USGS
science for a changing world

2022 Minerals Yearbook

TIN [ADVANCE RELEASE]

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

January 2026

U.S. Geological Survey, Reston, Virginia: 2026

Tin

By Chad A. Friedline

Domestic survey data and tables were prepared by Sidney W. DeLoach-Overton, statistical assistant.

Tin has not been mined in the United States since 1993, and primary tin metal has not been produced since the last smelter closed in 1989. Accordingly, the United States is completely reliant on imports and recycling for its tin needs, importing 33,200 metric tons (t) of refined tin during 2022, a 13% decrease from that in 2021 (tables 1, 7). In 2022, the reported amount of primary tin metal consumed domestically was 26,800 t (tables 1, 3) worth an estimated $915 million, and the reported amount of secondary tin consumed domestically was 2,350 t. Approximately 9,430 t of tin metal was produced from domestic old scrap, a 4% decrease from the revised total in 2021 (tables 1, 5). Industry stocks at yearend 2022 were 8,930 t compared with 9,010 t in 2021 (tables 1, 4).

World tin mine production in 2022 was 307,000 t, a 7% increase from 288,000 t in 2021 owing primarily to production increases in Burma and Indonesia (tables 1, 9). Of the 22 countries in which tin was mined in 2022, 7 countries accounted for 88% of total production. China and Indonesia were the leading producers, each accounting for 23% of global production, followed by Burma (15%), Peru (9%), and Bolivia, Brazil, and Congo (Kinshasa) (6% each) (table 9).

Total tin world smelter production was 349,000 t in 2022, a 6% increase from the revised total in 2021 (tables 1, 10). World primary tin smelter production was 330,000 t, and secondary production was 18,900 t. According to CRU International Ltd., world refined tin consumption for 2022 was 371,000 t, a 5% decrease from the revised consumption total in 2021 (CRU International Ltd., 2024a, p. 15; 2024b).

The S&P Global Platts Metals Week annual average New York dealer price was $15.46 per pound for Grade A tin in 2022, a slight decrease from that in 2021, and the annual average London Metal Exchange Ltd. (LME) cash price of $14.23 per pound in 2022 was a 4% decrease from that in 2021 (table 1). World tin reserves were estimated to be 4.6 million metric tons (Mt) (Friedline, 2023).

Government Actions and Legislation

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 focused on 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 those minerals originated in Congo (Kinshasa) or an adjoining country, also known as "covered countries" (U.S. Securities and Exchange Commission, 2012, p. 56274–56275).

In 2022, 1,005 companies filed conflict minerals disclosures (1,021 companies filed disclosures in 2021). In 2022, 51% of companies were able to determine the originating country for minerals used in their products. Among the companies reporting in 2022, 35% determined that minerals in their products may have originated from a covered country, whereas 12% determined that their minerals did not originate from a covered country. The remaining 49% of companies either were unable to make a determination or did not clearly indicate results of their determination. Based on a generalized sampling of company filings, companies did not report using tin in 2022, compared with 68% of companies reporting using tin in 2021 (U.S. Government Accountability Office, 2022, p. 33–34; 2023, p. 2, 11–15). Tin concentrate production from Congo (Kinshasa) and adjoining countries has constituted 3% to 6% of world production during the previous 5 years (table 9).

Foreign Trade.—In 2020, steel from all countries except Argentina, Australia, Brazil, Canada, the Republic of Korea, and Mexico were subject to a 25% ad valorem tariff (Executive Office of the President, 2022a, p. 13). In 2021, the United States and the European Union (EU) agreed to replace the additional 25% ad valorem tariffs on steel imports with an import quota system. The tariffs would apply only to imports from EU countries exceeding specified quotas (Executive Office of the President, 2022a, p. 12–15). In 2022, the United States agreed on import quota systems with Japan and the United Kingdom. The agreement with Japan allowed steel to be imported without being subject to the 25% ad valorem tariffs (Executive Office of the President, 2022b, p. 19351–19352). Steel products affected by these tariffs included varieties of tinplate with Harmonized Tariff Schedule of the United States codes 7210.11.00, 7210.12.00, and 7212.10.00 (U.S. Department of Commerce, 2021, p. 9, 13).

In 2022, the United States imported 982,000 t of tinplate, a 23% increase from imports in 2021 (table 7). Imports of tin in the form of ore and concentrates, unwrought metal, and waste and scrap remained duty free (U.S. International Trade Commission, 2022a, b).

Production

Tin has not been mined in the United States since 1993. In 2022, tin output recovered from old scrap totaled 9,430 t, a 4% decrease from the revised total in 2021 (tables 1, 5). A small quantity of alloy tin scrap was generated during manufacturing processes and was recycled within those same industries as new scrap. Secondary tin recovered from postconsumer (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). In 2022, the total amount of tin recovered from new scrap was 3,880 t, a 51% decrease from the revised total in 2021. Total tin recovered in 2022 was 13,100 t, a 26% decrease from that in 2021 (table 5).

