

2007 Minerals Yearbook

COLOMBIA

THE MINERAL INDUSTRY OF COLOMBIA

By Susan Wacaster

In 2007, Colombia continued with a wide range of national plans to increase industrial production and promote development of competitive products in international markets; the Government projected that the country's mining sector would be one of the most important industries in Latin America by 2019 in terms of value, production, and trade. Colombia is situated within the South American Andean metallogenic belt where tectonic motion of lithospheric plates in the Earth's crust caused structural deformation and magmatism with associated mineralization. Regional faulting patterns formed structural blocks with which significant economic resources are associated. In Colombia, continental rifting created basins where sediments rich in organic material became the source of the country's petroleum reserves. Magmatic activity created rocks that represent lucrative precious-metal exploration targets, such as recently reported multimillion-troy-ounce gold discoveries. In 2007, about 40% of the country's terrain remained geologically unmapped. The Colombian Institute of Geology and Mines (INGEOMINAS) had been engaged in mapping campaigns to produce 1:100,000- and 1:200,000-scale geologic maps covering the entire national territory by 2019 (Unidad de Planeación Minero Energética, 2006; Gomez and Nivia, 2007; Gaona, Tatiana, Doctoral Candidate, Florida International University, oral commun., December 28, 2008).

Colombia's mining industry was led by the coal, natural gas, and petroleum sectors in 2007. Yearend coal reserves were 7 billion metric tons (Gt), which was just 0.8% of the world total; however, for 2007, Colombia was the leading coal producer in Latin America, the 10th ranked coal producer in the world, and the 4th ranked coal exporter. Proven crude oil reserves were 1.5 billion barrels, which was a 0.4% increase compared with those identified in 2006 and 0.1% of the world total. Colombia was a net exporter of petroleum and, in 2007, officials announced that the country would remain self sufficient until 2014. Natural gas reserves were 130 billion cubic meters at the end of the year, which was a 1.6% increase compared with those identified in 2006 and 0.1% of the world total. For the year, Colombia was the world's sixth ranked producer of nickel and platinum. BHP Billiton Ltd. produced about 3% of the world's nickel from laterite deposits in the Cordoba Department. Colombia was the world's leading emerald supplier; however, reported production rates had declined since 2003 and they dropped by 40% in 2007. Production of copper, industrial minerals, iron ore, and silver continued to be significant in the national economy (table 1; BHP Billiton Ltd., 2008; BP p.l.c., 2008; Business News Americas, 2008c).

Minerals in the National Economy

In recent years, the Colombian mining sector experienced growth whereas petroleum production was gradually declining. The value of mining, including extraction of hydrocarbons, had remained nearly constant since 2003 and accounted for

about 1.5% of the total gross domestic product (GDP). In 2007, production of crude petroleum, natural gas, and some quantity of thorium and uranium was valued at about \$5.6 billion and accounted for 3.3% of the national GDP, whereas coke oven products, combustibles, and refinery products were valued at about \$3.6 billion, or 2.1% of the GDP. Production of coal, lignite, and peat was valued at \$2 billion, or 1.1% of the GDP; production of metallic minerals was valued at \$2.1 billion or 1.2%; and nonmetallic mineral production was valued at \$1.3 billion, or 0.8%. In 2007, the value of foreign direct investment (FDI) in the petroleum sector was about \$3.5 billion. Total FDI in the mining sector, including coal, was valued at \$1.1 million compared with \$1.8 million, or 27% of the GDP, in 2006 (Agencia Nacional de Hidrocarburos, 2008a; Banco de la República de Colombia, 2008; Sistema Informacion Minero Colombiano, 2008).

Reports on industrial mineral production, including that of aggregates, clays, gravels, phosphate rock, and sands, indicated that, in recent years, its value was second only to coal in the national economy, but production of industrial minerals was closely tied to national economic trends. Production data for industrial minerals was difficult to obtain, and the Colombian Government was working to consolidate and publish data from all mining districts as an important part of the country's mining development plan (Ortiz, J.E., Manager, Unidad de Planeación Minero Energética, oral commun, 2006).

Ecopetrol S.A. completed its first round of capitalization in August 2007. Shares were initially offered only to Colombian citizens and could be purchased throughout the country at more than 2,500 locations ranging from supermarkets to banks. Shares were offered in blocks of 1,000 with a minimum purchase of 1,000 and a maximum of 50,000. A single block was valued at less than \$700, and purchases could be financed with a 15% down payment followed by 12 interest-free monthly installments. In November, shares were opened on the Colombian Stock Exchange. By the end of the year, Ecopetrol had privatized 10.1% of its ownership, 37% of which went to pension funds (Reuters, 2007; Ecopetrol S.A., 2008b).

