



2006 Minerals Yearbook

PERU

THE MINERAL INDUSTRY OF PERU

By Alfredo C. Gurmendi

In 2006, Peru's economic turnaround was assisted by floating exchange rates and increased interest rates by the Banco Central de Reserva del Perú to fight inflationary pressures. The International Monetary Fund supported Peru's move to a system of inflation targets and currency devaluation to guide its monetary policy. This action allowed the country to restore confidence in the Government's economic policies and created conditions for lower inflation and interest rates. Inflation was 1.1% compared with 1.5% in 2005.

In 2006, Peru occupied a leading position in the global production of the following mineral commodities: arsenic trioxide (fourth after China, Chile, and Morocco), bismuth (third after China and Mexico), copper (third after Chile and the United States), gold (fifth after South Africa, Australia, the United States, and China), 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 first ranked producer of, in order of value, gold, silver, zinc, lead, tin, and tellurium and the second ranked producer of copper and molybdenum (after Chile), and bismuth (after Mexico) (Brooks, 2007a, b; Carlin, 2007a, b; Edelstein, 2007; Gabby, 2007; George, 2007; Jasinski, 2007; Magyar, 2007a, b; Ministerio de Energía y Minas, 2007c; ProInversión—Private Investment Promotion Agency in Peru, 2007).

The country underwent significant economic change during the decade 1995-2005. In 2006, Peru's economy benefited from high prices for mineral commodities. The gross domestic product (GDP) grew at a real rate of 6.4%, foreign reserves increased by \$3.2 billion, exports exceeded imports by almost \$9 billion, foreign direct investment (FDI) increased by almost \$1 billion, and inflation fell to 1.1% (Dancourt, 2006, p. 19; Banco Central de Reserva del Perú, 2007; Economic Commission for Latin America and the Caribbean, 2007).

Private investment in Peru continued to be significant, increasing to \$15.4 billion in 2006 from \$14.2 billion in 2005. To date, the Government has privatized 220 state-owned firms via joint ventures and consortia in the mining and fuels industries. The firms have generated \$9.2 billion, with an additional committed capital flow of about \$11.4 billion, representing 17% and 21% of Peru's GDP, respectively. Privatizations and concessions generated a committed investment of \$6.9 billion (2006-2010) by mining companies, such as Perú Copper Inc. for the Toromocho copper project (\$2.5 billion), Xstrata plc. for Las Bambas (\$1 billion), Phelps Dodge Corp. for expansion of the Cerro Verde copper mine (\$850 million), Monterrico Metals Inc. for the Rio Blanco base metals project (\$800 million), Rio Tinto Limited for La Granja copper project (\$700 million), Southern Copper Corporation for expansion of the Ilo smelter (\$400 million), Goldfields Ltd. for the Cerro Corona copper-gold project (\$350 million), and

Companhia Vale do Rio Doce for the the Bayovar phosphate project (\$300 million). The Ministerio de Energía y Minas reported that of the committed investment in 2006, Peru received \$1 billion for gas and \$200 million for petroleum.

Petróleos del Perú (PETROPERU S.A.) was created on July 24, 1969 (law No.17753) as a state-owned entity dedicated sequentially to transportation, refining, and commercialization of refined products and other derivatives of petroleum. The Peruvian Congress on June 2, 2004 (law No.28244) excluded PETROPERU S.A. from the privatization process and authorized its participation in the exploration and production of hydrocarbons. The state agency Perupetro S.A. was created on November 18, 1993 (law No. 26221) to be responsible for promoting investments for hydrocarbon exploration and production in the country. Perupetro negotiates, signs, and administers hydrocarbon contracts, for which PETROPERU must compete with private firms as well. Recently, Peru's government improved the country's legal framework and its national economy, which were welcomed by foreign investors. In 2006, PETROPERU invested \$4.5 billion in the hydrocarbon sector (Sánchez, 2006, p. 18; Banco Central de Reserva del Perú, 2007; Ministerio de Energía y Minas, 2007a; ProInversión—Private Investment Promotion Agency in Peru, 2007).

Minerals in the National Economy

Higher mineral commodity prices contributed to the upturn in the country's economic growth. The mining and mineral processing industries represented almost 1% of the GDP in 2006. The minerals sector employed about 5% (83,000) of the industrial sector total of 1.7 million miners; this did not include nearly 5,000 active informal miners (Dancourt, 2006, p. 5, 17; Banco Central de Reserva del Perú, 2007; U.S. Central Intelligence Agency, 2007).

Government Policies and Programs

Peru's legal framework regarding domestic and foreign investors is governed by such Constitutional Mandates as Legislative Decree No. 662 (promotion of foreign investment), which provides unrestricted access to all economic sectors; Legislative Decree No. 757 (framework for the development of private investment), which pertains to private investment growth; and Texto Unico Oficial (TUO) approved by Supreme Decree 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 No. 818 of April 1996 (incentives for investing in natural resources), and Supreme Decree No. 162-92-EF of October 1992 (rules guaranteeing foreign investment), more than 250 domestic stability and guarantee contracts have been signed since 1993 (Sánchez, 2006, p. 22-23;

Banco Central de Reserva del Perú, 2007; ProInversión—Private Investment Promotion Agency in Peru, 2007).

Supreme Decree No. 014-92-EM of June 1992 (the general mining law) and Legislative Decree No. 868 of May 1996 (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). Additionally, Peru enacted Supreme Decree 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. The capital, goods, and services linked to minerals exploration benefited from the elimination of the 18% sales tax when law No. 27623-EF was enacted in January 2002. Supreme Decree 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 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 (Sánchez, 2006, p. 22-23; Banco Central de Reserva del Perú, 2007; ProInversión—Private Investment Promotion Agency in Peru, 2007).