Consumption

During 2022, tin in the United States was used in tinplate (23%); chemicals (22%); alloys (11%); solder (10%); bronze and brass (5%); babbitt, bar tin, and tinning (4%); and other (25%) (table 3). Tin-based chemicals were commonly used in polyvinyl chloride production and biocides, catalysts, curing, and electroplating. Tinplate is a layer of tin adhered to a steel or wrought iron substrate for corrosion protection; tin was used to inhibit rust and was commonly used in food-grade cans. Tin alloys were used in brass and bronze products, solders, and low-friction metals. Solder was commonly used in electronic devices for connections on circuit boards.

Domestic consumption data for tin were developed by the U.S. Geological Survey (USGS) from a voluntary survey of companies that consumed tin. The amount of tin consumed by the companies that did not respond to the survey was estimated based on prior reports or information from other sources. In 2022, reported consumption of primary tin was 26,800 t, a slight increase from the total in 2021. Reported secondary tin consumption in 2022 was 2,350 t, a 14% decrease from the revised total in 2021 (table 1).

In May, Exurban Ltd. (United Kingdom) announced plans to build a $340 million electronic-waste and nonferrous metals recycling plant in Fort Wayne, IN. The facility was designed to create zero waste and would produce refined precious and base metals including tin. At full capacity the plant would recycle up to 45,000 metric tons per year (t/yr) of feedstock. Construction was expected to begin in 2023 and conclude by 2025 (Exurban Ltd., 2022; Hotter, 2022; Indiana Economic Development Corp., 2022; Paben, 2022).

In May, Wieland Group, a copper products manufacturer based in Ulm, Germany, purchased U.S. metals recycling company, Totall Metal Recycling, Inc. Located in Granite City, IL, Totall Metal processed scrap, including tin, at a rate of 100,000 t/yr (Wieland Group, 2022).

In June, Aurubis AG (Belgium) started construction on its $320 million metal recycling plant in Augusta, GA. The facility was expected to have the capacity to process up to 90,000 t/yr of recyclables and would recover multiple metals, including tin. The Augusta facility was expected to create 120 jobs and begin operations in the first half of 2024 (Aurubis AG, 2022b).

In October, U.S. Steel Corp. temporarily idled its tin mill at the Gary Works steel mill in Gary, IN, which manufactured products for the container industry. Initially, the company announced in August that it would partially idle the facility, but it then extended this process to the entire tin mill. The shutdown was attributed to competing imports and unfavorable market conditions (Pete, 2022; U.S. Steel Corp., undated).

Prices

The S&P Global Platts Metals Week annual average New York dealer price for Grade A tin metal was $15.46 per pound in 2022, a slight decrease from the revised 2021 average New York dealer price of $15.80 per pound. The LME remained the principal commodity exchange for trading tin. In 2022, the annual average LME cash price for tin was $14.23 per pound, a 4% decrease from the revised 2021 average LME price of $14.78 per pound (table 1).

Foreign Trade

In 2022, the United States imported a total of 1.03 Mt of tin products valued at $3.04 billion, a 20% increase in quantity and a 43% increase in value from the totals in 2021 (table 7). Refined tin imports, which supplied most domestic primary tin requirements, totaled 33,200 t valued at $1.14 billion in 2022, a 13% decrease in quantity and unchanged in value from that in 2021. Imports of tin alloys totaled 735 t in 2022 valued at $21 million, a 34% decrease in quantity and a 16% decrease in value from that in 2021. The leading tin imports in 2022 by quantity, were tinplate and terneplate, which equaled 982,000 t and were valued at $1.78 billion, a 23% increase in quantity and more than double in value from that in 2021. The leading sources of refined tin to the United States were Bolivia (32%), Peru (28%), Indonesia (16%), Brazil (13%), and Poland (4%) (table 8).

In 2022, the United States exported a total of 141,000 t of tin products valued at $279 million, a 43% increase in quantity and a 37% increase in value from that in 2021. Refined tin exports in 2022 equaled 1,310 t valued at $31.3 million, essentially unchanged in quantity and a slight decrease in value from that in 2021. Exports of tin alloys equaled 531 t valued at $14.1 million, a 16% decrease in quantity and a 3% decrease in value from that in 2021. The leading tin exports in 2022 by quantity were tinplate and terneplate, which equaled 100,000 t and were valued at $120 million, a 19% increase in quantity and a 45% increase in value from that in 2021 (table 6).

World Review

In 2022, the International Tin Association Ltd. (ITA) reported the results from its annual surveys—from its first survey, ITA compiles an annual list of the world's leading tin producers, and from its second survey, ITA estimates global tin use by application.

