

THE MINERAL INDUSTRY OF VENEZUELA

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The Venezuelan economy contracted in 1996. The gross domestic product (GDP) decreased by 1.5%. (The Washington Times, 1997b). Inflation reached 103% (The Washington Times, 1997a). Mining contributed 1% to the GDP in 1996 (Ministerio de Energía y Minas, 1997a). Petroleum continued to be the most significant mineral commodity to Venezuela's economy and the largest source of foreign exchange contributing to about 80% of the country's exports.

In April, the Venezuelan Government introduced an economic adjustment plan (Agenda Venezuela) aimed at stabilizing the economy and creating the basis for long-term growth. The plan was backed by International Monetary Fund (Latin American Economy and Business, 1996a). Some of the key points under the adjustment plan, elimination of exchange controls and the program for privatizing Government enterprises, directly affect the mining sector (Ministerio de Energía y Minas, 1997b). The privatization of Corporación Venezolana de Guayana's (C.V.G.) selected mining and mineral-related industries, already stated as part of the Government policy prior to the new plan, had not materialized. The privatization of C.V.G.-Siderúrgica del Orinoco C.A. (SIDOR) and C.V.G.-Venezolana de Ferrosilicio C.A., subsidiaries of C.V.G. was scheduled for December 1996 and January 1997, respectively (Latin American Economy and Business, 1996b). Privatization of the aluminum sector was scheduled for 1997.

Under the Venezuelan Constitution, ownership of Venezuela's mineral and hydrocarbon resources in Venezuelan territory belong to the Nation and the rights to explore and exploit these resources may be granted through concessions. The Venezuelan mining law, published on December 28, 1944, covers regulation on prospecting, exploration, mining concessions, and claims. Various legislation and resolutions have been enacted to modify specific items of the mining law. Resolution No. 115 of March 1990 modified issues of concessions and mining contracts (Latin America Mining Institute, 1993). Resolution No. 96-12-02 deals with the exports of gold. The resolution requires 15% of the domestic gold production to be sold internally. Gold exporters must be registered with the Central Bank. Decree No. 2.095 of 1992, regulates foreign investment and ensures equal treatment for foreign and domestic investment. Under the decree, the domestic or international private sector may participate in the exploration and production of minerals, except iron ore, which is reserved for the Venezuelan Government. Its processing and transformation is opened to the private sector (Labrador, 1997, p. 7).

El Ministerio de Energía y Minas, the Ministry of Energy and Mines (MEM), is responsible for managing all mining and energy activities. In some instances, MEM has granted mining concessions to regional Government entities, which in turn, may lease these concession to the private sector. Nonmetallic minerals (for construction and ornamentals, excluding precious materials) are outside of the purview of the MEM, unless found in Government land. Under Article 7 of the mining law, these minerals may be exploited as determined by the land owner without further formality (Labrador, 1997, p. 10).

In 1996, Decree No. 3.281, which gave C.V.G., the right to enter into contracts on gold and diamonds, was derogated. In recent years, in an effort to encourage foreign investment, a new mining law has been proposed and has been sent to the Congress. In 1996, review of the proposed law continued and efforts to enact the new law were unsuccessful.

The Ley Orgánica del Ambiente deals with environmental control and the restoration of areas where mining activity occurred. In addition to MEM, the regional offices of the Ministerio de Recursos Naturales Renobables (the Ministry of the Environment and Renewable Natural Resources) must approve mining projects. For approval, companies must complete an environmental impact study and a mining reclamation plan. Decree No. 1.257 of March 1996, specifies mining activities for which environmental impact studies are required.

Venezuela is a significant producer of several mineral commodities. Even though petroleum, natural gas, and petroleum products continued to dominate the country's economy in 1996, and Venezuela's nonfuel mining industry contributed modestly to the country's GDP, Venezuela was an important producer of some nonfuel minerals. It was among the six leading world producers of bauxite and ranked eighth in the production of both alumina and aluminum. Venezuela also produced metal and metal products such as direct-reduced iron, ferroalloys, gold, iron ore, and steel. In the industrial mineral sector, Venezuela produced cement, diamonds, and other mineral commodities. Venezuela's production of coal, still modest by world standards, was on the increase and the country was planning to expand its production significantly.

