THE MINERAL INDUSTRY OF

COLOMBIA

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Colombia is in the northwestern corner of South America and is the only South American country with coastlines on both the Caribbean Sea and the Pacific Ocean. The majestic Andes Mountains transect the country from north to south in the western portion of the country. The lowland plains occupy the eastern portion, with tributaries of the Amazon and Orinoco Rivers.

Colombia is known worldwide for its coal, emeralds, gold, nickel, and platinum. Colombia was the leading producer of kaolin and a major producer of cement, ferronickel, and natural gas in Latin America. Mineral production in Colombia contributed just in excess 5% to the gross domestic product (GDP) and over 45% of total exports. Coal and petroleum contributed 45% and precious stones and metals contributed more than 6% to the Colombian economy.

Government Policies and Programs

The 1989 mining law (Código Minero) facilitates and encourages mineral exploration and development, containing provisions to expedite the processing of claim applications, to improve the security of mineral concessions, and to establish a fund to provide financial assistance to small- and medium-scale miners. The Coinvertir agency, created in November 1991, promotes foreign investment. Government policy encourages the development of the Colombian coal industry and welcomed foreign investment.

The new Constitution replacing the 1886 Constitution became effective on July 5, 1991. Under Article 332, the State retains the rights to all surface and subsurface nonrenewable natural resources. The new Constitution also created the position of Minister of Foreign Trade.

Law 9 of 1991 regulates foreign investment in Colombia. Resolutions 51 and 52 of 1991 and 53, 55, 56, and 57 of 1992 of the National Economic and Social Policy Council are integrated into the International Investment Statute (IIS), Decisions 291 and 292 of 1991, Law 6 of 1992, and Decree 259 of 1992. The IIS is based on three principles: equal treatment for domestic and foreign investors, applied worldwide, and simplification of foreign investment procedures. The new economic development is based on an outward oriented strategy, thus opening up the economy to foreigners, eliminating many taxes and tariffs that existed in the past. The new regulation allows ownership of up to 100% by foreigners, permits payment of royalties to patent holders of new technology, and reduces withholding taxes. Foreign capital can be invested without limitation in all sectors of the economy.

The Government adopted a Mining Development Plan in 1993 as proposed by Instituto Nacional de Investigaciones en Geociencias, Mineria y Quimica (Ingeominas), Empresa Colombiana de Carbon S.A. (Ecocarbon), and Minerales de Colombia S.A. (Mineralco). The plan includes seven points for revitalizing the mineral sector, such as a new simplified system for the granting of exploration and mining licenses, provision of infrastructure in mining areas, and environmental control. The Government lifted its monopoly to sell gold, allowing anyone to purchase, sell, or export the metal.

In 1994, the Colombian tax office accused petroleum companies for not paying the "war tax" established by the 1992 tax reform. The war tax, a royalty of about $1.00[2] on each barrel produced, and a 25% additional tax on each barrel exported, were levied against foreign companies. Furthermore, oil companies have to bear the full cost of exploration expenses and, once a discovery is made, they have to split any oil found with the Empresa Colombiana de Petróleos S.A (Ecopetrol). The war tax was introduced to finance anti-guerrilla programs. Only Carbocol and Ecopetrol, state-owned coal and oil companies, have been making war tax payments. Revenues from the war tax from petroleum companies were expected to total $72 million in 1994. Coal, gas, and nickel producers are also subject to the war tax, and were included on the tax collector's delinquents list.[3]

Environmental Issues

Colombia's first comprehensive environmetal law went into effect on January 1, 1994. The environmental law included more than 110 articles and 80 pages. This law established the Ministry of the Environment and "SINA," a national organization and private groups involved in promoting environmetal concerns. The Ministry would define environmental policy and promote national environmental regulations relating to a broad range of matters, such as mining, transportation, pollution, and emissions, as well as set tariffs, taxes and fines, issue licenses, regulate national parks, and negotiate with private sector interests for implementation of pollution mitigation measures. The

Ministry would also supervise the Regional Autonomous Corp. (RAC) and would have the authority to suspend exploration, mining, and other activities involving the use of renewable and non-renewable resources. RAC, as the highest environmetal authority in each jurisdiction, was authorized to set emissions and discharge limits, grant licenses for exploration or use of non-renewable resources, regulate water resources, grant concessions or permits for use, set taxes and fines, and impose sanctions for violations of environmetal laws. All revenues collected by RAC would be used in municipal and regional projects for the protection of the environment and renewable resources.[4]

The economic activities in Colombia with the most important impact on the environment were the extraction of lumber and the mining of gold and platinum from alluvial deposits. Both mining and deforestation caused soil erosion and the production of large amounts of sediment from exposed soil and water jet mining, some containing traces of mercury.[5]

Colombia's security police reportedly expelled 197 Brazilian miners from an Indian reserve in the Amazon jungle. The miners were illegally dredging for gold and polluting the Inirida River with mercury.[6]

Production

Colombia was the world's 4th largest platinum producer and 10th largest gold producer. Reportedly, the production of platinum-group metals dropped by 37% in 1994, to the lowest point since production began. Production of bauxite, gold, and manganese remained about the same in 1994, while other metals increased slightly. Output of almost all industrial minerals held steady in 1994, except for emeralds, which increased by 40%.

