

THE MINERAL INDUSTRY OF

VENEZUELA

By Ivette E. Torres

Driven by high petroleum prices, Venezuela's gross domestic product (GDP) was \$120.4 billion,¹ which was a 3.2% increase in constant prices after a decrease of 6.1% in 1999 (Banco Central de Venezuela, December 28, 2000, Oferta y demanda global [Global supply and demand] accessed July 20, 2001, at <http://www.bcv.org.ve/cuadros/7/711a.htm>). Construction output contracted by 4.9%, but the mining, manufacturing, and petroleum sectors increased by 8.3%, 3.6%, and 3.4%, respectively (Banco Central de Venezuela, December 28, 2000, Producto interno bruto [Gross domestic product], accessed July 20, 2001, at URL <http://www.bcv.org.ve/cuadros/7/712a.htm>). Total unemployment decreased to 10.2% from 13.5% (revised) in 1999, and inflation was estimated to be 13% compared with 20% in 1999 (Latin-focus 2001, Venezuela economic indicators 1996-2001, accessed July 20, 2001, at URL <http://www.latin-focus.com/countries/venezuela/venindex.htm>).

The petroleum sector, which continued to dominate Venezuela's economic activity, represented 27.5% of the GDP at constant prices (Banco Central de Venezuela, December 28, 2000, Producto interno bruto [Gross domestic product], accessed July 20, 2001, at URL <http://www.bcv.org.ve/cuadros/7/712a.htm>) and 72.5% of exports (Banco Central de Venezuela, updated November 23, 2000, Comercio exterior [Foreign trade], accessed July 20, 2001, at URL <http://www.bcv.org.ve/cuadros/7/715a.htm>). Mining, which continued to contribute modestly to the economy, represented less than 1% of the GDP (Banco Central de Venezuela, December 28, 2000, Producto interno bruto [Gross domestic product], accessed July 20, 2001, at URL <http://www.bcv.org.ve/cuadros/7/712a.htm>).

Government Policies and Programs

The new mining law, Decreto No. 295 of September 5, 1999, which became effective in October 1999, replaced the Mining Law of 1945. The new law establishes the rules for all mines and minerals (except hydrocarbons and some industrial minerals not found in Government lands) within Venezuelan territory; exploration, production, beneficiation, storage, lease, distribution, transportation, and internal and external marketing of extracted substances not included in other laws are included. Under Venezuelan law, the country's mineral and hydrocarbon resources belong to the nation. Under the new decree, the Ministerio de Energía y Minas (MEM) is the Government institution responsible for all matters related to mining activity. Mining is permitted only through direct participation of Government, concessions, and production authorization to the

¹Where necessary, values have been converted from Venezuelan Bolivars (Bs) to U.S. dollars at the rate of Bs 680.25=US\$1.00.

small mining sector, mining cooperatives, and artisanal miners.

The new law establishes a combined 20-year exploration and production concession renewable for a period not to exceed 20 years. Exploration period for the concession is limited to 3 years with a possible extension of 1 year. The size of a concession is not to exceed 6,156 hectares (ha). A financial, technical, and environmental feasibility study must be presented to the MEM during the exploration period of the concession. With permission from the MEM, the concessions may be transferred, rented, or subcontracted.

The new mining law establishes the mining cooperative and regulates the artisanal mining sector for the first time. It defines the small mining sector in reference to the production of gold and diamond in areas not to exceed 10 ha to be worked by no more than 30 individuals with a nonrenewable, nontransferable permit unless transferred to a social fund to form a mining cooperative. The maximum production period is 10 years.

A permanent interministerial commission, which was integrated by the Ministries of Energy and Mining, Environment, Natural Resources, Finances, and Defense, was created to coordinate all aspects that affect the mining sector. The law proposes a one-stop office to deal with all associated permits related to mining concessions.

The surface tax that must be paid beginning at the fourth year of the concession eliminates the exploration tax. At the production phase of the concession, the production tax will be reduced from the surface tax. For gold, silver, and platinum-group metals, the production tax is 3% of the Caracas commercial value of the refined "mineral." Diamond and precious stones are taxed at 4% of the Caracas commercial value. Other minerals are taxed at a calculated 3% of commercial value at the mine. At the discretion of the Executive, the production tax may be reduced to 1% as merited by economic conditions.

The Executive also reserves the option of exempting mining entities of import taxation of items indispensable to mining but not produced in Venezuela. With permission from the Executive, equipment exempted from import taxation may be sold to a third party with the purchaser paying the import tax.

Industrial minerals, with the exception of precious materials, not found in Government lands continue to be governed by Articles 7, 8, 9, and 10 of the derogated Mining Law of 1945 until the individual States establish regulations.

At the expiration of the mining rights, all equipment and installations related to the mining activity will become the property of Venezuela without compensation to the concession holder.

The Instituto Nacional de Geología y Minería (INGEOMIN) (National Institute of Geology and Mining) was established as an independent agency ascribed to the MEM under the Decree.

INGEOMIN was charged with interdisciplinary research in geosciences, planning, execution, and coordination of all geoscience-related programs. The agency was also given responsibility for evaluating Venezuela's mineral and nonconventional energy resources, providing technical advice to other Government entities and the private sector, and disseminating technical and scientific information.

