

THE MINERAL INDUSTRIES OF LATIN AMERICA AND CANADA¹

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Introduction

Mining and related activity in roughly 40 countries and territories of Latin America, Canada, and the Caribbean Basin during 1995 are described in this regional report. As with the United States, these other countries of the Western Hemisphere are endowed with a great diversity of minerals, comprising metals, industrial minerals, and energy minerals. For many of the countries in this study, the mining, processing, and marketing of these mineral commodities play a significant role in the foundations of their economies, in many cases earning export revenues in hard currencies.

Table 1 depicts a synopsis of Latin America and Canada's production of their major mineral commodities during 1995. Table 2 shows the role of Latin America and Canada in world mineral production.

The rich and varied mineral endowment of Latin America and Canada, taken together, complement the mineral resources of the United States. New interest and capital investment are attracted to many of these countries, as discussed in the ensuing country chapters.

Position in the World Mineral Economy

By itself, Latin America produced 40% of the world's silver and 20% to 33% of the world's total output of copper, tin, bauxite, iron ore, zinc, and, with Canada, produced even greater proportions of silver (49%), copper (40%), and zinc (36%).² Likewise, in combination with Canada, Latin America produced 32% of the world's nickel, 26% of its iron ore, 24% of its lead, and 22% of the world's primary aluminum. Moreover, Latin America and Canada, separately and together, are of great significance to the world economy as producers of petroleum crude and natural gas, petroleum refinery products, and coal.

Canada led the world in production of uranium and zinc, with a strong showing in output of silver, gold, and nickel. Chile led the world in production of copper while Mexico led in the production of silver, sodium sulfate, and strontium. Brazil led in output of columbium and, although not the greatest producer of iron ore, was the largest exporter in recent years, as well as eighth largest steel producer in the world, followed in the Western Hemisphere by Canada and Mexico as second and third largest producers of steel. Brazil

was also the fifth ranking source of manganese in the world, followed in Latin America by Mexico. After Russia, Canada was the second largest world nickel producer, with other significant production in the hemisphere by Cuba and the Dominican Republic.

The inclusion of the United States in summary table 1 shows the position of the entire Western Hemisphere in world supply of mineral commodities. This hemisphere produced significantly more than one-half of the world's silver (60%) and copper (58%), as well as 45% of its zinc, 39% of its aluminum, 38% of its lead, and 32% of the world's nickel and iron ore. Among the industrial minerals, in 1995 the Western Hemisphere produced 46% of the world's sulfur, 39% of its salt, 34% of its phosphate rock, and 33% of its gypsum. Of the mineral fuels, this hemisphere produced 37% of the world's output of natural gas, 26% of its crude, and 24% of its coal; further in the processing stream, it produced 33% of refined petroleum products.

Production Trends

Nonfuel Minerals

For all of Latin America, the most significant production of the region in terms of share of world output includes silver, copper, tin, bauxite, iron ore, zinc, lead, nickel, gold, and primary aluminum, in order of importance, as shown in table 2. In the past 10 years, exploration, investment, and development have taken various new discoveries to the point of production such that tin, copper, nickel, bauxite, and iron ore have increased Latin America's world position in production of these metals.

In certain years, some of this activity seems to have been at the expense of silver, zinc, and lead, which have either declined in terms of their proportion of world production or fluctuated erratically in terms of world share. This is partly because of changes in output in other countries. It may be noted that Latin America's world share of output of bauxite and gold has not changed much in the past 5 years, but conspicuous effort is being exerted to find and produce these minerals. Gold has been the center of attention in the Guyana Shield of Venezuela and Guyana as well as virtually all of the Andean countries. The bauxite industry has

weathered the unusual surge of aluminum exports from the former Soviet Union during the early 1990's and is the object of increased interest in Brazil and Venezuela for domestic aluminum production. Jamaica, the biggest Latin American bauxite producer, exports virtually all of its production.

