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(Part- II :Metals and Alloys)

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TIN

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GOVERNMENT OF INDIA
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17 Tin

Tin is one of the earliest metals known and used mainly in bronze implements. It is a scarce element having an incidence of about 2 ppm in the earth's crust. Its unique combination of properties like non-toxic nature, high malleability, chemical inertness and ease with which it can form an amalgam and alloy with other metals has given it a special status among non-ferrous metals. Pure tin is a silvery-white metal which is soft and malleable. It does not occur naturally as metal. By far, the most important tin mineral is cassiterite (SnO_2), which theoretically, in its purest form contains 78.6% tin. But usually it includes impurities of Nb,Ta, Zr, Sc, W, and Fe.The less common tin ore is stannite (Cu_2SnFeS_4). Tin is now used mostly for tin plating, soldering special alloys and in making bronze.

RESERVES/RESOURCES

In India tin ore is found associated with granite, pegmatites and quartz veins and also in placer deposits. Resources are spread over in Bastar and Dantewada districts of Chhattisgarh, Tosham deposit in Bhiwani district of Haryana and Malkangiri district of Odisha.

The total reserves/resources of tin ore in the country as per NMI data, based on UNFC system, as on 1.4.2015 are placed at 83.73 million tonnes containing about 1,02,413 tonnes metal. About 4,419 tonnes ore containing 154 tonnes metal are placed under 'Reserves' category and the bulk, i.e., about 83.72 million tonnes containing about 1,02,259 tonnes metal are placed under 'Remaining Resources' category. The entire ore Reserves are located in Chhattisgarh and Haryana. About 64% of total ore resources are located in Haryana and 36% in Chhattisgarh, while nominal resources are located in Odisha (Table-1).

EXPLORATION & DEVELOPMENT

The exploration and development details, if any, are given in the Review on 'Exploration and Development' in 'General Reviews' i.e., Vol.I of the title.

PRODUCTION, STOCKS & PRICES

Concentrates

The production of tin concentrates in 2017-18 was at 16,758 kg as against 12,121 kg in the preceding year. One Public Sector and five Private Sector mines reported production in 2017-18. All these mines are located in Chhattisgarh.

The mine-head closing stock of tin concentrates was 5,136 kg in 2017-18 as against 6,989 kg in 2016-17.

The Chhattisgarh Mineral Development Corporation Ltd (CMDC) purchases tin ores/minerals from local tribals, who collect them from the lease area. Hence, no labour was reported by the mine owned by the CMDC Ltd, whereas Precious Minerals and Smelting Ltd employed 16 workers in the current year as against 19 in the previous year on average daily basis (Tables-2 to 5).

Tin Metal

The plant owned by Precious Minerals and Smelting Ltd. reported production of 13,741 kg of tin metal in 2017-18 as against nil production in the preceding year. The plant is located at Jagdalpur in Dantewada district of Chattisgarh. (Table-6).

Table – 1 : Reserves/Resources of Tin as on 1.4.2015
(By Grades/States)

(In tonnes)

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						
All India : Total													
Ore	**2067**	**897**	**1455**	**4419**	**22594200**	**2653**	**31330072**	**168457**	**561080**	**29064288**	**-**	**83720749**	**83725168**
Metal	**44.56**	**94.02**	**15.62**	**154.2**	**33139.45**	**842.8**	**54049.65**	**813.29**	**231.63**	**13182.34**	**-**	**102259.16**	**102413.36**
By States													
Chhattisgarh													
Ore	2067	897	1455	4419	1508	2017	72	168457	559914	29063288	-	29795255	29799674
Metal	44.56	94.02	15.62	154.2	917.02	342.02	16.85	813.29	209.43	13172.34	-	15470.95	15625.15
Haryana													
Ore	-	-	-	-	22580000	-	31330000	-	-	-	-	53910000	53910000
Metal	-	-	-	-	32187.8	-	54032.8	-	-	-	-	86220.6	86220.6
Odisha													
Ore	-	-	-	-	12692	636	-	-	1166	1000	-	15494	15494
Metal	-	-	-	-	34.63	500.78	-	-	22.2	10	-	567.61	567.61

Figures rounded off.

