

VENEZUELA¹

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At current prices, Venezuela's gross domestic product (GDP) was \$126.1 billion². At constant prices, the GDP increased by 2.8% from that of 2000; this was a slightly smaller increase than that of 2000 when the GDP increased by 3.2% (Banco Central de Venezuela, 2002b³). Construction output increased by 13.5% after a reduction of 4.9% in 2000. Mining and manufacturing increased by 1.1% and 2.8%, respectively. Petroleum, however, decreased by 8.7% (Banco Central de Venezuela, 2002c³). Total unemployment increased to 11% from 10.2% in 2000 (Latin-focus, 2002b³). During the second semester of 2000 (the latest period of time for which information is available), the construction sector had the highest unemployment rate at 23%. Unemployment in petroleum and mining and quarrying was 8.2% (Banco Central de Venezuela, 2002d³). Inflation decreased to 12.3% from 13.4% in 2000 (Latin-focus, 2002a³).

The petroleum sector, which continued to dominate Venezuela's economic activity, represented 26.4% of the GDP at constant prices and 76.5% of exports of goods and services at 2001 prices (Banco Central de Venezuela, 2002a³, c³). Mining, which continued to contribute modestly to the economy, represented less than 1% of the GDP (Banco Central de Venezuela, 2002a³, c³).

Government Policies and Programs

The mining law Decreto No. 295 of September 5, 1999, which became effective in October 1999, replaced the Mining Law of 1945. This 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 state. Under the Decreto, 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 the Government, concessions, and production authorization to artisanal miners, mining cooperatives, and the small-mining sector.

The 1999 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 for 1 year. The size of a concession is not to exceed 6,156 hectares (ha). An environmental, financial, and technical feasibility study must be presented to the MEM during the exploration period of the concession. With permission from the MEM, the concessions may be rented, subcontracted, or transferred.

¹Revised on March 16, 2004.

²Where necessary, values have been converted from Venezuelan bolivars (Bs) to U.S. dollars at the rate of Bs724.46=US\$1.00.

³References that include a section twist (§) are found in the Internet References Cited section.

The 1999 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 diamond and gold in areas not to exceed 10 ha to be worked by no more than 30 individuals with a nonrenewable, nontransferrable 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 that deal with defense, energy, environment, finances, mining, and natural resources, 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 deducted 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 that are not produced in Venezuela. With permission from the Executive, equipment exempted from import taxation may be sold to a third party; the purchaser pays the import tax.

With the exception of precious materials, industrial minerals 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) was established as an independent agency ascribed to the MEM under the Decree. The INGEOMIN was charged with interdisciplinary research in geosciences, planning, execution, and coordination of all geoscience-related programs. The agency also was given the 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.

The new Reglamento General de la Ley de Minas—Decreto No. 1.234 was published in the Gaceta Oficial de la República Bolivariana de Venezuela on March 9, 2001. The Reglamento establishes the terms, conditions, and administrative procedures in support of the mining law of 1999.

In 1975, the Government of Venezuela nationalized the petroleum sector. In November 2001, a new hydrocarbon law,

Decreto No. 1.510, was passed. The law, which was published in November in the *Gaceta Oficial de la República Bolivariana de Venezuela* No. 37.323, became effective on January 1, 2002. Under the decree, all hydrocarbon deposits belong to the nation. In agreement with article 302 of the Constitution of 1999, all primary hydrocarbon activities are reserved for the Government. Refining and marketing of hydrocarbons (secondary activities) can be by the Government and the private sector jointly or separately. Primary activities will be carried out by the Government directly by the Executive, companies owned by the Government, or companies in which the Government owns more than 50% interest (mixed enterprises). Companies engaged in hydrocarbon production are denominated operating companies. The maximum area assigned to an operating company is 100 square kilometers (km²).

The creation of a mixed enterprise for primary production of hydrocarbons requires the approval of the National Assembly. The duration of the mixed company will be 25 years with a possible extension for 15 years. The extension must be applied for between 12.5 and 20 years of the granting of the original permit. The lands and permanent works, which include installations, accessories, and equipment, must be maintained in good working order to be relinquished to Venezuela so their future use or activity cessation with minimal environmental damage can be guaranteed.

The Government has the right to 30% of production from any deposit as royalty payment. The rate can be decreased to 20% if the economics of the production are affected by the higher rate. The production royalty from mixed bitumen from the Orinoco Belt can be reduced to 160% if the projects are not viable at the 30% rate. In both cases, the higher royalty rate can be reestablished when necessary. Natural gas is excluded from this law; it is regulated by the *Ley Orgánica de Hidrocarburos Gaseosos*.

Decreto No. 1.257 of 1996, *Normas sobre Evaluación Ambiental de Actividades Susceptibles de Degradar el Ambiente*, establishes the Ministerio del Ambiente y de los Recursos Naturales Renovables. The Decreto requires an environmental impact study for projects and programs in the areas of mining and hydrocarbons.

In November, Corporación Venezolana de Guayana (C.V.G.) was transferred to the Ministerio de la Secretaría de la Presidencia by Decreto No. 1.531. Between 1999 and November 2001, the regional development company had been ascribed to the Ministerio de Planificación y Desarrollo (Corporación Venezolana de Guayana, 2002b§). With the change, C.V.G.'s level of autonomy was restored to that in force at the time of company's creation in 1960. C.V.G. has also been exonerated from all taxes, and the President can release the partial or total payment of taxes of the companies under C.V.G., many of which are in the mineral sector (table 2). The reduction or elimination of taxes by the Executive also applies to the importation of equipment, investments, and technologies by these entities.

