



# 2006 Minerals Yearbook

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COLOMBIA

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# THE MINERAL INDUSTRY OF COLOMBIA

By Steven T. Anderson

Although Colombia is a globally significant mine producer of nickel, mineral production in the country was dominated by production of mineral fuels, such as coal, natural gas, and crude petroleum. Colombia was the only miner of platinum in Latin America; the country's other mined metallic minerals of significant importance to the domestic economy were copper, gold, iron ore, and silver. In addition, Colombia was Latin America's seventh ranked producer of steel and accounted for about 2% of total production of crude steel in the region. Historically, Colombia has also been recognized as an important producer and the world's leading exporter of emeralds, although annual mine production decreased in both 2005 and 2006 compared with that of previous years (table 1; International Iron and Steel Institute, 2007, p. 11).

At the end of 2006, Colombia was ranked second to Brazil in terms of total coal reserves, but Brazil's coal reserves consisted only of subbituminous coal and lignite. Colombia's proven coal reserves consisted of approximately 92% anthracite and bituminous coal and 8% subbituminous coal and lignite. In terms of metric tons of oil equivalent, Colombia produced about 18 times as much coal as Brazil and was by far the leading producer in Latin America and the Caribbean. Colombia was the 10th ranked producer of coal in the world, although the country's total production during 2006 was only about 1.4% of the world total. The country was also the leading producer of mined nickel in Latin America and the Caribbean, and accounted for about 6% of the world's mine production of nickel. Colombia was the fifth ranked producer of crude petroleum in Latin America and the Caribbean and accounted for 5% of the region's total (about 1% of the world total). It was the seventh ranked producer of natural gas in the region, and accounted for about 4% of the region's total (BP p.l.c., 2007, p. 9, 24, 32, 34; World Coal Institute, 2007).

## Minerals in the National Economy

In the crude mineral extraction sector, the combined value (approximately \$4.6 billion<sup>1</sup>) of the production of natural gas, crude petroleum, and related minerals (possibly including some mining of thorium and/or uranium) accounted for about 3.4% of the gross domestic product (GDP); that of coal (including lignite and possibly some peat) was \$1.5 billion and accounted for 1.1% of the GDP; that of metallic minerals was about \$1.4 billion and accounted for approximately 1.0% of the GDP; and that of industrial minerals was \$0.9 billion and accounted for about 0.7% of the GDP. In the mineral processing sector, the combined value of production of coke oven products, petroleum refinery products, and nuclear fuel was approximately \$2.6 billion and accounted for about 1.9% of the GDP; that of metals in crude form (including crude steel) was about \$1.7

billion and accounted for about 1.2% of the GDP; and that of glass and other products in crude form from industrial minerals was about \$1.2 billion and accounted for about 0.9% of the GDP (Banco de la República de Colombia, 2008a).

Foreign direct investment (FDI) in the petroleum extraction sector was valued at \$2.0 billion and accounted for about 30% of total FDI in Colombia; that in the mining sector (including coal mining) was valued at about \$1.8 billion and accounted for approximately 27% of total FDI in the country. FDI in the petroleum sector increased by about 77% compared with that of 2005, and FDI in the mining sector decreased by about 17% (Banco de la República de Colombia, 2008b; International Monetary Fund, 2008).

## Government Policies and Programs

The Ministerio de Minas y Energía (MME) was the Government entity entrusted with oversight of the minerals and energy sectors. Several agencies either reported directly to the Ministry or were associated with it; some of these agencies were the Agencia Nacional de Hidrocarburos (ANH), the Comisión de Regulación de Energía y Gas, the Dirección de Energía, the Dirección de Gas, the Dirección de Hidrocarburos, the Dirección de Minería, Ecopetrol S.A., Empresa Colombiana de Gas, Instituto Colombiano de Geología y Minería (Ingeominas), and the Unidad de Planeación Minero Energética (UPME).