In 1975, the Government of Venezuela nationalized the petroleum sector. Under the law, production of hydrocarbons is reserved for the Government.

Production

In 2000, Venezuela was an important producer of nonfuel mineral commodities in the Latin American region, although it held modest ranking in terms of world output (table 1).

According to U.S. Geological Survey data, Venezuela ranked among the top 10 world producers of bauxite, alumina, and primary aluminum. In Latin America, it was the second largest producer of primary aluminum and iron ore (after Brazil), the third largest producer of bauxite and alumina (after Jamaica and Brazil) and phosphate rock (after Brazil and Mexico), and the fourth largest producer of cement (after Brazil, Mexico, and Colombia) and steel (after Brazil, Mexico, and Argentina).

In the Western hemisphere, Venezuela was the third largest producer of bauxite (after Brazil and Jamaica) and the fourth largest of alumina (after the United States, Brazil, and Jamaica), primary aluminum (after the United States, Canada, and Brazil), and phosphate rock (after the United States, Brazil, and Mexico).

Nonfuel mineral production in Venezuela increased compared with that of 1999 (table 1). Output of most of Venezuela's traditional mineral commodities—bauxite and alumina and iron ore—increased, production of primary aluminum remained at 1999 levels. Official production of diamond and gold also increased after 2 years of declining production. Few industrial minerals increased. Cement production was estimated to have increased by about 1%. Venezuela was a net exporter of cement.

Trade

Venezuela's exports totaled \$34.7 billion in 2000; of this, 72.5% (\$25.15 billion) was from petroleum. Imports totaled \$20.5 billion (Banco Central de Venezuela, updated December 28, 2000, Comercio exterior [Foreign trade], accessed July 23, 2001, at URL <http://www.bcv.org.ve/cuadros7/715a.htm>).

In 1999 (the last year for which data are available), exports of metals in all forms were valued at \$75.7 million, and their imports totaled \$18 million. Value of exports of industrial minerals, which included cement, totaled \$122.1 million, and that of their imports totaled \$56.3 million. In addition, exports of ferroalloys were valued at \$25.4 million, and their imports were only \$6.4 million. Exports of steel products were valued at \$66.9 million, and imports were valued at \$64.7 million (Ministerio de Energía y Minas, 2000, p. 92, 98, 180, 183, 214-217).

In 2000, Venezuela's crude petroleum exports averaged 2.823 million barrels per day (Mbbbl/d). The main recipient of

Venezuelan oil was the United States. Exports to Latin American and the Caribbean increased by 80,000 barrels per day (bbl/d) when compared with those of 1999. Venezuela began exporting crude petroleum to India; these exports totaled 7.5 million barrels. The price of Venezuelan export basket reached \$25.91 per barrel; this was a 60% increase from the average price in 1999 (Petróleos de Venezuela S.A., March 30, 2001, PDVSA's resources expand, company increases presence in energy markets, First Annual Shareholders' Regular Assembly, accessed on August 1, 2001, at URL http://www.pdvsa.pdv.com/news/english2001/asamblea1_en.html).

Structure of the Mineral Industry

The private sector participated in the production of nonfuel minerals in Venezuela; Government companies, however, controlled a great portion or the entire production of bauxite and alumina, aluminum, diamond, gold, and iron ore (table 2). Bauxite, alumina, and aluminum production was controlled by the Government through the Corporación Venezolana de la Guayana (C.V.G.). Private international companies held small interest in alumina and aluminum.

A large portion of gold was produced by C.V.G. or by its subsidiary C.V.G. Compañía General de Minería de Venezuela C.A.

Production of iron ore was nationalized in 1975. The only producer was C.V.G. Ferrominera Orinoco, C.A. Steel production became totally private in 1997 when Siderúrgica del Orinoco C.A. (SIDOR), which was the largest steel producer in Venezuela and the Andean region, was privatized. The ferrosilicon producer C.V. G. Felsiven C.A. was privatized in 1998.

Five private companies produced cement in Venezuela. CEMEX Venezuela S.A. (formerly Venezolana de Cementos), which was the largest company, was owned by Cementos Mexicanos S.A. de C.V. (CEMEX), which was the world's third largest cement company. Holderbank Management and Consulting Ltd. and Lafarge France, which were the other world-leading cement companies, held interests in Consolidada de Cementos C.A. and C.A. Fábrica Nacional de Cementos, which were the second and third largest cement companies, respectively, in Venezuela.

Following Venezuela's nationalization of the petroleum sector, Petróleos de Venezuela S.A. (PDVSA) was formed in 1976 as the Government company responsible for the exploration and production of all hydrocarbons. PDVSA also has the responsibility for crude refining and petrochemical manufacturing. Storing, transporting, and domestic and international marketing of hydrocarbons and their products are also the responsibility of PDVSA. Since the early 1990s, however, Corporación Venezolana de Petróleos (CVP) (a subsidiary of PDVSA) began to open opportunities to the private sector through a number of production agreements. The early program involved opening the production of inactive wells. CVP also entered into association with the private sector to explore new areas and to develop the extra-heavy crude in the Orinoco belt.

Commodity Review

Metals

Bauxite, Alumina, and Aluminum.—Venezuela produced 4.4 million metric tons (Mt) of bauxite in 2000; this was a 4.7% increase from that of 1999. Los Pijiguajos, State of Bolívar, which was owned by C.V.G. Bauxilum, C.A. (Bauxilum), was the sole producing bauxite mine in Venezuela. The mine had a production capacity of 6 million metric tons per year (Mt/yr). All the bauxite production was used in the domestic production of alumina by Bauxilum.