Production

In 2001, 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 and alumina; it was the 11th largest producer of 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 producer 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).

Performance of the nonfuel mineral production in Venezuela was mixed when compared with that of 2000 (table 1). Output of bauxite and alumina, which were two of Venezuela's traditional mineral commodities, increased by about 4% each, and the production of iron ore decreased; production of primary aluminum was estimated to have remained at the levels of 1999 and 2000. Official production of diamond decreased for the fourth consecutive year and represented a 79% decrease from that of 1997. Gold production increased for the second consecutive year after 2 years of decline, but output in 2001 was only 41% of the production level of 1997. Statistics for industrial minerals were incomplete. The Government of Venezuela does not require companies to report industrial mineral production. Based on available data, production of a few industrial minerals increased. Of these, the most significant were in the production of limestone, sand and gravel, and silica sand. Cement production was estimated to have increased by about 2%; Venezuela was a net exporter of cement.

Trade

Venezuela's exports totaled \$28 billion in 2001; of this, 76.5% (\$21.5 billion) was from petroleum. At 2001 prices, the value of petroleum exports decreased by 23% from that of 2000 (Banco Central de Venezuela, 2002a§). The export price decreased by 22% (Petróleos de Venezuela S.A., 2002). Total imports increased to \$22 billion (Banco Central de Venezuela, 2002a§).

In 2000 (the last year for which information was available), exports of metals in all forms were valued at \$83.2 million, and imports totaled \$57.6 million. The value of exports of industrial minerals, which included cement and lime, totaled \$120.4 million. Of this total, cement exports were \$115.0 million (95.5% of the total). Imports of industrial minerals were \$55.8 million. Cement accounted for \$3.8 million. In addition, exports of ferroalloys were valued at \$40.9 million, and their imports were only \$11.6 million (Ministerio de Energía y Minas, 2001, p. 113-114, 144-146).

In 2001, Venezuela's exports of crude petroleum and products averaged 2.762 million barrels per day (Mbbbl/d) (Petróleos de Venezuela S.A., 2002). The main recipient of Venezuelan oil was the United States.

Structure of the Mineral Industry

The private sector participated in the production of nonfuel minerals in Venezuela; Government companies, however, controlled a varying 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 C.V.G. Private international companies held small interests 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, and the only producer was C.V.G. Ferrominera Orinoco C.A. (Ferrominera). 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.C.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 in Venezuela, respectively.

Venezuela was a founding member of the Organization of Petroleum Exporting Countries (OPEC). 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 had the responsibility for crude refining and petrochemical manufacturing. Storing, transporting, and domestic and international marketing of hydrocarbons and their products also were the responsibility of PDVSA. Since the early 1990s, however, Corporación Venezolana de Petróleos (CVP), which was PDVSA's subsidiary, began to open opportunities to the private sector through a number of production agreements. The early program involved 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's entire bauxite production was from the Pijiguaos mine in the State of Bolívar. The mine was owned by C.V.G. Bauxilum (Bauxilum) [owned by the Venezuelan Government through C.V.G. (99%) and Alusuisse Lonza Holding (1%)]. Bauxilum was also the sole producer of alumina in Venezuela. Bauxite production from Los Pijiguaos fed the alumina refinery owned by Bauxilum. Bauxite production increased by 3.8% to 4.5 million metric tons (Mt). Alumina production increased by 4.4% to 1.8 Mt (table 1).

In 2001, Bauxilum and Pechiney Group of France signed a definite agreement for the modernization and capacity expansion of the bauxite and alumina production complex. The agreement covered commercial, financial, managerial, and technical support for the project, which was designed to increase alumina production capacity to 2 million metric tons per year (Mt/yr) of alumina, a feasibility study for an additional increase in the capacity to 3 Mt/yr, and work to ensure that the complex will meet environmental standards. The cost of the project was estimated to be \$200 million. Pechiney was to market all alumina production in excess of 1.7 Mt (Pechiney Group, 2001). This was the first large investment by the private sector in Venezuela's aluminum sector after the Government's inability to privatize the sector in 1998 (Metal Bulletin, 2000).

Production of aluminum in Venezuela was by two primary smelters with majority ownership by C.V.G. The largest of

the two was C.V.G. Venalum C.A. with a nominal capacity of 430,000 metric tons per year (t/yr). In 2001, C.V.G. Venalum produced 412,380 metric tons (t) (Metal Bulletin, 2002). The company modernized its No. 1 production line, and a number of other renovations were completed with the purpose of improving environmental conditions and productivity of the smelter. With the improvements, Venalum anticipated that the smelter should produce at full capacity in 2002.

The other smelter, C.V.G. Aluminio del Caroní, S.A. (Alcasa), had a design capacity of 210,000 t/yr of aluminum. Its capacity for most of 2001, however, was 160,000 t/yr because two 25,000-t production lines were still out of production. During the year, one of the two lines was repaired, and by yearend, production capacity increased to 185,000 t. The second production line was expected to be operational in 2002. Glencor International AG was working with the Government company to repair the lines. The total cost for the repairs was estimated to be \$16 million (Metal Bulletin, 2001a, b, d, e; Mining Journal, 2001b; Corporación Venezolana de Guayana, 2002a§).

In 2001, C.V.G. and Pechiney were discussing the possibility of signing a letter of intent to construct another primary aluminum smelter with a capacity of 250,000 to 300,000 t/yr at an estimated cost of \$900 million (Metal Bulletin, 2001f).

