



2015 Minerals Yearbook

TIN [ADVANCE RELEASE]

TIN

By C. Schuyler Anderson

Domestic survey data and tables were prepared by Linda M. Barnes, statistical assistant, and the world production tables were prepared by Lisa D. Miller,¹ international data coordinator.

Tin has not been mined in the United States since 1993; thus, the United States is reliant on imports and recycling for its tin needs. In 2015, the amount of primary tin metal consumed domestically was 23,700 metric tons (t) worth an estimated \$394 million. Approximately 11,200 metric tons (t) of the tin consumed was recovered from domestic scrap. Industry stocks were slightly more than those at yearend 2014 (tables 1, 5).

World tin mine production was 289,000 t, a slight increase from revised production total in 2014 (table 9). Of the 18 countries in which tin was mined, 6 countries accounted for 90% of the total production. China was the leading producer (38% of world output), followed by Indonesia (18%), Burma (12%), Brazil (9%), Bolivia (7%), and Peru (7%). World primary tin smelter production was 326,000 t (table 10), an 11% decrease from revised total of 2014. According to CRU International Ltd., world refined tin consumption for 2015 was 347,000 t, a 3% decrease from the previous year (CRU Tin Monitor, 2015).

The annual average New York dealer price for Grade A tin decreased by 26% in 2015 from that in 2014 to \$7.56 per pound, and the annual average London Metal Exchange Ltd. (LME) cash price was \$7.29 per pound, 27% less than that in 2014. World tin reserves were estimated to be 4.8 million metric tons, more than 16 times the estimated 2015 world mine production of tin. The majority of tin reserves were in Asia and South America.

Legislation and Government Programs

In July 2010, the Dodd-Frank Wall Street Reform and Consumer Protection Act was signed into law. Section 1502 requires publicly listed companies to verify and disclose their sources of “conflict minerals,” defined as “columbite-tantalite (coltan), cassiterite, gold, wolframite, or their derivatives”; this group of minerals is commonly called “3TG” (tantalum, tin, tungsten, gold) minerals. Section 1502 also required companies to file, by June 2014, a specialized disclosure form with the U.S. Securities Exchange Commission that indicates whether or not any 3TG minerals used in their products were sourced from the Democratic Republic of the Congo [Congo (Kinshasa)] and the adjoining countries (U.S. Congress, 2010). In 2014, some companies that used any of the 3TG minerals publicly released their supply sources for the 3TG minerals that they consumed.

Production

Tin has not been mined in the United States since 1993, when it was mined in Alaska. In 2015, tin recovered from new and old scrap was estimated to be 11,200 t, 7% lower than that of 2014 (table 5). A significant quantity of alloy tin scrap was generated

during manufacturing processes and recycled within those same industries (new scrap).

Secondary tin recovered from obsolete fabricated parts (old scrap) was used in many types of products and was a particularly important source of tin for the manufacture of brass, bronze, and solder. In 2015, 10,100 t of tin was recovered from old scrap, with 8,150 t from lead-base scrap and 1,900 t from directly melted copper-base scrap at brass mills, ingot makers, and foundries (table 5).

Consumption

Tin in the United States was used, in descending order by weight, in tinplate, 22%; chemicals, 20%; solder, 16%; alloys, 10%; babbitt, bronze and brass, and tinning, 9%; and other, 23% (table 3). Tinplate is a layer of tin adhered to steel or wrought iron substrate for corrosion protection. Tin is used in this case to inhibit rust and is commonly used in food-grade cans. Tin-based chemicals are commonly used in polyvinyl chloride (PVC) production and curing, biocides, and catalysts. Tin alloys are used in brass and bronze products, solders, and low-friction metals. Solder is commonly used in electronic devices for connections on circuit boards.

In 2015, U.S. reported tin consumption was 23,700 t of primary tin and 2,940 t of secondary tin. Domestic consumption data for tin were developed by the U.S. Geological Survey from a voluntary survey of tin consumers. Of the 96 firms to which a survey form was sent, 45 responded, accounting for 47% of estimated reported consumption. Data for the nonrespondents were estimated based on prior-year reporting.