Alumina production was almost 1.8 Mt; this was a 19.5% increase from that of 1999. About 66% of the alumina was sold domestically. Production of primary aluminum, which was estimated to be 570,000 tons (t), was basically unchanged from that of 1999.

After several failed attempts at privatizing the aluminum sector in its entirety, Venezuela modified its approach to increase production capacity and to modernize its sector. On August 3, C.V.G. (the parent company of Bauxilum) signed an agreement with Pechiney of France to modernize and upgrade Bauxilum's bauxite and alumina production. Under the agreement, annual production capacity would increase to 2 Mt from the current (2000) 1.75 Mt, and the partners would improve technical performance. Early estimates of this project were between \$200 million and \$300 million (Mining Journal, 2000a; Pechiney, 2000). Although modified plans in 1999 called for a joint-venture partner for Bauxilum, the agreement did not call for Pechiney to become a shareholder in the bauxite and alumina producer. Plans not originally in the agreement called for further expansion of alumina capacity to 3 Mt (Mining Journal, 2000b).

Pechiney's interest in the Venezuelan aluminum sector was not limited to expanding the alumina production capacity. In August, the company expressed interest in investing more than \$2 billion in strategic associations, which included building a new 500,000-metric-ton-per-year (t/yr) smelter; investing in C.V.G. Carbonorca C.A., which was a 205,000-t/yr carbon anode plant; and participating in the second phase of alumina expansion to 3 Mt (Metal Bulletin, 2000b).

In December, the strategic partnership between Pechiney and C.V.G. was formalized. The agreement included a \$260 million investment and management support project and an expansion of the alumina plant to 2.15 Mt/yr with additional facilities to upgrade environmental performance and further expansion to 3 Mt/yr (Metal Bulletin, 2000c).

Gold.—Official production of gold increased by 23% to 7,332 kilograms (kg) in 2000, after 2 consecutive years of decline from its peak production level of more than 22,322 kg in 1997. La Camorra gold mine [owned by Minera Hecla Venezolana, C.A. (a subsidiary of Hecla Mining Company)], produced almost 2,900 kg (reported as 92,848 ounces) of gold in 2000. Reserves at La Camorra at yearend 2000 were 591,000 t with almost 12,000 kg (reported as 375,000 ounces) of gold (Hecla Mining Company, 2001).

In July, Crystallex International Corporation acquired Bolívar Goldfields' assets in Venezuela, which included the Tomi Mine,

the Remevin mill, and the 44,438-ha exploration area in El Callao for \$20 million. The mine and the mill were operated by Crystallex's subsidiary Crystallex de Venezuela, C.A. As of March 2000, minable reserves at Tomi from four pits (Charlie Richards, Fosforito, McKenzie, and Milagrillo) were 8,200 kg (reported as 263,000 ounces) of gold (Crystallex International Corporation, 2000c). Crystallex planned to expand the Remevin mill to 3,000 metric tons per day of ore by the last quarter of 2001 (Crystallex International Corporation, 2000a).

Crystallex also owned the Albino concession, which operated as an open pit from 1994 to 1998. Its economic feasibility as an underground mine was determined in 1999. The company planned to begin operations of the underground mine in 2001. As of December 2000, Albino 1 probable reserves totaled 398,616 t at a grade of 10.75 grams per ton (g/t) gold, a cutoff grade of 4.40 g/t, and a gold price of \$300 per ounce (Crystallex International Corporation, 2001, [p. ii]).

Crystallex also acquired through a takeover bid and the purchase of assets from the principal shareholder the 10,000-ha Lo Increible prefeasibility gold property in El Callao. In September, Crystallex entered into an agreement with Bema Gold Corporation, which owned 45% of El Callao Mining Corp.; El Callao owned 51% of Lo Increible (Crystallex International Corporation, 2000b). The transaction was completed at the end of January 2001. As of December 31, 2000, probable reserves of Lo Increible totaled 5.2 Mt at a grade of 3.146 g/t, a cutoff grade of 1 g/t, and a gold price of \$325 per ounce (Crystallex International Corporation, 2001, [p. ii]).

Crystallex also continued its legal battle over the rights of the Las Cristinas 4 and 6 concessions (Crystallex International Corporation, 2001, p. 19). As of December 21, 2000, the total cost to Crystallex of the acquisition effort was \$38 million. Las Cristinas, which was the most anticipated project in Venezuela in the last decade, was being developed by Placer Dome Inc. and C.V.G., but after construction had started in 1999, Placer Dome suspended the project activity in July by citing low gold prices (Placer Dome Inc., 1999). After reviewing its options in early 2000, Placer Dome informed C.V.G. that the project was not viable, and in June, the company wrote off its \$116 million investment in the project. In August, despite maintaining the project inactive, Placer Dome announced that it had reached an agreement with C.V.G. to extend the work contract for a year (Placer Dome, 2000a, b).

During the year, Gold Reserve Inc., which owned of the Brisas project south of Las Cristinas, made a proposal to the Venezuelan Government to combine the projects to create the second largest gold mine in Latin America and the world's sixth largest. The proposal envisioned a production of 40 t/yr of gold and 57,730 t/yr of copper (Metal Bulletin, 2000a).

