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2018 Minerals Yearbook

TIN [ADVANCE RELEASE]

U.S. Department of the Interior
U.S. Geological Survey

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Tin

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Tin has not been mined in the United States since 1993; accordingly, the United States is completely reliant on imports and recycling for its tin needs. In 2018, the reported amount of primary tin metal consumed domestically was 28,000 metric tons (t) (tables 1–3) worth an estimated $577 million. Approximately 9,900 t of tin was recovered from domestic scrap (tables 1, 5). Industry stocks increased by 52% from the revised total at yearend 2017 (tables 1, 4).

World tin mine production was 318,000 t, a 7% decrease from the revised production total in 2017 (tables 1, 9). Of the 20 countries in which tin was mined in 2018, 6 countries accounted for 89% of the total production. China was the leading producer (28% of world output), followed by Indonesia (27%), Burma (17%), Peru (6%), and Bolivia and Brazil (5% each). World primary tin smelter production was 348,000 t (table 10), a slight decrease from the revised primary tin smelter total of 2017. According to CRU International Ltd., world refined tin consumption for 2018 was 364,000 t, a slight increase from that in the previous year (CRU Tin Monitor, 2019, p. 3). Total tin world smelter production was 367,000 t in 2018, a 3% decrease from that in 2017 (table 1).

The annual average New York dealer price of $9.36 per pound for Grade A tin in 2018 was essentially unchanged from that in 2017, and the annual average London Metal Exchange Ltd. (LME) cash price was $9.14 per pound, essentially unchanged from that in 2017 (table 1). World tin reserves were estimated to be 4.7 million metric tons (Mt) (Anderson, 2020), about 14 times the estimated 2018 world primary tin production. Most global tin reserves were in Asia and South America.

Legislation and Government Programs

Conflict Minerals.—The U.S. Securities and Exchange Commission (SEC) is responsible for implementing section 1502 of the Dodd-Frank Wall Street Reform and Consumer Protection Act, which is related to the use of minerals determined to be financing conflict in Congo (Kinshasa) or adjoining countries. A "conflict mineral" is defined as cassiterite, columbite-tantalite, gold, wolframite, or their derivatives. Cassiterite is one of two principal minerals mined for tin. Section 1502 requires companies for which conflict minerals or their derivatives are necessary to the functionality or manufacture of their products to disclose annually whether any of those minerals originated in Congo (Kinshasa) or an adjoining country (U.S. Securities and Exchange Commission, 2012, p. 56274–56275).

In 2018, 1,117 companies filed conflict minerals disclosures for 2017 (1,165 companies filed disclosures in 2017 for 2016). The ability of reporting companies to identify the country of origin of their conflict minerals is hindered when there are multiple tiers of suppliers between the reporting company and the upstream concentrate-processing facility. After conducting due diligence on determining the mineral source and chain of custody of the conflict minerals in their products, an estimated 35% of the companies reported that their products contained minerals originating from a covered country or from scrap or recycled sources, compared to 37% in 2017. An estimated 61% of the companies could not confirm whether minerals used originated from covered countries compared with 47% in 2017. Only three companies reported that they could determine that the minerals in their products were neither financing nor benefiting armed groups. Although reporting companies were not required to identify which conflict minerals they used, of those that did, an estimated 76% reported using tin, compared to 69% in 2017 (U.S. Government Accountability Office, 2019, p. 1–3, 12, 13). Tin concentrate production from Congo (Kinshasa) and adjoining countries has been only 1% to 3% of world production over the past 5 years (table 9).

In October, the LME proposed requiring listed companies to comply with the Organisation for Economic Co-operation and Development's (OECD's) conflict mineral sourcing guidance. Listed companies would be required to assess risk factors regarding their sourcing of minerals, including tin. In certain circumstances, companies would be asked to provide proof of compliance (London Metal Exchange Ltd., 2018).