The Peruvian Constitution establishes equal protection for domestic and foreign investors who may enter into agreements with the Government and guarantees free access, possession, and disposal of foreign currency. Hydrocarbon Law No. 26844 of May 1997 eliminated the exclusive rights of state-owned *Petróleos del Perú S.A.* to control the secondary recovery of crude oil, refining, and imports and 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 (Sánchez, 2006, p. 30; ProInversión—Private Investment Promotion Agency in Peru, 2007). Legal procedures to obtain mining rights were made easier by the enactment of complementary legislation Supreme Decree No. 018 of July 9, 1992. The Government relinquished exclusive control over 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 dividends, depreciation, 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 No. 25312 and with the Overseas Private Investment Corporation in December 2002, which was authorized by Legislative Decree No. 25809 (Sánchez, 2006, p. 22-23; ProInversión—Private Investment Promotion Agency in Peru, 2007).

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. The DGAA also approves environmental impact assessments for new operations and environmental adjustment and management programs for ongoing ones, and administers the national environmental information system. The MEM is authorized to manage environmental affairs in the minerals sector, such as 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. Oil companies, in particular, are under pressure because the number of operations in the Amazon Rain Forest, which is one of the world's most sensitive ecosystems, is increasing (Ministerio de Energía y Minas, 2007a; ProInversión—Private Investment Promotion Agency in Peru, 2007).

Production

In 2006, the value of Peruvian minerals (metals, industrial minerals, and fuels) production amounted to \$6.5 billion compared with \$5.1 billion in 2005. Mining and fuel production increased by 8.1% as a result of higher values of metals (7%) and fuel output (23%). The increase of mineral outputs (content) was mainly led by natural gas (77%), molybdenum (22%), gold (20%), crude oil (18%), and iron (8%) and, to a lesser extent by silver and lead (4% each) compared with 2005 outputs.

In 2006, metal prices were also driven upwards because of the higher consumption associated with increased world economic activity, such as in China, the United States, and other countries. Metal production growth was mainly led by increased

of copper, iron, silver, and lead, which offset the decreased output of gold, molybdenum, and zinc. 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 the result of the 16 new oil exploration and production contracts signed in 2006 (table 1; Banco Central de Reserva del Perú, 2007; Ministerio de Energía y Minas, 2007c).

Structure of the Mineral Industry

Peruvian laws have attempted to ensure equitable mineral, crude oil, and gas exploration and production. Owing to these terms, an increased number of domestic and foreign companies, including AngloGold Ashanti, Barrick Gold Corp., BHP Billiton Plc., Cambior, Inc., Falconbridge Limited, Mitsui & Co., Ltd., Mitsubishi Corp., Peñoles, Teck Cominco Ltd., and others, have expressed interest in participating in prospection, exploration, production, and distribution of natural gas and petroleum contracts with Perupetro and mineral properties with Centromín (Sánchez, 2006, p. 30; ProInversión—Private Investment Promotion Agency in Peru, 2007). 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 (2007b, c), Peru was the seventh most attractive area for investments in exploration after, in order of investment attractiveness ranking, Tasmania (Australia), Nevada and Alaska (United States), Northwest Territories (Canada), Western Australia, and Indonesia (Ministerio de Energía y Minas, 2007a; ProInversión—Private Investment Promotion Agency in Peru, 2007).

The new operating process, which was the result of the privatization and joint-venture projects, incorporated policies that deal with economic and societal development issues and with environmental protection in a sustainable way. Private local interests owned most of the medium- and small-sized mining operations. More than 250 foreign mining companies have been established in Peru since 1990 (table 2). Crude oil was transported through 1,754-km pipelines, natural gas and natural gas liquids through 983-km dual pipelines, and refined products through 13-km pipelines. 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 electrical generating capacity of 5,050 megawatts (MW), about 80% of which was accounted for by 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 hydro (74.5%), fossil fuel (24.5%), and others (1.0%) (Ministerio de Energía y Minas, 2007a; U.S. Central Intelligence Agency, 2007).

Mineral Trade

Peru's mining industry, which has consistently been the country's major foreign exchange generator since 1997, accounted for almost 61.8% (\$14.7 billion) of total export revenues of more than \$23.8 billion in 2006 compared with 56.3% (\$9.8 billion) of total export revenues of about \$17.4 billion in 2005. In 2006, Peru's total trade balance recorded a surplus of about \$8.9 billion compared with \$5.3 billion in 2005, which was an increase of almost 68% compared with a 6.6% increase in 2005. Peru's minerals sector had a trade surplus of \$16.2 billion compared with \$11 billion in 2005 (Dancourt, 2006, p. 19; Banco Central de Reserva del Perú, 2007; Ministerio de Energía y Minas, 2007a).

In 2006, mining was the main exporting sector of the country. Price increases for zinc (136.5%), copper (82.6%), and gold (36%) played an essential role in the Peruvian trade balance. Almost 82% of the total minerals exported (\$14.7 billion) were copper (\$6 billion), gold (\$4 billion), and zinc (\$2 billion). Peru's other mineral exports were molybdenum (\$838 million), lead (\$713 million), silver (\$479 million), tin (\$332 million), and iron (\$256 million) (Banco Central de Reserva del Perú, 2007; ProInversión—Private Investment Promotion Agency in Peru, 2007).