Prices

The annual average New York dealer price for Grade A tin metal decreased by 26% to \$7.56 per pound in 2015 from \$10.23 per pound in 2014. The LME remained the principal commodity exchange for trading tin and in 2015, the annual average LME cash price for tin was \$7.29 per pound, a decrease of 27% from the 2014 average LME price of \$9.94 per pound (table 1).

Foreign Trade

U.S. imports for consumption of refined tin, which supplied most domestic tin requirements, totaled 33,600 t, 6% less than those of 2014 (table 8). Imports of tin in all forms (metal, ore and concentrate, scrap, and waste) remained duty free. Foreign-owned trading firms operating in the United States tended to dominate the marketing of imports. U.S. imports of tin came mostly from Malaysia, Peru, Bolivia, and Indonesia, in descending order of quantity imported. Refined tin exports in 2015 were 807 t, a 2,120-t decrease from 2014 (table 6).

¹Deceased.

World Review

According to a survey by the International Tin Research Institute Ltd. (ITRI), the world's 10 leading refined tin producers and their production in 2015 were, in descending order of production, Yunnan Tin Group Co. Ltd. (China), 75,500 t; Malaysia Smelting Corp. Bhd. (Malaysia), 30,260 t; PT Timah (Persero) Tbk. (Indonesia), 27,431 t; Minsur S.A. (Peru), 20,224 t; Yunnan Chengfeng Co. Ltd. (China), 16,600 t; Empresa Metalúrgica Vinto S.A. (Bolivia), 12,106 t; Guangxi China Tin Group Co. Ltd. (China), 11,100 t; Gejiu Zi-Li Mining and Smelting Co. Ltd. (China), 11,000 t; Thailand Smelting and Refining Co. Ltd. (Thailand), 10,502 t; and Metallo Chimique International N.V. (Belgium), 8,863 t (ITRI Ltd., 2016b).

Australia.—Consolidated Tin Mines Ltd., owner of the Mount Garnet tin project in Queensland, voted to acquire the assets of Snow Peak Mining Pty. Ltd., which included the concentrator at Mount Garnet, the Surveyor-Balcooma open pit and underground mines, the Baal Gammon Mine, and the Maitland and Einasleigh projects. This purchase diversified Consolidated Tin Mines, allowing them to produce zinc, copper, and polymetallic ore, along with tin. The Mount Garnet concentrator was expected to produce 2,900 metric tons per year (t/yr) of tin in concentrate, 235,000 t/yr of iron ore, and 54,000 t/yr of fluorite (ITRI Ltd., 2013, 2015c).

Metalicity Ltd. filed for three exploration licenses at the Pilgangoora project in Western Australia for lithium, tantalum, and tin. The licenses covered 450 square kilometers and were adjacent to Global Advanced Metals Pty Ltd.'s Wodgina operations and Pilbara Minerals Ltd.'s Pilgangoora operations, which have resources of tantalum and lithium-tantalum, respectively (Macmillan, 2015).

Brazil.—Minsur S.A.'s Pitinga tin-niobium-tantalum mine produced 5,740 t of tin in 2015, 5% less than that in 2014. Production at the mine was negatively affected by power supply issues beginning in the third quarter relating to water leaks at the hydroelectric dam that powered operations at Pitinga. Minsur countered the decline in mine production by processing tin slag stockpiles at their Pirapora tin smelter, which produced 5,530 t of refined tin in 2015, 10% more than that in 2014. Overall, Minsur produced 25,800 t of tin in 2015, down from the 29,200 t produced in 2014 (ITRI Ltd., 2015e; Minsur S.A., 2016, p. 50).

Burma.—Burma accounted for 98% of China's tin concentrate imports in 2015, supplying 286,000 t of tin ore and concentrates containing an estimated 41,000 t of tin. The import level increased by 65% from that of 2014. Most of Burma's ore was mined in Wa County, close to the border with China's Yunnan Province (ITRI Ltd., 2016a).

