International Mineral scenario

1. Aluminium

The aluminium industry in India is strategically well placed and is one of the largest producers in the world with discernible growth plans and prospects for the future. India's rich bauxite mineral base renders a competitive edge to the industry as compared to its counterparts globally. As per available information, four major primary producers, National Aluminium Co. Ltd, Hindalco Industries Ltd, Bharat Aluminium Co. Ltd and Vedanta Aluminium Ltd (VAL) are at the forefront in aluminium production. NALCO is one of the largest integrated Bauxite-Alumina-Aluminium complexes in the Country. The installed capacity of alumina and aluminium plants in the country during 2018-19(P) was about 7.5 million tonnes per year and 4.06 million tonnes per year, respectively.

Plant wise Installed Capacity of Alumina and Aluminium during 2018-19 (P)

(Quantity in Th. Tonnes)

Commodity	Producer	Plant	2018-19(P)
Alumina	Nalco	Damanjodi	2275
	Hindalco	Belagavi	350
		Muri	450
		Renukoot	700
		Utkal Alumina*	1500
	Vedanta	Lanjigarh	2000
	Balco	Korba	200#
	Total	**All India**	**7475**
Aluminium	Nalco	Angul	460
	Hindalco	Aditya	360
		Hirakund	215
		Mahan	360
		Renukoot	345
	Balco	Korba	570
	Vedanta	Jharsuguda	1750
	Total	**All India**	**4060**

Source: Individual plants.
(P): Provisional **: related to calcined alumina* *#: Plants remained non-operational during the year*

The production of aluminium by primary aluminium producers in the years 2017-18 and 2018-19 is given in the following table

Production of Aluminium

	Aluminium Production (IN TONNES)	
Name of the Company	**2017-18**	**2018-19**
VEDANTA	1115751	1392076
HINDALCO	1291035	1294664
BALCO	568883	571480
NALCO	424949	437961

Uses

Aluminium is more environment-friendly than steel, plastic and other materials. Aluminium has widespread uses throughout the economy and is equally important to both the industrial and consumer sectors. Aluminium is used in the Aerospace Industry as well as other industries requiring light metal. On the industrial side, aluminium is heavily used in electrical power transmission, machinery & equipment and construction. Aluminium usage in automobiles is rising and is expected to increase internationally. Over the past five years considerable progress has been made in aluminium-intensive vehicle production.

Housing, in particular, make heavy use of the lightweight material as a substitute for steel and wood in doors, windows and sidings. Aluminium is also used in a variety of retail products including cans, packaging, air conditioners, furniture and automobile. In addition, India has pioneered the replacement of copper by aluminium in power transmission & distribution which has enhanced the demand for aluminium. There are nearly 600 cable and conductor manufacturing units in the country, having a total capacity of about 4,00,000 tpy. The major end-use of aluminium is as rolled sheets, extrusions and foils. India Foils, Pennar Aluminium and Century Extrusions are the major players in the extrusion & foil market.

Consumption

Key sectors to drive aluminium consumption in India are Auto, Power, Electronics, Railways, Aerospace & Defence Construction, Solar Energy and Aluminium packaging.

China was the largest producer as well as consumer during the year, contributing about 57% share of the world production (36.15 million tonnes) and 55% of the world consumption (35.71 million tonnes) of aluminium. The world excluding China is expected to see aluminium consumption growth of around 1% in the year 2019 from around 2% in the year 2018 due to likely moderation in demand from North America and Europe.

In India, the power, packaging, transport, construction, machinery and equipment sectors are key demand drivers of aluminium. The domestic imports of aluminium products, including scrap, are growing significantly, which is a major concern for the domestic aluminium producers. In advanced economies, aluminium is increasingly replacing wood and steel in Building Sector. Aluminium cans and containers are used extensively, world over. Aluminium is also the ideal packaging material for pharmaceuticals and processed foods.

In India, aluminium was consumed mainly in the Electrical sector (48%), followed by Automobile & Transport sector (15%), Construction (13%), Consumer Durables (7%), Machinery & Equipment (7%), Packaging (4%) and others (6%). In the Electrical sector, aluminium usage is in overhead conductor, and power cable used in generation, transmission, and distribution of electricity. Aluminium is also used in switchboards, coil windings, capacitors, etc.