Colombia ranked as the third largest coal producer in the Western Hemisphere after the United States and Canada. Colombia was the third largest oil producer in Latin America. Output of natural gas and crude oil increased again to historic highs. *(See table 1.)*

Trade

According to the Colombian Foreign Trade Minister, the country had at least 20 bilateral agreements and more than 10 arrangements that included three or more countries.[7]

Colombia was a member of the Andean Pact and of General Agreement on Tariffs and Trade. The Andean Pact opened trade within the region and opened the region to the rest of the world. Agreements with the Central American Common Market and the Caricom countries also were signed. Colombia is also the chief exporter to other countries in the Pact (Bolivia, Ecuador, Peru, and Venezuela), accounting for more than 40% of all intra-regional exports.[8] It was also a beneficiary under the U.S. Generalized System of Preferences. Under U.S. trade policy, Colombia is entitled to most-favored-nation status.

On June 13, 1994, Colombia, Mexico, and Venezuela renewed the San Jose Accord for the 14th year, liberalizing trade and creating a common market. Trade barriers on Colombian and Venezuelan goods entering Central America and Caribbean countries would be dropped within 10 years. Colombia now ranks as Venezuela's second largest trading partner, surpassing the European Union and Japan. Currently, Columbia exports 42% of its goods to Mexico.[9]

In 1994, 25 Caribbean and Latin American countries formed the Association of Caribbean States. In addition to Colombia, Mexico, and Venezuela, the new trade pact included 7 Central American countries, as well as Cuba and 13 other Caribbean states.[10]

Coal was the second largest export earner, following petroleum. Colombia was the fourth largest coal exporter in the world, with about 18 million metric tons (Mmt), mostly steam coal. The principal importers of Colombian coal continued to be Western Europe and the United States. In Colombia, the sale and exports of emeralds doubled in 1993 and increased again in 1994. Almost all nickel produced was exported primarily to Europe, the United States, India, and Japan under a long-term contract expiring in 1995. (*See table 2.)*

Structure of the Mineral Industry

Two Government agencies were created to administer mining exploration and development: Ingeominas, founded in 1919 for exploration activities, and Ecominas (now Mineralco), created in 1968 to implement mining projects and execute the national mining development plan. Additional Government entities were created to operate the coal, nickel, and nuclear industries. Ecocarbon was the new Colombian Government agency created to promote and develop the country's coal industry and also was the advisor to the Ministry of Mines and Energy.

The major part of Colombia's mining industry was privately owned. Oil and natural gas exploration was funded primarily by private companies but production was controlled by the Government agency Ecopetrol. Foreign investors could enter the mineral industry through either fixed-term concessions or an association contract with a state enterprise.

Commodity Review

Metals

Production of copper, bauxite, lead, and manganese ore was small in Colombia. Lateritic bauxite was produced by small operations in the Upper Cauca Valley, southwest of Bogota. Copper was mined at El Roble, southwest of Medellin. The mine was operated by a Colombian-Japanese consortium. Colombian lead and zinc mines are in Antioquia

Department, operated by Frontino Gold Mines S.A. Acerias Paz del Rio S.A. (APR) is the largest steel company in Colombia, accounting for 50% of total production. APR also produced coal for its own use, iron ore, and cement. The company employed about 3,700 workers.[11]

Gold.—Except for an increase in 1991 gold production has been dropping in Colombia since 1986. In 1994 output was the lowest in the past 6 years.

Colombia ranked fourth in gold production in the Western Hemisphere after the United States, Canada, and Brazil. About 75% of Colombian gold output was produced from alluvial deposits. Gold mineralization is also associated with quartz veins in metasedimentary sections of the central Cordillera, as well as gold-copper-porphyries in the western Cordilerra. Bolivar Department, Colombia's major source area for gold, produced 34% of the Nation's total output; Antioquía Department followed with 31%.[12] About 10% of gold came from placers in El Choco Department on the Pacific Coast, which also produced the country's platinum. Gold in Cordoba Department, accounting for 8% of total production, came exclusively from placers.

Mineros de Antioquia S.A. (MA) is the largest private gold producer in Colombia. MA operates four bucket-line dredges along the Nechi River. Most of the ground has been worked several times and old dredge tailings can be clealry seen in many places along the banks of the river.

Frontino Gold Mines, Ltd. is the second largest gold producer at Segovia, extracting gold from hard rock. The company was in continuous operation since 1854.

Greenstone Resources Ltd., Toronto, Canada, operated the Oronorte gold Mine near Zaragoza, Antioquía Department. The mine produced about 315 kilograms (kg) of gold annually, or about 1% of Colombia's total gold production. The company formed a publicly owned Colombian company, Compania Minera Oronorte S.A. (CMO), listed on the Bogota and Medellin stock exchanges. Instituto de Fomento Industrial S.A. acquired a 12.3% interest in CMO. Greenstone was planning to sell a further 32.5% interest through a public offering.[13]

Nickel.—Colombia was the world's fourth largest producer of ferronickel, after New Caledonia, Canada, and Japan. The Cerro Matoso S.A. (CM) Mine at Montelíbano, Córdoba Department, is one of the world's largest nickel mines with a capacity of 23,000 metric tons per year (mt/a) nickel in ferronickel. The mine produced about 900,000 metric tons (mt) of ore, grading 2.7% nickel. Reserves of nickel ore were estimated at 20 Mmt grading 2.7% nickel. CM is a joint venture between Billiton Overseas Ltd. (52.3%), a subsidiary of Royal Dutch Shell of the Netherlands, and Empresa Colombiana de Níquel (47.7%), a subsidiary of a Government agency, Industrial Development Institute (IFI). All production was exported, with 80% shipped to Europe. Plans for a smelter expansion remained shelved as the company concentrated on improving efficiency.[14]

In Fall 1994, IFI announced that Shell sold its interest in CM to a South African company, Gemcor Ltd. The sales price was not announced.[15]

Platinum.—Colombia was fourth worldwide in the production of platinum, with only 1.5% of total world production. Platinum production dropped by 37% in 1994. Almost all platinum production came from placer deposits, tributaries of the Atrato, Nechi, and San Juan Rivers in Chocó Department. Small amounts of gold, iridium, palladium, rhodium, and other metals also occurred in those deposits.

