

Zinc – 2012 Annual Review

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CANADIAN PRODUCTION

In 2012, Canadian mines produced 643,393 tonnes (t) of zinc in concentrate, compared to 622,600 t in 2011, a 3.3% increase (Table 1). The increase can be attributed to higher production at the Kidd Creek and Langlois mines, which was offset by slightly lower production at the Brunswick and LaRonde mines. Refined metal production for 2012 was 641,996 t, compared to 662,151 t in 2011, a 3.0% decrease.

Zinc is produced at 12 mines located in six provinces and one territory (Table 6). In 2012, the Langlois mine in Quebec was commissioned. Zinc metal is produced from domestic and foreign concentrates at three metallurgical sites in Quebec, Manitoba, and British Columbia. Zinc oxide is produced at one plant located in Brampton, Ontario. Statistics on exports and imports of zinc concentrates, metal, and semi-fabricated products are provided in Table 2. Total refined zinc capacity at Canada's three smelters remained unchanged at 693,000 t.

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

In Newfoundland and Labrador, the **Duck Pond** mine, owned by **Teck Resources Limited**, is located 35 kilometres (km) southeast of Buchans. It produced a total of 19,500 t of zinc in concentrate during the year (2012 Annual Report).

In New Brunswick, **Xstrata Zinc Canada** owns the **Brunswick** zinc-lead mine located 30 km southwest of Bathurst. In 2012, the mine produced 2.88 million tonnes (Mt) of ore grading 7.6% zinc and 3.0% lead, resulting in production of 190,345 t of zinc in concentrate, down from 208,995 t in 2011 (2012 Production Report). This decrease in production reflects the fact that the mine will close permanently in 2013 due to the depletion of reserves.

In Quebec, by-product zinc is produced at the **LaRonde** mine owned by **Agnico-Eagle Mines Ltd.** The mine is situated about 60 km west of Val-d'Or. It is a gold-silver-copper-zinc orebody comprising massive to disseminated sulphide lenses within a regional shear zone. In 2012, the mine produced 38,637 t of zinc in concentrate from 2.35 Mt of ore milled at a grade of 2.2% zinc, which was a 30%

decrease from the previous year (2012 20-F Report). Zinc grades will continue to decrease as mining transitions from the copper-zinc-rich upper zones to the gold-rich lower orebody. The **Perseverance** mine at Matagami is owned by **Xstrata Zinc Canada**. Ore from the mine is processed at Xstrata's 2,600-tonnes-per-day (t/d) Matagami mill. During 2012, the mine treated 1.1 Mt of ore grading 12.5% zinc, resulting in the production of 125,174 t of zinc in concentrate (2012 Production Report). **Nyrstar NV** owns the **Langlois** mine located 213 km northeast of Val-d'Or. During 2012, the mine was ramping up towards full production and produced 39,000 t of zinc in concentrate. Total production capacity is estimated at 50,000 t (2012 Annual Report). The mine also produces by-product copper, gold, and silver. The **CEZ** zinc hydrometallurgical plant was commissioned in 1963 and is located in Salaberry-de-Valleyfield just west of Montréal. It is owned by the **Noranda Income Fund**. **Xstrata plc** owns 25% of the fund units and is the operator of the facility under a supply and processing agreement that expires in May 2017. The rated capacity of the plant is 280,000 tonnes per year (t/y) of refined zinc. In 2012, the plant produced 263,697 t of zinc, virtually unchanged from the previous year (2012 Annual Report). During the year, the facility invested \$20 million in process upgrades to allow the treatment of concentrates with higher silica levels. This will enable the plant to treat a more varied concentrate mix in future years.

In Ontario, **Xstrata Copper Canada** operates the **Kidd Creek** copper-zinc mine located about 25 km north of Timmins. The orebody was discovered in 1963 and open-pit mining commenced in 1966. Mining was later converted to underground and the mine is presently developed to a depth of 2,925 metres (9,600 feet). The Kidd Creek mine produced 2.26 Mt of ore resulting in 78,094 t of zinc in concentrate (2012 Production Report). **Horsehead Corporation** based in Monaca, Pennsylvania, owns a zinc oxide production facility in Brampton. The company announced its intention to increase the capacity of the facility to 72,000 t/y by mid-2013.

In Manitoba, **HudBay Minerals Inc.** operates an integrated mining and smelting business through its wholly owned subsidiary, **Hudson Bay Mining and Smelting Co., Limited**. It operates the **777** and **Trout Lake** mines, as well as a smelter complex in Flin Flon situated about 630 km northwest of Winnipeg. The Trout Lake mine closed in June 2012 after more than 30 years in operation. The company also owns the **Chisel North** mine in Snow Lake, located 120 km east of Flin Flon. The Chisel North mine closed in September 2012. The Flin Flon concentrator produced 123,300 t of zinc concentrates grading 51.3% zinc from ore mined at the 777 and Trout Lake mines. The Snow Lake concentrator produced 33,270 t of zinc concentrates at similar grades from ore mined at the Chisel North mine (2012 Management Discussion and Analysis). In 2012, the 777 mine produced 1.53 Mt of ore grading 4.2% zinc while the Trout Lake mine produced 248,000 t of ore grading 3.7% zinc. The Chisel North mine produced 136,000 t of ore grading 8.78% zinc. Construction of the **Lalor** mine, located in Snow Lake, is nearing completion. During the year, 72,200 t of ore were processed at a grade of 11.8% zinc. The new mine concentrator will have a capacity of 5,400 t/d. The zinc hydrometallurgical facility is situated in Flin Flon and includes an oxygen plant, a two-stage pressure leaching plant, and a four-step solution purification and electrolysis, and casting plant to produce special high-grade zinc. It has an annual capacity of 118,000 t of refined zinc metal. The plant produced 100,697 t of refined zinc in 2012, down from 107,704 t in 2011. This total can be broken down to 69,476 t from HudBay concentrates and 31,221 t from purchased concentrates.