Government Policies and Programs

In 2006, the Mining and Energy Planning Unit (UPME), which was the entity that was responsible for the development of the mining sector, published a long-range national mining development plan with projections to 2019. Another strategic plan was formulated and published for the period from 2007 to 2010. Those plans seek cooperation among all levels of government and the public sector. They state that, although economic growth, employment, and investment in mining fall within the domain of the private sector, the central Government should develop a strategy to guarantee long-term development. The plans outline the following basic goals: (1) a governmental and business environment conducive to mining, (2) development

of sustainable mining, and (3) Government oversight of resource exploitation. The specific lines of action to be addressed are efficiency, transparency, sustainability, reduced corruption, labor rights, and development of mining districts, especially those that will most increase the mining economy (Unidad de Planeación Minero Energética, 2006).

In a first debate of mining code reform, 27 articles were approved to clarify ambiguities in the Mining Code Law of 2001. Some of the approved articles deal with awarding concessions objectively based upon the best economic, environmental, social, and technical use of resources; the creation of a special application process for the development of work plans in the emerald sector; and charges and royalties that would essentially limit speculation (Unidad de Planeación Minero Energética, 2006; Sistema Informacion Minero Colombiano, 2007).

Production

Data on mineral production are in table 1. In terms of mine output of metals, copper production increased to 4,196 metric tons (t) in 2007 from 2,902 t in 2006. Gold production remained nearly constant at 15,482 kilograms (kg) in 2007 compared with 15,682 kg in 2006. Platinum production increased to 1,526 kg from 1,438 kg in 2006. Silver production increased to 9,765 kg from 8,399 kg in 2006.

In terms of industrial minerals, production of cement (hydraulic), some clays, and gypsum increased significantly in 2007 compared with production in 2006. Production of cement (hydraulic) increased to 11,068 thousand metric tons from 10,038 thousand metric tons, and common clay and kaolin together increased to 25,811 thousand metric tons from 8,400 thousand metric tons. Production of gypsum increased to 200,400 t from 186,300 t. There was a notable decrease in production of emerald to 3,389 thousand carats in 2007 from 5,734 thousand carats in 2006. Production of rock salt decreased in 2007 to 204,090 t from 248,245 t in 2006, and marine salt production decreased to 309,557 t from 389,630 t in 2006.

Structure of the Mineral Industry

Brazil's Votorantim Group acquired 52% of Acerías Paz del Río S.A., which controlled 30% of the country's metal production and was Colombia's second ranked steel producer and its only integrated steel mill. Latin American Minerals Inc. signed an agreement to option a 100% interest in the Esmeralda gold project, which is located in Pasto Department. Colombian oil company Meta Petroleum Ltd. was wholly acquired by Pacific Rubiales Energy Corp. Pacific Rubiales planned to construct a 260-kilometer (km) pipeline from the Rubiales oilfield to the existing Oleoducto Central pipeline (OCENSA). The OCENSA pipeline was reported to have greater than 250,000 barrels per day (bbl/d) of spare capacity and transported oil to the Covenas export terminal on the Caribbean coast. Ecopetrol would have 65% participation in the startup operations for the new pipeline. Operations were expected to begin during 2009 (Ecopetrol, S.A., 2007a; Latin American Minerals Inc., 2007; Votarantim Group, 2007; Business News Americas, 2008a).

Mineral Trade

In 2007, the total value of Colombian exports was about \$30 billion. About 21%, or \$6.4 billion, was accounted for by the value of mining products. Coal and coke product exports were up by almost 17% compared with those of 2006 to \$3.5 billion from \$2.9 billion. Coal exports were up by 12% from the previous year to 65 million metric tons (Mt). Carbones del Cerrejon, a joint venture owned in equal parts by a consortium comprising Anglo American plc, BHP Billiton plc, and Xstrata plc, reported that export values reached \$1.5 billion, which was a 21% increase compared with values in 2006. The export values of ferronickel, nonmonetary gold, and emerald increased to \$1.7 billion, \$332 million, and \$130 million, respectively. Ecopetrol generated \$3.9 billion in export revenue from international sales of crude and refined products, which was a 15% increase compared with that of 2006. In 2007, Colombia exported more than 63 million barrels (Mbbl) of crude petroleum (Business News Americas, 2008b; Ecopetrol, S.A. 2008a; Información Minera de Colombia, 2008).