Critical Minerals.—In 2018, the U.S. Department of the Interior, in coordination with other executive branch agencies, published a list of 35 critical mineral commodities, which included tin. The list was developed to serve as an initial focus, pursuant to Executive Order 13817, "A Federal Strategy to Ensure Secure and Reliable Supplies of Critical Minerals." The Department of the Interior intends to periodically update the list to reflect current data on supply, demand, and concentration of production. The U.S. Department of Commerce will use the list when developing a strategy to reduce the Nation's reliance on critical minerals as required by section 4 of the Executive order (U.S. Department of the Interior, 2018).

Foreign Trade.—In March 2018, the President of the United States imposed a 25% ad valorem tariff on steel articles imported from most countries based on the U.S. Department of Commerce findings regarding the effect of imports on national security under section 232 of the Trade Expansion Act of 1962, as amended (19 U.S.C. 1862). Under the Presidential proclamation, steel articles were described to include varieties of tinplate with the following Harmonized Tariff Schedule of the United States (HTS) codes: 7210.11.00, 7210.12.00, and 7212.10.00. A new HTS code was created, 9903.80.01, to represent the new tariffs (Trump, 2018a, b). As of December 2018, the additional import duty for steel articles remained at 25% for most countries of origin and 50% for Turkey. Imports of tin in the form of ore and concentrates, unwrought metal, and waste and scrap remained duty free.

On September 24, 2018, the United States imposed an additional 10% import tariff on approximately $200 billion worth of Chinese goods. A variety of tinplate (HTS code 7326.90.10), which is used to manufacture containers for foods and beverages, was included on the list. A new HTS code was created, 9903.88.01, to represent the new tariff. The tariff was scheduled to increase to 25% on January 1, 2019 (Office of the U.S. Trade Representative, 2018).

Production

Tin has not been mined in the United States since 1993. In 2018, tin output recovered from scrap was 9,900 t, a slight decrease from the previous year's total of 10,000 t (revised) (tables 1, 5). A significant quantity of alloy tin scrap was generated during manufacturing processes and was recycled within those same industries as new scrap; however, data were withheld to avoid disclosing company proprietary data. Secondary tin recovered from post-consumer waste (old scrap) was used in many types of products and was a particularly important source of tin for the manufacture of brass and bronze (table 3).

Consumption

During 2018, tin in the United States was used, in descending order by weight, in chemicals, 22%; tinplate, 18%; solder, 13%; alloys, 10%; bronze and brass, 7%; babbit, bar tin, and tinning, 4% cumulatively; and other, 26% (table 3). Tin-based chemicals commonly are used in polyvinyl chloride production and curing, biocides, and catalysts. 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 alloys are used in brass and bronze products, solders, and low-friction metals. Solder commonly is used in electronic devices for connections on circuit boards.

Domestic consumption data for tin were developed by the U.S. Geological Survey from a voluntary survey of 125 companies that consume tin. Responses were received from 40 companies. The amount of tin consumed by the companies that did not respond to the survey was estimated based on prior reports or on information from other sources. In 2018, reported consumption was 28,000 t of primary tin and 4,680 t of secondary tin, increases of 20% and 51%, respectively, from the revised totals of 2017 (table 1).

Prices

The Platts Metals Week annual average New York dealer price for Grade A tin metal was $9.36 per pound in 2018, essentially unchanged from that in 2017. The LME remained the principal commodity exchange for trading tin. In 2018, the annual average LME cash price for tin was $9.14 per pound, essentially unchanged from the 2017 average LME price of $9.11 per pound (table 1).

Foreign Trade

The leading tin imports in 2018, by quantity, were tinplate and terneplate, of which 696,000 t valued at $720 million was imported; this was a decrease of 18% in quantity compared with imports of 854,000 t valued at $820 million in 2017 (table 7). Refined tin imports, which supplied most domestic primary tin requirements, totaled 36,800 t valued at $731 million in 2018, a 7% increase in quantity and an 8% increase in value from the revised amount in 2017 (tables 1, 7). Imports of tin alloys totaled 1,430 t in 2018 valued at $27.4 million, a 7% decrease in quantity from the revised amount in 2017. Top sources of refined tin to the United States were Indonesia (29%), Malaysia (21%), Peru (18%), Bolivia (17%), and Brazil (7%) (table 8).