In British Columbia, the **Myra Falls** zinc mine, owned and operated by **Nyrstar NV**, is located within Strathcona Provincial Park on Vancouver Island, about 65 km southwest of Campbell River. The mine produced approximately 470,000 t of ore grading 6.88% zinc. Total production was 32,000 t of zinc in concentrate. The integrated zinc and lead smelting and refining complex at **Trail**, owned by **Teck Resources Limited**, has a capacity of 295,000 t/y of refined zinc. 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 284,000 t of zinc, down from 291,200 t in 2011 (2012 Annual Report). Production in 2013 is expected to be similar to 2012 levels.

In Yukon, **Yukon Zinc Corporation** owns the **Wolverine** mine located 190 km northwest of Watson Lake. The mill capacity is 1,700 t/d producing separate zinc, lead, and copper concentrates. During 2012, the mine produced 441,095 t grading 7.72% zinc. The mine shipped 58,940 dry tonnes of concentrate grading 42% zinc (Yukon Zinc Corporation 2012 Annual Report). Yukon Zinc is privately owned; its majority shareholder is **Jinduicheng Molybdenum Group Ltd. 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 a grade of 4.8% zinc. In total, the mine produced 2,574 t of zinc.

CANADIAN DEVELOPMENTS

Buchans Minerals Corporation has entered into an agreement with Minco plc whereby Minco can earn a 51% interest in the **Lundberg** and other projects in Newfoundland and Labrador. A pre-feasibility study has been started. The Lundberg deposit contains indicated resources of 23.4 Mt grading 1.41% zinc and 0.6% lead. The study predicts annual production of 12,300 t of zinc and 7,400 t of lead.

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 the year, a 30,000-t bulk sample was processed at Brunswick for the purpose of testing recovery rates and other metallurgical characteristics.

Construction continued at the **Bracemac-McLeod** mine near Matagami, Quebec, jointly owned by **Donner Metals Ltd.** and **Xstrata Zinc Canada**. By year-end, development work was under way with some 25,000 t of stockpiled ore on the surface. Approximately 3,000 t/d of ore will be milled, beginning in early 2013, at the Matagami Lake mill owned by Xstrata Zinc. Commercial production is expected in 2013. Evaluation work is also continuing at the nearby McLeod Deep zone, which is estimated to contain an inferred resource of 2.47 Mt grading 9.21% zinc, 1.22% copper, 39.8 g/t silver, and 1.12 g/t gold.

Selwyn Chihong Mining Ltd., joint-venture operator of the **Howard's Pass** zinc-lead project in east-central Yukon, is completing a feasibility study for the project. The study is expected to be completed in early 2013 and will be based on a 3,500-t/d mine. Upon delivery of the study, Selwyn Chihong Mining will have a 50% vested interest in the project.

MMG Limited, owner of the **Izok Corridor** project in western Nunavut, has started the permitting process towards development of the Izok Lake and High Lake copper-zinc deposits. Izok Lake contains indicated resources of 14.8 Mt grading 12.8% zinc and 2.5% copper. High Lake contains indicated resources of 17.2 Mt grading 3.4% zinc and 2.3% copper. The company expects to complete a feasibility study in mid-2013 and first production could occur by mid-2018. The project concept includes a 320-km all-weather road to a port in the Coronation Gulf.

Xstrata Zinc Canada continued to explore its **Hackett River** silver-zinc project in western Nunavut. Xstrata purchased the project from Sabina Gold & Silver in 2011. It completed an extensive diamond drill

program to increase resources and to 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.

WORLD PRODUCTION

According to the International Lead and Zinc Study Group (ILZSG), world zinc mine production for 2012 was 13.61 Mt, up from 12.96 Mt in 2011 (Table 3). In terms of mine production, Canada ranked sixth behind China, Australia, Peru, India, and the United States. The top five zinc mines in terms of zinc-in-concentrate production in 2012 were: Rampura Agucha, India (649,000 t); Red Dog, Alaska (529,000 t); Century, Australia (515,000 t); Mt. Isa, Australia (322,000 t); and Antamina, Peru (219,000 t). The top five zinc mining companies were Xstrata, Hindustan Zinc, Teck Resources, MMG Limited, and Glencore International, which together accounted for 24% of world zinc mine production.