Table – 2 : Principal Producers of Tin Concentrates, 2017-18

Name & address of the producer	Location of the mine	
	State	District
Chhattisgarh Mineral Dev. Corp. Ltd, Sona Khan Bhawan, Ring Road No.1, Raipur- 492 006 Chhattisgarh.	Chhattisgarh	Dantewada
Precious Minerals and Smelting Ltd, Semi Urban Industrial Estate, Frezerpur, Jagdalpur - 494 001, Chhattisgarh.	Chhattisgarh	Dantewada

Table – 3 : Production of Tin Concentrates, 2015-16 to 2017-18 (P) (By State)

(Quantity in kg; Value in `'000)

State	2015-16		2016-17		2017-18 (P)	
	Quantity	Value	Quantity	Value	Quantity	value
India	**13541**	**9231**	**12121**	**8736**	**16758**	**10139**
Chhattisgarh	13541	9231	12121	8736	16758	10139

Table – 4 : Production of Tin Concentrates, 2016-17 and 2017-18 (P) (By Sectors/State/District)

(Quantity in kg; Value in `'000)

State	2016-17			2017-18 (P)		
	No. of mines	Quantity	Value	No. of mines	Quantity	Value
India	**6**	**12121**	**8736**	**6**	**16758**	**10139**
Public sector	1	10006	5331	1	14227	9010
Private sector	5	2115	3405	5	2531	1129
Chhattisgarh	**6**	**12121**	**8736**	**6**	**16758**	**10139**
Dantewada	6	12121	8736	6	16758	10139

Table – 5 : Mine-head Closing Stocks of Tin Concentrates, 2016-17 & 2017-18 (P) (By State)

(In kg)

State	2016-17	2017-18 (P)
India	**6989**	**5136**
Chhattisgarh	6989	5136

Table – 6 : Production of Tin Metal 2015-16 to 2017-18 (P)

(Qty in kg; Value in `'000)

Year	Production	
	Quantity	Value
2015-16	16675	21677
2016-17	-	-
2017-18 (P)	13741	15459

MINING

In Govindpal-Tongpal area of Dantewada district, Chhattisgarh, tin in the form of cassiterite is being mined from the sediments deposited in the streams. The stream sediments are dug up manually with conventional implements. Subsequent panning of these sediments helps in separating the lighter gangue minerals while the heavier part is recovered as cassiterite. Chhattisgarh is the only tin producing State in India. Tin ore is known as cassiterite, which was reported in Dantewada district (Bastar district in formerly Madhya Pradesh) by the Directorate of Geology and Mining and was found being associated with the lepidolite bearing pegmatites. CMDC has an arrangement of collecting tin ore from cooperative societies of tribals in district-Dantewada, Chhattisgarh. CMDC has formed a J.V.C. for mining and marketing of tin ore in the name of Precious Minerals and Smelting Ltd Jagdalpur, Chhattisgarh.The Precious Minerals & Smelting Limited (PMSL) (An ISO 9001:2000 Company), is a flagship Company of Lunia Group.The Group is into mining & mineral processing for more than 25 years. The PMSL is the first Joint Venture Company setup with the Chhattisgarh Mineral Development Corporation Limited (A Government of Chhattisgarh Enterprise), for identification, exploration and exploitation of tin bearing areas of Chhattisgarh State.

USES & SPECIFICATIONS

Tin, as a metal, is the most preferred and environment-friendly packing material. Tin plate, a value added flat steel product, is a versatile packaging substrate used in edible oils, paints, pesticides, processed foods, beverages and other industries. As a pure metal, it can be used in storage tanks for pharmaceutical chemical solutions, in capacitors, electrodes, fuse-wires, ammunitions, tinned iron sheets to protect victuals, sweets or tobacco, etc. The tin plate is manufactured by depositing tin on iron plate of thickness ranging from 0.17 mm to 0.60 mm. IS 1993:2006 (fourth revision, Reaffirmed Sept. 2011) specifies the requirement for cold reduced electrolytic tin plate. The specifications for tin ingot which is to be used for various purposes is as per IS : 26:1992 (Fourth Revision, Reaffirmed Feb. 2014). There shall be two grades of tin ingot, viz, Sn 99.85% and 99.75%. BIS has prescribed IS : 4280-1992 (Reaffirmed Feb. 2014) for refined secondary tin ingots.