As per Technology Vision Document 2035, the per capita consumption of aluminium in India is among the lowest in the world with only 2.2 kg as compared to world average roughly of 8 kg with 22-25 kg in developed nations.

Alumina is produced from bauxite. About one tonne of alumina is produced from 3 to 3.5 tonnes of bauxite and about one tonne of aluminium is produced from about two tonnes of alumina.

Reserve/Resources

The total resources of bauxite in the country as on 1.4.2015 are estimated at 3,897 million tonnes. These resources include about 656 million tonnes (17%) reserves and 3,240 million tonnes (83%) remaining resources. Out of the total resources, about 65% are in freehold areas and remaining 35% in leasehold areas. The country is endowed with huge quantities of metallurgical grade bauxite with resources of 3,145 million tonnes, about 81% of the total resources. Out of the total metallurgical grade, about 76% is metallurgical- I, 20% metallurgical - II and remaining 4% is metallurgical mixed grade.

World Review

World production of alumina was 130 million tonnes in 2018. China continued to be the leading producer with a share of about 56% which is followed by Australia (15%), Brazil (6%), India (5%), Russia & Jamaica (2% each). World production of aluminium was at 63 million tonnes in 2018. China continued to be the leading producer with a share of about 57% which is followed by Russia (6%), Canada (5%) and India & UAE (4% each).

Source: https://ibm.gov.in/writereaddata/files/11092020132709Alumina%20And%20Aluminium_2019_AR.pdf

2. Copper

Hindustan Copper Limited (HCL), a public sector undertaking, is the only integrated producer of primary copper in India. HCL has two smelting & refining plants at Khetri Copper Complex (KCC) and Indian Copper Complex (ICC) with annual installed capacity of 51.5 thousand tonnes per annum. Apart from HCL, two other major players dominate the Indian Copper Industry, namely, Hindalco (Birla Copper) and Sterlite Industries which are under the Private Sector. M/s Hindalco at Dahej in Gujarat and M/s Sterlite Industries in Thoothukudi in Tamil Nadu have set up smelting and refining plants which depend on imported copper concentrates either from their own mines abroad or other overseas sources with annual production capacity of 500 thousand tonnes and 400 thousand tonnes, respectively. Besides, there are few small companies which produce Electrowon copper but their capacities are very low and production is inconsistent. Hindustan copper Ltd (formerly Jhagadia Copper Ltd) has a plant with a capacity of 50 thousand tonnes per annum copper cathodes through secondary route. The total installed capacity of copper smelter in the country during 2018-19(P) was around one million tonne per annum. Hindustan Copper Ltd produces copper metal from the ore produced at their captive mines. Sterlite Industries (India) Ltd and Hindalco Industries Ltd produce copper metal from imported copper concentrates.

The details of production of major players in copper industry during 2018-19 are given in the following table

Production of Copper Cathode

	Copper Cathode Production (IN TONNES)	
Name of the Company	**2017-18**	**2018-19**
HINDALCO	413808	351041

VEDANTA	403436	89514
HCL	13280	13782

Uses

The per capita consumption of copper in India during the year 2017 is at 0.6 kg which is very low in comparison to countries like Russia 3.3 kg, China 5.4 kg, USA 5.5 kg, Italy 8.9 kg and Germany 13.6 kg. The average per capita consumption of copper in developed nation works out to be 10 kg. 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 heatsinks help remove heat from transistors and enable computer speeds using less energy, and 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.

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 & Construction (7%), General Engineering goods (6%) and other industries including Process Industries (16%). The apparent availability of copper for internal consumption in various industries has been computed on the basis of production of refined copper (cathodes) and from the imports and exports data of copper (refined).

Reserve/Resources

The total reserves/resources of copper ore as on 1.4.2015 as per NMI database based on UNFC system are estimated at 1.51 billion tonnes. Of these, 207.77 million tonnes (13.75%) fall under 'Reserves category' while the balance 1.30 billion tonnes (86.25%) are placed under 'Remaining resources' category. Gradewise there are no reserves with 1.85% or more copper grade. However, 203.83 million tonnes reserves fall under 1% to below 1.85% Cu grade. Of the total ore resources 8.28 million tonnes (0.55%) comprise ore containing 1.85% Cu or more and 657.92 million tonnes (43.53%) resources fall under 1% to below 1.85% Cu grade.