According to the ITA, the world's 10 leading refined tin producers and their 2022 production were Yunnan Tin Group Co. Ltd. (China), 77,100 t; Minsur S.A. (Peru), 32,700 t; Yunnan Chengfeng Non-ferrous Metals Co. Ltd. (China), 20,600 t; PT Timah (Persero) Tbk. (Indonesia), 19,800 t; Malaysia Smelting Corp. (Malaysia), 18,800 t; Guangxi China Tin Group Co. Ltd. (China), 10,900 t; Jiangxi New Nanshan Technology Ltd. (China), 10,800 t; Empresa Metalúrgica Vinto S.A. (Bolivia), 10,300 t; Thailand Smelting and Refining Co. Ltd. (Thailand), 9,500 t; and Aurubis Beerse nv (Belgium), 8,200 t. Production for the top producer, Yunnan Tin, decreased by 6% from that in 2021. Overall production by the top 10 refined tin producers decreased by 5% in 2022 from that in 2021 (International Tin Association Ltd., 2023a).

In 2022, 84 companies participated in the ITA annual survey of global tin use by application (128 companies participated in 2021). Based on results of the survey, estimated total refined tin use was 376,900 t, a 3% decrease from 389,500 t in 2021. Total global tin use (both refined and unrefined tin) was 432,000 t, a slight decrease from that in 2021. The recycling input rate, an indicator of sustainability in tin use, was reported as 29% in 2022, compared with 28% in 2021. Solder remained the predominant application for tin, accounting for 50% of global use, an increase of 1% compared with that in 2021, whereas

the share for chemicals decreased by 1% during the same period. The proportions for tinplate, batteries, tin copper, and the 'other' category, which includes traditional metal product markets, remained unchanged from those in 2021 at 12%, 7%, 7%, and 8%, respectively (International Tin Association Ltd., 2022a, 2023b).

Australia.—In 2022, TinOne Resources Inc. (Canada) acquired 100% interest in the Rattler Range tin project in northeastern Tasmania. The project included hard-rock greisen and vein mineralization in a cupola zone of highly fractionated, evolved granite, and included the presence of 47 individually named tin occurrences. With the acquisition, TinOne controlled five out of the seven primary tin occurrences in northeastern Tasmania (TinOne Resources Inc., 2022).

Belgium.—In 2022, Aurubis AG (Germany), a leading global tin metal producer, announced that construction of its $28 million[1] recycling facility in Beerse began in the second quarter of 2022, with commissioning expected in early 2024. Once complete, the facility was expected to enhance the processing of anode sludge and facilitate a more efficient extraction of tin and precious metals such as gold and silver (Aurubis AG, 2022a, p. 26, 78).

China.—In 2022, the USGS estimated that China's tin mine production was 71,000 t and tin smelter production was and 179,000 t, a 7% decrease and essentially unchanged, respectively, from those in 2021 (tables 9, 10). China accounted for 23% of the total global tin mine production, compared with 26% in 2021. In 2022, China was estimated to have approximately 720,000 t of tin reserves (Friedline, 2023).

CRU International Ltd. reported that China consumed a total of 182,710 t of refined tin in 2022, of which 63% was consumed in China's solders industry, 13% in the country's chemical industry, 7% in the tinplate industry, 7% in the lead acid battery industry, 3% in the copper alloys industry, and 7% in other industries. China was the world's leading refined tin consumer, accounting for 46% of worldwide consumption and 86% of global imports of tin ores and concentrates (International Tin Association Ltd., 2022b, p. 23, 32; CRU International Ltd. 2024b; Project Blue Group Ltd., The, 2024, p. 11).

Tin demand in China for the production of solders remained relatively stable in 2022, primarily driven by consumption from the electronics, plumbing, and automotive industries. Based on tin consumption data from the ITA, the USGS estimated that China's solders industry consumed approximately 111,000 t of tin in 2022, a 6% decrease from the reported 117,800 t of tin consumed in 2021 (International Tin Association Ltd., 2022b, p. 32).

China's major primary refined tin producers were Yunnan Tin Group Co. Ltd. (Yunnan Province), Yunnan Chengfeng Non-ferrous Metals Co. Ltd. (Yunnan Province), Guangxi China Tin Group Co. Ltd. (Guangxi Province), and Jiangxi New Nanshan Technology Ltd. (Jiangxi Province) (Project Blue Group Ltd., The, 2024, p. 15).

Congo (Kinshasa).—In 2022, Alphamin Resources Corp. (Mauritius) produced 12,493 t of payable tin in concentrate at its underground Bisie tin mine, marking the mine's third full year of production and a 14% increase from production in 2021. The Bisie Mine includes both the Mpama North and Mpama South deposits, located within the Walikale District in the North Kivu Province. In March, Alphamin announced an updated mineral resource estimate and the decision to develop the Mpama South project. The Mpama South development was expected to be completed within a budget of $116 million by late 2023, increasing the mine's annual contained tin production from 12,000 t to approximately 20,000 t (Alphamin Resources Corp., 2023, p. 2–4, 7, 9).

