

2011 Minerals Yearbook

VENEZUELA [ADVANCE RELEASE]

THE MINERAL INDUSTRY OF VENEZUELA

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Venezuela's gross domestic product (GDP) based on purchasing power parity increased by about 6.4% to \$374.1 billion in 2011 from \$351.6 billion (revised) in 2010. Economic prospects remained mostly dependent on oil prices and the export of petroleum. The oil sector accounted for almost 12% of the GDP, about 95% of export earnings, and about 40% of the Government's budget revenues. Owing to high crude oil prices and record Government spending, Venezuela's GDP increased in spite of a sharp drop in oil prices caused by the global economic crisis during 2009 and 2010. Venezuela remained an important supplier of crude and refined petroleum products to the United States. Venezuela's leading produced mineral commodities consisted primarily of, in order of value, petroleum, natural gas, coal, bauxite, alumina and primary aluminum, iron ore and steel, gold, nickel, and diamond. The state-owned petroleum company Petróleos de Venezuela S.A. (PDVSA) continued to control the exploration for and production of asphalt, natural gas, and petroleum and its derivatives. Venezuela was a member of the Organization of the Petroleum Exporting Countries (OPEC) and an active participant in the global crude oil market. Venezuela accounted for more than 2% of the world's bauxite output, almost 0.9% of the world's aluminum output, and almost 0.6% of the world's iron ore output in 2011 (table 1; Banco Central de Venezuela 2012; Bray, 2012a, b; International Monetary Fund, 2012; Jorgenson, 2012; Petróleos de Venezuela S.A., 2012; U.S. Central Intelligence Agency, 2012; U.S. Department of

Changes in the Chinese economy and a new dynamic in that country's petroleum demand, its need for raw materials, and the growth of its manufacturing sector have sparked an important expansion of China's commercial and political relations with other countries of the developing world, particularly Latin America. The Government of Venezuela and the Industrial and Commercial Bank of China signed an agreement for the financing of crude oil and natural gas projects plus financial services in Venezuela (Mendez, 2011; Wiggin, 2012; Woodrow Wilson International Center for Scholars, Institute of the Americas, Chinese Academy of Social Sciences, 2012, p. 31).

Minerals in the National Economy

PDVSA controls Venezuela's petroleum sector. Government companies also control the electricity sector and important parts of the telecommunications and media sectors. During 2009 and 2010, the Venezuelan Government had nationalized companies in the agricultural, banking, chemicals, and construction sectors as well as U.S. assets in the packaging and petrochemical industries. The nationalization process, high inflation (26.1%), and foreign exchange controls had led to reduced private investment. Threats of continuing nationalizations, as well as other threats to property rights and an uncertain macroeconomic environment characterized by high inflation and foreign

exchange controls, have led to reduced activity for the private sector and low levels of private investment. Previously, in April 2008, Venezuela decided to nationalize the cement industry, which affected international companies, such as Cementos Mexicanos S.A of Mexico; LaFarge Group of France, and Holcim Ltd. of Switzerland. Venezuela's leading mineral resources included, in order of value, petroleum, natural gas, coal, iron ore, gold, nickel, diamond, and bauxite. In 2011, according to the Banco Central de Venezuela, the country's manufacturing sector accounted for almost 15% of the GDP; the crude oil sector, almost 12%; the construction sector, almost 8%; and the mining sector, almost 1% (Banco Central de Venezuela, 2012; International Monetary Fund, 2012; Petróleos de Venezuela S.A., 2012).

Government Policies and Programs

According to the Venezuelan Constitution, all mineral and hydrocarbon resources belong to the state. The Mining Law (Decree No. 295 of September 5, 1999) establishes the rules for all mines and minerals (except hydrocarbons and some industrial minerals not found on state lands) within Venezuelan territory. The Mining Law governs also the exploration, development, production, marketing, and transportation of minerals. The Ministerio del Poder Popular de Petróleo y Minería (MPPM) is responsible for all matters related to petroleum and mining operations. The General Regulation of the Mining Law (Decree No. 1234 of March 9, 2001) establishes terms, conditions, and administrative procedures in support of Decree No. 295. Most industrial minerals found on private lands continue to be governed by Articles 7 through 10 of the Mining Law of 1945 until the individual States establish regulations. The Hydrocarbon Law, which is known as the Decree with Force of Organic Law on Hydrocarbons (Decree No. 1510 of November 2001), and Article 302 of the Constitution of 1999 reserve all primary hydrocarbon activities for the state. The Hydrocarbon Law was amended in 2006 by the Partial Amendment Law to Decree 1510 with Force of Law, Organic Law of Hydrocarbons. Nonassociated gas (natural gas that is not produced simultaneously with crude oil) and downstream natural gas operations are excluded from the Hydrocarbon Law; they are regulated instead by the Decree with Rank and Force of Organic Law on Gaseous Hydrocarbons (Decree 310 of September 1999) and by the Regulation of the Law on Gaseous Hydrocarbons (Decree 840 of June 2000), as amended by the MPPM's Resolution 244 of January 9, 2006 (Banco Central de Venezuela, 2012: Petróleos de Venezuela S.A., 2012).