Tin readily forms alloys with other metals to create useful materials, such as, solders, bronzes and fusible alloys. Tin with lead forms an excellent alloy which melts at very low temperature and is used as solders in electronics or as a seal in plumbing. Tin is used in making fusible alloys to be used in safety devices, such as, fire sprinklers, pressure cookers, boiler plugs and electrical fuses. Powder containing 60% silver, 27% tin and 13% copper when mixed with appropriate quantity of mercury forms excellent dental amalgam to be used for filling dental cavities.

Tin is used in cast iron to improve the microstructure and it results in higher uniform hardness. Tin bronzes are used for making gears, tubing, springs and plumbing fitments and for making bearings. Tin is also used in making high-tech alloys, such as, zirconium-tin, used for cladding the fuel elements in thermal nuclear reactors and a niobium-tin-intermetallic compound used in certain high-performance superconducting fields, such as, in high-energy physics.

Tin oxide-based catalysts are used in air purification system, gas sensors and CO_2 lasers. Organotin compounds are used in agrochemicals and antifouling paints in seafaring vessels. Float Glass Industry is an important user of tin, it utilises a method of floating molten glass over a huge vat of molten tin. Pure tin in molten form is used to provide a flat surface as well as fire-polish on both sides of float glass which solidifies on it. It is also used in the production of lead crystal glass. Tin oxide films thicker than 1 mm on glass, produce a transparent, yet electrically conductive layer. This layer is used in de-icing windscreen, antistatic glassware, security alarm, etc.

Tin has established a long-term future as an innovative, competitive and sustainable material. A new low cost, efficient and environment-friendly solar cell has been developed that uses tin instead of the hazardous lead. Tin, known as fuel catalyst, can save energy and reduce emissions when added

to fuel. Tin is also considered as synergist for replacement of antimony fire retardants used in most plastics. Tin can make lithium batteries last more than three times longer. Tin and zinc work well together to heal wounds and kill bacteria, enabling use in new range of animal healthcare products. Eletrolytic Tinplate undoubtedly enjoys the pride of place as a packaging medium especially of food.

POLICY

As per the Foreign Trade Policy, 2015-20, there are no restrictions on the export and import of tin ores and concentrates.

INDUSTRY/CONSUMPTION

In India the main consumers of tin are the Tin Plate Industry and Solder Industry. The latter advancing to become the biggest single end-use sector, over the last decade. The domestic tin plate market is categorised broadly into three basic packaging market segments-edible oil/vanaspati & cashew, processed food and non-processed food. The consumption in IT Industry and in food/ beverages Packaging Industry has increased in the recent years. Tin plate companies, namely, Tin Plate Company of India Ltd, GPT Steel Industries Ltd, Vardhaman Industries Ltd, SAIL's Rourkela Steel Plant, Kaira Can Company Ltd, Hindustan Tin Works Ltd etc. use tin metal in appreciable quantities for the manufacture of tin plate.

