersected one 3.40 m (along borehole) mineralised zone. Second borehole has intersected three mineralised zones of 12.40m, 18.60m and 4.00m and third borehole has intersected so far four mineralised zones of 8.30m, 5.00m, 1.70m and 4.50 m.
Sirohi	Danva Block	–	–	–	–	–	Two deeper boreholes (DAN-1 & DAN-2) were planned to intersect the mineralisation delineated in shallow borehole (60m vertical depth) at 300m vertical depth. But the borehole DAN-1 did not intersect massive sulphide mineralised zone at desired depth.
Udaipur	Bara Block	1:2500	–	–	–	–	The evidence of sulphide mineralisation in the area includes malachite stains and old workings. The area has been covered by detailed mapping and systematic soil sampling on the grid 100 m x 25m. Analytical results are awaited.
Sikkim Sikkim West	Chakung Jugdum Area	–	–	–	–	–	The copper mineralisation is mainly confined to the quartz veins occurring in fractures and shears in chloritic phyllite of Gorubathan Formation of Daling Group. Presently systematic sampling is being carried out for a strike length of more than 1 km in Jugdum block covering all the three old workings reported earlier.
DGM, Madhya Pradesh Katni- Jabalpur	Badwara Steenabad and Bagirubabad areas	–	–	–	–	47	About 273 sq km area has been reconnoitered.
DGM, Nagaland Phek	Meluri	–	–	–	150	–	Core logging and sampling were carried out.

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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		
DMG, Rajasthan							
Ajmer	N/v Nayagaon, Jiwana, Chainpura etc.	1:50,000 1:10,000 1:2,000	100 10 1	–	–	15	Gossan zone was located at the contact of limestone and quartzite in about 1 km x 5-70 m area.
Bhilwara	N/v Thadia	1:2,000	1	10	–	–	An area extending for a strike length of 1150 m with width 30 to 40 m is indicative of base metal occurrences.
Pali	N/v Jadan Kharadi, etc.	1:50,000 1:10,000 1:2,000	100 10 2	–	–	–	–
Rajsamand	N/v Sunarkui	1:2,000	1	2	329	38	Indication of base metal mineralisation is revealed along a thin ferruginous sheared, gossan zone within dolomite exposed for more than 1500 m strike length.
Sikar & Jhunjhunu	N/v Raghunathpura Baseri, Chhapdi	1:50,000 1:10,000	415	– 16	–	–	Five gossan zones around village Ponkh varying in length from 100-300 m and 10 & 30 m in width. N/v Satkui Hill gossanised zone exposed over a strike length of 900 m with 10-30 m width showing copper mineralisation.
Sirohi	Anua and Chotila blocks	1:50,000 1:10,000 1:2,000	150 10 1.5	– –	– –	17	Malachite staining, gossan areas, old trenches, old slag debris sulphide mineralisation in the form of stringers in calc silicate and pyroxinites have been marked in the area.
Udaipur	N/v. Kun, Balicha, Kodarwadia, etc.	–	–	6	739.50	–	Old workings show plenty of malachite encrustations and staining.
MECL Rajasthan							
Ajmer	Bajta North Block (Phase-1)	–	–	859	5	166	1.241 million tonnes of resources with 0.70% Cu, 0.35% Pb and 0.56% Zn (at 0.50% Cu (cut - off) were estimated.
- do -	Ganeshpura	–	0.50	5	1067	200	0.973 million tonnes of resources with 1.33% Pb and 1.44% Zn (2.77% Total Metal Content) at 2.00%. Total Metal Content (TMC) cut-off.
Chittorgarh	Rewara Block	–	1	8	2300	298	2.65 million tonnes of resources with 3.42% Pb, 0.66% Zn and 0.38% Cu (4.4% TMC) at 2% TMC.

PRODUCTION & PRICES

Copper Ore and Concentrates

The production of copper ore at 3.23 million tonnes in 2009-10 decreased by 7% from that in the previous year due to poor availability of exposed ore benches and increase in cost of input and wages.