The Norms of Environmental Evaluation of Activities Susceptible to Degrade the Environment (Decree No. 1257 of 1996) establishes the Ministerio del Poder Popular para el Ambiente (MINAMB) [Ministry of Popular Power for the Environment]. The law requires an environmental impact study for projects and operations in the hydrocarbon and mining

sectors. The MINAMB implements Decrees No. 1510 and No. 1257 through the Ley Orgánica del Ambiente [the Organic Law for the Environment] (Ministerio del Poder Popular para el Ambiente, 2012).

In June 2009, the Government passed legislation that requires private-sector petrochemical producers to enter into joint ventures with the Government-owned chemicals company Petroquímica de Venezuela S.A. (Pequiven) in order to continue doing business in Venezuela. The Government would allow private sector consortia to negotiate the formation of joint ventures to produce crude oil and to develop heavy-crude-oil upgrades in the Carabobo region of the Orinoco Belt from 2010 through 2013. Owing to the Government's nationalization drive, such foreign investors as Eni S.p.A. of Italy, Statoil ASA of Norway, and Total S.A. of France had entered into joint ventures with the Government in which the Government's equity share was 60%. The Government was considering administrative and technical audits of foreign and domestic crude oil companies interested in partnerships, conforming to the framework of the strategic collateral plan called the National Social and Economic Development Plan for the period 2007-13 (Petróleos de Venezuela S.A., 2012).

In 2011, Venezuela's National Assembly approved the creation of two joint ventures between PDVSA and two consortia of international oil companies for the development of projects in the Orinoco heavy oil belt. The first joint venture gave PDVSA a 60% share of the Carabobo 1 project, and the remaining 40% was divided among Indian Oil Corp. Ltd. of India, Repsol YPF S.A. of Spain, and others. In the second joint venture project, Carabobo 3, PDVSA also held 60% interest, and the remaining 40% was shared among Chevron Corp. of the United States, Inpex Corp. and Mitsubishi Corp. of Japan, and Venezuela's Suelopetrol C.A. Each of the two projects would have the capacity to produce 400,000 barrels per day (bbl/d) of oil and each would include the construction of a heavy crude upgrader that could turn 200,000 bbl/d of tar-like Orinoco oil into synthetic crude; the remaining 200,000 bbl/d of Orinoco oil would be blended to produce an intermediate grade. These two projects were expected to generate \$30 billion worth of investment and to increase the country's output by 880,000 to 960,000 bbl/d.

The National Assembly also ratified an agreement to establish an oil production joint venture, called Petromiranda S.A., between PDVSA (60%) and Russia's National Oil Consortium (NOC) (40%); the agreement was signed on April 2, 2011. NOC was created to conduct oil and gas operations in Venezuela, and its members included Russian companies OAO Rosneft, OAO Gazprom, Lukoil Oil Co., OJSC "Surgutneftegas" and TNK-BP. According to earlier reports, the Petromiranda joint venture would focus on developing the Junin 6 oil block, which had estimated reserves of 500 billion barrels (Gbbl) of oil. Production from the block was expected to reach 450,000 barrels per day (bbl/d) of heavy oil by 2017. The Venezuelan Government expected that the Orinoco oil belt could attract investment of more than \$120 billion during the next 7 years, which would allow Venezuela to produce 3 million barrels per day (Mbbl/d) of crude oil in the Orinoco oil belt and add 108 Gbbl to the country's certified oil reserves,

which totaled 170 Gbbl in 2012 (Oil & Gas Journal, 2012; PennEnergy, 2012; Petróleos de Venezuela, S.A., 2012).

Production

Venezuela's production data for selected mineral commodities are in table 1. According to the BP Statistical Review of World Energy, Venezuela's crude oil production increased to 914,500,000 bbl in 2011 from a revised 901,915,000 bbl in 2010, or by almost 1.4%. The country's gross natural gas production amounted to 28 billion cubic meters in 2011 compared with 28.5 billion cubic meters in 2010, which was a nearly 1.8% decrease (table 1; BP p.l.c., 2012; Petróleos de Venezuela S.A., 2012; U.S. Energy Information Administration, 2012a).

Structure of the Mineral Industry

The Government-owned mineral and industrial producer Corporación Venezolana de Guayana Minerven C.A. (CVGMinerven) and the Instituto Nacional de Geología y Mina were part of the MPPM. The Government-owned Compañía Nacional de Industrias Básicas (a holding company under CVGMinerven) participated in the production of bauxite and alumina, aluminum, and iron ore. PDVSA continued to be responsible for the development and management of the hydrocarbon sector and produced about 70% of the national output of crude oil. As a PDVSA affiliate, CVGMinerven managed the Government's 32 operating service agreements (OSAs) with such international oil companies as BP p.l.c. of the United Kingdom and Chevron Corp. of the United States and the eight risk-and-profit-sharing agreements that accounted for about 20% of Venezuelan crude oil production in 2011. Corporación Venezolana de Petróleos (CVP), which was a wholly owned subsidiary of PDVSA, also managed four OSAs that produced and processed extra-heavy crude oil and accounted for about 10% of the total national output of petroleum. According to the International Cement Review, the Venezuelan cement company Venezolana de Cemento S.A. was expected to increase production to 8.3 million metric tons (Mt) of cement in 2012 from 7.7 Mt in 2011. The Loma de Niquel Mine was owned by Anglo American plc of the United Kingdom. Many companies in the coal, iron, synthetic crude oil (including heavy crude oil), and steel (including hot-briquetted iron) sectors were owned by joint ventures of the Government and private sector companies, such as Kobe Steel Ltd. and Mitsui and Co. Ltd. of Japan (tables 1, 2; International Cement Review, 2012a, b; Petróleos de Venezuela, S.A., 2012).