The leading tin exports in 2018 by quantity, were tinplate and terneplate at 110,000 t valued at $79.8 million, decreases of 23% in quantity and 14% in value compared with exports of 142,000 t (revised) valued at $93.2 million (revised) in 2017. Refined tin exports in 2018 were 941 t valued at $18.9 million, a 40% decrease in quantity from the revised quantity in 2017. Exports of tin alloys were 885 t valued at $19.9 million, a decrease of 8% from the revised quantity in 2017 (table 6).

World Review

According to an annual survey by the International Tin Association Ltd., the world's 10 leading refined tin producers and their 2018 production were Yunnan Tin Group Co. Ltd. (China), 77,789 t; PT Timah Tbk. (Indonesia), 33,444 t; Malaysia Smelting Corp. (Malaysia), 27,086 t; Yunnan Chengfeng Co. Ltd. (China), 22,900 t; Minsur S.A. (Peru), 18,345 t; Jiangxi Nanshan Tin (China), 12,220 t; Empresa Metalúrgica Vinto S.A. (Bolivia), 11,369 t; Thailand Smelting and Refining Co. Ltd. (Thailand), 10,544 t; Metallo Chimique International N.V. (Belgium), 9,328 t; and Guangxi China Tin Group Co. Ltd. (China), 9,219 t. The top two producers, Yunnan Tin Group Co. Ltd. and PT Timah Tbk., reported increases of 4.5% and 10.6%, respectively, in production from that in 2017 (International Tin Association Ltd., 2019).

China.—Effective November 1, China reduced import tariff rates on more than 1,500 products including tin ore (cassiterite ore). The average import tariff rates for all products were reduced to 7.8% from 10.5%. The import tariff rate on tin ore (cassiterite ore) decreased to 5% from 5.5% (Argus Metals International, 2018a; Yao, 2018).

In October, the Gejiu City government of Yunnan Province ordered an estimated 50 ore processing plants to close or agree to relocate to a new industrial park. Approximately 30 processing plants had no plans to move and were required to shut down voluntarily by the end of October or risk being forcibly shut down. The remaining plants agreed to voluntarily relocate, with construction anticipated to be complete by the end of April 2019. This mass relocation was expected to reduce tin concentrate production by 1,000 metric tons per month (t/mo) (International Tin Association Ltd., 2018a).

Congo (Kinshasa).—A new mining law was signed by the President in March 2018 which raised mineral royalties in the Democratic Republic of Congo [Congo (Kinshasa)]. The new law increased the royalty rate on tin to 3.5% from 2%; increased state ownership of mining projects to 10%; eliminated the 10-year grace period for compliance to the increased royalty rate by existing licensees; imposed a new tax triggered by high

commodity prices; and reduced contract stability guarantees to 5 years from 10 years (International Tin Association Ltd., 2018b; Mining Review Africa, 2018).

Alphamin Bisie Mining SA [Alphamin Resources Corp. (80.75%); Industrial Development Corp. (14.25%); and Government of Congo (Kinshasa) (5%)] completed the crushing circuit at its Bisie tin mine. Construction continued on the gravity concentration building and storage tailings facility, which had a target completion date of March 2019. The plant was expected to produce concentrates by that date. A revised reserve statement and National Instrument 43–101 technical report would likely be released in early 2019 (Alphamin Resources Corp., 2018; Argus Metals International, 2018b).

Germany.—Thyssenkrupp AG announced an agreement to create a 50–50 joint venture by combining its European steel operations, Thyssenkrupp Steel Europe, with India's Tata Steel BSL Limited. The company expected an annual cost savings of 400 million to 500 million euros ($468 million to $585 million[1]). The new company would be named Thyssenkrupp Tata Steel B.V. and would create Europe's second largest steel producer with a 50% share of the European market for tinplate (Steitz and others, 2018; Thyssenkrupp AG, 2018). In October, the European Commission began an investigation over concerns that the merger would reduce competition and increase prices. The commission planned to report its findings by March 19, 2019 (Strupczewski and Steitz, 2018).