Ferroalloys.—Ferroatlántica de Venezuela, S.A. (Ferroven), produced ferrosilicon in its Ciudad Guayana plant. The company [owned by Ferroatlántica S.L. of Spain (80%) and C.V.G. (20%)] produced an estimated 85,000 t of ferrosilicon, which was slightly less than the 86,188 t produced in 2000. Production has increased steadily since 1998 when it was only 35,571 t and exceeded plant capacity in 2000 and 2001. Most of the ferrosilicon production (95% in 2000) was for export. By far, the main export market was North America followed by Japan, South America and the Caribbean, and South Africa. Ferroven continued its efforts to ensure the supply of quartz for metallurgical use. In early 2001, Ferroven was granted the exploration titles for three quartz properties in the State of Bolívar—La Candelaria, El Manteco, El Mery. The company began work in La Candelaria during the year (Ferroatlántica de Venezuela, S.A., 2001, p. 12-13, 17-18).

Gold.—Official production of gold in Venezuela increased by 24% to 9,076 kilograms (kg) in 2001 compared with that of 2000. Still, production was about 40% of the level achieved in 1997. The largest producer was Hecla Mining Company through its subsidiary Minera Hecla Venezolana C.A., which operated La Camorra underground mine in the State of Bolívar and produced about 4,700 kg (reported as 152,303 ounces), or 52% of Venezuela's official gold output. Production from La Camorra mine increased by 64% from that of 2000 at an average total cash cost of \$133 per troy ounce. One of the reasons for the increase in production was high ore grade for the year. At yearend 2001, La Camorra's proven and probable reserves totaled about 437,500 t with an average grade of 29.7 grams per metric ton (g/t) gold (reported as 482,238 short tons with an average grade of 0.867 ounces per short ton) (Hecla Mining Company, 2002).

Hecla began to produce gold from La Camorra in 1999. Ore production in 2001 ranged from 450 to 500 metric tons per day (t/d). Production was mostly by longhole stopping, and the ore was hauled to the surface by truck. In the processing plant, after a two-step crushing process, the ore was ground. Gold was then recovered by the conventional carbon-in-leach process; the plant had a recovery rate of 95%. Gold bars were then sent

to a refinery. In addition, Hecla had nine other exploration concessions near La Camorra with a total area of 8,000 ha (Hecla Mining Company, 2002§).

Another gold producer in Venezuela was Crystallex International Corporation of Vancouver, British Columbia, Canada, through its subsidiary Crystallex de Venezuela C.A. The company produced 346 kg (reported as 11,123 ounces) from four open pit deposits in the Tomi mine in the Callao area of the State of Bolívar (Crystallex International Corporation, 2002a). Crystallex acquired Tomi in 2000. Recent exploration under the open pits found underground resources. A bankable feasibility study conducted by Mine Development Associates of Reno, Nevada, calculated that the Charlie Richards deposit had probable underground reserves of 162,730 t with a grade of 14.48 g/t gold at a cutoff grade of 5 g/t gold and probable surface reserves of 94,070 t with a grade 5.61 g/t gold at a cutoff grade of 1.74 g/t gold and a price of \$265.00 per ounce (Crystallex International Corporation, 2001). Crystallex began development of the underground deposit at Tomi during the fourth quarter of 2001 and expected to begin production in July 2002 (Crystallex International Corporation, 2002a).

From April to December, Crystallex also produced 824 kg from La Victoria open pit mine in its Lo Increíble concession also in the area of El Callao in the State of Bolívar, which it acquired in early 2001 when it purchased 80% of the shares of El Callao Mining Corp. El Callao Mining owned 51% of the holding company that owned 100% of Auríferos El Callao, which was the operating company of Lo Increíble. The property consisted of six deposits, the largest of which was La Victoria. Indicated resources at Lo Increíble totaled 8.8 Mt with a grade of 3.39 g/t gold, and inferred resources were 15.08 Mt with a grade of 3.26 g/t gold with a cutoff of 1.0 g/t gold (Crystallex International Corporation, 2002b).

In addition to Tomi and Lo Increíble, Crystallex had a concession in the Kilometro 88 in the State of Bolívar. Albino1 had been in production from 1996 to 1998. During 2001, a bankable feasibility study for an underground mine was completed on Albino 1 by Mine Development Associates. Albino 1's underground proven and probable reserves were calculated to be 82,040 t with a grade of 14.82 g/t gold and a cutoff grade of 8 g/t gold and 96,800 t with a grade of 14.66 g/t gold and a cutoff grade of 8 g/t gold, respectively, at a price of \$270 per ounce (Crystallex International Corporation, 2001). Based on the feasibility studies, Crystallex envisioned that production from the Albino 1 and the Charlie Richards underground deposits would be 350 t/d each with a cash cost of \$137.00 per ounce; the cost would include mining, milling, and transportation. The cost for developing both deposits was estimated to be \$15.28 million (Crystallex International Corporation, 2001).

Ore from Crystallex's mines was sent to the Revemin mill in El Callao. In 2001, the company began to expand the plant's capacity to 1,800 t/d in 2002 and a further expansion to 3,000 t/d in 2003. With the expansion, the plant would be able to process the ore produced from the two new underground deposits. In addition to Crystallex's ores, the plant also processed 19,393 t of ore from nearby concessions in 2001 (Crystallex International Corporation, 2002a).