Some of China's state-owned corporations were planning to invest in Venezuela. The Venezuelan Government announced that China was planning to invest \$16 billion by 2012 to develop oil reserves in the country's eastern Orinoco Belt. China International Engineering Consulting Corp., China Petroleum and Petrochemical Engineering, and PDVSA were considering developing technology for crude oil refining and upgrading. PDVSA was planning to increase its output to about 4 Mbbl/d by 2014 from its current (2011) production level of 2.5 Mbbl/d (Mendez, 2011; Oil & Gas Journal, 2012; PennEnergy, 2012; Petróleos de Venezuela, S.A., 2012).

Private Japanese companies, such as Japan Oil, Gas & Metals National Corp. (JOGMEC), backed by the Japanese Government were planning to provide funding to Inpex and Mitsubishi, which, along with subsidiaries of Chevron and the Venezuelan Suelopetrol, was participating in an extra-heavy crude oil development project on three blocks of Venezuela's Carabobo area. The four firms had participated jointly in the bidding round for development of the Carabobo projects, which was held in January 2010, and were awarded the contract for the Carabobo 3, which would entail the development, production, and upgrading of Block 2 South, Block 3 North, and Block 5. The consortium was conducting a feasibility study with a plan to form a joint venture with PDVSA to produce about 400,000 bbl/d of crude oil at the project. JOGMEC was planning to invest \$40.2 billion once the joint venture was established. PDVSA held a 60% stake in the venture; Chevron, 34%; Inpex and Mitsubishi jointly, 5%; and Suelopetrol, 1% (Oil & Gas Journal, 2012; PennEnergy, 2012; Petróleos de Venezuela, S.A., 2012).

Mineral Trade

Venezuelan economic prospects remained mostly dependent on crude oil prices and the export of petroleum and its derivatives; thus, the petroleum sector continued to benefit the country's economy owing to its significant contributions to the country's trade balance. In 2011, Venezuela's commodity exports amounted to \$92.6 billion compared with \$65.8 billion in 2010. Exports included, in order of value, petroleum (\$88 billion), bauxite and aluminum, steel, cement, chemical products, iron ore, and other products (\$4.6 billion) in 2011 alone. The country's leading export partners were the United States (38.7%), China (7.7%), India (4.8%), Cuba (4.1%), and others (44.7%). Venezuela's imports amounted to \$46.4 billion compared with \$38.6 billion in 2010, and included consumer goods, machinery and transport equipment, manufactured goods, and construction materials. Venezuela's leading suppliers were the United States (26.6%), Colombia (11.4%), Brazil (9.6%), China (9.1%), and others (43.3%) (Banco Central de Venezuela, 2012; Petróleos de Venezuela, S.A., 2012; U.S. Energy Information Administration, 2012b).

Although political tensions between the United States and Venezuela continued in 2011, the United States remained Venezuela's leading trading partner. In 2011, trade between the two countries amounted to \$55.6 billion. Venezuelan exports to the United States were valued at \$43.3 billion (accounting for at least 42% of total Venezuelan exports), and the U.S. exports to Venezuela were valued at \$12.4 billion, which was about 24.2% of total Venezuelan imports. The United States continued to be the leading customer for Venezuelan petroleum. Venezuela shipped an average of 987,000 bbl/d to the United States in 2010. This accounted for at least one-half of Venezuelan oil exports and 8.3% of U.S. oil imports (Banco Central de Venezuela, 2012; Petróleos de Venezuela, S.A., 2012; U.S. Department of State, 2012).

Commodity Review

Metals

Aluminum and Bauxite and Alumina.—Venezuela's CVG Venezuela Aluminum Corp. was planning to increase production to 2 million metric tons per year (Mt/yr) of alumina at its Bauxilum plant in the Ciudad Guayana by 2013. In March 2011, a joint venture between China Aluminum International Engineering Co., Ltd. (Chalieco) and CVG Alumino del Caroni S.A. (Alcasa) planned to invest \$430 million in a 2-year project to restore operating levels at the Alcasa plant in the city of Puerto Ordaz in eastern Venezuela's Guayana region. The Alcasa plant would start operating at a capacity of 10,000 t/yr, and the capacity would be increased to 40,000 t/yr between 2013 and 2015. The investment was from an \$18 billion development established between Alcasa and Chalieco in 2007 (Beltran, 2012; Mbendi Information Services (Pty) Ltd., 2012a).

Gold.—Most of Venezuela's gold mining activities took place in the State of Bolivar in southern Venezuela. As of January 2011, the country's leading gold mine, Las Cristinas, which is located at Kilometro 88 in Bolivar State, had proven and probable reserves of 464.4 Mt grading 1.13 grams per metric ton (g/t) gold containing 16.9 million troy ounces, or the equivalent of 525 metric tons (t) of gold. In addition, Las Cristinas had measured and indicated resources of 165 Mt grading 0.73 g/t gold containing 3.9 million troy ounces, or the equivalent of 120 t of gold (Ministerio del Poder Popular para las Industrias Básicas y Minería, 2012; Reuters, 2012).

