



2007 Minerals Yearbook

PERU [ADVANCE RELEASE]

THE MINERAL INDUSTRY OF PERU

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In 2007, Peru occupied a leading position in the global production of the following mineral commodities, in alphabetical order, arsenic trioxide (fourth after China, Chile, and Morocco), bismuth (third after China and Mexico), copper (second after Chile), gold (fifth after Australia, South Africa, China, and the United States), lead (fourth after China, Australia, and the United States), molybdenum (fourth after the United States, China, and Chile), rhenium (fourth after Chile, Kazakhstan, and the United States), silver (first followed by Mexico and China), tin (third after China and Indonesia), and zinc (third after China and Australia).

In Latin America, Peru was the leading producer of, in terms of value, gold, silver, zinc, lead, tin, and tellurium, and it ranked second in the production of copper and molybdenum (after Chile) and bismuth (after Mexico) (Jasinski, 2007; Brooks, 2008a, b; Carlin, 2008a, b; Edelstein, 2008; George, 2008; Magyar, 2008a, b; ProInversión—Private Investment Promotion Agency in Peru, 2008; Smith, 2008).

In 2007, Peru's economy benefited from high prices for mineral commodities; the gross domestic product (GDP) grew at a real rate of 9%, which was the highest growth rate since 1994. Peru's net international reserves amounted to \$27.7 billion, exports exceeded imports by \$8.4 billion, and foreign direct investment (FDI) amounted to \$5.3 billion. Private investment in Peru continued to be significant, increasing to \$21.5 billion in 2007 from \$15.2 billion in 2006 (Banco Central de Reserva del Perú, 2008; Economic Commission for Latin America and the Caribbean, 2008; International Monetary Fund, 2008; Ministerio de Energía y Minas, 2008a; ProInversión—Private Investment Promotion Agency in Peru, 2008).

Legislative Decree No. 662 requires the registration of foreign investment. Privatization of state-owned firms through joint ventures and private investment in the mining and fuel industries generated \$4.1 billion, which represented almost 2% of Peru's GDP, and an additional committed capital flow of about \$12.5 billion, which represented about 6% of Peru's GDP in 2007. Privatizations generated an estimated committed investment of \$36 billion for the period 2008-10 (ProInversión—Private Investment Promotion Agency in Peru, 2008).

In 2007, several mining companies committed to invest in the Peruvian mining sector, such as Aluminum Corp. of China (Chinalco), which acquired 91% of the junior Canadian Perú Copper Inc. for \$790 million in August 2007. Chinalco also invested \$2 billion for the Toromocho copper project. In addition, Xstrata plc. invested \$1 billion in Las Bambas copper mine; Sociedad Minera Cerro Verde S.A. [a consortia formed by the U.S. company Freeport-McMoRan Copper & Gold Inc. (53.56%), the Japanese company Sumitomo Metal Mining Co., Ltd. (21%), the Peruvian company Compañía de Minas Buenaventura S.A.A. (18.21%), and others (7.23%)] invested \$890 million for expansion of the Cerro Verde copper mine; Monterrico Metals plc. of the United Kingdom [Xiamen Zijin Tongguan Investment Development Co. Ltd. of

China (Consorcio Zijin) (89.9%) and LS-Nikko Copper Inc. of the Republic of South Korea (10.1%)] committed to invest \$890 million in the Rio Blanco base-metals project; Rio Tinto Ltd. of Australia (BHP Billiton plc., 100%) committed to invest \$700 million in the La Granja copper project; Southern Copper Corp. (a subsidiary of Grupo Mexico S.A. de C.V.) committed to invest \$400 million in the expansion of Ilo smelter; Gold Fields Ltd. of South Africa committed to invest \$350 million in the Cerro Corona copper-gold project; and Companhia Vale do Rio Doce (Vale) of Brazil committed to invest \$300 million in the Bayovar phosphate project. The total committed investment in the mining sector for the period 2009-15 was \$22 billion (MinerAndina y Sociedad, 2008, p. 9, 21; Ministerio de Energía y Minas, 2008a).

Petróleos del Perú S.A. (PETROPERU), which was a state-owned company, was involved in the transportation, refining, and marketing of refined products and other derivatives of petroleum. On June 2, 2004, the Peruvian Congress enacted law No. 28244 to exclude PETROPERU from the privatization process but authorized its participation in exploration and production of hydrocarbons. The state agency Perúpetro S.A. was created on November 18, 1993 (law No. 26221) to be responsible for promoting investments in the Peruvian hydrocarbon sector. Perúpetro negotiates, signs, and administers hydrocarbon contracts, for which PETROPERU must compete with the private sector. Private investment in Peru continued to increase owing to the macroeconomic stability and the involvement of operating companies with the communities where they operate. The Peruvian Government had revised the country's legal framework by enacting legislation for mining and hydrocarbons, which made the country more investor friendly, and Peru's national economy continued to attract foreign investment (Ministerio de Energía y Minas, 2008c, d). In 2007, Perúpetro attracted investment of more than \$1.1 billion to the hydrocarbon sector. The Camisea Natural Gas Project had received an investment of \$1.3 billion. PERU LNG, which was Camisea's liquid natural gas (LNG) project, was a partnership of Hunt Oil Company of Dallas, Texas, 50%; SK Energy Co. Ltd. of the Republic of Korea, 20%; Repsol YPF S.A. of Spain, 20%; and Marubeni Corp. of Japan, 10%. Construction of the PERU LNG plant continued on schedule. The plant was expected to produce 4.4 million tons per year (Mt/yr) of LNG, with initial delivery of LNG projected for mid-2010. The total project cost was estimated to be about \$3.8 billion, which included financing costs (Camisea Project, 2008; Ministerio de Energía y Minas, 2008e).

Minerals in the National Economy

Peru was the leading producer of gold, lead, silver, tellurium, tin, and zinc in Latin America and the second ranked producer of bismuth, copper, and molybdenum. The mining and mineral processing industries represented almost 1.7% of the GDP in

2007. The mineral sector employed almost 5% (122,100) of the industrial sector total of 2.5 million; this did not include the nearly 100,000 active informal miners (Banco Central de Reserva del Perú, 2008; Ministerio de Energía y Minas, 2008a; U.S. Central Intelligence Agency, 2008).

Government Policies and Programs

Peru's legal framework regarding domestic and foreign investors is governed by such constitutional mandates as Legislative Decree law No. 662 (promotion of foreign investment), which allows investors unrestricted access to all economic sectors; Legislative Decree law No. 757 (framework for the development of private investment), which pertains to private investment growth; and Legislative Decree law No. 868 of May 1996 (Texto Unico Oficial) approved by Supreme Decree law No. 059-96-PCM, which promotes private investment in public infrastructure and utility works. Within the framework of Decree law No. 708 of November 1991 (promotion of investment in mining), Legislative Decree law No. 818 of April 1996 (incentives for investing in natural resources), and Supreme Decree law No. 162-92-EF of October 1992 (rules guaranteeing foreign investment), more than 250 domestic stability and guarantee contracts have been signed since 1993 (Banco Central de Reserva del Perú, 2008; Ministerio de Energía y Minas, 2008c, d).

