

2009 Minerals Yearbook

PERU

THE MINERAL INDUSTRY OF PERU

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In 2009, 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 (second after Chile), gold (sixth after China, Australia, South Africa and the United States, and Russia), lead (fourth after China, Australia, and the United States), molybdenum (fourth after China, the United States, and Chile), rhenium (fourth after Chile, Kazakhstan, and the United States), silver (first followed by China and Mexico), tin (third after China and Indonesia), and zinc (second after China). In Latin America, Peru was first in the production of bismuth, gold, lead, silver, tellurium, tin, and zinc, and second in the production of cadmium, copper, molybdenum, and selenium (Brooks, 2010a, b; Carlin, 2010a, b; Edelstein, 2010; George, 2010; Guberman, 2010; Ministerio de Energía y Minas, 2010a, p. 18; Polyak, 2010a, b; Tolcin, 2010).

In 2009, Peru's gross domestic product (GDP) grew at a real rate of 0.9% compared with 9.8% in 2008. Peru's net international reserves increased to \$33.1 billion compared with \$31.2 billion in 2008, exports exceeded imports by \$5.7 billion, and foreign direct investment (FDI) amounted to \$4.1 billion. Private investment in Peru continued to be significant, increasing to \$37 billion in 2009 from \$27.3 billion in 2008 and \$19.5 billion in 2007. The mining investment in the country amounted to almost \$2.8 billion in 2009 compared with more than \$1.7 billion in 2008, which was an increase of almost 65% (Banco Central de Reserva del Perú, 2010, p. 8-9; Ministerio de Energía y Minas, 2010a, p. 44-47; ProInversión—Private Investment Promotion Agency in Peru, 2010a; 2010b, p. 10, 32).

In 2009, several mining companies invested in the Peruvian mining sector—Southern Peru Copper Corp. (a subsidiary of Grupo Mexico, S.A. de C.V.) invested \$434.8 million in the expansion of the Ilo smelter by 2012; Xstrata Tintaya S.A. (a subsidiary of Xstrata plc of Switzerland) invested \$332.1 million in the Tintaya copper mine, which was to start operations by 2014; Cia. Minera Miski Mayo S.A. invested \$257.6 million in the Bayovar phosphate project; Cia. de Minas Buenaventura S.A.A. invested \$251.1 million in the Brepampa and the Titiminas gold projects in the Department of Ayacucho; Votorantim Metais Cajamarquilla S.A. invested \$155.4 million in the expansion of its Cajamarquilla refinery; Minera Yanacocha S.R.L. invested \$146.7 million in the initiation of the Conga gold mine; and others invested \$842 million in diverse expansions for base-metal and iron ore mines (Luna, 2010, p. 111-112; Ministerio de Energía y Minas, 2010a, p. 48-49).

The stability of the Peruvian judicial framework was fundamental to encouraging investments in the mining sector. The total committed investment in the mining sector for the period 2009-16 was \$35.5 billion. Of leading investors, Xstrata Perú S.A. (a subsidiary of Xstrata) committed to invest \$3.6 billion in Las Bambas copper project, which is located in the Apurimac Region and was to start operations by 2014; Jinzhao Mining Perú S.A. (a subsidiary of Nanjinzhao Group

Co. Ltd., Zibo of China) committed to invest \$3.3 billion in the Pampa de Pongo iron project, which is located in the Arequipa Region and was to start operations by 2012; Anglo American Quellaveco S.A. (a subsidiary of Anglo American plc. of the United Kingdom) committed to invest \$3.0 billion in the Quellaveco copper project, which is located in the Moquegua Region and was to start operations by 2014; Lumina Copper S.A.C. (a subsidiary of Minmetals Jiangxi Copper Co. of China) committed to invest \$2.5 billion in the Galeno copper project, which is located in the Cajamarca Region and was to start operations by 2012; Minera Chinalco Perú S.A. (a subsidiary of Chinalco-Aluminum Corp. of China) committed to invest \$2.2 billion in the Toromocho copper project, which is located in the Junin Region and was to start operations by 2012; and Anglo American Michiquillay S.A. committed to invest \$700 million in the Michiguillay copper project, which is located in the Cajamarca Region and was to start operations by 2016. Other investors were Rio Blanco Copper S.A. and Zijin Mining Group of China, which each committed to invest \$1.44 billion in the Rio Blanco copper project, which was to start operations by 2012; Rio Tinto Ltd. of Australia, which committed to invest \$1 billion in La Granja copper project, which was to start operations by 2014; and Sociedad Minera Cerro Verde S.A. (a consortium formed by the U.S company Freeport-McMoRan Copper Inc.), which invested \$1 billion for expansion of the Cerro Verde copper mine by 2012 (Banco Central de Reserva del Perú, 2010, p. 34; Ministerio de Energía y Minas, 2010a, p. 51).