Industrial Minerals

Colombia was well endowed with industrial minerals. The 17 cement plants, operated by 14 companies, were near their own limestone quarries. At least six cement plants were being expanded in 1994 and were refurbished with upgraded equipment. Cement was used for domestic purposes with about 10% of country's hydraulic cement being exported.

Gypsum was produced in Guainia Department in the east-central area of the country. Gypsum also was imported from Mexico and used in cement plants on the Caribbean coast.

Phosphate deposits in Columbia were along the eastern Andes Range. Salt was produced from seawater evaporation basins on the north coast and from the Zipaquira underground mine north of Bogota.

The only active sulfur mine in Colombia was the Mina El Vinagre, near Puracé in Cauca Department. A record was set in 1994 in the production of native sulfur.

Emeralds.—Colombia was the leading emerald producer, producing about 60% of the world's finest emeralds. Most of Colombia's emeralds came from mines in Boyacá Department, north of Bogota, most notably the Chivor, Coscuez, Gachala, Muzo, Quípama, and Ubala. The Chivor and Muzo Districts have been operating continuously for more than 500 years, since the colonial period. Chivoreña de Minas Ltda. of Bogota signed contracts in 1994 with Mineralco to mine emeralds south of Chivor.[16]

Most emeralds were exported as uncut stones, a large portion illegally. Reportedly, Israel's Tel Aviv Precious Stone Exchange and its partner, Bolso Mundial de Esmeraldas, were handling the emeralds, as well as gold and platinum from Antioquía de Caldas Department. The emeralds contributed about $400 million to the country's economy. Japan continued as the single largest market of emeralds (70%), followed by the United States, European countries, and others. Mineralco manages the emerald industry to maintain the quality and reputation of Colombian stones.

Mineral Fuels

Coal.—Colombia is rich in coal, natural gas, petroleum, and hydropower and was the third largest steam coal producer in the Western Hemisphere, after Canada and the United States. Colombia was the eighth largest coal exporter, with about 9% of the thermal coal market. More than 80% of Colombian coal produced was exported, accounting for about 12.5% of Colombia's total export earnings in 1994. The United Kingdom was the largest importer of Colombian coal, accounting for about 20% of its total coal exports. Coal was also exported to Brazil, Denmark, France, Ireland, Israel, Italy, Japan, the Netherlands, Spain, and the United States.[17]

Colombia possessed the largest coal reserves in Latin America, mostly steam coal. More than one-half of the country's reserves occurred along the north coast, concentrated in the La Guajira Peninsula, followed by Cesar (19%), Cundinamarca and Boyaca (9%), and Cordoba (8%). Colombia had an estimated 6.5 billion mt of economic reserves of steam coal. Reserves of thermal coal amounted to more than 15,000 Mmt, and coking coals about 670 Mmt. There was also about 19 Mmt of anthracite coal reserves.[18]

Of the nearly 1,200 coal mines in Colombia, 3 were large (65% of total production); 33 were medium size (13%), and the rest were small mines. The coal industry employed about 29,000 workers, about 35% of which were located at the Cerrejon Mine.

About 60% of Colombian coal came from the Cerrejon Norte open pit and 80% of exports, or 6% of all national exports. Cerrejon Norte is part of the Cerrejon Coalfield, divided into North, Central, and South sections. The South section at times is referred to as Oreganal, but has not been yet developed. With reserves of 1.6 billion mt of high-quality steam coal, the open pit Cerrejon Mine is the largest of its type in the world. The coal from this region is of excellent quality—steam coal has a sulfur content of less than 1% and an ash content not exceeding 8%. In a 50-50 partnership with Carbones de Colombia S.A. (Carbocol), a State-owned company, Cerrejon was operated by International Colombia Resources Corp. (Intercor), a subsidiary of Exxon Corp. A number of environmental measures were in place at the mine, such as water oxidation and sedimentation ponds, dust control systems, and oil recovery and disposal.[19]

Prodeco S.A. is the largest private coal producer and exporter in Colombia. Prodeco signed a 30-year contract in 1989 to operate the Calenturitas Mine, Cesar Department. The mine is about 20 kilometers (km) from La Loma rail station, and the 220-km route to Santa Marta is accessible by rail, road or both. Recoverable reserves were estimated at 247 Mmt of low sulfur (0.6%) steam coal. Mining started in December 1993 and 0.5 Mmt was exported in 1994, expected to rise to 3 Mmt by 1997. The Calenturitas Mine is part of the same deposit where the La Jagua and La Loma Mines also are located, south of the Cerrejon deposit. Since 1990, Prodeco also operated the Central Cerrejon Mine. The mine has about 400 Mmt of recoverable reserves of low sulfur coal, with a planned capacity of 6 to 10 Mmt/a. Production has increase from less than 1 Mmt in 1992 to 1.7 Mmt in 1993; 2.5 Mmt was expected in 1994. Prodeco also operated a metallurgical coal mine at Guacheta, Cundinamarca Department, just north of Bogota, with production of 400,000 mt in 1993. The mine also operated a coking plant, producing 60,000 mt/a of coke for export to the Latin American markets. All Prodeco's coal is sold to powerplants and domestic and industrial markets in Europe and the United States. Prodeco exported its production through its 3.5 Mmt/a facility at Santa Marta, also known as Puerto Zuniga.