Production of mineral commodities, in terms of volume, was mixed for Venezuela in 1996. Output of most metals increased during the year, while that of most of the industrial minerals decreased. Gold lead the increase with a 71% improvement in output level.

Venezuela's aluminum sector was controlled by the Government, with a small percentage of ownership by the

private sector. Bauxite and alumina were produced by C.V.G.-Bauxilum C.A. (BAUXILUM). Aluminum metal was produced by two smelters C.V.G.-Industria Venezolana de Aluminio C.A. (VENALUM) and C.V.G.-Aluminio del Caroní S.A. (ALCASA).

Production of bauxite increased by 11.5% from that of 1995. At the end of September, a memorandum of understanding was signed between the Japanese Consortium that owns 20% of VENALUM smelter and the Government-owned C.V.G., the majority owner of the smelter (Mining Journal, 1996b). The agreement was an important step in an effort to resolve the dispute between the two owners that resulted from the Venezuelan Government's efforts to remove the veto power held by the Japanese consortium in order to make the smelter, being offered to the private sector as part of a block that includes the bauxite and alumina producer, BAUXILUM and C.V.G.-Carbones del Orinoco C.A. (CARBONORCA), a producer of carbon anodes, more attractive to interested buyers. During the year, negotiations between the parties were halted when the Venezuelan Government halted shipments of aluminum ingots to Japan. After the agreement was signed, shipments to Japan resumed (Mining Journal, 1996c). The register for potential bidders was formally opened in July (Mining Journal, 1996a), but the sale, scheduled for December, did not proceed in 1996.

Official gold production reached 12 tons in 1996, a 71% increase from that of 1995. The sharp increase was attributed to higher production from the private sector. Production from C.V.G.-Compañía General de Minería C.A. (MINERVEN), a company owned by the Government holding company C.V.G. (33.3%) and C.V.G.-Ferrominera Orinoco C.A. (FERROMINERA) (66.7%) increased about 10% to 3.5 tons (Metals and Minerals Latin America, 1997). Illegal gold production has been estimated at 10 times the official production level for 1996 (Mining Journal, 1996d).

Production from La Camorra mine in the Bolívar State was 56,549 troy ounces (1,759 kilograms), a 15% increase from 1995 production. Based on 1996 data, reserves of 93,000 additional ounces, more than 1.5 years of production at 1996 output level, were discovered in 1996. On January 1, 1997, La Camorra's measured and indicated reserves were 390,000 ounces (about 12,000 kilograms) (Monarch Resources Limited, 1997). In addition, there were 101,000 ounces (about 3,100 kilograms) classified as inferred resources.

Gold production from Monarch's Revemin mill in 1996 was 13,370 ounces (416 kilograms). A more severe and prolonged rainy season, which limited the delivery of small mill tailings, was one of the reasons for the low output from the Revemin (Accessed February 1998 on the World Wide Web at URL <http://www.atamericas.com/pages/news.970423/ckk1.htm>). In April 1996, Monarch and El Callao Mining Corp. signed a 1-year contract for processing ore from El Callao Mining's Lo Increíble property at Revemin. However, because of operating problems, El Callao Mining was only able to deliver 9,000 tons at average levels lower than the 8 grams per ton from May to the beginning of October, when the contract was terminated. Because of the inability of Revemin to operate with the low level

of tailings available, Monarch decided to write off the net investment of its Venezuelan assets, with the exception of the Camorra mine, as of December 31, 1996.

El Callao Mining's Lo Increíble property covers more than 9,000 hectares in the Callao District. Four main gold target zones were discovered in a 7-kilometer belt in Lo Increíble including La Victoria and La Cruz. Limited production from La Victoria began in May 1996. Preliminary estimates of geological reserves by the company indicate 7.86 million tons of ore grading 0.106 grams of gold per ton (Bema Gold Corporation, 1996).