Petróleos del Perú S.A. (Petroperú), which was a state-owned company, was involved in the transportation, refining, and marketing of refined products and other derivatives of petroleum. Petroperú was excluded from the privatization process but was authorized to participate in the exploration for and production of hydrocarbons (law No. 28244 of June 2, 2004). 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 Petroperú must compete with the private sector. Private investment in Peru continued to increase owing to the country's macroeconomic stability and the involvement of operating companies with the communities where they operate. The Peruvian Government made the country's legal framework, for both the Mines and the Hydrocarbon Divisions of the mineral industry investor-friendly, and Peru's national economy continued to attract foreign investment (Ministerio de Energía y Minas, 2010a-c).

In 2009, Perúpetro attracted investment of more than \$3.4 billion to the hydrocarbon sector. The Camisea Natural Gas Project received an investment of \$1.3 billion, and investment in Camisea was expected to increase to \$3.0 billion by 2013. PERU LNG, which was Camisea's liquefied natural gas (LNG) project, was a partnership of Hunt Oil Co. of Dallas, Texas (50%),

Repsol YPF, S.A. of Spain and SK Energy Co. Ltd. of the Republic of Korea (20% each), and Marubeni Corp. of Japan (10%). Construction of the PERU LNG plant, which would have the capacity to produce 4.4 million metric tons per year (Mt/yr) of LNG, continued on schedule, 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, 2010; ProInversión—Private Investment Promotion Agency in Peru, 2010b, p. 2, 10, 32).

Minerals in the National Economy

The mining and hydrocarbon sectors registered a small growth of 0.6% in 2009 compared with 7.6% in 2008. The mining and mineral processing industries registered a negative growth of 1.4% of the GDP in 2009 compared with 7.3% of the GDP in 2008 owing to decreases of certain mineral commodity prices (except small price increases for copper, gold, and silver) as a result of the world financial crisis. In 2009, hydrocarbon production in Camisea (Lot 56 of the Pagoreni deposit and Lot 88 of the Cashiriari deposit) started in September 2008; as a result, the hydrocarbon sector's output increased by 16.1% in 2009 compared with 10.3% in 2008. The mineral sector employed 125,603 people in 2009 compared with 127,232 in 2008; this did not include the nearly 60,000 active informal miners (Banco Central de Reserva del Perú, 2010, p. 28; Ministerio de Energía y Minas, 2010a, p. 70-73; U.S. Central Intelligence Agency, 2010).

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 allows investors unrestricted access to all economic sectors; Legislative Decree 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) as 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 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 had been signed since 1993 (Banco Central de Reserva del Perú, 2010, p. 97; Ministerio de Energía y Minas, 2010a, p. 44-69; 2010b).

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] (Banco Central de Reserva del Perú, 2010, p. 95, 97).

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, 2010, p. 95; Ministerio de Energía y Minas, 2010a, p. 78-81).

The Peruvian Constitution establishes equal protection for domestic and foreign investors who enter into agreements with the Government. Hydrocarbon law No. 26844 of May 1997 eliminated the exclusive rights of state-owned Petroperú 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 (Ministerio de Energía y Minas, 2010a, p. 12-17; 2010b; ProInversión—Private Investment Promotion Agency in Peru, 2010b, p. 2).

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 its exclusive management of 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, and consortia, corporations, and joint ventures 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, 2010b, c; ProInversión—Private Investment Promotion Agency in Peru, 2010b, p. 10).

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 ones, 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, 2010b, c; ProInversión—Private Investment Promotion Agency in Peru, 2010b, p. 9, 14).

Production

In 2009, the effect of the global financial crisis generated increases and decreases in the international prices of Peru's leading mineral commodities, including an increase in the price of gold and decreases in the prices of copper, iron, lead, silver, and zinc. The global financial crisis caused companies in the Peruvian base-metals sector to initiate cost-reduction programs to offset their lower prices. In 2009, slight increases in mineral production were led by silver (4.6%), gold (1.4%), and copper (0.6%); decreases in mineral production included lead (12.4%), zinc (5.8%), and tin (3.9%); and significant decreases took place in refined products led by lead (77.2%), antimony (72.7%), indium (66.7%), silver (62.6%), bismuth (60.1%), zinc (21.5%), and copper (10%). The hydrocarbon sector's output increased owing to the increased extraction of natural gas mostly at Camisea. Crude oil output decreased by 7.5%; it was, however, expected to increase in the near future as a result of the 25 new oil exploration and long-term production contracts signed in 2007 (table 1; Banco Central de Reserva del Perú, 2010, p. 28; Ministerio de Energía y Minas, 2010a, p. 20, 35; 2010d, p. 5).

