



2006 Minerals Yearbook

INDONESIA

THE MINERAL INDUSTRY OF INDONESIA

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Indonesia slowly recovered from an earthquake in the central part of the Island of Java in May 2006 that caused more than \$3 billion in damage and losses. The country's gross domestic product (GDP) grew by 5.5% in 2006 compared with 5.6% in 2005. Industrial output contributed 46% of the GDP and grew by 2.6%. The Government introduced three new economic policies in 2006 to improve the health of the financial sector, the infrastructure, and the investment climate. Indonesia's principal mineral resources are bauxite, coal, copper, gold, nickel, oil and gas, silver, and tin. The cement, metal mining, and oil and gas industries were the mainstays of the country's industrial sector. The country was among the top five producers of copper and nickel in the world and its tin output ranked second after China (U.S. Geological Survey, 2007, p. 53, 113, and 173). The country's gas production ranked eighth.

Minerals in the National Economy

Indonesia is one of the mineral-resource-rich countries in southeastern Asia. Development of mineral deposits, together with oil and gas development, has been a vital part of the Government's economic growth plan. The value of mineral output contributed 10% to the country's GDP. The oil and gas sector, including refining, contributed 24% of Government revenues.

Government Policies and Programs

The Government was trying to attract foreign investors to exploit Indonesia's abundant coal and gas reserves to increase revenues, reduce the fuel subsidy, and diversify the country's energy sources away from oil, the production of which was in decline. The Government launched an alternative energy program that was aimed at finding cheap and sustainable sources of energy and promoting the efficient use of energy. Extensive use of natural gas for transportation and in the home and coal for power generation would continue.

In September 2006, the Government authorized coal producers to cease paying a 5% export tax on coal and replaced the export tax with a 10% value-added tax on coal in 2007. The 5% export tax was imposed in October 2005. The Government also eliminated the import taxes levied on capital goods used in the upstream oil and gas sector. The policy change was enacted on October 16, 2006, but was retroactive to July 16, 2006. Goods related to drilling and production, plant and machinery, and many types of equipment were exempted from import tariffs (Indonesia's Trade and Investment News, 2006g).

In August 2006, the Government invited foreign and domestic investors to bid for 41 onshore and offshore oil and gas blocks under production-sharing agreements. These blocks are located in the Natuna area, and in the Provinces of East Kalimantan, Lampung, South Sumatra, West Java, and West Sulawesi. The Government expected to raise \$50 million from the sale of the blocks. Major foreign companies, such as China National

Offshore Oil Co. and PetroChina of China; Total S.A. of France; ENI S.p.A. of Italy; and Chevron Corp., ConocoPhillips Co., and Exxon Mobil Corp. of the United States, were among those considering a bid for the blocks (Miningindo.com, 2006).

In February 2006, the Government announced a new investment package as Presidential Instruction No. 3/2006. The package consisted of policies designed to strengthen investment services; harmonize central and regional regulations; improve customs, excise, and taxation services; create jobs; and support small and medium enterprises (U.S. Department of State, 2007).

Production

The major mineral commodities produced in Indonesia included bauxite, cement, coal, copper, natural gas, nickel, petroleum, and tin. Production of bauxite increased by 39% in 2006 owing to strong demand for alumina. The output of gold also increased by 26% owing to higher-grade ore mined in the underground operations. Iron sand production decreased owing to depleted resources, and steel output declined owing to P.T. Krakatau Steel's aging production facilities. The country was a member of the Organization of the Petroleum Exporting Countries (OPEC) and, in 2006, produced 1.04 million barrels per day (Mbbbl/d) of petroleum and accounted for 1.8% of world output. Indonesia was the leading producer and exporter of liquefied natural gas (LNG) in the world (table 1).