Commodity Review

Metals

Gold.—Each year since 1999, gold production in Colombia remained at between 0.5% to 2% of total world production; however, important major discoveries were announced in 2007. At yearend, AngloGold Ashanti Ltd. of South Africa announced inferred and indicated resources of about 7 million troy ounces at its La Colosa project. By early 2008, the company had added another 13 million troy ounces of inferred resources. Colombia Goldfields Ltd. was developing a multimillion-troy-ounce gold resource in the Marmato Gold district. The company acquired 111 of 117 legal mining claims in the area. To complete a scoping study and continue drilling on all properties, the town of Marmato was being relocated to El Llano, which was located 4 km away. At year's end, 160 homes were built in El Llano and 29 others were under construction. Water-quality tests in the area revealed toxic levels of cyanide from unregulated discharge of tailings by small operations. Colombia Goldfields signed a letter of intent to acquire Colombia Gold, Plc, which was the owner of the rights to the Echandia Mine, a property adjacent to the Marmato deposits. Colombia Goldfields believed that the mineralized structures of the properties were connected and estimated the gold potential at Echandia to be 2 million to 4 million troy ounces. Greystar Resources Ltd. increased the resource estimates for its Angostura gold and silver deposit to more than 10 million troy ounces of measured and indicated gold resources combined and greater than 3 million troy ounces of inferred resources (International Mining, 2007; AngloGold Ashanti Ltd., 2008; Colombia Goldfields Ltd., 2008; Greystar Resources Ltd., 2008).

Nickel.—The Cerro Matoso ferronickel operation was an integrated mine and ferronickel smelter and refinery. The plant had crushers, ore storage, a blender, and a coal-fed rotary kiln. Electric furnaces produced molten metal that was sent for refining into ferronickel granules of about 35% nickel and 65%

iron. The smelter produced high-purity low-carbon ferronickel granules (BHP Billiton Ltd., 2008).

Industrial Minerals

Cement.—Cementos Argos S.A. held 51% of the Colombian cement market; its cement plants in Colombia had a total combined capacity of 11.6 million metric tons per year (Mt/yr). The company's new cement production line in Cartagena was scheduled to open in 2009, which would increase the company's production capacity of cement to greater than 13 Mt/yr by the end of 2009. Cementos Argos was the only producer of white cement in Colombia (Cementos Argos S.A., 2008).

Phosphate Rock.—Significant deposits of phosphate minerals exist in Colombia's Upper Cretaceous marine sedimentary rocks. About 15 phosphate rock producers operated in Colombia; however, three companies controlled 40% of the phosphate rock production, and production data for 2007 were available for only one company, Empresa de Fosfatos del Huila S.A. Estimated reserves of phosphate rock in Colombia were about 367 Mt in 2005 (the most recent year for which reserve data were available), or 2% of the world total that year. Assuming a 30% P₂O₅ content, there would have been 110 Mt of contained P₂O₅. More than 95% of production of phosphate rock was used for the production of fertilizers, and the remainder was used mostly for animal food (Unión Temporal GI. Georecursos, 2005; Ortiz, J.E., Manager, Empresa de Fosfatos del Huila S.A., oral commun., January 4, 2009).

Mineral Fuels

Coal.—In 2007, proven coal reserves in Colombia were about 7 Gt, of which about 94% was composed of anthracite and bituminous coal (which have higher fixed carbon and a greater fuel ratio) and 381 Mt of lignite and subbituminous coal combined. BHP Billiton's Cerrejon Coal operation was an opencut mine located in Maicao. The operation had its own export facility located 150 km northeast on the Caribbean coast, which was connected to the mine by a single-track railway. Coalcorp Mining Inc. increased resource estimates for its La Francia property from 54 Mt to 105 Mt. The company was set to acquire 100% interest in an adjacent property, La Francia II, which had an identified resource of 41 Mt (Coalcorp Mining Inc., 2007; BHP Billiton Ltd., 2008; BP p.l.c., 2008).