Supreme Decree law No. 014-92-EM of June 1992 (the general mining law) and the Texto Unico Oficial provide guaranteed protections to mining ventures and contracts under the Peruvian Civil Code. Consequently, such ventures and contracts are immune from unilateral changes by any governmental authority in Peru without an appropriate legal or administrative remedy or arbitration by the Convenio Constitutivo del Centro Internacional de Arreglo de Diferencias Relativas a Inversiones (Formal Consent of the International Center for Settlement of Relative Differences on Investments).

Peru enacted Supreme Decree law No. 047-2002-EF of April 2002 (import duties for capital goods) to reduce the duties paid to 7% from 20% and 12% on capital goods to be used in exploration and production of certain minerals, such as oil and gas in the Amazon region. Law No. 27623-EF was enacted in January 2002 to eliminate the 18% sales tax on capital, goods, and services for mineral exploration. Supreme Decree law No. 015-2004-PGM of January 2004 (legal framework for decentralization) was established to use revenues from mineral production to maximize the well-being of the local communities through economic growth, environmental protection, and social development in a sustainable way. Supreme Decree law No. 066-2005-EM of May 2006 (legal framework for creation of the Dirección de Gestión Social) was established to administer the Corporate Social Responsibility program in the mining sector (Banco Central de Reserva del Perú, 2008; Ministerio de Energía y Minas, 2008c, d).

The Peruvian Constitution establishes equal protection for domestic and foreign investors who enter into agreements with the Government and guarantees free access to and possession and disposal of foreign currency. Hydrocarbon Law No. 26844 of May 1997 eliminated the exclusive rights of the state-owned

PETROPERU to control the secondary recovery of crude oil, refining, and imports and the subsequent resale of petroleum and byproducts. The Peruvian laws have attempted to ensure more-favorable minerals and crude oil and gas exploration and production contract terms for investors (Ministerio de Energía y Minas, 2008c, d; ProInversión—Private Investment Promotion Agency in Peru, 2008).

Legal procedures to obtain mining rights were made easier by the enactment of complementary legislation Supreme Decree law No. 018 of July 9, 1992. The Government relinquished exclusive management of the exploration, mining, smelting, and refining of metals and fuel minerals. Individuals and private companies are allowed to hold mining permits in Peru. In the legal framework for investment and taxation, no distinction is made among domestic and foreign investors, corporations, joint ventures, and consortia formed in Peru or abroad. Municipalities and Regional governments in areas where mineral resources (metals and industrial minerals) are exploited will receive 50% of the taxes collected to be invested in education and social programs (health, housing, and others) in conformance with the Canon Minero (Ministry Resolution No. 266-2002-EF/15 of May 1, 2002). The remittance of depreciation, dividends, and royalties abroad has no restrictions. Contracts can be signed by investors, and the Government guarantees the stability of legal commitments and taxes. To increase protection of investors' interests, Peru signed agreements with the World Bank's Multilateral Investment Guarantee Agency in April 1991, which was authorized by Legislative Decree law No. 25312, and with the Overseas Private Investment Corporation in December 2002, which was authorized by Legislative Decree law No. 25809 (Ministerio de Energía y Minas, 2008c, d; ProInversión—Private Investment Promotion Agency in Peru, 2008).

The Dirección General de Asuntos Ambientales (DGAA) of the Ministerio de Energía y Minas (MEM) has the responsibility to address environmental problems that result from energy and mining activities and is mandated to implement the laws and regulations of the environmental legal framework, such as Legislative Decree No. 613 of September 1990 (the environmental code) and Supreme Decree No. 016-93-EM of April 28, 1993 (the environmental regulation). The sustainable development model for the mining and energy sectors began in 1993 with regulations and procedures for the gradual reduction of pollution, which include economic development policies and environmental protection. The mining industry must comply by adjusting its ongoing operations to permissible effluent levels and its new operations by using cleaner technologies. The DGAA evaluates and proposes the environmental regulations for the mining and energy sectors, which include the maximum emission levels that are compatible with the internationally accepted limits set by the United Nations and the World Bank, approves environmental impact assessments for new operations and environmental adjustment and management programs for ongoing operations, and administers the national environmental information system. The MEM is authorized to manage environmental affairs in the mineral sector, such as by establishing the environmental protection policy and maximum allowable levels for effluents, signing environmental administrative stability agreements, overseeing the impact

of operations, determining responsibilities, and imposing administrative sanctions. The oil companies, in particular, were under pressure because the number of operations in the Amazon Rain Forest—one of the world's most sensitive ecosystems—was increasing (Ministerio de Energía y Minas, 2008c, d; ProInversión—Private Investment Promotion Agency in Peru, 2008).

Production

In 2007, the value of Peruvian minerals (metals, industrial minerals, and fuels) production amounted to \$6.6 billion compared with \$6.5 billion in 2006. The mining and hydrocarbon sector grew by 2.1% as a result of increased production of metals (1.7%) and fuel (6.5%). In 2007, the increase in mineral production was led mainly by natural gas (50.7%), zinc (20%), copper (16.4%), iron ore (6.7%), and lead (5%) (table 1). In 2007, metal prices were also driven upwards because of the higher consumption associated with increased world economic activity, especially in such countries as China and the United States. Metal production growth was led mainly by increased production of copper, iron ore, lead, silver, and tin, which offset the decreased output of gold and molybdenum. The hydrocarbon sector's output also increased owing to the increased extraction of natural gas at Aguaytia and Camisea. Crude oil output was expected to increase as a result of the 25 new oil exploration and production contracts signed in 2007 (Banco Central de Reserva del Perú, 2008; Ministerio de Energía y Minas, 2008a, e).

Structure of the Mineral Industry

Peruvian laws have attempted to ensure equitable treatment of domestic and foreign firms involved in mineral, crude oil, and gas exploration and production. Owing to these terms, an increased number of domestic and foreign companies have expressed interest in participating in prospecting, exploration, production, and distribution of natural gas and petroleum contracts with Perúpetro S.A. and mineral properties with Centromín. These companies include AngloGold Ashanti Ltd. of South Africa; Barrick Gold Corp., Cambior, Inc., Falconbridge Ltd., and Teck Cominco Ltd. of Canada; BHP Billiton plc of the United Kingdom; Hunt Oil Company of the United States; Marubeni Corp., Mitsui & Co., Ltd., and Mitsubishi Corp. of Japan; Peñoles S.A. of Mexico; SK Energy Co. Ltd. of the Republic of Korea; Repsol YPF S.A. of Spain; and others (Ministerio de Energía y Minas, 2008a; ProInversión—Private Investment Promotion Agency in Peru, 2008).

The structure of the Peruvian mineral industry continued to change owing to privatizations and joint-venture projects. The establishment of consortia in such deregulated industries as oil and gas, and joint ventures in energy and mining projects were becoming a common practice in Peru. According to the Ministerio de Energía y Minas (2008c), Peru was the seventh most attractive area for investments in exploration after, in order of exploration investments in 2007, Tasmania (Australia), Nevada and Alaska (United States), Northwest Territories (Canada), Western Australia (Australia), and Indonesia

(Ministerio de Energía y Minas, 2008a; ProInversión—Private Investment Promotion Agency in Peru, 2008).

