

# Lead – 2012 Annual Review

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## CANADIAN PRODUCTION

Lead in concentrate was produced at four mines in 2012. Primary refined lead metal is produced from domestic and foreign concentrates at two smelters: one located in New Brunswick and the other in British Columbia (B.C.). Secondary lead metal is produced from recycled lead (primarily used car batteries) at four sites located in Quebec, Ontario, and B.C. Table 7 lists the lead-producing mines and smelters in operation in Canada in 2012.

Canadian mines produced 62,276 tonnes (t) of lead in concentrate in 2012, compared to 67,505 t in 2011, a 7.7% decrease (Table 1). This decrease in mine production mainly relates to lower production at Xstrata's Brunswick mine, which is expected to close permanently in 2013 due to the exhaustion of reserves. Refined metal production decreased to 280,627 t from 282,589 t in 2011 (Table 1). Primary lead metal production was 133,408 t in 2012, compared to 112,531 t in the previous year. Secondary metal production was 147,219 t, compared to 170,059 t in 2011. Statistics on exports and imports of lead concentrates, metal, and semi-fabricated products are provided in Table 2.

The following is a summary of Canadian lead mines and metal production facilities in operation during 2012.

### New Brunswick

**Xstrata Zinc Canada** owns the **Brunswick** zinc and lead mine. It is located 21 kilometres (km) southwest of Bathurst and is Canada's largest producer of primary lead. In 2011, the Brunswick mine produced 2.88 million tonnes (Mt) of ore grading 7.6% zinc and 3.0% lead, resulting in the production of 51,837 t of lead in concentrate, down from 56,762 t in 2011 (2012 Full-Year Production Report). Xstrata has announced that the mine will close by March 31, 2013, due to the depletion of ore reserves.

Xstrata also owns and operates the **Belledune** lead smelter and refinery located 35 km north of Bathurst. The smelter produced 74,486 t of lead in 2012, compared to 76,524 t in 2011. Xstrata also operates a lead-acid battery-recycling plant at Belledune that produces secondary lead feeds for the smelter.

## Quebec

**Newalta Corporation** of Calgary, Alberta, owns and operates a lead recycling facility in Ville Ste-Catherine, Quebec, just south of Montréal. The facility operates two long rotary kilns. It is capable of recycling 3.7 million lead-acid batteries per year and has the capacity to produce up to 100,000 t of lead and lead alloys, primarily for the automotive and industrial battery manufacturing industry. In 2012, the company reported sales volumes of 64,700 t of lead, compared to 71,700 t in 2011 (2012 Annual Report).

## Ontario

**Tonolli Canada Ltd.** of Mississauga operates a secondary lead smelter and refinery that processes about 60,000 t of lead-acid batteries annually to produce about 35,000 t of lead and lead alloys.

## British Columbia

The integrated zinc and lead smelting and refining complex at **Trail**, owned by **Teck Resources Limited**, has a capacity of 100,000 tonnes per year (t/y) of refined lead. The complex produces refined zinc and lead, as well as gold, silver, cadmium, germanium, indium, sulphuric acid, and fertilizers. In 2012, production at Trail was 87,900 t of lead, up from 85,600 t in 2011 (2012 Annual Report). The increase was due to increased feed rates at the KIVCET furnace. This production included about 11,700 t of lead recovered from spent lead-acid batteries. Teck Resources continues to increase lead quantities recovered from electronic wastes. In 2012, 12,000 t of e-waste were processed. The company has deferred construction of a new slag fuming furnace that was to improve the e-waste recycling capacity at the smelter.

**Nyrstar NV's Myra Falls** mine, located about 65 km west of Campbell River, reported 1,100 t of lead in concentrate production in 2012.

**Metalex Products Ltd.** of **Richmond** is a secondary lead smelting and refining operation that processes lead-acid batteries and other forms of scrap lead to produce lead and lead alloys for various manufacturing customers. The plant has the capacity to process 300,000 automotive batteries per year.

## Yukon

**Yukon Zinc Corporation** owns the **Wolverine** mine located 190 km northwest of Watson Lake. The company is privately owned; its majority shareholder is **Jinduicheng Molybdenum Group Ltd.** The mill capacity is 1,700 tonnes per day (t/d), producing separate zinc, lead, and copper concentrates. During 2012, the mine produced 441,095 t of ore grading 7.72% zinc and 1.0% lead. It shipped 10,065 dry tonnes of concentrate grading 15.93% lead (Yukon Zinc Corporation 2012 QML-006 Annual Report).

**Alexco Resource Corp.** owns the **Bellekeno** silver-lead-zinc mine located in the historic Keno Hill silver district. During 2012, 94,800 t of ore were processed at an average of 260 t/d and a grade of 9.6% lead and 4.8% zinc. In total, the mine produced 8,246 t of lead. The company expects new production from the Onek and Lucky Queen deposits in 2013 and is developing the adjacent Flame & Moth deposit.

## CANADIAN DEVELOPMENTS

**Trevali Mining Corporation** acquired Maple Minerals Corporation, owner of the 3,000-t/d **Caribou** mine and mill project. The Caribou deposit contains a historic resource of 3.8 Mt grading 7.5% zinc, 3.2% lead, and 92 grams per tonne (g/t) silver in the indicated category and 3.9 Mt grading 7.3% zinc, 3.6% lead, and 107 g/t silver in the inferred category. Trevali is developing the Halfmile Lake property located

70 km southwest of Bathurst, New Brunswick. The company has signed a short-term toll milling agreement with Xstrata Zinc for the processing of ore at the Brunswick mill. During 2012, a 30,000-t bulk sample was processed at Brunswick for the purpose of testing recovery rates and other metallurgical characteristics.