Petroleum.—In 2007, there were 24 sedimentary basins delineated in Colombia, including 4 offshore and 1 deep Pacific. The country remained relatively unexplored yet boasted estimated crude oil reserves of 47 billion barrels (Gbbl). Numerous fields, each with more than 1 Gbbl of proven reserves, provided the possibility of important discoveries. At the end of the year, Ecopetrol had 136 exploration and production contracts; 107 of those contracts were operated by third parties and included 199 fields. The company directly operated 59 fields. Seventy exploratory wells were drilled in 2007, and 27 became producers. About 189 Mbbl (517,000 bbl/d) of crude oil was transported in 2007, of which, about 113 Mbbl (310,000 bbl/d) was received by refineries

and more than 63 Mbbl (175,000 bbl/d) was exported. The remainder was accounted for by losses, such as unscheduled transportation shutdowns and hydrocarbon theft. Ecopetrol planned to invest \$60 billion to increase production by 12% per year to reach 1 million barrels per day by 2015. In December, Ecopetrol announced that leases in the United States' Gulf of Mexico had become part of its international portfolio after its subsidiary Ecopetrol America Inc. signed an agreement with Shell Offshore Inc. to participate in exploration. Shell Offshore would continue to be the operator, and Ecopetrol America would hold a 25% interest in the blocks. In July, the two companies also signed an agreement for joint exploration of the Cano Sur Block in the Oriental Plainlands, which was the most productive heavy crude basin in Colombia (Ecopetrol S.A., 2007b, c; 2008a; Agencia Nacional de Hidrocarburos, 2008b; BP p.l.c., 2008).

Natural Gas.—Colombia was third among Latin American countries for the number of vehicles that ran on natural gas. With industry-funded conversion bonuses and conversion stations, for which Ecopetrol had invested \$12 million, the country's long-term goals were to have 500,000 vehicles running on natural gas by 2015 and 1 million by 2020 (Ecopetrol, S.A., 2007d).

The first section of a transnational natural gas pipeline between Colombia and Venezuela was completed in 2007. The 225-km Antonio Ricuarte Pipeline could transport more than 14 billion cubic meters per day. The pipeline ran from Colombia's La Guajira gasfields to Venezuela's Paraguana refining complex, which required large amounts of natural gas to operate. Colombia planned to supply Venezuela with natural gas until 2011, which would allow Venezuela time to increase its production, at which time the direction of flow would be reversed (Alexander's Gas & Oil Connections, 2007).

Outlook

As of the end of 2007, a network of Government agencies in Colombia was implementing a business plan for the country's entire industrial sector, especially for the extractive industries, but also for biofuel, infrastructure, and power generation. Numerous forward-looking plans and strategies have been created to develop a modern, sustainable mining industry. A long-term projection for mineral production in Colombia is being developed based on studies of mineral production and the GDP trends in other Latin American countries with significant mineral resources. Despite a downturn in foreign investment in the country and limited exploration, recent discoveries have established a foundation upon which the country can move forward with the bargaining and regulatory maneuvers required in the early stage of industry development.

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$\label{eq:table1} \textbf{TABLE 1}$ COLOMBIA: PRODUCTION OF MINERAL COMMODITIES 1

(Metric tons unless otherwise specified)