The new operating process incorporated policies for dealing with economic and societal development issues and with environmental protection in a sustainable way. Private domestic interests owned most of the medium- and small-sized mining operations. More than 300 foreign mining companies have been established in Peru since 1990. Crude oil was transported through 1,754 km of pipeline; natural gas and natural gas liquids, through 983 km of dual pipeline; and refined products, through 13 km of pipeline. Important mineral industry ports included Callao, Chimbote, Ilo, Matarani, Paita, Puerto Maldonado, Salaverry, San Martín, San Nicolás, and Talara on the Pacific Ocean, and Iquitos Pucallpa and Yurimaguas on the Amazon River and its tributaries. Peru had an installed electricity generating capacity of 5,050 megawatts (MW), about 90% of which was in hydroelectric plants. The Peruvian Government raised about \$2 billion from the privatization of its electrical sector and committed to an investment of about \$20 million to install an additional 1,006 MW of capacity in the immediate future. The energy mix, by source, was hydroelectric (79%), fossil fuel (20%), and others (1%) (Ministerio de Energía y Minas, 2008a, e; U.S. Central Intelligence Agency, 2008).

Mineral Trade

Peru's mining sector accounted for almost 62% (\$17.3 billion) of total export revenues of about \$28 billion in 2007 compared with 62% (\$14.7 billion) of total export revenues of about \$23.7 billion in 2006. In 2007, Peru's total trade balance recorded a surplus of about \$8.4 billion compared with \$8.9 billion in 2006, which indicates that the country imported goods valued at \$19.6 billion in 2007 compared with \$14.9 billion in 2006. Peru's mineral sector had a trade surplus of \$19.1 billion compared with \$16.2 billion in 2006 (Banco Central de Reserva del Perú, 2008; Ministerio de Energía y Minas, 2008a).

In 2007, mining was the main exporting sector of the country. Price increases for tin (66.1%), lead (38.6%), silver (18.2%), and gold (15.2%) played an essential role in the Peruvian trade balance. Almost 62% of the total minerals exported (\$17.3 billion) were copper (\$7.2 billion), gold (\$4.2 billion), zinc (\$2.5 billion), and lead (\$1 billion). Peru's other mineral exports were silver (\$537 million), tin (\$507 million), and iron (\$286 million) (Banco Central de Reserva del Perú, 2008; Ministerio de Energía y Minas, 2008a).

Peru's fourth major traditional export (petroleum and derivatives) amounted to \$2.2 billion in 2007 compared with \$1.8 billion in 2006. Peru's total mineral exports, which included petroleum and derivatives, amounted to almost 70% of its total exports in 2007. Total mineral imports, which were mostly petroleum and derivatives, however, increased by almost 13% to \$3.5 billion compared with \$3.1 billion in 2006. Total imports increased by about 31.5% to \$19.6 billion compared with \$14.9 billion in 2006 and generated a surplus of \$8.4 billion compared with \$8.9 billion in 2006 (Banco Central de Reserva del Perú, 2008).

In 2007, the main destination markets of Peruvian exports, as a percent of total exports, were the United States (19.7%),

China (10.9%), and Japan (7.8%). The United States, China, Brazil, Japan, and Chile, in order of value, were the main importers of gold, copper, and molybdenum. Peru sold about 5% of its exports to other members of the Mercado Común Andino (ANCOM), whose members were Bolivia, Colombia, Ecuador, Peru, and Venezuela; about 4%, to the Mercado Común del Cono Sur (MERCOSUR) countries of Argentina, Brazil, Paraguay, and Uruguay and associate members Bolivia and Chile; and 12%, to other Latin American countries. Peruvian mineral exports could increase if the negotiations between ANCOM and MERCOSUR lead to a South American free trade agreement, and in response to the United States-Peru Trade Promotion Agreement already signed in 2007 (Banco Central de Reserva del Perú, 2008; Ministerio de Energía y Minas, 2008a).

Commodity Review

Metals

Copper.—Peru's copper output (Cu content) in 2007 was about 1.2 million metric tons (Mt) compared with almost 1.05 Mt in 2006, which was an increase of more than 14%. The country's copper metal exports in 2007 totaled more than 1.12 Mt valued at more than \$7.2 billion compared with 981,000 metric tons (t) valued at \$6.1 billion in 2006; this value was more than 18% higher than that of 2006 as a result of the copper price increase to \$2.910 per pound of copper in 2007 from \$2.770 per pound in 2006 (Banco Central de Reserva del Perú, 2008; Ministerio de Energía y Minas, 2008a, f; ProInversión—Private Investment Promotion Agency in Peru, 2008).

Owing to China's increased demand for copper, two Chinese firms—Chinalco was planning to develop Toromocho's contained 1.4 billion metric tons (Gt) of proven and probable reserves at a grade of 0.71% of copper equivalent, to produce 275,000 t/yr of copper metal by 2012, and—Consortio Xiamen Zijin Tongguan Investment Development Co. Ltd. (Consortio Zijin) was planning to develop Rio Blanco's 1.3 Gt at a grade of 0.57% copper equivalent, to produce 25 Mt of copper ore by 2011 (MinerAndina y Sociedad, 2008, p. 22-23).

In 2007, Peru's planned investments of more than \$21.5 billion were expected to include mineral projects with advanced exploration and environmental assessment work, such as Las Bambas (\$1.5 billion) and Los Chancas (\$1.3 billion) copper deposits, which are located in the Department of Apurímac and were owned by Xstrata and Southern Copper, respectively (Banco Central del Perú, 2008; MinerAndina y Sociedad, 2008, p. 24, 27).

Other investments in copper deposits included Rio Blanco Copper S.A.'s Rio Blanco deposit, which is located in the Department of Piura (a \$1.5 billion investment to produce copper by 2012), and the partnership of China Minmetals Corp. and Jiangxi Copper Co, Ltd., which had acquired 93.9% of Northern Perú S.A.'s Galeno, Hilorico, and Pashpap copper projects in Celendin, Cajamarca Region. The estimated investment in the Galeno copper project (which has reserves of 803 Mt at a grade of 0.63% equivalent copper) was \$975 million to produce copper metal by 2013. Southern Copper was planning to invest \$600 million in additional exploration and to

improve efficiencies at the Cuajone and the Toquepala copper mines, and to invest \$934 million in its Tia María copper project, which is located in the Department of Arequipa, to produce 120,000 t/yr of copper metal by 2011. Other mineral prospects included the San Gregorio copper-lead-zinc project of Sociedad Minera El Brocal S.A.A., which is located in the Department of Cerro de Pasco; the Minas Carachugo gold-and-silver project of Minera Yanacocha S.R.L. (MYS) [Newmont Mining Corp. of the United States (51.35%), Compañía de Minas Buenaventura S.A.A. (43.65%), and the World Bank Group's International Finance Corporation (5%)], which is located in the Department of Cajamarca; and the Magistral copper-molybdenum-silver project of Inca Pacific Resources, which is located in the Department of Ancash. Magistral is located in the same geologic trend as that of Compañía Minera Antamina S.A.'s (CMA) Antamina base-metal mine (Banco Central del Perú, 2008; MinerAndina y Sociedad, 2008, p. 21, 24-25, 27).