Up to December 15, 2011, the Canadian-Russian joint-venture company Rusoro Mining Ltd. was engaged in the acquisition, exploration, development, and operation of gold properties in Venezuela. The company operated as a joint venture with CVGMinerven. On September 16, 2011, however, the Venezuelan Government enacted Law-Decree No. 8413, which reserves to the Government of Venezuela exclusive rights for the extraction of gold in Venezuela. According to the nationalization decree, all Venezuelan mining assets, including those owned by private enterprises, must be transferred to a new mixed-interest enterprise (joint venture), of which the private enterprises cannot own more than 45%. If a private enterprise is unable to agree upon the terms and conditions of Law-Decree No. 8413, then 100% of the company's mining concessions, related contracts, and assets revert to the Government. Law-Decree No. 8413, however, established a negotiation period of 90 days, which would end on December 15, 2011, and this nationalization decree was extended by decree No. 8683 an additional 90 days, to March 14, 2012. The effects of the 180-day extension for negotiations between the private sector and Government remains unknown [Mbendi Information Services (Pty) Ltd., 2012c; Ministerio del Poder Popular para las Industrias Básicas y Minería, 2012; Reuters, 2012; Rusoro Mining Ltd., 2012].

Iron Ore.—According to Business News Americas and Mbendi Information Services (Pty) Ltd., Venezuelan iron ore producer CVG Ferrominera Orinoco (CVG) increased production to 17 Mt of beneficiated iron ore in 2011 compared with a revised 14 Mt in 2010, or by about 21.4%. The production target for 2012 was 20 Mt. CVG supplied 62% of its iron ore to Venezuelan iron ore and steel processors and

exported 38% to the European Union, Asia, and other Latin American countries [Bourke, 2012; CVG Ferrominera Orinoco, 2012; Mbendi Information Services (Pty) Ltd., 2012d].

Mineral Fuels and Related Materials

Coal.—In 2011, Venezuela produced about the same amount of bituminous coal (8.8 Mt) as it produced in 2010. Venezuela was Latin America's second ranked coal producer after Colombia. Carbones del Guasare, S.A. operates the country's leading coal mine, the Paso Diablo, which is located in the State of Zulia. Carbones del Guasare used the open pit method to access about 175 Mt of coal reserves and an additional 530 Mt of recoverable coal reserves in the Guasare coal basin near the Colombian border. The Paso Diablo Mine is owned by a joint venture of Government-owned Carbozulia, S.A. (51%) and Carbones del Guasare (49%). Carbones de la Guajira, S.A. operated the Mina Norte coal mine, which is also located in the State of Zulia; the company was operated by the joint venture of InterAmerican Coal Holdings NV (64%) and Carbozulia (36%). The Venezuelan Government continued to express an interest in developing a coal-powered electricity-generating plant to supplement the national electricity grid, much of which was supplied by hydroelectric plants [Carbozulia, S.A., 2011; Mbendi Information Services (Pty) Ltd., 2012b; U.S. Energy Information Administration, 2012a].

Natural Gas.—In 2011, natural gas production and consumption remained at about the same level as that of 2010 (28,500 million cubic meters and 29,500 million cubic meters, respectively); the difference between production and consumption appears to have been imported from Colombia. Most natural gas output was associated with petroleum production. According to BP and the U.S. Energy Information Administration, Venezuela has the second largest natural gas reserves (about 5.5 trillion cubic meters) in the Western Hemisphere behind the United States (7.7 trillion cubic meters). The petroleum sector consumed more than 65% of Venezuela's natural gas production in the form of reinjection to produce crude oil. Venezuela's most important natural gas projects included the Barrancas and the Yucal Placer Blocks. During the period from 2008 through 2011, the Antonio Ricaurte 224-kilometer gas pipeline, which connects western Venezuela to Colombia's Punta Ballenas area, had delivered between 2,700 and 4,300 million cubic meters per day of natural gas from Colombia to Venezuela; the flow of gas was to be reversed by no later than 2014 when Venezuela was to begin exporting about 4,000 million cubic meters per day to Colombia, and that contracted volume was reportedly the pipeline's average flow in 2011 (BP p.l.c., 2012; Petróleos de Venezuela, S.A., 2012; U.S. Energy Information Administration, 2012a, b).

Venezuela planned to increase its natural gas supply to cover domestic and regional demand, and the excess was to be exported to the world markets. Proposed natural gas projects included the development of the offshore nonassociated natural gas resources in the Plataforma Deltana area, which is located south of Trinidad and Tobago in the Atlantic Ocean; the development of natural gas resources in the Gulf of Venezuela and the State of Falcon; the construction of the

Center West Interconnection Project gas pipeline; and the construction of the Gran Mariscal de Ayacucho industrial complex and the Mariscal Sucre LNG plant (Petróleos de Venezuela, S.A., 2012; U.S. Energy Information Administration, 2012b).