In July, after years of work and several attempts to begin production at its Las Cristinas deposit in the State of Bolívar, Placer Dome Inc. abandoned the property because Placer Dome's contract with the Venezuelan Government was due to expire on July 15, 2001. The company sold its 70% share of Minera Las Cristinas C.A., which had been set up to operate Las

Cristinas, to Vanessa Ventures Ltd. from Canada. Placer Dome was to retain interest in the gold and copper revenues and a back-in-right in the project. Originally, Las Cristinas called for production of about 16,500 kilograms per year (kg/yr) (reported as 530,000 ounces per year) of gold for the first 10 years of the 20-year planned life of the mine, but Placer Dome had written off its \$116 million investment in 2000. Vanessa Ventures plans for the deposit were on the much smaller scale of 3,100 kg/yr (Daily Journal, 2001b; Financial Times, 2001; Northern Miner, 2001a, b).

In late 2001, C.V.G., which was Placer Dome's original partner, announced that it planned to combine Las Cristinas with the project at Las Brisas. Las Brisas concession, which is directly south of Las Cristinas, was held by Gold Reserve Inc. through its subsidiary Gold Reserve de Venezuela. Apparently, C.V.G. did not recognize the validity of the transaction between Placer Dome and Vanessa Ventures. Near yearend, Vanessa Ventures announced that it would appeal the decision made by C.V.G. to revoke Vanessa Ventures's contract for Las Cristinas. C.V.G. cited Vanessa Venture's failure to meet reporting requirements and delays in mine development as the reason for the cancellation of the contract (Mining Journal, 2001 a, c).

Iron and Steel.—Production of iron ore from Ferrominera's Cerro San Isidro, Los Barrancos, and Las Pailas open pit deposits decreased by 2.6% to 16.9 Mt. With the exception of 2000 when iron ore production increased by 23.5% to 17.4 Mt, production has been decreasing since 1997 when production was 18.5 Mt. Venezuela had 14.657 billion metric tons (Gt) of iron ore, of which 4.184 Gt was proven. Of the 1.708 Gt of high-grade iron ore, Los Barrancos had 318 Mt; San Isidro, 214 Mt; Cerro Bolívar, 182 Mt; Grupo Redondo, 165 Mt; and Altamira, 163 Mt (C.V.G. Ferrominera Orinoco C.A., 2002a§).

One of the strategic projects Ferrominera was planning was the construction of a concentration plant in the Municipality of Raúl Leoni to produce 8 Mt of iron ore with 68% iron content. In December, Ferrominera announced that it had signed a service preagreement with Metchem-Duro Felguera Group, which won the bid for the plant construction. The preliminary agreement allowed the construction of a pilot plant and other preliminary work necessary prior to beginning the construction of the plant in mid-2002. The cost of the project was estimated to be \$223 million. The company estimated that the concentration plant would increase the life of the mines by 40 years (C.V.G. Ferrominera Orinoco C.A., 2001).

Among other Ferrominera planned projects for the near future were the reopening of the Altamira deposit where work was scheduled to begin in 2001 and to be completed in 2004 at a cost of \$33.5 million; the iron ore production capacity expansion to 30 Mt, which was scheduled to begin in 2003 and to be completed in 2005 at an estimated cost of \$251.9 million; and the pellet plant expansion to 4 Mt, which was scheduled to begin in 2003 and to be completed by 2005 at a cost of \$42.8 million (C.V.G. Ferrominera Orinoco C.A., 2002b§).

Production of direct-reduced iron (DRI) and raw steel decreased by 14.5% and less than 1%, respectively, after they increased by 26.4% and 17.6%, respectively, in 2000. Despite an increase in the construction sector, the steel sector continued to be affected by low internal demand and low international prices because of an excess world supply.

Low prices for DRI iron and the overall softness of steel demand had a significant impact on the iron and steel industry in Venezuela. Complejo Siderúrgico de Guayana (Comsigua), which produced hot-briquetted iron, and Operaciones al Sur del

Orinoco (OPCO) stopped production in early 2001. Comsigua stopped for 20 days for scheduled maintenance. OPCO planned to suspend production for 2 months. The most impacted of the hot-briquetted iron operations was the new 2.2-Mt plant owned by Siderúrgia de Venezuela Sivensa S.A. through International Briquettes Holding and BHP (since October, BHP-Billiton Group). The \$860 million project, which was completed in August 2000, was unable to reach full capacity because of technical problems. In March, BHP announced that it would pull out of the project and was writing off its \$410 million investment. Sivensa was searching for a new partner to complete the project, which needed another \$220 million to \$240 million in investment for 2001. Orinoco Iron defaulted on a debt payment of \$16.3 million, which was due on March 30, 2001 (Metal Bulletin, 2001c, g; Steel Times International, 2001).

At yearend, Sivensa was negotiating to restructure its debt, which was, in part, affected by the developments related to the Orinoco Iron plant and its participation in SIDOR (Siderúrgia de Venezuela Sivensa S.A., 2001).

SIDOR suffered significant losses as a result of 18 labor stoppages between June 2000 and May 2001. After a 21-day strike in May, the company signed a new contract with its employees. The company also reported losses of \$80 million in 2000. By yearend, the company's shareholders were meeting with their creditors to reschedule SIDOR's debt; this was the second restructuring of the company's debt since the company was privatized in 1997. In December, SIDOR failed to make its interest payment of \$31.3 million on its debt (Metal Bulletin, 2001h-k).

The Venezuelan steel market continued to be affected by internal and external conditions. Total imports of steel products increased almost by 50% to 651,000 t in 2000 from 442,000 t in 1999. As a result, Venezuela decided to increase tariffs on a number of steel products to 35% from 10% (Metal Bulletin, 2001l, m).