Structure of the Mineral Industry

The Government encouraged the participation of domestic and foreign investors in the mining sector. Thirteen mining projects worth \$98.5 million were brought into production in 2006. The U.S. firms provided a majority of the investment in the oil and gas sector and undertook some of the largest mining projects in Indonesia. Majority state-owned P.T. Antam Tbk produced such metals as aluminum, gold, nickel, silver, and tin. Wholly state-owned P.T. Krakatau Steel, P.T. Pertamina, and P.T. Tambang Batubara Bukit Asam were engaged in the production of steel, oil, and coal, respectively (table 2).

Trade

Indonesia's exports grew significantly in 2006 owing to the world's high demand for such mineral-resource-based export commodities as coal, copper, hydrocarbons, nickel, and tin, in addition to crude palm oil and rubber. Total exports were reported to be \$101 billion, of which minerals (15.7%) and oil and gas (21.2%) were the significant components. Total imports were valued at \$61 billion, of which raw materials and intermediate products, such as petroleum products, accounted for 77%. Owing to a limited refining capacity and growing domestic demand for petroleum products, the country was a net petroleum importer in 2006.

Commodity Review

Metals

Aluminum.—P.T. Antam Tbk was planning to build a second \$250 million alumina plant with a capacity of 600,000 metric tons per year (t/yr) on Bintan Island. Construction was expected to begin at the end of 2007, and commercial production would begin in 2009 (P.T. Antam Tbk, 2006).

Copper.—Asia Gold Corp. of Canada signed a joint-venture and cooperation agreement with P.T. Harita Multi Karya Mineral to explore and develop the Kaputusan porphyry copper-gold project on Bacan Island in Maluku Province. The property was made up of two contiguous exploration leases with a total area of 25,771 hectares (ha). The company earned an 85% equity interest in the joint-venture company. Asia Gold announced that trench sampling results from the Kaputusan prospect expanded the zones of mineralization by 400 meters (m) in the North Zone and by 150 m in the South Zone. The results continued to increase the north-south extent of the mineralization to 1.8 kilometers (km). The host rock was potassic and propylitically altered tonalite. A 3,000-m diamond drilling program to test the North, South, and West Zones was planned to begin in February 2007 (Asia Gold Corp., 2006).

Kalimantan Gold Corp. Ltd. signed an agreement with Oxiana Ltd. of Australia to explore the Kalimantan Surya Kencana contract-of-work area for copper-gold porphyry prospects in Central Kalimantan Province. Kalimantan Gold held a 75% interest in the contract of work with exploration rights for an area of 941 square kilometers (km²). P.T. Pancaran Cahaya Kahayan held the remaining 25% stake. Three key porphyry copper-gold prospects were Baroi, Beruang, and Mansur. Oxiana would fund expenditures of \$2.5 million for a program of data compilation, review, reprocessing, and assessment followed by drill testing. The company also could fund expenditures to earn a 40% equity interest in the project at the completion of a prefeasibility study and 66.67% at the completion of a bankable feasibility study. After that point, both parties would contribute to future expenditures in accordance with their percentage interests (Kalimantan Gold Corp. Ltd., 2006).

Freeport-McMoRan Copper & Gold Inc. of the United States reported that a new mining plan at Grasberg for 2006-10 could result in significantly lower production owing to the deferral of mining of certain high-grade ore from 2007 and 2008 to future years. This decline was expected to be partially offset by an expansion of the underground operations that would accelerate high-grade ore development from the underground part of the mine (Metals Insider, 2006). Mitsubishi Materials Corp. suspended operations at the Gresik copper smelter because of troubles with oxygen supplies for the plant. The suspension could free up 150,000 metric tons (t) of copper concentrate to the market but would do little to solve the shortages in concentrate supplies. The smelter was owned by Mitsubishi Materials (60.5%), Freeport-McMoRan (25%), and others (14.5%).

Newmont Mining Corp. of the United States and other foreign owners of the Batu Hijau copper and gold mine, including Sumitomo Corp. of Japan, sold a combined 3% stake in the

mine to P.T. Trakindo Utama for \$100 million. Foreign interests owned 80% of the mine; one of these interests—Newmont Mining—held a 45% stake.