Crystallex International Corporation produced gold from its 500 hectare Albino 1 concession located east of Placer Dome Inc.'s Las Cristinas property in the Kilometro 88, Bolívar State. In 1996, gold output from Albino 1 decreased from 16,391 ounces (510 kilograms) in 1995 to 4,593 ounces (143 kilograms). The decrease was because of work being performed at the mill (Accessed February 1998 on the World Wide Web at URL <http://www.crystallex.com/96ar/96armd.html>). During the year, the mill's capacity was doubled from 200 to 400 tons per day (Accessed February 1998 on the World Wide Web at URL <http://www.crystallex.com/96ar/96arnemo.html>). As a result of the exploration program conducted in 1996, the Albino reserves were increased to 1,589,500 tons of ore averaging 6.03 grams of gold per ton for a total of 9.58 tons of contained gold (Crystallex International Corporation, 1997). Crystallex also has three other concessions in the region. The Carabobo concession is south of Albino 1 and Santa Elena 7 and 8 are about 50 miles (80 kilometers) of Carabobo in El Dorado District.

In January 1996, Bolivar Goldfields Ltd. commissioned a feasibility study on its Tomi property (80%), a 540-hectare mining concession in the Callao District (Bolivar Goldfields Ltd., 1996a). The company also has three concessions covering an area of 9,500 hectares east and south of Tomi, Dividual I and II, and Belén II. In total, Bolivar Goldfields holds 80% to 100% interest in 12 concessions, approximately 47,000 hectares in the Bolívar State (Bolivar Goldfields Ltd, 1996b).

In March, Placer Dome announced that it had completed a positive feasibility study for development of a mine and processing facilities at its 70%-owned Las Cristinas gold property in Bolívar State (Placer Dome, 1996b). The study estimated ore reserves of 8 million ounces in the main Cuatro Muertos and Conductor zones. With a combined 40,000-ton-per-day flotation/carbon pulp processing plant, the operation was expected to produce 450,000 ounces (about 14,000 kilograms) of gold per year for 14.5 years. Gold would be recovered in copper concentrate (60%) and doré (40%). The project was expected to produce about 36 million tons of copper per year.

In August, Placer Dome and the C.V.G., the Government-owned joint-venture partner (30%) in Las Cristinas project, announced the approval of the \$536 million expenditure for the gold mine pending completion of financing and a risk management plan, the cost of which is not included in the capital cost estimate (Placer Dome Inc., 1996a). Placer Dome's share of Las Cristinas ore reserves (70% of the total) as of December

31, 1996 was 162 million tons averaging 1.2 grams of gold per ton (Placer Dome Inc., 1997).

The Broken Hill Proprietary Company Ltd. formed a joint-venture partnership with Siderúrgica Venezolana S.A. (SIVENSA), the largest privately owned iron and steel company in Venezuela, for the construction of a 2-million-ton-per-year direct-reduction plant in Puerto Ordaz, Estado Bolívar. (Metal Bulletin, 1996a). The existing 400,000-ton-per-year Fior de Venezuela and the 715,000-ton-per-year Venprecar C.A. plants would become part of the 50-50 joint venture. The new plant, Orinoco Iron, scheduled to begin operating in 1998, will be built using the FINMET technology developed by Fior and Voest-Alpine of Austria. Venezuela is the world's leading producer of direct-reduced iron. SIVENSA operates three steelmaking plants through its subsidiary Siderúrgica del Turbio S.A. (SIDETUR). SIDETUR Barquisimeto, SIDETUR Antímano, and Casima have a combined capacity of 907,000 tons per year of raw steel (Accessed February 1998 on the World Wide Web at URL <http://www.sivensa.com.ve/us/corps.htm>).

Another direct-reduced iron plant was approved in 1996 (Metal Bulletin, 1996b). The 1-million-ton direct reduced plant was scheduled for completion in 1998. The owner, the Complejo Siderúrgico de Guayana (COMSIGUA) has Kobe Steel (35%) as its main shareholder. The Government of Venezuela owns 17% of COMSIGUA through FERROMINERA, the country's iron ore producer. All of the production from the COMSIGUA plant will be exported.