Structure of the Mineral Industry

The structure of the Peruvian mineral industry continued to change owing to the establishment of consortia in such deregulated industries as petroleum and natural gas, and joint ventures in energy and mining projects. Peruvian laws ensure equitable treatment of domestic and foreign investors involved in mineral, crude oil, and natural gas exploration and production. Because of these laws, an increased number of domestic and foreign companies had expressed interest in participating in prospecting, exploration, production, and distribution of natural gas and petroleum contracts with Perúpetro and mineral properties with the state agency Centromín Perú S.A. Some of these companies included Anglo American and BHP Billiton plc of the United Kingdom; Sulliden Gold Corp. Ltd. and Teck Cominco Ltd. of Canada; Hunt Oil Co. and Newmont Mining Corp. of the United States; Marubeni Corp., Mitsubishi Corp. and Mitsui & Co., Ltd. of Japan; Shougang Corp. and Zijin Mining Group of China; Peñoles S.A. of Mexico; SK Energy Co. Ltd. of the Republic of Korea; Repsol YPF, S.A. of Spain; Vale S.A. and Votorantim Metais of Brazil; and Xstrata plc of Switzerland (table 2; Ministerio de Energía y Minas, 2010a, p. 50-51; 2010b, c; ProInversión—Private Investment Promotion Agency in Peru, 2010a; 2010b, p. 15-17).

Private domestic interests owned most of the medium- and small-sized mining operations. More than 300 foreign mining companies had been established in Peru since 1990. Crude oil was transported through the country's 1,754 kilometers (km) of pipeline; natural gas and natural gas liquids, through 983 km of dual pipeline; and refined products, through 13 km of pipeline. Ports that were important to the mineral industry included Callao, Chimbote, Ilo, Matarani, Paita, Puerto Maldonado, Salaverry, San Martin, San Nicolas, 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 energy mix, by source, was hydroelectric (79%), fossil fuel (20%), and others (1%) (Ministerio de Energía y Minas, 2010a, p. 82-83; 2010c, d; U.S. Central Intelligence Agency, 2010).

Mineral Trade

Peru's mining sector accounted for about 61% (\$16.4 billion) of total export revenues of about \$26.9 billion in 2009 compared with about 59.4% (\$18.7 billion) of total export revenues of about \$31.5 billion in 2008. In 2009, Peru's total trade balance recorded a surplus of almost \$5.9 billion compared with \$3.1 billion in 2008, which indicates that the country imported goods valued at \$21 billion in 2009 compared with \$28.4 billion in 2008. Peru's petroleum and derivatives sector accounted for about 7.1% (\$1.9 billion) of total export revenues compared with about 8.6% (\$2.7 billion) of total export revenues in 2008. Peru's imported crude oil and lubricants amounted to \$2.9 billion in 2009 compared with \$5.2 billion in 2008. Peru's mineral sector had a trade surplus of \$15.3 billion in 2009 compared with \$16.1 billion in 2008 (Banco Central de Reserva del Perú, 2010, p. 60-61; Luna, 2010, p. 91; Ministerio de Energía y Minas, 2010a, p. 8-9).

In 2009, the leading destination markets of Peruvian exports as a percent of total exports were the United States (17.4%), China (15.3%), Switzerland (14.9%), Canada (8.7%), Japan (5.1%), Germany (3.9%), Chile (2.8%), and others (31.9%).

Peru's leading import partners were the United States (19.7%), China (15.0%), Brazil (7.6%), Ecuador (4.9%), Chile (4.7%), Colombia (4.3%), Japan (4.1%), and others (39.7%). 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 4.7% 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 (Banco Central de Reserva del Perú, 2010, p. 58-59; Ministerio de Energía y Minas, 2010a, p. 6-7).

Commodity Review

Metals

Copper.—Peru's copper output (Cu content) in 2009 was about the same level as that of 2008, or 1.1 million metric tons (Mt). The country's copper metal exports in 2009 totaled about 1.25 Mt valued at about \$5.9 billion compared with 1.24 Mt valued at more than \$7.7 billion in 2008; this value decreased by about 23.4% compared with that of 2008 owing to the copper price decrease to \$2.14 per pound of copper in 2009 from \$2.85 per pound in 2008 (Banco Central de Reserva del Perú, 2010, p. 61; Ministerio de Energía y Minas, 2010a, p. 21-22, 35).

Owing to China's increased demand for copper, the Chinese firm Chinalco was planning to develop the Toromocho deposit, which contains 1.4 billion metric tons (Gt) of proven and probable reserves at a grade of 0.71% copper equivalent, and to produce 275,000 metric tons per year (t/yr) of copper metal by 2012. Consorcio Xiamen Zijin Tongguan Investment Development Co. Ltd. (Zijin Mining Group) was also planning to develop the Rio Blanco copper project, which is located in the Department of Piura and contains 1.3 Gt of proven and probable reserves at a grade of 0.57% copper equivalent, to produce 25 Mt/yr of copper ore by 2012 (Ministerio de Energía y Minas, 2010a, p. 51).