**Canadian Zinc Corporation** continues work at its **Prairie Creek** zinc-lead-silver project located in the western Northwest Territories. During the year, the company received land-use permits and a renewed water licence for the mine. A technical report has outlined measured and indicated resources of 5.84 Mt grading 10.71% zinc, 9.9% lead, and 161 g/t silver, as well as inferred resources of 5.54 Mt grading 13.53% zinc, 11.43% lead, and 215 g/t silver. The company foresees a 1,200-t/d mine that would be in operation for 14 years. It continues to explore for extensions to the main deposit in the vicinity of the mine.

**Xstrata Zinc Canada** continued to explore its **Hackett River** silver-zinc project located in western Nunavut. Xstrata purchased the project from **Sabina Gold & Silver** in 2011 and completed an extensive diamond drill program to both increase resources and conduct wider regional exploration for new deposits. Further work to support a pre-feasibility study is planned for 2013. A conceptual mine would be at a rate of 15,000 t/d over an expected 15-year mine life. The deposit contains indicated and inferred resources of 82 Mt grading 3.6% zinc and 0.5% lead, along with 115 g/t silver.

## WORLD PRODUCTION

According to the International Lead and Zinc Study Group (ILZSG), world lead mine production for 2012 was 5.24 Mt, up from 4.69 Mt in 2011, an increase of 11.2% (Table 3). In terms of mine production, Canada ranked ninth among producing countries. The top five countries for lead mine production were China, Australia, the United States, Peru, and Mexico. World refined lead metal production was 10.61 Mt, up slightly from 10.54 Mt in 2011 (Table 4). Canada ranked eighth in the world in terms of refined lead production. The top five lead metal-producing countries were China, the United States, India, South Korea, and Germany. Global refined lead use statistics are presented in Table 5. Lead use in Asia increased 2.1% driven by strong growth in India (15.9%) and Japan (12.6%). Lead use in Europe declined by 1.0% with the United Kingdom being an exception that saw 9.5% growth in 2012. Use in the United States increased by 5.5%.

The production of lead from secondary sources was 5.99 Mt, which represents about 56% of total metal produced, up slightly from 2011. Table 6 shows global secondary lead production for the period 2008-12.

In 2012, the top five mining companies producing lead were: Xstrata AG (256,000 t); BHP Billiton (242,000 t); Doe Run Company (184,000 t); Hindustan Zinc (130,000 t); and JSC Gorevsky (100,000 t). These five companies together accounted for about 17% of world mine production (Wood Mackenzie Limited). The largest lead mines in 2012 were: Cannington, Australia (240,000 t); Mount Isa, Australia (200,000 t); Doe Run, Missouri, United States (184,000 t); Gorevsk, Russia (100,000 t); and Red Dog, Alaska, United States (88,000 t). These five mines together accounted for 15% of global mine production (Wood Mackenzie Limited).

Output from Chinese and European smelters increased only marginally in 2012. In North America, lead production increased 1.4%.

## MARKETS AND PRICES

The average annual London Metal Exchange (LME) settlement price for lead in 2012 was US\$2,061/t, compared to US\$2,398/t in 2011, representing a 14% decrease. Lead inventories held in LME warehouses

decreased from 366,000 t in January 2012 to 317,000 t in December 2012. Total reported stocks (LME, producers, consumers, and Shanghai Futures Exchange) in December were 638,000 t, compared to 604,000 t in 2011.

Daily LME cash prices started the year at US\$1,994/t and were range-bound between US\$1,850/t and US\$2,275/t before closing the year at US\$2,315/t. The highest price reached in 2012 was US\$2,315/t on October 2.

According to the most recent figures from the ILZSG, world refined lead usage was 10.58 Mt in 2012, up from 10.39 Mt the previous year (Table 5). On a regional scale, increases in demand were seen in the United States, China, India, and Japan due to recoveries in these economies.

## **TRADE**

Total exports of lead and lead products from Canada were valued at \$704.6 million in 2012, compared to \$761.6 million in 2011. Imports were valued at \$987 million, compared to \$991 million in the previous year. Canadian smelters imported 89,700 t of lead in concentrates, compared to 68,300 t in 2011. Concentrates were imported mainly from the United States, Peru, Mexico, and Australia. Smelters exported 271,600 t of refined lead in 2012, compared to 278,500 t in 2011, the majority of which went to the United States with minor amounts shipped to China, Japan, and Taiwan.

## **OUTLOOK**

The ILZSG predicts that global lead mine production for 2013 will be 5.55 Mt, up 5.7% over 2012 production levels due primarily to anticipated increases in Australia and China. Refined metal production should increase 4.7% to 11.02 Mt. It is expected that global refined lead usage will be 11.00 Mt in 2013, a 5% rise from 2012 levels.

The outlook for lead demand in 2013-14 is highly variable depending on the region being studied. According to many analysts, global lead demand will increase 5.0-5.5% in 2014. Demand growth will be strongest in China and India. In China, continued development of telecom networks, which use stationary batteries for back-up power, and strong vehicle production growth countered by weakness in e-bike sales will keep demand growth in the 8.0-9.0% range. In India, growth will be driven by batteries for grid back-up power (a much higher use given India's inefficient grid power system) and by the continued development of the 3G telecom network. Strong growth in vehicle sales will drive lead demand in that sector. Growth in lead demand in India is expected to be around 6% for 2013-14.

Economic conditions in Europe will continue to limit lead demand growth in the region. Some economies in the Eurozone continue to struggle with high unemployment and difficulty in implementing deficit reduction programs. Currently strong auto sales are expected to fall off, thus reducing demand for new and replacement car batteries. Demand for lead in the construction sector, particularly for lead sheet for roofing, should see some growth. Demand growth for Europe as a whole is estimated at 0.5% for 2013-14.