Peru's fourth major traditional export, petroleum and derivatives, was valued at \$1.6 billion in 2006 compared with \$1.5 billion in 2005. Peru's total mineral exports, which included petroleum and derivatives, amounted to more than 68% of its total exports in 2006. Total mineral imports, which consisted mostly of petroleum and derivatives, however, increased in value by about 34.8% to \$3.1 billion compared with \$2.3 billion in 2005. Total imports increased in value by about 21.5% to \$14.7 billion compared with \$12.1 billion in 2005 and generated a surplus of \$2.6 billion compared with \$5.3 billion in 2005 (Banco Central de Reserva del Perú, 2007). In 2006, the United States (34%), China (11%), Chile (7%), Canada (6%), and Japan (5%) were Peru's leading mineral consumers. The United States, China, and Chile were the main importers of gold, copper, and molybdenum, respectively. Peru sold about 6% of its exports to the other members of the Mercado Común Andino (ANCOM) (Bolivia, Colombia, Ecuador, Peru, and Venezuela); about 3% was sold to the Mercado Común del Cono Sur (MERCOSUR) countries (Argentina, Brazil, Paraguay, and Uruguay, and associate members Bolivia and Chile); and 15% was sold to other Latin American countries. Peruvian mineral exports could increase if the negotiations between ANCOM and MERCOSUR were to lead to a South American free trade agreement and because of the free trade agreement signed recently (2006) between the United States and Peru (Banco Central de Reserva del Perú, 2007; Ministerio de Energía y Minas, 2007a).

Commodity Review

Metals

Copper.—Peru's copper output (Cu content) in 2006 was about 1.05 million metric tons (Mt) compared with almost

1.01 Mt in 2005, which was an increase of almost 4%. The country's copper metal exports in 2006 totaled about 986,600 metric tons (t) valued at \$6 billion compared with 984,200 t valued at \$3.4 billion in 2005; this value was 76.5% higher than that of 2005 as a result of the copper price increase to \$2.829 per pound of copper in 2006 from \$1.549 per pound in 2005 (Banco Central de Reserva del Perú, 2007; Ministerio de Energía y Minas, 2007a; ProInversión—Private Investment Promotion Agency in Peru, 2007).

Owing to China's increasing consumption of metals and minerals such as copper, which was expected to increase to 6 Mt by 2010 from 4 Mt in 2005, two Chinese companies, Baosteel Co., Ltd. (Baosteel) and Aluminum Corp. of China Ltd. (Chalco) were planning to have joint ventures with Latin America's leading copper mining companies, such as Companhia Vale do Rio Doce (CVRD) of Brazil, Corporación Nacional del Cobre (Codelco) of Chile, and Sociedad Minera Cerro Verde S.A.A. of Peru. China Minmetals Corp. planned to invest in metals and minerals mainly in Brazil, Chile, and Peru. In 2006, Peru's planned investments of \$2.8 billion were expected in 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 owned by Xstrata plc of Switzerland and Southern Copper Corp. a subsidiary of Grupo Mexico S.A. de C.V., respectively (M.A. Yepez, Mineral Economist, U.S. Embassy, Economic Section, written commun., August 25, 2006; Banco Central del Peru, 2007).

Other investments in copper deposits included Rio Blanco Copper S.A.'s Rio Blanco deposit, which is located in the Department of Piura (\$1.5 billion to produce copper by 2008); and Perú Copper Inc.'s Toromocho deposit, which is located in the Department of Junín (\$1.5 billion to \$2.0 billion. with reserves of 1.6 billion metric tons). Also, Southern Copper was planning to invest \$600 million in additional exploration and to improve efficiencies in the Cuajone and the Toquepala copper mines, and Sociedad Minera Cerro Verde SA was planning to increase Cerro Verde Mine's copper output to 300,000 metric tons per year (t/yr) from 100,000 t/yr with an investment of \$890 million by 2006-07. Other mineral prospects included the San Gregorio 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 World Bank/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 Compañía Minera Antamina S.A.'s (CMA) Antamina base-metal mine (M.A. Yepez, Mineral Economist, U.S. Embassy, Economic Section, written commun., August 28, 2006; Banco Central de Reserva del Perú, 2007).

CMA's Antamina Mine was the leading copper concentrate producer in the country with a total output of 390,800 t in 2006 compared with 383,000 t in 2005. SPCC was the second ranked producer of copper in the country with an output of 362,000 t in 2006 compared with 355,000 t in 2005.

BHP Billiton Tintaya S.A. reported an output of 79,000 t of copper concentrate in 2006 compared with 78,300 t in 2005. SPCC reported 35,800 t of cathode copper from Toquepala, which was produced by solvent extraction-electrowinning (SX-EW). Copper metal output at its Ilo refinery, which is located in the Department of Moquegua, was 273,100 t compared with 285,200 t in 2005. Cerro Verde's SX-EW plant at the Cerro Verde copper mine produced 96,500 t of cathode compared with 93,500 t in 2005 (Ministerio de Energía y Minas, 2007c).

Gold.—In 2006, gold output was 202.8 t compared with 208 t in 2005, which was a decrease of 2.5%. MYS produced 81.2 t compared with 103.2 t in 2005. Other leading gold producers were Minera Barrick Misquichilca S.A. (51.9 t), Madre de Dios S.A. (15.8 t), Compañía de Minas Buenaventura S.A.A. (7.9 t), and Aruntani S.A.C. (6.5 t). Gold exports in 2006 totaled about 6,702.1 troy ounces valued at \$4 billion compared with 7,036.8 troy ounces valued at \$3.2 billion in 2005; this value was 25% higher than that of 2005 as a result of the gold price increase to \$605 per troy ounce in 2006 from \$445 per troy ounce in 2005 (Banco Central de Reserva del Perú, 2007; Ministerio de Energía y Minas, 2007a; ProInversión—Private Investment Promotion Agency in Peru, 2007).