Nickel.—In 2000, Venezuela began producing nickel and ferronickel from its Loma de Níquel mine and ferronickel plant located along the boundaries of the States of Aragua and Miranda. The mine and ferronickel plant were operated by Loma de Níquel C.A. (majority owned by Anglo American plc). Nickel mine production in 2001 was about 13,600 t, which was more than five times that of 2000. The nickel content of ferronickel produced was 9,700 t, which was about 60% of the design capacity (tables 1, 2).

Industrial Minerals

Cement.—Venezuela was the fourth largest cement producer in Latin America after Brazil, Mexico, and Colombia. Production of cement in 2001 was estimated to have increased slightly to 8.8 Mt despite responding to the increase in the construction sector. Venezuela was a net exporter of cement. CEMEX Venezuela S.A.C.A. (a subsidiary of CEMEX) was the largest producer with more than 50% of the country's production capacity (CEMEX, S.A. de C.V., 2002§).

Diamond.—With the exception of 2000, official production of diamond has been decreasing in recent years. In 2001, production decreased by 51% from that of 2000 but was only 21% of that of 1997. Traditionally, diamond in Venezuela has been produced by the small-scale producers either through cooperatives or in contract with C.V.G. The main producing

areas were Aza Karon, Guaniamo, Icabarú, Santa Elena, and San Salvador de Paúl.

Nitrogen (Ammonia).—In January, Fertilizantes Nitrogenados de Oriente S.A. (FertiNitro) began exporting ammonia to the United States from the José Industrial Park, which was its fertilizer complex, in the State of Anzoátegui. FertiNitro had a design capacity of 1.3 Mt of ammonia and 1.5 Mt of urea. Construction of the \$1.1 billion complex began in 1998 and was completed near schedule. The plant workforce totaled 215. A joint venture of Pequiven (a subsidiary of PDVSA) (35%), Koch Industries (35%), Snamprogetti International S.A. (20%), and Industrias Polar (10%), FertiNitro planned to market its production in Latin America and the United States. In addition to the new complex, Pequiven had an additional ammonia capacity of 818,000 t/d in two other complexes in the States of Carabobo and Zulia (Petróleos de Venezuela S.A., 2001a; Pequiven, 2000§).

Mineral Fuels

Coal.—Production of coal in Venezuela decreased by about 3% to 7.7 Mt, but it was about three times that of 1992 when the production was only about 2.5 Mt (Ministerio de Energía y Minas, 2001, p. 103). Most of the production (7.6 Mt) was from the State of Zulia where PDVSA produced coal through its subsidiary Carbozulia S.A., in two joint ventures with the private sector—Carbones de Guasare, S.A. and Carbones de la Guajira, S.A. Carbones de Guasare's Paso Diablo mine, which had been managed by Washington Group International, Inc., of the United States since 1999, produced 6.9 Mt of coal (Petróleos de Venezuela S.A., 2002). Carbones del Guasare's resources in 2000 totaled 6.3 Gt, which was almost 77% of Venezuela's total coal resources of 8.756 Gt. Of that total, 898 Mt was measured reserves, 2,439 Gt was indicated reserves, and 3,738 Gt was inferred (Ministerio de Energía y Minas, 2001, p. 102).

Carbones de la Guajira's only producing mine Mina Norte produced 670,000 t (Petróleos de Venezuela S.A., 2002). In May 2001, Carbones de la Guajira sent Washington Group International a letter of intent for a service contract for Mina Norte. Under the letter of intent, Washington Group International was to provide key management personnel and engineering support for the mine. The goal of Washington Group International was to increase the production of the mine to 1.2 Mt/yr and to sign a multiyear contract with the Venezuelan company (Washington Group International, Inc., 2001). No contract had been signed by yearend.

Natural Gas and Petroleum.—PDVSA's exploration unit announced that it was reactivating its offshore natural gas and petroleum exploration program by beginning preliminary exploration in areas north of the islands of Margarita and La Tortuga by yearend 2001. The program would continue throughout 2002. The Delta Platform, which is a marine area northeast of the States of Anzoátegui and Falcón, was also an area of interest to PDVSA. Work north of Margarita and La Tortuga included the recording of 700 kilometers (km) of two-dimensional seismic and 3,100 km of three-dimensional seismic in an area of 5,000 km² and a depth that ranged from 100 to 1,000 meters. Early estimates indicated that the cost of this exploration program could reach \$22 million (Petróleos de Venezuela S.A., 2001e).

An important part of Venezuela's strategy for expanding its petroleum production capacity has been to develop its immense

resources of extra-heavy crude in the Orinoco Belt. For that, it formed strategic alliances with the private international companies in the late 1990s to begin producing extra-heavy crude. In 2001, four strategic associations—Hamaca, Operadora Cerro Negro S.A. (Cerro Negro), Petrozuata, and Sincrudos del Oriente S.A. (Sincor)—achieved different levels of development and production. The scope of all the projects included exploration, production, transportation, and upgrade to produce synthetic medium or light petroleum. When these associations achieve full production capacity, they will contribute to about 15% of Venezuela's 2001 production capacity (Petróleos de Venezuela S.A., 2002).