The metal content in the ore produced in 2009-10 works out to 30,802 tonnes as against 29,101 tonnes in 2008-09. During the year under review, 3.26 million tonnes of ore was treated for obtaining copper concentrates as against 3.64 million tonnes in 2008-09.

Production of copper concentrates at 124,471 tonnes in 2009-10 decreased by about 9% as compared to that in the previous year. Madhya Pradesh was the leading producer of copper concentrates, accounting for about 52% of the production during 2009-10, followed by Rajasthan with 37% and Jharkhand with 11% production. The number of reporting mines was 4 in both the years (Tables - 3 to 7).

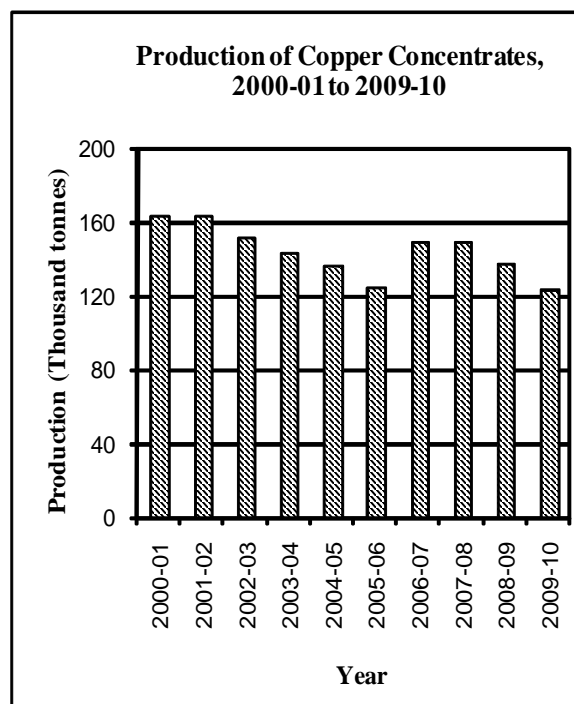
Grade Analysis

Copper content in the ore produced during 2009-10 was 0.95% Cu as against 0.84% in the previous year 2008-09. All India average metal content of ore treated in 2009-10 works out to 0.81% Cu as against 0.93% in the preceding year. The copper content in the ore treated varied from state to state. It was 0.89% Cu in Rajasthan, 0.76% Cu in Madhya Pradesh and 0.88% Cu in Jharkhand. The average metal content in the concentrate produced works out to 22.86% Cu in 2009-10 as against 22.20% Cu in the previous year. The grade of copper concentrate produced in Madhya Pradesh in 2009-10 was 26.35% Cu while that of Jharkhand was 23.80% Cu and Rajasthan 17.72% Cu (Tables - 4 to 7).

The average daily employment of labour in copper mines in 2009-10 was 3,219 as against 2,291 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 decreased by 39% and copper continuous cast wire rods (CCWR) registered a decrease of 1%, in 2009-10. Similarly in the production of copper cathodes a marginal increase of 4% was recorded during the year, 2009-10. Production of copper electrolytic wire bars was not reported during last four years (Tables -9 to 12).

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

Table – 3 : Principal Producer of Copper Concentrates, 2009-10

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)

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**Table – 4 : Production of Copper Ore, 2008-09 and 2009-10
(By States)**

(In tonnes)

State	2008-09			2009-10(P)		
	Ore produced	Cu%	Metal content	Ore produced	Cu%	Metal content
India	3452406	0.84	29101	3227667	0.95	30802
Jharkhand	328168	0.88	2879	387314	0.88	3398
Madhya Pradesh	2073524	0.78	16090	1932965	0.97	18780
Rajasthan	1050714	0.96	10132	907388	0.95	8624

**Table – 5 : Copper Ore Treated, 2008-09 and 2009-10
(By States)**

(In tonnes)