In August, the Government of Venezuela opened bids for the privatization of SIDOR. Sixty percent to 80% of SIDOR's shares were for sale (Metal Bulletin, 1996c). SIDOR was the largest steel producer in Venezuela.

Venezuela has the second largest resources of coal in South America after Colombia (Weaver, 1993). Production in 1996 increased slightly to 4.3 million tons, most of which came from the State of Zulia. The largest producer, Carbones del Guasare S.A., owned by Carbones de Zulia S.A. (a subsidiary of Petróleos de Venezuela S.A., the National oil company), Ruhrkohle Handel Inter, and Shell Coal International, operated the Paso Diablo and Socuy mines. The Paso Diablo mine produced about 70% of the country's total output in 1996. Although plans for production expansion from Paso Diablo mine continued, output for 1996 decreased because of difficulties with equipment and labor availability (Gellici, 1997). By 2002, expansion plans call for output from Paso Diablo and Socuy mines to reach 18 million tons (Petróleos de Venezuela S.A., 1997, p. 49).

Carbones de la Guajira S.A., a joint venture between Carbones de Zulia and Carbones del Mar S.A., a subsidiary of Evans Energy of the United States, was operating the Mina Norte and Chachirí also in the Guasare coal basin. Production from Mina Norte, which began in 1995, was estimated at 476,000 tons. Production from Mina Norte is expected to be 2 million tons at full capacity. The viability of Chachirí had not been determined at yearend 1996. In addition to the State of Zulia, three other States, Anzoátegui, Falcón, and Táchira, produced small amounts of coal.

Preliminary data indicate that exports of coal from Venezuela decreased about 20% to 3.5 million tons, probably in part owing to the decrease in output and exports from the Paso Diablo mine. However, the expansion of the coal sector is one of the priorities of the Venezuelan Government. Projected coal investment for 1997-2000 is \$2.5 billion (Ministerio de Energía y Minas, 1997a, p. 21), 38% of all public and private investment planned for the mining sector during that period.

In 1996, Venezuela was the leader in Latin America and the fifth in the world in natural gas reserves with 143 trillion (143×10^{12}) cubic feet (4 trillion cubic meters), with a production capacity of 6,053 million cubic feet per day (171.5 million cubic meters per day). Proven reserves of crude petroleum increased to 72.574 billion (72.5×10^9) barrels. Crude petroleum production capacity was 3.416 million barrels per day, 10% higher than that of 1995 (Petróleos de Venezuela S.A., 1997, p. 23). Production of crude petroleum in 1996 was almost 3 million barrels per day.

During the year, Venezuela continued with its strategy to increase the country's output level with the participation of the foreign private sector. Expansion plans call for more than doubling the Venezuela's production to 6.6 million barrels per day by 2006 (Oil & Gas Journal, 1997). Venezuela was the leading source of petroleum to the United States. The leading recipients of Venezuelan petroleum were the United States, Latin America and the Caribbean, and Europe.

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Major Sources of Information

- Dirección General Sectorial de Hidrocarburos
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TABLE 1
VENEZUELA: PRODUCTION OF MINERAL COMMODITIES 1/

(Thousand metric tons unless otherwise specified)