World Review

The world reserves of copper metal are assessed at 870 million tonnes of copper content. Chile has the largest share, accounting for about 23% of world reserves, followed by Australia & Peru (10% each), Russia (7%), Mexico & USA (6% each) and Indonesia & China (3% each).

The world mine production of copper increased slightly by 2% at 20.6 million tonnes of metal content in 2018 as compared to 20.2 million tonnes of metal content during previous year. Chile continued to be the largest single producer of copper in 2018 with 28% share followed by Peru (12%), China (8%) and USA & Congo, Dem. R (6% each).

As per BGS world refined copper production was 23.9 million tonnes in the year 2018 which showed an increase of 0.4% from that of the previous year. China was the largest producer of refined copper with 9 million tonnes in the year 2018 (38% of world production) followed by Chile (10%), Japan (7%) and USA & Russia (4% each), etc.

The world consumption of refined copper was 23.3 million tonnes in the year 2017. China is the largest refined copper consuming country with 11.8 million tonnes (51% of world consumption) followed by USA (8%), Germany (5%), Japan (4%) and Republic of Korea (3%).

International Copper Study Group (ICSG) estimated that world refined copper production would increase up to 24.8 million tonnes in 2019 and may further increase to 26.2 million tonnes in 2020. The ICSG expects world apparent demand to increase by 2% in 2019 and 1.5% in 2020. Sustained growth in copper demand to continue because copper is essential to economic activity and even more so to the modern technological society. Infrastructure development in major countries, such as, China and India and the global trend towards cleaner energy will continue to support copper demand.

Source: **https://ibm.gov.in/writereaddata/files/10142020121913Copper_2019_AR.pdf**

3. Lead & Zinc

Primary lead was produced entirely by HZL which operated smelter at Chanderiya and Dariba having capacity of 85,000 tonnes and 1,20,000 tonnes per annum of lead metal, respectively. Thus, the smelting capacity for lead (primary) in the country presently is 2,05,000 tonnes per annum.

The smelting capacity of HZL for zinc is distributed between three smelters at Debari (88,000 tonnes), Chanderiya (5,58,000 tonnes) and Dariba (2,34,000 tonnes). Edayar Zinc Ltd's plant at Binanipuram (Aluva), Kerala has capacity of 38,000 tonnes per annum. Thus, the smelting capacity for zinc in the country is 9,18,000 tonnes per annum. EZL produced zinc from imported concentrates but since the Company has been declared as sick unit, it did not operate its plant.

The data regarding apparent production of lead (primary) and zinc (ingots) for the years 2017-18 and 2018-19 is shown in the following tables.

Production of Lead (Primary) (2017-18 and 2018-19)

(Quantity in Tonnes)

Item	**2017-18**	**2018-19**
Total Production Lead (Primary)	168245	197839

Production of Zinc (ingots) (2017-18 and 2018-19)

(Quantity in Tonnes)

Item	2017-18	2018-19
Total Production Zinc (Ingots)	791461	696283

Uses

The largest single use of lead worldwide today is in the manufacture of lead-acid storage batteries which is about 74%, while the single largest use for zinc is in the Galvanising Industry which is about 50%.

Zinc is the forth most widely used metal across the globe, trailing only steel, aluminium and copper. The country has the self-sufficiency in respect of zinc. In contrast, there is short supply of lead vis-avis the demand in the country.

Consumption

The Battery Industry consumes about 80% of lead and remaining 20% is consumed in pigments & compounds, rolled & extruded products, alloys, cable sheathing and other industries. The apparent consumption of lead during the year 2017-18 and 2018-19 was calculated on the basis of production of lead (primary) and imports & exports of refined lead (unwrought). The apparent consumption thus arrived at was 1,78,300 tonnes in 2018-19 and 1,63,435 tonnes in 2017-18. In addition to this, it is understood that large quantities of recycled lead were also consumed in certain other industries.