World refined zinc production was 12.61 Mt, down from 13.12 Mt in 2011 (Table 4). The top five zinc metal-producing countries in 2012 were China, South Korea, India, Canada, and Japan. The top refined zinc producers were Korea Zinc, Nyrstar, Hindustan Zinc, Xstrata, and Votorantim, together accounting for 33% of global production. Chinese refined zinc production dropped 7.3% in 2012 as the rate of growth in the Chinese economy started to diminish. Zinc metal production in Europe remained stable in 2012 while metal production in Japan and South Korea increased slightly. Data on zinc use by country can be found in Table 5.

MARKETS AND PRICES

Total refined zinc stocks, comprising producers, consumers, and London Metal Exchange (LME) stocks, stood at 1,671,000 t at the end of 2012, an increase of 349,000 t, or 26%. Producer and consumer stocks ended the year at 451,000 t, down 10% from 2011. LME metal stocks rose substantially from 820,000 t at the end of 2011 to 1,220,000 t in December 2012, an increase of 48%.

Monthly average settlement prices on the LME during 2012 ranged from a low of US\$1,813/t (82.2¢ per pound [lb]) in August to a high of US\$2058/t (93.4¢/lb) in February. The average for the year was US\$1948/t (88¢/lb).

TRADE

Total exports of zinc and zinc products from Canada were valued at \$1.521 billion in 2012, compared to \$1.688 billion in 2011. Imports were valued at \$401 million, compared to \$434 million in 2011. Canadian smelters imported 235,000 t of zinc in concentrates, compared to 211,000 t the previous year. Concentrates were imported mainly from the United States, Bolivia, Mexico, and Australia. Smelters exported 495,000 t of refined metal in 2012, compared to 483,000 t in 2011. Zinc metal was exported primarily to the United States with minor amounts shipped to Taiwan, Hong Kong, and Malaysia.

OUTLOOK

Canadian zinc production will continue to decrease in 2013 and beyond. Xstrata Zinc's Brunswick mine is scheduled to close in early 2013 after almost 50 years of continuous production. This will remove approximately 200,000 t of zinc production. In addition, production of by-product zinc from Agnico-Eagle's LaRonde mine will continue to decrease as the mine transitions into the lower gold-rich part of

the orebody. Zinc output at Bracemac McLeod in Quebec will be lower than the current output at the Perseverance mine, which will close by the end of 2014.

Zinc demand, primarily for galvanizing steel, is forecast to increase by about 5% in 2013 and 2014. The focus will be on the capacity of China's economy to continue to grow at 8% per year and the strength of the recovery in the United States and Europe, which is expected to be in the 2% range. Global zinc stocks will remain high, potentially putting downward pressure on prices in the medium term.

Zinc prices improved 12% during 2012. Prices were range-bound between 80¢ and 92¢/lb for the year, although the trend was negative for much of the year. It is expected that zinc prices will remain in the 80¢- 90¢/lb range for 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.

Zinc - Other Information

INTRODUCTION TO ZINC

Zinc is a relative newcomer to the group of metals discovered and used by society. While the first use of copper pre-dates recorded history and the discovery of tin goes back 5,000 years, the first recovery of metallic zinc came much later. The production of metallic zinc was first described in India around 1200 A.D. By 1374, zinc was recognized as a new metal, the eighth to be discovered at that time, and a limited amount of commercial zinc production was under way. Although brass-making had developed much earlier, the zinc in brass was obtained by treating zinc ore to produce zinc vapour, which combined with granulated copper under heat. From India, zinc production was introduced to China sometime around 1600 A.D. and then began to be exported to Europe.

The first full-scale zinc smelting operation outside of Asia started in Bristol, England, about 1743. By the beginning of the 19th century, zinc production was established on the continent of Europe, notably in Belgium and parts of Eastern Europe. In the latter half of the century, large zinc industries developed rapidly in the United States and Germany.

HISTORY OF ZINC MINING IN CANADA

Zinc production in Canada dates back to the First World War when the Consolidated Mining and Smelting Company of Canada began operating a small electrolytic zinc plant at Trail, British Columbia, to help offset a critical wartime shortage of zinc in the United Kingdom. At that time, the Consolidated Mining and Smelting Company of Canada and The Anaconda Copper Mining Company in Montana were pioneering the production of zinc in North America by the electrolytic method.

The ores used at Trail came from the Sullivan mine near Kimberley, British Columbia, but production was hampered because the complex lead-zinc-iron ore was difficult to treat using existing methods. In 1920, however, the differential flotation method was successfully applied to separate the Sullivan ore into a lead concentrate, a zinc concentrate, and an iron by-product. This marked the beginning of significant zinc production in Canada. Today, the Trail operations are the world's largest fully integrated lead and zinc smelting and refining complex. Owned and operated by Teck Resources Limited of Vancouver, the Trail facility has a zinc production capacity of 29, 000 tonnes per year (t/y).

In Manitoba, the discovery in 1915 of significant zinc and copper ore with important quantities of gold led to the development of the Flin Flon-Snow Lake mining camp, smelter complex, and dedicated power plant in the late 1920s. Since 1930, Hudson Bay Mining and Smelting Co. Limited, now a subsidiary of HudBay Minerals Inc., has owned and operated some 30 mines that have in turn fed the company's metallurgical complex at Flin Flon. The Flin Flon smelter and refinery complex has undergone significant capital improvements since it first commenced operations in 1930 with the introduction of zinc pressure leach technology in the early 1990s and a new tank house in 2000 that expanded its zinc production capacity to 118,000 t/y.