Burma's Ministry of Mining was working on developing a list of partners to operate its tin refinery and smelting plant near Rangoon. The plant has operated intermittently over the past few years and was in need of upgrades. The seven companies in consideration for partnership were Thailand Smelting and Refining Co. Ltd. and OM Manufacturing Co. Ltd. (Thailand); Mining World Co. Ltd. and UMG Co. Ltd. (Burma); Malaysia Smelting Co. Ltd. and Keiwa Innovation Co. Ltd. (Japan); and Myanmar Pongpipat Co. Ltd. (a Burma-Thai joint venture) (ITRI Ltd., 2015f).

Production at the Mawchi tin and tungsten mine in Kayah State restarted in November after operations were suspended in October owing to heavy rains which caused landslides that destroyed nearby residential housing. Twenty-eight people were killed, local mine workers were displaced to temporary camps, and migrant workers were told to return to their home countries (Dragomanovich, 2015).

China.—In 2015, China's imports of tin ores and concentrates (gross weight) increased by 65% to 291,000 t from 176,400 t in 2014 as a result of a decrease in domestic mine production. Private tin mines in Yunnan Province were reported to have closed, and the Hunan Southern Mines operations, the third largest tin mining company in China, closed in July because of environmental issues. Refined tin production was reported to be 159,000 t in 2015, down from 175,000 t in 2014 (CRU Tin Monitor, 2016a, b).

In March, the Shanghai Futures Exchange received permission from China's Securities Regulatory Commission to start trading tin futures contracts. The minimum contract size was 1 t, the maximum contract size was 500 t, and there was a daily price limitation of 4% from the settlement price of the previous day. The grade and quality was listed at 99.9% or greater tin (ITRI Ltd., 2015h; Shanghai Futures Exchange, 2015).

In December, the Hong Kong Exchanges and Clearing Ltd. (HKEX) launched its London Tin Mini Futures contract, a renminbi-traded 1-t futures contract for tin, aimed at Chinese retail investors. The final settlement price was based on the official settlement price at the LME. Unlike the LME, however, the HKEX contracts were to be settled at the end of the month in cash, rather than daily (ITRI Ltd., 2015d).

Egypt.—Arrowhead Resources Ltd. (Australia), formerly Gippsland Ltd., had a 50% interest in the Abu Dabbab tantalum-tin-feldspar project, with the other 50% owned by the Egyptian Government through the Egyptian Company for Mineral Resources (ECMR). On March 26, Arrowhead claimed that ECMR was attempting to dissolve the partnership. ECMR responded that Arrowhead had abandoned the Abu Dabbab project. Arrowhead ceased funding when the ECMR became unresponsive and is now seeking resolution through legal channels (ITRI Ltd., 2015a).

Indonesia.—According to preliminary estimates, Indonesia's exports of refined tin were 70,200 t in 2015, down from 75,900 t in 2014. Beginning November 1, tin exporters in Indonesia were required to obtain a "clean and clear" certification for their mining leases before receiving a long-term export license. Depending on how strictly Indonesia implements the latest regulations, ITRI expected that Indonesia's exports would decline in 2016 to between 5,000 and 5,500 metric tons per month, down from about 5,850 metric tons per month in 2015 (ITRI Ltd., 2015b; Dragomanovich, 2016).

Rwanda.—Rwanda's Ministry of Natural Resources signed contracts with six companies to mine 10 mining concessions, estimated to earn Rwanda up to \$45 million dollars over 5 years. The successful bidders, Ruli Mining and Trade Ltd., Geosami Ltd., Crystal Mining and Trading Co. Ltd., Nsyabire Ltd., SEAVMC Ltd., and KNM Combines Ltd., were expected to invest \$9 million over 5 years, have committed to local

corporate social responsibility programs, and to have established high safety standards at their mines. Seven additional licenses were expected to be allocated in the future (ITRI Ltd., 2015g).

Outlook

According to ITRI analysis, global demand for tin decreased at yearend 2015 owing to low prices. ITRI also projected that global tin consumption would decrease by 3% in 2016 (CRU Tin Monitor, 2015).