Indonesia.—PT Timah Tbk, a leading global tin producer, produced 20,100 t of tin in ore and 19,800 t of tin metal in 2022, decreases of 19% and 25%, respectively, from those in 2021. Additionally, the company produced 6,200 t of tin chemicals and 541 t of tin solder, decreases of 12% and 6%, respectively, from those in 2021. Of the total production of tin in ore, 35% was from onshore mining, whereas 65% was from offshore mining. PT Timah attributed the 2022 decrease in sales to fluctuating tin prices owing to the Russia-Ukraine geopolitical crisis, a decrease in tin production owing to regulatory changes in tin-mining activities, and an increase in downtime caused by weather and equipment malfunctions. In 2022, PT Timah announced that construction on its Advanced Tin Smelter project at its existing smelter in Muntok was complete. The project included installing new smelting equipment that used Ausmelt technology and was initiated in response to the low recovery rate of the existing smelter technology and decreasing availability of high-grade tin ore. The smelter increased the company's capacity to 40,000 t/yr of crude tin (PT Timah Tbk, 2023, p. 11, 29–30, 44, 144, 147, 191, 488).

Malaysia.—Malaysia Smelting Corp. Berhad (MSC), a leading global tin producer, produced 2,542 t of tin in ore and 19,385 t of tin metal in 2022, increases of 6% and 17%, respectively, from those in 2021. From July through September 2022, MSC experienced a furnace outage owing to a delay in the delivery of fire-rated bricks from China. MSC attributed the 2022 increase in tin production to the easing of global coronavirus disease 2019 (COVID-19) pandemic lockdown measures in Malaysia, which had resulted in a 6-month force majeure from June through December 2021. Additionally, MSC cited geopolitical tensions owing to Russia's invasion of Ukraine to have increased supply disruptions and led to higher energy and freight costs in tin production for the company.

In 2022, MSC announced that progress on its new Top Submerged Lance furnace in Pulau Indah was ongoing, and by yearend, the furnace had reached 90% of designed capacity. Once complete, the expansion is expected to increase MSC's production capacity by 50%, with an additional 40,000 t/yr of tin metal and the potential to expand to 60,000 t/yr. The Pulau Indah facility uses a single-stage smelting process to enhance extractive yields and reduce manpower costs. Its strategic location near a port and an LME warehouse is expected to yield considerable savings in transportation and distribution expenses. The company expects to decommission its older Butterworth smelter by mid-2024 (Malaysia Smelting Corp. Berhad, 2021, p. 14, 18; 2023, p. 14, 16–22).

[1]Because of fluctuating exchange rates, a meaningful conversion to U.S. currency is impractical. At yearend, however, the 2022 average exchange rate was EUR0.951=US$1.00.

Spain.—In 2022, Strategic Minerals Europe Corp. (Canada) [formerly known as Buccaneer Gold Corp.] announced the transition of operations to open pit mining at its Penouta Project, moving from prior production in tailing ponds from previous operations. The Penouta Project, located in the Ourense Province of northwestern Spain, has a measured and indicated resource of 76.3 Mt at 443 parts per million tin. In May, the company was granted the Concession C Grant, allowing for full development of the open pit mine for 30 years and permitting the mining of cassiterite (a tin oxide mineral), niobium, tantalum, and industrial minerals such as feldspars, micas, and quartz. Through 2022, Strategic Minerals produced 455 t of cassiterite concentrate with 70% tin content, and 86 t of coltan concentrate containing 23% tantalite and 25% columbite (Strategic Minerals Europe Corp., 2023, p. 3–5, 8).

Outlook

Tin is a vital component of the electronics and packaging industries. As such, the demand for tin is currently closely tied to these industries. According to the ITA, future demand for tin will be driven largely by electronics and energy uses, including computing and robotics; electric vehicles; and energy generation, storage, and infrastructure. The ITA projects that refined tin production and consumption will increase in 2023 from that in 2022 (International Tin Association, 2022b, p. 12).

References Cited

Alphamin Resources Corp., 2023, Management's discussion and analysis for the years ended December 31, 2022 and 2021: Grand Baie, Mauritius, Alpahmin Resources Corp., 34 p. (Accessed April 24, 2024, at https://www.alphaminresources.com/wp-content/uploads/2023/03/MDA_2022_FINAL.pdf.)

Aurubis AG, 2022a, Aurubis AG annual report 2021/22: Hamburg, Germany, Aurubis AG press release, December 7, 288 p. (Accessed May 29, 2024, at https://annualreport2021-22.aurubis.com/fileadmin/static/pdf_en/Aurubis-AR-2021-22-Complete-report-2.pdf.)

Aurubis AG, 2022b, Aurubis AG starts construction of a €300 million (approx. $320 million) multimetal recycling plant in Augusta, Georgia: Hamburg, Germany, Aurubis AG press release, June 17. (Accessed April 12, 2024, at https://www.aurubis.com/en/media/press-releases/press-releases-2022/aurubis-ag-starts-construction-of-a-300-million-multimetal-recycling-plant-in-august-georgia.)