State	2008-09			2009-10 (P)		
	Ore treated	Cu%	Metal content	Ore treated	Cu%	Metal content
India	3644796	0.93	33980	3258137	0.81	26393
Jharkhand	329150	0.88	2897	351625	0.88	3098
Madhya Pradesh	2081997	0.78	16156	1962745	0.76	14886
Rajasthan	1233649	1.21	14927	943767	0.89	8409

**Table – 6 : Production of Copper Concentrates
2007-08 to 2009-10
(By States)**

(Quantity in tonnes; value in Rs. '000)

State	2007-08		2008-09		2009-10 (P)	
	Quantity	Value	Quantity	Value	Quantity	Value
India	150187	3471268	137514	4091113	124471	3625381
Jharkhand	1550	58947	11415	338694	13054	401468
Madhya Pradesh	81858	1873941	57575	1802506	64915	1900652
Rajasthan	66779	1538380	68524	1949913	46502	1323261

**Table – 7 : Production of Copper Concentrates, 2008-09 and 2009-10
(By Sector/States/Districts)**

(Quantity in tonnes; value in Rs. '000)

State/District	No. of mines	2008-09			No. of mines	2009-10 (P)		
		Quantity	Cu %	Value		Quantity	Cu %	Value
India/Public sector	4	137514	22.20	4091113	4	124471	22.86	3625381
Madhya Pradesh/ Balaghat	1	57575	25.79	1802506	1	64915	26.35	1900652
Rajasthan/ Jhunjhunu	2	68524	18.95	1949913	2	46502	17.72	1323261
Jharkhand/ Singbhum (East)	1	11415	23.65	338694	1	13054	23.80	401468

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Table – 8 : Producers of Copper, 2009-10

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	Jhunjhunu
	Maharashtra	Raigad
	Jharkhand	Singhbhum (East)
M/s Hindalco Industries Ltd, Century Bhawan, Dr. Annie Besant Road, Mumbai – 400 025, Maharashtra.	Gujarat	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)
Jhagadia Copper Ltd, 747, GIDC Industrial Estate, Post Box No. 14, P.O. Jhagadia – 393 110, Dist. Bharuch, Gujarat.	Gujarat	Bharuch

Table – 9 : Production of Copper, 2007-08 to 2009-10

(In tonnes)

Year	Copper blister	Copper cathodes	Copper electrolytic wire bars	Copper CCWR*
2007-08	45346	501485	–	283570
2008-09	29472	513640	–	314425
2009-10 (P)	17864	532865	–	312447

* CCWR - Continuous Cast Wire Rods.

**Table – 10 : Production of Copper (Blister), 2008-09 and 2009-10
(By States/Plant)**

(Quantity in tonnes)

State	Plant	2008-09		2009-10	
		Quantity	Value	Quantity	Value
India		29472	–	17864	–
Jharkhand	Surda ICC	9132	–	17864	–
Rajasthan	KCC	20340	–	–	–

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**Table – 11 : Production of Copper (CCWR), 2008-09 and 2009-10
(By States/Plants)**

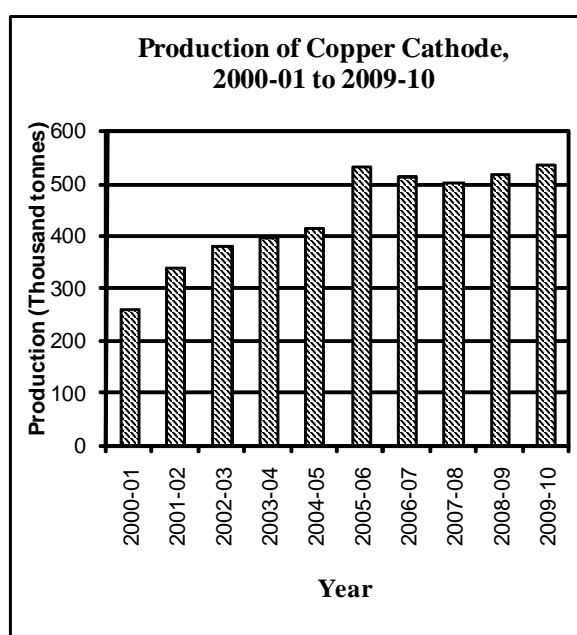
(Quantity in tonnes; value in Rs. '000)