The Tin Plate Company of India Ltd consumes tin at its Golmuri Works, Jamshedpur in East Singhbhum, Jharkhand. The TCIL is the pioneer and leading producer of tin mill products in India. It was incorporated in 1920 and has evolved as one of the important regional players in Asia. The Company is a subsidiary of Tata Steel Limited with the parent company holding 74.96% stake in TCIL. The manufacturing facility of the Company is located at Jamshedpur in the State of Jharkhand with an installed capacity of 3,79,000 tonnes per annum. The total apparent domestic consumption of tin plate in India in FY 2017-18 was around 6,47,000 tonnes per annum, of which around 41% was met through imports and the rest through domestic supplies. The TCIL produced 3,09,938 tonnes & 3,48,520 tonnes of Electrolytic Tinplate in the year 2016-17 & 2017-18, respectively. Similarly in cold rolling mill during 2016-17 and 2017-18, the C.R. products produced were of 3,32,024 tonnes and 3,66,778 tonnes respectively. GPT Steel Industries Ltd an ISO 9001:2008 accredited unit, was established in 2003 to manufacture Cold rolled products & Tinplate products. GPT is 2nd largest producer of tin plate in India with largest capacity for producing tin plates. GPT Steel has set up two complete Cold Rolling Mills (4Hi & 6Hi Mill) and state-of-the-art Electrolytic Tinplate Line (ETL) located at Gandhidham, Kuchchh district, Gujarat.

SUBSTITUTES

The most important use of tin is in making packing materials, as it is environment-friendly. Aluminium, glass, paper, plastic, or tin-free steel are among the major substitute for tin. A number of materials can replace tin in its various applications, such as, tetrapack for liquid food items; plastic/ polycontainers for solid, semi-solid food; aluminium, glass, tin-free steel can be used in place of tin cans and containers. Tin-Free Steel (TFS) is an electrolytic chrome plated steel consisting of a thin layer of chromium and a layer of chromium oxide deposited on the steel base which gives it a beautiful, lustrous metallic finish on both sides. TFS offers outstanding corrosion resistance, lacquer adhesion as well as printability. Additional features of TFS are filiform rust resistance, sulphur blackening resistance and coating. For tin solders new epoxy resins; for bronze-aluminium alloys, copper-base alloys and plastic; plastic for bearing metals that contain tin; compounds of lead and sodium for some tin chemicals are the other substitutes now in use in place of tin.

WORLD REVIEW

The world reserves of tin metal estimated in 2018 was 4.7 million tonnes, located mainly in China (23%), Indonesia (17%) and Brazil (15%). The world reserves of tin by principal countries are furnished in Table-7.

The world mine production of tin in 2017 increased to 3,35,000 tonnes from 3,02,000 tonnes in the previous year (Table-8). China continued to be the largest producer of tin in 2017 with about 28% share in the total world production followed by Indonesia (25%) and Myanmar (20%).

According to a report 'Tin for the Future' published by International Tin Association, formerly International Tin Research Institute Ltd (ITRI), the world's 10 leading refined tin producers in 2017 were, Yunnan Tin Group Co. Ltd (China), PT Timah (Persero) tbk. (Indonesia), Malaysia Smelting Corp. Bhd. (Malaysia), Yunnan Chengfeng Co. Ltd (China), Minsur S.A. (Peru), Empresa Metalurgica Vinto S.A. (Bolivia), Guangxi China Tin Group Co. Ltd (China), Thailand Smelting and Refining Co. Ltd (Thailand), Metallo Chinique International N.V. (Belgium) and Gejiu Zi-Li Mining & Smelting Co. Ltd (China).

A generalised view of the development in various countries, along with country-wise description sourced from latest available publication of Minerals Yearbook of 'USGS' 2016 are presented as below.

Australia

AusTin Mining Ltd recommenced production at the Granville tin processing plant in Tasmania. Initially, the existing tailings at the site were retreated at the plant and later in the year processing of stockpiled ore was taken up. AusTin Mining was also in the process of obtaining the necessary regulatory approval for an expansion project at Granville, which included resuming mining at the site and increasing tin-concentrate production to about 550 metric tons per year (t/yr).

The Federal Court of Australia rejected the merger proposal between Kasbah Resources Ltd and Asian Mineral Resources Ltd. The merger had the approval of the Kasbah Board of Directors and 90% of the shareholders, but the minority shareholders objected, citing an error in the valuation of their shares. The court ordered Kasbah to pay the minority shareholders reasonable costs, including at least 50% of the previous court hearing costs. Kasbah Resources owned the Achmmach deposit in Morocco, which has been projected to produce up to 7,000 t/yr.When the merger failed, Pala Investments Ltd purchased a 19.9% stake in Kasbah for $2.7 million (3.23 million Australian dollars), allowing Pala Investments to appoint two representatives to the Kasbah Board.