CRU International Ltd., 2024a, Tin monitor: London, United Kingdom, CRU International Ltd., February 22, 18 p. (Accessed April 16, 2024, via https://www.crugroup.com/.)

CRU International Ltd., 2024b, Tin monitor data: London, United Kingdom, CRU International Ltd., April 19. (Accessed May 16, 2024, via https://www.crugroup.com/.)

Executive Office of the President, 2022a, Adjusting imports of steel into the United States—Proclamation 10328 of December 27, 2021: Federal Register, v. 87, no. 1, January 3, p. 11–26. (Accessed September 6, 2024, at https://www.govinfo.gov/content/pkg/FR-2022-01-03/pdf/2021-28516.pdf.)

Executive Office of the President, 2022b, Adjusting imports of steel into the United States—Proclamation 10356 of March 31, 2022: Federal Register, v. 87, no. 63, April 1, p. 19351–19365. (Accessed September 6, 2024, at https://www.govinfo.gov/content/pkg/FR-2022-04-01/pdf/2022-07136.pdf.)

Exurban Ltd., 2022, Exurban to build the world's first zero waste smelter to recycle e-waste: London, United Kingdom, Exurban Ltd. press release, May 23. (Access July 24, 2022, at https://www.exurban.co.uk/news/13494/exurban-to-build-the-worlds-first-zero-waste-smelter-to-recycle-ewaste.)

Friedline, C.A., 2023, Tin: U.S. Geological Survey Mineral Commodity Summaries 2023, p. 182–183.

Hotter, Andrea, 2022, Exurban's smelter, refinery to set new standards for recycling, execs say: Fastmarkets-AMM Daily Market Newsletter, May 23, p. 20.

Indiana Economic Development Corp., 2022, [IEDC] Exurban plans $340M investment in Ft. Wayne, international e-waste recycling business bolsters Indiana's circular economy: Indianapolis, IN, Indiana Economic Development Corp. press release, May 23. (Accessed May 20, 2024, at https://events.in.gov/event/iedc_exurban_plans_340m_investment_in_ft_wayne_international_e-waste_recycling_business_bolsters_indianas_circular_economy/.)

International Tin Association Ltd., 2022a, ITA study—Strong tin recovery stalls on macro: Frogmore, United Kingdom, International Tin Association Ltd. news release, November 3. (Accessed February 12, 2024, at https://www.internationaltin.org/ita-study-strong-tin-recovery-stalls-on-macro/.)

International Tin Association Ltd., 2022b, Tin industry review 2022: Frogmore, United Kingdom, International Tin Association Ltd., November, 140 p. (Accessed March 25, 2024, via https://www.internationaltin.org/.)

International Tin Association Ltd., 2023a, Global tin production maintains output in 2022: Frogmore, United Kingdom, International Tin Association Ltd. news release, February 13. (Accessed February 12, 2024, at https://www.internationaltin.org/global-tin-production-maintains-output-in-2022/.)

International Tin Association Ltd., 2023b, ITA study—Macro pressure rolls back tin demand: Frogmore, United Kingdom, International Tin Association Ltd. news release, October 17. (Accessed February 12, 2024, at https://www.internationaltin.org/ita-study-macro-pressure-rolls-back-tin-demand/.)

Malaysia Smelting Corp. Berhad, 2021, Annual report 2021: Pulau Indah, Selangor, Malaysia, Malaysia Smelting Corp. Berhad, 198 p. (Accessed March 6, 2024, at https://ir2.chartnexus.com/msmelt/docs/ar/ar2021.pdf.)

Malaysia Smelting Corp. Berhad, 2023, Annual report 2022: Pulau Indah, Selangor, Malaysia, Malaysia Smelting Corp. Berhad, 202 p. (Accessed March 6, 2024, at https://ir2.chartnexus.com/msmelt/docs/ar/ar2022.pdf.)

Paben, Jared, 2022, The strategy behind Exurban's US smelter project: E-Scrap News [Portland, OR], May 25. (Accessed May 20, 2024, at https://resource-recycling.com/e-scrap/2022/05/25/the-strategy-behind-exurbans-us-smelter-project/.)

Pete, J.S., 2022, U.S. Steel idling tin mill at Gary Works: The Times of Northwest Indiana [Munster, IN], October 12. (Accessed May 20, 2024, at https://www.nwitimes.com/business/local/u-s-steel-idling-tin-mill-at-gary-works/article_754f39ad-4771-515c-9dfe-0d729c91e15b.html.)

Project Blue Group Ltd., The, 2024, Tin market service—Tin analysis: London, United Kingdom, The Project Blue Group Ltd., May 1, 21 p. (Accessed May 20, 2024, via https://proxima.projectblue.com/.)