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

References Cited

- CRU Tin Monitor, 2015, Tin holding up against global commodity malaise: London, United Kingdom, CRU International Ltd., December 10. (Accessed April 14, 2016, via <http://mycru.crugroup.com/>.)
- CRU Tin Monitor, 2016a, China turns tin tide: London, United Kingdom, CRU International Ltd., February 11. (Accessed April 14, 2016, via <http://mycru.crugroup.com/>.)
- CRU Tin Monitor, 2016b, Supply demand consumption: London, United Kingdom, CRU International Ltd., April 14. (Accessed April 14, 2016, via <http://mycru.crugroup.com/>.)
- Dragomanovich, Vanya, 2015, Mawchi tin and tungsten mines restart work after landslides: London, United Kingdom, Argus Media group Metal-Pages, November 3. (Accessed December 15, 2015, via <http://www.metal-pages.com/>.)
- Dragomanovich, Vanya, 2016, Indonesian tin exports fall in 2015: London, United Kingdom, Argus Media group Metal-Pages, January 13. (Accessed February 15, 2015, via <http://www.metal-pages.com/>.)
- ITRI Ltd., 2013, Consolidated still targeting 2014 tin production: Frogmore, United Kingdom, ITRI Ltd. news release, October 3. (Accessed January 15, 2017, at <https://www.itri.co.uk/tin-explorers/news-7/consolidated-still-targeting-2014-tin-production>.)
- ITRI Ltd., 2015a, Abu Dabbab project still in limbo following expropriation dispute: Frogmore, United Kingdom, ITRI Ltd. news release, October 29. (Accessed November 2, 2015, at <https://www.itri.co.uk/tin-explorers/news-7/abu-dabbab-project-still-in-limbo-following-expropriation-dispute>.)
- ITRI Ltd., 2015b, Certification delays could slash Indonesia November exports: Frogmore, United Kingdom, ITRI Ltd. news release, October 29. (Accessed December 15, 2016, at <https://www.itri.co.uk/market-analysis/news-2/certification-delays-could-slash-indonesia-november-exports>.)
- ITRI Ltd., 2015c, Consolidated Tin Mines completed asset acquisition: Frogmore, United Kingdom, ITRI Ltd. news release, January 20. (Accessed April 2, 2016, at <https://www.itri.co.uk/tin-explorers/news-7/consolidated-tin-mines-completes-asset-acquisition>.)
- ITRI Ltd., 2015d, Hong Kong exchange launches tin futures contract: Frogmore, United Kingdom, ITRI Ltd. news release, December 15. (Accessed December 18, 2015, at <https://www.itri.co.uk/market-analysis/news-2/hong-kong-exchange-launches-tin-futures-contract>.)
- ITRI Ltd., 2015e, Mixed production results from Minsur's Brazilian operations: Frogmore, United Kingdom, ITRI Ltd. news release, November 18. (Accessed December 15, 2015, at <https://www.itri.co.uk/market-analysis/news-2/mixed-production-results-from-minsur-s-brazilian-operations>.)
- ITRI Ltd., 2015f, Myanmar mining ministry shortens list of prospective smelter partners: Frogmore, United Kingdom, ITRI Ltd. news release, July 2. (Accessed December 15, 2015, at <https://www.itri.co.uk/market-analysis/news-2/myanmar-mining-ministry-shortens-list-of-prospective-smelter-partners>.)
- ITRI Ltd., 2015g, Rwanda Government signs new mining agreements: Frogmore, United Kingdom, ITRI Ltd. news release, July 30. (Accessed August 6, 2015, at <https://www.itri.co.uk/tin-explorers/news-7/rwanda-government-signs-new-mining-agreements>.)