During 2012, the United States saw rapid growth in new vehicle sales. This growth rate is not expected to continue. Future battery technologies present an opportunity for increases in lead demand in the medium term. Stop-start technology is being introduced into the U.S. vehicle fleet. This technology uses a second, smaller lead-acid battery. Growth in this sector may be limited if alternative technologies, such as lithium-ion batteries, are adopted by car makers. U.S. demand growth is estimated at 0.5% for 2013-14.

The forecast for the lead metal balance in 2013 is 22,000 t, according to the ILZSG.

Lead prices are expected to vary within the US\$1,990-\$2,100/t (US\$0.90-\$0.95 per pound) range during 2013.

*Notes: (1) For definitions and valuation of mineral production, shipments and trade, please refer to the document entitled "Definitions and Valuation: Mineral Production, Shipments, and Trade." (2) Information in this review was current as of June 30, 2013. (3) This and other reviews, including previous editions, are available on the Internet at [www.nrcan.gc.ca/mining-materials/markets/commodity-reviews/8360](http://www.nrcan.gc.ca/mining-materials/markets/commodity-reviews/8360).*

## Lead - Other Information

### INTRODUCTION TO LEAD

Lead has been known since ancient times and is one of several metals that were discovered during the earliest periods of human history. Some experts believe that lead was used as early as 5000 B.C. The oldest archaeological evidence of lead use by humans is a figurine found in the Dardanelles area of Asia Minor dating from 3800 B.C.

Lead was used in coinage in China about 2000 B.C. and was mined by the Greeks from about 1200 B.C. to make coins, ornaments, weights, and many other articles. One of lead's most enduring uses has been as pipe for the transportation of water. Romans manufactured lead pipes in one standard length and in several diameters, and used them extensively in municipal water systems. The Latin word for lead is *plumbum*, which forms the root of modern English words such as "plumber" and "plumbing," as well as the chemical symbol for lead, Pb.

Almost all lead is obtained from sulphide ores in which the most common lead mineral is galena (PbS). It is usually found in combination with other sulphide ores, most frequently zinc, and also copper. Other lead-containing minerals include cerussite (PbCO<sub>3</sub>) and anglesite (PbSO<sub>4</sub>).

### HISTORY OF LEAD MINING IN CANADA

Lead-zinc ores were originally discovered in the Kootenay region of British Columbia in the 1820s. Active prospecting in the area dates from 1865 and mining commenced shortly thereafter. In the early years, the ore from British Columbia was sent to the United States for smelting and refining.

The now-famous Sullivan mine started operating near Kimberley, British Columbia, in the early 1900s and continued to produce lead until its closure in December 2001. By 1914, the Sullivan mine was the largest lead producer in Canada – a position it held for 50 years until the Pine Point mine in the Northwest Territories completed its first year of operation in 1966. Pine Point closed in 1988. The Kingdon mine at Galetta, on the Ottawa River near Arnprior, Ontario, was discovered in 1884, operated briefly in the 1880s, and was reactivated in 1914, producing lead and zinc ore until the early 1930s. The discovery, by the Geological Survey of Canada, of lead and zinc ores on Baffin Island in the mid-1950s led to the development of the Nanisivik mine in the mid-1970s. It closed in 2002. The discovery of lead-zinc on Little Cornwallis Island in 1971 led to the development of the Polaris mine. Operated by Teck Cominco,

the mine had the distinction of being the most northerly base-metal mine in the world until its closure in 2002 after 20 years of operation.

## **USES**

The largest single use of lead today is in the manufacture of the lead-acid storage battery, which is a vital part of every automobile. The average car battery contains about 10 kilograms of lead. Lead-acid batteries for automotive, industrial, and consumer purposes account for about 75% of world lead usage. In the communications industry, lead is still used extensively as protective sheathing for underground and underwater cables, including transoceanic cable systems. Lead-acid storage batteries are also used for back-up power in the telecommunications sector in cell phone towers. With the expected advancement in mobile phone technology, demand for large battery systems will continue to be strong. Certain lead compounds are used as paint pigments. Red lead (lead oxide) is the basic paint primer for iron and steel. Lead compounds are also used as stabilizers in plastic (polyvinyl chloride) piping and in decorative glass. Lead's corrosion-resistant nature also makes it suitable for applications in sheeting for roofing purposes, while its high density imparts radiation attenuation properties that prevent the emission of harmful radiation from television, video, and computer screens. Lead alloys such as lead-antimony are used in batteries and in the chemicals industry for pumps and valves. Lead-tin solders are used for welding metal parts together. In the area of hybrid vehicles, lead starter batteries will still be standard equipment in cars no matter which hybrid battery system is chosen.

## **INTERNATIONAL LEAD AND ZINC STUDY GROUP**

The International Lead and Zinc Study Group (ILZSG) is an intergovernmental organization that regularly brings together 30 member countries in an international forum to exchange information on lead and zinc. Particular attention is given to providing regular and frequent information on supply, demand, and the outlook for lead and zinc prices and markets. The twice-yearly supply-demand and metal balance reports compiled by the ILZSG, with member government support, are widely used in industry as a basis for determining potential price directions.

The Study Group, headquartered in Lisbon, Portugal, represents most of the world's major lead- and zinc-producing and using nations. The Group has an extensive information-gathering and dissemination role, and acts as an effective mechanism for increasing market transparency related to the production, use, and trade of lead and zinc. The Group is also an important forum for communication among governments, among industry, and between governments and industry. It holds a general session each year in October.

More information on the Group's activities can be obtained from its web site at [www.ilzsg.org/static/home.aspx](http://www.ilzsg.org/static/home.aspx).