Commodity	1992	1993	1994	1995	1996	
METALS						
Aluminum:						
Alumina	1,310	1,500	1,300	1,641	1,700 e/	
Bauxite	1,117 r/	2,530 r/	4,419	5,022 r/	5,600	
Metal, primary, unalloyed	metric tons	561,000	568,000	585,445	629,828	634,800
Gold, mine output, Au content	kilograms	8,547 r/	8,985 r/	10,094	7,110 r/	12,127
Iron and steel:						
Iron ore and concentrate	18,887 r/	16,871	18,318	18,954 r/	20,842	
Metal, direct-reduced iron	4,230	4,510	4,710	4,720	5,340	
Ferroalloys:						
Ferromanganese e/	9 2/	-- 2/	--	--	--	
Ferrosilicomanganese	32	42	40 e/	40 e/	40 e/	
Ferrosilicon 3/	40	47	41	50 r/	63	
Total e/	81 2/	89 2/	81	90 r/	103	
Steel, crude	3,489	3,392	3,524	3,568 r/	3,725	
Semimanufactures, hot-rolled	2,450	2,560	2,390	3,080	3,100 e/	
Lead, secondary, refined e/	metric tons	15,000	14,000 2/	15,000 2/	16,000	16,000
INDUSTRIAL MINERALS						
Amphibolite	200	143 r/	50	243 r/	149	
Cement, hydraulic	6,590	6,840	6,927	7,672 r/	7,556	
Clays:						
Kaolin	41	32	10	6 r/	8	
Other	1,915 r/	2,036 r/	2,434	5,467 r/	2,263	
Diamond:						
Gem e/	carats	302,000 2/	267,000 r/	380,000 r/	125,000 r/	105,000
Industrial e/	do.	176,000 2/	144,000 r/	203,000 r/	66,000 r/	55,000
Total	do.	478,000	411,000 r/	583,000 r/	191,000 r/	160,000
Feldspar	182 r/	187 r/	137 r/	227 r/	156	
Gypsum	207 r/	210 r/	135	100 r/	30	
Lime e/	250	250	250	250	279 2/	
Nitrogen, N content of ammonia	404	535	505	600	650 e/	
Phosphate rock	21 r/	--	99 r/	169 r/	203	
Pyrophyllite e/	32	32	32	32	32	
Salt, evaporated e/	metric tons	318,000 2/	370,000	400,000	350,000	350,000
Serpentinite, crushed e/	550	550	550	550	550	
Stone, sand and gravel:						
Stone:						
Dolomite	300 r/	300 r/	300	300	275	
Granite	228 r/	394 r/	264	400 r/	256	
Limestone	15,182 r/	12,621 r/	11,687	16,630 r/	15,134	
Marble	134	--	--	--	--	
Sand and gravel	6,637 r/	3,562 r/	4,165	4,334 r/	3,367	
Silica sand	557 r/	882 r/	141	679 r/	748	
Sulfur, petroleum byproduct	155	135	158	180	250	
MINERAL FUELS AND RELATED MATERIALS						
Carbon black e/	60	60	60	60	60	
Coal, bituminous	2,480 r/	3,958	4,434 r/	4,264 r/	4,342	
Gas, natural:						
Gross	million cubic meters	43,400	42,500	31,640 r/	34,360 r/	38,470
Marketed e/	do.	15,000	15,000 2/	25,000 r/	26,000 r/	27,000
Natural gas liquids: 4/						
Natural gasoline	thousand 42-gallon barrels	18,600	7,900	11,300 e/	11,300 e/	12,000 e/
Liquid petroleum gas	do.	74,500	38,800	49,275	50,000 e/	55,000 e/
Total	do.	93,100	46,700	60,575	61,300 e/	67,000 e/
Petroleum:						
Crude	thousand 42-gallon barrels	907,000	816,000	940,000 r/	1,018,000 r/	1,086,000
Refinery products:						
Liquified petroleum gas	do.	3,500 e/	2,920	3,290	3,200 r/ e/	3,300 e/
Gasoline:						
Aviation	do.	300 e/	64 e/	--	--	-- e/
Motor	do.	105,000 e/	68,900	68,800	69,000 r/ e/	70,000 e/
Naphtha e/	do.	12,000	58,000 2/	50,500	50,000 r/	51,000
Jet fuel	do.	29,000 e/	28,500	27,700	27,700 r/ e/	28,000 e/
Kerosene	do.	1,000 e/	999	--	500 e/	600 e/

See footnotes at end of table.

TABLE 1--Continued
 VENEZUELA: PRODUCTION OF MINERAL COMMODITIES 1/ 2/

(Thousand metric tons unless otherwise specified)

Commodity	1992	1993	1994	1995	1996	
MINERAL FUELS AND RELATED MATERIALS--Continued						
Refinery products--Continued:						
Distillate fuel oil	thousand 42-gallon barrels	100,000 e/	104,000	93,800	94,000 e/	96,000 e/
Lubricants	do.	2,950 e/	3,320	2,750	2,600 r/ e/	2,700 e/
Residual fuel oil	do.	105,000 e/	102,000	96,400	96,000 r/ e/	98,000 e/
Asphalt and bitumen	do.	10,000 e/	8,230	10,300	10,000 r/ e/	10,200 e/
Refinery fuel gas e/	do.	9,000	27,900 2/	9,000	8,800 r/	9,000
Unspecified e/	do.	1,500	1,240	2,320 2/	2,200 r/	3,200
Total e/	do.	379,250	406,073	364,860	364,000 r/ 2/	372,000 2/

e/ Estimated. r/ Revised.