- ITRI Ltd., 2015h, Shanghai Future Exchange will launch tin trading on 27 March: Frogmore, United Kingdom, ITRI Ltd. news release, March 19. (Accessed December 15, 2016, at <https://www.itri.co.uk/market-analysis/news-2/shanghai-future-exchange-will-launch-tin-trading-on-27-march>.)
- ITRI Ltd., 2016a, Myanmar tin ore export boom continues: Frogmore, United Kingdom, ITRI Ltd. news release, January 27. (Accessed April 2, 2016, at <https://www.itri.co.uk/market-analysis/news-2/myanmar-tin-ore-export-boom-continues>.)
- ITRI Ltd., 2016b, The top 10 refined tin producers of 2015: Frogmore, United Kingdom, ITRI Ltd. news release, March 15. (Accessed April 2, 2016, at <https://www.itri.co.uk/market-analysis/news-2/the-top-10-refined-tin-producers-of-2015>.)
- Macmillan, Angus, 2015, Metalicity lodges licences for Sn, Ta, Li exploration: London, United Kingdom, Argus Media group Metal-Pages, December 30. (Accessed January 7, 2015, via <http://www.metal-pages.com/>.)
- Minsur S.A., 2016, Annual integrated report 2015: Lima, Peru, Minsur S.A., 163 p. (Accessed May 13, 2016, at <http://www.minsur.com/wp-content/uploads/pdf/Memoria%20Anual/ENG/MINSUR%20Annual%20Report%202015.pdf>.)
- Shanghai Futures Exchange, 2015, SHFE standard tin contract specifications: Shanghai, China, Shanghai Futures Exchange, March 30. (Accessed May 27, 2016, at <http://www.shfe.com.cn/en/products/Tin/contract/911322443.html>.)
- U.S. Congress, 2010, Dodd-Frank Wall Street Reform and Consumer Protection Act: U.S. Congress Public Law 111–203, July 21, p. 1375–2223. (Accessed December 15, 2016, at <http://www.gpo.gov/fdsys/pkg/PLAW-111publ203/pdf/PLAW-111publ203.pdf>.)

GENERAL SOURCES OF INFORMATION

U.S. Geological Survey Publications

- Conflict Minerals from the Democratic Republic of the Congo—Tin Processing Plants, a Critical Part of the Tin Supply Chain (ver. 2.1, February 2017). U.S. Geological Survey Fact Sheet 2015–3022, 2017.
- Historical Statistics for Mineral and Material Commodities in the United States. Data Series 140.
- Recycling—Metals. Ch. in Minerals Yearbook, annual.
- Tin. Ch. in Mineral Commodity Summaries, annual.
- Tin. Ch. in United States Mineral Resources, Professional Paper 820, 1973.
- Tin. International Strategic Minerals Inventory Summary Report, Circular 930–J, 1990.
- Tin. Mineral Industry Surveys, monthly.
- Tin Resources of the World. Bulletin 1301, 1969.
- Tin (Sn). Ch. in Metal Prices in the United States Through 2010, Scientific Investigations Report 2012–5188, 2013.

Other

- Canadian Mining Journal.
- Resource World.
- Resources Recycling.
- Roskill Information Services Ltd.
- Tin. Ch. in Mineral Facts and Problems, U.S. Bureau of Mines Bulletin 675, 1985.
- Waste Age.

TABLE 1
SALIENT TIN STATISTICS¹
(Metric tons of contained tin, unless otherwise specified)

	2011	2012	2013	2014	2015
United States:					
Production, secondary (old scrap)	11,000	11,200	10,600	10,100 ^r	10,100 ^e
Exports, refined tin	3,460 ^r	2,900 ^r	2,990 ^r	2,920 ^r	807
Imports for consumption, refined tin	34,200	36,900	34,900	35,600	33,600
Consumption:					
Primary	25,200	24,500	25,700	24,200	23,700
Secondary	3,280	3,240	4,730	3,250	2,940
Stocks, yearend, U.S. industry	6,280	6,910	6,520	6,970 ^r	7,090
Prices, average:					
Platts Metals Week New York dealer, Grade A cents per pound	1,220.00	989.60	1,040.00	1,020.00	756.43
Platts Metals Week composite do.	1,580.00	1,280.00	1,350.00	NA	NA
London Metal Exchange, cash do.	1,180.00	957.26	1,010.00	993.75	729.18
Kuala Lumpur, Malaysia do.	1,190.00	958.44	1,010.00	992.53	NA
World, production:					
Mine	315,000 ^r	249,000 ^r	260,000 ^r	285,000 ^r	289,000
Smelter:					
Primary	321,000	314,000	313,000 ^r	369,000 ^{r,e}	326,000 ^e
Secondary	22,000	23,600	23,500	23,000 ^e	23,200 ^e
Total	344,000	338,000	336,000 ^r	392,000 ^{r,e}	349,000 ^e

^eEstimated. ^rRevised. do. Ditto. NA Not available.