In 2009, Peru's planned investments of about \$35.5 billion included mineral projects with advanced exploration, feasibility studies, and expansion work, such as Las Bambas (\$3.6 billion) and Los Chancas (\$1.2 billion) copper deposits, which are located in the Department of Apurimac and were owned by Xstrata and Southern Copper, respectively (Banco Central de Reserva del Peru, 2010, p. 63; Ministerio de Energía y Minas, 2010a, p. 51). Other investments in copper deposits included the partnership of China Minmetals Corp. and Jiangxi Copper Co., Ltd., which had acquired 93.9% interest in Northern Perú S.A.'s Galeno copper project in Celendin, Department of Cajamarca. The estimated investment in the Galeno copper project (which has reserves of 803 Mt at a grade of 0.63% equivalent copper) was \$2.5 billion to produce copper metal by 2012. Southern Copper was planning to invest \$600 million in additional exploration and to improve efficiencies at the Cuajone and the Toquepala copper mines by 2012 and to invest \$950 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 2012. Other investments included Rio Tinto's

La Granja copper deposit in Cajamarca; Xstrata Copper's investment of \$1.3 billion in the Antapaccay copper deposit in Cusco; and an investment of almost \$15 billion to explore 13 additional copper deposits located in the Departments of Ancash, Arequipa, Apurimac, Cajamarca, Cusco, Huancavelica, La Libertad, Lambayeque, and Moquegua between 2011 and 2016 (Ministerio de Energía y Minas, 2010a, p. 51).

Gold.—In 2009, gold output was almost 182.4 metric tons (t) compared with 180 t in 2008, which was an increase of about 1.3%. Peru's gold exports in 2009 totaled about 218 t (7.01 million troy ounces) valued at about \$6.8 billion compared with about 200 t (6.42 million troy ounces) valued at about \$5.6 billion in 2008, which was an increase in value of more than 21.4%. In 2009, Peru's planned investments of about \$23 billion were expected to include mineral projects with advanced exploration and environmental assessment work for gold, such as Minera Yanacocha's Pita cianuration plant at Yanacocha Mine (\$270 million), its project at Chaquicocha (\$400 million), and its Minas Conga project (\$1.1 billion) in the Department of Cajamarca, which was expected to be completed by 2014; Buenaventura's Tantahuatay gold deposit (\$56 million), which was expected to be completed by 2011; and Sulliden's Shahuindo gold deposit (\$90 million), which was expected to be completed by 2012; the latter two deposits are located in the Department of Cajamarca (Banco Central de Reserva del Perú, 2010, p. 61; Ministerio de Energía y Minas, 2010a, p. 23-24, 35, 51).

From the total gold output in 2009, large-, medium-, and small-scale producers reported 156.1 t of gold and an unknown number of gold placers, and informal individual miners reported 26.3 t of gold. Placers accounted for more than 14% 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, 2010a, p. 24, 51).

Iron Ore.—Shougang Hierro Perú S.A.A. (a subsidiary of China's Shougang Corp.) continued to be Peru's sole iron ore producer (exclusively from the Marcona iron ore mine in the Department of Ica). Mine output decreased to almost 4.5 Mt of iron content in 2009 from more than 5.2 Mt in 2008. In 2009, iron ore exports remained at about the same level as in 2008 (7 Mt) with a value of \$299 million compared with \$385 million in 2008, or a decrease of more than 22%. This iron ore value decrease was in response to lower prices (\$44 per metric ton in 2009 compared with \$56 per metric ton in 2008). According to the Ministerio de Energía y Minas, besides China's Nanjinzhao Group commitment to the Pampa de Pongo iron project, Strike Resources Inc. of Australia was exploring the Apurimac iron ore deposit and was planning to invest \$2.3 billion to start operations there by 2015, and Cuervo Resources Inc. of Canada was exploring the Cerro Ccopane and the Huillque iron ore deposits, which are located in the Department of Cusco (Banco Central de Reserva del Perú, 2010, p. 61; Ministerio de Energía y Minas, 2010a, p. 29, 51).

Lead, Silver, and Zinc.—The Peruvian zinc industry produced more than 1.5 Mt of zinc in concentrates in 2009 compared with about 1.6 Mt in 2008. The country's total silver

content output increased to 3,854 t from 3,686 t in 2008. Peru surpassed China's and Mexico's silver output of 3,000 t and 2,500 t, respectively, in 2009. Companies that produced silver, such as Aruntani S.A.C., Compañía de Minas Buenaventura S.A.A., Sociedad Minera El Brocal S.A., and Volcan Compañía Minera S.A.A., were more active in 2009, and silver production was higher than in 2008 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. Lower international prices of \$14 per troy ounce in 2009 compared with \$15 per troy ounce in 2008 did not affect the medium-sized mines and small-scale producers that mined lower grade ores. Peru produced 302,412 t of lead in concentrates compared with 345,109 t in 2008. Exports of lead amounted to 680,000 t valued at \$1.14 billion in 2009 compared with 525,000 t valued at \$1.11 billion in 2008; prices decreased to \$0.720 per pound in 2009 from \$1.002 per pound in 2008. The export value of silver amounted to \$214 million in 2009 compared with \$595 million in 2008; prices decreased to \$14 per troy ounce in 2009 from \$15 per troy ounce in 2008. The value of exports of zinc amounted to more than \$1.2 billion in 2009 compared with almost \$1.5 billion in 2008; prices decreased to \$0.390 per pound in 2009 from \$0.472 per pound in 2008 (Banco Central de Reserva del Perú, 2010, p. 61; Ministerio de Energía y Minas, 2010a, p. 25-29, 35, 51).