The Kidd Creek orebody near Timmins, Ontario, was discovered in 1963 and Texasgulf Inc. began open-pit mining of the deposit in 1966. The Kidd Creek zinc plant started production in 1972. In 1983, Kidd Creek started up a zinc pressure leaching facility. The mine and plant continued to operate under Falconbridge until 2006. Today, Xstrata Copper owns and operates the Kidd Creek complex with a zinc metal production capacity of 150,000 t/y.

With the discovery of significant zinc-bearing ores in the Matagami region of northern Quebec in the late 1950s and early 1960s, Noranda Inc. began looking at options to build an electrolytic zinc plant. Construction began at Valleyfield, Quebec, west of Montréal, in 1962 and Canadian Electrolytic Zinc (CEZ) was brought into production in 1963. Xstrata Zinc has a 25% interest in the CEZ refinery held through the Noranda Income Fund. The plant's capacity has increased steadily from its original 64,000 t/y at the time of opening to 280,000 t/y today.

USES

The greatest use for zinc is as a coating for iron and steel products to make them resistant to rust and corrosion. The application of a zinc coating, known as galvanizing, is accomplished electrolytically or by hot-dip methods. Galvanizing accounts for about 60% of the worldwide use of zinc.

The most commonly galvanized products are sheet and strip steel, tube and pipe, and wire and wire rope. The automobile industry is the largest user of galvanized steel. The desire to reduce weight and improve fuel efficiency has led to the increased use of galvanized steel by the automotive industry to protect the thinner gauges of steel from corrosion. Both hot-dipped and electro-galvanized steel are used, with the thicker coating of hot-dipped steel giving more corrosion protection to unexposed surfaces and the thinner coating of electro-galvanized steel providing a smoother finish for exposed, painted surfaces.

Galvanized sheet and strip steel are also widely used by the construction industry for roofing and siding, and for heating and ventilation ducts, as well as for many other applications. Nails and other building materials are often hot-dip galvanized. Zinc and zinc-aluminum thermally sprayed coatings are used for the long-term corrosion protection of large steel structures such as bridges and hydro-electric transmission towers.

Another important use of zinc, representing about 16% of world supply, is in the manufacture of a vast range of die-cast products. Because it has a relatively low melting point and is very fluid, die-cast zinc is easy to pour when melted. Therefore, it is well suited to rapid, assembly-line die-casting, particularly to produce small and intricate shapes.

A major use of die castings is in the automobile industry as trim pieces, grills, door and window handles, carburetors, pumps, and other components. However, with the trend toward lighter, more energy-efficient cars, zinc demand for this purpose has declined in recent years. Other familiar zinc die castings include small electrical appliances, business machines, and other light equipment, tools, and toys.

Zinc is also an essential ingredient of brass, which is basically an alloy of copper and zinc with the proportion of zinc ranging from 5 to 40%. The zinc brasses have good physical, electrical, and thermal properties, and are corrosion resistant. They are used in plumbing, heat exchange equipment, and a wide range of decorative hardware, to name a few applications. Rolled zinc metal is a basic component in dry-cell batteries, and zinc oxide is used as a catalyst in the manufacture of rubber and as a pigment in white paint. It is also used in agricultural products, cosmetics, and medicinal products.

HEALTH AND THE ENVIRONMENT

Zinc plays an important role as a micro-nutrient in the development and health of a variety of plants and animals. In humans, zinc is a key element in the function of more than 200 enzymes, for the stabilization of DNA and the expression of genes, and for the transfer of nerve signals.

The human body contains 2-3 grams of zinc. The recommended daily zinc intake is 10 milligrams (mg) for children, 12 mg for adult women, and 15 mg for adult men. Daily intake is not only dependent on food, but also on gender, age, and general health status. Growing infants, children, adolescents, women in pregnancy, and the elderly have a higher zinc requirement.

Food is the primary source of zinc for humans with only a small part coming from drinking water. Some dietary sources of zinc include red meat, nuts, poultry, and milk products. Zinc deficiency is the most common micro-nutrient deficiency affecting many agricultural areas in Asia, Africa, and the Middle East. The World Health Organization attributes 800,000 deaths worldwide each year to zinc deficiency. Zinc in fertilizers can significantly enhance the quality and yield of crops.

In 2009, the International Zinc Association, in partnership with UNICEF, launched the “Zinc Saves Kids” initiative. This campaign is a fund-raising effort in support of UNICEF’s zinc supplementation programs in Asia, Africa, and Latin America. Zinc nutritional supplements will reduce zinc deficiency in children and are an inexpensive way of treating diseases such as diarrhea and pneumonia. This program was recognized by the Clinton Global Initiative in New York as a global strategy that can save many lives for little money.

A separate project, launched in conjunction with the International Fertilizer Industry Association, consists of crop trials in India, Laos, China, and Thailand to demonstrate the value of using zinc-enhanced fertilizers to increase crop yields.