According to Chevron, total daily production in 2011 from all Chevron's producing areas in Venezuela averaged 259,000 barrels (bbl) of crude oil and almost 3.4 million cubic meters of natural gas. That production came from three areas. The first was the Boscan field in the State of Zulia in western Venezuela under a contract that was to expire in 2026. Boscan was operated by Petroboscan, S.A. (an affiliate of PDVSA in which Chevron held a 39.2% interest). In 2011, Petroboscan's production averaged 103,000 bbl/d of liquids and 0.4 million cubic meters per day of natural gas. The second was the LL-652 field in Lake Maracaibo under a contract that was to expire in 2026. This field was operated by Chevron's affiliate Petroindependiente, S.A., in which Chevron was a 25.2% owner. In 2011, Petroindependiente's production averaged 4,000 bbl/d of liquids and more than 1.2 million cubic meters per day of natural gas. The third was the Hamaca project under an agreement that was to expire in 2033. The project was operated by Petropiar, S.A. (a company in which Chevron owned a 30% interest). The project was located in Venezuela's Orinoco Belt and had a total design capacity to process and upgrade 190,000 bbl/d of extra-heavy crude oil into 180,000 bbl/d of lighter-value synthetic crude oil. In 2011, production averaged 152,000 bbl/d of synthetic crude oil and 1.7 million cubic meters per day of natural gas. Chevron also held a 34% interest in Petroindependencia, which was conducting initial studies related to the development of the Carabobo 3 project. The initial license for the concession was for 25 years, and the license could be extended for an additional 15 years upon startup and initiation of thermal recovery operations. Chevron continued to prepare a development concept for Blocks 2 and 3 in the offshore Plataforma Deltana area, in which Chevron held 60% interest and 100% interest, respectively. Also, the company completed an initial exploration of the Cardon III Block, which is located north of Lake Maracaibo (Chevron Corp., 2012a; 2012b, p. 10).

Petroleum.—PDVSA controlled the country's petroleum sector through its wholly owned subsidiary CVP. In 2011, according to BP and the U.S. Energy Information Administration, Venezuela's proven reserves amounted to 211.2 Gbbl of crude oil (the largest in the Western Hemisphere). To increase petroleum refinery capacity in Venezuela, PDVSA planned to build new refineries by investing \$18 billion to construct the Cabruta refinery, which would have a capacity to process 400,000 bbl/d of extra-heavy crude; the Batalla de Santa Ines refinery (50,000 bbl/d of petroleum); and the Caripito refinery (50,000 bbl/d of asphalt). With these three new refineries online and improvements made to the country's existing refineries, PDVSA's processing capacity in Venezuela would be increased to 700,000 bbl/d by 2013 (BP p.l.c., 2012; Petróleos de Venezuela S.A., 2012; U.S. Energy Information Administration, 2012a, b).

Venezuela obtained a \$20 billion loan from the China Development Bank in 2010, which was paid off with shipments of oil totaling 100,000 bbl/d during 2011. The joint venture between China National Petroleum Corp. (CNPC) and PDVSA

invested \$8 billion on the joint exploration of the Junin-2 and Junin-4 Blocks in the Orinoco heavy-oil belt. CNPC was planning to invest an additional \$7 to \$10 billion on both fields after 2012 (Petróleos de Venezuela S.A., 2012; Woodrow Wilson International Center for Scholars, Institute of the Americas, Chinese Academy of Social Sciences, 2012, p. 26–27, 31).

The Ministerio del Poder Popular para la Energía y Petróleo indicated that Venezuela had 1.3 Mbbl/d of crude-oil refining capacity in 2011, all of which was operated by PDVSA. The major facilities included the Paraguana refining center (940,000 bbl/d), the Puerto de la Cruz refinery (195,000 bbl/d), and El Palito refinery (127,000 bbl/d). Venezuela's CITGO Petroleum Corp., through PDVSA, also controlled significant refining capacity outside of the country (Petróleos de Venezuela S.A., 2012; U.S. Energy Information Administration, 2012a, b).

Uranium.—Venezuela planned to produce uranium eventually from deposits located in the States of Amazonas and Bolivar, which supposedly contain about 50,000 t of uranium reserves. Russia and Venezuela signed cooperation agreements in the fields of crude oil exploration and nuclear energy and were planning to sign a 25-year intergovernmental cooperation agreement for crude oil and natural gas production and nuclear power generation (RIA Novosti, 2011).

Outlook

Venezuela is expected to remain a leading supplier of crude oil and refined derivatives to the United States. Natural gas will be incorporated into the country's energy supply as progress is made on future offshore gas developments on the Deltana Platform off the coast of eastern Venezuela and in the Paraguana Peninsula in the northwestern part of the country (Petróleos de Venezuela, S.A., 2012).

Although Venezuela's nationalizations and uncertain macroeconomic environment could lead to reduced involvement of the private sector, Venezuela's large reserves of petroleum (the largest in the Americas) are more likely to encourage new investments from China, Iran, Italy, and Russia. Investment could include the construction of infrastructure to deliver crude oil and natural gas throughout the world and could give Venezuela a significant advantage in marketing its petroleum and derivatives and natural gas on a long-term basis. PDVSA's exploration and production joint ventures are expected to encourage additional development of hydrocarbon resources in the Orinoco Belt and to increase the country's production of petroleum to about 6 Mbbl/d in the near term. PDVSA's plans to build new petroleum refineries at Cabruta and Llanos de Barinas (Batalla de Santa Inés) and to build an asphalt plant at Caripito are also likely to encourage the continuation of Venezuela's strategic alliances with other nations with strong economies, such as Canada, China, Italy, Russia, and others, particularly in the crude oil, natural gas, and precious metals sectors. To develop Las Cristinas, which is one of the leading gold deposits in Latin America, such alliances could be a welcome alternative for Venezuela (Organization of the Petroleum Exporting Countries, 2012, p. 5–7; Petróleos de Venezuela, S.A., 2012; U.S. Energy Information Administration, 2012a, b).