Gold.—Avocet Mining plc of the United Kingdom obtained positive trenching results and continued trench sampling at the Mangkaluku project in South Sulawesi Province to extend the gold mineralization trench exposures in three zones of sheeted veins hosted by a phyllic-altered, metamorphosed, monzodiorite intrusion. The most significant zones struck east-northeast for a distance of 600 m and a width of up to 200 m and north-northeast for a distance of 500 m and a width of up to 100 m (Indonesia's Trade and Investment News, 2006c).

Iron and Steel.—P.T. Krakatau Steel was in negotiations with Al Tuwairqi of Saudi Arabia regarding plans to build a \$450 million iron ore pellet plant in South Kalimantan Province, which was rich in iron ore. Al Tuwairqi wanted a majority stake in the project. Construction of the pellet plant would begin in 2007 (Indonesia's Trade and Investment News, 2006k). Meanwhile, P.T. Essar Indonesia of India was interested in developing a \$500 million pellet plant also in South Kalimantan Province; the plant would have a production capacity of 2 million metric tons per year (Mt/yr). Local P.T. Gunung Garuda also planned to invest in the pellet producing industry (Antara News, 2006d).

P.T. Blue Scope Steel Indonesia, which was a subsidiary of Blue Scope Steel of Australia, planned to construct a steel plant in Cilegon, Banten Province, at a cost of \$101.1 million to produce 90,000 t/yr of metal-coated steel and 55,000 t/yr of color-coated steel. The plant would start operating in 2008. Another subsidiary, P.T. Blue Scope Lysaght Indonesia, planned to build a steel plant in Cibitung, West Java Province, at a cost of \$3.9 million to produce 4,500 t/yr of rollformers-coated steel and 8,500 t/yr of welded steel mesh. In addition, P.T. International Steel Indonesia, which was a joint venture between Daewoo Group (51%) of the Republic of Korea and a local Indonesian company (49%), planned to build a steel plant at an undetermined location at a cost of \$10 million. The plant would have a production capacity of 240,000 t/yr of steel. Startup was expected in July 2006 (Steel Times International, 2006).

Indonesia's steel consumption was estimated to be 3.5 Mt/yr, and the country imported 1 Mt/yr of steel. Domestic output totaled only 2.5 Mt/yr, of which Krakatau Steel produced 2 Mt/yr.

Nickel.—Rio Tinto Group of the United Kingdom planned to invest \$1 billion to develop a nickel mine on Sulawesi Island; the mine was expected to produce 46,000 t/yr of nickel and employ 5,000 workers. Eramet SA of France announced that it would invest \$1.5 billion in a nickel mining project in Halmahera, North Maluku Province (Jakartapost.com, 2006d).

P.T. Antam Tbk produced 13,000 to 14,000 t of ferronickel in 2006, which was less than its 20,000-t target, owing to the shutdown of the third smelter in July for repairs. The Pomalaa smelter was reopened in mid-October. The plant was expected to produce 20,000 to 22,000 t in 2007. The third smelter had a capacity of 15,000 t/yr (Indonesia's Trade and Investment News, 2006a).

Tin.—P.T. Timah's output of refined tin in 2006 totaled 42,040 t, which was above its target of 38,407 t, because of the increased supply of tin ore from informal miners. The company

bought tin ore from these miners who exploited Timah's areas on Bangka and Belitung Islands but were not licensed to do so. Indonesia exported 123,500 t of refined tin, of which 35% came from Timah (Antara News, 2006i). Timah discovered 5,000 t of tin reserves with a content of 0.385 kilograms per square meter on the Riau Islands.

Zirconium.—Olympia Resources Ltd., through its 90% owned P.T. Olympia Resources Indonesia, signed agreements covering 2,913 ha to explore three zircon tenements in the Kasongan and the Tumbangsamaba areas on Kalimantan Island. The heavy mineral sands contained a very large amount of zircon compared with conventional sand deposits. Zircon was associated with gold, ilmenite, kyanite, and rutile. Phase 1 of the project was to supply China with 35,000 t/yr of zircon concentrate that would be sourced from local mines. The company also signed agreements with two Chinese companies to supply 50,000 t/yr of zircon concentrate from Olympia Resources' own mine and processing plant in Indonesia during the next 10 years. The company aimed to supply 100,000 t/yr of zircon concentrate eventually (Industrial Minerals, 2006).