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 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 about the Group's activities can be obtained from its web site at www.ilzsg.org/static/home.aspx.

OTHER SOURCES OF INFORMATION

American Galvanizers Association	www.galvanizeit.org
International Zinc Association	www.zincworld.org
London Metal Exchange	www.lme.co.uk
U.S. Geological Survey	http://minerals.usgs.gov/minerals/pubs/commodity/zinc
World Bureau of Metal Statistics	www.world-bureau.com
Zinc Information Centre	www.zincinfocentre.org
North American Die Casting Association	www.diecasting.org
International Fertilizer Industry Association	www.fertilizer.org

TABLE 1. CANADA, TOTAL ZINC PRODUCTION BY PROVINCE AND TERRITORY, 2010-12

Province	2010		2011		2012 (p)	
	(tonnes)	(\$000)	(tonnes)	(\$000)	(tonnes)	(\$000)
PRODUCTION (All Forms) (1)						
Newfoundland and Labrador	13,774	30,648	19,974	43,323	19,545	37,918
New Brunswick	203,442	452,659	201,146	436,287	172,762	335,159
Quebec	200,693	446,542	191,120	414,539	206,161	399,953
Ontario	81,779	181,957	68,487	148,548	71,024	137,786
Manitoba	74,806	166,443	73,775	160,018	78,731	152,739
Saskatchewan	—	—	—	—	1,110	2,154
British Columbia	35,074	78,039	34,020	73,790	30,566	59,299
Yukon	—	—	2,481	5,381	28,392	55,080
Total	609,568	1,356,288	591,003	1,281,886	608,291	1,180,088
Mine output (2)	649,065	..	622,600	..	643,393	..
Refined (3)	691,221	..	662,151	..	641,996	..

Sources: Natural Resources Canada; Statistics Canada.

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

(1) New refined zinc produced from domestic primary materials (concentrates, slags, residues, etc.) plus estimated recoverable zinc in ores and concentrates shipped for export. (2) Zinc content of ores and concentrates produced.

(3) Refined zinc produced from domestic and imported ores.

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

TABLE 2. CANADA, ZINC TRADE, 2010-12

		2010		2011		2012	
		(tonnes)	(\$000)	(tonnes)	(\$000)	(tonnes)	(\$000)
EXPORTS							
2608.00.30	Zinc content in zinc ores and concentrates						
	Spain	72,348	97,424	52,791	71,995	91,839	126,461
	South Korea	18,777	22,920	20,919	28,547	46,647	71,800
	Belgium	30,482	43,283	44,264	84,505	48,344	46,570
	China	10,463	10,699	23,329	23,553	26,998	33,707
	Mexico	—	—	—	—	4,300	6,219
	Poland	—	—	2,086	1,804	4,069	6,198
	Germany	—	—	1	1	2,495	3,098
	Italy	—	—	—	—	20	105
	India	—	—	—	—	22	41
	United States	—	—	2,901	6,899	15	35
	Other countries	57,651	73,565	61,173	75,697	4	5
	Total	189,721	247,891	207,464	293,001	224,753	294,239
2617.90	Other ores and concentrates: other						
	China	2,277	2,147	995	824	—	—
	Hong Kong	—	—	640	582	241	131
	United States	44	59	35	160	3	90
	Other countries	3	4	65	28	206	316
	Total	2,324	2,210	1,735	1,594	450	537
2620.11	Ash and residues containing hard zinc spelter						
	Japan	—	—	40	83	120	188
	Maldives	—	—	—	—	21	30
	Other countries	67	184	9	24	—	—
	Total	67	184	49	107	141	218
2620.19	Ash and residues containing mainly zinc, n.e.s.						