China

Nine of China’s tin producers agreed to cut production by a combined 17,000 tonnes for the year, citing low prices. Participants in this production cut included Yunnan Tin, China Tin and Chengfeng. The total tin production of all participating Companies was around 1,40,000 tonnes, equivalent to 80% of China’s tin production, or 40% of global tin production in 2015. Tin smelters in Guangxi Zhuang Autonomous Region and Jiangxi and Yunnan Provinces suspended or scaled back production, reportedly for Government-mandated special environmental inspections. Inspection teams were sent to eight Provinces where most of the country’s non-ferrous metals production took place, and inspections were mostly completed by the end of August. Smelters gradually built their production levels back up to previous levels when the inspections had been successfully completed. In September, only four smelters remained closed, which represented 18% of China’s annual refined tin production.

Indonesia

PT Refined Bangka Tin closed its smelting and refining facility and stopped tin production, citing low tin prices and stringent environmental regulations.The Company announced that the refinery would be dismantled and the site would be turned into a conservation area. PT Refined Bangka Tin typically exported about 5,000 t/yr of tin. According to the results of an audit carried out by Indonesia’s Ministry of Energy and Mineral Resources, only 29 out of 47 tin smelters in the Bangka-Belitung Islands Province were in operation in 2015. The tin smelting capacity utilisation rate in the Province, which accounted for approximately 90% of Indonesia’s tin production, was only around 20%. The audit also showed that of the 755 Companies that held a license to operate, only 498 had a “clean and clear” certification. The “clean and clear” certification had been required since November 1, 2015.

Brazil

Brasil Manganês Corporation Mineração S.A. (BMC) (a subsidiary of Meridian Mining S.E.) signed an agreement with Cooperativa de Garimpeiros de Santa Cruz Ltda. and Cooperativa Metalúrgica de Rondônia Ltda. to reprocess tailings from the Bom Futuro Mine in the Ariquemes District, Rondonia State. BMC also gained the first right of refusal on either the acquisition of the mineral rights or the provision of underground mining services in the area and could secure up to 80% of the unexplored area surrounding the mines.

Myanmar

Myanmar accounted for most of China's tin concentrate imports in 2016, supplying 4,72,506 t of tin ore and concentrates containing an estimated 57,000 t of tin. Approximately 18% of this was believed to be from Wa County government stocks. Myanmar's ore continued to be produced predominantly in Wa County, or Wa Special Region 2 in northern Shan State, close to the border with China.

Table – 7 : World Reserves of Tin (By Principal Countries)

(In '000 tonnes of tin content)

Country	Reserves
World : Total (rounded off)	**4700**
Australia[a]	370
Bolivia	400
Brazil	700
Myanmar	110
China	1100
Congo (Kinshasa)	150
Indonesia	800
Malaysia	250
Peru	110
Russia	350
Thailand	170
USA	-
Vietnam	11
Other countries	180

Source: *Mineral Commodity Summaries, 2019.*

a: For Australia, Joint Ore Reserves Committee-compliant reserves were about 2,60,000 tonnes.

Table – 8 : World Mine Production of Tin (By Principal Countries)

(In tonnes of metal content)

Country	2015	2016	2017
World: Total	**310000**	**302000**	**335000**
Australia	7158	6635	7402
Bolivia	20135	17460	18341
Brazil	18900	15183	13900
Myanmar	43000	57000	68000
China	110156	97165	93400
Congo, Dem. P.R	4567	6503	10391
Indonesia	71309	66358	83200
Laos	692	1005	975
Malaysia	4125	4158	4819
Nigeria	2298	3443	6550
Peru	19511	18789	17790
Rwanda	2884	2662	3570
Vietnam	4530	4579	4500
Other countries	1017	1230	1967