State	Plant	2008-09		2009-10	
		Quantity	Value	Quantity	Value
India		314425	83388321	312447	100987199
Gujarat	Hindalco	119062	36212407	129457	44413400
Maharashtra	HCL Taloja	51777	12604000	41999	14864500
Tamil Nadu	Sterlite	143586	34571914	140991	41709299

**Table – 12 : Production of Copper (Cathodes), 2008-09 and 2009-10
(By States/Plants)**

(Quantity in tonnes; value in Rs. '000)

State	Plant	2008-09		2009-10	
		Quantity	Value	Quantity	Value
India		513640	129849338	532865	158204331
Gujarat		310469	79779243	336854	100368562
	Hindalco	297795	76452225	333360	99533194
	Jhagadia (formerly SWIL)	12674	3327018	3494	835368
Jharkhand	Surda ICC	8286	1783764	15868	5035362
Rajasthan	KCC	21758	7632249	–	–
Tamil Nadu	Sterlite	173127	40654082	180143	52800407



MINING & MILLING

HCL, a Public Sector Enterprise of Government of India has integrated operations encompassing mining, beneficiation, smelting, refining & casting of refined copper metal and also recovery of by-products. It 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. 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 3.6 million tpy ore capacity, that includes 1.2 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.

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 one 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. It was proposed to increase the mine output from 2 to 2.3 million tonnes ore per year. HCL has applied to Government of Madhya Pradesh for development of mines at Malanjkhand through underground mining methods.

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 and production of copper cathode are given in Table - 13.

Table – 13 : Capacity and Production of Copper Smelters

Smelter/Location	Annual Capacity	Production*	
		2008-09	2009-10(P)
TOTAL	1001.5	513.64	532.86
1. Hindustan Copper Ltd	51.5	30.03	15.86
i) Khetri Copper Complex, Dist. Jhunjhunu, Rajasthan.	31	21.75	Nil
ii) Indian Copper Complex, Ghatsila, Dist. East Singhbhum, Jharkhand.	20.5	8.28	15.86
2. Sterlite Industries (India) Ltd., Thoothukudi, Tamil Nadu.	400	173.12	180.14
3. Hindalco Industries Ltd, Dahej, Dist. Bharuch, Gujarat.	500	297.79	333.36
4. Jhagadia Copper Ltd, (Formerly SWIL Ltd), Dist. Bharuch, Gujarat.	50	12.67	3.49

* *Copper cathodes.*

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 4,00,000 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 have 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 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 5,00,000 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

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 2,42,321 tpa for handling different types of scrap.

In addition to this, there are 132 units with combined capacity of 5,17,515 tpa 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 1,06,573 tonnes of secondary copper, all in organised sector, in the country.

CONSUMPTION & USES

The per capita consumption of copper in India is currently at 0.5 kg per annum as compared to China's per capita consumption of 4.6 kg per annum and to that of 10 kg of developed nations and 2.4 kg. in the entire world. India's per capita consumption is likely to be moderate and has many strides to cover so as to match that of China. As per one forecast, the per capita consumption of copper in India will be 3 kg in 2025. 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 & 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.

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%). Apparent consumption in various industries have been computed on the basis of production of refined copper (cathodes), import and exports of copper and alloys & scrap. The apparent consumption during 2008-09 was 396,851 tonnes which decreased to 390,308 tonnes in 2009-10 (Table-14).

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.

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

Item	(In tonnes)	
	2008-09	2009-10
I) Total Production (Cathodes)	513640	532865
II) Total Imports (copper & alloys and scrap)	129662	134383
III) Total Exports (copper & alloys and scrap)	246451	276940
IV) Apparent Consumption	396851	390308

WORLD REVIEW

The world reserves of copper metal is assessed at 540 million tonnes of copper content. Chile has the largest share, accounting for about 30% of world reserves, followed by Peru (12%), Mexico (7%), USA (6%), China and Poland (5% each) (Table-15).