Tin.—Production from Minsur's San Rafael Mine, which is located in the Mariategui Region, was 37,503 t in concentrate in 2009 compared with 39,037 t in 2008. Minsur's tin smelting and refining operations, which are located in Pisco, south of Lima, produced 34,503 t of metal in 2009 compared with 38,865 t in 2008. 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 more than 11% of the world's output and exported 38,000 t valued at \$476 million in 2009 compared with 39,760 t valued at \$695 million in 2008 (Banco Central de Reserva del Perú, 2010a, p. 60; Carlin, 2010b; Ministerio de Energía y Minas, 2010a, p. 29, 35).

Industrial Minerals

Phosphate Rock.—Empresa Minera Regional Grau Bayóvar S.A.'s phosphate deposits (Bayovar project) produced about 38,000 t of phosphate rock, which was about the same level as that of 2008. The 90,000-t/yr phosphate plant that was operated by Grau Bayóvar produced an estimated 17,100 t of phosphate (P₂O₅) in 2009. Vale owned the Bayovar phosphate project located in the Sechura desert in the Department of Piura. The Bayovar project comprised 150,000 hectares of phosphate and brine. The planned Bayovar open pit contained a reserve base of 238 Mt of phosphate with a nominal production capacity of 3.9 Mt/yr of phosphate concentrate with a minimum grade of 29% P₂O₅, which is used mostly in fertilizers. The approximately \$600 million project was expected to enter into production by mid-2010 and would have an estimated life of 27 years. Vale had already started construction of the concentrating plant, which was to be

completed by 2010 (Ministerio de Energía y Minas, 2010a, p. 30; Vale S.A., 2010).

Mineral Fuels

Coal.—Peru's largest coal deposits are located at Alto Chicama in La Libertad Department. Other known 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 2009, Peru's recoverable coal reserves were estimated to be 1.1 Gt, and coal production was 156,371 t compared with 142,021 t in 2008; the estimated consumption of coal was more than 1.3 Mt/yr and imports were about 1.2 Mt/yr and came mostly from Colombia (tables 1, 3; Ministerio de Energía y Minas, 2010a, p. 30-31; U.S. Energy Information Administration, 2010).

Natural Gas and Petroleum.—In 2009, Peru's recoverable (proven and probable) and possible resources of crude oil were estimated to be 5,810 million barrels (Mbbl); of LNG, 1,337 Mbbl; and of natural gas, 881 billion cubic meters. The leading gasfields were the Aguaytia, which is located about 41 km west-northwest of Pucallpa, Ucayali Department, and had proven reserves of 8.5 billion cubic meters of gas and 9 Mbbl of natural gas liquids (NGL) and the Camisea gasfields in the Ucayali Basin, Cusco Department, which had proven reserves of 250 billion cubic meters of gas and 411 Mbbl of NGL. Natural gas production increased to 3,474 million cubic meters in 2009 from 3,387 million cubic meters in 2008 and was produced by Pluspetrol S.A. (81.7%), Aguaytia S.A. (10.1%), Petróleo Brasileiro S.A. (Petrobrás) (3.1%), and others (5.1%) (Camisea Project, 2010; Ministerio de Energía y Minas, 2010d; U.S. Energy Information Administration, 2010).

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. Peru had received an investment of \$1.1 billion to implement the above segments in 2009. Pluspetrol was planning to invest about \$3.0 billion in Camisea's natural gas project by 2013 (Camisea Project, 2010; Ministerio de Energía y Minas, 2010d).

In 2009, crude oil production decreased to about 71,000 barrels per day (bbl/d) from 76,500 bbl/d in 2008. Production of petroleum derivatives decreased to about 168,500 bbl/d from 173,200 bbl/d in 2008. Peru imported an average of 10,600 bbl/d of crude oil and petroleum products to satisfy its internal consumption of 157,000 bbl/d. Peru's total crude oil production of 26 Mbbl in 2009 came from Pluspetrol (42.3%), Petrobrás (18.8%), Petrotech (15.7%), and others (23.2%) (table 1; Banco Central de Reserva del Perú, 2010, p. 28; Ministerio de Energía y Minas, 2009d; U.S. Energy Information Administration, 2010).

In 2009, the largest oil refinery in Peru continued to be La Pampilla, which had a designed capacity of about 110,000 bbl/d. The second largest oil refinery was Talara, which had a designed capacity of about 62,000 bbl/d. Other refineries had the following designed capacities: Conchan, 15,500 bbl/d; Iquitos, 10,500 bbl/d; Pucallpa, 3,300 bbl/d; and El Milagro, 1,700 bbl/d. Pluspetrol was planning to build the

5,200 bbl/d-capacity Shiviyacu petroleum refinery, which would be located in the Department of Loreto, by 2013. In 2009, refinery production came from La Pampilla (44.3%), Talara (34.9%), Conchan (14.4%), Iquitos (4.3%), Pucallpa (1.1%), and Milagro (1.0%) (Ministerio de Energía y Minas, 2010d).

Reserves and Resources

Table 3 lists the Peruvian reserves of major minerals, such as copper, gold, iron ore, lead, molybdenum, silver, and zinc, as of about January 1, 2010. 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 are 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, 2010d).