India.—In June, India included tinplate under its mandatory quality regime to ensure quality standards of products made with tinplate. Tinplate products produced in India would be required to register with the Bureau of Indian Standards as part of an effort to ensure that high quality tin was used in the packaging of food, beverages, and pharmaceuticals. The proposed quality order covered manufacture, import, storage, sale, and distribution of tin products (Argus Metals International, 2018c).

Namibia.—In October, AfriTin Mining Ltd. completed construction of the phase 1 processing plant at its Uis project. AfriTin Mining Ltd. expected the phase 1 processing plant to process 500,000 metric tons per year (t/yr) of tin ore and produce 720 t/yr of tin concentrate. Phase 2 was planned to increase the plant's processing capacity to 3 million metric tons per year of tin ore producing 66,000 t/yr of tin concentrate (AfriTin Mining Ltd., 2018b). In December, mining commenced at the Uis project followed by tin-ore stockpiling (AfriTin Mining Ltd., 2018a).

Spain.—W Resources Plc began production of tin concentrate at the La Parrilla open pit mine. Initial production rates of 10 to 15 t/mo were expected to increase to full-scale production rates by the second quarter of 2019. At full production, the mine was expected to produce about 500 t/yr of tin concentrate (International Tin Association Ltd., 2018c; W Resources Plc, 2018.)

United Kingdom.—Wolf Minerals Ltd. increased tin output at its Drakelands open pit tungsten-tin mine (formerly known as the Hemerdon Mine) in Devon, United Kingdom, to 324 t of tin in concentrate in fiscal year 2018 (July 1, 2017, through June 30, 2018) from 194 t of tin in concentrate in fiscal year 2017 (July 1, 2016, through June 30, 2017) (Argus Metals International, 2018d). In October, Wolf Minerals Ltd. stopped mining at the Drakelands Mine and employees were sent home as the company struggled to finance the operation. On October 9, company shares were suspended from trading on the Australian Securities Exchange and the London Stock Exchange's Alternative Investment Market (Waddinton, 2018). On October 17, the company was ordered by the High Court of Justice to liquidate (Adeeb, 2018).

[1]Where necessary, values have been converted from euro area euros (EUR) to U.S. dollars (US$) at the rate of EUR0.855=US$1.00 for June 30, 2018.

Outlook

The feedstock supply of and consumer demand for tin is expected to be steady throughout the near term. World tin reserves appear to be adequate to meet any short-term demand. Secondary sources of tin are likely to become an increasingly important component of supply, especially in the United States, as Chinese tin supply is affected by economic growth, environmental and economic policies, and tightening supplies of tin concentrates from Burma. Domestic tin requirements are expected to continue to be met primarily through imports and the recycled tin sector (CRU Tin Monitor, 2018).

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TABLE 1
SALIENT TIN STATISTICS[1]

(Metric tons, tin content, unless otherwise specified)

		2014	2015	2016	2017	2018
United States:						
Production, secondary, tin content of old scrap[e]		10,100 r	10,100 r	9,960 r	10,000 r	9,900
Exports, refined tin		2,920	807	1,150	1,560	941
Imports for consumption, refined tin		35,600	33,600	32,200	34,300 r	36,800
Consumption, reported:						
Primary		24,200	23,900	22,500	23,300 r	28,000
Secondary		3,250 r	2,940	2,920	3,100 r	4,680
Stocks, yearend, U.S. industry[2]		6,970	7,090	6,370	6,660 r	10,100
Price, average:[3]						
Platts Metals Week New York dealer, Grade A	cents per pound	1,023.05	756.43	839.10	936.65	935.87
London Metal Exchange, cash	do.	993.75	729.18	815.23	911.24	914.10
Kuala Lumpur, Malaysia	do.	992.53	NA	NA	NA	NA
World, production:						
Mine		322,000 r	307,000 r	304,000 r	342,000 r	318,000
Smelter:						
Primary		377,000 r	347,000	342,000 r	354,000 r	348,000
Secondary		23,800 r	22,800 r	22,400 r	22,800 r	19,300
Total		401,000 r	370,000	365,000 r	377,000 r	367,000

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

[1]Table includes data available through June 5, 2020. Data are rounded to no more than three significant digits, except prices; may not add to totals shown.