In February, Conoco Inc. of the United States and PDVSA announced that the first plant for upgrading extra-heavy crude from the Orinoco Belt was formally inaugurated and had begun operation. The \$1 billion plant, which is located in the José Industrial Park in the State of Anzoátegui, was part of the 35-year \$2.5 billion strategic association (joint venture) between Conoco (50.1%) and PDVSA (49.9%) that began in 1997. In the plant, crude of 9° API can be upgraded to about 22° API. The plant had the capacity to process 120,000 barrels per day (bbl/d) of extra-heavy crude to produce 103,000 bbl/d of light crude, 3,900 bbl/d of liquefied petroleum gas, 3,000 t/d of coke, and 145 t/d of sulfur. The joint venture began drilling in Zuata in 1997 with first production in August 1998. In 2001, Petrozuata produced 120,000 bbl/d. The extra-heavy crude was transported through a 90-centimeter pipeline about 200 km to the upgrading plant. The lighter synthetic crude produced at the plant was to be used domestically and for exports. Conoco's share of the production was shipped to its Lake Charles, Louisiana, refinery, which had been commissioned in 2000 (Conoco Inc., 2001; Petróleos de Venezuela S.A., 2001d).

In May, the Cerro Negro upgrading plant in the José Industrial Park was inaugurated. The \$790 million plant, which was part of another joint venture producer of heavy crude from the Orinoco Belt, had the capacity to process 120,000 bbl/d of extra-heavy crude (8.5° API) to produce 108,000 bbl/d of a lighter synthetic crude (16.5° API). The 35-year, \$2 billion Cerro Negro project, which began producing extra-heavy crude in the State of Monagas in 1999, was a joint venture of PDVSA (41.665%), Exxon Mobil Corporation (ExxonMobil) (41.665%), and Veba Oil & Gas GmbH (16.67%). The synthetic crude went to the PDVSA-ExxonMobil Chalmette, Louisiana, refinery (Veba Oil & Gas GmbH, 2001a, b).

The Sincor project was a strategic alliance of TotalFinalElf of France (47%), PDVSA (38%), and Statoil of Norway (15%). In February, production began in the project's main production station where blending the extra-heavy crude with naphtha created an intermediate crude (16° API). Sincor's upgrading plant in the José Industrial Park was in its construction phase and was expected to be completed by yearend. The plant would upgrade 200,000 bbl/d of medium blend to 180,000 bbl/d of light synthetic crude (32° API). In addition, the plant had a design capacity to produce 6,000 t/d of coke and 860 t/d of sulfur. The cost for the Sincor project was estimated to exceed \$4 billion (Sincrudos de Oriente S.A., 2002).

In June, Phillips Petroleum Company (40%), Texaco Inc. (after October 9, ChevronTexaco Corp.) (30%), and PDVSA (30%), which were the joint-venture partners of the 35-year, \$3.5 billion Hamaca extra-heavy-crude project, announced that they had secured \$1.1 billion in project financing from the Import-Export Bank of the United States (\$628 million) and commercial banks (\$470 million) (Petróleos de Venezuela S.A., 2001c; Phillips Petroleum Company, 2001; Texaco Inc.,

2001). Production of extra heavy crude (8.5° API) began in November at a rate of 30,000 bbl/d, which was blended with lighter petroleum to be sold in international markets. The \$1 billion upgrading plant in the José Industrial Park, which when completed will be able to treat 190,000 bbl/d of the extra-heavy crude to produce 180,000 bbl/d of a lighter crude (26E API), was scheduled for completion in 2004 (ChevronTexaco Corp., 2001).

Orimulsión.—Orimulsión is a PDVSA-patented boiler fuel (a mix of natural bitumen and water) that is used in power generation. Venezuela's production capacity of Orimulsión was 6.2 Mt/yr. The producing company is Bitúmenes de Orinoco, C.A. (Bitor) (a subsidiary of PDVSA). In 2001, Bitor produced at 100% of installed capacity, which was the same production level achieved in 2000. Orimulsión was exported to Barbados, Canada, China, Denmark, Finland, Germany, Italy, Japan, and Lithuania.

In July, Bitor announced that it had reached an agreement in principle to supply Orimulsión to Canada's New Brunswick Power Corporation. Beginning in 2004, Bitor was to supply a minimum of 1.6 Mt of Orimulsión for the 1,050-megawatt Coleson Cove generating plant for 20 years with the option of increasing the amount as necessary. Although New Brunswick Power had an existing contract with Bitor, which supplied Orimulsión for the Dalhousie generating plant, the new contract would be Bitor's largest (Daily Journal, 2001a).

In December, Bitor, China National Oil and Gas Exploration and Development Corporation, and Petrochina Fuel Oil Company Limited signed an association contract to build a new bitumen production and emulsifying plant to produce Orimulsión. The emulsifying plant with a capacity of 125,000 bbl/d of Orimulsión would be built in the José Industrial Park. Bitumen production facilities would be in the Cerro Negro and Marichal areas in the State of Monagas. The initial investment for project was estimated to be \$330 million with production expected to begin at yearend 2003 or the beginning of 2004 (Analítica, 2001§).

Refinery.—PDVSA and a Japanese-Venezuelan consortium, which included JGC Corporation and Chiyoda Corporation, signed a \$300 million contract for the construction of a naphtha and hydrotreatment facilities, hydrosulfurization, and environmental units for the Puerto La Cruz petroleum refinery. This modification will give the refinery the capacity to produce 45,000 bbl/d of unleaded gasoline for the domestic market and 30,000 bbl/d of low-sulfur diesel for exports to the Caribbean and Latin America. Commercial operation of the expansion project of the Puerto La Cruz refinery was planned for the third quarter of 2003 (Petróleos de Venezuela S.A., 2001b).