Industrial Minerals

Cement.—Semen Gresik Group planned to increase its sales of cement on the domestic market and to reduce its exports. The Group comprised P.T. Semen Gresik, P.T. Semen Padang, and P.T. Semen Tonasa. The Group supplied 45% of the total domestic demand of 40 Mt/yr. Demand for cement was expected to increase inline with the Government's plan to construct a 1,000-km toll road that would connect the cities of Jakarta and Surabaya. The country's total production capacity of cement was about 47 Mt/yr. P.T. Semen Gresik planned to begin construction of a new cement plant on Java Island in 2007 at a cost of \$312 million; the plant was expected to be completed in 2011. The plant would have a capacity of 2.5 Mt/yr of cement, which would increase the company's total capacity to about 16 Mt/yr. P.T. Semen Gresik decided to postpone construction of a new cement plant at Tuban in East Java Province because it needed shareholders' approval for funding of the project and the company had overproduced cement in 2006 (Antara News, 2006j).

Diamond.—BDI Mining Corp. reported continuing progress at its Cempaka alluvial diamond mine, which is located 30 km from Banjarsmin in the southeastern part of Kalimantan Island. Mining of the Danau Seran channel, which is the smaller northern tributary to the Cempaka main channel, achieved steady production with an average monthly recovery of 3,500 to 4,000 carats of diamond. The production could be expanded with an investment of \$1.5 million to 7,000 to 8,000 carats per month. Commercial-scale mining began in 2005. Cempaka was the only diamond mine in Indonesia and in Southeast Asia. The company had a 30-year seventh-generation contract of work that covered an area of 8,000 ha. BDI Mining owned 80% of the project and the Government owned 20% through P.T. Antam Tbk (BDI Mining Corp., 2006).

Fertilizers.—P.T. Pupuk Kujang opened its second fertilizer plant at Cikampek in West Java in April 2006. The plant had a production capacity of 330,000 t/yr of ammonia and

570,000 t/yr of urea, and its opening increased the company's total urea output to 1.14 Mt/yr. Urea demand in West Java was estimated to be 800,000 t/yr. The plant was built with an investment of \$296 million, of which 78% was financed by loans from the Japan Bank for International Cooperation (JakartaPost.com, 2006c).

Mineral Fuels

Coal.—The Government estimated that the country had more than 19 billion metric tons of coal resources. About 60% of the coal could be used for power generation. Indonesia produced 153.4 million metric tons (Mt) of bituminous coal in 2006 and its output was expected to grow to 185 Mt in 2007. Coal exports were about 110 Mt in 2006 and were expected to increase to 130 Mt in 2007 because of greater demand. About 70% of the country's coal output was exported. Hong Kong, Japan, the Republic of Korea, and Taiwan were the destinations (Antara News, 2006e).

BHP Billiton Ltd. of Australia planned to start coal mining in the Haju block in Central Kalimantan Province in 2007 with initial production of 700,000 t/yr. The company had spent \$40 million on developing the mine. The Haju block covered a total area of 4,787 ha.

Kobe Steel Ltd. of Japan and P.T. Arutmin Indonesia signed an agreement to develop an upgraded brown coal plant to be located in Asam-Asam in South Kalimantan Province at a cost of \$68 million. The new technology would enable the upgrade of low-calorie coal of less than 5,100 kilocalories per kilogram (kcal/kg) to a level of more than 6,000 kcal/kg. The high-calorie coal would be mainly for the export market, including Japan. The plant was expected to go into full production by mid-2009 (Indonesia's Trade and Investment News, 2006b).