[2]Includes primary, secondary, in process, jobbers-importers, and pig tin afloat to the United States.

[3]Source: Platts Metals Week.

TABLE 2
U.S. CONSUMPTION OF PRIMARY AND SECONDARY TIN[1]

(Metric tons, tin content)

	2017	2018
Stocks, January 1[2]	5,530	9,220
Net receipts during year:		
Primary	23,100	28,100
Secondary	1,230	2,890
Scrap	2,210	2,210
Total receipts	26,500	33,200
Total available	32,100	42,300
Tin consumed in manufactured products:		
Primary	23,300 r	28,000
Secondary	3,100 r	4,680
Total	26,400 r	32,700
Intercompany transactions in scrap	395	389
Total processed	26,800 r	33,000
Stocks, December 31 (total available less total processed)	5,320	9,230

rRevised.

[1]Table includes data available through June 5, 2020. Data are rounded to no more than three significant digits; may not add to totals shown.

[2]Includes tin in transit in the United States.

TABLE 3
U.S. CONSUMPTION OF TIN, BY FINISHED PRODUCT[1]

(Metric tons, tin content)

Product	2017			2018		
	Primary	Secondary	Total	Primary	Secondary	Total
Alloys, miscellaneous[2]	2,640	W	2,640	3,270	11	3,280
Babbitt	237 r	28 r	265 r	378	25	403
Bar tin	384	W	384	461	--	461
Bronze and brass	762 r	1,120	1,880	867	1,400	2,260
Chemicals	5,450	W	5,450	7,150	W	7,150
Solder	2,520 r	W	2,520 r	4,170	W	4,170
Tinning	337	--	337	427	--	427
Tinplate[3]	5,440	W	5,440	5,760	W	5,760
Other[4]	5,490 r	1,950 r	7,440 r	5,490	3,250	8,740
Total	23,300 r	3,100 r	26,400 r	28,000	4,680	32,700

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

[1]Table includes data available through June 5, 2020. Data are rounded to no more than three significant digits; may not add to totals shown.

[2]Includes terne metal.

[3]Includes secondary pig tin and tin acquired in chemicals.

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

TABLE 4
U.S. INDUSTRY YEAREND TIN STOCKS[1]

(Metric tons)

	2017	2018
Plant raw materials:		
Pig tin:		
Primary[2]	4,620 r	8,140
Secondary	112	577
In process[3]	481 r	501
Total	5,220 r	9,220
Additional pig tin:		
Jobbers-importers	1,230	909
Afloat to United States	211	2
Total	1,440	911
Grand total	6,660 r	10,100

rRevised.

[1]Table includes data available through June 5, 2020. Data are rounded to no more than three significant digits; may not add to totals shown.

[2]Includes tin in transit in the United States.

[3]Data 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 SCRAP[1]

(Metric tons)

	Gross weight of scrap								
	Stocks,		Consumption			Stocks,	Tin recovered[e]		
Type of scrap	January 1	Receipts	New	Old	Total	December 31	New	Old	Total
2017:									
Copper-base scrap:[e]									
Ingot makers	3,460	43,400	W	W	43,400	3,370	(2)	(2)	(2)
Brass mills[3]	W	W	W	W	W	W	(2)	(2)	(2)
Foundries and other plants	684	3,410	W	W	3,410	685	(2)	(2)	(2)
Total	XX	XX	XX	XX	XX	XX	(2)	(2)	(2)
Lead-base scrap	22,300	960,000	W	W	963,000	19,600	(2)	(2)	(2)
Tin-base scrap[4]	W	W	W	W	W	W	(2)	(2)	(2)
Grand total	XX	XX	XX	XX	XX	XX	8,080 r	10,000	18,100
2018:									
Copper-base scrap:[e]									
Ingot makers	3,370	43,600	W	W	43,500	3,400	(2)	(2)	(2)
Brass mills[3]	W	W	W	W	W	W	(2)	(2)	(2)
Foundries and other plants	685	3,380	W	W	3,360	699	(2)	(2)	(2)
Total	XX	XX	XX	XX	XX	XX	(2)	(2)	(2)
Lead-base scrap	19,600	889,000	27,900	864,000	892,000	W	(2)	(2)	(2)
Tin-base scrap[4]	W	W	W	W	W	W	(2)	(2)	(2)
Grand total	XX	XX	XX	XX	XX	XX	8,110	9,900	18,000