## **OTHER SOURCES OF INFORMATION**

Battery Council International	<a href="http://www.batterycouncil.org">www.batterycouncil.org</a>
Eurometaux (European Association of Metals)	<a href="http://www.eurometaux.org">www.eurometaux.org</a>
International Lead Association	<a href="http://www.ldaint.org">www.ldaint.org</a>
International Lead Management Center	<a href="http://www.ilmc.org">www.ilmc.org</a>
Lead Sheet Association	<a href="http://www.leadsheet.co.uk">www.leadsheet.co.uk</a>
London Metal Exchange	<a href="http://www.lme.com">www.lme.com</a>
U.S. Geological Survey	<a href="http://minerals.usgs.gov/minerals/pubs/commodity/lead">http://minerals.usgs.gov/minerals/pubs/commodity/lead</a>
World Bureau of Metal Statistics	<a href="http://www.world-bureau.com">www.world-bureau.com</a>

**TABLE 1. CANADA, LEAD PRODUCTION, (1) BY PROVINCE AND TERRITORY, 2010-12**

	2010		2011		2012 (p)	
	(tonnes)	(\$000)	(tonnes)	(\$000)	(tonnes)	(\$000)
<b>SHIPMENTS (1)</b>						
New Brunswick	57,917	128,112	52,858	140,284	49,065	99,357
Quebec	1,942	4,295	2,264	6,010	1,052	2,130
British Columbia	2,538	5,615	762	2,022	1,039	2,105
Yukon	–	–	6,664	17,686	9,749	19,742
<b>Total</b>	<b>62,397</b>	<b>138,022</b>	<b>62,548</b>	<b>166,002</b>	<b>60,905</b>	<b>123,334</b>
Mine output (2)	64,844	..	67,505	..	62,276	..
<b>REFINED PRODUCTION</b>						
Primary	105,836	..	112,531	..	133,408	..
Recycled	167,101	..	170,059	..	147,219	..
<b>Total</b>	<b>272,937</b>	<b>..</b>	<b>282,589</b>	<b>..</b>	<b>280,627</b>	<b>..</b>

Sources: Natural Resources Canada; Statistics Canada.

– Nil; .. Not available; (p) Preliminary.

(1) Production includes recoverable lead in ores and concentrates shipped valued at the Montréal Exchange average price for the year. (2) Lead content of domestic ores and concentrates exported.

Note: Numbers may not add to totals due to rounding.

**TABLE 2. CANADA, LEAD TRADE, 2010-12**

		2010		2011		2012	
		(tonnes)	(\$000)	(tonnes)	(\$000)	(tonnes)	(\$000)
<b>EXPORTS</b>							
2607.00	Lead ores and concentrates						
	China	827	824	4,443	13,369	19,436	37,692
	Other countries	–	–	6	80	5	1,154
	<b>Total</b>	<b>827</b>	<b>824</b>	<b>4,449</b>	<b>13,449</b>	<b>19,441</b>	<b>38,846</b>
2608.00.20	Lead content of zinc ores and concentrates						
	China	5,414	4,882	2,350	2,787	6,907	8,747
	Poland	–	–	1,367	1,352	2,325	3,146
	Other countries	7	12	–	–	702	838
	<b>Total</b>	<b>5,421</b>	<b>4,894</b>	<b>3,717</b>	<b>4,139</b>	<b>9,934</b>	<b>12,731</b>
2616.10.20	Lead content of silver ores and concentrates						
	Germany	339	675	381	833	447	912
	Chile	–	–	–	–	6	10
	Spain	–	–	–	–	..	..
	<b>Total</b>	<b>339</b>	<b>675</b>	<b>381</b>	<b>833</b>	<b>453</b>	<b>922</b>
2617.90	Other ores and concentrates: other						
	Hong Kong	–	–	640	582	241	131
	United States	44	59	35	160	3	90
	Chile	–	–	–	–	39	59
	Turkey	–	–	–	–	36	55
	Other countries	2,280	2,151	1,060	852	131	202
	<b>Total</b>	<b>2,324</b>	<b>2,210</b>	<b>1,735</b>	<b>1,594</b>	<b>450</b>	<b>537</b>
2620.29	Slag, ash and residues (other than from the manufacture of iron or steel) containing metals, arsenic, or their compounds: containing mainly lead: other						
	Belgium	3,417	11,673	1,870	9,395	7,088	10,489
	United States	–	–	–	–	3,710	822
	Other countries	201	52	3	3	–	–
	<b>Total</b>	<b>3,618</b>	<b>11,725</b>	<b>1,873</b>	<b>9,398</b>	<b>10,798</b>	<b>11,311</b>
7801.10	Refined lead, unwrought						
	United States	108,471	236,756	98,040	234,543	89,037	180,767