Carbones del Caribe S.A. (CC), the other significant private coal producer, operated open pit mines at Puerto Libertador, Cordoba Department. The mine reserves were estimated at 300 Mmt. The company was using its coal as a fuel and the balance was exported. CC also extracted coal from one small underground mine (600,000 mt in 1994) and six open pits (900,000 mt in 1994) in the La Jagua coal Basin. CC has 20-year mining rights for those mines. Undeground production began in 1991. The coal from that mine was exported primarily to Ireland, Scandinavia, and the United Kingdom.

Drummond Ltd., a subsidiary of Drummond Coal Co. of Jasper, Alabama, continued to develop the La Loma open pit mine in 1994. Recoverable reserves at the mine were estimated at 485 Mmt, with 11 coal seams. Mining was scheduled to begin in February 1995 with an initial output of 2.5 Mmt, then rising to 10 Mmt/a of steam coal in 2000. La Loma Mine will thus become the second largest coal producer in Colombia. Most of the coal will be shipped to Europe. In the latter part of 1993, Drummond announced that production of coal from the La Jagua deposit would start in 1995. It was estimated that 25 Mmt of coal can be recovered from open pit operations and 70 Mmt by undergound mining. The deposit was expected to produce 10 Mmt/a when fully developed. The main export markets would be France, Germany, Spain, Sweden, United Kingdom, and the United States. Drummond negotiated with the newly created railway company, Ferrovias S.A., for the upgrading of the 180—km railway link between the mine and the Caribbean port of Cienaga. The cost of the La Loma project was estimated at more than $800 million. Drummond planned to transport coal from La Jagua and other mines by November 1994 and ship coal in January 1995.[20]

In 1993, the Government reorganized its coal industry by dividing Carbocoal into two entities: a new Carbocol, which continues to administer the Government's 50% interest in Correjon Norte, and Ecocarbon, a regulatory agency that oversees the Government's interest in the coal industry outside of Cerrejon Norte, collects royalties, provides technical support, and administers safety regulations. All investments in new coal projects will be channeled though

Ecocarbon, but all were to be 100% privately financed.[21]

Carbocol plans to develop 9 new coalfields in Antioquia, Boyaca, Cundinamarca; two in Santander; the Valle del Cauca; and one each in the northern provinces of Cesar, Cordoba, and Guajira.[22]

Natural Gas and Petroleum.—Natural gas reserves in Colombia were estimated in 1994 at 283 billion cubic meters (m^3).[23] More than 80% of the natural gas produced in Colombia was used domestically. Only one gasfield has been developed in the Caribbean Basin, the Chuchupa Field. Much of the Nation's natural gas reserves are either offshore, on the La Guajira Peninsula, or in Meta Department. Texaco and Ecopetrol are constructing a second platform for their offshore activities. La Guajira gas is exclusively used by customers on the Caribbean coast. Once the gas pipeline is completed in mid-1995, Guajira gas will be pumped to Bucaramanga and Medellin where the gas has been almost depleted. Two small deposits were developed by Lasmo Ltd. in Guepaje and Purificaccion, both in Upper Magdalena Department.[24]

In August 1994, British Petroleum Ltd. (BP) announced the discovery of a large gasfield in the Volcanera area in the Llanos Basin about 30 km from the Cusian/Cupiaga oilfields. The gasfield is partly in the Recetor Block, in which BP acquired a majority stake from Maxus Ltd., subsidiary of Maxus Energy Corp. of Dallas, Texas, in 1993 for $10 million. The majority of the field lies in the Piedmonte Block, in which BP holds a 100% interest. The recoverable reserves were estimated at 140 billion m^3 of gas and 250 million barrels of condensate, thus doubling Colombia's reserves of gas.[25]

Amoco Colombia Petroleum Co., a subsidiary of Amoco Corp., of Chicago, Illinois, announced a gas discovery on the Opon Association Contract (OAC) area in the Middle Magdalena Valley, adjacent to the Llanos oil basin. The partners in the discovery well and the OAC area were Amoco (60% and also its operator), Hondo Magdalena Oil & Gas (30%), and Opon Development Company (10%). Ecopetrol would have the right to take 50% interest in any further commercial discoveries.[26]

Colombia's recoverable oil reserves were estimated at 8.6 billion bbl in eight major basins.[27] In 1994, Colombia was the third largest crude oil producer in Latin America. Production of crude oil in Colombia continued to increase to a historic high level in 1994.