Iron and Steel.—Production of iron ore from the Cerro San Isidro, Los Barrancos, and Las Pailas deposits, which were owned by C.V.G. Ferrominera Orinoco, C.A., increased by 23.5% to 17.4 Mt after 2 years of decline. Production of primary iron and raw steel increased by 26.4% and 17.6%, respectively. The steel sector continued to be affected by low internal demand, low international prices because of an excess world supply, and the decrease the Venezuelan construction industry in 2000.

SIDOR lost \$80 million in 2000 (Metal Bulletin, 2001). In early 2000, it restructured its debt, which allowed it to continue with its investment plan (Siderúrgica del Orinoco C.A., 2000, Acordada la reestructuración financiera de SIDOR [SIDOR's financial restructuring agreement reached], accessed July 26, 2001, at URL <http://www.sidor.com/english/archive/sidorflash.htm>). With a 6½-year loan from domestic and international creditors, SIDOR was able to restructure \$449 million of debt (El Universal, 2000, Sidor renegoció su deuda por \$449 million, [SIDOR renegotiated its debt for \$449 million], accessed December 8, 2000, at URL <http://universal.eud.com/2000/02/24/2425AA.shtml>). The company planned to invest \$787 million by 2005 for facility expansion; \$180 million was earmarked for 2000. The production goal by the end of the investment cycle was 4.3 Mt of raw steel; in 1999, production totaled 2.7 Mt (Siderúrgica del Orinoco C.A., 2000, Efectos sobre la economía venezolana [Impact on Venezuelan economy], accessed December 8, 2000, at URL <http://www.sidor.com/english/archive/sidorflash.htm>).

The Siderúrgica Venezolana S.A. (SIVENSA) (the parent company of Siderúrgica del Turbio C.A.) restructured its \$288 million debt in July. The company had losses of \$97.7 million in the fiscal year that ended in September 2000 after a loss of \$124 million in fiscal year 1999 mainly because of losses in its automobile parts division. SIVENSA was also affected by the losses of its Orinoco Iron hot-briquette plant, which totaled \$12.9 million, and of SIDOR; SIVENSA was an equity holder through its participation in Amazonia Consortium (El Universal, 2001, Sivensa pierde \$97.7 millones al cierre del año fiscal 2000 [Sivensa losses \$97.9 as the fiscal year 2000 ends], accessed July 26, 2001, at URL http://www.noticias.eluniversal.com/2001/01/30/30012001_69007.html). In April, SIVENSA decided to decrease its equity in the Consortium. Its original 20% share in the Consortium was decreased to 13.2% in 2000 and was expected to be reduced further to 10.4% by 2002 (El Universal, 2000, Operatividad y Finanzas, accessed July 26, 2001, at URL <http://noticias.eluniversal.com/2000/10/05/05204CC.shtml>).

The Orinoco Iron hot-briquette plant in Puerto Ordaz, which was a BHP Ltd. and SIVENSA (through its International Briquettes Holding) joint venture, began test production in May (International Briquettes Holding, 2000). The plant, which had a design capacity of 2.2 Mt, produced only 139,000 t of briquettes, which was significantly lower than the company had anticipated. Because of the poor operating and economic results, the future of the operation was unclear at yearend (Siderúrgica Venezolana S.A., 2001).

Nickel.—Construction of Minera Loma de Níquel, C.A., open pit mine and ferronickel plant, which was on the boundary of the States of Aragua and Miranda, was completed in 2000. Mine production at yearend was 2,472 t of contained nickel. Ferronickel production totaled 133 t (40 t of contained nickel) (International Nickel Study Group, 2001). Minera Loma de Níquel [owned by Anglo American plc (87.5%) of the United Kingdom, Grupo Federal de Venezuela (7.9%), International Finance Corp. of the World Bank (3.5%), and Jordex Resources Inc. of Canada (1.1%)] had an estimated cost of \$538 million and an expected production of about 17,500 t/yr of contained

nickel in ferronickel for 30 years. Loma de Níquel reserves were 42.4 Mt at a grade of 1.48% nickel (Anglo American plc, 2001, p. 59).

Industrial Minerals

Venezuela was the fourth largest cement producer in Latin America after Brazil, Mexico, and Colombia. Production of cement in 2000 was estimated to have increased slightly to 8.6 Mt despite the decrease in the construction sector. Venezuela was a net exporter of cement. CEMEX Venezuela (a subsidiary of CEMEX) was the largest producer with more than 50% of the country's production capacity.

Mineral Fuels

Coal.—Production of bituminous coal in Venezuela in 2000 increased by almost 19% to 7.8 Mt and was mainly for exports. About 86% of the production was from Carbones de Guasare, S.A., in the State of Zulia. Carbones de la Guajira, S.A., which was also in the State of Zulia, produced about 13% of the total. Both companies were owned by Carbozulia S.A. (a subsidiary of PDVSA in partnership with the private sector). The remaining 1% was produced in the State of Táchira. Since 1996, production has increased by 88%. Carbozulia had plans to increase production to 22.5 Mt. For that, the company was contemplating the improvement and expansion of the operations infrastructure, a train line, and a deep port facility in the Gulf of Venezuela (Petróleos de Venezuela, S.A., 2000, Planes de crecimiento [Growth plans], accessed August 1, 2001, at URL http://www.pdvsa.pdv.com/carbon/espanol/carbon_planes_es.html). Although production has increased significantly in recent years, expansion has been limited because of, among other things, lack of adequate infrastructure to support the expansion.