Energy Minerals

World share of Latin American production of petroleum crude (12%), natural gas (5%), and resultant petroleum products (7%) dropped moderately in 1995 after fluctuating unevenly since 1985. In spite of this, however, new highs in output of crude were achieved by Bolivia, Colombia, and Cuba. The top seven producers were Mexico, Venezuela, Argentina, Brazil, Colombia, Ecuador, and Trinidad, representing 97.5% of the regional total. Bolivia and Colombia also reached new highs in production of natural gas.

Canada likewise confirmed a new high in production of both crude and natural gas and, if combined with Latin America and the United States, showed the Western Hemisphere to represent 37% of the world share of natural gas production and 26% of crude oil production. Mexico, Brazil, and Venezuela, in order of output, led Latin American production of refinery products and, with Canada and the United States, the region achieved a world share of 33%.

Coal output in Latin America was led by Colombia, Mexico, and Venezuela, in that order, with products that were generally competitive in world markets while increasing local and regional market share over the past 10 to 20 years. These coals range from anthracite through semianthracite, bituminous, and subbituminous, depending upon the country, plus some lignites used locally in most cases. Latin American coals are suitable for both metallurgical and thermal use, as is true for Canadian and U.S. coals. Together, the Western Hemisphere coal output amounts to a 24% world share.

Trade Liberalization Developments

Canada, Mexico, and the United States ratified the North American Free Trade Agreement (NAFTA) that went into effect on the first day of 1994. This agreement created the largest and richest trading bloc in the world, including 370 million consumers and an annual output approximating \$7 trillion. NAFTA automatically replaced the Free Trade Agreement between the United States and Canada after 5 years of generally successful operation. The excellent infrastructural connections between Canada, the United States, and Mexico, including railroads, highways, and pipelines, were expected to be a significant factor in the marketing of mineral commodities. Other Latin American nations, Chile in particular, viewed the possibility of joining NAFTA to enable greater freedom of mineral trade and, ultimately, greater efficiencies of production. A first step in

this direction was under discussion by Chile and Canada, with the hope of negotiating a Free Trade Agreement between those two countries.

Other Latin American countries, over the past 30 years or more, have entered trade agreements among themselves, such as the Southern Cone Common Market (MERCOSUR) including Argentina, Brazil, Paraguay, and Uruguay; Chile's bilateral Free Trade Agreement with Mexico; the Venezuela and Colombia agreement with the Central American Common Market; Venezuela's agreement with Chile to begin phasing out tariffs over a 6-year period; and a free trade pact between Colombia, Mexico, and Venezuela to phase out tariffs.

During MERCOSUR negotiations Brazil discussed measures to lower its average tariff to approximately 14% and abolish the 40% ceiling on foreign investor stockholdings in privatized companies. Brazil also signed an agreement with Peru to reduce tariffs on bilateral trade by 50%. Chile signed an agreement with Colombia to eliminate tariffs entirely by 1999. In 1993, Argentina signed a bilateral investment treaty with the United States guaranteeing U.S. investors the best of national or most-favored-nation treatment, free transfer of profits, and access to international arbitration.

Privatization and Investment Interest

Many governments recognize that privatization of ownership and acceptance of foreign investment fosters vigorous growth, not least in the mining industry, leading to enhanced revenues and, for many countries, expanded overall economic strength in labor and wages. The year 1995 saw the continuation of a strong trend toward privatization in Latin America. A significant proportion of U.S. and Canadian interest, along with mining development capital, was shifting to Latin America. Among the most popular geologic exploration targets were the Cordillera and the Guyana Shield. The Cordillera extends southward through Mexico and Central America to the Andes of South America, virtually to Tierra del Fuego. The Guyana Shield comprises parts of northern Brazil and smaller countries between Brazil and the northern coast.