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TABLE 1
VENEZUELA: PRODUCTION OF MINERAL COMMODITIES 1/

(Thousand metric tons unless otherwise specified)

Commodity	1997	1998	1999	2000	2001	
METALS						
Aluminum:						
Alumina	1,730	1,553	1,469	1,755	1,833	
Bauxite	4,967	4,826	4,166	4,361	4,526	
Metal, primary, unalloyed	metric tons	633,836	584,690	570,321	569,123 r/	570,000 e/
Gold, mine output, Au content	kilograms	22,322	6,740	5,946	7,332	9,076
Iron and steel:						
Iron ore and concentrate	18,503	16,553	14,051	17,350	16,902	
Metal, direct-reduced iron	5,608	5,424	5,071	6,401 r/	5,473	
Ferroalloys:						
Ferromanganese	--	10	--	--	--	
Ferronickel	--	--	--	133	28,400 e/	
Ferrosilicomanganese	64	49	50	50	50 e/	
Ferrosilicon 2/	58	36	56 r/	86 r/	85 e/	
Total	122	95	106 r/	269 r/	28,500 e/	
Steel, crude	3,986	3,553	3,261	3,835	3,814	
Semimanufactures, hot-rolled	3,287	2,643	2,599 r/	2,858 r/	2,797	
Lead, secondary, refined e/	metric tons	25,000 r/	25,000 r/	25,000 r/	30,000 r/	30,000
Nickel:						
Mine output, Ni content	do.	--	--	2,540 r/	13,600	
Ferronickel, Ni content	do.	--	--	40	9,700 e/	
INDUSTRIAL MINERALS						
Amphibolite	59	--	--	--	5,692	
Cement, hydraulic	8,145	8,202	8,500 e/	8,600 e/	8,800 e/	
Clays:						
Kaolin	5	4	12	10 e/	10 e/	
Other	2,759	2,099	2,180	2,319 r/	4,664	
Diamond:						
Gem	carats	199,564	80,033	59,446	29,280 r/	14,321
Industrial	do.	84,644	16,778	35,698	80,317 r/	38,483
Total	do.	248,208	96,811	95,144	109,597 r/	52,804
Feldspar	160	148	125	130 r/	142	
Gypsum	80	72	42	25	5	
Lime	321	378	400 e/	400 e/	400 e/	
Nitrogen, N content of ammonia	612	526 r/	522	423 r/	808	
Phosphate rock	291	322	366	389	399	
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	204	71	--	12	165	
Granite	400	807	1,151	581	796	
Limestone 3/	14,177	14,246	13,735	11,302	18,158	
Sand and gravel	4,218	4,753	5,431	3,106	8,576	
Silica sand 3/	798	344	295	422 r/	627	
Sulfur, petroleum byproduct	326 r/	401 r/	68 r/	328 r/	400 e/	
MINERAL FUELS AND RELATED MATERIALS						
Carbon black e/	60	60	60	60	60	
Coal, bituminous	5,291	6,458	6,593	7,910 r/	7,688 r/	
Gas, natural:						
Gross	million cubic meters	59,771	62,167	57,203 r/	62,001 r/	61,000 e/
Marketed	do.	30,212 r/	32,335 r/	27,269 r/	27,801 r/	27,500 e/
Natural gas liquids: 4/						
Natural gasoline	thousand 42-gallon barrels	12,000 e/	13,104 r/	12,519 r/	10,731 r/	11,000 e/
Liquid petroleum gas	do.	55,000 e/	53,070 r/	56,503 r/	53,035 r/	54,000 e/
Total	do.	67,000 e/	66,174 r/	69,022 r/	63,766 r/	65,000 e/

See footnotes at end of table.

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

(Thousand metric tons unless otherwise specified)

Commodity	1997	1998	1999	2000	2001
MINERAL FUELS AND RELATED MATERIALS--Continued					
Petroleum:					
Crude 5/ thousand 42-gallon barrels	1,153,400	1,215,120	1,116,705 r/	1,151,436 r/	1,155,000 e/
Refinery products:					
Liquified petroleum gas	do. 5,026	4,636	3,679 r/	4,530 r/	4,500 e/
Gasoline, motor	do. 67,908	70,956	71,887 r/	73,460 r/	75,000 e/
Naphtha and other gasolines	do. 72,828	72,964	70,405 r/	66,350 r/	65,000 e/
Jet fuel	do. 31,069	32,529 r/	35,022 r/	34,226 r/	34,000 e/
Kerosene	do. 1,175	766	146 r/	-- r/ e/	100 e/
Distillate fuel oil	do. 121,300	120,815	121,465 r/	116,176 r/	120,000 e/
Lubricants	do. 2,051	2,227	2,033 r/	1,880 r/	2,000 e/
Residual fuel oil	do. 79,059	80,957	73,624 r/	92,046 r/	95,000 e/
Asphalt	do. 11,618	10,986	12,990 r/	12,297 r/	12,500 e/
Petroleum coke	do. 10,888	8,369	2,869 r/	10,454 r/	10,000 e/
Parafins	do. 201	190	157 r/	193 r/	190 e/
For internal company consumption	do. 26,393	27,200	25,032 r/	24,667 r/	25,000 e/
Unspecified	do. 1,993	2,581	2,584 r/	2,295 r/	2,400 e/
Gains and losses	do. (8,362)	(8,140)	2,807 r/	(281)r/	500 e/
Total 6/	do. 423,147	427,036 r/	424,700 r/	438,293 r/	446,000 e/

e/ Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. r/ Revised. -- Zero.