To take better advantage of the Government's attempts to improve security in Colombia and of high mineral commodity prices, MME was in the process of designing revisions to the 2001 mining code to help attract greater private investment to the mining sector. These revisions included the following:

- Require certification of economic production capacity, and require greater transparency concerning the size, characteristics, and financial requirements of the proposed mining projects before awarding mining exploitation concession contracts.
- Allow the Government to delimit a geologic prospective area when a field is considered of national interest, and define a special bidding process for a mining concession in such areas, which will improve the chances of the license being awarded to the investor that has the best economic and operational plan for the area.
- Require payment of a "surface fee" up front, before an exploration license is granted, to help deter acquisition of mining rights by investors who do not actually intend to conduct any exploration or mining activities on the concession.
- Design a more dynamic framework for investors to acquire licenses for mining areas, including fast-track mechanisms, and attempt to guarantee a more-efficient process of discovering and developing mineral resources (Torres, 2007, p. 2, 23-27).

The President of Colombia signed law 1118 on December 27, 2006, which authorized an eventual 20% capitalization (privatization) of Ecopetrol. No single private company would be permitted to own more than 3% of the new

<sup>1</sup>Where necessary, nominal values have been converted from Colombian pesos (Col\$) to U.S. dollars (US\$) at an annual average exchange rate of Col\$2359=US\$1.00 for 2006. All values are nominal, at current 2006 prices, unless otherwise stated.

shares in Ecopetrol, which were going to be put up for sale as a result of this law, and domestic pension funds or mutual funds would be allowed to acquire only up to 15% of the new share capital, at least during the first two issuing rounds of the new shares (Ecopetrol S.A., undated).

## Production

Colombia was by far the leading producer of coal in Latin America and the Caribbean, accounting for slightly more than 71% of regional production (in metric tons). In 2006, production increased by about 11% compared with that of 2005 mostly owing to a reported 1,461 million metric tons (Mt) of production by Compañía de Carbones del César S.A. (César) at the company's La Francia Mine, for which 2005 production data was unavailable and not included in table 1. Also, C.I. Prodeco S.A. (a wholly owned subsidiary of Glencore International AG of Switzerland) produced an additional 1,377 Mt compared with that of 2005, and Carbones del Cerrejón LLC [owned by Anglo American plc of the United Kingdom, 33.33%; BHP Billiton Ltd. and BHP Billiton plc (BHP Billiton) of Australia, 33.33%; and Xstrata plc of Switzerland, 33.33%) increased production by an additional 1,179 Mt at the company's Cerrejon Central Mine (BHP Billiton Ltd. and BHP Billiton Plc, 2007b, p. 17, 55, 58-59; Coalcorp Mining Inc., 2007, Mining Journal, 2007).

Production of nickel contained in ferronickel at the plant operated by Cerro Matoso S.A., which was a wholly owned subsidiary of BHP Billiton, decreased slightly compared with that of 2005 because the plant underwent maintenance and adjustments to handle changes in the chemical content of the ore. This decrease in plant production took place despite increasing mine output of ore. Mine output of gold fell substantially, although reliable figures were not available because producers were reporting less consistently. Emerald production continued to decrease, although owners of emerald mining properties were investing in the infrastructure necessary to be able to extend existing mines in the Boyaca Department. Gerdau S.A. of Brazil expanded production through making technological improvements and other expansions at the company's Diaco plant in Colombia during 2006. Gerdau's improvements were primarily responsible for the increase in the production of crude steel in Colombia compared with that of 2005 (table 1; BHP Billiton Ltd. and BHP Billiton Plc, 2006, p. 81; 2007a, p. 18; Gerdau S.A., 2007, p. 36; Información Minera de Colombia, 2007b; Mining Journal, 2007).

## Structure of the Mineral Industry

In 2005, Gerdau completed acquisition of Diaco S.A. and Siderúrgica del Pacífico S.A. in Colombia. In 2006, Gerdau increased combined crude steel production capacity at Diaco to 530,000 metric tons per year (t/yr) compared with 380,000 t/yr in 2005. BHP Billiton owned all the production capacity in Colombia for both mine output of nickel laterite ore and production of ferronickel, mostly for export. The company listed a nameplate capacity of the ferronickel plant at 50,000 t/yr of nickel contained in ferronickel, but attained production levels in excess of that in both 2005 and 2006 (despite restructuring).