The world mine production of contained copper was 15.8 million tonnes in 2009, as against 15.6 million tonnes in 2008. Chile continued to be the largest producer of copper in 2009 with 34% share followed by USA and Peru (8% each), China (7% each) & Indonesia(6%) (Table-16).

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

Australia

OZ Minerals Ltd (Melbourne, Australia) began production at its Prominent Hill Mine. It is expected to produce 110,000 tpa of copper in concentrate for at least 4 years.

Chile

Escondida is the world's largest copper mine. Codelco (Corporacion Nacional del cobre de Chile) regained its position as leading global mine producer of copper. Expansion of the Al Norte (Xstrata) and Codelco Norte Smelters were completed.

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.

Expansion of the Guixi (Jiangxi Copper Corp.) Jinchuan (Jinchuan Nonferrous Metals Group) and Tongling II (Tongling Nonferrous Metal Corp.) smelters were completed. The greenfield Baiyin Electrolytic Refinery (Baiyin Nonferrous Metals) was constructed to match existing smelter capacity of 100,000 tpa. Its projected capacity of 300,000 tpa was expected to exceed the proposed expansion of Baiyin smelter to 200,000 tpa.

COPPER

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

(In '000 tonnes of copper content)

Country	Reserves
World: Total (rounded)	540000
Australia	24000
Canada	8000
Chile	160000
China	30000
Indonesia	31000
Kazakhstan	18000
Mexico	38000
Peru	63000
Poland	26000
Russia	20000
USA	35000
Zambia	19000
Other countries	70000

Source : Mineral Commodity Summaries, 2010.

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

(In '000 tonnes of metal content)

Country	2007	2008	2009
World: Total	15500	15600	15800
Australia	871	886	854
Canada	596	608	494
Chile	5557	5328	5390
China	946	1093	1029
Indonesia	797	655	989
Kazakhstan	406	422	400
Mexico	338	247	241
Peru	1190	1268	1275
Poland	452	430	439
Russia	690	705	676
USA	1169	1308	1204
Zambia	524	568	601
Other countries	1964	2082	2208

Source: World Mineral Production, 2005-2009.

Congo (Kinshasa)

Capacity continued to increase at several mines that began production in 2007, including 15,000 tpa of additional concentrate production capacity at the Frontier Mine (First Quantum Minerals Ltd, Vancouver); 30,000 tpa of additional electrowon capacity at the Kamoto Mine (Katanga Mining Ltd, Baar, Switzerland); 60,000 tpa of additional electrowon capacity at the Luita Mine (Central African Mining and Exploration Co., London); and 16,000 tpa of additional electrowon capacity at the Ruashi II Mine (Metorex Ltd, Johannesburg, South Africa). The Tenke Fungurume Mine (57.75% owned by FCX), which along with Prominent Hill were the only significant greenfield startups in 2009, began production in March 2009 and was expected to reach full capacity of 115,000 tpa in 2010.

USA

In the United States, mine and refinery production continued to decline in 2010 owing to mine cutbacks instituted at year end 2008 and lower ore grades. The White Pine electrolytic refinery in Michigan that treated imported anode closed in August. U.S. copper mine production was expected to rise by more than 100,000 tonnes in 2011 owing to expansion and restoration of cutbacks. Domestic consumption of refined copper rose by about 5% in 2010 but remained below the 2008 level.

Zambia

The Kansanshi Mine (First Quantum Minerals) increased concentrate and electrowon capacities by 15,000 tpa and 30,000 tpa, respectively; the Lumwana Mine (Equinox Minerals Ltd, Perth, Australia, and Toronto) reached capacity of 170,000 tpa following a delayed startup in 2008.

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.