Commodity		2003	2004	2005	2006	2007 ^e
METALS	8					
Copper, mine output, Cu content		1,578	1,701	1,259	2,902 ^r	4,196 ²
Gold	kilograms	46,515	37,739	35,783	15,682 ^r	15,482 ²
Iron and steel:						2
Iron ore and concentrate	thousand metric tons	625	587	608	644	624 ²
Pig iron	do.	288	316	325	351	350
Steel, crude	do.	668	730	842	1,221	1,260 ²
Semimanufactures, hot-rolled ^e	do.	501	578	694	700	700
Lead, refined (secondary) ^e		12,000	12,000	12,000	10,000	10,000
Nickel:						
Mine output, Ni content		70,844	75,032	89,000	94,100 ^e	99,500
Ferronickel, Ni content		47,868	48,818	52,749	51,137	49,312 ²
Platinum	kilograms	828	1,209	1,082	1,438	1,526 ²
Silver	do.	9,511	8,533	7,142	8,399	9,765 ²
INDUSTRIAL MI	NERALS					
Asbestos, mine output ^e		60,000	60,000	60,000	60,000	60,000
Barite ^e		600	600	600	600	600
Cement, hydraulic ³	thousand metric tons	7,337	7,822	9,959	10,038 ^r	11,068 ²
Clays: ^e						
Bentonite		8,500	8,500	8,500	8,500	8,500
Common clay and kaolin	thousand metric tons	8,400	8,400	8,400	8,400	25,811 ²
Diatomite ^e		4,000	4,000	4,000	4,000	4,000
Feldspar ^e		75,000 ^r	78,000 ^r	81,000 ^r	86,000 ^r	91,000 2
Fluorite ^e		800	800	800	800	800
Gemstones, emerald ⁴	thousand carats	8,963	9,825	6,746	5,734	3,389 ²
Gypsum		149,700 ^r	161,400 ^r	173,300 ^r	186,300 ^r	200,400 2
Lime, hydrated and quicklime ^e	thousand metric tons	1,300	1,300	1,300	1,300	1,300
Magnesite		34,000 ^r	36,000 r	38,000 r	40,000 r	42,000 ²
Mica ^e		55	55	55	55	55
Nitrogen, N content of ammonia		107,800	98,200	100.000 e	100.000 e	100,000
Phosphate rock:		,	,	,	,	,
Gross weight		36,400 r, 5	48.300 r, 5	43,000 e	43,000 e	24,000 ^{2, 6}
P ₂ O ₅ content ^e		10,920 ^r	14,490 ^r	12,900 ^r	12,900 ^r	7,200 7
Salt:	-	10,720	11,120	12,700	12,500	7,200
Rock		199,364	231,721	215,962	248,245	204,090 ²
Marine		247,901	294,343	428,957	389,630	309,557 ²
Total		447,265	526,064	644,919	637,875	513,647 ²
Sodium compounds, sodium carbonate, n	e s e, 8	125,000	125,000	125,000	125,000	125,000
Stone and sand: ^e		120,000	120,000	120,000	120,000	120,000
Calcite		6,500	6,500	6,500	6,500	6,500
Dolomite	thousand metric tons	45	45	45	45	45
Limestone for cement	do.	9,887 ²	10,087 ²	12,082 2	7,000	7,000
Marble	301	190,000	190,000	190,000	190,000	190,000
Sand, excluding metal-bearing		925,000	925,000	925,000	925,000	925,000
Sulfur:	-	****	<u> </u>	*****		,
Native (from ore)	_	73,024	97,596	64,660	30,018 ^r	30,000
Byproduct, from petroleum ^e	_	15,500	15,500	15,500	15,500	15,500
Total		88,524	113,096	80,160	45,518 ^r	45,500
Talc, soapstone, pyrophyllite ^e		15,000	15,000	15,000	15,000	15,000
MINERAL FUELS AND REL	ATED MATERIALS	13,000	13,000	13,000	13,000	13,000
Carbon black ^e	IIIII LINII XLIU	24,000	24,000	24,000	24,000	24,000
Coal	thousand metric tons	50,028	53,693	59,064	66,192 ^r	69,902 ²
Coke, all types ^e	do.	615	615	1,037 2	803	800
Coke, all types	uo.	013	013	1,05/	803	800

See footnotes at end of table.

TABLE 1—Continued COLOMBIA: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons unless otherwise specified)

Commodity		2003	2004	2005	2006	2007 ^e
MINERAL FUELS AND RELATED MATI	ERIALS—Continued					
Gas, natural:	_					
Gross	million cubic meters	36,417	35,600	36,591	35,885 ^r	33,924 ²
Marketed	do.	5,975	6,404	6,708	6,600 e	6,600
Natural gas liquids ^e th	ousand 42-gallon barrels	2,600	2,600	2,600	2,600	2,600
Petroleum:						
Crude	do.	197,586	192,866	192,057	192,503	193,949 ²
Refinery products:	_					
Liquefied petroleum gas	do.	8,797	7,260 ^r	7,300	7,649 ^r	6,794 ²
Gasoline:						
Aviation	do.	315	320	508 ^r	388 ^r	213 ²
Motor	do.	40,250	41,897	35,555	29,979 ^r	30,411 2
Jet fuel	do.	9,770	7,521	7,300	6,421 ^r	6,275 ²
Kerosene	do.	1,093	256	113 ^r	112 ^r	118 2
Medium distillate fuel oil	do.	23,912	26,573	26,451	36,909 ^r	40,226 ²
Lubricants ^e	do.	400	400	400	400	400
Residual fuel oil (black oil)	do.	19,413	21,990	20,240	23,379 ^r	20,000
Asphalt	do.	1,311	970	1,117	1,000 e	1,000
Refinery fuel and losses and unspecified pro	oducts do.	2,124	5,067	10,205	10,000 ^e	10,000
Total	do.	107,385	112,254 ^r	109,189 ^r	116,237 ^r	115,437

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

¹Includes data available through March 31, 2009.