[e]Estimated. [r]Revised. W Withheld to avoid disclosing company proprietary data. XX Not applicable.
[1]Table includes data available through June 5, 2020. Data are rounded to no more than three significant digits; may not add to totals shown.
[2]Withheld to avoid disclosing company proprietary data; included in totals.
[3]Consumption is assumed to be equal to receipts.
[4]Includes tinplate and other scrap recovered at detinning plants.

TABLE 6
U.S. EXPORTS OF TIN IN VARIOUS FORMS[1]

	2017		2018	
Form	Quantity (metric tons, gross weight)	Value (thousands)	Quantity (metric tons, gross weight)	Value (thousands)
Unwrought:				
Refined tin	1,560	$32,500	941	$18,900
Tin alloys	966 r	17,900	885	19,900
Wrought:				
Tin bars, rods, profiles, and wire	5,420	40,400	6,010	44,700
Tin foil	95	446	20	320
Tin plates, sheet, and strip	2,670	3,400	2,280	4,700
Tin tubes, pipes, and tube and pipe fittings	309	2,670	171	2,560
Tin waste and scrap	3,460 r	8,530 r	5,980	4,570
Tin flakes and powders	81	1,850	285	4,610
Tinplate and ternplate	142,000 r	93,200 r	110,000	79,800

[r]Revised.
[1]Table includes data available through June 5, 2020. Data 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 FORMS[1]

Form	2017 Quantity (metric tons, gross weight)	2017 Value (thousands)	2018 Quantity (metric tons, gross weight)	2018 Value (thousands)
Unwrought:				
Refined tin	34,300 r	$679,000 r	36,800	$731,000
Tin alloys	1,550 r	29,500 r	1,430	27,400
Wrought:				
Tin bars, rods, profiles, and wire	1,130	21,500 r	1,460	26,400
Tin foil	98	3,170	91	3,290
Tin plates, sheet, and strip	74	438	89	459
Tin tubes, pipes, and tube and pipe fittings	11	92 r	143	572
Tin waste and scrap	52,100	15,800	47,700	15,700
Tin flakes and powders	172 r	4,340 r	189	5,310
Tin oxides	559	10,800	590	11,100
Tinplate and ternplate	854,000	820,000	696,000	720,000

rRevised.
[1]Table includes data available through June 5, 2020. Data 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 COUNTRY OR LOCALITY[1]

Country or locality	2017 Quantity (metric tons)	2017 Value (thousands)	2018 Quantity (metric tons)	2018 Value (thousands)
Belgium	26 r	$620	112	$2,430
Bolivia	6,450 r	133,000 r	6,310	130,000
Brazil	1,720	35,100	2,740	56,900
Canada	17	293	61	1,150
China	510	10,200	1,310	26,700
Indonesia	9,910	174,000	10,500	189,000
Japan	8	182	--	--
Malaysia	7,050	144,000	7,590	155,000
Peru	7,350	154,000	6,660	138,000
Poland	607 r	12,900 r	731	16,000
Portugal	75	1,580	--	--
Singapore	40	811	50	991
Taiwan	98	2,100	119	2,540
Thailand	449	9,640	422	9,030
Other	2 r	37 r	171	3,430
Total	34,300 r	679,000 r	36,800	731,000

rRevised. -- Zero.
[1]Table includes data available through June 5, 2020. Data are rounded to no more than three significant digits; may not add to totals shown.

Source: U.S. Census Bureau.