Thus, the production capacity in table 2 is given as the designed capacity (55,000 t/yr) from the specifications for the most recent expansion of the plant, which was completed in 2001 (table 2; BHP Billiton Ltd. and BHP Billiton Plc, 2007a, p. 18; 2007b, p. 43; Gerdau S.A., 2007, p. 36).

Ingeominas began attempting to auction off former state-run mining properties, including the Acandi copper-molybdenum porphyry, the Pantanos porphyry copper, and the Taraira gold-bearing-polymetallic property. The mining properties were subsequently acquired by Anglo American, Glencore, and Cosigo Resources Inc., respectively. The leading foreign-based companies in the mineral industry of Colombia were Anglo American; BHP Billiton; Drummond Company Inc. of Birmingham, Alabama; Glencore, and Xstrata (table 2; Mining Journal, 2007).

On April 20, 2006, Xstrata acquired its 33.33% share in Carbones del Cerrejón from Glencore. Cerrejón was the leading coal mining company in Colombia, and it was in the midst of expanding its coal mining operations. On August 26, Glencore acquired a 51% interest in Refinería de Cartagena S.A. from Ecopetrol. The Cartagena refinery was ranked a distant second in the country and Ecopetrol continued to own 49% of the refinery as part of the joint-venture contract. On February 8, Coalcorp Mining Inc. of Canada acquired César, including La Francia coal mine. On September 7, Coalcorp also acquired Carbones Colombianos del Cerrejón, S.A., including the Caypa coal mine (table 2; Coalcorp Mining Inc., 2007, p. 10, 12, 14; Ecopetrol S.A., 2007; Glencore International AG, 2007a, b; Xstrata plc., 2007, p. 5, 34, 63, 68, 102, 165).

## Mineral Trade

In 2006, the value of exports of coal and coke was \$2.9 billion, that of ferronickel was \$1.1 billion, that of nonmonetary gold was about \$281 million, that of emeralds was about \$90 million, and that of other mineral products, including platinum, was about \$817 million. The total value of Colombia's exports of goods during the year was about \$24.4 billion, so the value of exports from the mining sector accounted for approximately 21.4% (Información Minera de Colombia, 2008).

## Commodity Review

### Metals

**Copper.**—Mine production of copper in table 1 is provided only for that of Minera El Roble S.A. This company does not appear to be publically traded or a subsidiary of a publicly traded company. As such, this company may not have to file public reports with any agency that regulates any stock exchange and instead reports production only to certain agencies of the Government of Colombia. Hence, reliable information concerning the causes of changes in the Minera El Roble's copper production are often not available or only available two or more years later. Known copper mines that may have produced small amounts of copper, but for which reliable production information is unavailable (even through the Government), are the Ancuyá, the Nariño, and El Dovio Mines in the Cauca Valley (Información Minera de Colombia, 2007a).

On July 14, Antofagasta plc of the United Kingdom announced a joint-venture agreement with AngloGold Ashanti Ltd. of South Africa to explore for, discover, and develop copper and gold mining projects in southern Colombia. Subsequently, however, it was reported that Antofagasta had decided to cease investing in exploration of the Mocoa copper and molybdenum property in this region (AngloGold Ashanti Ltd., 2007, p. 31, 93; Antofagasta plc, 2007, p. 15, 124; Mining Journal, 2007).

**Gold.**—Ingeominas conducted regional exploration for gold in the San Lucas range (epithermal gold) and the Guyana Shield terrain (sedimentary-origin gold, as well as zircon and ilmenite). Greystar Resources Ltd. of Canada continued to explore for gold, silver, and other precious metals on the Angostura gold project in northeastern Colombia, and the company hired Hatch Ltd. to complete a scoping study to help determine whether or not to proceed to the feasibility stage. The scoping study was expected to be completed during the middle of 2007. On June 1, 2006, AngloGold Ashanti began an exploration joint venture with Bema Gold Corp. of Canada and then continued this joint venture with B2Gold Corp. (incorporated by former members of Bema's management and still located in Canada) after Kinross Gold Corp. of Canada acquired Bema in December. AngloGold Ashanti held 49% of the ownership interest; B2Gold owned 51% and was the operator in Colombia. B2Gold planned to focus exploration on the Gramalote and the Quebradona gold projects in northern Colombia (Bema Gold Corp., 2006, p. 6, 25; AngloGold Ashanti Ltd., 2007, p. 21, 31, 93; Greystar Resources Ltd., 2007; Mining Journal, 2007; B2Gold Corp., 2008, p. 1)