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$\label{table 1} \textbf{TABLE 1}$ <code>VENEZUELA: PRODUCTION OF MINERAL COMMODITIES^1</code>

(Thousand metric tons unless otherwise specified)

Commodity	2007	2008	2009	2010	2011 ^e
METALS					
Aluminum: ²	4.000.0	4.000		4.000	4.000
Alumina	1,900 °	1,900	1,900	1,900	1,900
Bauxite	5,323 ^r	4,192 ^r	4,267 ^r	2,500 ^r	4,500
Metal, primary, unalloyed metric tons	615,700 ^r	607,800 r	561,100 ^r	335,000 ^r	380,000
Gold, mine output, Au content ² kilograms	10,092	10,100	11,880 ^r	12,000	12,000
Iron and steel:					
Iron ore and concentrate:	20.700	20.550	11000	4.4.000	44000
Gross weight	20,700	20,650	14,900	14,900	14,900
Metal content ²	13,400 ^r	13,000 ^r	15,200	14,000 ^r	17,000
Metal, direct-reduced iron	8,400 e	8,400	8,500	8,500	8,500
Ferroalloys: ^e					
Ferromanganese	15,000	15,000	15,000	15,000	15,000
Ferronickel	57,000	57,000	57,000	57,000	57,000
Ferrosilicon ³	92,000	92,000	92,000	50,000 ^r	62,000
Silicomanganese	35,000	35,000	35,000	35,000	35,000
Total	199,000	199,000	199,000	157,000	169,000
Steel, crude ³	5,005 ^r	4,225 ^r	3,808 ^r	2,207 ^r	2,200
Semimanufactures, hot-rolled	3,500 e	3,500	3,500	3,500	3,500
Lead, secondary, refined ² metric tons Nickel:	35,100 ^r	35,100 ^r	35,100 ^r	35,100 ^e	35,100
Mine output, Ni content ² do.	15,700 ^r	10,900 ^r	10,400 ^r	10,400 e	10,400
Ferronickel, Ni content do.	16,600 °	16,600	16,600	16,600	16,600
INDUSTRIAL MINERALS	10,000	10,000	10,000	10,000	10,000
Cement ²	8,000 e	8,200 e	8,500 e	8,000 e	7,700
Clays, common	250 °	250	8,300 250	250	250
	230	230	230	230	230
Diamond: ²	5 000 f	2.752.1	C 000 T	C 000 T	c 000
Gem carats	5,800 ^r 8,700 ^r	3,752 ^r	6,000 r	6,000 ^r 9,000 ^r	6,000
Industrial do. Total do.	14,500 ^r	5,629 ^r 9,381 ^r	9,000 ^r 15,000 ^r	15,000 ^r	9,000 15,000
:	200 e	200	200	200	13,000
Feldspar Gypsum	7 e	200 7	200 7	200 7	7
	400	400	400	400	400
Lime ^c Nitrogen, N content of ammonia	1,160 ^e	1,160	1,160	1,160	1,200
Phosphate rock:	1,100	1,100	1,100	1,100	1,200
Gross weight	400 e	400	400	400	400
P ₂ O ₅ content ^e	115	115	115	115	115
Pyrophyllite ^e	30	30	30	30	30
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:	750	750	750	750	750
Granite ^e	750	750	750	750	750
Limestone ⁴	18,000 e	18,000	18,000	18,000	18,000
Sand and gravel	600 e	600	600	600	600
Silica sand ³	500 ^e	500	500	500	500
Sulfur, petroleum byproduct MINERAL FUELS AND RELATED MATERIALS	850 ^r	710 ^r	570 ^r	800 °	800
Carbon black ^e	60	60	60	60	60
Coal, bituminous ⁵	7,647 ^r	6,174 ^r	8,792 ^r	8,793 ^r	8,792
Gas, natural:					
Gross ⁵ million cubic meters	29,500 ^r	30,000 ^r	28,700 ^r	28,500 ^r	28,000
Marketed ^e do.	28,500	26,000 r	24,800	24,900	24,900
Natural gas liquids:	•		*		•
Natural gasoline thousand 42-gallon barrels	13,600 ^e	13,600	13,600	13,600	13,600
Natural gasonne inousanti 42-ganon parteis					
Liquid petroleum gas do.	64,900 e	64,900	64,900	64,900	64,900

See footnotes at end of table.