Gold.—In 2007, gold output was 170.1 t compared with 202.8 t in 2006, which was a decrease of 16.1%. Peru's gold exports in 2007 totaled about 184.4 t (5.93 million troy ounces) valued at about \$4.2 billion compared with 206.2 t (6.63 million troy ounce) valued at \$4 billion in 2006; this value was about 5% higher than that of 2006 as a result of the gold price increase to \$697 per troy ounce of gold in 2007 from \$605 per troy ounces in 2006. In 2007, Peru's planned investments of more than \$21.5 billion were expected to include mineral projects with advanced exploration and environmental assessment work for gold, such as MYS's Pita cyanuration plant at Yanacocha Mine (\$270 million), its project at Chaquicocha (\$400 million), and its Minas Conga project in the Department of Cajamarca by 2011; Gold Field's Cerro Corona deposit in the Department of Cajamarca (\$421 million) by 2008; and Buenaventura's La Zanja gold deposit in the Department of Cajamarca (\$60 million) (Banco Central de Reserva del Perú, 2008; Ministerio de Energía y Minas, 2008a, f; ProInversión—Private Investment Promotion Agency in Peru, 2008).

Gold recovered as a byproduct from the concentrates of Peru's polymetallic mines amounted to 2.6 t. From the total gold output in 2007, large-, medium-, and small-scale producers reported producing 153.7 t and an unknown number of placers and "garimperos" (informal individual miners) reported producing 16.4 t. Placers accounted for almost 10% of the gold produced in the country. The southeastern Andes have well-known gold placers on the Inambari River and its tributaries. Placer gold was produced mostly in the Inca and the Mariategui Regions and from rivers and streams throughout the jungle (Ministerio de Energía y Minas, 2008a, f).

Iron Ore.—Shougang Hierro Perú S.A.A. (a subsidiary of China's Shougang Corp.) continued to be Peru's sole iron ore producer in Marcona, which was located in the Department of Ica. Mine output increased to 5.1 Mt of iron content in 2007 from 4.8 Mt in 2006. The iron ore exports amounted to 7.2 Mt that was valued at \$286 million compared with 6.7 Mt that was valued at \$256 million in 2006, which was an increase in value of 11.7%. Domestic consumption of iron ore amounted to 300,000 t, which was about the same level of consumption as in 2006. Iron ore production increased in response to increased

demand in China and other economies in the Asian region for construction and greater steel output, which had a positive effect on higher molybdenum production as well. According to the MEM, Cuervo Resources Inc. of Canada was exploring the Cerro Ccopane and Huillque iron deposits, which are located in the Department of Cusco (Banco Central de Reserva del Perú, 2008; Ministerio de Energía y Minas, 2008a, f; ProInversión—Private Investment Promotion Agency in Peru, 2008).

Lead, Silver, and Zinc.—Owing to increased demand for zinc by Asian countries and higher international prices (\$0.91 per pound in 2007 compared with \$0.82 per pound in 2006), the Peruvian zinc industry produced more than 1.4 Mt of zinc in concentrates compared with about 1.2 Mt in 2006 (Ministerio de Energía y Minas, 2008a, f).

The country's total silver content output increased slightly to 3,494 t compared with 3,471 t in 2006. Peru surpassed Mexico's silver output of 3,000 t in 2007. Companies that produced silver, such as Aruntani, El Brocal, Compañía de Minas Buenaventura S.A.A., and Volcan Compañía Minera S.A.A., were more active in 2007, and silver production was higher than in 2006 because MYS and medium-sized gold-silver mines exceeded their initial production goals. MYS increased its output mainly as a result of technological innovations in its gold-silver recovery process. Higher international prices of \$13 per ounce in 2007 compared with \$11 per ounce in 2006 allowed medium-sized mines and small-scale producers to mine lower-grade ores. Peru produced 329,154 t of lead in concentrates compared with about 313,322 t in 2006. Exports of zinc, lead, and silver were valued at about \$2.5 billion, \$1 billion, and \$537 million, respectively, compared with \$2 billion, \$713 million, and \$480 million in 2006, respectively (Banco Central de Reserva del Perú, 2008; Ministerio de Energía y Minas, 2008a, f; ProInversión—Private Investment Promotion Agency in Peru, 2008).

Tin.—Production from Minsur's San Rafael Mine, which is located in the Mariategui Region, was 39,019 t in concentrate in 2007 compared with 38,470 t in 2006. Minsur's tin smelting and refining operations, which are located in Pisco, south of Lima, produced 36,004 t of metal compared with 40,495 t in 2006. Peru continued to be the leading tin producer in Latin America followed by Bolivia and Brazil. Minsur, which was the only fully integrated tin supplier in Peru, produced almost 13% of the world's output and exported 35,000 t valued at \$507 million in 2007 compared with 40,000 t valued at \$346 million in 2006 (Banco Central de Reserva del Perú, 2008; Carlin, 2008b; Ministerio de Energía y Minas, 2008a, f; ProInversión—Private Investment Promotion Agency in Peru, 2008).

Industrial Minerals

Phosphate Rock.—Empresa Minera Regional Grau Bayóvar S.A.'s phosphate deposits (Bayóvar project) produced 38,000 t of phosphate rock, which was about the same level as that of 2006. The 90,000-t/yr phosphate plant that was operated by Grau Bayóvar produced 17,100 t of phosphate (P_2O_5) in 2007. The Bayóvar project comprises 150,000 hectares of phosphate and brine and has proven reserves of 800 Mt of phosphatic rock equivalent to 262 Mt of rock phosphate with a P_2O_5 content of 30%. Grau Bayóvar was planning to invest \$600 million to

conduct exploration of this world-class deposit and a feasibility study to produce 3.3 Mt/yr of rock phosphate by 2010 (MBendi Directory of Projects, 2008; Ministerio de Energía y Minas, 2008f).

Mineral Fuels

Coal.—Peru's largest coal deposits are located at Alto Chicama in La Libertad Region. Other known coal deposits occur in the Cuenca del Santa in the Marañón Region and the coal basins of Goyllarisquizga and Hatun Huasi in the Caceres Region of central Peru. In 2007, according to the Ministerio de Energía y Minas (2008a), Peru's recoverable coal reserves were estimated to be 1.1 billion metric tons (table 3), and coal production was 279,138 t compared with an estimated consumption of more than 1.3 Mt/yr (table 1; Ministerio de Energía y Minas, 2008f; U.S. Energy Information Administration, 2008).

Natural Gas and Petroleum.—In 2007, according to the Ministerio de Energía y Minas (2008b), Peru's recoverable (proven and probable) and possible crude oil, liquefied natural gas (LNG), and natural gas resources were estimated to be 6,425 million barrels (Mbbbl); LNG, 1,360 Mbbbl; and natural gas, 856 billion cubic meters, respectively. The leading gasfields were the Aguaytia, which is located about 41 km west-northwest of Pucallpa and had proven reserves of 8.5 billion cubic meters of gas and 9 Mbbbl of natural gas liquids (NGL) and the Camisea gasfields in the Ucayali Basin, which had proven reserves of 250 billion cubic meters and 600 Mbbbl of NGL. Natural gas production increased to 2,676 million cubic meters from 1,775 million cubic meters in 2006 and was produced by Pluspetrol S.A. (73%), Aguaytia S.A. (15%), Petrotech del Perú S.A. (5%), Petróleo Brasileiro S.A. (Petrobrás) (4%), and others (3%). Petrobrás through Petrobrás Energía S.A. acquired exploration and production rights for natural gas and petroleum in Lots 57 and X, respectively (Petróleo Brasileiro S.A., 2008; Ministerio de Energía y Minas, 2008b; U.S. Energy Information Administration, 2008).