Source: *World Mineral Production, 2013-2017, BGS*

FOREIGN TRADE

Exports

There were negligible exports of tin ores & concentrates during 2017-18. Exports of tin & alloys including scrap declined to 990 tonnes in 2017-18 as compared to 1,275 tonnes in the preceding year. Out of total exports in 2017-18, tin & alloys was only 565 tonnes (57%), tin & alloys (worked) at 422 tonnes (43%) and tin waste & scrap were negligible. Exports of tin & alloys were mainly to Korea, Rep. of (43%), UAE (24%) UK (7%), Iran & USA (4% each), Sri Lanka, South Africa & Saudi Arabia (3% each) and Nepal & Hungary (1% each) (Tables - 9 to 16).

Table – 9 : Exports of Tin Ores & Conc. (By Countries)

Country	2016-17		2017-18	
	Qty (t)	Value (`'000)	Qty (t)	Value (`'000)
All Countries	-	-	++	3
Nepal	-	-	++	3

Table – 10 : Exports of Tin & Alloys Incl. Scrap (By Countries)

Country	2016-17		2017-18	
	Qty (t)	Value (`'000)	Qty (t)	Value (`'000)
All Countries	**1275**	**723630**	**990**	**762616**
UAE	259	216504	190	221792
Korea, Rep. of	245	195128	244	193165
UK	31	47809	52	68163
Iran	-	-	25	45000
Sri Lanka	25	47098	20	44942
South Africa	50	22093	56	36130
USA	10	19297	25	29882
Saudi Arabia	13	17878	16	24381
Nepal	350	26061	259	21341
Oman	19	16985	8	10984
Other countries	273	114777	95	66836

Table – 11 : Exports of Tin & Alloys (By Countries)

Country	2016-17		2017-18	
	Qty (t)	Value (`'000)	Qty (t)	Value (`'000)
All Countries	**522**	**591974**	**565**	**712543**
UAE	143	173718	136	213538
Korea, Rep. of	240	194299	244	193133
UK	29	46961	40	65011
Iran	-	-	25	44989
Sri Lanka	18	38879	18	40727
South Africa	9	17281	17	31678
USA	8	18477	22	28546
Saudi Arabia	12	17395	16	24381
Nepal	3	3754	5	8913
Hungary	0	670	5	8853
Other countries	60	80540	37	52774

Table – 12 : Exports of Tin & Alloys: Worked (By Countries)

Country	2016-17		2017-18	
	Qty (t)	Value (`'000)	Qty (t)	Value (`'000)
All Countries	**752**	**130773**	**422**	**47466**
Nepal	346	22104	252	12092
UAE	116	42786	54	8254
South Africa	41	4789	39	4452
Sri Lanka	7	8219	2	4215
Zambia	184	17999	26	4141
Oman	19	16929	3	3925
UK	2	848	12	3152
USA	2	820	3	1336
Guinea	-	-	12	1181
Pakistan	-	-	5	830
Other countries	35	16279	14	3888

Table - 13 : Exports of Tin Waste & Scrap (By Countries)

Country	2016-17		2017-18	
	Qty (t)	Value (`'000)	Qty (t)	Value (`'000)
All Countries	**1**	**883**	**3**	**2607**
Sudan	-	-	1	1408
Slovenia	-	-	++	534
Nepal	1	203	2	336
Germany	++	369	++	140
Bhutan	-	-	++	64
Belgium	++	66	++	50
Malaysia	-	-	++	45
Indonesia	-	-	++	12
Iran	-	-	++	11
Mali	-	-	++	6
Other countries	++	245	++	1

Table - 14 : Exports of Tin & Alloys : NES (By Countries)

Country	2016-17		2017-18	
	Qty (t)	Value (`'000)	Qty (t)	Value (`'000)
All Countries	**313**	**293283**	**328**	**326991**
Korea, Rep. of	240	194299	244	193133
UK	29	46961	40	64915
UAE	8	14266	15	27545
Chinese Taipei/Taiwan	3	4874	7	6870
Canada	-	-	4	6410
Nepal	-	-	4	6402
Oman	-	-	3	4442
Ethiopia	-	-	3	4225
Bangladesh	-	-	3	3868
South Africa	-	-	2	3610
Other countries	33	32883	3	5571