The lure of rights to private ownership in Latin American countries such as Argentina, Bolivia, Chile, Colombia, Ecuador, Guyana, Mexico, Peru, and Venezuela attracted great interest in the mineral endowment of those countries. Even Cuba, seeking sources of hard currency for its economy, increasingly permitted exploration efforts by foreign companies for metals and petroleum while entering negotiations to formalize its long-term processing of nickel matte in Canada.

Venezuela courted foreign exploration for metals, particularly gold, and encouraged joint efforts in petroleum operations. The gold rush, now several years old, persisted around "Kilometre 88" on Highway 10 south of El Dorado,

the site of the Las Cristinas (Placer Dome, 70%, Government, 30%) major gold project. Many other companies, mostly but not entirely U.S. and Canadian, acquired concessions throughout this area, roughly 30 kilometers (km) by 45 km. Although public concern remained high over mercury pollution in the Las Cristinas area from old garimpeiros' (unauthorized miners) panning operations, interest did not stop there. Many of the same companies explored for gold and diamonds toward the south and east, throughout the Guyana Shield but north of the Brazil border, through Guyana, Suriname, and French Guinea.

Brazil, itself highly mineralized and a major player in the mining world, awaited congressional ratification of new constitutional provisions on privatization and foreign investment. By keeping inflation under control via its new currency, the "Real," Brazil has established a favorable climate for investment and especially the privatization of state-owned companies. This new stabilization plan has invoked stricter control of the domestic deficit, stable rules for repatriation of capital and profits, stable foreign exchange rates, reduction of tax burdens, renegotiation of international debt, and the reduction of tariffs and nontariff barriers.

Privatization of business ownership and operations advanced at varying rates in countries such as Argentina, Bolivia, Chile, Colombia, Ecuador, and Peru and was anticipated in others.

After adopting new mining and environmental laws in 1992, Mexico continued its privatizing efforts but was hindered by the collapse of the peso at the end of 1994 and into 1995, which resulted in a strong economic recession and financial uncertainty. Plans for privatization of the petrochemical industry went forward, but with waning enthusiasm.

For the present, privatization in Chile extended only to joint ventures with the Government parastatal companies. The state-owned Comision Chilena del Cobre (CODELCO) was still negotiating on a joint venture with the Cyprus Amax Mineral Co. (U.S.) on the El Abra copper project, according to CODELCO. Commitments in the \$4 billion to \$6 billion range in major capital investments were being considered for this and a number of other new copper projects or expansions along with several new gold-mining projects in Chile.

Similarly, the Peruvian Government negotiated the sale of its Cerro Verde copper project to the U.S. company Cyprus Mines. Other negotiations resulted in the sale of the Tintaya copper mine to another U.S. company, Magma Copper. Investment was invited for CENTROMIN, the parastatal base-metal mining company, which intended the sale of each of its seven mines.

The Corporacion Minera de Bolivia, widely known as COMIBOL and once the leading mineral producer in the country, sought private partners to operate its existing mines under joint-venture or other contracts. The Bolivian

Government has undertaken significant legal and regulatory reforms, such as a single income tax rate of 25%, enactment of environmental laws to balance the need for environmental protection against the imperative of sustainable economic development, and a revised mining code ensuring equal treatment of foreign and domestic investors.

In Canada, privatization was not a concern. That country recently has seen increasing environmental challenge to property development, mining, and closure or abandonment. The industry has striven to respond to responsible criticism by way of adopting environmentally acceptable methods of operation. However some companies have chosen to shift their interest elsewhere, particularly to Latin American countries. Otherwise, groups of Canadian citizens representing all views have combined to reconcile conflicting interests between preservation and development. This effort brought together a coalition of Federal and local governments, native peoples, industry, labor unions, and nongovernmental organizations to formulate a common policy integrating public land use, resource development, and the environmental and economic concerns of the nation's people. Progress was evident in 1995, but the work continued.

¹Based on information available as of Dec. 1995.

²Unless otherwise noted, all listings of mineral commodities or countries for enumerative or comparative purposes are stated in order of importance based on volumes produced, exported, or imported.