The Camisea Project encompasses three segments—Upstream, Transportation, and Distribution of natural gas from the Camisea field—and is located in the Ucayali Basin in the Department of Cusco. The reduction of consumers' bills and the cost savings realized by the use of natural gas are some important benefits of this project, and thus far Peru had received an investment of \$1.3 billion to implement the above segments (Camisea Project, 2008).

In 2007, crude oil production decreased slightly to 77,100 barrels per day (bbl/d) from 77,500 bbl/d in 2006. Production of petroleum derivatives increased to 175,930 bbl/d from 165,220 bbl/d in 2006, which was an increase of about 6.5%. Peru's crude oil balance was negative by \$1,242 million because of higher imports of crude and derivatives, which amounted to \$3,490 million as a result of both higher demand and prices; thus, the country imported an average of 136,800 bbl/d crude oil and petroleum products to satisfy its internal consumption of 170,000 bbl/d (table 1; Banco Central de Reserva del Perú, 2008; Ministerio de Energía y Minas, 2008b; U.S. Energy Information Administration, 2008).

Peru's total crude oil production of 28.1 Mbbl in 2007 came from Pluspetrol S.A. (56.7%), Petrobrás (17.3%), Petrotech (15.4%), and others (10.6%) (table 1; Ministerio de Energía y Minas, 2008b). Almost 60% of the country's crude oil production came from the jungle blocks in the Loreto and the Ucayali Regions; the remainder was produced at the coastal and offshore fields in Talara. The country's proven petroleum reserves were estimated to be about 416 Mbbl (tables 1, 3; Camisea Project, 2008; Ministerio de Energía y Minas, 2008b; U.S. Energy Information Administration, 2008).

In 2007, the largest oil refinery continued to be Petroperú's La Pampilla, which had a designed capacity of about 100,000 bbl/d. The second largest oil refinery was Petroperú's Talara, which had a designed capacity of about 70,000 bbl/d. Other refineries had the following designed capacities: Conchan, 20,000 bbl/d; Iquitos, 10,500 bbl/d; Pucallpa, 3,500 bbl/d; and El Milagro, 2,500 bbl/d. Refinery production came from La Pampilla (50%), Talara (36%), Conchan (7%), Iquitos (5%), and Milagro and Pucallpa (1% each) (Ministerio de Energía y Minas, 2008b).

Reserves

Table 3 lists the Peruvian reserves of major minerals, such as copper, gold, iron ore, lead, molybdenum, silver, and zinc, on or about January 1, 2008. Data are shown in terms of metal contained in ore for the base and precious metals or recoverable quantities of other mineral commodities, which included industrial minerals and mineral fuels. These mineral reserves represent "proven" (measured) and "probable" (indicated) categories and exclude quantities reported as "possible" (inferred). Reserves were defined as being well delineated and economically recoverable volumes of crude oil and natural gas from wells and minable ore from mines committed to production (Ministerio de Energía y Minas, 2008b; U.S. Bureau of Mines and U.S. Geological Survey, 1980).

Annual changes in assessment of reserves are the result of additions to reserves, deletions from reserves, and production. A complication in Peru has been the production of more than one metal by a large number of mines, thus necessitating close attention to market prices and processing costs for two or more mineral commodities simultaneously to determine production as coproducts (share costs) and byproducts (credits).

Reserves of the leading base and precious metals increased significantly—gold in Alto Chicama and copper ore during the expansions of the Cerro Verde, the Cuajone, the Tintaya, and the Toquepala Mines. Reserves and resources of major mineral commodities are distributed unevenly throughout Peru and influenced by the mineralization of the Precambrian Cordillera in the Andes and the Coastal Ranges where several mineral deposits dominated the reserves position in terms of proven and probable (minable) reserves of major metals (Ministerio de Energía y Minas, 2008a, b).

Outlook

Peru continues on a path of steady economic growth with low inflation. The energy, mining, and related industries are expected to continue to attract capital flows by way of joint ventures and

consortia, privatizations, and direct acquisitions. According to ProInversión, the privatization process, particularly in the banking and energy industries, is expected to continue to generate additional investments. Higher demand for copper, gold, iron ore, and silver and high metal prices is likely to encourage mining companies to invest in expanding and modernizing their operations. The liquefaction of Camisea's natural gas for export to China, MERCOSUR, North America, and other markets and trading partners is expected to increase Peru's mineral exports further. The transportation phase of Camisea's pipelines for natural gas (714 km) and for natural gas liquids (560 km) is expected to be financed by the PERU LNG consortia, which would produce 4.4 Mt/yr of LNG, with initial delivery of LNG by mid-2010. Thus far, PERU LNG has announced that they expect to secure \$2.25 billion, or almost 60% of the total project cost, which is estimated to be \$3.8 billion (Banco Central de Reserva del Perú, 2008; Camisea Project, 2008; Ministerio de Energía y Minas, 2008b, e; ProInversión—Private Investment Promotion Agency in Peru, 2008).

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TABLE 1
PERU: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons unless otherwise specified)

Commodity	2003	2004	2005	2006	2007 ^p	
METALS						
Antimony:						
Mine output, Sb content ^e	460	460	1,000	1,000	1,000	
Metal	356	356	807	810	810	
Arsenic, white ²	2,970	2,970	2,970	3,000	3,000	
Bismuth:^c						
Mine output, Bi content	1,000	1,000	952	950	950	
Metal	600	600	600	600	600	
Cadmium, metal	529	532	481	416	416	
Copper:						
Mine output, Cu content	842,578	1,035,574	1,009,898	1,048,472 ^r	1,190,281 ³	
Sulfate, Cu content	2,000 ^c	2,000	2,000	2,000	2,000	
Metal:						
Blister	314,228	320,135	320,625	322,188	236,809	
Refined, primary:						
Electrowon	171,198	167,000	165,530	173,871 ^r	172,118	
Other	345,848	338,308	346,206	333,839	241,789	
Total	517,046	505,308	511,736	507,710 ^r	413,907	
Gold:⁴						
Mines	kilograms	159,770	158,438	191,910	187,022	153,755
Placers	do.	12,849	14,786	16,092	15,800	16,373
Total	do.	172,619	173,224	208,002	202,822	170,128
Indium ^c	do.	5,500	5,500	5,500	5,500	5,500
Iron and steel:						
Iron ore and concentrate:						
Gross weight	thousand metric tons	5,239	6,439	6,810	7,138	7,614
Fe content	do.	3,541	4,315	4,565	4,785	5,104
Metal:						
Pig iron ^c	do.	330	330	330	330	330
Sponge iron ^c	do.	80	80	80	80	80
Ferrosilicon ^c		600	600	600	600	600
Steel:						
Crude ^c		750,000	750,000	750,000	750,000	750,000
Ingots and castings ^c	thousand metric tons	510	510	510	510	510
Semimanufactures ^c		250	250	250	250	250
Lead:						
Mine output, Pb content		308,874	306,211	319,368	313,322	329,154
Metal		112,289	118,970	122,079	120,311	116,774
Manganese, mine output, Mn content ^c		200	200	200	200	200
Molybdenum, mine output, Mo content		9,561	14,246	17,325	17,209	16,787
Selenium, metal, refined	kilograms	72,010	75,660	69,820	75,390	75,400
Silver:						
Mine output, Ag content		2,921	3,060	3,206	3,471	3,494
Metal, refined		1,147	1,250	1,227	1,296	1,203
Tellurium, metal	kilograms	22,000 ^c	22,000	32,880	33,000	33,000
Tin:						
Mine output, Sn content		40,202	41,613	42,145	38,470	39,019
Metal ⁵		39,181	40,624	36,733	40,495	36,004
Zinc:						
Mine output, Zn content		1,372,790	1,209,006	1,201,671	1,203,364 ^r	1,444,354
Metal		202,076	195,692	163,603	175,250	162,375

See footnotes at end of table.