	Other countries	763	1,828	1	2	–	–
	<b>Total</b>	<b>109,234</b>	<b>238,584</b>	<b>98,041</b>	<b>234,545</b>	<b>89,037</b>	<b>180,767</b>
7801.91	Lead, unwrought, containing by weight antimony as the principal other element						
	United States	22,730	45,751	24,033	54,717	28,997	58,493
	China	1,036	1,831	5,406	12,539	5,183	10,590
	Other countries	...	...	63	168	–	–
	<b>Total</b>	<b>23,766</b>	<b>47,582</b>	<b>29,502</b>	<b>67,424</b>	<b>34,180</b>	<b>69,083</b>
7801.99	Lead, unwrought, other						
	United States	107,680	259,621	129,486	334,735	123,986	284,584
	Japan	5,306	12,962	8,641	23,066	11,134	24,760
	Taiwan	2,939	6,713	4,712	13,982	6,297	15,290
	China	1,835	3,948	1,701	3,864	3,281	6,821
	Thailand	7,521	15,879	4,140	10,786	3,051	6,819
	Other countries	2,426	5,642	2,384	5,638	651	1,318
	<b>Total</b>	<b>127,707</b>	<b>304,765</b>	<b>151,064</b>	<b>392,071</b>	<b>148,400</b>	<b>339,592</b>
7802.00	Lead waste and scrap						
	United States	685	1,570	584	1,337	831	1,174
	India	440	640	616	886	490	651
	Sri Lanka	–	–	83	132	202	292
	Belgium	–	–	25	16	63	66
	Other countries	157	159	167	301	25	38
	<b>Total</b>	<b>1,282</b>	<b>2,369</b>	<b>1,475</b>	<b>2,672</b>	<b>1,611</b>	<b>2,221</b>
7804.11	Lead sheets, strip and foil of a thickness (excluding any backing) less than 0.2 mm						
	United States	40	92	36	118	2	5
	Other countries	17	40	1	3	–	–
	<b>Total</b>	<b>57</b>	<b>132</b>	<b>37</b>	<b>121</b>	<b>2</b>	<b>5</b>
7804.19	Lead plates, sheet, strip and foil, n.e.s.						
	United States	93	343	145	567	250	776
	Cuba	3	7	5	13	–	–
	Other countries	15	34	...	...	3	8
	<b>Total</b>	<b>111</b>	<b>384</b>	<b>150</b>	<b>580</b>	<b>253</b>	<b>784</b>
7804.20	Lead powders and flakes						
	United States	1	9	16	11	–	–
	Morocco	21	50	–	–	–	–
	<b>Total</b>	<b>22</b>	<b>59</b>	<b>16</b>	<b>11</b>	<b>–</b>	<b>–</b>
		<b>(n.a.)</b>	<b>(\$000)</b>	<b>(n.a.)</b>	<b>(\$000)</b>	<b>(n.a.)</b>	<b>(\$000)</b>
7806.00	Other articles of lead						
	United States	..	7,353	..	9,701	..	10,069
	South Africa	..	164	..	291	..	450
	United Arab Emirates	..	93	..	45	..	207
	Thailand	..	178	..	207	..	81
	Other countries	..	249	..	508	..	351
	<b>Total</b>	<b>..</b>	<b>8,037</b>	<b>..</b>	<b>10,752</b>	<b>..</b>	<b>11,158</b>
		<b>(number)</b>	<b>(\$000)</b>	<b>(number)</b>	<b>(\$000)</b>	<b>(number)</b>	<b>(\$000)</b>
8507.10	Electric accumulators, lead-acid of a kind used for starting piston engines						
	United States	10,185	1,887	6,663	1,961	18,809	3,527
	Russia	33	...	1,335	109	2,108	150
	Australia	40	4	3,116	243	571	71
	Other countries	3,161	335	6,440	1,052	3,288	314
	<b>Total</b>	<b>13,419</b>	<b>2,226</b>	<b>17,554</b>	<b>3,365</b>	<b>24,776</b>	<b>4,062</b>
		<b>(n.a.)</b>	<b>(\$000)</b>	<b>(n.a.)</b>	<b>(\$000)</b>	<b>(n.a.)</b>	<b>(\$000)</b>
8548.10	Waste and scrap of primary cells, primary batteries and electric accumulators; spent primary cells, spent primary batteries and spent electric accumulators						
	United States	..	17,885	..	20,668	..	32,532
	South Africa	..	184	..	26	..	58
	Other countries	..	94	..	29	..	...
	<b>Total</b>	<b>..</b>	<b>18,163</b>	<b>..</b>	<b>20,723</b>	<b>..</b>	<b>32,590</b>
<b>Total exports</b>		<b>..</b>	<b>642,629</b>	<b>..</b>	<b>761,677</b>	<b>..</b>	<b>704,609</b>



		(tonnes)	(\$000)	(tonnes)	(\$000)	(tonnes)	(\$000)
<b>IMPORTS (1)</b>							
2607.00	Lead ores and concentrates						
	Peru	5,582	91,157	18,488	397,806	33,509	385,260
	Mexico	1,041	7,096	5,328	75,623	13,070	202,326
	Australia	6,706	30,754	–	–	23,100	133,055
	United States	32,480	143,442	33,577	257,607	10,127	52,100
	Spain	7,036	30,420	3,430	39,491	2,498	22,412
	Bolivia	–	–	–	–	2,336	22,278
	Argentina	–	–	–	–	14	12 548
	Belgium	5,900	29,091	–	–	1 759	5 206
	United Kingdom	1,184	5,267	4,424	8,126	3,111	4,596
	Chile	–	–	3,031	20,478	9	1,104
	Other countries	1	2	24	1,046	254	1,186
	<b>Total</b>	<b>59,930</b>	<b>337,229</b>	<b>68,302</b>	<b>800,177</b>	<b>89,787</b>	<b>842,071</b>
2608.00.00.20	Lead content of zinc ores and concentrates						
	Chile	–	–	–	–	...	...
	Ireland	–	–	...	...	–	–
	United States	–	–	...	...	–	–
	<b>Total</b>	<b>–</b>	<b>–</b>	<b>–</b>	<b>–</b>	<b>...</b>	<b>...</b>
2616.10.00.20	Lead content of silver ores and concentrates						
	Bolivia	625	649	852	894	409	442
	Peru	1	1	–	–	182	182
	Other countries	5	5	–	–	24	24
	<b>Total</b>	<b>631</b>	<b>655</b>	<b>852</b>	<b>894</b>	<b>615</b>	<b>648</b>
2617.90.00.90	Other ores and concentrates: other: other						
	United States	4,055	1,278	7,759	1,716	8,484	1,910
	Australia	31	6	587	198	307	74
	New Zealand	–	–	6	18	207	62
	China	38	11	170	1,126	98	33
	Other countries	247	96	874	349	395	91
	<b>Total</b>	<b>4,371</b>	<b>1,391</b>	<b>9,396</b>	<b>3,407</b>	<b>9,491</b>	<b>2,170</b>
2620.29.00	Slag, ash and residues (other than from the manufacture of iron or steel) containing metals, arsenic or their compounds: containing mainly lead: other						
	Belgium	13,757	4,064	47,800	20,818	15,016	3,640
	United States	41	21	315	167	9	5
	<b>Total</b>	<b>13,798</b>	<b>4,085</b>	<b>48,115</b>	<b>20,985</b>	<b>15,025</b>	<b>3,645</b>
2824.90.10	Other: red lead and orange lead						
	United States	...	...	2	2	(a)	(a)
2824.90	Lead oxides; red lead and orange lead: other						
	Switzerland	(a)	(a)	(a)	(a)	2 216	2 117
	Germany	(a)	(a)	(a)	(a)	510	500
	United States	(a)	(a)	(a)	(a)	33	104
	Other countries	(a)	(a)	(a)	(a)	6	18
	<b>Total</b>	<b>(a)</b>	<b>(a)</b>	<b>(a)</b>	<b>(a)</b>	<b>2 765</b>	<b>2 739</b>
7801.10.10	Refined lead, unwrought, pig and block						
	United States	3,198	6,311	595	1,117	(a)	(a)
	Other countries	1	2	12	20	(a)	(a)
	<b>Total</b>	<b>3,199</b>	<b>6,313</b>	<b>607</b>	<b>1,137</b>	<b>(a)</b>	<b>(a)</b>
7801.10.00.10	Refined lead: unwrought: pig and block						
	United States	(a)	(a)	(a)	(a)	456	744
	Other countries	(a)	(a)	(a)	(a)	16	27
	<b>Total</b>	<b>(a)</b>	<b>(a)</b>	<b>(a)</b>	<b>(a)</b>	<b>472</b>	<b>771</b>
7801.10.90	Unwrought lead: refined lead: other						
	United States	507	1,080	218	407	(a)	(a)
	Other countries	14	25	...	...	(a)	(a)
	<b>Total</b>	<b>521</b>	<b>1,105</b>	<b>218</b>	<b>407</b>	<b>(a)</b>	<b>(a)</b>
7801.10.00.90	Unwrought lead: refined lead: other						