Table - 15 : Exports of Tin : Anode, Cathode etc of Tin Unwrought (By Countries)

Country	2016-17		2017-18	
	Qty (t)	Value (`'000)	Qty (t)	Value (`'000)
All Countries	**74**	**106294**	**70**	**106553**
Iran	-	-	25	44989
USA	-	-	18	22329
Saudi Arabia	10	14330	10	14155
UAE	53	74493	7	9944
Uganda	3	5212	4	6640
Nepal	2	3120	1	2131
Ethiopia	2	3560	1	1797
Nigeria	1	542	1	1223
Oman	-	-	1	1074
Kenya	++	502	1	1073
Other countries	3	4535	1	1198

Table – 16 : Exports of Tin Blocks (By Countries)

Country	2016-17		2017-18	
	Qty (t)	Value (`'000)	Qty (t)	Value (`'000)
All Countries	**5**	**12580**	**1**	**1909**
Oman	++	56	1	1539
Nepal	1	577	++	121
Bhutan	-	-	++	117
Sri Lanka	-	-	++	68
Spain	-	-	++	38
USA	4	11507	++	26
Japan	++	440	-	-

Imports

The imports of tin ores and concentrates in 2017-18 were at 57 tonnes as compared to 68 tonnes in the previous year which were mainly from France (70%) and Kenya (30%). Imports of tin & alloys including scrap were at 12,202 tonnes in 2017-18 as compared to 9,179 tonnes in the previous year. Imports of tin and alloys were mainly from Indonesia (61%) and Malaysia (34%). Out of the total imports in 2017-18, tin & alloys were11,987 tonnes comprising 69 tonnes tin, alloys (NES), 271 tonnes tin & alloys (worked) (Tables -17 to 25).

Table – 17 : Imports of Tin Ores & Conc. (By Countries)

Country	2016-17		2017-18	
	Qty (t)	Value (`'000)	Qty (t)	Value (`'000)
All Countries	**68**	**37334**	**57**	**56980**
France	-	-	40	47341
Kenya	20	11067	17	9639
Thailand	22	12174	-	-
Rwanda	++	147	-	-
Guinea	4	2773	-	-
Laos	22	11173	-	-

Table – 18 : Imports of Tin & Alloys, Incl. Scrap (By Countries)

Country	2016-17		2017-18	
	Qty (t)	Value (`'000)	Qty (t)	Value (`'000)
All Countries	**9179**	**11714969**	**12202**	**15775529**
Indonesia	5143	6694330	7399	9420405
Malaysia	3490	4398601	4199	5691563
Singapore	32	36898	146	199546
China	310	274314	292	148717
Korea, Rep. of	25	53416	42	106029
Germany	43	69474	62	105761
Japan	18	32876	18	38497
Italy	9	11334	12	19674
Chinese Taipei Taiwan	11	15385	11	17116
Hong Kong	++	239	9	10902
Other countries	98	128102	12	17319

Table – 19 : Imports of Tin & Alloys (By Countries)

Country	2016-17		2017- 18	
	Qty (t)	Value (`'000)	Qty (t)	Value (`'000)
All Countries	**9033**	**11625659**	**11987**	**15647702**
Indonesia	5143	6694330	7399	9420405
Malaysia	3489	4397664	4198	5690470
Singapore	32	36080	143	184616
China	207	252135	127	112580
Korea, Rep. of	21	52550	40	104111
Germany	38	56655	59	95640
Chinese Taipei/Taiwan	8	11659	11	17012
Japan	++	1152	3	10292
Canada	1	1400	5	8018
Czech Republic	++	321	1	1479
Other countries	94	121713	1	3079

Table – 20 : Imports of Tin & Alloys : Worked, NES (By Countries)