TABLE 9
TIN: WORLD MINE PRODUCTION, BY COUNTRY OR LOCALITY[1]

(Metric tons, tin content)

Country or locality	2014	2015	2016	2017	2018
Australia	6,898	7,158	6,635	7,402 r	6,871
Bolivia	19,791 r	20,135 r	17,460 r	16,221 r	16,924
Brazil	25,534	18,824	15,183 r	15,183 r	17,081
Burma[e, 2]	35,000	41,000 r	57,000 r	67,500 r	54,600
Burundi[e]	8 r	45 r	14 r	180 r	100
China	102,100	110,156	97,200 r	101,000 r, e	90,000 e
Congo (Kinshasa)[e]	4,400 r	5,000	7,100	11,000 r	7,400
Indonesia	88,319	70,361	69,621	83,000	85,000
Laos	869 r	512 r	1,117 r	1,100 r	1,100 e
Malaysia	3,777	4,125	4,158	3,894 r	4,300 e
Mongolia	79	64	39	25	25
Nigeria[3]	2,800	2,500	2,300	8,300 r	7,800
Peru	23,105	19,511	18,789	17,790	18,601
Portugal	75 e	42	54 r	81 r	75 e
Russia	321 e	578	627 r	1,000 r	1,410
Rwanda[e]	3,700	2,400	2,200	3,000 r	2,400
Tanzania	79	179	138	21	25 e
Thailand, mineral concentrate	156	72	92	541 r	75
Uganda	33 r	135	63 r	66 r	13
Vietnam	4,833 r	4,530 r	4,579 r	4,560 e	4,560 e
Total	322,000 r	307,000 r	304,000 r	342,000 r	318,000

[e]Estimated. [r]Revised.

[1]Table includes data available through August 15, 2019. All data are reported unless otherwise noted. Totals and estimated data are rounded to no more than three significant digits; may not add to totals shown.

[2]Includes content of tin-tungsten concentrate.

[3]Tin content is estimated as 62% of reported gross weight concentrate.

TABLE 10
TIN: WORLD SMELTER PRODUCTION, BY COUNTRY OR LOCALITY[1, 2]

(Metric tons, tin content)

Country or locality	2014	2015	2016	2017	2018
Belgium, secondary	9,810	8,860	8,540	9,700	9,330
Bolivia, primary	15,439	15,464 r	16,810	16,120 r	15,750
Brazil, primary	22,334 r	28,935	12,542 r	13,796 r	12,900
China, primary	187,000	167,200 r	182,500 r	182,000 r, e	175,000 e
Greece, secondary	--	--	--	50 e	50 e
India:					
Primary	30	17	9	10 e	10 e
Secondary	3,800	3,800 e	3,800 e	3,000 e	--
Total	3,830	3,817	3,809	3,010 e	10
Indonesia, primary	69,800	67,400	66,900	80,000	81,427
Japan, primary	1,746	1,688	1,620	1,624 r	1,647
Malaysia, primary	34,971	30,209	26,758	27,200	27,197
Norway, secondary[e]	50	50	50	50	50
Peru, primary	24,462	20,396	19,390	17,906 r	18,255
Rwanda, primary	--	400 e	-- e	-- e	--
Spain, secondary	10 e	10 e	11 r	35 r	-- e
Thailand, primary	16,494 r	10,616 r	10,807 r	10,588 r	10,880
United States, secondary[e]	10,100 r	10,100 r	9,960 r	10,000 r	9,900
Vietnam, primary	4,688	4,382	4,919	4,440 r	4,440
Grand total	401,000 r	370,000	365,000 r	377,000 r	367,000
Of which:					
Primary	377,000 r	347,000	342,000 r	354,000 r	348,000
Secondary	23,800 r	22,800 r	22,400 r	22,800 r	19,300

[e]Estimated. [r]Revised. -- Zero.

[1]Table includes data available through July 28, 2019. All data are reported unless otherwise noted. Grand totals, U.S. data, and estimated data are rounded to no more than three significant digits;

[2]Whenever possible, total output has been separated into primary production (from ores and concentrates) and secondary production (tin metal recovered from old scrap). Data reflect metal production at the first measurable stage of metal output.