PT Timah Tbk, 2023, 2022 integrated annual report: Pankga, Bangka Belitung, Indonesia, PT Timah Tbk, 674 p. (Accessed March 21, 2024, at https://timah.com/userfiles/post/2305036451BA0FE9293.pdf.)

Strategic Minerals Europe Corp., 2023, Management's discussion and analysis for the year ended December 31, 2022: Toronto, Ontario, Canada, Strategic Minerals Europe Corp., 28 p. (Accessed June 6, 2024, at https://www.strategicminerals.com/wp-content/uploads/2023/04/MDASMEC2022-Q4.pdf.)

TinOne Resources Inc., 2022, TinOne completes acquisition of the Rattler Range tin project in Tasmania, Australia: Vancouver, British Columbia, Canada, TinOne Resources Inc. press release, November 23. (Accessed May 22, 2024, at https://tinone.ca/wp-content/uploads/2022/11/2022-11-23-Rattler-Range-News-Release-FINAL-hhas86aw4.pdf.)

U.S. Department of Commerce, 2021, Announcement of actions on EU imports under section 232—October 31, 2021: Washington, DC, U.S. Department of Commerce, October 31, 70 p. (Accessed February 7, 2024, at https://www.commerce.gov/sites/default/files/2021-10/US%20232%20EU%20Statement.pdf.)

U.S. Government Accountability Office, 2022, Conflict minerals—Overall peace and security in eastern Democratic Republic of the Congo has not improved since 2014: Washington, DC, U.S. Government Accountability Office, GAO–22–105411, September 14, 67 p. (Accessed January 11, 2024, at https://www.gao.gov/assets/gao-22-105411.pdf.)

U.S. Government Accountability Office, 2023, Conflict minerals—2022 company reports on mineral sources were similar to those filed in prior years: Washington, DC, U.S. Government Accountability Office, GAO–23–106295, July 19, 36 p. (Accessed January 11, 2024, at https://www.gao.gov/assets/gao-23-106295.pdf.)

U.S. International Trade Commission, 2022a, Ores, slag, and ash, chap. 26 *of* Harmonized Tariff Schedule of the United (2022) Revision 12: Washington, DC, U.S. International Trade Commission Publication Number 5394, November. (Accessed February 7, 2024, at https://hts.usitc.gov/reststop/file?release=2022HTSARev12&filename=Chapter%2026.)
U.S. International Trade Commission, 2022b, Tin and articles thereof, chap. 80 *of* Harmonized Tariff Schedule of the United (2022) Revision 12: Washington, DC, U.S. International Trade Commission Publication Number 5394, November. (Accessed February 7, 2024, at https://hts.usitc.gov/reststop/file?release=2022HTSARev12&filename=Chapter%2080.)
U.S. Securities and Exchange Commission, 2012, Conflict minerals—Final rule: Federal Register, v. 77, no. 177, September 12, p. 56274–56365. (Accessed January 4, 2024, at https://www.gpo.gov/fdsys/pkg/FR-2012-09-12/pdf/2012-21153.pdf.)
U.S. Steel Corp., [undated], U.S. Steel's footprint: Pittsburgh, PA, U.S. Steel Corp. (Accessed October 25, 2022, at https://www.ussteel.com/about-us/locations.)
Wieland Group, 2022, With the acquisition of Totall Metal Recycling, Wieland steps ahead towards red metal recycling leadership in North America: Ulm, Germany, Wieland Group press release, May 2, 3 p. (Accessed May 20, 2024, at https://www.wieland.com/en/media/press-releases/press-release-wieland-acquires-totall-metal-recycling.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. 2.0, July 31, 2015): U.S. Geological Survey Fact Sheet 2015–3022.
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 2012–5118, 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 STATISTICS[1]

(Metric tons, tin content, unless otherwise specified)

		2018	2019	2020	2021	2022
United States:						
Production, secondary, tin content from old scrap[e]		9,890	10,500	9,550	9,860 r	9,430
Exports, refined tin		941	1,300	519	1,290	1,310
Imports for consumption, refined tin		36,800	34,100	31,600	38,100	33,200
Consumption, reported:						
Primary		28,000	28,500	28,300	26,300	26,800
Secondary		4,680	4,240	2,840	2,750 r	2,350
Stocks, yearend, U.S. industry[2]		10,100	10,200 r	10,400	9,010 r	8,930
Price, average:[3]						
Platts Metals Week New York dealer, Grade A	cents per pound	935.87	868.08	798.65	1,580.06	1,545.94
London Metal Exchange, cash	do.	914.29	846.43	777.15	1,478.14	1,422.55
World, production:[4]						
Mine		327,000	301,000 r	290,000 r	288,000 r	307,000
Smelter:						
Primary		350,000	347,000	344,000	308,000 r	330,000
Secondary		19,400	19,900 r	18,700	19,900 r	18,900
Total		370,000	367,000	363,000	328,000 r	349,000

[e]Estimated. [r]Revised. do. Ditto.
[1]Table includes data available through November 7, 2023. Data are rounded to no more than three significant digits, except prices.
[2]Includes primary, secondary, in process, jobbers-importers, and pig tin afloat to the United States.
[3]Source: S&P Global Platts Metals Week.
[4]May include estimated data.