Outlook

According to the Anuario Minero 2009, Peru's economy is committed to trade integration through 36 investment agreements with investors from Australia, Brazil, Canada, China, the European Union, Mexico, Switzerland, the United States, and others. In spite of the global economic crisis, Peru's legal framework is expected to continue to be favorable to foreign investment in the fields of energy, mining, and related industries and to attract capital flows by way of joint ventures and consortia, privatizations, and direct acquisitions. Continued privatization in the mineral sector and investment in every sector of the Peruvian economy, particularly in the mineral and energy industries, are expected to generate additional investments. Peru is likely to continue to be the world's leading producer of silver and the second ranked producer of copper and zinc, as well as Latin America's leading producer of, in order of value, silver, gold, zinc, tin, bismuth, and lead and the second ranked producer of copper and molybdenum. The country has high potential for nonmetallic production as well, such as bentonite, borates, diatomite, phosphate rock, and travertine. Increased demand for copper, gold, iron ore, natural gas, and silver is likely to encourage investors to expand and modernize their operations. The liquefaction of Camisea's natural gas for export to China, member countries of the Mercado Comun del Cono Sur (MERCOSUR) (the second largest trade association in the Americas), member countries of the North America Free Trade Agreement (the largest trade association in the Americas), and other markets and trading partners is expected to increase Peru's mineral exports further (Banco Central de Reserva del Perú, 2010, p. 34-35; Camisea Project, 2010; Ministerio de Energía y Minas, 2010a, p. 51, 2010d; ProInversión—Private Investment Promotion Agency in Peru, 2010a; 2010b, p. 12-13).

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 $\label{eq:table 1} \mbox{TABLE 1}$ PERU: PRODUCTION OF MINERAL COMMODITIES 1

(Metric tons unless otherwise specified)

Commodity		2005	2006	2007	2008	2009 ^p
METALS						
Antimony, metal		807	691	590	531	145
Arsenic, white ²		3,150	4,399	4,321	4,822	300
Bismuth, metal		952	1,081	1,114	1,061	423
Cadmium, metal		481	416	347	371	289
Copper:						
Mine output, Cu content		844,369 ^r	874,602 ^r	1,018,155 ^r	1,107,789 ^r	1,118,643
Metal:						
Smelter		320,625	322,188	236,809	306,584	325,788
Refined, primary:						
Electrowon		165,530	173,871	172,118	160,078	157,082
Electrolytic		346,206	333,839	237,719	303,855	260,618
Total		511,736	507,710	409,837	463,933	417,700
Gold: ³						
Mines	kilograms	191,910	187,026	153,863	163,162	156,089
Placers	do.	16,092	15,800	16,373	16,708	26,314
Total	do.	208,002	202,826	170,236	179,870	182,403
Indium	do.	7,000	6,000	5,000	6,000 ^r	2,000
Iron and steel:						
Iron ore and concentrate:						
Gross weight	thousand metric tons	6,810	7,138	7,614	7,823	6,698
Fe content	do.	4,565	4,939	5,186	5,244	4,490
Metal: ^e						
Pig iron	do.	330	330	330	330	330
Sponge iron	do.	80	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		319,368	313,332	329,165	345,109	302,412
Metal		122,079	120,311	116,774	114,259	26,082
Manganese, mine output, Mn content ^e		200	200	200	200	200
Molybdenum, mine output, Mo content		17,325	17,209	16,787	16,721	12,295
Selenium, metal, refined	kilograms	69,820	75,390	60,000	60,000 ^e	61,000
Silver:						
Mine output, Ag content		3,206	3,471	3,501	3,686	3,854
Metal, refined		1,227	1,296	1,203	1,190	445
Tellurium, metal	kilograms	32,880	37,000	35,000	28,000	7,000
Tin:						
Mine output, Sn content		42,145	38,470	39,019	39,037	37,503
Metal ⁴		36,733	40,495	36,004	38,865	34,503
Tungsten, metal ⁵		110	128	366 ^r	456	502
Zinc:						
Mine output, Zn content		1,201,671	1,203,364	1,444,381	1,602,597	1,509,129
Metal		163,603	175,250	162,375	190,324	149,494
C C + + + 1 C+ 11		100,000	1,0,200	. 0=,5 / 5		117,17

See footnotes at end of table.

PERU—2009

$\label{total loss} \mbox{TABLE 1---Continued}$ PERU: PRODUCTION OF MINERAL COMMODITIES 1

(Metric tons unless otherwise specified)