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TABLE 1
PRODUCTION OF SELECTED MINERALS IN LATIN AMERICA AND CANADA, 1995

(Thousand metric tons unless otherwise specified)

	Metals										
	Aluminum primary metal	Bauxite	Copper mine output	Gold (tons)	Iron ore, (gross weight)	Lead mine output	Nickel mine output	Silver (tons)	Steel, crude	Tin mine output	Zinc, mine output
Argentina	165	--	(1/)	1	--	11	--	48	3,617	--	32
Bolivia	--	--	(1/)	14	--	20	--	425	--	14	146
Brazil	1,180	11,370	49	42	186,000	1	33	55	25,076	22	150
Chile	--	--	2,488	39	8,174	1	--	1,032	1,013	--	30
Colombia	--	2	11	21	734	(1/)	24	6	792	--	(1/)
Costa Rica	--	--	--	1	--	--	--	(1/)	--	--	--
Cuba	--	--	2	--	--	--	41	--	207	--	--
Dominican Republic	--	--	--	3	--	--	49	21	--	--	--
Ecuador	--	--	(1/)	7	--	(1/)	--	(1/)	22	--	(1/)
El Salvador	--	--	--	--	--	--	--	--	10	--	--
Guatemala	--	--	--	(1/)	3	(1/)	--	--	18	--	--
Guyana	--	2,100	--	12	--	--	--	--	--	--	--
Honduras	--	--	(1/)	(1/)	--	2	--	25	--	--	15
Jamaica	--	10,857	--	--	--	--	--	--	25	--	--
Mexico	10	--	332	20	8,523	164	--	2,324	12,128	(1/)	364
Nicaragua	--	--	--	2	--	--	--	2	--	--	--
Panama	--	--	--	1	--	--	--	(1/)	--	--	--
Paraguay	--	--	--	--	--	--	--	--	96	--	--
Peru	--	--	405	53	7,500	233	--	1,908	515	22	682
Suriname	32	3,300	--	(1/)	--	--	--	--	--	--	--
Trinidad and Tobago	--	--	--	--	--	--	--	--	738	--	--
Uruguay	--	--	--	1	5	--	--	--	40	--	--
Venezuela	630	5,184	--	7	19,484	--	--	--	3,634	--	--
Others 2/	--	--	--	3	--	--	--	--	--	--	--
Total Latin America	2,017	32,813	3,287	227	230,423	432	147	5,846	47,931	58	1,419
Share of world total (percent)	10	30	33	10	22	16	14	40	6	31	20
Canada	2,172	--	729	150	38,560	210	181	1,245	14,415	--	1,111
Total Latin America and Canada	4,189	32,813	4,016	377	268,983	642	328	7,091	62,346	58	2,530
Share of world total (percent)	22	30	40	17	26	24	32	49	8	31	36
United States	3,375	W	1,850	320	62,489	394	2	1,636	95,172	--	644
Total Western Hemisphere 3/	7,564	32,813	5,866	697	331,472	1,036	330	8,727	157,518	58	3,174
Share of world total (percent)	39	30	58	31	32	38	32	60	21	31	45
Total world	19,403	109,167	10,048	2,252	1,031,481	2,707	1,036	14,618	751,704	187	7,120

See footnotes at end of table.

TABLE 1--Continued
 PRODUCTION OF SELECTED MINERALS IN LATIN AMERICA AND CANADA, 1995

(Thousand metric tons unless otherwise specified)