	United States	(a)	(a)	(a)	(a)	117	200
	China	(a)	(a)	(a)	(a)	1	1
	<b>Total</b>	(a)	(a)	(a)	(a)	<b>118</b>	<b>201</b>
7801.91	Lead, unwrought, containing by weight antimony as the principal other element						
	United States	126	209	136	246	569	977
	China	6	10	8	14	9	15
	Other countries	...	1	1	3	...	...
	<b>Total</b>	<b>132</b>	<b>220</b>	<b>145</b>	<b>263</b>	<b>578</b>	<b>992</b>
7801.99	Lead, unwrought, other						
	United States	1,268	2,123	875	1,450	190	319
	Other countries	10	34	...	...	2	8
	<b>Total</b>	<b>1,278</b>	<b>2,157</b>	<b>875</b>	<b>1,450</b>	<b>192</b>	<b>327</b>
7802.00	Lead waste and scrap						
	United States	8,062	8,679	5,010	8,014	4,316	5,826
	Other countries	27	30	28	47	51	45
	<b>Total</b>	<b>8,089</b>	<b>8,709</b>	<b>5,038</b>	<b>8,061</b>	<b>4,367</b>	<b>5,871</b>
7804.11	Lead sheets, strip and foil of a thickness (excluding any backing) less than 0.2 mm						
	United States	383	2,544	441	3,481	401	2,485
	Poland	–	–	2	52	31	273
	Germany	3	21	7	71	5	56
	Other countries	4	43	11	52	4	23
	<b>Total</b>	<b>390</b>	<b>2,608</b>	<b>461</b>	<b>3,656</b>	<b>441</b>	<b>2,837</b>
7804.19	Lead plates, sheet, strip and foil, n.e.s.						
	United States	187	486	111	294	129	365
	United Kingdom	19	52	12	34	20	56
	Other countries	3	11	2	6	4	12
	<b>Total</b>	<b>209</b>	<b>549</b>	<b>125</b>	<b>334</b>	<b>153</b>	<b>433</b>
7804.20	Lead powders and flakes						
	United States	166	608	172	688	148	580
	Other countries	...	3	9	24	12	37
	<b>Total</b>	<b>166</b>	<b>611</b>	<b>181</b>	<b>712</b>	<b>160</b>	<b>617</b>
7806.00	Other articles of lead						
	United States	1,348	8,641	1,702	12,446	776	4,626
	Netherlands	...	...	...	1	6	378
	China	194	349	89	239	57	198
	Germany	33	218	29	211	24	167
	Other countries	40	294	69	355	62	322
	<b>Total</b>	<b>1,615</b>	<b>9,502</b>	<b>1,889</b>	<b>13,252</b>	<b>925</b>	<b>5,691</b>
		<b>(number)</b>	<b>(\$000)</b>	<b>(number)</b>	<b>(\$000)</b>	<b>(number)</b>	<b>(\$000)</b>
8507.10.00.90	Electric accumulators. Lead-acid, of a kind used for starting piston engines: other						
	United States	445,704	15,332	471,538	20,642	461,414	23,213
	South Korea	289,489	9,148	214,893	9,482	143,909	6,655
	China	183,233	2,865	175,932	3,205	95,469	2,491
	Other countries	52,727	2,045	46,871	2,161	45,242	1,307
	<b>Total</b>	<b>971,153</b>	<b>29,390</b>	<b>909,234</b>	<b>35,490</b>	<b>746,034</b>	<b>33,666</b>
		<b>(n.a.)</b>	<b>(\$000)</b>	<b>(n.a.)</b>	<b>(\$000)</b>	<b>(n.a.)</b>	<b>(\$000)</b>
8548.10	Waste and scrap of primary cells, primary batteries and electric accumulators; spent primary cells, spent primary batteries and spent electric accumulators						
	United States	..	64,829	..	99,804	..	85,212
	Other countries	..	72	..	1,089	..	1,747
	<b>Total</b>	<b>..</b>	<b>64,901</b>	<b>..</b>	<b>100,893</b>	<b>..</b>	<b>86,959</b>
<b>Total imports</b>		<b>..</b>	<b>469,425</b>	<b>..</b>	<b>991,118</b>	<b>..</b>	<b>986,899</b>

Sources: Natural Resources Canada; Statistics Canada.