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

(Metric tons, tin content)

	2021	2022
Stocks, January 1[2]	9,050	8,490
Net receipts during year:		
Primary	26,700	27,200
Secondary	1,030	729
Scrap	3,160	3,030
Total receipts	30,900	30,900
Total available	39,900	39,400
Processed:		
Tin consumed in manufactured products:		
Primary	26,300	26,800
Secondary	2,750 r	2,350
Total	29,100	29,200
Intercompany transactions in scrap	1,420 r	1,280
Total processed	30,500 r	30,500
Stocks, December 31 (total available less total processed)	9,440 r	8,930

rRevised.
[1]Table includes data available through September 14, 2023. 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)

	2021			2022		
Product	Primary	Secondary	Total	Primary	Secondary	Total
Alloys, miscellaneous[2]	3,090 r	22	3,110 r	3,190	64	3,250
Babbitt	207	W	207	269	W	269
Bar tin	542	--	542	567	--	567
Bronze and brass	699	656	1,360	959	388	1,350
Chemicals	6,810	W	6,810	6,470	W	6,470
Solder	2,840	W	2,840	3,060	W	3,060
Tinning	345	W	345	343	W	343
Tinplate[3]	6,480	W	6,480	6,670	W	6,670
Other[4]	5,310	2,070 r	7,380 r	5,320	1,900	7,220
Total	26,300	2,750 r	29,100	26,800	2,350	29,200

rRevised. W Withheld to avoid disclosing company proprietary data; included with "Other." -- Zero.
[1]Table includes data available through September 14, 2023. 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)

	2021	2022
Plant raw materials:		
Pig tin:		
Primary[2]	7,880	8,060
Secondary	15	23
In process[3]	602 r	624
Total	8,490 r	8,710
Additional pig tin:		
Jobbers-importers	W	W
Afloat to United States	W	W
Total	517	223
Grand total	9,010 r	8,930

rRevised. W Withheld to avoid disclosing company proprietary data.
[1]Table includes data available through September 14, 2023. 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 include only 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
2021:									
Copper-base scrap:[e]									
Ingot makers	3,170 r	40,400 r	W	W	40,100 r	3,470 r	(2)	(2)	(2)
Brass mills[3]	W	W	W	W	W	W	(2)	(2)	(2)
Foundries and other plants	537 r	W	W	W	3,180 r	568 r	(2)	(2)	(2)
Total	XX	XX	XX	XX	XX	XX	(2)	(2)	(2)
Lead-base scrap	W	946,000 r	W	W	944,000	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	7,960 r	9,860 r	17,800 r
2022:									
Copper-base scrap:[e]									
Ingot makers	2,960	36,600	W	W	36,500	3,040	(2)	(2)	(2)
Brass mills[3]	W	W	W	W	W	W	(2)	(2)	(2)
Foundries and other plants	568	W	W	W	2,330	569	(2)	(2)	(2)
Total	XX	XX	XX	XX	XX	XX	(2)	(2)	(2)
Lead-base scrap	W	856,000	W	W	836,000	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	3,880	9,430	13,100

[e]Estimated. rRevised. W Withheld to avoid disclosing company proprietary data. XX Not applicable.
[1]Table includes data available through September 14, 2023. 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]

Form	2021		2022	
	Quantity (metric tons, gross weight)	Value (thousands)	Quantity (metric tons, gross weight)	Value (thousands)
Unwrought:				
Refined tin	1,290	$32,100	1,310	$31,300
Tin alloys	630	14,500	531	14,100
Wrought:				
Tin bars, rods, profiles, and wire	7,230	54,000	7,250	56,000
Tin foil	78	591	93	1,600
Tin plates, sheet, and strip	1,630	5,810	881	3,940
Tin tubes, pipes, and tube and pipe fittings	175 r	2,470 r	119	2,010
Tin flakes and powders	367	7,210	348	8,820
Tin waste and scrap	2,790 r	4,480 r	30,300	41,500
Tinplate and ternplate	84,500	82,300	100,000	120,000

rRevised.
[1]Table includes data available through August 22, 2023. 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	2021		2022	
	Quantity (metric tons, gross weight)	Value (thousands)	Quantity (metric tons, gross weight)	Value (thousands)
Unwrought:				
Refined tin	38,100	$1,140,000 r	33,200	$1,140,000
Tin alloys	1,110	25,000	735	20,900
Wrought:				
Tin bars, rods, profiles, and wire	1,770	57,500 r	1,510	57,800
Tin foil	110	5,090	90	5,460
Tin plates, sheet, and strip	38	259	6	166
Tin tubes, pipes, and tube and pipe fittings	38	186	19	187
Tin waste and scrap	18,600	13,200	11,600	14,800
Tin flakes and powders	300	7,000	308	12,000
Tin oxides	489	14,500	273	8,740
Tinplate and ternplate	797,000	865,000 r	982,000	1,780,000

rRevised.
[1]Table includes data available through August 22, 2023. 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]