Gold recovered as a byproduct from the concentrates of Peru's polymetallic mines amounted to 2.6 t. From the total gold output in 2006, large, medium, and small producers reported 187 t and an unknown number of placers and "garimperos" (informal individual miners) reported 15.8 t. Placers accounted for almost 8% 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 also from rivers and streams throughout the jungle (Ministerio de Energía y Minas, 2007c).

Goldfields Limited, the world's fourth ranked gold producer, entered into a joint venture with Compañía de Minas Buenaventura S.A.A. to start operations in the Puquio gold project in the Department of Ayacucho in the third quarter of 2007. Goldfields Limited was also looking into the Cerro Corona gold project in the Department of Cajamarca (Sánchez, 2006, p. 30; ProInversión—Private Investment Promotion Agency in Peru, 2007).

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, Department of Ica. Mine output increased to 4.8 Mt of iron content in 2006 from 4.6 Mt in 2005. The iron ore exports amounted to 6.7 Mt at a value of \$256 million compared with 6.6 Mt at a value of \$216.1 million in 2005, which was an increase in value of 18.5% compared with that of 2005. The domestic consumption amounted to 300,000 t of iron ore, which was about the same level as that of 2005. Iron ore production increased in response to higher demand in China and other economies in the Asian region for construction and higher steel output, which had a positive effect on higher molybdenum production as well (Banco Central de Reserva del Perú, 2007; Ministerio de Energía y Minas, 2007c; ProInversión—Private Investment Promotion Agency in Peru, 2007).

Lead, Silver, and Zinc.—In spite of higher demand for zinc by Asian countries and higher international prices in 2006, the

Peruvian zinc industry produced 1.2 Mt of zinc in concentrates, which was about the same level as that of 2005. Of the total output, the main producers' contributions were, in order of tonnage, Volcan (232,645 t), Empresa Minera Los Quenuales S.A. (199,600 t), CMA (178,180 t), Compañía Minera Milpo S.A. (79,600 t), El Brocal (69,800 t), Empresa Administradora Chungar S.A.C. (62,230 t), Atacocha (59,800 t), and others (320,000 t) (Ministerio de Energía y Minas, 2007c).

The country's total silver content output increased to more than 3,471 t compared with 3,206 t in 2005. Peru, for the third time, surpassed Mexico's silver output of 3,000 t in 2006. In silver output, companies, such as Aruntani, El Brocal, Compañía de Minas Buenaventura S.A.A., and Volcan Compañía Minera S.A.A. were more active, and silver production was higher than last year because Minera Yanacocha S.R.L. and medium-sized gold-silver mines exceeded their initial production goals. Yanacocha increased its output mainly as a result of technological innovations in its gold-silver recovery process. Higher international prices allowed medium-sized mines and small producers to mine lower grade ores. Peru produced more than 313,300 t of lead in concentrates compared with about 319,400 t in 2005 (Ministerio de Energía y Minas, 2007c). Exports of zinc, lead, and silver were valued at about \$2 billion, \$713 million, and \$479 million, respectively, compared with \$805 million, \$491 million, and \$281 million in 2005, respectively (Banco Central de Reserva del Perú, 2007; Ministerio de Energía y Minas, 2007c; ProInversión—Private Investment Promotion Agency in Peru, 2007).

In 2005, Volcan was the first ranked zinc producer in the country with an output of 232,645 t of zinc, 65,540 t of lead, and 413.5 t of silver from its operations in the Cerro de Pasco property, which is located in the Department of Cerro de Pasco, and the Andaychahua, the Carahuacra, and the San Cristobal base-metal mines, which are located in the Department of Junin. Empresa Minera Los Quenuales S.A. was the second ranked zinc producer and produced 199,540 t of zinc, 21,600 t of lead, and 183.4 t of silver from the Iscaycruz, the Pachangara, and the Yauliyacu Mines. CMA was the third ranked zinc producer from its operations in the Antamina Mine, which produced 178,180 t of zinc and 301.5 t of silver (Ministerio de Energía y Minas, 2007c).

Refined metals were reported as follows: Doe Run Peru produced 120,300 t of lead, 1,145 t of silver, and 41,000 t of zinc from the La Oroya complex; Sociedad Minera Refinería de Zinc Cajamarquilla S.A. produced 31.5 t of silver and 134,240 t of zinc from the Cajamarquilla refinery; and SPCC produced 119.2 t of silver from its refining operations in Ilo. Peru's silver metal production increased to 1,300 t from 1,230 t in 2005 (table 1; Ministerio de Energía y Minas, 2007c).

In the mining sector, the Grupo Votorantim Metais S.A. of Brazil acquired 99% of the Cajamarquilla refinery for about \$210 million. Grupo Votorantim was planning to increase its zinc output to 260,000 t/yr from 130,000 t/yr with an additional investment of \$200 million by 2007-08 (Grupo Votorantim Metais S.A., 2006; Banco Central de Reserva del Perú, 2007).

Tin.—Production from Minsur's San Rafael Mine located in the Mariátegui Region was 38,470 t in concentrate in 2006 compared with 42,145 t in 2005. Minsur's tin smelting and

refining operations in Pisco, which is located south of Lima, produced 40,500 t of metal compared with 36,700 t in 2005. 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 15.5% of world's output and exported 38,100 t valued at \$332.1 million in 2006 compared with 36,900 t valued at \$270.0 million in 2005 (Banco Central de Reserva del Perú, 2007; Ministerio de Energía y Minas, 2007c; ProInversión—Private Investment Promotion Agency in Peru, 2007).