$\label{total commodities} TABLE~1\\ \hbox{$-$Continued}$ VENEZUELA: PRODUCTION OF MINERAL COMMODITIES 1

(Thousand metric tons unless otherwise specified)

Commodity MINERAL FUELS AND RELATED MATERIALS—Continued		2007	2008	2009	2010	2011 ^e
Petroleum: ⁶						
Crude ⁵	thousand 42-gallon barrels	953,745	933,670	889,505	901,915 ^r	914,500 7
Refinery products: ^e						
Liquefied petroleum gas	do.	7,000	7,000	7,000	7,000	7,000
Gasoline, motor	do.	85,000	85,000	85,000	85,000	85,000
Naphtha and other gasolines	do.	60,000	60,000	60,000	60,000	60,000
Jet fuel	do.	32,000	32,000	32,000	32,000	32,000
Kerosene	do.	120	120	120	120	120
Distillate fuel oil	do.	109,000	109,000	109,000	109,000	109,000
Lubricants	do.	1,200	1,200	1,200	1,200	1,200
Residual fuel oil	do.	90,000	90,000	90,000	90,000	90,000
Asphalt	do.	6,000	6,000	6,000	6,000	6,000
Petroleum coke	do.	10,000	10,000	10,000	10,000	10,000
Paraffins	do.	250	250	250	250	250
For internal consumption	do.	30,000	30,000	30,000	30,000	30,000
Unspecified	do.	1,000	1,000	1,000	1,000	1,000
Gains and losses	do.	2,000	2,000	2,000	2,000	2,000
Total ⁸	do.	434,000	434,000	434,000	434,000	434,000

^eEstimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. ^fRevised. do. Ditto.

¹Table includes data available through March 3, 2012.

²Sources: International Cement Review, 2012; USGS Mineral Commodity Summaries, 2011–12; World Mining Data, v. 26, Vienna, Austria, 2011; World Metal Statistics Yearbook, 2009–11.

³Source: Steel Statistical Yearbook 2011; production of 75% silicon-content ferrosilicon.

 $^{^4\}mathrm{Excludes}$ production under contract with the Government.

⁵Sources: BP Statistical Review of World Energy, June 2011; U.S. Energy Information Administration, 2012.

⁶Includes condensate and bitumen for the production of Orimulsión®.

⁷Reported figure.

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

${\it TABLE~2}$ VENEZUELA: STRUCTURE OF THE MINERAL INDUSTRY IN 2011

(Thousand metric tons unless otherwise specified)

Commodi	ty	Major operating companies and major equity owners ¹	Location of main facilities	Annual capacity
Alumina		C.V.G. Bauxilum C.A. (Corporación Venezolana de Guayana)	Ciudad Guayana, Bolivar State	2,000
Aluminum		C.V.G. Aluminio del Caroní, S.A. (Corporación Venezolana de Guayana and others)	do.	420
Do.		C.V.G. Venezolana de Aluminio C.A. (Corporación Venezolana de Guayana, 80%, and Showa Denko K.K., Kobe Steel Ltd., Sumitomo Chemical Co. Ltd., Mitsubishi Materials Corp., Mitsubishi Aluminum Co., and Marubeni Corp., 20%)	do.	430
Do.		Compañía Nacional de Industrias Básicas (Corporación Venezolana de Guayana, 100%)	do.	210
Bauxite		C.V.G. Bauxilum C.A. (Corporación Venezolana de Guayana, 100%)	Los Pijiguaos, Bolivar 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, Anzoategui State; San Cristobal, Tachira State	4,600
Do.		Lafarge Venezuela (Lafarge Group, 56.2%)	La Vega, Miranda State, and San Cristobal, Tachira State	1,750
Do.		Holcim (Venezuela) S.A. (Holcim Ltd., 85%)	Carupano, Sucre State, and San Sebastian de los Reyes, Aragua State	2,200
Do.		C.A. Fábrica Nacional de Cementos (Lafarge Group, 46.13%)	Palmira and Ocumare del Tuy, Miranda State	1,330
Do.		Cementos Catatumbo (Lafarge Group, 23.32%)	Montellano, Zulia State	650
Do.		Cemento Andino	Curcas, Trujillo State	560
Coal		Carbones del Guasare, S.A. (Carbozulia S.A., 51%, and Carbones del Guasare, S.A., 49%)	Paso Diablo, Zulia State, Guasare coal basin	8,000
Do.		Carbones de la Guajira, S.A. (InterAmerican Coal Holdings NV, 64%, and Carbozulia S.A., 36%)	Mina Norte and Cachiri, Zulia State, Guasare coal basin	1,500
Ferronickel		Loma de Níquel C.A. (Anglo American plc, 91.4%)	Loma de Niquel, Aragua and Miranda States	18
Ferrosilicon		Ferroatlántica de Venezuela, S.A. (Ferroatlántica S.L., 80%, and Corporación Venezolana de Guayana, 20%)	Ciudad Guayana, Bolivar State	80
Gold	kilograms	C.V.G. Compañía General de Minería C.A. (Rusoro Mining Ltd., 50%, and Corporación Venezolana de Guayana, 50%)	Isidora Mine, El Callao, Bolivar State	1,000
Do.	do.	C.V.G. Compañía General de Minería C.A. (C.V.G. Ferrominera Orinoco C.A., 66.77%, and Corporación Venezolana de Guayana, 33.23%)	Colombia and Union Mines. Caratal and El Peru plants, El Callao, Bolivar State	4,600
Do.	do.	Promotora Minera de Venezuela (Rusoro Mining Ltd., 95%, and Ferrominera Orinoco C.A., 5%)	Choco Mine, El Callao, Bolivar State	4,000
Do.	do.	C.V.G. Compañía General de Minería C.A.	Tomi Mine, El Callao, Bolivar State	1,500
Do.	do.	Revemin (C.V.G. Compañía General de Minería C.A., 51%, and Corporación Venezolana de Guayana, 49%)	Remevin mill, El Callao, Bolivar State	1,500
Do.	do.	El Callao Mining Corp. (Crystallex de Venezuela C.A., 80%)	La Victoria (Lo Increible), El Callao, Bolivar State	200
Iron and steel:				
Iron:				
Direct-reduced		Siderúrgica del Orinoco C.A. (Cosorcio Siderúrgico Amazonia Ltd., 70%, and Corporación Venezolana de Guayana, 30%)	Ciudad Guayana, Bolivar State	4,600
Hot-briquetted		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, Bolivar State	2,200
Do.		Venezolana de Prereducidos de Caroní (International Briquettes Holding, 100%)	do.	815
Iron ore		C.V.G. Ferrominera Orinoco C.A. (Corporación Venezolana de Guayana, 100%)	Cerro San Isidro, Los Barrancos, and Las Pailas, Bolivar State	13,000
Do.		Compañía Nacional de Industrias Básicas (Corporación Venezolana de Guayana, 100%)	do.	12,000