Commodity		2005	2006	2007	2008	2009 ^p
INDUSTRIAL MINERALS						
Barite		5,647 ^r	1,499 ^r	27,368 ^r	45,199 ^r	27,875
Boron materials, crude (borates)		147,461 ^r	r	233,991	349,891	187,221
Cement, hydraulic th	ousand metric tons	4,600	5,782	6,208	6,862	8,100
Chalk		101,000	201,000	334,688	495,717	495,717
Clays:						
Bentonite		19,028 ^r	27,106 r	21,451	31,557	119,495
Fire clay ^e		5,900	6,000	6,000	6,000	6,000
Kaolin		2,567 ^r	5,049 r	4,772 ^r	13,215	9,347
Common clay		1,176,370 ^r	948,617 ^r	2,183,804 ^r	1,720,838 ^r	1,483,771
Diatomite		35,100	35,100	21,603	12,206	9,946
Feldspar		8,876 ^r	9,280 ^r	15,450	13,333 r	5,006
Gypsum, crude		150,000	151,000	334,688	335,000 °	335,000
Lime		215,400	215,500	216,000 r, e	216,000 r, e	216,000 e
Nitrogen, N content of ammonia ^e		5,000	5,000	5,000	5,000	5,000
Phosphate rock:		3,000	3,000	3,000	3,000	3,000
		37,800 ⁶	38,000	38,000	38,000	38,000
Crude, gross weight ^e		*	· · · · · · · · · · · · · · · · · · ·		,	*
P ₂ O ₅ content		14,000	17,075	17,100 r, e	17,100 r, e	17,100 e
Salt, all types		250,000	922,000	1,185,273	1,276,271	1,567,279
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
	ousand metric tons	7,385 6	8,425 r, 6	9,610 r, 6	10,227 ^{r, 6}	10,304 6
Marble		72,510 6	8,842 r, 6	24,513 6	595 ⁶	338 6
Onyx		150	150	150	150	150
Quartz and quartzite (crushed)		40,000	40,000	40,000	123,542 3	124,000
Shell, marl		4,000	4,000	4,000	6,210	6,200
Slate		20,365 r,6	30,110 r, 6	10,844 6	42,436 r, 6	16,440 6
Travertine		33,763 ^{r, 6}	129,805 r,6	284,755 r, 6	231,887 ^{r, 6}	97,586 ⁶
Sand and gravel:						
Stone (construction) th	ousand metric tons	1,815 ^r	1,773 ^r	2,659 ^r	5,798 ^r	5,562
Sand	do.	1,278 ^r	2,042 ^r	2,248 ^r	2,802	3,522
Sulfur, elemental: ^e						
Native		100	100	100	100	100
Byproduct of metallurgy		204,000	204,000	204,000	204,000	204,000
Sulfuric acid, gross weight		623,000	623,000	623,000	623,000	623,000
Talc and related materials:						
Talc		30,317 ^r	20,700 r	23,096 r	17,984	13,296
Pyrophyllite		10,100 ^r	r	r	r	
Total		40,417 ^r	20,700 r	23,096 ^r	17,984 ^r	13,296
MINERAL FUELS AND RELATED MA	TERIALS					
Coal:	-					
Anthracite, run-of-mine		8,837	26,717	227,088	65,506	65,490
Bituminous, run-of-mine		13,415	2,818	52,050	76,515	90,881
Total		22,252	29,535	279,138	142,021	156,371
Coke, all types ^e		10,000	10,000	10,000	10,000	10,000
Natural gas:						-
	nillion cubic meters	1,517	1,775	2,676	3,387 ^r	3,474
Marketed	do.	857	1,003	1,512	1,750	2,003
	d 42-gallon barrels	13,082	13,873	13,417	12,236	27,100
C ftu-tt d -ft-l-l-	<i>S</i>	- ,	- , - , -	- , ,	,	.,

$\label{eq:table_loss} \mbox{TABLE 1---Continued}$ PERU: PRODUCTION OF MINERAL COMMODITIES 1

(Metric tons unless otherwise specified)

Commodity		2005	2006	2007	2008	2009 ^p
MINERAL FUELS AND RELAT	TED MATERIALS—Continued					
Petroleum:						
Crude	thousand 42-gallon barrels	27,641	28,314	28,146	28,027	25,927
Refinery products:						
Liquefied petroleum gas	do.	2,978	2,286	2,363	2,468	2,274
Gasoline, motor	do.	8,968	12,777	13,948	13,355	9,063
Jet fuel	do.	3,874	3,722	4,144	4,416	4,522
Kerosene	do.	2,501	960	818	598	150
Distillate fuel oil	do.	15,287	17,598	19,018	19,519	27,747
Lubricants	do.	271	423	406	326	500
Residual fuel oil	do.	20,740	14,713	14,669	13,874	10,170
Asphalt	do.	1,025	838	930	1,113	1,548
Other ⁷	do.	8,746	6,988	6,701	7,532	5,521
Total	do.	64,390	60,305	62,997	63,201	61,495

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

PERU—2009

¹Table includes data available through October 31, 2010.

²Output reported by Doe Run Resources Corp.

³Peru's placer gold production was reported.

⁴Output reported by Minsur S.A.'s smelter.

⁵Reported figure. Source: Malaga Inc. In November 2005, Malaga purchased Pasto Bueno tungsten mine.

⁶Reported figure. Source: Ministerio de Energía y Minas del Perú.

⁷Includes refinery fuel and losses.