Churchill Mining plc of the United Kingdom acquired the Sendawar thermal coal project on Kalimantan Island from P.T. Indonesia Coal Development. The Kalimantan coal province had low ash, low sulfur, and high energy thermal coal. Ground resistivity and drilling programs continued in 2006. The project covered more than 1,000 km² of prospective ground. The company drilled 30 of the 64 holes planned for the second round of drilling. Churchill Mining also signed an agreement with P.T. Techo Coal Utama to undertake due diligence work on a thermal coal project at Easy Kutai on Kalimantan Island. The project covered an area of approximately 400 km². Two rigs were sent to the property to test coal seam outcrops ranging from 2 m to 7 m thick that are hosted in a sequence of Tertiary sediments and to begin a 10- to 15-hole 1,000-m verification drilling program (Churchill Mining plc, 2007).

Straits Asia Resources Ltd. of Australia secured the Government's approval to expand the company's coal mining concession area in Sebuku. The company planned to explore an additional 6,500-ha area adjacent to its present coal mines in Sebuku. The new area was estimated to contain 31.5 Mt of coal, which would boost the company's total coal resources to 102.5 Mt (Indonesia's Trade and Investment News, 2006n).

Essel Mining and Industries Ltd., which was a subsidiary of Aditya Birla Group of India, was looking to acquire wholly or partially a coal mine in Indonesia for which it planned to spend

\$80 million to \$150 million. This could be a coking coal mine or a thermal coal mine (Indonesia's Trade and Investment News, 2006f). Meanwhile, an Indonesian investor in P.T. Berau Coal spent \$279 million to buy out four other owners of the company to boost the investor's stake to 90% from more than 9%. Japan's Sojitz retained the remaining 10% stake. P.T. Berau Coal had a production capacity of 13 Mt/yr of coal; its output was mainly for export to China, Hong Kong, and India (Indonesia's Trade and Investment News, 2006i).

P.T. Bumi Resources was seeking new buyers for its two coal mining units so it would become solely an oil and gas company. The company had a 95% stake in P.T. Kaltim Prima Coal, which produced 36 Mt of coal in 2006, and a 100% stake in P.T. Arutmin Indonesia, which produced 10 Mt in the same year. Their combined output accounted for 37% of Indonesia's coal production. Earlier in 2006, the company canceled a \$3.2 billion deal to sell the two units to a consortium of companies led by P.T. Renaissance Capital (Antara News, 2006b).

State coal company P.T. Tambang Batubara Bukit Asam planned to start building two coal-fired powerplants in South Sumatra Province. The company would build a 200-MW powerplant in Lahat Regency, which was expected to be completed by 2009, and a 2,400-MW powerplant in Muara Enim Regency, which was expected to be completed by 2010.

PLN short-listed 15 mining firms in the first stage of a selection process to secure a coal supply of 40 Mt/yr for its power-capacity expansion plan. PLN aimed to build 24 new coal-fired powerplants at a cost of \$5.7 billion to raise its installed capacity by 10,000 MW by 2009. Ten of these plants with a combined capacity of 7,140 MW would be located on Java Island (Antara News, 2006h).

PLN signed a memorandum of understanding with a consortium led by AES Transpower Ltd. of the United States and including Sojitz of Japan and local company P.T. Triaryani for a \$2 billion 1,200-MW coal-fired powerplant to be built in South Sumatra Province. The consortium would be responsible for supplying the coal and building the powerplant. Power generated by the plant would be purchased by PLN. Construction of the project was expected to take 3 years (Antara News, 2006f).

Natural Gas.—State gas company P.T. PGN reduced its gas supply in East Java Province by 2.3 million cubic meters per day from the normal 3.8 million cubic meters per day following an explosion of state oil and gas company P.T. Pertamina's gas pipeline. P.T. Pertamina's East Java gas pipeline had carried 2.3 million cubic meters per day from its Santos station to P.T. PGN and 1.4 million cubic meters per day from its Kangean station to P.T. Petrokimia Gresik. The supply of 1.5 million cubic meters per day from Kodeco and Lapindo Brantas to P.T. PGN was not affected by the explosion. As a result, P.T. Petrokimia Gresik temporarily ceased its fertilizer production as its gas supply had been cut (Antara News, 2006g).