Petroleum and Natural Gas.—Venezuela's production of crude and condensate increased almost 4% to 3.2 bbl/d. PDVSA's net profits totaled \$7.353 billion (twice that of 1999), and world revenues were \$53.234 billion (63% increase from 1999). Proven reserves of crude and condensate increased to 77.685 billion barrels, and production capacity increased to 3.584 Mbbl/d (Petróleos de Venezuela, S.A., March 30, 2001, PDVSA's resources expand, company increases presence in energy markets, First Annual Shareholders' Regular Assembly, accessed August 1, 2001, at URL http://www.pdvsa.pdv.com/news/english2001/asamblea1_en.html).

PDVSA's 2001-06 plan called for an investment of \$43.5 billion and will focus on core activities, such as exploration and production, refining, natural gas, chemicals, Orimulsión, and coal. International and private participation is key to the plan with a 53% share of the investment (Petróleos de Venezuela, S.A., February 6, 2001, According to its 2001-2006 business plan, PDVSA promotes a maximum private sector participation in its oil business, accessed August 1, 2001, at URL http://www.pdvsa.pdv.com/news/english/2001/encuentro1_feb_en.html).

PDVSA approved an investment in the petroleum sector of \$5.7 billion for 2001; this was an increase of 22% from that of

2000. The budget included PDVSA's contribution to 36 operating agreements with the private sector. Crude petroleum production capacity planned for the year was 4.194 Mbb/d; this included output from the Orinoco belt extra heavy crude associations, which was a 17% increase from the 2000 output (Petróleos de Venezuela, S.A., December 12, 2000, PDVSA assembly approves next year's budget, accessed August 1, 2001, at URL http://pdvsa.pdv.com/news/english/2000/asamblea2000_en.html).

At yearend, one of the Orinoco belt associations began production. Sincor [a \$4 billion association of France's TotalFinaElf (47%), PDVSA (38%), and Norway's Statoil ASA (15%)] was to include production, transportation, upgrading, and marketing of heavy crude. Before completing the upgrading plant, extra-heavy crude (8.5° API) would be mixed with light crude (30° API) to produce a light crude (16° API) for export. The upgraded plant, which was scheduled for competition by yearend 2001, would convert 200,000 bbl/d of extra-heavy crude into 170,000 bbl/d of synthetic 32° API light crude (Petróleos de Venezuela, S.A., December 20, 2000, After a sustained two-year effort Sincor starts extra-heavy crude production in the Orinoco belt, accessed August 1, 2001, at URL http://pdvsa.pdv.com/news/english/2000/sincor_2012en.html).

Refinery.—PDVSA refined an average of 1.079 Mbb/d in its domestic refineries. Most of its refinery products were produced at the Paraguaná and the Puerto La Cruz refinery complexes. Venezuelan refinery production capacity was 1.3 Mbb/d in 1997. About 70% of the capacity was from the Paraguaná complex, which includes the Amuay and Cardón refineries (U.S. Department of Energy, March 20, 2001, An energy overview of Venezuela, accessed August 3, 2001 at URL <http://www.fe.doe.gov/international/venzover.html>).

Orimulsión.—Orimulsión is a PDVSA-patented boiler fuel (a mix of natural bitumen and water) used in power generation. Venezuela's production capacity of Orimulsión is 6.2 Mt/yr. The producing company was Bitúmenes de Orinoco, C.A. (Bitor) (a subsidiary of PDVSA). The company produced at 100% of installed capacity with earnings of \$60 million. It exported the fuel to Barbados, Canada, China, Denmark, Finland, Germany, Italy, Japan, and Lithuania.

In 2000, Bitor and China National Petroleum Corp. signed a 3-year agreement by which Bitor would export 4 Mt of Orimulsión to the Chinese company. Pending expansion of power generation by other customers, Bitor was planning to expand its production capacity to 12.4 Mt/yr by 2004 (Petróleos de Venezuela, S.A., 2001, Bitor profits reported at \$60 million, accessed August 1, 2001, at URL http://www.pdvsa.pdv.com/news/english/2001/resultados_bitor2000_en.html).

Electrical Energy.—In 1999 (the last year for which data are available), Venezuela had an electrical generation capacity about 21 gigawatts. Of this, 67% was hydroelectric, and 33% was thermal. With abundant sources of electricity, Venezuela had one of the highest electrification rates in Latin America at more than 90%. About 80% of the capacity was Government-owned (Corporate Information, 2001, Industry overview—

Electric power companies, accessed August 3, 2001, at URL <http://www.corporateinformation.com/vesector/Energy.html>). It generated 81.2 billion kilowatthours (GkWh) and consumed 75.5 GkWh (U.S. Department of Energy, March 20, 2001, An energy overview of Venezuela, accessed August 3, 2001, at URL <http://www.fe.doe.gov/international/venzover.html>).