Industrial Minerals

Phosphate Rock.—Empresa Minera Regional Grau Bayóvar S.A.'s phosphate deposits (Bayóvar project) produced 38,000 t of phosphate ore, which was about the same level as that of 2005. The 90,000-t/yr phosphate plant that was operated by Grau Bayóvar produced 17,100 t of phosphate (P_2O_5) in 2006. The Bayóvar project comprises 150,000 hectares of phosphate and brine and has proven reserves of 820 Mt of phosphatic rock equivalent to 260 Mt of rock phosphate with a P_2O_5 content of 30%. CVRD won an international bid on March 16, 2005, to explore further the Bayóvar phosphate deposit. The feasibility study to produce about 3.3 Mt/yr was expected to be completed in the second quarter of 2007 (Companhia Vale do Rio Doce, 2006; Ministerio de Energía y Minas, 2007c).

Mineral Fuels

Coal.—Peru's largest coal deposits were at Alto Chicama located in La Libertad Region. Other coal deposits occur in the Cuenca del Santa in the Marañon Region and the coal basins of Goyllarisquizga and Hatun Huasi in the Caceres Region of central Peru. In 2006, according to the Ministerio de Energía y Minas (2007a), Peru's recoverable coal reserves were estimated to be 1.1 billion metric tons (table 3), and coal production was relatively small (about 29,535 t) compared with an estimated consumption of more than 1.3 Mt/yr (table 1; U.S. Energy Information Administration, 2007).

Natural Gas and Petroleum.—In 2006, according to the Ministerio de Energía y Minas (2007b), Peru's recoverable (proven and probable) and possible crude oil, liquefied natural gas (LNG), and natural gas resources were estimated to be 6,239.1 million barrels (Mbbbl); LNG 1,373.8 Mbbbl; and natural gas 859 billion cubic meters (30.4 trillion cubic feet), 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 (301 billion cubic feet) of gas and 9 Mbbbl of natural gas liquids (NGL) and the Camisea gasfields in the Ucayali Basin with 250 billion cubic meters (8.7 trillion cubic feet), which included 600 Mbbbl of NGL. Natural gas production increased to 1,775 million cubic meters from 1,517 million cubic meters in 2005 and was produced by Pluspetrol S.A. (59%), Aguaytia S.A. (22%), Petrotech del Perú S.A. (8%), Petróleo Brasileiro S.A. (Petrobrás) (6%), and others (5%). 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., 2006;

Ministerio de Energía y Minas, 2007b; U.S. Energy Information Administration, 2007).

The Camisea Project encompasses three segments—Upstream, Transportation, and Distribution of natural gas from the Camisea field, which is located in the Ucayali Basin in the Department of Cusco. Under the license contract, the Upstream Consortium holds the rights to produce natural gas and liquids in Block 88 for 40 years. Investments to develop, produce, transport, and distribute natural gas from the Camisea field were estimated as follows: the Upstream Project to develop and produce natural gas, \$550 million; the Transportation Project to transport natural gas and liquids to Lima through pipelines, \$820 million; and the Distribution Project for the distribution network in Lima, \$170 million (Camisea Project, 2007).

In 2006, crude oil production increased to 77,500 barrels per day (bbl/d) from 75,400 bbl/d in 2005, or by almost 3%. Production of petroleum derivatives decreased to 165,220 bbl/d from 176,411 bbl/d in 2005, or by more than 6%. Peru imported an average of 121,400 bbl/d crude oil and petroleum products to satisfy its internal consumption of 155,800 bbl/d (table 1; Ministerio de Energía y Minas, 2007b, c; U.S. Energy Information Administration, 2007).

Peru's total crude oil production of 28.3 Mbbl in 2006 came from Pluspetrol S.A. (59.6%), Petrobrás (16.7%), Petrotech (14.2%), and others (9.5%) (table 1; Ministerio de Energía y Minas, 2007b). 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 355 million barrels (tables 1, 3; Ministerio de Energía y Minas, 2007b; U.S. Energy Information Administration, 2007).

In 2006, 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 (47%), Talara (38%), Conchán (7%), Iquitos (5%), Pucallpa (2%), and Milagro (1%) (Ministerio de Energía y Minas, 2007b).

Reserves and Resources

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, 2007. 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 (U.S. Bureau of Mines and U.S. Geological Survey, 1980; Ministerio de Energía y Minas, 2007b, c).

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) or (and) byproducts (credits).

Reserves of the leading base and precious metals increased significantly—gold in Alto Chicama and copper ore during the expansion of the Cerro Verde, the Cuajone, the Tintaya, and the Toquepala Mines. Reserves of major metals are distributed unevenly throughout Peru and were influenced mostly by mineralization of the Precambrian Cordillera de los Andes and the Coast Ranges where several districts dominated the reserves position in terms of proven and probable (minable) reserves of major metals (Ministerio de Energía y Minas, 2007b, c).