TABLE 1--Continued
PERU: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons unless otherwise specified)

Commodity	2003	2004	2005	2006	2007 ^p
INDUSTRIAL MINERALS					
Barite	2,906	3,606	17,300 ^r	23,800 ^r	27,369
Boron materials, crude (borates)	9,315	9,578	120,000 ^r	190,800 ^r	233,991
Cement, hydraulic thousand metric tons	4,000	4,590	4,600	5,000	5,000
Chalk ^c	101,000	101,000	101,000	201,000 ^r	334,688
Clays:					
Bentonite	14,980	18,471	18,500	19,000	21,451 ³
Fire clay	5,900	5,900	5,900	6,000	6,000
Kaolin	2,653	2,720	2,700	5,750 ^r	7,532 ³
Common clay	232,002	438,976	440,000	439,000	334,688 ³
Diatomite ^c	35,100	35,100	35,100	35,100	21,603
Feldspar	7,349	6,005	6,000	6,010	15,450
Gypsum, crude	71,114	149,735	150,000	151,000	334,688
Lime	195,400	205,100	215,400	215,500	215,500
Limestone	6,021,502	6,321,592	6,636,600	7,737,000 ^r	9,580,748
Nitrogen, N content of ammonia ^c	5,000	5,000	5,000	5,000	5,000
Phosphate rock:					
Crude, gross weight	31,600	37,760 ³	37,800	38,000	38,000
P ₂ O ₅ content	11,610	13,870	14,000	17,075	17,075
Salt, all types	187,416	248,898	250,000	922,000	1,185,273
Stone, sand and gravel:					
Stone: ^c					
Dolomite	645	645	645	645	645
Flagstone	300,000	300,000	300,000	300,000	300,000
Granite	2,000	2,000	2,000	2,000	2,000
Limestone thousand metric tons	4,400	4,400	4,400	4,400	4,400
Marble	21,134 ³	22,208 ³	22,200	23,200 ^r	24,513 ³
Onyx	150	150	150	150	150
Quartz and quartzite (crushed)	40,000	40,000	40,000	40,000	40,000
Shell, marl	4,000	4,000	4,000	4,000	4,000
Slate	14,260 ³	11,950 ³	11,950 ³	12,000	12,000
Travertine	4,658 ³	6,038 ³	6,050	116,670 ^r	228,710 ³
Sand and gravel:					
Construction thousand metric tons	907	1,220	1,220 ^e	1,220	2,594
Silica sand do.	196	871	900 ^e	350 ^{r,e}	235 ³
Sulfur, elemental:					
Native ^c	100	100	100	100	100
Byproduct of metallurgy	204,000	204,000 ^e	204,000 ^e	204,000	204,000
Sulfuric acid, gross weight	623,000	623,000	623,000	623,000	623,000
Talc and related materials:					
Talc	10,791	9,548	9,500	9,550	9,171 ³
Pyrophyllite	12,291	14,282	14,300	14,500	13,925 ³
Total	23,082	23,830	23,800	24,050	23,096 ³
MINERAL FUELS AND RELATED MATERIALS					
Coal:					
Anthracite, run-of-mine	5,768	8,876	8,837	26,717	227,088 ³
Bituminous, run-of-mine	9,900	13,475	13,415	2,818	52,050 ³
Total	15,668	22,351	22,252	29,535	279,138 ³
Coke, all types ^c	10,000	10,000	10,000	10,000	10,000
Natural gas:					
Gross million cubic meters	523	860	1,517	1,775	2,676
Marketed do.	442	520	857	1,003	1,512
Natural gas liquids thousand 42-gallon barrels	1,470	5,205	13,082	13,870 ^r	13,416

See footnotes at end of table.

TABLE--Continued
 PERU: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons unless otherwise specified)

Commodity	2003	2004	2005	2006	2007 ^p	
MINERAL FUELS AND RELATED MATERIAL--Continued						
Petroleum:						
Crude	thousand 42-gallon barrels	31,865	29,164	27,521	28,288	28,146
Refinery products:						
Liquefied petroleum gas	do.	2,551	2,938	2,978	2,286	2,073
Gasoline, motor	do.	9,202	8,848	8,968	12,777	13,188
Jet fuel	do.	3,289	3,822	3,874	3,722	4,303
Kerosene	do.	4,354	2,467	2,501	960	777
Distillate fuel oil	do.	14,972	15,082	15,287	17,598	19,451
Lubricants	do.	520	266	271	423	450
Residual fuel oil	do.	23,134	20,462	20,740	14,713	15,133
Asphalt	do.	770	1,011	1,025	838	1,606
Other ⁶	do.	5,379	8,629	8,746	6,988	7,233
Total	do.	64,171	63,525	64,390	60,305	64,214

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

¹Table includes data available through July 2008.

²Output reported by Doe Run Resources Corp.

³Source: Ministerio de Energía y Minas - Perú.

⁴Peru's placer gold production was reported.

⁵Output reported by Minsur S.A.'s smelter.

⁶Includes refinery fuel and losses.