1/ Table includes data available through Dec. 1997.

2/ Reported figure.

3/ Figures represent combined 45%-silicon-content and 75%-silicon-content production.

4/ From nonassociated gas only.

TABLE 2
 VENEZUELA: STRUCTURE OF THE MINERAL INDUSTRY FOR 1996

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity	
Alumina	C.V.G.-Bauxilum C.A. (Government, 88.7%; Aluminio Suizo S. A., 11.3%)	Ciudad Guayana, Bolívar State	2,000.	
Aluminum	Aluminio del Caroní S.A. (ALCASA) (Government, 82%; Reynolds International, Inc. 8%)	do.	210.	
Do.	Industria Venezolana de Aluminio C.A. (VENALUM) (Government, 80%; six Japanese companies, 20%)	do.	430.	
Bauxite	C.V.G.-Bauxilum C.A.	Los Pijiguaos, Bolívar State	6,000.	
Cement	C. A. Venezolana de Cementos (VENCEMOS) (CEMEX)	Barquisimeto, Lara State; Maracaibo, Zulia State; Pertigalete, Anzoátegui State	5,265 clinker.	
Do.	C.A. Fábrica Nacional de Cementos (Lafarge 46.13%)		1,770. clinker.	
Coal	Carbones del Guasare S. A. (Carbones de Zulia S.A., 54.68%; Ruhrkohle Handel Inter, 22.66%; Shell Coal International, 22.66%)	Paso Diablo, Zulia State, Guasare coal basin	4,000.	
Do.	Carbones de la Guajira S.A. (Carbones de Zulia S.A., 36%; Cabones del Mar S.A., 64%)	Mina Norte and Chachirí, Zulia State, Guasare coal basin	500.	
Ferrosilicon	C.V.G.-Venezolana de Ferrosilicio C.A. (FELSIVEN) (Government, 100%)		55.	
Gold	kilograms Revemin (Monarch, 51%; C.V.G., 49%)	El Callao, Bolívar State	900 mill.	
Do.	do. Crystallex de Venezuela C.A. (100% Crystallex International Corporation)	Albino mine, Kilometro 88, Bolívar State	1,500 mill.	
Do.	do. Las Cristinas (Placer Dome, 70%; C.V.G. 30%)	Kilometro 88, Bolívar State	new.	
Do.	do. C.V.G.-Compañía General de Minería C.A. (MINERVEN) (Government 100%)	El Callao, Bolívar State	3,500.	
Iron ore	C.V.G. Ferrominera Orinoco C. A. (Government, 100%)	Cerro Bolívar, El Pao, Los Barrancos, and San Isidro mines, Bolívar State	20,000.	
Iron ore pellets	do.	Ciudad Guayana, Bolívar State	3,300.	
Nickel	Jordex Resources and Corporación de Caracas, 90%; Anglo American of South America, 10%)	Loma de Hierro, Aragua/Miranda States	new.	
Petroleum:				
Crude	million 42-gallon barrels	Petróleos de Venezuela S.A. (PDVSA) (Government, 100%)	Fields in Anzoátegui, Apure, Falcón, Guárico, Monagas, and Zulia States	1,250.
Refinery products	do.	do.	Major refineries at Amuay Bay and Cardón, both in Falcón State	434.
Steel		C.V.G.-Siderúrgica del Orinoco C.A. (SIDOR) (Government, 100%)	Ciudad Guayana, Bolívar State	3,600.
Do.		Siderúrgica del Turbio S.A. (SIDETUR) (100% private)	Antúmano, Barquisimeto, and Casima	907.