Outlook

Peru continues on a path of steady economic growth with low inflation and the fiscal stance and balance of payments seem to be sustainable. The energy, mining, and related industries are expected to continue to attract capital flows via joint ventures and consortia, privatizations, and direct acquisitions. According to ProInversión, the privatization process in the minerals sector and FDI in every sector of the Peruvian economy, particularly in the banking and energy industries are expected to continue to generate additional investments. Higher demand for copper, gold, iron ore, and silver and high metal prices are 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 American Free Trade Agreement (NAFTA), and other trading partners is expected to increase Peru's mineral exports further (Ministerio de Energía y Minas, 2007b, c; ProInversión—Private Investment Promotion Agency in Peru, 2007). The transportation phase of Camisea's pipelines for natural gas (714 km) and for natural gas liquids (560 km), however, could encounter financial difficulties because of a leaky NGL pipeline. This second phase would involve establishment of infrastructure to pipe the gas and associated liquids from Camisea to the Lima area and to liquefy 17 million cubic meters per day of gas for export to NAFTA and possibly to Chile. For that, and to develop the 113 billion cubic meters of gas in Camisea's Block 56 will require an investment of \$3.2 billion. However, the natural gas liquids pipeline, which began operating in 2004 following the Upstream phase of development, has ruptured on five different occasions (Petroleum Economist, 2006, p. 39).

At the national level, this trend could reduce the attraction of new investments and preclude Camisea's higher output needed for the regional economic development. On the other hand, Peru continues to encourage community development and environmental protection based on social responsibility and sustainable development principles. In spite of that strategy, the country is facing political unrest, and the mining industry has been the target of social protest. These events have affected the image of the mining industry and caused growing concern about the regional climate for mining investments.

References Cited

- Banco Central de Reserva del Perú, 2007, Monetary policy—Inflation report; Recent trends and macroeconomic forecasts: Banco Central de Reserva del Perú, January. (Accessed September 4, 2007, via <http://www.bcrp.gob.pe/bcr/ingles/index.php?lang=en>.)
- Brooks, W.E., 2007a, Arsenic: U.S. Geological Survey Mineral Commodity Summaries 2007, p. 22-23.
- Brooks, W.E., 2007b, Silver: U.S. Geological Survey Mineral Commodity Summaries 2007, p. 148-149.
- Camisea Project, 2007, Upstream, transportation, and distribution, Camisea Natural Gas Project: Camisea Project. (Accessed August 29, 2007, at <http://www.camisea.com.pe/>.)
- Carlin, J.F., Jr., 2007a, Bismuth: U.S. Geological Survey Mineral Commodity Summaries 2007, p. 32-33.
- Carlin, J.F., Jr., 2007b, Tin: U.S. Geological Survey Mineral Commodity Summaries 2007, p. 172-173.
- Companhia Vale do Rio Doce, 2006, CVRD wins international bid to explore phosphate in Peru: Companhia Vale do Rio Doce, March. (Accessed December 17, 2006, at http://www.cvr.com.br/cvrd_us/cgilua.exe/sys/start.htm?infoid=831&sid=307.)
- Dancourt, Oscar, 2006, Economic Outlook for Perú, *in* Banco Central del Perú—Council of the Americas: Lima, Perú, June 2006, 25 p.
- Economic Commission for Latin America and the Caribbean, 2007, Foreign investment in Latin America and the Caribbean 2006 report: Economic Commission for Latin America and the Caribbean, September. (Accessed September 4, 2007, via <http://www.eclac.cl/default.asp?idioma=IN>.)
- Edelstein, D.L., 2007, Copper: U.S. Geological Survey Mineral Commodity Summaries 2007, p. 52-53.
- Gabby, P.N., 2007, Lead: U.S. Geological Survey Mineral Commodity Summaries 2007, p. 92-93.
- George, M.W., 2007, Gold: U.S. Geological Survey Mineral Commodity Summaries 2007, p. 70-71.
- Grupo Votorantim Metais S.A., 2006, The Votorantim Group, business areas—Metals: Grupo Votorantim Metais S.A. (Accessed December 12, 2006, at http://www.votorantim.com.br/enu/areas_de_negocio/votorantim_metalis.)
- Jasinski, S.M., 2007, Zinc: U.S. Geological Survey Mineral Commodity Summaries 2007, p. 186-187.
- Magyar, M.J., 2007a, Molybdenum: U.S. Geological Survey Mineral Commodity Summaries 2007, p. 110-111.
- Magyar, M.J., 2007b, Rhenium: U.S. Geological Survey Mineral Commodity Summaries 2007, p. 132-133.
- Ministerio de Energía y Minas, 2007a, PERU; Mining Guides 2006—The Mining Investor: Ministerio de Energía y Minas. (Accessed September 4, 2007, via <http://www.minem.gob.pe>.)
- Ministerio de Energía y Minas, 2007b, Perúpetro—Estadística Petrolera, 2006: Ministerio de Energía y Minas. (Accessed September 4, 2007, via <http://www.minem.gob.pe/hidrocarburos/index.asp>.)
- Ministerio de Energía y Minas, 2007c, Producción anual, *in* Minería Estadísticas, 2006: Ministerio de Energía y Minas. (Accessed September 4, 2007, via <http://www.minem.gob.pe>.)
- Petróleo Brasileiro S.A., 2006, Peru, Petrobrás Worldwide: Petróleo Brasileiro S.A. (Accessed December 12, 2006, at <http://www2.petrobras.com.br/portal/ingles/AtuacaoInternacional.htm>.)
- Petroleum Economist, 2006, Liquefied natural gas—Peru LNG plans forge ahead, but leaky pipeline is an obstacle, v. 73, no. 9, September, p. 39.
- ProInversión—Private Investment Promotion Agency in Peru, 2007, Investment Opportunities: ProInversión—Private Investment Promotion Agency in Peru. (Accessed September 6, 2007, at <http://www.proinversion.gob.pe/default.aspx?ARE=1&PFL=0>.)
- Sánchez, M.G., 2006, Perú; A mining country—Investing in mining in Perú: Prospectors & Developers Association of Canada—PDAC 2006, 74th, Toronto, Ontario, Canada, March 5-8, 2006, PDAC Activities and Canadian Exploration News, 31 p.
- U.S. Bureau of Mines and U.S. Geological Survey, 1980, Principles of a resource/reserve classification for minerals: U.S. Geological Survey Circular 831, 5 p.
- U.S. Central Intelligence Agency, 2007, Peru, *in* World factbook 2006: U.S. Central Intelligence Agency. (Accessed September 4, 2007, at <http://www.cia.gov/cia/library/publications/the-worldfactbook/geos/pe.html>.)
- U.S. Energy Information Administration, 2007, Peru: U.S. Energy Information Administration country analysis brief, June. (Accessed September 5, 2007, at <http://www.eia.doe.gov/emeu/cabs/Peru/pdf.pdf>.)