ExxonMobil planned to drill and develop the D-Alpha Gasfield in the Natuna Sea off the west coast of Kalimantan Island in 2008; the gasfield held an estimated gas reserve of 1.3 trillion cubic meters, and was the largest such field in Southeast Asia. Because the field had high carbon dioxide content, the production cost was expected to be high. The

company had a 76% interest in the field, and P.T. Pertamina held the remaining 24% (Jakartapost.com, 2006b).

Santos Ltd. of Australia started production at its \$75 million Maleo Gasfield, which is located 140 km east of Surabaya in East Java Province, in the Madura offshore production-sharing contract area. Gas would be delivered to P.T. Perusahaan Gas Negara under a contract signed in May 2005. The field was estimated to contain 6.8 billion cubic meters of gas reserves with a production life of 8 to 10 years. Gas would be supplied at a rate of 3.1 million cubic meters per day for 5 years. Santos had a 67.5% interest and was the operator. Its partners were Petrolim Nasional Berhad (Petronas) of Malaysia (22.5%) and P.T. Panta Madura (10%) (Antara News, 2006a).

P.T. Energi Mega Persada began producing gas from the Baru and the West Baru wells in Riau Province; output was supplied to state power company P.T. PLN. Energi Mega's wholly owned company Kalila Ltd. held a 100% working interest in and was the operator of the Korinci project. Energi Mega signed a gas sales and purchase agreement with P.T. PLN to supply 0.85 million cubic meters per day of gas for 15 years (Indonesia's Trade and Investment News, 2006e).

Indonesia was to supply 2.6 Mt/yr of LNG from the Tangguh project, which was operated by BP p.l.c., to a terminal in China's Fujian Province for a period of 25 years beginning in 2009. P.T. Pertamina was in talks with Mitsubishi Corp. of Japan and P.T. Medco Energi International to build a \$600 million LNG plant with a capacity of between 2 Mt/yr and 2.5 Mt/yr on Sulawesi Island. The plant would tap the companies' combined gas reserves of 68 billion cubic meters on Sulawesi Island. Production was to begin in 2010 and the LNG was expected to be exported to Japan. The Government decided to convert the gas-fired generators powering its Bontang LNG plant in East Kalimantan Province into coal-fired ones. The \$600 million conversion project for the 16 power units, each of which had a capacity of 12.5 megawatts (MW), was expected to be completed by 2009. The conversion would save 6.2 million cubic meters per day of gas, which is equivalent to 33 LNG cargoes per year (Indonesia's Trade and Investment News, 2006d).

Petroleum.—To increase Indonesia's oil and gas production, P.T. Pertamina and Statoil ASA of Norway, which had expertise in deep-sea exploration, planned to establish a joint venture to explore crude oil in the Makassar Strait and the southern part of Java Island.

The Government announced that 22 new wells with a combined reserve of 1.2 billion barrels of crude oil had been discovered in 2006. Owing to its inadequate system of extraction, Indonesia was the only member of the OPEC to be a net importer of petroleum. The country produced 857,000 barrels per day (bbl/d) of petroleum from more than 1,000 wells (Alexander's Gas & Oil Connections, 2007).

Genting Oil & Gas Ltd. of Malaysia discovered crude oil in two exploration wells in Indonesia's West Natuna area. The first test on the wells produced crude oil at a flow rate of 525 bbl/d, and the second test produced oil at a flow rate of 1,210 bbl/d. Further evaluation would be undertaken to determine the size of the find and the development potential (Indonesia's Trade and Investment News, 2006i).