Owing to its corrosion resistance in varied types of environment, zinc is used for protecting steel by way of galvanising. The Galvanising Industry alone consumes about 57% of zinc, followed by coatings (16%), die-casting alloys (14%), oxides & chemicals (7%) and extruded products (6%). The apparent consumption of zinc during the year 2017-18 and 2018-19 was calculated on the basis of production of zinc, import & export of zinc (not alloyed). The apparent consumption, thus arrived at was 6,50,755 tonnes in 2017-18 and 6,22,188 tonnes in 2018-19. The data on trade of zinc (not-alloyed) was taken from DGCI&S (HS Code 79011100). In addition to this, some quantities of recycled zinc are also consumed in certain other industries.

Reserve/Resources

The total resreves/resources of lead and zinc ore as on 1.4.2015 as per NMI data base based on UNFC system have been estimated at 749.46 million tonnes. Of these, 106.12 million tonnes (14.16%) fall under 'Reserves' category while balance 643.34 million tonnes (85.84%) are classified as 'Remaining Resources'.

The total metal content in reserves/ resources of lead is 13 million tonnes and that of zinc is 36.36 million tonnes and for lead & zinc metal is 0.14 million tonnes. In terms of reserves, 2.48 million tonnes of lead metal and 9.99 million tonnes of zinc metal have been estimated. Rajasthan is endowed with the largest reserves/ resources of lead-zinc ore amounting to 670.34 million tonnes (89.44%), followed by Andhra Pradesh 22.69 million tonnes (3.03%), Madhya Pradesh 14.84 million tonnes (1.98%), Bihar 11.43

million tonnes (1.52%) and Maharashtra 9.27 million tonnes (1.24%). Resources are also established in Gujarat, Meghalaya, Odisha, Sikkim, Tamil Nadu, Uttarakhand and West Bengal.

World Review

The world's reserves of lead were estimated at 90 million tonnes in terms of lead content. Australia possesses 40% of the world's reserves followed by China (20%), Russia & Peru (7% each), Mexico & USA (6% each), etc. (Table- 19).

The world's reserves of zinc were estimated at 250 million tonnes of zinc content. Australia accounts for 27% of world's zinc reserves, followed by China (18%), Russia & Mexico (9% each), Peru (8%), Kazakhstan (5%), USA (4%), etc. (Table-20).

Source: https://ibm.gov.in/writereaddata/files/10142020122001Lead_Zinc_2019_AR.pdf

4. Rare Earths

IREL has a plant at Udyogamandal, Aluva, located in Ernakulam district, Kerala, wherein the monazite obtained from Manavalakurichi is chemically treated to separate rare earths in its composite chloride form and thorium as hydroxide upgrade. India is the second largest supplier of yttrium in the world and the maximum production is reported from the plant in Kerala.

IREL has also entered into an Memorandum of Understanding (MoU) with BARC, DMRL and International Advanced Research Center for powder metallurgy & New material (ARCI) for development of rare earth permanent magnet rings. DMRL has the necessary technology for production of rare earth magnets. BARC has developed the technology for manufacturing of RE Phosphors. However, these technologies are yet to see commercial application. Japan and India have reached at a basic agreement to jointly develop rare earths, used in the production of several high-tech goods from weapons to cellphones.

IREL has also set up a Monazite Processing Plant (MoPP) at Odisha to produce about 11,000 tonnes of Rare Earth Chloride and associated products and High Pure Rare Earths (HPRE) plant at Rare Earth Division, Aluva, to produce separated Rare Earth Oxide/Carbonates. The Company is also in the process of facilitation, setting up of industry in value chain of minerals produced other than expanding its existing capacity in near future. IREL has in-house R&D division at Kollam, Kerala, to support mineral and chemical operation and Corporate Office at Mumbai, Maharashtra.

The Rare Earth Permanent Magnet (REPM) in Vizag and Rare Earth and Titanium Theme Park (RETTP) in Bhopal have kick started with the funding assistance of Government of India, which will enhance the visibility of IREL in the strategic and niche sector. Environmental clearance for REPM project has been received from MoEF&CC and M/s MECON Limited, Bengaluru has been appointed as consulting firm for detailed engineering.

As regards RETTP project, lease deed execution towards land has been completed. A Letter of Understanding has been inked with BARC towards developing and transferring laboratory-scale technologies in the value chain of Rare Earths which will be suitably upscaled by IREL to pilot-scale and installed in the theme park. In addition, IREL has been assigned the responsibility of carrying out civil

construction works on behalf of BARC for the 5 million liters per day (MLD) hybrid seawater desalination plant at OSCOM. About 60% construction of plant building has been completed.