COPPER

Export of copper ores and concentrates increased sharply to 40,422 tonnes in 2009-10 as against 26,613 tonnes in 2008-09. Exports were almost entirely to Belgium (99%). Export of refined copper increased to 199,842 tonnes in 2009-10 from 138,001 tonnes registered in 2008-09. China was the largest importer of copper from India with a share of 41% followed by UAE (16%) Saudi Arabia 15%, Thailand and Singapore (7% each) (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.

During the year 2009-10, imports of copper ores and concentrates were slightly lower at 2,187,460 tonnes as compared to 2,264,732 tonnes in 2008-09. Chile with a share of 28% was the leading supplier followed by Australia and Indonesia (20% each). Imports of refined copper decreased in 2009-10 at 11,543 tonnes as against 17,454 tonnes in 2008-09. Australia with 21% share was the major supplier followed by Zambia (12%) (Tables - 25 to 34).

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

Country	2008-09		2009-10	
	Qty (t)	Value (Rs.'000)	Qty (t)	Value (Rs.'000)
All Countries	26613	397134	40422	286841
Belgium	–	–	39823	284473
Nigeria	–	–	308	1402
Israel	–	–	273	570
Saudi Arabia	–	–	14	364
USA	1	4	4	31
China	10507	288553	–	–
Germany	16000	108073	–	–
Kuwait	3	21	–	–
Maldives	98	461	–	–
Nepal	3	15	–	–
Other countries	1	7	++	1

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

Country	2008-09		2009-10	
	Qty (t)	Value (Rs.'000)	Qty (t)	Value (Rs.'000)
All Countries	138001	41349811	199842	58344444
China	13456	3230576	81423	24439613
UAE	21867	6714001	31001	8562253
Saudi Arabia	36947	11671508	30827	8338611
Thailand	13427	4383379	13374	4135693
Singapore	3141	789865	13648	4094319
Malaysia	32269	9663078	10681	3105342
Chinese Taipei/ Taiwan	2947	806525	7645	2337032
Oman	989	343230	2699	809073
Vietnam	1346	414728	2100	653975
Indonesia	4471	1488173	1798	551215
Other countries	7141	1844748	4646	1317318

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

Country	2008-09		2009-10	
	Qty (t)	Value (Rs.'000)	Qty (t)	Value (Rs.'000)
All Countries	278655	80988135	303749	85146161
China	33922	5439371	86235	25655924
Saudi Arabia	51808	16563801	44364	12332442
UAE	47639	15299467	38151	10496959
Singapore	8722	569918	17109	5099655
Thailand	17846	5746280	16066	4960879
Malaysia	37075	11101464	14673	4327010
Chinese Taipei/ Taiwan	3767	1019338	8037	2441992
Hong Kong	7206	2125085	7269	1999220
Sri Lanka	7126	2174264	6693	1969967
USA	7798	2299278	6960	1811264
Other countries	55746	16649869	58192	14050849

COPPER

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

Country	2008-09		2009-10	
	Qty (t)	Value (Rs.'000)	Qty (t)	Value (Rs.'000)
All Countries	768	186253	2250	530500
Germany	182	30323	568	158598
China	-	-	759	144980
Japan	-	-	167	46123
Spain	331	99980	194	42624
Portugal	67	14745	150	42383
Korea, Rep. of	-	-	98	24880
UAE	++	106	71	19310
Philippines	99	27317	81	16894
Greece	-	-	41	11728
Netherlands	++	25	23	6720
Other countries	89	13757	98	16260

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

Country	2008-09		2009-10	
	Qty (t)	Value (Rs.'000)	Qty (t)	Value (Rs.'000)
All Countries	245683	72084889	274690	77997519
China	33531	5338986	84613	25308381
Saudi Arabia	50649	16209644	43133	11975879
UAE	45471	14703114	36054	9941965
Singapore	8068	2404405	16944	5054187
Thailand	17164	5568967	15649	4847354
Malaysia	36103	10815745	13900	4123724
Chinese Taipei/ Taiwan	2982	816903	7729	2361791
Hong Kong	7006	2072225	6988	1922482
Sri Lanka	6732	2061062	6242	1874070
Oman	3828	1331513	5482	1607515
Other countries	34149	10762325	37956	8980171