	United States	7,112	7,513	5,521	6,687	5,943	7,189
	Malaysia	–	–	–	–	59	88
	Germany	–	–	–	–	1	4
	Other countries	21	32	134	289	–	–
	Total	7,133	7,545	5,655	6,976	6,003	7,281
2817.00	Zinc oxide; zinc peroxide						
	United States	50,879	115,549	44,967	103,835	42,489	90,234
	Egypt	556	1,412	399	950	569	1,468
	Sweden	419	1,015	603	1,555	550	1,267
	United Kingdom	453	1,128	595	1,497	431	1,028
	Other countries	3,760	9,229	2,528	6,536	781	1,882
	Total	56,067	128,333	49,092	114,373	44,820	95,879
7901.11	Zinc, not alloyed, unwrought, containing by weight 99.99% or more of zinc						
	United States	295,254	676,470	291,104	661,968	289,532	593,161
	Taiwan	12,756	30,038	9,591	24,072	9,917	20,534
	Hong Kong	3,270	7,554	3,209	7,305	4,940	10,135
	Philippines	816	2,007	835	1,954	813	1,741
	Malaysia	1,974	5,010	1,145	2,654	640	1,356
	Trinidad and Tobago	20	46	19	36	20	46
	Other countries	3,192	7,953	775	1,801	4	13
	Total	317,282	729,078	306,678	699,790	305,866	626,986
7901.12	Zinc, not alloyed, unwrought, containing by weight less than 99.99% of zinc						
	United States	210,264	476,395	156,422	352,547	173,826	357,094
	Taiwan	10,698	25,193	13,418	34,029	11,464	23,790
	Malaysia	5,978	14,875	3,724	8,676	2,779	6,081
	Vietnam	1,523	3,183	1,531	3,649	1,116	2,326
	Australia	–	–	–	–	83	146
	Other countries	1,740	4,133	724	1,788	72	141
	Total	230,203	523,779	175,819	400,689	189,340	389,578
7901.20	Zinc alloys, unwrought						
	United States	460	887	35,323	79,125	10,993	22,996
	Hong Kong	5,419	13,532	5,824	15,036	4,522	9,951
	China	3,731	9,613	3,068	8,011	2,142	4,653
	Taiwan	41	98	41	103	1,347	3,076
	Thailand	1,714	4,205	1,596	3,863	1,282	2,830
	Other countries	374	923	973	2,394	493	1,111
	Total	11,739	29,258	46,825	108,532	20,779	44,617
7902.00	Zinc waste and scrap						
	United States	9,964	12,679	12,513	15,217	13,932	16,785
	India	307	517	458	697	518	739
	Italy	–	–	–	–	167	258
	Japan	137	180	210	319	166	200
	Malaysia	21	38	–	–	82	135
	Belgium	5	7	79	136	95	112
	Other countries	336	504	997	1,869	109	162
	Total	10,770	13,925	14,257	18,238	15,069	18,391
7903.10	Zinc dust						
	United States	5,343	15,838	5,990	17,761	8,840	24,820
	Other countries	81	187	135	362	69	127
	Total	5,424	16,025	6,125	18,123	8,909	24,947
7903.90	Zinc powders and flakes						
	United States	5,969	15,496	2,317	6,492	1,924	4,195
	Brazil	8	33	–	–	8	33
	United Kingdom	...	...	19	53	1	5
	Other countries	297	961	1,743	6,335	–	–
	Total	6,274	16,490	4,079	12,880	1,933	4,233

7904.00	Zinc bars, rods, profiles and wire						
	United States	57	321	59	334	144	544
	India	–	–	–	–	74	274
	Australia	1	4	...	1	15	56
	United Kingdom	2	6	5	28	4	14
	Other countries	22	95	7	24	9	37
	Total	82	426	71	387	246	925
7905.00	Zinc plates, sheets, strip and foil						
	United States	5	82	5	21	3	19
	Chile	–	–	...	...	1	3
	Other countries	16	58	1	6	1	5
	Total	21	140	6	27	5	27
7907.00	Other articles of zinc						
	United States	1,780	17,881	1,336	13,115	1,327	13,159
	China	17	45	2	13	60	298
	Mexico	8	44	18	158	39	192
	Other countries	31	152	68	354	103	460
	Total	1,836	18,122	1,424	13,640	1,529	14,109
Total exports		838,943	1,733,406	819,279	1,688,357	819,843	1,521,967
IMPORTS							
2607.00.00.30	Zinc content in lead ores and concentrates						
	United States	89	158	103	197	–	–
2608.00.00.30	Zinc content in zinc ores and concentrates						
	United States	145,844	195,908	149,985	244,234	139,557	189,631
	Bolivia	24,159	36,495	24,857	42,309	33,046	50,388
	Mexico	14,626	26,729	27,060	42,247	29,275	42,317
	Australia	–	–	–	–	19,645	22,045
	Peru	26,106	23,722	6,577	9,205	9,896	12,262
	Other countries	5,457	9,348	2,147	3,840	3,988	2,493
	Total	216,192	292,202	210,626	341,835	235,407	319,136
2617.90.00.90	Other ores and concentrates: 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
	Total	4,371	1,391	9,396	3,407	9,491	2,170
2620.19	Ash and residues containing mainly zinc, n.e.s.						
	United States	6,951	765	12,813	1,195	9,328	2,224
	Other countries	84	14	135	13	–	–
	Total	7,035	779	12,948	1,208	9,328	2,224
2817.00	Zinc oxide; zinc peroxide						
	United States	3,959	9,906	4,770	10,868	4,620	10,246
	Mexico	2,359	5,012	2,484	4,979	2,614	5,191
	India	18	23	...	...	655	1,416
	Netherlands	274	420	297	506	633	1,210
	Other countries	763	1,613	482	880	939	1,934
	Total	7,373	16,974	8,033	17,233	9,461	19,997
7901.11	Zinc, not alloyed, unwrought, containing by weight 99.99% or more of zinc						
	United States	798	1,877	352	918	894	1,971
	Norway	–	–	1	4	15	55
	Germany	–	–	18	74	12	36
	Other countries	505	1,111	12	48	1	3
	Total	1,303	2,988	383	1,044	922	2,065
7901.12	Zinc, not alloyed, unwrought, containing by weight less than 99.99% of zinc						
	United States	26	70	...	1	8	21