**Iron and Steel.**—Vale Colombia Ltda. (a wholly owned subsidiary of Companhia Vale do Rio Doce of Brazil) was evaluating mineral exploration opportunities in Colombia, possibly including exploring for iron ore (magnetite) and copper near Colombia's border with Venezuela, as well as coal in undisclosed location(s). Vale was still analyzing its options in Colombia and had not yet made any decision to move forward with any of these potential investment opportunities. Upon acquiring Diaco in 2005, Gerdau planned to increase crude steel production capacity to about 600,000 t/yr there by 2008 (Gerdau S.A., 2005; Mining Journal, 2007; Companhia Vale do Rio Doce, 2008).

**Nickel.**—BHP Billiton decided to refurbish parts of the Cerro Matoso ferronickel plant to increase the efficiency of energy usage (per metric ton of ore feed) with respect to both natural gas in the kilns and electricity in the electric furnaces. During 2006, this restructuring required temporary closures of parts of the plant, which resulted in a lower level of ferronickel output compared with that of 2005. However, the mine production of nickel laterite ore by Cerro Matoso was estimated to have actually increased compared with that of 2005 (BHP Billiton Ltd. and BHP Billiton Plc, 2007a, p. 18).

### *Industrial Minerals*

**Cement.**—Colombia's leading cement company was Cementos Argos S.A., which operated seven cement plants in the country for domestic consumption and four plants for export (only). In 2006, Cementos Argos announced plans to construct a

new cement plant in Cartagena by mid-2009 at a projected cost of about \$300 million. The new plant will have a production capacity of 1.8 million metric tons per year (Mt/yr) of cement, which would increase the company's total domestic production capacity to 13.4 Mt/yr of cement (at 12 plants). The company plans to export all the production from the new plant, mostly to the United States and the Caribbean via the port in the Bay of Cartagena. Cementos Argos was the only producer of white portland cement in Colombia (Cementos Argos S.A., 2007a, b; 2008, p. 6-7, 39).

**Gemstones.**—Ingeominas conducted regional exploration for emerald in the eastern and western emerald belts (Mining Journal, 2007). The data for production of emeralds in table 1 accounts for only those gemstones that were officially registered with the Government for export. The Government estimated that 98% of the marketable emeralds produced in the country were registered for export (Unidad de Planeación Minero Energética, 2008, p. 46, 53).

### *Mineral Fuels*

**Coal.**—The owners of Carbones del Cerrejón expected to attain an annual production capacity of 32 Mt/yr of coal by the end of 2008, but a capacity of 30 Mt/yr was estimated for table 2 owing to increased production already achieved during 2006 as a result of the expansion. Further expansion potential for Carbones del Cerrejón was estimated to be up to about 50 Mt/yr. La Jagua Mine was the fourth ranked coal mine in the country. Carbones de La Jagua S.A. was the operator of this mine and was a wholly owned subsidiary of Glencore. La Jagua Mine accounted for about 3% of the total production of coal in the country. Glencore was negotiating with the Government to expand La Jagua (table 2; Anglo American plc, 2007, p. 8, 18-20, 28; Glencore International AG, 2007a, b).

On February 17, Coalcorp received environmental approval from the Government to expand coal mining at La Francia Mine. By 2010, the company expected to expand production capacity to about 4 Mt/yr of coal there. Drummond was expanding capacity at La Loma and looking into developing other properties. Rio Tinto plc, which is dual-listed in Australia and the United Kingdom, was attempting to secure exploration concessions for coal in the Magdalena Valley Coal basin and expected to be able to assess their economic potential more accurately in 2007 (Coalcorp Mining Inc., 2007, p. 12-13; Drummond Company, Inc., 2007; Mining Journal, 2007; Rio Tinto plc, 2007, p. 30).