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

Country	2008-09		2009-10	
	Qty (t)	Value (Rs.'000)	Qty (t)	Value (Rs.'000)
All Countries	31967	8639392	26565	6571018
USA	4673	1230941	3818	991791
UAE	2161	594775	1908	518528
Germany	2246	645734	1718	388201
Canada	3060	470392	2367	381343
Saudi Arabia	1159	354108	1202	352422
Australia	889	252425	1185	325773
UK	1717	500190	1436	310507
Malaysia	954	279564	773	203194
Italy	1268	336849	643	168805
Netherlands	1009	310176	620	161704
Other countries	12831	3664238	10895	2768750

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

Country	2008-09		2009-10	
	Qty (t)	Value (Rs.'000)	Qty (t)	Value (Rs.'000)
All Countries	232	76588	225	44365
Germany	20	4955	84	22173
UAE	7	1472	118	17156
UK	20	839	2	1113
Belgium	32	7845	2	1078
USA	19	7742	1	686
Sweden	2	760	1	485
Malaysia	18	6155	++	92
Nepal	14	5020	++	71
China	23	1213	-	-
Netherlands	56	35603	-	-
Other countries	21	3984	17	1511

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

Country	2008-09		2009-10	
	Qty (t)	Value (Rs.'000)	Qty (t)	Value (Rs.'000)
All Countries	14	531	-	-
Afghanistan	++	13	-	-
USA	14	518	-	-

COPPER

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

Country	2008-09		2009-10	
	Qty (t)	Value (Rs.'000)	Qty (t)	Value (Rs.'000)
All Countries	2264732	178221088	2187460	189675846
Indonesia	191101	15974735	452962	50593706
Chile	632940	59974463	610144	44296728
Australia	510019	31498421	444228	40938529
Iran	124794	10815238	166711	12722250
Brazil	184862	15427375	135097	8924781
South Africa	89479	5160065	84606	7079730
Peru	169100	10665816	61288	5009399
Congo, People's Rep. of	98956	8121987	50213	3732080
Zambia	117678	7877395	28623	2544156
Papua New Guinea	79503	8298709	20865	1994888
Other countries	66300	4406884	132723	11839599

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

Country	2008-09		2009-10	
	Qty (t)	Value (Rs.'000)	Qty (t)	Value (Rs.'000)
All Countries	17454	4687954	11543	3363394
Australia	4683	1076546	2440	711732
Zambia	1673	303053	1370	378336
Ukraine	100	24145	707	237763
UAE	638	184549	520	169615
Austria	559	190413	449	142268
Russia	2022	447162	509	130093
Malaysia	1012	278566	320	99110
Sri Lanka	578	154456	222	72378
Iran	2411	813260	–	–
Norway	989	370787	–	–
Other countries	2789	845017	5006	1422099

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

Country	2008-09		2009-10	
	Qty (t)	Value (Rs.'000)	Qty (t)	Value (Rs.'000)
All Countries	220300	55434757	205591	55366184
UAE	13361	3669319	23534	6331167
Germany	27996	5885018	16869	5309779
China	14018	4153600	15264	4677684
Malaysia	10134	3272436	12799	3875761
Australia	13356	3646338	12472	3545532
Russia	11923	3584150	12296	3260592
Korea, Rep. of	7274	2292771	9400	3054775
UK	19464	3884397	13107	2893711
USA	26057	2752439	6160	1537773
Saudi Arabia	6560	1875804	6645	1480598
Other countries	70157	20418485	77045	19398812

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

Country	2008-09		2009-10	
	Qty (t)	Value (Rs.'000)	Qty (t)	Value (Rs.'000)
All Countries	106417	32683321	110169	34138378
China	11792	3590776	13355	4118810
Australia	11695	3202749	11681	3378799
Malaysia	8160	2739382	10393	3310815
Russia	11219	3343334	12136	32288848
UAE	1950	538534	9837	3085574
Korea, Rep. of	6752	2137789	8896	2898589
Germany	13698	2215908	7224	2766560
USA	2437	1102409	1561	634096
Thailand	3492	1411566	3883	1274993
Congo, People's Rep. of	5014	1480952	1124	259552
Other countries	30208	10919922	30079	9181742