	Singapore	–	–	...	1	7	20
	Other countries	–	–	6	30	...	1
	Total	26	70	6	32	15	42
7901.20	Zinc alloys, unwrought						
	United States	5,386	13,562	5,605	13,454	5,572	12,935
	Other countries	26	106	26	71	16	52
	Total	5,412	13,668	5,631	13,525	5,588	12,987
7902.00	Zinc waste and scrap						
	United States	272	497	226	434	2,049	4,186
	Cuba	–	–	–	–	20	25
	Canada	1	2	1	1	2	4
	Mexico	–	–	16	36	–	–
	Total	273	499	243	471	2,071	4,215
7903.10	Zinc dust						
	Belgium	3,156	7,681	3,215	8,181	2,738	6,686
	United States	228	953	247	983	394	1,476
	Canada	9	52	23	111	5	69
	Other countries	...	...	...	...	...	...
	Total	3,393	8,686	3,485	9,275	3,137	8,231
7903.90	Zinc powders and flakes						
	United States	496	1,538	705	1,950	390	1,200
	Germany	6	30	1	3	9	39
	Other countries	17	59	1	3	–	1
	Total	519	1,627	707	1,956	399	1,240
7904.00	Zinc bars, rods, profiles and wire						
	United States	572	2,000	825	2,934	783	2,673
	China	277	1,132	358	1,313	297	1,783
	Finland	188	667	255	944	240	829
	India	32	105	55	222	56	305
	Other countries	8	38	39	166	4	57
	Total	1,077	3,942	1,532	5,579	1,380	5,647
7905.00	Zinc plates, sheets, strip and foil						
	France	459	2,716	378	2,075	188	1,067
	United States	197	713	294	1,145	203	821
	Germany	194	943	273	917	118	441
	China	61	257	31	108	31	117
	Other countries	61	235	50	213	32	128
	Total	972	4,864	1,026	4,458	572	2,574
7907.00	Other articles of zinc						
	China	1,291	9,543	1,219	7,965	561	3,528
	Mexico	352	2,664	435	3,164	410	3,513
	United States	2,449	9,289	1,564	8,431	389	1,995
	Other countries	1,024	6,765	840	6,213	211	2,246
	Total	5,116	28,261	4,058	25,773	1,571	11,282
		(number)	(\$000)	(number)	(\$000)	(number)	(\$000)
8506.60	Primary cells and primary batteries, air-zinc						
	United States	3,693,001	3,803	4,622,921	4,781	5,931,669	5,969
	Germany	2,052,743	2,907	2,942,939	2,888	1,929,113	2,491
	United Kingdom	168,587	107	154,674	104	128,202	114
	Other countries	340,901	193	235,434	206	178,344	253
	Total	6,255,232	7,010	7,955,968	7,979	8,167,328	8,827
Total imports		..	383,119	..	433,972	..	400,637

Sources: Natural Resources Canada; Statistics Canada.

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

Notes: Numbers may not add to totals due to rounding. Harmonized System code descriptions in this table may have been abbreviated.

TABLE 3. WORLD MINE PRODUCTION OF ZINC, 2007-12

Country	2007	2008	2009	2010	2011	2012 (p)
	(000 tonnes)					
EUROPE						
Finland	39	28	30	56	64	52
Ireland	401	398	386	343	344	338
Poland	124	132	116	73	65	58
Russia	177	204	214	235	243	246
Spain	–	–	6	17	33	35
Sweden	214	188	193	199	194	189
Others	79	121	72	91	91	125
Subtotal	1,034	1,071	1,017	1,014	1,034	1,043
AFRICA						
Morocco	51	48	44	46	45	38
Namibia	196	204	208	209	215	200
South Africa	31	29	28	38	37	32
Others	3	3	10	8	25	24
Subtotal	281	284	290	301	322	294
OCEANIA						
Australia	1,498	1,479	1,270	1,458	1,472	1,518
AMERICAS						
Bolivia	194	384	434	425	435	405
Brazil	194	173	173	196	186	163
Canada	630	716	699	649	612	648
Mexico	452	442	478	570	632	645
Peru	1,444	1,603	1,509	1,470	1,256	1,281
United States	803	779	736	751	769	739
Others	117	125	96	96	91	94
Subtotal	3,834	4,222	4,125	4,157	3,981	3,975
ASIA						
China	3,048	3,186	3,324	3,842	4,050	4,930
India	558	616	695	740	835	838
Iran	75	86	115	128	138	138
Japan	–	–	–	–	–	–
Kazakhstan	446	459	442	459	462	425
Mongolia	77	72	74	62	62	60
North Korea	95	48	29	38	34	35
Thailand	42	35	30	33	30	35
Turkey	71	127	136	196	160	206
Others	77	5	6	83	127	113
Subtotal	4,489	4,634	4,851	5,581	5,898	6,780
Total world	11,136	11,690	11,553	12,511	12,959	13,610

Source: International Lead and Zinc Study Group.

– Nil; (p) Preliminary.