### **Outlook**

Security and other risk factors appeared to be of decreasing concern to mining companies interested in investing in the mineral industry of Colombia. In 2006, mining companies showed more interest in including Colombia in the Fraser Institute's Survey of Mining Companies, and the country was included in this survey for the first time. By the end of 2006, the Government appeared to have basically completed restructuring the agencies that are involved with the mineral industry to more efficiently manage the country's mineral resources, and



revisions of the mining code are expected to be completed by the end of 2008. Ingeominas continued to conduct regional exploration for deposits of many different minerals, including emeralds, and such data may be useful for companies interested in investing further in both exploration and development of mining in the country. By the end of 2006, however, it was yet to be seen whether these efforts would be successful in drawing more investment to mining in Colombia, and FDI in the mining sector of the mineral industry actually decreased significantly compared with that of 2005 (AngloGold Ashanti Ltd., 2007, p. 21; McMahon and Melham, 2007, p. 6; Mining Journal, 2007; Banco de la República de Colombia, 2008b).

Exploration projects for deposits of base and precious metals were well underway, although definite timelines for proving feasibility had not been established by the end of 2006. Cement production capacity (for export) could increase by about 1.8 Mt/yr by the second half of 2009. If the numerous projects to expand coal mine production proceed as planned, coal production could increase by as much as 1 Mt/yr to 2 Mt/yr through 2010. In 2006, FDI in the petroleum sector of the mineral industry increased substantially, but well-defined timelines and expected increases in production capacity were not available.

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TABLE 1  
COLOMBIA: PRODUCTION OF MINERAL COMMODITIES<sup>1</sup>

(Metric tons unless otherwise specified)