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

Country	2008-09		2009-10	
	Qty (t)	Value (Rs.'000)	Qty (t)	Value (Rs.'000)
All Countries	23245	6855978	24214	6407313
UAE	7997	2483047	8063	2258013
Saudi Arabia	5020	1596558	2297	647994
UK	1227	361942	1607	482539
Zambia	–	–	2244	464456
Qatar	16	5666	1213	330587
Bahrain	758	233366	1100	313766
Malaysia	969	308908	1056	284650
USA	633	144168	805	173048
Kuwait	438	153215	573	153711
Singapore	639	159907	215	49698
Other countries	5548	1409201	5041	1248851

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

Country	2008-09		2009-10	
	Qty (t)	Value (Rs.'000)	Qty (t)	Value (Rs.'000)
All Countries	3	1740	27	3879
Egypt, A Rep.	–	–	27	3879
Italy	++	490	–	–
Malaysia	3	1250	–	–

COPPER

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

Country	2008-09		2009-10	
	Qty (t)	Value (Rs. '000)	Qty (t)	Value (Rs. '000)
All Countries	18200	5661285	14626	4570432
Germany	5244	2035787	3913	1481697
Nepal	2211	549929	2179	569960
China	1909	544766	1854	554229
Japan	655	303615	728	280360
Chinese Taipei/Taiwan	495	137244	1030	251512
Canada	314	106487	546	196103
USA	440	182055	629	171054
Switzerland	352	172354	344	131827
Russia	704	240816	134	27711
Australia	870	275107	11	2086
Other countries	5006	1113125	3258	902893

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

Country	2008-09		2009-10	
	Qty (t)	Value (Rs. '000)	Qty (t)	Value (Rs. '000)
All Countries	72435	10232433	56555	10246182
UK	17129	3099979	10564	2077139
Germany	8843	1577139	5476	998993
UAE	3098	577846	5200	902154
Saudi Arabia	1453	264407	3931	733154
USA	22547	1323807	3165	559575
Bangladesh	836	143926	2702	499860
Netherlands	2810	519809	2074	405972
Sweden	1653	302658	2043	337903
Denmark	1152	216933	1917	334682
Switzerland	1456	269559	1462	290528
Other countries	11458	1936370	18021	3106222

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

Country	2008-09		2009-10	
	Qty (t)	Value (Rs. '000)	Qty (t)	Value (Rs. '000)
All Countries	321	59757	2177	212716
Zambia	–	–	2128	204868
Singapore	48	9505	10	1387
China	–	–	++	1
UK	–	–	++	1
Chinese Taipei/Taiwan	++	42	–	–
Congo, People's Rep. of	72	14461	–	–
Malaysia	43	10079	–	–
USA	3	768	–	–
Zaire/Congo Democratic Rep.	96	16135	–	–
Tanzania	40	6016	–	–
Unspecified	19	2751	39	6459

COPPER

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

Item	2008-09		2009-10	
	Qty (t)	Value (Rs. '000)	Qty (t)	Value (Rs. '000)
All Items	106417	32683321	110169	34138378
Blister & other unrefined copper	9036	2965664	2252	490305
Copper & alloys: worked (bars, rods, plates, etc.)	29765	10934608	35997	11782162
Copper & alloys: worked, NES	13570	2062307	3348	1464731
Copper & alloys: unwrought	1436	517780	1394	388302
Copper matte	57	7739	294	35721
Copper powder & flakes	400	287825	476	287805
Copper refined: copper worked	32202	10287238	53820	15997048
Electroplated anode of nickel	2435	882687	443	142068
Master alloys of copper	62	49519	602	186842
Refined copper	17454	4687954	11543	3363394

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 1,063 thousand tonnes based on sectorial growth of copper consumption.