¹Data are rounded to no more than three significant digits, except prices; may not add to totals shown.

TABLE 2
U.S. CONSUMPTION OF PRIMARY AND SECONDARY TIN¹
(Metric tons, contained tin)

	2014	2015
Stocks, January 1 ²	5,530	5,330
Net receipts during year:		
Primary	24,000	24,200
Secondary	1,250	1,180
Scrap	2,450	2,140
Total receipts	27,700	27,500
Total available	33,200	32,800
Tin consumed in manufactured products:		
Primary	24,200	23,900
Secondary	3,250	2,940
Total	27,500	26,800
Intercompany transactions in scrap	368	285
Total processed	27,800	27,100
Stocks, December 31 (total available less total processed)	5,350 ^r	5,700

^rRevised.

¹Data are rounded to no more than three significant digits; may not add to totals shown.

²Includes tin in transit in the United States.

TABLE 3
U.S. CONSUMPTION OF TIN, BY FINISHED PRODUCT¹

(Metric tons, contained tin)

Product	2014			2015		
	Primary	Secondary	Total	Primary	Secondary	Total
Alloys, miscellaneous ²	3,970	W	3,970	2,640	W	2,640
Babbitt	245	37	282	268	37	305
Bar tin	W	W	W	W	W	W
Bronze and brass	650	1,070	1,720	699	1,060	1,760
Chemicals	5,420	W	5,420	5,440	W	5,440
Solder	2,820	2,040	4,860	2,460	1,740	4,200
Tinning	514	--	514	392	--	392
Tinplate ³	5,940 ^r	W	5,940 ^r	5,840	W	5,840
Other ⁴	4,680	98	4,780	5,910	104	6,020
Total	24,200	3,250	27,500	23,700	2,940	26,600

^rRevised. W Withheld to avoid disclosing company proprietary data; included with "Other." -- Zero.

¹Data are rounded to no more than three significant digits; may not add to totals shown.

²Includes terre metal.

³Includes secondary pig tin and tin acquired in chemicals.

⁴Includes britannia metal, collapsible tubes and foil, jewelers' metal, pewter, tin powder, type metal, and white metal.

TABLE 4
U.S. INDUSTRY YEAREND TIN STOCKS¹

(Metric tons)

Stocks	2014	2015
Plant raw materials:		
Pig tin:		
Primary ²	4,820 ^r	4,830
Secondary	102	105
In process ³	379	465
Total	5,300 ^r	5,400
Additional pig tin:		
Jobbers-importers	1,480	1,470
Afloat to United States	191	211
Total	1,670	1,680
Grand total	6,970 ^r	7,090

^rRevised.

¹Data are rounded to no more than three significant digits; may not add to totals shown.

²Includes tin in transit in the United States.

³Data only include tin content of scrap.

TABLE 5
U.S. STOCKS, RECEIPTS, AND CONSUMPTION OF NEW AND OLD SCRAP AND TIN RECOVERED, BY TYPE OF SCRAP¹

(Metric tons)

Type of scrap	Gross weight of scrap						Tin recovered ^e		
	Stocks, January 1	Receipts	Consumption			Stocks, December 31	New	Old	Total
			New	Old	Total				
2014:									
Copper-base scrap: ^e									
Ingot makers	3,650	47,500 ^r	6,180 ^r	41,300 ^r	47,500 ^r	3,630 ^r	197 ^r	1,830 ^r	2,030
Brass mills ²	W	W	W	W	W	W	1,070 ^r	W	1,070 ^r
Foundries and other plants	1,320 ^r	16,900 ^r	14,400 ^r	2,280 ^r	16,700	1,540 ^r	W	84 ^r	84 ^r
Total	XX	XX	XX	XX	XX	XX	1,270 ^r	1,910 ^r	3,180 ^r
Lead-base scrap	44,100 ^r	888,000 ^r	24,300	865,000 ^r	889,000 ^r	44,400 ^r	638	8,170 ^r	8,810 ^r
Tin-base scrap ³	W	W	W	W	W	W	W	W	W
Grand total ^e	XX	XX	XX	XX	XX	XX	1,900 ^r	10,100 ^r	12,000 ^r
2015:									
Copper-base scrap: ^e									
Ingot makers	3,630	47,200	6,060	41,300	47,400	3,470	196	1,830	2,030
Brass mills ²	W	W	W	W	W	W	253	W	253
Foundries and other plants	1,540	15,400	13,800	1,820	15,600	1,380	W	72	72
Total	XX	XX	XX	XX	XX	XX	449	1,900	2,350
Lead-base scrap	44,400	874,000	25,500	845,000	870,000	31,800	671	8,150	8,820
Tin-base scrap ³	W	W	W	W	W	W	W	W	W
Grand total ^e	XX	XX	XX	XX	XX	XX	1,120	10,100	11,200