| Commodity  | 2002                | 2003             | 2004             | 2005                  | 2006 <sup>c</sup>    |
|--|---------------------|------------------|------------------|-----------------------|----------------------|
| <b>METALS</b>  |                     |                  |                  |                       |                      |
| Copper, mine output, Cu content                                | 1,853               | 1,578            | 1,701            | 1,259                 | 2,900                |
| Gold kilograms   | 20,823              | 46,515           | 37,739           | 35,783 <sup>r</sup>   | 15,700               |
| Iron and steel:  |                     |                  |                  |                       |                      |
| Iron ore and concentrate thousand metric tons                  | 688                 | 625              | 587 <sup>r</sup> | 608 <sup>r</sup>      | 644 <sup>2</sup>     |
| Pig iron do.   | 313                 | 288              | 316              | 325 <sup>r</sup>      | 351 <sup>2</sup>     |
| Steel, crude do.   | 664                 | 668              | 730              | 842 <sup>r</sup>      | 1,221 <sup>2</sup>   |
| Semimanufactures, hot-rolled <sup>c</sup> do.                  | 527 <sup>r</sup>    | 501 <sup>r</sup> | 578 <sup>r</sup> | 694 <sup>r</sup>      | 700                  |
| Lead, refined (secondary) <sup>c</sup>                         | 12,000              | 12,000           | 12,000           | 12,000                | 10,000               |
| Nickel:  |                     |                  |                  |                       |                      |
| Mine output, Ni content  | 58,196              | 70,844           | 75,032           | 89,000 <sup>r,c</sup> | 94,100               |
| Ferronickel, Ni content  | 43,987              | 47,868           | 48,818           | 52,749                | 51,137 <sup>2</sup>  |
| Platinum kilograms   | 661                 | 828              | 1,209            | 1,082                 | 1,438 <sup>2</sup>   |
| Silver do.   | 6,986               | 9,511            | 8,533            | 7,142                 | 8,399 <sup>2</sup>   |
| <b>INDUSTRIAL MINERALS</b>                                     |                     |                  |                  |                       |                      |
| Asbestos, mine output <sup>c</sup>                             | 62,785 <sup>2</sup> | 60,000           | 60,000           | 60,000                | 60,000               |
| Barite <sup>c</sup>  | 600                 | 600              | 600              | 600                   | 600                  |
| Cement, hydraulic <sup>3</sup> thousand metric tons            | 6,064               | 7,337            | 7,822            | 9,959                 | 10,000               |
| Clays: <sup>c</sup>  |                     |                  |                  |                       |                      |
| 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                 | 8,400                |
| Diatomite <sup>c</sup>   | 4,000               | 4,000            | 4,000            | 4,000                 | 4,000                |
| Feldspar <sup>c</sup>  | 93,452 <sup>2</sup> | 100,000          | 100,000          | 100,000               | 100,000              |
| Fluorite <sup>c</sup>  | 800                 | 800              | 800              | 800                   | 800                  |
| Gemstones, emerald <sup>4</sup> thousand carats                | 5,390               | 8,963            | 9,825            | 6,746                 | 5,734 <sup>2</sup>   |
| Gypsum <sup>c</sup>  | 560,000             | 560,000          | 560,000          | 700,000               | 700,000              |
| Lime, hydrated and quicklime <sup>c</sup> thousand metric tons | 1,300               | 1,300            | 1,300            | 1,300                 | 1,300                |
| Magnesite <sup>c</sup>   | 10,500              | 10,500           | 10,500           | 10,500                | 10,500               |
| Mica <sup>c</sup>  | 55                  | 55               | 55               | 55                    | 55                   |
| Nitrogen, N content of ammonia                                 | 110,900             | 107,800          | 98,200           | 100,000 <sup>e</sup>  | 100,000              |
| Phosphate rock: <sup>c</sup>                                   |                     |                  |                  |                       |                      |
| Gross weight   | 43,000              | 43,000           | 43,000           | 43,000                | 43,000               |
| P <sub>2</sub> O <sub>5</sub> content                          | 8,000               | 8,000            | 8,000            | 8,000                 | 8,000                |
| Salt:  |                     |                  |                  |                       |                      |
| Rock   | 191,554             | 199,364          | 231,721          | 215,962 <sup>r</sup>  | 248,245 <sup>2</sup> |
| Marine   | 335,783             | 247,901          | 294,343          | 428,957 <sup>r</sup>  | 389,630 <sup>2</sup> |
| Total  | 527,337             | 447,265          | 526,064          | 644,919 <sup>r</sup>  | 637,875 <sup>2</sup> |
| Sodium compounds, n.e.s., sodium carbonate <sup>c</sup>        | 125,000             | 125,000          | 125,000          | 125,000               | 125,000              |
| Stone and sand:  |                     |                  |                  |                       |                      |
| Calcite <sup>c</sup>   | 6,500               | 6,500            | 6,500            | 6,500                 | 6,500                |
| Dolomite <sup>c</sup> thousand metric tons                     | 45                  | 45               | 45               | 45                    | 45                   |
| Limestone for cement do.                                       | 9,047               | 9,887            | 10,087           | 12,082                | 7,000                |
| Marble <sup>c</sup>  | 190,000             | 190,000          | 190,000          | 190,000               | 190,000              |
| Sand, excluding metal-bearing <sup>c</sup>                     | 925,000             | 925,000          | 925,000          | 925,000               | 925,000              |
| Sulfur:  |                     |                  |                  |                       |                      |
| Native (from ore)  | 60,162              | 73,024           | 97,596           | 64,660                | 30,000               |
| Byproduct, from petroleum <sup>c</sup>                         | 15,500              | 15,500           | 15,500           | 15,500                | 15,500               |
| Total  | 75,662              | 88,524           | 113,096          | 80,160                | 45,500               |
| Talc, soapstone, pyrophyllite <sup>c</sup>                     | 15,000              | 15,000           | 15,000           | 15,000                | 15,000               |
| <b>MINERAL FUELS AND RELATED MATERIALS</b>                     |                     |                  |                  |                       |                      |
| Carbon black <sup>c</sup>                                      | 24,000              | 24,000           | 24,000           | 24,000                | 24,000               |
| Coal thousand metric tons                                      | 39,484              | 50,028           | 53,693           | 59,064                | 65,758 <sup>2</sup>  |
| Coke, all types <sup>c</sup> do.                               | 615                 | 615              | 615              | 1,037 <sup>r,2</sup>  | 803                  |

See footnotes at end of table.