See footnotes at end of table.

TABLE 2—Continued VENEZUELA: STRUCTURE OF THE MINERAL INDUSTRY IN 2011

(Thousand metric tons unless otherwise specified)

C	ommodity	Major operating companies and major equity owners ¹	Location of main facilities	Annual capacity
Iron and steel-	•	Major operating companies and major equity owners	Location of main facilities	сарасну
Iron—Conti				
Iron ore pe		Compañía Nacional de Industrias Básicas (Corporación	Ciudad Guayana, Bolivar State	3,600
non ore p		Venezolana de Guayana, 100%)	eradad Gadyana, 2011 tar State	2,000
Do.		Siderúrgica del Orinoco C.A. (Cosorcio Siderúrgico Amazonia	do.	7,000
		Ltd., 70%, and Corporación Venezolana de Guayana, 30%)		,
Steel		do.	do.	4,000
Natural gas	million cubic meters	Petróleos de Venezuela S.A. (PDVSA) (Government, 100%)	Processing plants in Anzoategui, Monagas, and Zulia States	35,000
Do.	do.	Petróleos de Venezuela S.A. (PDVSA) (Government, 60.8%, and Chevron Corp., 39.2%)	Boscan Field in Zulia State	310
Do.	do.	Petróleos de Venezuela S.A. (PDVSA) (Government, 74.8%, and Chevron Corp., 25.2%)	LL-652 Field in Lake Maracaibo	520
Do.	do.	Petróleos de Venezuela S.A. (PDVSA) (Government, 70%, and Chevron Corp., 30%)	Hamaca Project in Orinoco Belt	410
Do.	do.	Petróleos de Venezuela S.A. (PDVSA) (Government, 60%, and Chevron Corp.; Inpex Corp.; Mitsubishi Corp.; Suelopetrol C.A., 40%)	Plataforma Deltana in Lake Maracaibo	500
Nickel, Ni con	ntent of mine output	Loma de Níquel C.A. (Anglo American plc, 91.4%)	Loma de Niquel, Aragua and Miranda States	22
Nitrogen cont	ent of ammonia	Fertilizantes Nitrogenados de Oriente S.A. (Pequiven, 35%; Koch Industries, 35%; Snamprogetti International S.A., 20%; Empresas Polar, 10%)	Jose Industrial Complex, Anzoategui State	1,070
Do.		Pequiven (Petróleos de Venezuela S.A., 100%)	Petrochemical complexes in Zulia and Carabobo States	670
Petroleum:				
Crude ² mi	llion 42-gallon barrels	Petróleos de Venezuela S.A. (PDVSA) (Government, 100%)	Fields in Anzoategui, Apure, Falcon, Guarico, Monagas, and Zulia States	750
Do.	do.	Petróleos de Venezuela S.A. (PDVSA) (Government, 60.8%, and Chevron Corp., 39.2%)	Boscan Field in Zulia State	750
Do.	do.	Petróleos de Venezuela S.A. (PDVSA) (Government, 74.8%, and Chevron Corp., 25.2%)	LL-652 field in Lake Maracaibo	2,200
Do.	do.	Petróleos de Venezuela S.A. (PDVSA) (Government, 70%, and Chevron Corp., 30%)	Hamaca Project in Orinoco Belt	800
Do.	do.	Joint ventures with Corporación Venezolana de Petróleos ³ [Petróleos de Venezuela S.A. (PDVSA), 100%]	Various locations	150
Refinery pro	oducts do.	Petróleos de Venezuela S.A. (PDVSA) (Government, 100%)	Refineries in Amuay and Cardon, Falcon State; Bajo Grande, Zulia State; El Palito, Carabobo State; Puerto La Cruz and San Roque, Anzoategui State	475

Do., do. Ditto.

¹Reflects 2005 Government holding company structure and does not include the reorganization that took place after the formation of Compañía Nacional de Industrias Básicas.

²Does not include extra-heavy crude processing (synthetic crude).

³Includes crude petroleum production undertakings that formerly produced crude petroleum under operating service, risk-sharing, or profit-sharing agreements.