– Nil; .. Not available; ... Amount too small to be expressed; mm Millimetres; n.a. Not applicable; n.e.s. Not elsewhere specified.

(a) As of 2012, Harmonized System (HS) code 2824.90.10 was replaced by 2824.90, 7801.10.10 was replaced by 7801.10.00.10, and 7801.10.90 was replaced by 7801.10.00.90.

(1) Imports from "other countries" may include re-imports from Canada.

Note: Numbers may not add to totals due to rounding.

**TABLE 3. MINE PRODUCTION OF LEAD, BY COUNTRY, 2008-12**

Country	2008	2009	2010	2011	2012 (p)
	(000 tonnes)				
EUROPE					
Bulgaria	15	12	12	12	12
Greece	15	12	12	13	14
Ireland	50	50	38	51	47
Italy	3	2	3	3	3
Macedonia	40	51	40	36	34
Poland	72	61	47	38	37
Romania	—	3	3	3	6
Russia	60	72	97	123	138
Spain	—	—	3	6	5
Serbia and Montenegro	3	4	4	8	9
Sweden	64	69	68	62	64
Other	3	3	2	5	5
<b>Total Europe</b>	<b>301</b>	<b>338</b>	<b>329</b>	<b>360</b>	<b>374</b>
AFRICA					
Morocco	34	34	32	26	27
Namibia	14	12	11	9	10
South Africa	46	49	43	54	56
Other Africa	12	10	12	13	11
<b>Total Africa</b>	<b>106</b>	<b>107</b>	<b>98</b>	<b>102</b>	<b>104</b>
AMERICAS					
Argentina	21	25	23	23	25
Bolivia	82	85	73	100	88
Canada	99	67	65	59	64
Mexico	141	144	192	224	237
Peru	345	302	262	230	249
United States	410	406	372	342	346
Other Americas	28	23	43	22	22
<b>Total Americas</b>	<b>1,126</b>	<b>1,052</b>	<b>1,030</b>	<b>1,000</b>	<b>1,031</b>
ASIA					
China	1,403	1,610	1,851	2,406	2,838
India	84	82	97	115	117
Iran	30	32	30	40	45
Kazakhstan	39	40	38	35	39
North Korea	33	25	26	32	26
Turkey	18	16	26	40	56
Other Asia	21	20	18	38	41
<b>Total Asia</b>	<b>1,628</b>	<b>1,825</b>	<b>2,086</b>	<b>2,706</b>	<b>3,162</b>
OCEANIA					
Australia	589	594	525	531	573
<b>Total world</b>	<b>3,610</b>	<b>3,896</b>	<b>4,031</b>	<b>4,699</b>	<b>5,244</b>

Sources: Natural Resources Canada; International Lead and Zinc Study Group.

– Nil; (p) Preliminary.

**TABLE 4. REFINED LEAD PRODUCTION, BY COUNTRY, 2008-12**

Country	2008	2009	2010	2011	2012 (p)
	(000 tonnes)				
EUROPE					
Belgium	109	109	121	119	119
Bulgaria	91	83	81	71	68
Czech Republic	36	29	30	34	30
France	82	62	71	80	75
Germany	415	391	404	429	423
Italy	200	149	150	150	138
Poland	108	100	120	132	140
Russia	112	90	96	103	115
Spain	145	138	165	177	160
Sweden	56	52	56	61	61
United Kingdom	303	312	301	275	312
Other Europe	155	114	121	117	119
<b>Total Europe</b>	<b>1,812</b>	<b>1,629</b>	<b>1,716</b>	<b>1,748</b>	<b>1,760</b>
AFRICA					
Morocco	37	21	27	37	23
South Africa	62	58	51	56	54
Other Africa	17	19	24	27	22
<b>Total Africa</b>	<b>116</b>	<b>98</b>	<b>102</b>	<b>120</b>	<b>99</b>
AMERICAS					
Argentina	48	48	44	42	40
Brazil	96	155	172	184	188
Canada	259	259	273	287	278
Mexico	255	268	317	348	332
Peru	114	26	–	–	–
United States	1,280	1,214	1,252	1,247	1,311
Other Americas	69	87	93	98	99
<b>Total Americas</b>	<b>2,121</b>	<b>2,057</b>	<b>2,153</b>	<b>2,206</b>	<b>2,248</b>
ASIA					
China	3,206	3,708	4,199	4,604	4,646
India	274	307	380	426	463
Japan	279	248	267	253	252
Kazakhstan	98	89	109	111	88
Malaysia	39	54	26	44	32
South Korea	270	238	321	422	460
Thailand	73	57	71	93	87
Other Asia	252	239	242	277	276
<b>Total Asia</b>	<b>4,382</b>	<b>4,940</b>	<b>5,615</b>	<b>6,230</b>	<b>6,304</b>
OCEANIA					
Australia	261	246	218	233	200
New Zealand	9	13	11	13	3
<b>Total Oceania</b>	<b>270</b>	<b>259</b>	<b>229</b>	<b>246</b>	<b>203</b>
<b>Total world</b>	<b>8,653</b>	<b>8,866</b>	<b>9,683</b>	<b>10,549</b>	<b>10,615</b>

Sources: Natural Resources Canada; International Lead and Zinc Study Group.

– Nil; (p) Preliminary.

Note: Numbers may not add to totals due to rounding.