TABLE 1--Continued  
 COLOMBIA: PRODUCTION OF MINERAL COMMODITIES<sup>1</sup>

(Metric tons unless otherwise specified)

| Commodity   |                            | 2002               | 2003    | 2004                | 2005                 | 2006 <sup>c</sup>    |
|---|----------------------------|--------------------|---------|---------------------|----------------------|----------------------|
| MINERAL FUELS AND RELATED MATERIALS--Continued    |                            |                    |         |                     |                      |                      |
| Gas, natural:                                     |                            |                    |         |                     |                      |                      |
| Gross   | million cubic meters       | 33,789             | 36,417  | 35,600 <sup>e</sup> | 36,591 <sup>r</sup>  | 35,985 <sup>2</sup>  |
| Marketed  | do.                        | 6,234              | 5,975   | 6,404               | 6,708                | 6,600                |
| Natural gas liquids <sup>e</sup>                  | thousand 42-gallon barrels | 2,600              | 2,600   | 2,600               | 2,600                | 2,600                |
| Petroleum:  |                            |                    |         |                     |                      |                      |
| Crude   | do.                        | 211,007            | 197,586 | 192,866             | 192,057 <sup>r</sup> | 192,503 <sup>2</sup> |
| Refinery products:                                |                            |                    |         |                     |                      |                      |
| Liquefied petroleum gas                           | do.                        | 8,089              | 8,797   | 7,257               | 7,300 <sup>e</sup>   | 7,500                |
| Gasoline:   |                            |                    |         |                     |                      |                      |
| Aviation  | do.                        | 69                 | 315     | 320                 | 509                  | 500                  |
| Motor   | do.                        | 40,009             | 40,250  | 41,897              | 35,555               | 36,000               |
| Jet fuel  | do.                        | 9,032              | 9,770   | 7,521               | 7,300 <sup>e</sup>   | 7,000                |
| Kerosene  | do.                        | 151                | 1,093   | 256                 | 136                  | 140                  |
| Medium distillate fuel oil                        | do.                        | 23,678             | 23,912  | 26,573              | 26,451               | 26,000               |
| Lubricants <sup>c</sup>                           | do.                        | 398                | 400     | 400                 | 400                  | 400                  |
| Residual fuel oil (black oil)                     | do.                        | 21,036             | 19,413  | 21,990              | 20,240               | 20,000               |
| Asphalt   | do.                        | 883                | 1,311   | 970                 | 1,117                | 1,000                |
| Refinery fuel and losses and unspecified products | do.                        | 2,620 <sup>e</sup> | 2,124   | 5,067               | 10,205               | 10,000               |
| Total   | do.                        | 105,965            | 107,385 | 112,251             | 109,213              | 109,000              |

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

<sup>1</sup>Includes data available through November 2007.

<sup>2</sup>Reported figure.

<sup>3</sup>Excludes white portland cement produced in the country. Production capacity of white portland was about 200,000 metric tons.

<sup>4</sup>Based on registered exports by the Banco de la República.

TABLE 2  
COLOMBIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2006

(Thousand metric tons unless otherwise specified)