References Cited

- Anglo American plc, 2001, Company report: London, Anglo American plc, 63 p.
- Crystallex International Corporation, 2000a, Crystallex accelerates mining activity in Venezuela: Vancouver, Canada, Crystallex International Corporation press release, October 19, 2 p.
- 2000b, Crystallex agrees to acquire control of Lo Increible project in Venezuela: Vancouver, Canada, Crystallex International Corporation press release, September 13, 3 p.
- 2000c, Crystallex closes the acquisition of Bolivar Goldfields' Venezuelan assets: Vancouver, Canada, Crystallex International Corporation press release, July 28, 2 p.
- 2001, 2000 company report: Vancouver, Canada, Crystallex International Corporation, 33 p.
- Hecla Mining Company, 2001, Hecla releases 4th quarter and year-end results, produces nearly 8 million ounces of silver: Coeur.d'Alene, Idaho, Hecla Mining Company press release, March 1, 12 p.
- International Briquettes Holding, 2000, Orinoco Iron's production test started up: Caracas, Venezuela, International Briquettes Holding press release, May 29, 1 p.
- International Nickel Study Group, 2001, Venezuela—Nickel production: World Nickel Statistics, v. 11, no. 7, July, p. 60.
- Metal Bulletin, 2000a, Gold Reserve seeks to create major Venezuelan gold resource: Metal Bulletin, no. 8528, November 23, p. 7.
- 2000b, Pechiney looks at investing \$2bn in Venezuela: Metal Bulletin, no. 8501, August 21, p. 5.
- 2000c, Venezuelan Al sector set for more investment after Pechiney-CVG deal: Metal Bulletin, no. 8532, December 7, p. 7.
- 2001, Bonus offer fails to prevent new Sidor strike: Metal Bulletin, no. 8472, May 7, p. 19.
- Mining Journal, 2000a, Pechiney signs Bauxilum agreement: Mining Journal, v. 335, no. 8597, August 25, p. 155.
- 2000b, Pechiney wins Bauxilum contract: Mining Journal, v. 335, no. 8595, August 11, p. 103.
- Ministerio de Energía y Minas, 2000, Anuario estadístico minero 1999 [Mining statistics yearbook 1999]: Ministerio de Energía y Minas, August, 231 p.
- Pechiney, 2000, Pechiney selected by the Venezuelan government: Paris, Pechiney press release, August 7, 1 p.
- Placer Dome Inc., 1999, Las Cristinas gold project suspended: Vancouver, Canada, Placer Dome Inc. press release, July 15, 1 p.
- 2000a, Placer Dome's Las Cristinas contract extended: Vancouver, Canada, Placer Dome Inc. press release, August 9, 1 p.
- 2000b, Placer Dome's Las Cristinas remains on hold: Vancouver, Canada, Placer Dome Inc. press release, January 14, 1 p.
- Siderúrgica Venezolana S.A., 2001, International Briquettes Holding: Caracas, Venezuela, Siderúrgica Venezolana press release, March 28, 1 p.

Major Sources of Information

Ministerio de Energía y Minas (MEM)

Av. Lecuna, Parque Central

Torre Oeste, Piso 14

Caracas, Venezuela

Telephone: (58-212) 507 52 01

Fax.: (58-212) 575 43 86

Dirección de Planificación y Economía Minera

Av. Lecuna, Parque Central

Torre Oeste, Piso 6

Caracas, Venezuela

Telephone: (58-212) 507 59 70

Fax.: (58-212) 575 52 39

Instituto Nacional de Geología y Minería (INGEOMIN)

Av. Lecuna, Parque Central
Torre Oeste, Piso 8
Caracas, Venezuela
Telephone: (58-212) 507 52 46
Fax.: (58-212) 576 32 17

Carbones del Guasare, S.A.

Edif. Industrial Piso 5
Calle 77, esq. Av. 9B
Maracaibo, Estado Zulia, Venezuela
Telephone: (58-261) 7906440
Fax.: (58-261) 80868791

Carbones de la Guajira, S.A.

Av. 3E, entre calles 78 y 79
Sector Valle Frío
Torre Empresarial Claret, Piso 10
Maracaibo, Estado Zulia, Venezuela
Telephone: (58-261) 7930830
Fax.: (58-261) 7932468

Corporación Venezolana de Guayana (G.V.G.)

Av. La Estancia
Edificio General, Piso 2
Chua, Caracas, Venezuela
Telephone: (58-212) 991 31 77
Fax.: (58-212) 993 85 49

C.V.G. Ferrominera Orinoco C.A.

Av. La Estancia

Torre Las Mercedes, Piso 9
Chua, Caracas, Venezuela
Telephone: (58-212) 991 19 77 54
Fax.: (58-212) 991 19 77

C.V.G. Bauxilum, C.A./VENALUM, C.A.

Av. La Estancia
Torre Las Mercedes, Piso 9
Chua, Caracas, Venezuela
Telephone: (58-212) 991 11 43
Fax.: (58-212) 993 35 38

C.V.G. Aluminios del Caroní, S.A.