^eEstimated. ^rRevised. W Withheld to avoid disclosing company proprietary data. XX Not applicable.

¹Data are rounded to no more than three significant digits; may not add to totals shown.

²Consumption is assumed to be equal to receipts.

³Includes tinplate and other scrap recovered at detinning plants.

TABLE 6
U.S. EXPORTS OF TIN IN VARIOUS FORMS¹

Form	2014		2015	
	Quantity (metric tons, gross weight)	Value (thousands)	Quantity (metric tons, gross weight)	Value (thousands)
Unwrought:				
Refined tin	2,920	\$25,200	807	\$14,900
Tin alloys	2,790	20,300	2,540	19,400
Wrought:				
Tin bars, rods, profiles, and wire	5,140	38,800	5,180	40,700
Tin foil	23	344	33	563
Tin plates, sheet, and strip	1,180	3,110	300	2,280
Tin tubes, pipes, and tube and pipe fittings	113	1,130	114	1,630
Tin waste and scrap	7,480	19,600	2,530	7,350
Tin flakes and powders	174	4,260	110	2,470
Tinplate and terneplate	104,000 ^r	105,000 ^r	105,000	76,500

^rRevised.

¹Data are rounded to no more than three significant digits.

Source: U.S. Census Bureau.

TABLE 7
U.S. IMPORTS FOR CONSUMPTION OF TIN IN VARIOUS FORMS¹

Form	2014		2015	
	Quantity (metric tons, gross weight)	Value (thousands)	Quantity (metric tons, gross weight)	Value (thousands)
Unwrought:				
Refined tin	35,600	\$787,000	33,600	\$546,000
Tin alloys	1,570	30,200	2,720	43,400
Wrought:				
Tin bars, rods, profiles, and wire	1,890	38,200	1,220	21,300
Tin foil	73	2,940	96	3,400
Tin plates, sheet, and strip	116	647	90	502
Tin tubes, pipes, and tube and pipe fittings	17	100	12	149
Tin waste and scrap	49,700 ^r	19,400 ^r	32,700	12,300
Tin flakes and powders	170	4,760	238	5,400
Tin oxides	412	8,290	417	7,340
Tinplate and terneplate	633,000 ^r	695,000 ^r	700,000	729,000

^rRevised.

¹Data are rounded to no more than three significant digits.

Source: U.S. Census Bureau.

TABLE 8
U.S. IMPORTS FOR CONSUMPTION OF REFINED TIN,
BY COUNTRY¹

Country	2014		2015	
	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)
Belgium	222 ^r	\$4,660 ^r	917	\$17,200
Bolivia	4,570 ^r	104,000	6,260	97,000
Brazil	3,030	67,200	2,950	48,800
Canada	57	1,310	32	560
Chile	157	3,520	--	--
China	3,470	78,000	1,230	21,200
Hong Kong	--	--	125	2,530
Indonesia	8,140	170,000	5,210	72,000
Japan	(2) ^r	18 ^r	5	105
Malaysia	6,050	135,000	9,990	169,000
Netherlands	(2)	5	35	387
Peru	9,260	209,000	6,600	112,000
Singapore	375	7,840	225	4,020
Thailand	291	6,420	20	331
United Kingdom	--	--	2	17
Other	2	48 ^r	(2)	2
Total	35,600	787,000 ^r	33,600	546,000

^rRevised. -- Zero.

¹Data are rounded to no more than three significant digits; may not add to totals shown.

²Less than ½ unit.

Source: U.S. Census Bureau.