| Commodity             | Major operating companies and major equity owners   | Location of main facilities  | Annual capacity     |
|-----------------------|---|--|---------------------|
| Carbon black          | Cabot Colombiana S.A. (private, 100%)   | Cartagena, Bolivar Department (plant)  | NA                  |
| Do.                   | Productos Petroquímicos S.A. (private, 100%)  | Two plants at Cali, Valle del Cauca Department   | 12                  |
| Cement                | 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  | 200                 |
| 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   | 1,800               |
| 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 | 4,800               |
| 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 <sup>c</sup> |
| Do.                   | Drummond Ltd. (Drummond Co. Inc., 100%)   | La Loma Mine, Cesar Department   | 22,000              |
| Do.                   | C.I. Prodeco S.A. (Glencore International AG, 100%)   | Calenturitas Mine, Cesar Department  | 5,000               |
| Do.                   | Carbones de La Jagua S.A. (Glencore International AG, 100%)   | La Jagua Mine, La Jagua de Ibirico, Cesar Department   | 2,500               |
| Do.                   | Acerías Paz del Río S.A. (private, 100%)  | Paz del Rio, Boyaca Department (mine)  | 600                 |
| 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.  | Paz del Rio Mine, Boyaca Department,   | 800                 |
| Iron and steel, steel | do.   | and plants, Boyaca Department  | 400                 |
| Do.                   | Diaco S.A. (Gerdau Group, 100%)   | 3 plants: Tuta, Boyaca Department; Cali, Valle del Cauca; Muna, near Bogota  | 530                 |
| Do.                   | Siderúrgica del Pacífico S.A. (Gerdau S.A., 100%)   | Plant at Yumbo, Valle de Cauca Department  | 60                  |
| Kaolin                | Cerámicas del Valle Ltda. (private, 100%)   | Mine at Yumbo, Valle del Cauca Department  | NA                  |
| Natural gas           | million cubic meters Ecopetrol S.A. (Government, 100%)  | North coast, La Guajira Department (national gasfields)  | 4,500               |
| Do.                   | do. International Petroleum Colombia, Ltd. (International Petroleum Corp., 100%)                    | Barrancabermeja locale, Antioquia and Santander Departments  | 2,200               |

See footnotes at end of table.



TABLE 2--Continued  
 COLOMBIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2006

(Thousand metric tons unless otherwise specified)

| Commodity              | Major operating companies and major equity owners       | Location of main facilities  | Annual capacity |
|------------------------|---|--|-----------------|
| Nickel                 | Cerro Matoso S.A. (BHP Billiton plc, 100%)              | Cerro Matoso Mine and ferronickel plant, Montelibano, Cordoba Department | 55              |
| Nitrogen               | Abonos de Colombia (private, 100%)                      | Cartagena plant, Bolivar Department                                      | 100             |
| Do.                    | Monómeros Colombo-Venezolanos S.A. (private, 100%)      | Barranquilla plant, Atlantico Department                                 | 85              |
| Petroleum <sup>1</sup> | thousand 42-gallon barrels Ecopetrol S.A.               | 16 fields in various Departments   | 70,000          |
| Do.                    | do. HOCOL S.A.  | 14 fields in various Departments   | 36500           |
| Petroleum products     | do. Ecopetrol S.A.                                      | Barrancabermeja refinery, Norte de Santander Department                  | 81,400          |
| Do.                    | do. do.   | Tibu, Norte de Santander Department                                      | 1825            |
| Do.                    | do. do.   | Orito, Putumayo Department   | 875             |
| Do.                    | do. Glencore International AG, 51%; Ecopetrol S.A., 49% | Cartegena refinery, Bolivar Department                                   | 28,000          |
| Phosphate rock         | Fosfatos de Colombia S.A. (private, 100%)               | Neiva, Huila Department  | 30              |
| Do.                    | Fosfatos Boyacá S.A. (Government, 100%)                 | Iza, Boyacá Department   | 20              |
| Do.                    | Siderúrgica del Boyacá S.A. (private, 100%)             | Santa Fe de Bogota   | NA              |
| Do.                    | Siderúrgica del Medellín S.A. (private, 100%)           | Medellin, Antioquia Department   | NA              |
| Do.                    | Siderúrgica del Muna S.A. (private, 100%)               | Chusaca, Federal District  | NA              |
| Do.                    | Siderúrgica del Pacífico S.A. (private, 100%)           | Cali, Valle del Cauca Department   | NA              |
| Sulfur                 | Industrias Purace S.A. (private, 100%)                  | El Vinagre Mine, Cauca Department  | 60              |
| Do.                    | Ecopetrol S.A.  | Barrancabermeja, Santander Department                                    | 29              |

<sup>8</sup>Estimated; estimated data are rounded to no more than three significant digits. NA Not available.

<sup>1</sup>These two petroleum entries are examples only. Colombia has more than 3,000 producing wells drilled by Government and private companies; these wells have combined capacities that exceed 755,000 barrels per day of oil.