Av. La Estancia
Torre Las Mercedes, Piso 9
Chua, Caracas, Venezuela
Telephone: (58-212) 991 11 43
Fax.: (58-212) 959 42 74

C.V.G. Compañía General de Minería, C.A. (MINERVEN)

Av. La Estancia
Torre Las Mercedes, Piso 9
Chua, Caracas, Venezuela
Telephone: (58-212) 991 11 43
Fax.: (58-212) 993 35 38

Ministerio del Ambiente y de los Recursos Naturales

Centro Simón Bolívar
Caracas, Venezuela
Telephone: (58-212) 408 14 94
Fax.: (58-212) 481 74 16

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

(Thousand metric tons unless otherwise specified)

Commodity	1996	1997	1998	1999	2000	
METALS						
Aluminum:						
Alumina	1,701	1,730	1,553	1,469 r/	1,755	
Bauxite	4,807	4,967	4,826	4,166	4,361	
Metal, primary, unalloyed	metric tons	629,263	633,836	584,690	570,321	570,000 e/
Gold, mine output, Au content	kilograms	11,719	22,322	6,740	5,946	7,332
Iron and steel:						
Iron ore and concentrate	18,480	18,503	16,553	14,051	17,350	
Metal, direct-reduced iron	5,732	5,608 r/	5,424 r/	5,071 r/	6,412	
Ferroalloys:						
Ferromanganese	--	--	10	-- r/	--	
Ferronickel	--	--	--	--	133	
Ferrosilicomanganese	53	64	49	50	50	
Ferrosilicon 3/	60	58	36	40	57	
Total	113	122	95	90 r/	240	
Steel, crude	3,956	3,986	3,553	3,261	3,835	
Semimanufactures, hot-rolled	2,692	3,287	2,643	2,756	2,800 e/	
Nickel, mine 9/	metric tons	--	--	--	2,472	
Lead, secondary, refined e/	do.	16,000	16,000	16,000	16,000	16,000
INDUSTRIAL MINERALS						
Amphibolite	77	59	--	-- r/	-- e/	
Cement, hydraulic	7,556	8,145	8,202	8,500 e/	8,600 e/	
Clays:						
Kaolin	8	5	4	12	10 e/	
Other	2,737	2,759	2,099	2,180 r/	2,180	
Diamond:						
Gem	carats	99,129	199,564	80,033	59,446	65,000 e/
Industrial	do.	72,887	84,644	16,778	35,698	44,600 e/
Total	do.	172,016	248,208	96,811	95,144	109,597
Feldspar	205	160	148	125 r/	139	
Gypsum	57	80	72	42	25	
Lime	279	321	378	400 e/	400 e/	
Nitrogen, N content of ammonia	605	612	522	522 r/	377	
Phosphate rock	148	291	322	366	389	
Pyrophyllite e/	32	32	32	32	32	
Salt, evaporated e/	metric tons	350,000	350,000	350,000	350,000	350,000
Serpentinite, crushed e/	550	550	550	550	550	
Stone, sand and gravel:						
Stone:						
Dolomite	225	204	71	--	12	
Granite	286	400	807	1,151	581	
Limestone 4/	15,873	14,177	14,246	13,735 r/	11,302	
Sand and gravel	3,660	4,218	4,753	5,431 r/	3,106	
Silica sand 4/	763	798	344	295 r/	331	
Sulfur, petroleum byproduct	250	319	425	450 r/ e/	450 e/	
MINERAL FUELS AND RELATED MATERIALS						
Carbon black e/	60	60	60	60	60	
Coal, bituminous	4,181	5,291	6,458	6,593	7,844	
Gas, natural:						
Gross	million cubic meters	55,105	59,771	62,167	58,744	60,000 e/
Marketed	do.	35,648	36,901	39,005	36,000 e/	37,000 e/
Natural gas liquids: e/ 5/						
Natural gasoline	thousand 42-gallon barrels	12,000	12,000	13,697 6/	14,000	14,000
Liquid petroleum gas	do.	55,000	55,000	53,074 6/	53,000	53,000
Total	do.	67,000	67,000	66,771 6/	67,000	67,000
Petroleum:						
Crude 7/	do.	1,088,850	1,153,400	1,215,120	1,077,352	1,117,475
Refinery products:						
Liquified petroleum gas	do.	4,136	5,026	4,636	4,150 r/ e/	4,270 e/
Gasoline, motor	do.	66,173	67,908	70,956	63,600 r/ e/	65,400 e/
Naphtha and other gasolines	do.	65,697	72,828	72,964	65,400 r/ e/	67,200 e/
Jet fuel	do.	30,327	31,069	32,551	29,200 e/	30,000 e/

See footnotes at end of table.

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

(Thousand metric tons unless otherwise specified)

Commodity	1996	1997	1998	1999	2000
MINERAL FUELS AND RELATED MATERIALS--Continued					
Petroleum--Continued:					
Refinery products--Continued:					
Kerosene	966	1,175	766	687 r/ e/	706 e/
Distillate fuel oil	108,263	121,300	120,815	108,300 r/ e/	111,400 e/
Lubricants	2,233	2,051	2,227	2,000 e/	2,100 e/
Residual fuel oil	83,960	79,059	80,957	72,600 r/ e/	74,700 e/
Asphalt and bitumen	11,053	11,618	10,986	9,900 r/ e/	10,200 e/
Petroleum coke	8,231	10,888	8,369	7,500 r/ e/	7,700 e/
Parafins	47	201	190	170 r/ e/	175 e/
For internal consumption	24,888	26,393	27,200	24,400 r/ e/	25,100 e/
Unspecified	1,632	1,993	2,581	2,300 r/ e/	2,400 e/
Losses	(3,916)	(8,362)	(8,140)	(7,300) r/ e/	(7,500) e/
Total 8/	405,686 r/	425,144 r/	429,056 r/	382,885 p/	393,835 p/

e/ Estimated. r/ Revised. p/ Preliminary. -- Zero.