²Reported figure.

³Excludes white portland cement.

⁴Based on Colombian Institute of Geology and Mines (INGEOMINAS) production reports as determined by payments of royalties and other economic considerations prior to export.

⁵Revised for 2003 and 2004 from official data; however, estimates based upon a Colombian industry analysis result in a 25% to 30% increase in production volume. P₂O₅ content assumes 30% ore content, although some companies process phosphate rock with different P₂O₅ content.

⁶Reported phosphate rock production from one company, Empresa de Fosfatos del Huila S.A., which were the only data available.

⁷Calculated as 30% ore content of annual production. An estimate based upon phosphate rock production reported by Empresa de Fosfatos del Huila S.A.

⁸Not elsewhere specified.

${\bf TABLE~2}$ ${\bf COLOMBIA: STRUCTURE~OF~THE~MINERAL~INDUSTRY~IN~2007}$

(Thousand metric tons unless otherwise specified)

Commodite		Major operating companies	Location of main for the	Annual
Commodity		and major equity owners	Location of main facilities	capacity
Carbon black		Cabot Colombiana S.A. (private, 100%)	Cartagena, Bolivar Department (plant)	NA 12
Do.		Productos Petroquímicos S.A. (private, 100%)	Two plants at Cali, Valle del Cauca Department	12
Cement ¹		Cía. Colombiana de Clinker S.A. (Cementos Argos Colombia, 100%)	Plant at Cartagena, Bolivar Department	1,250
Do.		Cementos del Caribe S.A. (Cementos Argos Colombia, 74%)	Barranquilla, Atlantico Department	1,500
Do.		Cementos del Valle S.A. (Cementos Argos Colombia, 70%)	Yumbo, Valle del Cauca Department	1,500
Do.		Cales y Cementos de Toluviejo S.A. (Cementos Argos Colombia, 95%)	Toluviejo, Sucre Department	980
Do.		Cementos del Nare S.A. (Cementos Argos Colombia, 100%)	Puerto Nare, Antioquia Department	210
Do.		Cementos El Cairo S.A. (Cementos Argos Colombia, 100%)	Montebello, Antioquia Department	450
Do.		Cementos Paz del Río S.A. (Cementos Argos Colombia, 62%)	Belencito, Boyaca Department	880
Do.		Cementos Ríoclaro S.A. (Cementos Argos Colombia, 99%)	Sonson, Antioquia Department	1,400
Do.		Cementos Boyacá S.A. (Holcim Group, 100%)	Nobsa, Boyaca Department	1,500
Do.		CEMEX Colombia S.A. (CEMEX S.A.B. de C.V., 99.7%)	Bucaramanga, Santander Department; Buenos Aires, Tolima Department; Pamplona, Norte de Santander Department; La Calera, Cundinamarca	3,980
Coal		Carbones del Cerrejón LLC (Anglo American Plc, 33.3%; BHP Billiton plc, 33.3%; Xstrata plc., 33.3%)	Cerrejon Centro Mines, Cerrejon Sur Mines, Cerrejon Zona Norte, and Oreganal Mines, La Guajira Department	30,000
Do.		Drummond Ltd. (Drummond Co. Inc., 100%)	La Loma Mine, Cesar Department	23,000
Do.		C.I. Prodeco S.A. (Glencore International AG, 100%)	Calenturitas Mine, Cesar Department	11,000
Do.		Carbones de La Jagua S.A. (Glencore International AG, 100%)	La Jagua Mine, La Jagua de Ibirico, Cesar Department	2,500
Do.		Coalcorp [Coalcorp Mining Inc., La Francia, 100% (Caypa, 60%, and Xira Investment Co., 40%)]	La Francia Mine, Cesar Department, and Caypa Mine, La Guarjira Department	2,000
Do.		Acerías Paz del Río S.A. (Votorantim Group, 52%)	Paz del Rio Mine, Boyaca Department	350
Copper		Minera El Roble S.A.	El Roble Mine, El Carmen, Choco Department	3
Gemstones, emerald		Minerales de Colombia S.A. (MINERALCO) (Government, 100%)	Chivor, Coscuez, Muzo, and Quipama Mines, Boyaca Department	NA
Gold	kilograms	Frontino Gold Mines Ltd. (private, 100%)	El Silencio Mine, Segovia District; and Providencia Mine, Remedios District, Antioquia Department	1,500
Do.	do.	Grupo de Bullet S.A.	El Limon Oronorte Mine, Segovia, Antioquia Department	1,000
Do.	do.	Mineros de Antioquia S.A. (private, 100%)	El Bagre, Rio Nechi, Antioquia Department	2,000
Do.	do.	Small miners (cooperatives and individual prospectors)	do.	NA
Iron ore		Acerías Paz del Río S.A. (Votorantim Group, 62%)	Paz del Rio Mine, Boyaca Department, and plants, Boyaca Department	800
Iron and steel, steel		do.	do.	400
Do.		Diaco S.A. (Gerdau, 57%)	Tuta and Duitama, Boyaca; Cali, Valle del Cauca; Tocancipa, Cundinamarca; Muna, near Bogota	530
Do.		Siderúrgica del Pacífico S.A. (private, 100%)	Plant at Yumbo, Valle de Cauca Department	60
Kaolin		Cerámicas del Valle Ltda. (private, 100%)	Mine at Yumbo, Valle del Cauca Department	NA
See footnotes at end of table				