$\label{eq:table 2} \text{PERU: STRUCTURE OF THE MINERAL INDUSTRY IN 2009}$

(Thousand metric tons unless otherwise specified)

Comr	modity	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,	NA
			Lima Department	
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	Cuajone Mine, Moquegua Department	200
		Dodge Overseas Capital Corp., 14%; others, 17.6%)		
Do.		do.	Toquepala Mine, Tacna Department	170
Do.		do.	Cocotea, Simarrona, and Totoral	60
			Mines—electrowon, Tacna Department	
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	Antamina Mine, Huari, Ancash	350
		plc, 33.75%; Xstrata Copper, 33.75%; Teck Cominco Ltd., 22.5%; Mitsubishi Corp., 10%)	Department	
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	60
		•	Andaychagua, Junin Department	
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.,	Yanacocha, La Quinua, and	110,000
		51.35%; Compañía de Minas Buenaventura S.A.A., 43.65%; The World Bank's International Finance Corp., 5%)	Maqui-Maqui Mines, Cajamarca Department	,,,,,
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.			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	Río Caichive, Madre de Dios Department	200

TABLE 2—Continued PERU: STRUCTURE OF THE MINERAL INDUSTRY IN 2009

(Thousand metric tons unless otherwise specified)

Comme	odity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Gold—Continue		Minera Aurífera Retamas S.A. (private, 100%)	Retamas, La Libertad Department	5,500
Do.	do.	Consorcio 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,	6,500
		<i>u</i> , ,	Moquegua Department	,
Iron ore		Shougang Hierro Perú S.A.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.	Refinery at La Oroya, Junin Department	125
Do.		Empresa Minera Los Quenuales S.A.	Izcaycruz, Lima Department	10
Do.		do.	Yauliyacu, Lima Department	15
Do.		Volcan Compañía Minera S.A.A. (private, 100%)	San Cristobal, Mahr Tunel, and	70
			Andaychagua, Junin Department	
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%)	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
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
Natural gas	million cubic meters per day	Pluspetrol Perú Corp. S.A. (Pluspetrol S.A., 36%; Hunt Oil Co., 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	Petrotech del Perú S.A. (Perupetro, 100%)	Onshore Piura Department; northeast and	68,000
1	parrels per day		central jungle areas, Loreto Department	
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 produ	cts do.	Refinería La Pampilla S.A. (RELAPASA)	Refinery La Pampilla, Lima Department	110,000
Do.	do.	Petroperú S.A.	Refineries Talara, Piura Departament	62,000
Do.	do.	do.	Refinery Conchan, Lima Department	15,500
Do.	do.	do.	Refinery Iquitos, Loreto Department	10,500
Do.	do.	do.	Refinery Pucallpa Ucayali Department	3,300
Do.	do.	do.	Refinery El Milagro, Amazonas	
			Department	1,700
Do.	do.	Pluspetrol Norte S.A.	Refinery Shiviyacu, Loreto Department	5,200
Phosphate rock	metric tons	Empresa Minera Regional Grau Bayóvar S.A.	Bayovar phosphate mine, Piura	50
See footnotes at	1 0 11	(Vale S.A., 100%)	Department	

$\label{eq:table 2-Continued}$ PERU: STRUCTURE OF THE MINERAL INDUSTRY IN 2009

(Thousand metric tons unless otherwise specified)

Comr	modity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Silica sand	-	Minera Baribent S.A. (private, 100%)	Maria and Martin Mines, Junin Department	2'
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.	Co. 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%, and Centromin, 17%)	Julcani and Huachocolpa Mines, Huancavelica Department, and 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 Tunel, 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%)	Huanzala 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 Tunel, and Andaychagua, Junin Department	320
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	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.		Votorantim Metais Cajamarquilla S.A. (Grupo Votorantim Metais S.A., 99%, and employees, 1%)	Refinery at Cajamarquilla, Lima Department	130

TABLE 2—Continued PERU: STRUCTURE OF THE MINERAL INDUSTRY IN 2009

(Thousand metric tons unless otherwise specified)

			Annual
Commodity	Major operating companies and major equity owners	Location of main facilities	capacity
Zinc—Continued	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.,	Quiruvilca, La Libertad Department	25
	100%)		
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	60
		Department	
Do.	Empresa Administradora Chungar S.A.C. (private, 100%)	Animon Mine, Cerro de Pasco Department	60

Do., do. Ditto. NA Not available.

 $\label{eq:table 3} \mbox{PERU: RESERVES OF MAJOR MINERALS IN 2009}^1$

(Thousand metric tons unless otherwise specified)

	Commodity		Reserves
Coal, all types			1,100,000
Copper			90,815
Gold		metric tons	1,970 2
Iron ore			12,482
Lead			7,863
Molybdenum			450 e
Natural gas		billion cubic meters	881
Natural gas liquids		million barrels	1,337
Petroleum crude		do.	5,810
Phosphate rock			820
Salt			100,000 e
Silver		metric tons	120,532
Sulfur			150,000 e
Tin			307
Uranium			100 ³
Zinc			22,258

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

¹Sources: 2009 and 2010 "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 2010; U.S. Energy Information Administration, 2010; Perúpetro S.A., 2010; BP Statistical Review of World Energy, June 2009.

²Excludes metal in placer deposits.

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