1/ Table includes data available through September 6, 2002.

2/ Production of 75% silicon-content ferrosilicon.

3/ Excludes production under contract with the Government.

4/ From nonassociated gas only.

5/ Includes condensate and bitumen for the production of Orimulsión, which is a boiler fuel patented by Petróleos de Venezuela S.A.

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

TABLE 2
VENEZUELA: STRUCTURE OF THE MINERAL INDUSTRY IN 2001

(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. (Corporación Venezolana de Guayana, Ciudad Guayana, Bolívar State 99%; Alusuisse Lonza Holding, 1%)		1,800.
Aluminum	C.V.G. Aluminio del Caroní, S.A. (Corporación Venezolana de Guayana, 82%; Alcoa, 7.3%)	do.	210.
Do.	C.V.G. Venezolana de Aluminio C.A. (Corporación Venezolana de Guayana, 80%; Showa Denko K.K., Kobe Steel Ltd., Sumitomo Chemical Co. Ltd., Mitsubishi Materials Corp., Mitsubishi Aluminum Co., and Marubeni Corp., 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 and 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., 49%; RAG International Coal AG, 24%; Anglo Coal, 24%; private, 3%)	Paso Diablo, Zulia State, Guasare coal basin	7,000.
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	1,200.
Ferrosilicon	Ferroatlántica de Venezuela, S.A. (Ferroatlántica S.L., 80%; Corporación Venezolana de Guayana, 20%)	Ciudad Guayana, Bolívar State	80.

TABLE 2--Continued
 VENEZUELA: STRUCTURE OF THE MINERAL INDUSTRY IN 2001

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Gold	kilograms	ReveMin (Crystallex de Venezuela C.A., 51%; Corporación Venezolana de Guayana, 49%)	ReveMin 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.	Crystallex de Venezuela C.A. (Crystallex International Corp., 100%)	Tomi Mine, El Callao, Bolívar State	350.
Do.	do.	Minera Hecla Venezolana, C.A. (Hecla Mining Inc.)	La Camorra, 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 Guayana, 33.23%)	Colombia and Unión Mines and Caratal and El Perú plants, El Callao, Bolívar State	4,600 plant.
Iron ore		C.V.G. Ferrominera Orinoco C.A. (Corporación Venezolana de Guayana, 100%)	Cerro San Isidro, Los Barrancos, and Las Pailas, Bolívar State	25,000.
Iron ore pellets		do.	Ciudad Guayana, Bolívar State	3,600.
Do.		Siderúrgica del Orinoco C.A. (Cosorcio Siderúrgico Amazónico Ltd., 70%; Corporación Venezolana de Guayana, 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%; International Finance Corp., 8.7%)	do.	1,000.
Do.		Orinoco Iron (International Briquettes Holding, 100%)	Puerto Ordaz, Bolívar State	2,200.
Do.		Venezolana de Prereducidos de Caroní (International Briquettes Holding, 100%)	do.	815.
Lime		C.V.G. Compañía Nacional de Cal (Corporación Venezolana de Guayana, 100%)		500.
Natural gas	million cubic meters	Petróleos de Venezuela S.A. (Government, 100%)	Processing plants in Anzoátegui, Monagas, and Zulia States	25,000.
Nickel		Loma de Níquel C.A. (Anglo American plc, 87.5%; Grupo Federal de Venezuela, 7.9%; International Finance Corp, 3.5%; Jourdex Resources Inc., 1.1%)	Loma de Níquel, Aragua, and Miranda States	16.
Nitrogen content of ammonia		Fertilizantes Nitrogenados de Oriente S.A. (Pequiven, 35%; Koch Industries, 35%; Snamprogetti International S.A., 20%; Empresas Polar, 10%)	José, Anzoátegui State	1,070.
Do.		Pequiven (Petróleos de Venezuela S.A., 100%)	Petrochemical complexes in Zulia and Carabobo States	670.
Petroleum:				
Crude	million 42-gallon barrels	Petróleos de Venezuela S.A. (Government, 100%)	Fields in Anzoátegui, Apure, Falcón, Guárico, Monagas, and Zulia States	1,393.
Crude, synthetic	do.	Petrozuata (Conoco Inc., 50.1%; Petróleos de Venezuela S.A., 49.9%)	José Industrial Complex, Anzoátegui State	38.
Do.	do.	Cerro Negro (Exxon Mobil Corporation, 41.665%; Petróleos de Venezuela S.A., 41.665%; Veba Oil & Gas, 16.67%)	do.	39.
Refinery products	do.	do.	Refineries in Amuay and Cardón, Falcón State; Puerto La Cruz and San Roque, Anzoátegui State; El Palito, Carabobo State; Bajo Grande, Zulia State	450.
Steel		Siderúrgica del Orinoco C.A. (Amazonia Consortium, 70%; Corporación Venezolana de Guayana, 30%)	Ciudad Guayana, Bolívar State	3,750.
Do.		Siderúrgica del Turbio C.A. (Siderúrgica Venezolana Sivensa S.A., 100%)	Antímano, Miranda State; Barquisimeto, Lara State; Casima, Bolívar State	907.
Sulfur		Petróleos de Venezuela, S.A. (Government, 100%)	Refineries in Amuay and Cardón, Falcón State; El Palito, Carabobo State; San Roque, Anzoátegui State	422.
Do.		Petrozuata (Conoco Inc., 50.1%; Petróleos de Venezuela S.A., 49.9%)	José Industrial Complex, Anzoátegui State	53.