TABLE 2
PERU: STRUCTURE OF THE MINERAL INDUSTRY IN 2007

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Antimony	metric tons	Doe Run Resources Corp. (private, 100%)	Smelter at La Oroya, Junin Department	700
Barite		Barmine S.A. (private, 100%)	Santa Cruz de Cocachacra, Huarochiri, Lima Department	NA
Bentonite		Minerales Andinos S.A. (NL Industries Co., 90%)	Vichayal Mine, Piura Department	9
Bismuth	metric tons	Doe Run Resources Corp. (private, 100%)	Refinery at La Oroya, Junin Department	1,000
Cement		Cementos Lima S.A. (private, 100%)	Atocongo Plant, Lima Department	3,500
Do.		Cementos Pacasmayo S.A.A. (private, 100%)	Pacasmayo Plant, La Libertad Department	1,000
Do.		Cemento Andino S.A. (private, 100%)	East Lima Plant, Lima Department	800
Do.		Cementos Yura S.A. (private, 100%)	Yura Plant, Arequipa Department	300
Do.		Cementos Sur S.A. (private, 100%)	Arequipa Plant, Arequipa Department	200
Copper		Southern Copper Corp. (SPCC) (Grupo Mexico, S.A. de C.V., 54.2%; Marmon Corp., 14.2%; Phelps Dodge Overseas Capital Corp., 14%; others, 17.6%)	Cuajone Mine, Moquegua Department	200
Do.		do.	Toquepala Mine, Tacna Department	170
Do.		do.	Cocotea, Simarrona, and Totoral Mines—SX-EW, Tacna Department	60
Do.		do.	Smelter at Ilo, Moquegua Department	320
Do.		do.	Refinery at Ilo, Moquegua Department	300
Do.		Compañía Minera Antamina S.A. (CMA) (BHP Billiton plc, 33.75%; Xstrata Copper, 33.75%; Teck Cominco Ltd., 22.5%; Mitsubishi Corp., 10%)	Antamina Mine, Huari, Ancash Department	350
Do.		do.	Antamina concentrator, Ancash Department	1,500
Do.		Doe Run Peru S.R. Ltda. (private, 100%)	Cobriza, Huancavelica Department	70
Do.		do.	Smelter at La Oroya, Junin Department	65
Do.		do.	Refinery at La Oroya, Junin Department	60
Do.		Compañía Minera Atacocha S.A. (private, 100%)	Yanacancha Mine, Junin Department	30
Do.		Compañía Minera Condestable S.A. (private, 100%)	Condestable Mine, Junin Department	20
Do.		Glencore International AG (private, 100%)	Casapalca, Lima Department	60
Do.		Volcan Compañía Minera S.A.A. (private, 100%)	San Cristobal, Mahr Tunel, and Andaychagua, Junin Department	60
Do.		Cía. Minera San Ignacio de Morococha S.A. (private, 100%)	Yauricocha, Junin Department	60
Do.		Xstrata Tintaya S.A. (Xstrata plc, 100%)	Tintaya Mine, Cusco Department	120
Do.		Sociedad Minera Cerro Verde S.A.A. (Freeport-McMoRan Copper and Gold Inc., 53.6%; Sumitomo Corp. and Sumitomo Metal Mining Co. Ltd., 21%; Compañía de Minas Buenaventura S.A.A., 18.5%; others, 6.9%)	Cerro Verde, Arequipa Department	270
Do.		do.	Electrowon at Cerro Verde, Arequipa Department	90
Dolomite		Minera Baribent S.A. (private, 100%)	Esperanza, Ancash Department	25
Gold	kilograms	Minera Yanacocha S.R.L. (Newmont Mining Corp., 51.35%; Compañía de Minas Buenaventura S.A.A., 43.65%; World Bank/International Finance Corporation, 5%)	Yanacocha, La Quinua, and Maqui-Maqui Mines, Cajamarca Department	110,000
Do.	do.	Minera Barrick Misquichilca S.A. (Barrick Gold Corp., private, 100%)	Pierina, Cajamarca Department	40,000
Do.	do.	Compañía Minera Poderosa S.A. (private, 100%)	Poderosa, La Libertad Department	2,000
Do.	do.	Compañía de Minas Buenaventura S.A.A. (private, 100%)	Orcopampa, Arequipa Department	5,000
Do.	do.	Minas Arirahua S.A. (private, 100%)	Arirahua, La Libertad Department	2,000
Do.	do.	Asesoría Contable Minera S.A. (private, 100%)	Ocoña, Santa Clarita, Exploratoro, and Molino de Oro, Arequipa Department	1,000
Do.	do.	Cía. Aurífera Río Inambari S.A. (Cía. Minera del Sur S.A., 84%, and Aurífera Claudia, 16%)	Río Caichive, Madre de Dios Department	200
Do.	do.	Minera Aurífera Retamas S.A. (private, 100%)	Retamas, La Libertad Department	5,500
Do.	do.	Consortio Minero Horizonte S.A. (private, 100%)	Parcoy, La Libertad Department	4,000
Do.	do.	Compañía Minera Sipán S.A.C. (private, 100%)	Sipán, Inca, La Libertad Department	4,800

See footnote at end of table.

TABLE 2--Continued
PERU: STRUCTURE OF THE MINERAL INDUSTRY IN 2007

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Gold--Continued	kilograms	Compañía Minera Ares S.A.C. (private, 100%)	Ares, La Libertad Department	6,500
Do.	do.	Cía. Minera Aurífera Santa Rosa S.A. (private, 100%)	Santa Rosa, Puno Department	5,000
Do.	do.	Aruntani S.A.C (private, 100%)	Florencia and Santa Rosa Mines, Moquegua Department	6,500
Iron ore		Shougang Hierro Perú S.A. (Shougang Corp., 100%)	Marcona, Ica Department	13,000
Lead		Doe Run Peru S.R. Ltda. (private, 100%)	Smelter at La Oroya, Junin Department	150
Do.	do.	do.	Refinery at La Oroya, Junin Department	125
Do.		Empresa Minera Los Quenuales S.A.	Izcaycruz, Lima Department	10
Do.	do.	do.	Yauliyacu, Lima Department	15
Do.		Volcan Compañía Minera S.A.A. (private, 100%)	San Cristobal, Mahr Tunnel, and Andaychagua, Junin Department	70
Do.	do.	do.	Paragsha, Cerro de Pasco Department	85
Do.		Compañía Minera San Ignacio de Morococha S.A. (private, 100%)	Yauricocha, Junin Department	5
Do.		Compañía Minera Atacocha S.A. (private, 100%)	Yanacancha Mine, Junin Department	40
Do.		Compañía Minera Milpo S.A. (private, 100%)	El Porvenir Mine, Cerro de Pasco Department	25
Do.		Compañía Minera Santa Luisa S.A. (private, 100%)	Huanzala Mine, Junin Department	40
Do.		Sociedad Minera El Brocal S.A.A. (private, 100%)	Colquijirca Mines, Cerro de Pasco Department	30
Do.		Corp. Minera Nor Perú S.A. (Pan American Silver Corp., 100%)	Quirivilca, La Libertad Department	10
Molybdenum		Southern Copper Corp. (SPCC) (Grupo Mexico, S.A. de C.V., 54.2%; Marmon Corp., 14.2%; Phelps Dodge Overseas Capital Corp., 14%; others, 17.6%)	Cuajone, Moquegua Department and Toquepala, Tacna Department	NA
Do.		Sociedad Minera Cerro Verde S.A.A. (Freeport-McMoRan Copper and Gold Inc., 53.6%; Sumitomo Corp. and Sumitomo Metal Mining Co. Ltd., 21%; Compañía de Minas Buenaventura S.A.A., 18.5%; others, 6.9%)	Cerro Verde, Arequipa Department	2
Petroleum, crude	42-gallon barrels per day	Petrotech del Perú S.A. (Perupetro, 100%)	Onshore Piura Department; northeast and central jungle areas, Loreto Department	68,000
Do.	do.	Petróleo Brasileiro S.A. (Perupetro, 100%)	Pacific Coast, offshore Piura Department	30,000
Do.	do.	Pluspetrol S.A. (private, 100%)	Northeastern jungle, Loreto Department	90,000
Do.	do.	Occidental Petroleum Corp. (private, 100%)	Block 1-AB, northern jungle, Loreto Department	28,000
Petroleum products	do.	Petroperú S.A.	Refineries in Talara, Iquitos, Milagro, and Pucallpa	86,500
Do.	do.	do.	Refinery La Pampilla, Lima Department	100,000
Do.	do.	do.	Refinery Conchan, Lima Department	20,000
Phosphate rock	metric tons	Empresa Minera Regional Grau Bayóvar S.A. (Companhia Vale do Rio Doce, 100%)	Bayóvar phosphate mine, Piura Department	50
Natural gas	million cubic meters per day	Pluspetrol Perú Corp. S.A. (Pluspetrol S.A., 36%; Hunt Oil Company, 36%; SK Corp., 18%; Tecpetrol del Perú S.A.C., 10%)	Camisea gas deposit, Cusco Department	NA
Do.	do.	Petrotech del Perú S.A. (Petroperú S.A., 100%)	Pucallpa, Loreto Department	120
Do.	do.	Aguaytia S.A. (Petroperú S.A., 100%)	Aguaytia gas deposit, Ucayali Department	80
Do.	do.	Pluspetrol S.A. (private, 100%)	Pucallpa, Loreto Department	60
Silica sand		Minera Baribent S.A. (private, 100%)	Maria G. and Martin I., Junin Department	27
Silver	kilograms	Empresa Minera Los Quenuales S.A.	Yauliyacu, Lima Department	150,000
Do.	do.	do.	Izcaycruz, Lima Department	20,000
Do.	do.	Doe Run Peru S.R.Ltda. (private, 100%)	Refinery at La Oroya	1,100,000
Do.	do.	Compañía Minera San Ignacio de Morococha S.A. (private, 100%)	Yauricocha, Junin Department	46,500
Do.	do.	Compañía de Minas Buenaventura S.A.A. (private, 83%; Centromin, 17%)	Julcani and Huachocolpa Mines Huancavelica Department, Uchucchacua Mine, Lima Department	350,000