**TABLE 5. REFINED LEAD USE, BY COUNTRY, 2008-12**

Country	2008	2009	2010	2011	2012 (p)
	(000 tonnes)				
EUROPE					
Austria	34	33	35	37	40
Czech Republic	76	82	84	43	70
France	190	100	71	74	56
Germany	369	314	341	372	377
Ireland	42	35	33	33	20
Italy	276	209	247	233	220
Netherlands	25	18	18	17	17
Poland	99	82	121	128	122
Russia	75	58	72	65	74
Spain	248	245	264	265	245
United Kingdom	236	205	214	209	228
Other Europe	180	129	137	142	133
Total Europe	1,850	1,510	1,637	1,618	1,602
AFRICA					
Algeria	10	11	5	13	10
Egypt	6	4	1	3	6
South Africa	74	59	55	67	65
Other Africa	17	20	14	17	19
Total Africa	107	94	75	100	100
AMERICAS					
Brazil	177	233	258	263	260
Canada	31	38	21	14	16
Mexico	215	157	201	227	228
United States	1,515	1,397	1,441	1,531	1,615
Other Americas	123	62	54	124	124
Total Americas	2,013	1,887	1,975	2,159	2,243
ASIA					
China	3,211	3,860	4,213	4,588	4,628
India	290	297	446	452	524
Indonesia	103	88	95	130	116
Iran	65	58	54	43	42
Japan	261	189	224	236	268
Malaysia	64	54	47	34	25
South Korea	312	269	385	420	428
Taiwan	70	102	75	111	107
Thailand	124	124	145	157	151
Other Asia	508	255	281	316	335
Total Asia	5,008	5,296	5,965	6,487	6,624
OCEANIA					
Australia	23	20	28	22	17
New Zealand	2	2	2	4	1
Total Oceania	26	22	30	26	18
Total world	9,047	8,809	9,682	10,389	10,586

Sources: Natural Resources Canada; International Lead and Zinc Study Group.

(p) Preliminary.

Note: Numbers may not add to totals due to rounding.

**TABLE 6. WORLD PRODUCTION OF LEAD FROM RECYCLING, BY COUNTRY, (1) 2008-12**

Country	2008	2009	2010	2011	2012 (p)
	(000 tonnes)				
EUROPE					
Austria	23	23	24	20	24
Belgium	109	109	121	119	119
France	82	62	71	80	75
Germany	302	286	279	293	290
Greece	11	10	10	7	6
Ireland	20	19	19	18	16
Italy	158	132	150	150	138
Netherlands	16	17	16	21	22
Poland	66	62	82	110	121
Slovenia	15	14	14	15	12
Spain	145	138	165	177	160
Sweden	43	43	43	44	43
United Kingdom	165	154	150	150	155
Other Europe	211	156	173	165	162
Total Europe	1,366	1,225	1,317	1,369	1,343
AFRICA					
Algeria	6	6	9	10	6
Morocco	5	4	4	5	5
Nigeria	8	8	11	9	9
South Africa	62	58	51	56	54
Other Africa	2	5	4	8	7
Total Africa	83	81	79	88	81
AMERICAS					
Argentina	38	39	34	32	31
Brazil	96	155	172	184	188
Canada	154	157	167	175	145
Colombia	10	34	42	42	42
El Salvador	11	12	11	12	–
Mexico	114	115	128	208	200
United States	1,184	1,131	1,137	1,130	1,200
Venezuela	47	50	49	26	25
Other Americas	30	33	72	18	32
Total Americas	1,614	1,703	1,780	1,827	1,863
ASIA					
China	922	1,454	1,547	1,613	1,562
India	212	245	305	306	343
Indonesia	18	45	45	47	45
Iran	68	54	57	63	63
Japan	172	151	166	152	161
Malaysia	27	16	18	32	24
Philippines	34	32	30	34	32
South Korea	70	110	130	160	180
Taiwan, China	38	36	35	36	35
Thailand	73	57	71	93	87
Other Asia	135	176	139	137	129
Total Asia	1,769	2,376	2,543	2,673	2,661
OCEANIA					
Australia	40	30	38	45	47
New Zealand	9	13	11	13	3
Total Oceania	49	43	49	58	50
Total World	3,528	5,414	5,757	6,016	5,997

Sources: Natural Resources Canada; International Lead and Zinc Study Group.

Note: Numbers may not add to totals due to rounding.

(p) Preliminary.

(1) Refined lead and lead alloys (lead content) produced from scrap, waste, and residues.

**TABLE 7. LEAD PRODUCERS IN CANADA, 2012**

Operation/Location	Company	Web Site
<b>LEAD-PRODUCING MINES</b>		
Brunswick, N.B.	Xstrata Zinc Canada	<a href="http://www.xstrata.com">www.xstrata.com</a>
Myra Falls, B.C.	Nyrstar NV	<a href="http://www.nyrstar.org">www.nyrstar.org</a>
Wolverine, Yukon	Yukon Zinc Corporation	<a href="http://www.yukonzinc.com">www.yukonzinc.com</a>
Bellekeno, Yukon	Alexco Resource Corp	<a href="http://www.alexcoresource.com">www.alexcoresource.com</a>
<b>LEAD METALLURGICAL PLANTS</b>		
Belledune, N.B.	Xstrata Zinc Canada	<a href="http://www.xstrata.com">www.xstrata.com</a>
Newalta, Que.	Newalta Corporation	<a href="http://www.newalta.com">www.newalta.com</a>
Tonolli, Ont.	Tonolli Canada Ltd.	<a href="http://www.tonolli.ca">www.tonolli.ca</a>
Trail, B.C.	Teck Resources Limited	<a href="http://www.teck.com">www.teck.com</a>
Metalex, B.C.	Metalex Products Ltd.	<a href="http://www.metalexleadrecycling.com">www.metalexleadrecycling.com</a>

Source: Natural Resources Canada.