Occidental Petroleum Co. operated in the Caño Limon oil field. That field is the country's largest producing oilfield, with daily production of about 30,000 bbl. Crude oil was piped through a 760-km pipeline from the Caño field to the terminal at Covenas on the Caribbean coast. In February 1994, guerrillas attacked and damaged four production wells and a few electric generator sets. Lost production from the wells was put at 5,700 barrels per day (bbl/d) or about 2.5% of Occidental's production. The damage was repaired in 1 week. This was the first attack on the Caño Limon field; previously, guerrillas had attacked on several occasions the vulnerable [long] pipeline linking Caño Limon with Covenas. According to Ecopetrol, Colombia in the past 9 years was prevented from collecting more than $1 billion in oil revenue because of such terrorist attacks. Sections of the line were blown up 331 times during 1985-93.[28] Also, Colombian oil exports were stopped on May 6, 1994, for 26 days because of an accidental fire which destroyed 5 pumps at Caño Limon.[29]

The Casanare basin contained one-half of country's total oil reserves, thus becoming the richest source of low sulfur oil in Colombia. BP continued exploration work in the Casanare area. Six other international companies were also doing exploration work in the area.

Ecopetrol, which held 50%, and its partners, BP (19%); Triton Energy Ltd. (12%), Dallas, Texas; and Total Petroleum Ltd. (19%), Calgery, Canada, discovered a large gas and oilfield in eastern Colombia, the Cusiana and Cupiagua Fields, 200 km northeast of Bogota, in the Llano foothills. This field is the largest discovery in the Western Hemisphere in the past 25 years. The Cusiana oilfield has 1.5 billion bbl of recoverable reserves and its adjacent Cupiagua Field contains 0.5 billion bbl; both fields contain more than 85 billion m^3 of natural gas, or about 40% of total. Ecopetrol claimed that the Cupiagua Field is almost entirely gas. The gas market is nonexistent in Colombia, so the gas will be pumped into a nearby oilfield to increase the pressure in the field to pump out oil. BP started commercial crude oil production from the Cusiana Field in October. Reportedly, in 1994, the Cusiana Field produced 40,000 barrels per day (bbl/d) of oil, and expects to produce 150,000 bbl/d by mid-1995. Both oilfields are expected to produce about 500,000 bbl/d by 1998. A pipeline is being built to transport crude oil from Cusiana to the Covenas terminal on the Caribbean coast. Ecopetrol is looking for investors to built a 100,000 bbl/d refinery to process crude oil from the Cusiana field.[30]

In July 1994, the Colombian Ministry of Mines and Energy and Ecopetrol offered for the first time 21 blocks onshore for oil exploration. The competitive tender included Llanos, Putumayo, and Upper Magdalena Valley basins. Reportedly, only three oil companies submitted bids in the country's first international licensing round. This low response was attributed to the highest tax burden in the world for oil exploration. Exxon Corp., Irving, Texas, Kelt Ltd., London, United Kingdoom, and Total Ltd. bid on four of the 21 blocks in the Llanos Basin, near the Cusiana and Cupiagua Fields.[31]

In late 1993, Ecopetrol offered for competitive tender exploration plots in the Upper Magdalena Field. GHK Inc. Oil Company, of United States, was drilling two exploratory wells near Guaduas, in the Magdalena Valley. Harken de Colombia Ltd., a subsidiary of Harken Energy Corp. of Grand Prairie, Texas, signed its second contract with Ecopetrol, covering the Bocachico area in the Middle

Magdalena Valley.[32]

Shell Petroleum S.A. of the Netherlands offered two of its exploration and production companies (Hocol S.A. and Homcol S.A.) for sale in late 1994. The properties, producing 20,000 to 25,000 bbl/d, were valued at $500 million when purchased from Tenneco Co., Houston, Texas, in 1989. Hocol and Homcol own extensive exploration acreage and producing assets in the Upper Magdalena Valley and the central Llanos area, as well as interests in two Colombian oil pipelines. Reportedly, this sale would not affect Shell's other interests in Colombia. Through two other subsidiaries, Shell is active in exploration, production, manufacturing, and marketing, producing about 40,000 bbl/d.[33]

In excess of 50 petroleum companies were operating in Colombia, including Chevron Corp., San Francisco, California, Texaco Corp., Houston, Texas, and Tuskar Ltd., Dublin, Ireland, and Garnet Resources Corp., Houston, Texas, also were exploring for oil. Garnet was granted permission to proceed with plans to begin commercial production of Mary and Miraflor Oilfields in southwest Colombia's Putumayo Basin.[34] Amoco Corp. funded an exploration well in the Cano Caranal area on the Venezuelan border, about 380 km northeast of Bogota.[35] Argosy Petrolum Ltd., of the United Kingdom, was drilling in two blocks in the Mocoa Field, Putumayo Department.

Colombia continued to rely heavily on the imported crude oil for its domestic refineries. In 1994, Colombia imported 13.4 Mbbl of oil, primarily from Argentina and Venezuela. A small refinery was planned to be built at Triunfo port near the Cusiana and Cupiaga Fields. Ecopetrol operated refineries at Barrancabermeja, Cartagena, Orito, and Tibú. The largest refinery is at Barrancabermeja. Refining capacity was insufficient to supply the domestic market, therefore 28,000 bbl/d of petroleum products was imported to make up the shortfall. The least efficient in the Americas, the refinery loses averaged $21 million each year because of poor management and the high use of energy.[36]

Infrastructure

In Colombia, only 9,350 kilometers (km) of roads were paved out of the total 75,450 km of roads. Colombia has 3,236 km of single-track railroads. The only significant rail traffic involved short stretches used for transporting coal to export terminals on the Caribbean coast. Other railroad connections for coal mines were being built, mostly in the northern part of the country. Coal was exported through the ports of Puerto Bolívar and Santa Marta on the Caribbean coast. Buenaventura, on the Pacific coast, was the country's largest port. The Nation's primary petroleum port was Coveñas. Cartagena and Tumaco also handled petroleum exports. Buenaventura and Santa Marta handled imports of refined petroleum products.