TABLE 9
TIN: WORLD MINE PRODUCTION, BY COUNTRY^{1,2}

(Metric tons, tin content)

Country	2011	2012	2013	2014	2015
Australia	14,014	6,158	6,472	6,900 ^r	7,000
Bolivia	20,373	19,702	19,282 ^r	19,802 ^r	20,000
Brazil	10,725	13,667	16,830	25,534 ^r	25,000
Burma ³	11,000 ^e	10,600	17,000	30,000 ^r	34,271
Burundi	22	21	13	32	NA
China ^e	120,000	110,000	97,000	104,000 ^r	110,156 ⁴
Congo (Kinshasa) ^e	5,600	4,800	4,500 ⁴	6,500	6,400
Indonesia	89,600 ^r	44,202 ^r	59,412 ^r	51,801 ^r	52,000 ^e
Laos	674	762	579	866	900
Malaysia	3,340	3,725	3,697	3,777	3,800
Nigeria ^{e, 5}	270	340	2,600 ^r	2,800 ^r	2,500
Peru	28,882	26,105	23,668	23,105	19,511
Portugal	39	42	84	75 ^e	100
Russia	75	100	249	500 ^e	NA
Rwanda ^c	4,400	2,900	3,100	4,200 ^r	2,000
Thailand	286	199	132	156	100
Uganda, placer	--	--	18	31	NA
Vietnam ^e	5,400	5,400	5,400	5,400	5,400
Total	315,000 ^r	249,000 ^r	260,000 ^r	285,000 ^r	289,000

^eEstimated. ^rRevised. NA Not available. -- Zero.

¹Totals and estimated data are rounded to no more than three significant digits; may not add to totals shown.

²Includes data available through May 24, 2017.

³Includes content of tin-tungsten concentrate.

⁴Reported figure.

⁵Tin content is estimated as 62% of reported gross weight concentrate.

TABLE 10
TIN: WORLD SMELTER PRODUCTION, BY COUNTRY^{1,2}

(Metric tons)

Country	2011	2011	2011	2014 ^c	2015 ^c
Australia, secondary ^c	400	400	400	400	400
Belgium, secondary ^c	10,000	11,400	12,000	12,000	12,100
Bolivia, primary	14,295	14,626	14,862	15,439 ³	12,106 ³
Brazil:					
Primary	9,382	11,955	16,830 ^r	25,534 ^{r,3}	26,000
Secondary	250	250	250	250	250
Total	9,632	12,205	17,080 ^r	25,784 ^{r,3}	26,250 ³
Burma, primary ^c	30	30	30	30	30
China, primary ^c	156,000	148,000	150,000	187,000	166,900 ³
Denmark, secondary ^c	60	50	50	50	50
Greece, secondary ^c	50	50	50	50	50
Indonesia, primary	43,832	51,400	48,800	58,233 ³	48,000
Japan, primary	947	1,133	1,786	1,746 ³	1,700
Malaysia, primary	40,281	37,823	32,633	35,018 ³	30,260 ³
Norway, secondary ^c	50	50	50	50	50
Peru, primary	32,290	24,811	24,181	24,462 ³	20,396 ³
Russia: ^c					
Primary	526	500	400	400	400
Secondary	200	200	150	150	150
Total	726	700	550	550	550
Spain, secondary ^c	10	10	10	10	10
Thailand, primary	20,000	19,996	19,088	16,929 ³	16,500
United States, secondary	11,000	11,200	10,600	10,100 ³	10,100
Vietnam, primary	3,900	4,000	4,000	4,000	4,000
Grand total	344,000	338,000	336,000 ^r	392,000 ^r	349,000
Of which:					
Primary	321,000	314,000	313,000 ^r	369,000 ^r	326,000
Secondary	22,000	23,600	23,500	23,000	23,200

^cEstimated. ^rRevised. -- Zero.

¹Grand totals, U.S. data, and estimated data are rounded to no more than three significant digits; may not add to totals shown.

²Whenever possible, total output has been separated into primary (from ores and concentrates) and secondary (tin metal recovered from old scrap). Data reflect metal production at the first measurable stage of metal output. Includes data available through May 24, 2017.

³Reported figure.