See footnotes at end of table.

TABLE 2—Continued COLOMBIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2007

(Thousand metric tons unless otherwise specified)

		Major operating companies		Annual
Commodity		and major equity owners	Location of main facilities	capacity
Natural gas million cubic meters		Ecopetrol S.A. (Government, 100%)	North coast, La Guajira Department	4,500
			(national gasfields)	
Do.	do.	International Petroleum Colombia, Ltd.	Barrancabermeja locale, Antioquia and	2,200
		(International Petroleum Corp., 100%)	Santander Departments	
Nickel		Cerro Matoso S.A. (BHP Billiton Ltd., 100%)	Cerro Matoso Mine and ferronickel plant,	55
			Montelibano, Cordoba Department	
Nitrogen		Abonos de Colombia (private, 100%)	Cartagena plant, Bolivar Department	100
Do.		Monómeros Colombo-Venezolanos S.A.	Barranquilla plant, Atlantico Department	85
		(private, 100%)		
Petroleum ²	thousand 42-gallon barrels	Ecopetrol S.A.	16 fields in various Departments	70,000
Do.	do.	HOCOL S.A.	14 fields in various Departments	36,500
Petroleum product	do.	Ecopetrol S.A.	Barrancabermeja refinery, Norte de	81,400
			Santander Department	
Do.	do.	do.	Tibu, Norte de Santander Department	1,825
Do.	do.	do.	Orito, Putumayo Department	875
Do.	do.	Glencore International AG, 51%, and	Cartegena refinery, Bolivar Department	28,000
		Ecopetrol S.A., 49%		
Do.	do.	Pacific Stratus Energy (private, 100%)	Caguan, Dindal, Rio Seco, La Creciente	913
			and Moriche blocks	
Phosphate rock		Fosfatos de Colombia S.A. (private, 100%)	Neiva, Huila Department	30
Do.		Fosfatos Boyacá S.A. (private, 100%)	Iza, Boyaca Department	60
Do.		Fosfatos del Huila S.A. (private, 100%)	Neiva, Huila Department	30
Do.		Siderúrgica del Boyacá S.A. (private, 100%)	Santa Fe de Bogota	NA ³
Do.		Siderúrgica del Medellín S.A. (private, 100%)	Medellin, Antioquia Department	NA ³
Do.		Siderúrgica del Muna S.A. (private, 100%)	Chusaca, Federal District	NA ³
Do.		Siderúrgica del Pacífico S.A. (private, 100%)	Cali, Valle del Cauca Department	NA ³
Sulfur		Industrias Purace S.A. (private, 100%)	El Vinagre Mine, Cauca Department	60
Do.		Ecopetrol S.A.	Barrancabermeja, Santander Department	29

^eEstimated; estimated data are rounded to no more than three significant digits. Do., do. Ditto. NA Not available.

¹White cement only.

²These two petroleum entries are examples only. Colombia has more than 3,000 producing wells drilled by national and private companies; these wells have combined capacities that exceed 755,000 barrels per day of oil.

³Steel companies whose production results in slag with high percentage of P₂O₅.