Use & Consumption

Rare earth materials are utilised in a wide range of critical products enabling many emerging green energy technologies, high-tech applications and defence systems, such as, hybrid cars, plug-inhybrid electric-vehicles (PHEVs), the latest generation of efficient windpower turbines, computer disc drives, missile guidance systems, etc. The lanthanide elements as a group have magnetic, chemical and spectroscopic properties that have led to their application in a wide range of end-uses. Cerium finds application in polishing of glass items like lenses & display screens of cathode-ray tubes, liquid-crystal displays & plasma-display panels, in petrol & diesel fuels as fuel additive and along with lanthanum for replacement of cadmium in red pigments. Mixed salts of the cerium group of elements, other than fluorides are used in medicine, non-irritating antiseptic dressings, waterproofing agents and fungicides in textile manufacture. The principal uses of commercially pure cerium compounds that are in the form of nitrate is in the manufacture of incandescent gas mantles and cerium compounds as oxide. It also finds usage as a polishing agent of glass. Cerium compounds are also used in ceramic and glass as colouring pigments and also as catalysts in Chemical Industry.

Cerium, lanthanum and neodymium are used as glass additives in optical lenses and display screens, as catalysts in automobiles to reduce sulphur dioxide emission, in multilayer capacitors and along with yttrium in magnesium, aluminium and hydrogen storage alloys. Mischmetal which is an alloy of cerium with small amounts of other rare earth metals is used in lighter flints, for desulphurisation in steel and foundry, and with lanthanum alloys, in batteries and hydrogen storage systems meant for electronics and hybrid cars. Cerium oxide is used in glass polishing industries.

Lanthanum oxide and neodymium compounds are used in special glass manufacture. Lanthanum finds application in X-ray films as phosphors; yttrium in advanced ceramics like nitrides,Y-stabilised ceramics, etc., and gadolinium in magnet alloys. Yttrium, europium and terbium are used as phosphors in displays of computers, TV, etc. and with lanthanum, cerium & gadolinium as phosphors in fluorescent and halogen lamps. Neodymium,samarium, dysprosium, praseodymium and terbium have application as high intensity magnets in electronics, electric motors and audio equipment. Lanthanum, erbium and ytterbium have application in fibre optics and lasers. Lanthanum and yttrium find application in solid oxide fuel cells. Scandium is used mainly in aluminium alloys for sporting goods. Scandium in minor amounts is used in semiconductors and special lighting, including halogen bulbs. Mixed rare earth products are used as catalysts in petroleum refining and fluid cracking. Neodymium is used in welding in heavy industries and also in MRI scanners. Praseodymium is not a primary element for any specific use, but finds use as a substitute for neodymium in magnets.

Samarium is used essentially for the Sm-Co magnets. Europium is a primary component of phosphorus and is responsible for white light in compact fluoroscent lamps when used with terbium compounds.

Erbium used as fibre optic and has emerged in the nineties as a remarkable tool for communication technology through which high quality rapid data in tight pulses can be transferred in speed unthinkable in the past.

The main application for neodymium-iron-boron (Nd-Fe-B) magnets are in automobiles for anti-lock brakes, and in computer hard disk drives, videos, CD-ROMs used in many small-size electronic consumer products, such as, digital cameras, where major advantage is their small sizes. Nickel metal hydride (Ni MH) batteries, containing mischmetal, a mixture of rare earth compounds, are used mainly in portable electronic equipment, such as, laptops, camcorders and mobile phones. Though, the market for batteries for portable electronic equipment is growing strongly, the Ni MH batteries are increasingly replaced by lithium-ion batteries.

Monazite contains about 25.28% P2O5 which can be recovered as a by-product for manufacture of fertilizers and production of elemental phosphorus or its salts. Beside, rare earths, thorium is also recovered from monazite. It is a source of atomic energy. An important use of thorium is for addition to tungsten in minute quantity (about 0.75%) to increase the ductility of tungsten wire and thus to facilitate its drawing into filaments used in electric lamps. Metallic thorium is also used in photoelectric cells and X-ray tubes and in certain alloys. Thorium is used as catalytic agent for various processes. Amongst thorium salts, thorium nitrate is used largely in the manufacture of incandescent gas mantles. Mesothorium, the chief radioactive element recovered as a by-product in the chemical treatment of monazite, is marketed usually in the form of its bromide and used in self-luminous paints or enamels. Mesothorium is also used in the treatment of certain types of cancer and skin diseases.