TABLE 1
PERU: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons unless otherwise specified)

Commodity	2002	2003	2004	2005	2006 ^p
METALS					
Antimony:					
Mine output, Sb content ^e	460	460	460	1,000	1,000
Metal	356	356	356	807	810
Arsenic, white ²	2,970	2,970	2,970	2,970	3,000
Bismuth:^c					
Mine output, Bi content	1,000	1,000	1,000	952	950
Metal	568 ³	600	600	600	600
Cadmium, metal	422	529	532	481	416
Copper:					
Mine output, Cu content	844,553	842,578	1,035,574	1,009,898	1,049,933
Sulfate, Cu content	1,950	2,000 ^c	2,000	2,000	2,000
Metal:					
Blister	314,938	314,228	320,135	320,625 ^r	322,188
Refined, primary:					
Electrowon	156,467	171,198	167,000	165,530	173,874
Other	346,282	345,848	338,308	346,206 ^r	333,839
Total	502,749	517,046	505,308	511,736 ^r	507,713
Gold:⁴					
Mines kilograms	138,810	159,770	158,438	191,910 ^r	187,034
Placers do.	18,720	12,849	14,786	16,092 ^r	15,800
Total do.	157,530	172,619	173,224	208,002 ^r	202,834
Indium do.	5,500	5,500	5,500	5,500	5,500
Iron and steel:					
Iron ore and concentrate:					
Gross weight thousand metric tons	4,594	5,239	6,439	6,810	7,138
Fe content do.	3,105	3,541	4,315	4,565	4,785
Metal:^c					
Pig iron do.	330	330	330	330	330
Sponge iron do.	30 ³	80	80	80	80
Ferrosilicon	600	600	600	600	600
Steel:					
Crude	750,000	750,000	750,000	750,000	750,000
Ingots and castings thousand metric tons	510	510	510	510	510
Semimanufactures	250	250	250	250	250
Lead:					
Mine output, Pb content	305,651	308,874	306,211	319,368 ^r	313,322
Metal	119,588	112,289	118,970	122,079	120,311
Manganese, mine output, Mn content ^c	200	200	200	200	200
Molybdenum, mine output, Mo content	8,613	9,561	14,246	17,325	17,209
Selenium, metal, refined kilograms	70,230 ^r	72,010 ^r	75,660 ^r	69,820 ^r	75,390
Silver:					
Mine output, Ag content	2,870	2,921	3,060	3,206 ^r	3,471
Metal, refined	1,193	1,147	1,250	1,227 ^r	1,296
Tellurium, metal kilograms	21,600	22,000 ^e	22,000	32,880	33,000
Tin:					
Mine output, Sn content	38,815	40,202	41,613	42,145	38,470
Metal ⁵	35,828	39,181	40,624	36,733	40,495
Zinc:					
Mine output, Zn content	1,232,997	1,372,790	1,209,006	1,201,671	1,201,786
Metal	172,688	202,076	195,692	163,603	175,250

See footnotes at end of table.

TABLE 1—Continued
PERU: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons unless otherwise specified)

Commodity	2002	2003	2004	2005	2006 ^p
INDUSTRIAL MINERALS					
Barite	3,806	2,906	3,606	3,700	3,800
Boron materials, crude (borates)	6,698	9,315	9,578	9,600	9,800
Cement, hydraulic	thousand metric tons	3,980	4,000	4,590	5,000
Chalk ^e	101,000	101,000	101,000	101,000	101,000
Clays:					
Bentonite	20,760	14,980	18,471	18,500	19,000
Fire clay	5,900	5,900	5,900	5,900	6,000
Kaolin	1,934	2,653	2,720	2,700	2,750
Common clay	428,820	232,002	438,976	440,000	439,000
Diatomite ^e	35,100	35,100	35,100	35,100	35,100
Feldspar	6,018	7,349	6,005	6,000	6,010
Gypsum, crude	75,306	71,114	149,735	150,000	151,000
Lime	184,800	195,400	205,100	215,400	215,500
Limestone	5,695,392	6,021,502	6,321,592	6,636,600	6,637,000
Nitrogen, N content of ammonia ^e	5,000	5,000	5,000	5,000	5,000
Phosphate rock:					
Crude, gross weight ^e	16,400	31,600	37,760 ³	37,800	38,000
P ₂ O ₅ content	6,018	11,610	13,870	14,000	17,075
Salt, all types	278,948	187,416	248,898	250,000	252,000
Stone, sand and gravel:					
Stone: ^e					
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	4,370	4,400	4,400	4,400
Marble	16,553 ³	21,134 ³	22,208 ³	22,200	22,200
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	10,944 ³	14,260 ³	11,950 ³	11,950 ³	12,000
Travertine	4,183 ³	4,658 ³	6,038 ³	6,050	6,070
Sand and gravel:					
Construction	thousand metric tons	1,011	907	1,220	1,220 ^e
Silica sand	do.	300	196	871	900 ^e
Sulfur, elemental: ^e					
Native	100	100	100	100	100
Byproduct of metallurgy	201,000 ³	204,000 ³	204,000	204,000	204,000
Sulfuric acid, gross weight	623,100 ³	623,000	623,000	623,000	623,000
Talc and related materials:					
Talc	10,685	10,791	9,548	9,500	9,550
Pyrophyllite	9,514	12,291	14,282	14,300	14,500
Total	20,199	23,082	23,830	23,800	24,050
MINERAL FUELS AND RELATED MATERIALS					
Coal:					
Anthracite, run-of-mine	17,602	5,768	8,876	8,837	26,717
Bituminous, run-of-mine	3,976	9,900	13,475	13,415	2,818
Total	21,578	15,668	22,351	22,252	29,535
Coke, all types ^e	10,000	10,000	10,000	10,000	10,000
Natural gas:					
Gross	million cubic meters	442 ^r	523	860	1,517 ^r
Marketed	do.	370 ^r	442 ^r	520 ^r	857
Natural gas liquids ⁶	thousand 42-gallon barrels	1,493 ^r	1,470 ^r	5,205 ^r	13,082 ^r