	Industrial Minerals						Fuels			
	Barite crude	Cement, hydraulic	Gypsum crude	Phosphate rock (P ₂ O ₅)	Salt, all forms	Sulfur, all forms	Coal, all grades	Natural gas, gross (million cubic meters)	Petroleum (million 42-gallon barrels)	
									Crude	Products
Argentina	27	6,200	532	--	987	--	210	27,000	265	139
Bolivia	11	869	2	--	5	--	--	5,346	10	10
Brazil	70	25,500	780	700	6,100	261	5,173	8,115	257	458
Chile	3	2,900	550	3	3,000	360	1,500	4,300	4	47
Colombia	21	9,624	450	11	565	75	26,020	7,674	213	94
Costa Rica	--	990	--	--	47	--	--	--	--	4
Cuba	--	1,200	130	--	180	5	--	37	10	60
Dominican Republic	--	1,453	--	--	--	--	1	--	--	11
Ecuador	--	3,000	--	--	--	14	--	200	143	45
El Salvador	--	875	5	--	30	--	--	--	--	6
Guatemala	1	1,560	62	--	100	--	--	13	2	5
Guyana	--	--	--	--	--	--	--	--	--	--
Honduras	--	655	26	--	25	--	--	--	--	2
Jamaica	--	524	208	--	19	--	--	--	--	5
Mexico	248	23,971	4,918	180 4/	7,670	2,902	11,233	38,879	957	486
Nicaragua	--	350	13	--	15	--	--	--	--	5
Panama	--	350	--	--	22	--	--	--	--	10
Paraguay	--	600	5	--	--	--	--	--	--	2
Peru	37	2,100	35	12	238	60	80	1,200	47	55
Suriname	--	50	--	--	--	--	--	--	2	--
Trinidad and Tobago	--	600	--	--	--	--	--	8,000	48	37
Uruguay	(1/)	1,000	145	--	--	2	--	--	--	11
Venezuela	--	7,000	135	23	350	180	4,700	45,000	868	369
Others 5/	--	580	--	--	1,526	75	--	35	(1/)	59
Total Latin America	418	91,951	7,996	929	20,879	3,934	48,917	145,799	2,826	1,853
Share of world total (percent)	9	6	8	2	11	7	1	5	12	7
Canada	57	10,722	7,956	--	10,893	9,010	74,916	192,530	662 6/	650
Total Latin America and Canada	475	102,673	15,952	929	31,772	12,944	123,833	338,329	3,488	2,503
Share of world total (percent)	11	7	16	2	17	24	3	12	15	10
United States	543	78,320	16,587	12,765	42,150	11,770	934,128	679,834	2,394	5,838
Total Western Hemisphere 3/	1,018	180,993	32,539	13,694	73,922	24,714	1,057,961	1,018,163	5,882	8,341
Share of world total (percent)	23	13	33	34	39	46	24	37	26	33
Total world	4,412	1,420,000	98,127	40,146	188,686	54,258	4,484,000	2,750,170	22,703	25,240

W Withheld to avoid disclosing company proprietary data.

1/ Less than 1/2 unit.

2/ Includes French Guiana.

3/ Excludes Greenland.

4/ Includes only output used to manufacture fertilizers.

5/ Includes Aruba, The Bahamas, Barbados, French Guiana, Guadeloupe, Haiti, Martinique, the Netherlands Antilles, and St. Kitts and Nevis.

6/ Includes synthetic crude (from oil shale and/or tar sands).

TABLE 2
THE ROLE OF LATIN AMERICA IN WORLD MINERAL PRODUCTION

(Percent of world output) 1/

Commodity	1985	1990	1992	1993	1994	1995
Silver	35	35	34	31	39	33
Copper	26	26	28	30	31	33
Tin	25	28	31	32	32	31
Bauxite	20	24	28	28	28	30
Iron ore	17	21	21	20	22	22
Zinc	17	17	17	13	19	20
Lead	15	13	12	10	16	16
Nickel	6 e/	11	12	12	15	14
Crude oil	12	11	12	9	15	12
Gold	10	9	9	9	9	10
Aluminum	8	10	10	10	10	10
Petroleum products	7	9	9	9	8	7
Cement	7	7	7	7	7	6
Steel	5	5	5	6	6	6
Coal	1 r/	1	1	1	1	1

e/ Estimated. r/ Revised.

1/ By weight.