See footnote at end of table.

TABLE 2--Continued
PERU: STRUCTURE OF THE MINERAL INDUSTRY IN 2007

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Silver--Continued	kilograms	Compañía de Minas Buenaventura S.A.A. (private, 100%)	Orcopampa Mine, Arequipa Department	161,000
Do.	do.	Volcan Compañía Minera S.A.A. (private, 100%)	San Cristobal, Mahr Tunnel, and Andaychagua, Junin Department	350,000
Do.	do.	Sociedad Minera Corona S.A. (private, 100%)	Hualgayoc, Cajamarca Department	175,000
Do.	do.	Compañía Minas Arcata S.A. (private, 100%)	Arcata, Arequipa Department	170,000
Do.	do.	Southern Copper Corp. (SPCC) (Grupo Mexico, S.A. de C.V., 54.2%; Marmon Corp., 14.2%; Phelps Dodge Overseas Capital Corp., 14%; others, 17.6%)	Ilo smelting and refining, Moquegua Department	150,000
Do.	do.	Compañía Minera Santa Luisa S.A. (private, 100%)	Huanzalá Mine, Junin Department	53,000
Do.	do.	Compañía Minera Antamina S.A. (CMA) (BHP Billiton plc, 33.75%; Noranda Inc., 33.75%; Teck Cominco Ltd., 22.5%; Mitsubishi Corp., 10%)	Antamina Mine, Huari, Ancash Department	340,000
Do.	do.	Aruntani S.A.C (private, 100%)	Florencia and Santa Rosa Mines, Moquegua Department	14,500
Do.	do.	Compañía Minera Raura S.A. (private, 100%)	Raura, Lima Department	54,000
Do.	do.	Compañía Minera Milpo S.A. (private, 100%)	Yanacancha, Cerro de Pasco Department	110,000
Do.	do.	Compañía Minera Atacocha S.A. (private, 100%)	Yanacancha Mine, Junin Department	130,000
Do.	do.	Sociedad Minera El Brocal S.A.A. (private, 100%)	San Gregorio Mine, Cerro de Pasco Department	110,000
Do.	do.	Corp. Minera Nor Perú S.A. (Pan American Silver Corp., 100%)	Quiruvilca, La Libertad Department	125,000
Steel		Sider Corp. S.A. (Acero S.A., 49.4%; Grupo Wiese, 49.4%; others, 1.2%)	Chimbote, Ancash Department	550
Do.		Empresa Laminadora del Pacífico S.A. (Acero Arequipa S.A., 100%)	Pisco, Ica Department	180
Tellurium	metric tons	Doe Run Peru S.R. Ltda. (private, 100%)	Refinery at La Oroya	12
Tin	do.	Minsur S.A. (private 100%)	San Rafael Mine/plant, Puno Department	50,000
Do.	do.	do.	Pisco smelting and refining, Ica Department	45,000
Tungsten	do.	Minera Regina S.A. (private, 100%)	Palca XI, Puno Department	1,400
Do.	do.	Fermín Málaga Santolalla S.A. (private, 100%)	Pasto Bueno, Ancash Department	1,000
Zinc		Volcan Compañía Minera S.A.A. (private, 100%)	Cerro de Pasco, Cerro de Pasco Department; San Cristobal, Mahr Tunnel, and Andaychagua, Junin Department	320
Do.		Compañía Minera Antamina S.A. (CMA) (BHP Billiton plc, 33.75%; Xstrata Cooper, 33.75%; Teck Cominco Ltd., 22.5%; Mitsubishi Corp., 10%)	Antamina Mine, Huari, Ancash Department	325
Do.		do.	Antamina concentrator, Ancash Department	1,500
Do.		Empresa Minera Los Quenuales S.A.	Pachangara, Lima Department	200
Do.		do.	Izcaycruz, Lima Department	40
Do.		Compañía Minera San Ignacio de Morococha S.A. (private, 100%)	Yauricocha, Junin Department	80
Do.		do.	San Vicente Mine, Junin Department	70
Do.		Doe Run Peru S.R. Ltda. (private, 100%)	Refinery at La Oroya	70
Do.		Sociedad Minera Refinería de Zinc Cajamarquilla S.A. (Grupo Votorantim Metais S.A., 99%, and employees, 1%)	Refinery at Cajamarquilla, Lima Department	130
Do.		Compañía Minera Atacocha S.A. (private, 100%)	Yanacancha Mine, Junin Department	60
Do.		Compañía Minera Raura S.A. (private, 100%)	Raura, Lima Department	45
Do.		Corp. Minera Nor Perú S.A. (Pan American Silver Corp., 100%)	Quiruvilca, La Libertad Department	25
Do.		Compañía Minera Santa Luisa S.A. (private, 100%)	Huanzala Mine, Junin Department	50
Do.		Compañía Minera Milpo S.A. (private, 100%)	Yanacancha, Cerro de Pasco Department	80
Do.		Sociedad Minera El Brocal S.A.A. (private, 100%)	Colquijirca Mines, Cerro de Pasco Department	60
Do.		Empresa Administradora Chungar S.A.C. (private, 100%)	Animon Mine, Cerro de Pasco Department	60
Do., do.	Ditto.			

TABLE 3
PERU: RESERVES OF MAJOR MINERALS IN 2007

(Thousand metric tons unless otherwise specified)¹

Commodity	Reserves
Coal, all types	1,100,000
Copper	57,900
Gold	metric tons 3,000 ²
Iron ore	861,000
Lead	5,200
Molybdenum	450 ^c
Natural gas	billion cubic meters 335
Natural gas liquids	million barrels 682
Petroleum crude	million barrels 416
Phosphate rock	820
Salt	100,000 ^c
Silver	metric tons 43,800
Sulfur	150,000 ^c
Tin	700
Uranium	100 ³
Zinc	18,200

^cEstimated; estimated data are rounded to no more than three significant digits; the amounts are proven reserves.

¹2007 and 2008 "Anuario de la Minería del Perú" Ministerio de Energía y Minas, except for natural gas and petroleum crude; U.S. Geological Survey Mineral Commodity Summaries 2008; U.S. Energy Information Administration 2008; Perúpetro S.A. 2008.

²Excludes metal in placer deposits.

³Recoverable at prices of \$100 or less per kilogram of uranium.