TABLE 4. WORLD ZINC METAL PRODUCTION, (1) 2007-12

Country	2007	2008	2009	2010	2011	2012 (p)
(000 tonnes)						
EUROPE						
Belgium	240	239	14	254	252	237
Finland	306	298	294	307	308	313
France	125	118	161	163	164	161
Germany	295	292	153	165	170	169
Italy	102	107	103	105	110	97
Netherlands	219	241	227	259	261	260
Norway	157	145	139	149	153	164
Poland	142	143	139	135	156	161
Russia	263	263	208	241	252	257
Spain	509	466	515	515	524	521
Others	158	164	96	89	87	72
Subtotal	2,516	2,476	2,049	2,382	2,437	2,412
AFRICA						
Algeria	27	31	28	31	25	20
Namibia	150	145	150	152	146	145
South Africa	101	82	86	90	73	–
Zambia	1	2	1	–	–	–
Subtotal	279	260	265	273	244	165
AMERICAS						
Argentina	43	31	43	41	41	46
Brazil	265	249	242	280	285	251
Canada	802	764	686	691	662	649
Mexico	320	321	336	328	322	329
Peru	162	190	149	223	314	319
United States	279	286	204	249	241	261
Subtotal	1,871	1,841	1,660	1,812	1,865	1,855
ASIA						
China	3,743	3,913	4,286	5,164	5,212	4,829
India	459	606	640	735	810	711
Iran	125	110	115	115	132	148
Japan	598	616	541	574	545	571
Kazakhstan	358	366	328	319	320	320
South Korea	691	739	722	750	826	877
Thailand	99	102	105	101	98	98
Others	114	127	62	109	115	122
Subtotal	6,187	6,579	6,799	7,867	8,058	7,676
OCEANIA						
Australia	502	499	519	499	515	501
Total world	11,355	11,655	11,292	12,833	13,119	12,609

Source: International Lead and Zinc Study Group.

– Nil; (p) Preliminary.

(1) Total production by smelters and refineries of zinc in marketable form or used directly for alloying, including production on toll in the reporting country, regardless of the type of source material from which it is produced, i.e., whether ores, concentrates, residues, slag, or scrap. Remelted zinc and zinc dusts are excluded.

TABLE 5. ZINC USE, (1) BY COUNTRY AND BY REGION, 2007-12

Country	2007	2008	2009	2010	2011	2012 (p)
	(000 tonnes)					
EUROPE						
Belgium	387	382	288	399	395	372
France	275	252	221	217	206	207
Germany	535	527	376	493	509	474
Italy	398	318	216	339	338	247
Netherlands	117	105	78	98	94	88
Russia	207	195	150	178	208	231
Spain	225	210	148	200	201	170
United Kingdom	174	158	112	128	120	112
Others	532	473	350	436	454	464
Subtotal	2,850	2,620	1,939	2,488	2,525	2,365
AFRICA						
South Africa	108	100	77	92	83	67
Others	102	99	83	89	92	87
Subtotal	210	199	160	178	175	154
OCEANIA						
Australia	202	182	165	190	201	204
New Zealand	12	11	10	10	10	9
Subtotal	214	193	175	200	211	213
AMERICAS						
Brazil	248	248	194	238	237	244
Canada	173	134	140	149	145	140
Mexico	250	247	200	218	215	211
United States	1,016	1,003	912	891	928	905
Others	196	227	172	207	217	172
Subtotal	1,883	1,859	1,618	1,703	1,742	1,672
ASIA						
China	3,597	4,015	4,659	5,358	5,458	5,291
India	455	485	497	568	544	581
Japan	588	564	433	516	501	479
South Korea	512	504	465	538	545	563
Taiwan	226	220	189	232	221	193
Thailand	105	111	94	120	122	117
Turkey	137	128	136	153	163	196
Others	533	539	480	531	539	526
Subtotal	6,153	6,566	6,953	8,016	8,093	7,946
Total world	11,310	11,437	10,845	12,585	12,746	12,350

Source: International Lead and Zinc Study Group.

(p) Preliminary.

(1) Total refined zinc use, including zinc used directly for the production of zinc alloys, regardless of the type of source material from which it is produced, i.e., ores, concentrates, residues, slags, or scrap. Remelted zinc and zinc dusts are excluded.

TABLE 6. CANADA, ZINC-PRODUCING MINES, 2012

Name	Company	Web Site
ZINC-PRODUCING MINES		
Duck Pond	Teck Resources Limited	www.teck.com
Brunswick	Xstrata Zinc Canada	www.xstrata.com
LaRonde	Agnico-Eagle Mines Limited	www.agnico-eagle.com
Perseverance	Xstrata Zinc Canada	www.xstrata.com
Langlois	Nyrstar NV	www.nyrstar.org
Kidd Creek	Xstrata Copper Canada	www.xstrata.com
Trout Lake	HudBay Minerals Inc.	www.hudbayminerals.com
777	HudBay Minerals Inc.	www.hudbayminerals.com
Chisel North	HudBay Minerals Inc.	www.hudbayminerals.com
Lalor	HudBay Minerals Inc.	www.hudbayminerals.com
Myra Falls	Nyrstar NV	www.nyrstar.org
Wolverine	Yukon Zinc Corporation	www.yukonzinc.com
Bellekeno	Alexco Resource Corp.	www.alexcoresource.com
ZINC METALLURGICAL PLANTS		
Valleyfield	Canadian Electrolytic Zinc Limited	www.norandaincomefund.com
Flin Flon	HudBay Minerals Inc.	www.hudbayminerals.com
Trail	Teck Resources Limited	www.teck.com
ZINC OXIDE PLANTS		
Zochem	Horsehead Corporation	www.horsehead.net

Source: Natural Resources Canada.