

LEAD

(Data in thousand metric tons of lead content unless otherwise noted)

Domestic Production and Use: Six lead mines in Missouri, plus five mines in Alaska, Idaho, and Washington that produced lead as a coproduct, accounted for all domestic lead mine production. The value of the lead in concentrates mined in 2016, based on the average North American Market price for refined lead, was about \$665 million. Nearly all lead mine production was exported since the last primary refinery closed in 2013. The 11 secondary refineries in nine States that had capacities of at least 30,000 tons per year of refined lead accounted for more than 95% of the secondary lead produced in 2016. It was estimated that the lead-acid battery industry accounted for more than 85% of reported U.S. lead consumption during 2016. Lead-acid batteries were primarily used as starting-lighting-ignition (SLI) batteries for automobiles, as industrial-type batteries for standby power for computer and telecommunications networks, and for motive power. During the first 8 months of 2016, 83.6 million lead-acid automotive batteries were shipped by North American producers, a slight increase from those shipped in the same period of 2015.

Salient Statistics—United States:	2012	2013	2014	2015	2016^e
Production:					
Mine, lead in concentrates	345	340	379	367	335
Primary refinery	111	114	—	—	—
Secondary refinery, old scrap	1,110	1,150	1,020	1,050	1,070
Imports for consumption:					
Lead in concentrates	(¹)	(¹)	(¹)	(¹)	(¹)
Refined metal, wrought and unwrought	349	485	593	521	525
Exports:					
Lead in concentrates	211	210	357	349	320
Refined metal, wrought and unwrought	47	42	56	56	50
Consumption:					
Reported	1,350	1,390	1,510	1,560	1,580
Apparent ²	1,500	1,710	1,560	1,540	1,540
Price, average, cents per pound:					
North American producer	114	NA	NA	NA	NA
North American market	NA	110	106	91.2	90.0
London Metal Exchange	93.5	97.2	95.0	81.0	81.0
Stocks, metal, producers, consumers, yearend	72	70	66	49	55
Employment:					
Mine and mill (average), number ³	1,490	1,690	1,760	1,840	1,800
Primary smelter, refineries	290	290	—	—	—
Secondary smelters, refineries	2,000	2,000	1,800	1,800	1,850
Net import reliance ⁴ as a percentage of apparent consumption, refined lead	19	26	35	31	30

Recycling: In 2016, about 1.07 million tons of secondary lead was produced, an amount equivalent to 69% of apparent domestic consumption. Nearly all secondary lead was recovered from old scrap, mostly lead-acid batteries.

Import Sources (2012–15): Metal, wrought and unwrought: Canada, 51%; Mexico, 20%; Republic of Korea and Peru, 5% each; and other, 19%.

Tariff: Item	Number	Normal Trade Relations⁵ 12–31–16
Lead ores and concentrates	2607.00.0020	1.1¢/kg on lead content.
Refined lead	7801.10.0000	2.5% ad val.
Antimonial lead	7801.91.0000	2.5% ad val.
Alloys of lead	7801.99.9030	2.5% ad val.

Depletion Allowance: 22% (Domestic), 14% (Foreign).

Government Stockpile: None.

Events, Trends, and Issues: During the first 9 months of 2016, the average London Metal Exchange (LME) cash price for lead was \$0.81 per pound, slightly less than that in the same period of 2015. The average monthly LME price ranged between \$0.75 and \$0.82 per pound during the first half of 2016 and increased through the third quarter of the year to \$0.88 per pound in September. Global LME lead warehouse stocks were 190,250 tons at the end of September, slightly less than those at yearend 2015.

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In 2016, domestic mine production decreased from that in the previous year, owing primarily to decreased production in Alaska, Missouri, and Washington, but partially offset by an increase in Idaho. Production at mines in southeastern Missouri decreased by about 18,000 tons (about 10% of annual production), reportedly owing to increased operating costs and price declines for metals. Total domestic secondary lead production was slightly greater than that in 2015. Permitting and construction of a new secondary lead refinery in Nevada was completed and production was expected to begin by yearend. The plant was expected to have the capacity to produce about 80 tons per day of high-purity refined lead using electrochemical battery recycling technology. In 2016, the company reached an agreement with a leading distributor of used lead-acid batteries to provide feedstock for the plant. The United States has become more reliant on imported refined lead in recent years owing to the closure of the last primary lead smelter in 2013, and to an increase in exports of spent SLI lead-acid batteries that reduced the availability of scrap for secondary smelters. During the first 8 months of 2016, 12.5 million spent SLI lead-acid batteries containing an estimated 122,000 tons of lead were exported, 35% less than those in 2015, indicating U.S. producers may be obtaining more domestic scrap.

Global lead mine production was expected to decline slightly to about 4.82 million tons in 2016, partially owing to declines in Australia (one mine closure and reduced production at others) and the United States. In 2016, the International Lead and Zinc Study Group (ILZSG) forecast global refined lead production and consumption to be about 11.2 million tons each, slight increases from those in 2015.⁶

World Mine Production and Reserves: Reserves estimates for China, Peru, and Russia were revised and estimates for Iran, Kazakhstan, and Macedonia were added based on information from Government and industry sources.

	Mine production		Reserves ⁷
	2015	2016 ^e	
United States	367	335	5,000
Australia	652	500	35,000
Bolivia	82	80	1,600
China	2,340	2,400	17,000
India	136	135	2,200
Iran	41	41	540
Ireland	33	33	600
Kazakhstan	41	41	2,000
Korea, North	35	35	NA
Macedonia	33	33	600
Mexico	254	250	5,600
Peru	316	310	6,300
Poland	37	40	1,600
Russia	225	225	6,400
South Africa	41	40	300
Sweden	76	76	1,100
Turkey	74	75	860
Other countries	170	170	1,500
World total (rounded)	4,950	4,820	88,000

World Resources: Identified world lead resources total more than 2 billion tons. In recent years, significant lead resources have been identified in association with zinc and (or) silver or copper deposits in Australia, China, Ireland, Mexico, Peru, Portugal, Russia, and the United States (Alaska).

Substitutes: Substitution of plastics has reduced the use of lead in cable covering and cans. Tin has replaced lead in solder for potable water systems. The electronics industry has moved toward lead-free solders and flat-panel displays that do not require lead shielding. Steel and zinc are common substitutes for lead in wheel weights.

^eEstimated. NA Not available. — Zero.

¹Less than ½ unit.

²Defined as primary refined production + secondary refined production + refined imports – refined exports + adjustments for industry stock changes.

³Includes lead and zinc-lead mines for which lead was either a principal product or significant byproduct.

⁴Defined as imports – exports + adjustments for industry stock changes.

⁵No tariff for Canada, Mexico, and Peru for items shown.

⁶International Lead and Zinc Study Group, 2016, ILZSG session/forecasts: Lisbon, Portugal, International Lead and Zinc Study Group news release, October 31, 5 p. (Accessed October 31, 2016, via <http://www.ilzsg.org/>.)

⁷See [Appendix C](#) for resource and reserve definitions and information concerning data sources.