	2021		2022	
Country or locality	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)
Belgium	323	$9,820	433	$15,500
Belize	--	--	75	2,930
Bolivia	6,830	192,000	10,600	372,000
Brazil	3,470	104,000 r	4,390	148,000
Canada	5	160	281	9,410
Chile	284	9,600	40	1,720
China	1,560	54,900	(2)	3
India	176	6,050	1	5
Indonesia	8,410	250,000 r	5,250	174,000
Japan	3	148	66	1,490
Malaysia	3,870	115,000	878	35,200
Mexico	24	834	4	99
Peru	11,400	351,000	9,410	318,000
Poland	1,290	33,300	1,370	48,600
Rwanda	88	2,480	50	1,590
Thailand	287	8,320	279	9,930
United Kingdom	100	3,350	24	872
Other	2 r	81 r	76	208
Total	38,100	1,140,000 r	33,200	1,140,000

rRevised. -- Zero.
[1]Table includes data available through August 2, 2023. Data are rounded to no more than three significant digits; may not add to totals shown.
[2]Less than ½ unit.

Source: U.S. Census Bureau.

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

(Metric tons, tin content)

Country or locality	2018	2019	2020	2021	2022
Australia	6,871	7,738	8,118	8,772	9,001
Bolivia	17,251	17,147	14,709	19,628	17,613
Brazil	17,591	14,867	16,893	15,517	17,000 e
Burma[e, 2]	54,600	43,900	36,400	36,900	47,100
Burundi[e]	200	240	160	170 r	82
China	94,800	91,100 r	94,500	76,000 r, e	71,000 e
Congo (Kinshasa)[e]	9,800	11,200	16,400	16,700	18,600
Indonesia	85,000	77,468	65,127 r	52,467 r	70,000 e
Laos	480	1,168	1,335	1,980	2,507
Malaysia	3,868	3,611	2,963	5,000 e	5,000 e
Mongolia	17	26	100 e	8 r, e	36 e
Namibia	--	10	312	472 r	515
Nigeria[e, 3]	7,800	1,600	1,100 r	16,000 r	7,000
Peru	18,601	19,853	20,647	26,995	28,231
Portugal	111	108	104	60 r	96 e
Russia	1,531	2,471	2,559	3,360 r	3,700 e
Rwanda[e]	3,000	2,600 r	2,400 r	2,300 r	3,300
Spain	--	--	61	60 e	60 e
Tanzania	8	18	40 r	70 r, e	70 e
Thailand, mineral concentrate	75	73	315	351 r	300 e
Uganda	135 r	16 r	--	7 r	7
United Kingdom	230 e	--	--	--	-- e
Vietnam	5,500	5,500	5,400 e	5,400 e	5,900 e
Total	327,000	301,000 r	290,000 r	288,000 r	307,000

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

[1]Table includes data available through November 7, 2023. All data are reported unless otherwise noted; totals may include estimated data. Totals and estimated data are rounded to no more than three significant digits; may not add to totals shown.

[2]Includes tin 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	2018	2019	2020	2021	2022
Belgium, secondary	9,330	9,300	9,000	9,800	9,300
Bolivia, primary	15,611	15,111	10,414	16,258	14,825
Brazil, primary	12,900	11,927	11,810	16,000 e	17,000 e
China, primary	177,400	181,200	203,000	180,000 e	179,000 e
Greece, secondary	50 e	--	-- e	-- e	-- e
India, primary	18	19	13	19	47
Indonesia, primary	81,427	76,389	58,790	34,780 r	57,140
Japan, primary	1,650	1,547	1,558	1,500 e	1,600 e
Malaysia, primary	27,341	25,673	22,598	16,400	18,800
Norway, secondary[e]	50	--	--	--	--
Peru, primary	18,255	19,555	19,585	25,947	26,706
Rwanda, primary	--	92 r	547 r	395 r	643
Spain, secondary	81	101	115	220 r	129 e
Thailand, primary	10,721	10,956	11,265	12,100	9,500
United States, secondary[e]	9,890	10,500	9,550	9,860 r	9,430
Vietnam, primary	4,900	4,800	4,600 e	4,600 e	5,000 e
Grand total	370,000	367,000	363,000	328,000 r	349,000
Of which:					
Primary	350,000	347,000	344,000	308,000 r	330,000
Secondary	19,400	19,900	18,700	19,900 r	18,900

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

[1]Table includes data available through November 7, 2023. All data are reported unless otherwise noted; totals may include estimated data. Grand totals, U.S. data, and estimated data are rounded to no more than three significant digits; may not add to totals shown.

[2]Whenever 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.