Rare Earth Compounds producer was the main consumer accounting for about 99.68% of the total consumption followed by Glassware.

Reserve/Resources

The mineral monazite is a prescribed substance as per the Notification under the Atomic Energy Act, 1962. AMD has been carrying out its resource evaluation for over six decades. It occurs in association with other heavy minerals, such as, ilmenite, rutile, zircon, etc. in concentrations of 0.4 – 4.3% of total heavies in the beach and inland placer deposits of the country. The resource estimates of monazite in the beach and inland placer deposits have been enhanced from 11.935 million tonnes in 2012 to 12.47 million tonnes in 2016 which corresponds to about 1 million tonnes of thorium oxide.

World Review

The total world reserves are estimated at 120 million tonnes of rare earth oxides equivalent content (REO) of which China alone accounts for 44 million tonnes (37%) followed by Brazil & Vietnam (18% each) and Russia (10%).

China holds the leading position among producers of rare earth oxides with 140 thousand tonnes. The other major producers are Myanmar, Australia, USA, Russia and Malaysia. Concentrates/partially-processed intermediate products are further processed at many locations in Europe, USA, Japan and China. In China, the principal production centres of rare earths are located at Baotou, Inner Mongolia and in Jiangxi & Sichuan provinces. At Baotou, bastnaesite is recovered as a by-product of iron ore mining while

in Sichuan and in Gansu, bastnaesite occurs as primary mineral. In Jiangxi, Guangdong, Hunan and Jiangsu provinces, the ion adsorption clays are the source of the greater proportion of world yttrium production.

The Russian Rare Earths Industry is based on loparite, a titanium-tantalum niobate mined from Lovozero massif in the Murmansk region. Rare earth minerals have been recovered as by-products from titanium-bearing heavy sands, particularly in Australia and from tin dredging in Malaysia.

Source: https://ibm.gov.in/writereaddata/files/10012020172151RareEarth_2019_AR.pdf

Rank of India in World Production

As per World Mineral Production, 2014-18, British Geological Survey, India's ranking in 2018 in world production was 2nd in Steel (crude/liquid), 3rd in Zinc slabs, 4th in aluminium, Chromite, iron ore, and lead (refined); 5th in Bauxite, 7th in Manganese ore, 11th in copper (refined), 15th in Magnesite and 16th in apatite & rock phosphate. The statistics on indigenous and world production of principal minerals and metals are as follows:

Contribution and Rank of India in World Production of Principal Minerals & Metals, 2018

Sector	Unit of Commodity	Production (quantity)		Contribution (Percentage)	India's rank in World order $
		World	India*		
Minerals					
Bauxite	'000 tonnes	326000	23688	7.27	5th
Chromite	'000 tonnes	40800	3971	9.73	4th
Iron ore	million tonnes	2923	206	7.05	4th
Manganese ore	'000 tonnes	53000	2820	5.32	7th
Magnesite	'000 tonnes	29500	147	0.50	15th
Apatite & rock phosphate	'000 tonnes	232000	1285	0.55	16th
Metals					
Aluminium (Primary)	'000 tonnes	62700	3696	5.89	4th
Copper (refined)	'000 tonnes	23900	454	1.90	11th
Steel (crude/liquid)	million tonnes	1812	110.92	6.12	2nd
Lead (refined)	'000 tonnes	12000 ##	620 #	5.17	4th
Zinc (slab)	'000 tonnes	13300	696	5.23	3rd

Source: World mineral production data compiled from World Mineral Production, 2014-2018; British Geological Survey.

** Figures relate to 2018-19.*

$: India's rank based on production mentioned in World Mineral Production 2014-18; British Geological Survey.

#: Figures as published in World Mineral Production, 2014-18. However, the production of Lead (Primary) during 2018-19 was 198 thousand tonnes.

##: Figure relates to both primary and secondary refined lead and include the lead content of antimonial lead.

Note: (i) Data in respect of World Mineral Production is on calendar year basis, however the data on India's production is based on financial year.

(ii) Minor minerals have not been included due to non-availability of production data with respect to India on statutory basis.