Country	2016-17		2017-18	
	Qty (t)	Value (`'000)	Qty (t)	Value (`'000)
All Countries	**146**	**89160**	**215**	**127648**
China	103	22029	165	35958
Japan	18	31724	15	28205
Italy	9	11334	12	19674
Singapore	++	818	3	14930
Hong Kong	++	161	9	10902
Germany	5	12819	3	10121
Korea, Rep. of	4	866	2	1918
USA	1	710	1	1664
Malaysia	1	937	1	1093
Denmark	++	147	1	1033
Other countries	5	7615	3	2150

Table – 21 : Imports of Tin (Scrap) (By Countries)

Country	2016- 17		2017-18	
	Qty (t)	Value (`'000)	Qty (t)	Value (`'000)
All Countries	++	**150**	++	**179**
China	++	150	++	179

Table – 22 : Imports of Tin Alloys, NES (By Countries)

Country	2016-17		2017-18	
	Qty (t)	Value (`'000)	Qty (t)	Value (`'000)
All Countries	**53**	**82129**	**69**	**117669**
Germany	33	47745	54	86682
Malaysia	17	28629	10	20230
Japan	++	538	2	7079
Singapore	2	2440	2	2856
China	++	120	1	762
Czech Republic	-	-	++	55
USA	1	1496	++	5
UK	++	186	-	-
Chinese Taipei/Taiwan	++	443	-	-
Thailand	++	345	-	-
Other countries	++	187	-	-

Table – 23 : Imports of Tin & Alloys : Worked (By Countries)

Country	2016-17		2017-18	
	Qty (t)	Value (`'000)	Qty (t)	Value (`'000)
All Countries	**194**	**228463**	**271**	**350328**
China	82	69587	126	111700
Korea, Rep. of	21	51694	40	103034
Singapore	25	27588	65	77583
Malaysia	23	30709	17	21151
Chinese Taipei/Taiwan	3	4210	6	9114
Germany	5	8724	5	8833
Canada	1	1346	5	8018
Indonesia	33	31120	5	4714
Japan	++	540	1	3213
Czech Republic	++	321	1	1424
Other countries	1	2624	++	1544

Table – 24 : Imports of Tin : Anode, Cathode etc of Tin Unwrought (By Countries)

Country	2016-17		2017-18	
	Qty (t)	Value (`'000)	Qty (t)	Value (`'000)
All Countries	**8782**	**11308799**	**11642**	**15171496**
Indonesia	5110	6663210	7394	9415691
Malaysia	3449	4338326	4171	5649089
Singapore	5	6052	76	104177
Korea, Rep. of	++	856	++	1077
Spain	-	-	1	898
USA	++	52	++	198
UK	++	70	++	119
China	125	182317	++	118
New Zealand	-	-	++	97
Germany	-	-	++	32
Other countries	93	117916	-	-

Table – 25 : Imports of Tin Blocks (By Countries)

Country	2016-17		2017-18	
	Qty (t)	Value (`'000)	Qty (t)	Value (`'000)
All Countries	**4**	**6268**	**5**	**8209**
Chinese Taipei/Taiwan	4	5425	5	7898
Ukraine	-	-	++	218
Germany	++	186	++	93
China	++	111	-	-
USA	++	546	-	-

FUTURE OUTLOOK

According to the analyses put out by International Tin Research Institute Ltd (ITRI) the latest estimate of refined tin use in 2016 is 3,48,900 tonnes based on data from 2017 survey. The figure is just 1,200 tonnes lower than the preliminary 2016 estimates. Refined tin demand reported by survey participants increased by 3.3% in 2016 with more modest growth anticipated in 2017.

World tin reserves appeared to be adequate to meet short-term demand. Secondary sources of tin are likely to become an increasingly important component to meet supply demands especially in the United States. Domestic tin requirements are expected to continue to be met primarily through imports.

The per capita consumption of tinplate in India is considerably low when compared to many developed countries and developing economies like China. High growth in modern retail, FDI in multi-brand retail combined with Government's thrust on food processing industries augur well for the growth of Packaging Industry in India which in turn could spur growth of tin use in the country.