1/ Table includes data available through August 3, 2001.

2/ Estimated data are rounded to no more than three significant digits; may not add to totals shown.

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

4/ Excludes production under contract with the Government.

5/ From nonassociated gas only.

6/ Reported figure.

7/ Includes condensate and bitumen for the production of Orimulsión.

8/ Excludes byproduct sulfur, which is reported in the industrial minerals portion of this table, but includes losses.

9/ Revised June 6, 2003.

TABLE 2
VENEZUELA: STRUCTURE OF THE MINERAL INDUSTRY IN 2000

(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	1,750.
Aluminum	Aluminio del Caroní, S.A. Government, 82%; Alcoa, 7.3%)	do.	210.
Do.	Industria Venezolana de Aluminio C.A. (Government 80%; six Japanese companies, 20%)	do.	430.
Bauxite	C.V.G. Bauxilum C.A.	Los Pijiguaos, Bolívar State	6,000.
Cement	CEMEX Venezuela, S.A. C.A. (Cementos Mexicanos S.A. de C.V., 100%)	Barquisimeto, Lara State; Maracaibo, Zulia State; Pertigalete, Anzoátegui State; San Cristóbal, Táchira State	5,400.
Do.	Consolidada de Cementos C.A. (Holderbank Management and Consulting Ltd., 50%)	Cumarebo, Falcón State; San Sebastián de los Reyes, Aragua State	2,280.
Do.	C.A. Fábrica Nacional de Cementos (Lafarge France, 46.13%)	Palmira; Ocumare del Tuy, Miranda State	1,330.
Do.	Cementos Catatumbo (Lafarge France, 23.32%)	Montellano, Zulia State	650.
Do.	Cemento Andino	Curcas, Trujillo State	560.
Coal	Carbones del Guasare, S.A. (Carbozulia S.A., 54.68%; RAG International Coal AG, 22.66%; and Shell Coal International, 22.66%)	Paso Diablo, Zulia State, Guasare coal basin	5,500.
Do.	Carbones de la Guajira, S.A. (Carbones del Mar, S.A., 64%; Carbozulia S.A., 36%)	Mina Norte and Cachirí, Zulia State, Guasare coal basin	500.
Ferrosilicon	Venezolana de Ferrosilicio C.A. (Ferroatlántica S.L., 80%)	Ciudad Guayana, Bolívar State	80.
Gold	kilograms Revemin (Crystallex de Venezuela C.A., 51%; C.V.G., 49%)	Tomi Mine and Remevin mill, El Callao, Bolívar State	1,500 mill.
Do.	do. El Callao Mining Corp. (Crystallex de Venezuela C.A., 80%)	La Victoria (Lo Increíble), El Callao, Bolívar State	1,700.
Do.	do. La Camorra (Minera Hecla Venezolana, C.A.)	El Callao, Bolívar State	2,300.
Do.	do. C.V.G. Compañía General de Minería C.A. (C.V.G. Ferrominera Orinoco C.A., 66.77%; Corporación Venezolana de la Guayana, 33.23%)	Colombia and Unión mines, Caratal and El Perú plants, El Callao, Bolívar State	3,500.
Iron ore	C.V.G. Ferrominera Orinoco C.A. (Government, 100%)	Cerro San Isidro, Los Barrancos, and Las Las Pailas, Bolívar State	25,000.
Iron ore pellets	do.	Ciudad Guayana, Bolívar State	3,600.
Do.	Siderúrgica del Orinoco C.A. (SIDOR) (Amazonia Consortium, 70%, C.V.G. 30%)	do.	7,000.
Direct-reduced iron	do.	do.	4,600.
Do.	Complejo Siderúrgico De Guayana C.A. (Kobe Steel, 36.7%; C.V.G. Ferrominera, 17.4%; Tubos de Acero de México, S.A., 6.9%; Mitsui and Co. Ltd., Nissho Iwai Corp., Tomen Corp., and Shinsho Corp., 30.3%; and International Finance Corp., 8.7%)	do.	1,000.
Nickel	Loma de Níquel S.A. (Anglo American plc, 87.5%; Grupo Federal de Venezuela, 7.9%; International Finance Corp, 3.5%; and Jourdex Resources Inc., 1.1%)	Loma de Níquel, Aragua and Miranda States	16.
Petroleum:			
Crude	million 42-gallon barrels Petróleos de Venezuela, S.A. (Government, 100%)	Fields in Anzoátegui, Apure, Falcón, Guárico, Monagas, and Zulia States	1,380.
Refinery products	do. do.	Refineries in Amuay and Cardón in Falcón State, Puerto La Cruz and San Roque in Anzoátegui State, El Palito in Carabobo State, and Bajo Grande in Zulia State	434.
Steel	SIDOR (Amazonia Consortium, 70%, C.V.G., 30%)	Ciudad Guayana, Bolívar State	3,750.
Do.	Siderúrgica del Turbio C.A. (Siderúrgica Venezolana Sivensa S.A., 100%)	Antimano, Barquisimeto, and Casima	907.