A total of 5,890 km of pipeline included 3,585 km for transporting crude petroleum, 1,350 km for refined products, 830 km for natural gas, and 123 km for natural gas liquids. The Orito-Tumaco oil pipeline in southern Colombia, damaged by guerrilla attacks in summer 1993, resumed its previous flow of 30,000 bbl/d.

The 470-km crude oil pipeline from the Cusiana area to Coveñas was being completed by Trans-Canada Pipelines Ltd. and IPL Energy Inc., both Canadian companies. The capacity of the pipe is 150,000 bbl/d, rising to 185,000 bbl/d in 1995. Once finished, the capacity is expected to increase to 500,000 bbl/d.[37]

Ecopetrol awarded a contract to Enron Corp. (USA) to built a 575-km natural gas pipeline from Ballenas, near Santa Marta, Guajira Department, to Barrancabermeja, Santander Department as well as several feeder lines to Medellin, Bucaramanga, Cali, Bogota, and the southwest region. This construction is part of the natural gas distribution plan the Government started in 1991. The pipeline is expected to be operational in 1996.[38]

Hydropower furnished about 80% of the total installed electrical generating capacity of 9,624 meggawatts (MW); the rest was supplied by thermoelectric powerplants (630 MW from coal and 320 MW from gas). Carbocol is planning to build eight new thermoelectric power stations northeast of Bogota. The eight stations should have a combined generating capacity of at least 1,600 MW. Colombia's 1,000 MW El Guavio hydroelectric complex became operational in 1994, 6 years behind schedule, at a cost of $2.5 billion. Most of the output is designated for the Bogota region.[39]

Outlook

No significant investments are expected to be made in the development of new gold mines, thus all production will continue to come from the Pacific coastal region, which has been worked since the discovery of the Americas. The only exception is one development in lower Cauca Valley, which has developed rapidly in the last 2 years and now accounts for 25% of total gold production. Colombian mining companies will continue seeking investments to discover new deposits and to fund upgrading of equipment at their work sites.

The coal industry in Colombia is expected to continue growing during the next decade. New mines should be opened, and increased production from the existing facilities is anticipated as a result of heavy world demand for high quality coal. Port facilties also are being expanded as well as the overland roads and storage facilities. Colombia foresees remaining the fourth largest exporter of high-quality steam coal in the world, destined primarily to Europe, Japan, and the United States.

Ecopetrol is planning to double its oil production by 1997, mostly from the Cusiana and Cupiagua Fields. Colombia expects to be the third largest oil exporter in Latin America, shipping 600,000 bbl/d by the end of the century.

Gas demand in Colombia is forecast to grow by 10% a year for the next 5-to-10 years. Colombian gas consumption is now about 11 million cubic meters per day (Mm^3/d) and is expected to reach 28 Mm^3/d by 2000 under a $3 billion plan by Ecopetrol to expand the Nation's gas infrastructure. By about 2005, gas is expected to flow from the Caribbean coast to the interior, once the gas pipeline is completed.

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[1]Text prepared July 1995.

[2]Where necessary, values have been converted from Colombian pesos (Col$) to U.S. dollars at the average rate for 1994 of Col$830 =US$1.00.

[3]Latin American Economy & Business (London): Oct. 1994, p. 26. Latin American Mining Institute (Washington, DC): The South American Investment and Mining Guide, Colombia, Investment Laws Summary. U.S. Department of State (Washington, DC): Incoming Telegram, July 1, 1994; Oct. 7, 1994.

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[6]Mining Journal (London): Apr. 22, 1994, p. 290.

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[9]Latin American Economy & Business (London): Jan. 1, 1994, p. 11. Petroleum Economist (London): Sept. 1994, p. 56. U.S. Department of State (Washington, D.C.): Incoming Telegram, June 16, 1994. Washington Post (Washington, D.C.): June 14, 1994, p. A3.

[10]Work cited in footnote 7, page 16.

[11]Mining Journal (London): Feb. 25, 1994, p. 138.

[12]Ministerio de Minas y Energia (Ingeominas) (Santa Fé de Bogotá): Colombia, Una Mina de Oro: Mar. 1995, p. 17.

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

(Metric tons unless otherwise specified)