See footnotes at end of table.

TABLE 1—Continued
 PERU: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons unless otherwise specified)

Commodity	2002	2003	2004	2005	2006 ^p	
MINERAL FUELS AND RELATED MATERIALS—Continued						
Petroleum:						
Crude	thousand 42-gallon barrels	33,836 ^r	31,865 ^r	29,164 ^r	27,521 ^r	28,288
Refinery products:						
Liquefied petroleum gas	do.	3,100	2,551	2,938	2,978	2,286
Gasoline, motor	do.	11,593	9,202	8,848	8,968	12,777
Jet fuel	do.	3,521	3,289	3,822	3,874	3,722
Kerosene	do.	6,532	4,354	2,467	2,501	960
Distillate fuel oil	do.	15,417	14,972	15,082	15,287	17,598
Lubricants	do.	642	520	266	271	423
Residual fuel oil	do.	22,894	23,134	20,462	20,740	14,713
Asphalt	do.	--	770	1,011	1,025	838
Other ⁷	do.	5,998	5,379	8,629	8,746	6,988
Total	do.	69,697	64,171	63,525	64,390	60,305

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

¹Table includes data available through April 2008.

²Output reported by Doe Run Resources Corp.

³Reported figure. Source: Ministerio de Energía y Minas - Perú.

⁴Peru's placer gold production was reported.

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

⁶Includes hexane.

⁷Includes refinery fuel and losses.

TABLE 2
PERU: STRUCTURE OF THE MINERAL INDUSTRY IN 2006

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
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 Toquepala Mine, Tacna Department Cocotea, Simarrona, and Totoral Mines—SX-EW, Tacna Department	200 160 40
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%; Noranda Inc., 33.75%; Teck Cominco Ltd., 22.5%; Mitsubishi Corp., 10%)	Antamina Mine, Huari, Ancash Department	400
Do.		do.	Antamina concentrator, Ancash Department	400
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 Tunnel, and Andaychagua, Junin Department	60
Do.		Cía. Minera San Ignacio de Morococha S.A. (private, 100%)	Yauricocha, Junin Department	60
Do.		BHP Billiton Tintaya S.A. (private, 100%)	Tintaya Mine, Cusco Department	90
Do.		Sociedad Minera Cerro Verde S.A.A. (Phelps Dodge Corp., 55%; Sumitomo Metal Mining Co. Ltd., 25%; Compañía de Minas Buenaventura S.A.A., 20%)	Cerro Verde, Arequipa Department	100
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 Corp., 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, Explatoro, 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%)	Sipan, Inca, La Libertad Department	4,800
Do.	do.	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

See footnote at end of table.

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

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
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%)	Huanzalá 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%)	Quiruvilca, 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
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
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	105,000
Do.	do.	do.	Refinery La Pampilla, Lima Department	100,000
Do.	do.	do.	Refinery Conchán, 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
Silica sand		Minera Baribent S.A. (private, 100%)	María G. and Martín 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
Do.	do.	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

See footnote at end of table.

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

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Silver-- Continued	kilograms	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. (Acerco 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%; Noranda Inc., 33.75%; Teck Cominco Ltd., 22.5%; Mitsubishi Corp., 10%)	Antamina Mine, Huari, Ancash Department	220
Do.		do.	Antamina concentrator, Ancash Department	70
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

NA Not available.

TABLE 3
PERU: RESERVES OF MAJOR MINERALS IN 2006

(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 ^e
Natural gas	billion cubic meters 425
Natural gas liquids	million barrels 935
Petroleum crude	million barrels 355
Phosphate rock	820
Salt	100,000 ^e
Silver	metric tons 43,800
Sulfur	150,000 ^e
Tin	700
Uranium	100 ³
Zinc	18,200

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

¹2006 and 2007 "Anuario de la Minería del Perú" Ministerio de Energía y Minas except for natural gas and petroleum crude; U.S. Geological Survey's Mineral Commodity Summaries 2007; U.S. Energy Information Administration 2007; Perúpetro S.A. 2007.

²Excludes metal in placer deposits.

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