Commodity		1990	1991	1992	1993	1994 e/
METALS						
Bauxite		1,640	1,720	1,750 e/	1,700 e/	1,700
Copper, mine output, Cu content		304	3,640	3,940	3,940 r/	3,140 3/
Gold	kilograms	29,400	34,800	32,100	27,500 r/	27,500 3/
Iron and steel:						
Iron ore and concentrate	thousand tons	628	450 r/	674	545 r/	610 3/
Pig iron	do.	323	305	304 r/	264 r/	244 3/
Steel, crude	do.	701	652	657	687 r/	702 3/
Semimanufactures, hot-rolled	do.	592	581	590 r/ e/	636	642 3/
Lead:						
Mine output, Pb content		331	611	620 r/	447 r/	440
Refined (secondary) e/		3,500	3,600	3,600	3,600	3,500
Manganese: Mine output, Mn content		500	552	600 e/	800 r/	800
Nickel:						
Mine output, Ni content		22,400	20,600	23,100	23,300 e/	23,500
Ferronickel, Ni content		18,400	20,200	20,200	18,000 r/	20,800 3/
Platinum-group metals	kilograms	1,320	1,600	1,960	1,720 r/	1,080 3/
Silver	do.	6,590	8,040	8,290	7,330 r/	7,200
Zinc, mine output, Zn content		356	266	277	279 r/	275
INDUSTRIAL MINERALS						
Asbestos						
Mine output		160,000	160,000	170,000	-- r/	--
Fiber		8,000 e/	7,830	7,900	-- r/	--
Barite		5,380	9,290	9,380	4,840 r/	7,000
Cement, hydraulic	thousand tons	6,250	6,300	6,810	7,660 r/	7,110 3/
Clays:						
Bentonite		3,100	3,180	3,260 r/	3,500 e/	3,250
Common clay and kaolin	thousand tons	1,920	1,980	2,050 r/	2,100 r/	3,000
Diatomite		3,100	3,890	4,360	4,400 e/	4,000
Feldspar		34,800	45,600	78,400 r/	60,500 r/	70,000
Fluorite		780	894	959 r/	1,800 r/	1,500
Gem stones, precious and semiprecious:						
Emerald 4/	thousand carats	3,100	1,080	2,310	5,150 r/	7,200 3/
Gypsum	thousand tons	608	639	671	439 r/	450 3/
Lime, hydrated and quicklime e/	do.	1,300	1,300	671 3/	439 r/ 3/	450
Magnesite		19,300	18,800	18,800	9,820 r/	9,500
Mica		60	50	54	55 e/	55
Nitrogen: N content of ammonia e/		90,000	91,900 r/	86,300 r/	98,500 r/	90,000
Phosphate rock		31,000	31,500	31,500	17,500 r/	20,000
Salt:						
Rock	thousand tons	209	219	230	231 r/	315
Marine	do.	478	482	317	169 r/	250
Total	do.	687	701	547	400 r/	565 3/
Sodium compounds, n.e.s.: Sodium carbonate		121,000	121,000	121,000 e/	121,000 e/	121,000
Stone and sand:						
Calcite		7,210	5,760	6,320 r/	6,500 e/	6,500
Dolomite	thousand tons	45	46	46 r/	45 e/	45
Limestone e/	do.	17,000 r/	15,700 3/	16,000 r/	16,000	14,000
Marble		32,200	33,400	34,600	34,500 e/	35,000
Sand excluding metal-bearing e/		790,000 3/	859,000 3/	860,000	850,000	850,000
Sulfur:						
Native (from ore)		31,700	37,600	39,200	51,400 r/	53,400 3/
Byproduct, from petroleum e/		8,000	9,000	9,200	12,200 r/	12,200
Total		39,700	46,600	48,400	63,600 r/ e/	65,600
Talc, soapstone, pyrophyllite		10,100	11,100	13,300	19,600 r/	20,000
Carbon black		20,400	20,000 e/	23,600	23,800 e/	24,000
Coal:						
Metallurgical e/	thousand tons	700	800	900	1,800 r/	2,000
Steam	do.	19,800	19,200	22,900	19,900 r/	20,500
Total	do.	20,500	20,000	23,800	21,700 r/	22,500 3/
Coke, all types e/	do.	339 3/	400	450	632 r/ 3/	562 3/
Gas, natural: e/						
Gross	million cubic meters	5,200 r/	5,200 3/	5,200	5,350 r/	6,900 3/
Marketed	do.	4,200 r/	4,250 3/	4,450 r/	4,450	6,500
Natural gas liquids e/	thousand 42-gallon barrels	1,500	2,240 3/	2,300	2,300	2,500
Petroleum:						
Crude	do.	160,000	155,000	161,000 r/ e/	165,000 r/	166,000
Refinery products:						
Liquefied petroleum gas (propane)	do.	4,500 e/	4,860	4,900 e/	4,080 r/	4,200
Gasoline: e/						
Aviation	do.	265	301 3/	320	209 r/ 3/	225
Motor	do.	29,000	32,100 3/	32,200	30,700 r/	31,500
Jet fuel	do.	4,000 e/	3,960	4,000	4,840 r/	5,000
Kerosene	do.	2,300 e/	1,690	1,700 e/	1,750 r/	1,900
Distillate fuel oil	do.	14,300 e/	16,800	16,900 e/	19,200 r/	19,300

See footnotes at end of table.

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

(Metric tons unless otherwise specified)

Commodity		1990	1991	1992	1993	1994 e/
Petroleum:--Continued						
Refinery products:--Continued						
Lubricants e/	do.	750	651 3/	700	402 r/ 3/	500
Residual fuel oil e/	do.	24,000	26,900 3/	27,000	21,100 r/	22,500
Asphalt and bitumen	do.	1,100 e/	1,210	1,250 e/	1,640 r/	1,500
Refinery fuel and losses, and unspecified products e/	do.	3,500	422 3/	500	500 r/	500
Total	do.	83,700 e/	88,900	89,500 e/	84,400 r/	87,100

e/ Estimated. r/ Revised.
1/ Previously published and 1994 data are rounded by the U.S. Bureau of Mines to three significant digits; may not add to totals shown.
2/ Includes data available through July 14, 1995.
3/ Reported figure.
4/ Based on registered exports by the Banco de la Republica.

TABLE 2
COLOMBIA: STRUCTURE OF THE MINERAL INDUSTRY FOR 1994

(Thousand metric tons unless otherwise specefied)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Carbon black		Cabot Colombiana, S.A. (Private, 100%)	Cartagena, Bolívar Department (plant)	NA
Do.		Productos Petroquímicos, S.A. (Private, 100%)	Cali, Valle del Cauca Department (two plant)	12
Cement		Cía. Colombia de Clinker, S.A. (Colclinker) (Private, 100%)	Cartagena, Bolívar Department (plant)	1,100
Do.		Cementos del Caribe, S.A. (Private, 100%)	Barranquillaa, Atlántico Department (plant)	1,000
Do.		Cementos del Valle, S.A. (Private, 100%)	Yumbo, Valle del Cauca Department (plant)	1,200
Do.		Cementos Río Claro, S.A. (Private, 100%)	Puerto Trifuno, Antioquía Department (plant)	1,000
Coal		Carbones de Colombia, S.A. (CARBOCOL) (Government, 50%) and International Colombia Resources Corp. (INTERCOR) (Exxon, 50%)	El Cerrejón Norte Mine, La Guajra Department	15,000
Do.		Drummond, Ltd. (Drummond Co., 100%)	La Loma Mine, César Department	10,000 1/
Do.		Prodeco (Private, 100%)	A number of mines in Central Colombia	1,000
Do.		Acerías Paz del Río, S.A. (Private, 100%)	Paz del Río, Boyaca Department (mine)	600
Copper		El Roble Exploración Y Explotación, S.A. (Minas El Roble, 51%; Nittetsu Mining, 44.1%; and C Itoh, 4.9%)	El Roble Mine, El Carmen, Chocó Department	4
Emerald		Minerales de Colombia, S.A. (Government, 100%)	Chivor, Coscuez, Muzo, and Quípama Mines, Boyaca Department	NA
Gold	kilograms	Frontino Gold Mines, Ltd. (Private, 100%)	El Silencio Mine, Segovia, Antioquía Department	1,500
Do.	do.	Greenstone Resources, Ltd. (Private, 100%)	Oronorte Mine, Segovia, Antioquía Department	500
Do.	do.	Mineros de Antioquía, S.A. (Private, 100%)	Río Nechí, near El Bagre, Antioquía Department (mines)	2,000
Do.	do.	Small miners (Cooperatives and individual prospectors)	Río Nechí, Antioquía Department (mines)	NA
Iron ore		Acerías Paz del Río, S.A.	Paz del Río, Boyaca Department (mine)	800
Kaolin		Cerámicas del Valle, Ltda. (Private, 100%)	Yumbo, Valle del Cauca Department (mine)	NA
Natural gas	million cubic meters	Empresa Colombiana de Petróleos (Ecopetrol) (Government, 100%)	North coast, Guajira Department (national gasfields)	3,500
Do.	do.	International Petroleum Colombia, Ltd. (International Petroleum Corporation, 100%	Barrancabermeja locale, Antioquía and Santander Departments	1,200

See footnotes at end of page.

TABLE 2--Continued
COLOMBIA: STRUCTURE OF THE MINERAL INDUSTRY FOR 1994

(Thousand metric tons unless otherwise specefied)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Nickel		Cerro Matoso, S.A. (Billiton Overseas Ltd, 52.3%; Government, 47.7%)	Cerro Matoso Mine, Montelíbano, Córdoba Department	23
Nitrogen		Abonos de Colombia (Private, 100%)	Cartagena, Bolívar Department (plant)	100
Do.		Monomeros Colombo-Venezolanos, S.A. (Private, 100%)	Barranquilla, Atlántico Department (plant)	85
Petroleum	thousand 42-gallon barrels	Ecopetrol	16 fields in various departments	70,000
Do.	do.	Houston Oil Colombiana, S.A. (HOCOL) (Royal Dutch Shell, 100%)	14 fields in various separtments	36,500
Petroleum products	do.	Ecopetrol	Barrancabermeja Refinery, Santander Department	71,400
Do.	do.	Do.	Cartegena Refinery, Bolívar Department	25,806
Do.	do.	Do.	Tibú, Norte de Santander Department	1,825
Do.	do.	Do.	Orito, Putumayo Department	875
Phosphate		Fosfatos de Colombia, S.A. (Private, 100%)	Neiva, Huila Department	30
Do.		Fosfatos Boyaca, S.A (Government, 100%)	Iza, Boyaca Department	20
Platinum		Small miners (Cooperatives and individual prospectors)	Río San Juan, Chocó Department	NA
Salt: marine		Instituto de Fomento Industrial (IFI) (Government, 100%)	Manaure Salina, La Guajira Department	700
Rock		Concesión Salinas (Government, 100%)	Zipaquira, Cundinamarca Department	500
Silver	kilograms	Frontino Gold Mines, Ltd.	Segovia, Antioquía Department (mine)	2,500
Do.	do.	Small miners (Individual prospectors and cooperatives)	Río Nechí, Antioquía Department (mines)	2,000
Steel: Intergrated plant		Acerías Paz del Río, S.A.	Belencito, Boyaca Department	400
Semi-intergrated plants		Fundiciones Technicas, S.A. (Private, 100%)	Medellín, Antioquía Department	NA
Do.		Siderúrgica del Boyaca, S.A. (Private, 100%)	Bogotá, Federal District	NA
Do.		Siderúrgica del Medellín, S.A. (Private, 100%)	Medellín, Antioquía Department	NA
Do.		Siderúrgica del Muña, S.A. (Private, 100%)	Chusacá, 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	Barrancabermeja, Santander Department	29

NA Not available.
1/ Under development.