Partners in the Sampang production-sharing contract offshore the Province of East Java discovered gas at Jeruk, which is located 7 km west of the Oyong oilfield and gasfield. The Wortel-1 near-field exploration well encountered a gross gas column of 141 m in a good quality reservoir. Santos (the operator) had a 40.5% stake, and the remaining equity was distributed among Singapore Petroleum Corp. (36%), Cue Energy (13.5%), and Petrogas Oyong Jatim (10%). The Government urged Santos to keep developing its Jeruk Field offshore East Java Province despite lower reserve forecasts as the country was in need of additional crude oil production. Based on the Jeruk-3 appraisal well, recoverable crude oil resources were estimated to be less than 50 million barrels (Mbbbl), which was significantly smaller than a previous forecast of 170 Mbbbl. Indonesia was the OPEC's second smallest oil producer after Qatar and was struggling to maintain its output after failing to discover new oilfields. The Oyong Field was expected to produce between 8,000 bbl/d and 10,000 bbl/d of crude oil in 2007 and up to 1.7 million cubic meters per day of gas in 2008 (Indonesia Investment Coordinating Board, 2006).

Indonesia signed five production-sharing contracts with foreign petroleum companies in September in a bid to boost crude oil production. A contract with ExxonMobil covered 5,339 km² of the offshore Surumana block in the Makassar Strait, and a contract with ConocoPhillips covered 9,469 km² of the Amborip VI block in the Arafura Sea. The Government also signed a contract with Petronas for 4,139 km² of the offshore Lampung II block in the southern part of Sumatra Island, and with Husky Energy Inc. of Canada for 4,254 km² of the offshore East Bawean II Block in East Java Province. A contract was signed with Marathon Oil Corp. of the United States and Talisman Energy Inc. of Canada to cover 4,700 km² of the offshore Pasang Kayu Block in the Makassar Strait (Indonesia's Trade and Investment News, 2006h).

ExxonMobil Oil Indonesia planned to speed up development of the Cepu Block with the Government's request to start production in 2008. The company was the operator of the block, which straddled the border of Central Java and East Java Provinces. The \$2.6 billion field had an estimated 600 Mbbbl of oil and 48 billion cubic meters of gas. The company was awarded a 30-year contract until 2035. At its peak output, the field could produce 165,000 bbl/d, which was equivalent to 20% of Indonesia's annual production of crude oil (JakartaPost.com, 2006a).

P.T. Pertamina, through its subsidiary P.T. Pertamina Eksplorasi dan Produksi, planned to boost oil output by 1,000 bbl/d in 2007. Additional production was expected to come from 41 fields to be operated by contractors. P.T. Chevron Pacific Indonesia expected its crude oil and gas production to decrease to 555,000 bbl/d in 2007 from 610,000 bbl/d in 2006 because of depleted oilfields and gasfields, even though there was an additional output of 15,000 bbl/d from the Duri Field in Riau Province. The company expected additional production from its oilfields and gasfields in East Kalimantan Province in 2009. Chevron Pacific Indonesia was currently exploring and producing crude oil and gas from 88 fields in 4 blocks in North Sumatra and Riau Provinces (Antara News, 2006c).

Several Japanese companies (Chiyoda and Toyo Engineering, Marubeni Corp., and Sumitomo Corp.) were interested in participating in a new \$4 billion 300,000-bbl/d refinery project on Java Island operated by P.T. Pertamina's subsidiary P.T. Elnusa. Venezuela would provide 150,000 bbl/d of crude oil feedstock for the refinery, and Iran, 150,000 bbl/d. About 70% of the refinery's output would be exported and 30% would be allocated to the local market. The refinery would begin operating in 2010 (Indonesia's Trade and Investment News, 2006j).

P.T. Pertamina planned to increase the capacity of its petroleum refinery by 5% (53,000 bbl/d) in 2007 from the 1.06 Mbbbl/d currently produced. The increase in capacity could enable the company to reduce Indonesia's fuel imports by 30,000 bbl/d. The company planned to increase its petroleum refining capacity by 20% in 2012 with an investment of \$11 billion for the expansion (Indonesia's Trade and Investment News, 2006m).

Outlook

The Indonesian economy is expected to continue to grow at a slow pace. Although Indonesia's share of global mineral exploration spending dropped to 1% in 2006, the country's prospects for the discovery of mineral deposits are expected to remain high in the future. The Government started 110 infrastructure projects valued at \$16.5 billion in 2006, and this activity is expected to encourage more investment in mining. With the help and investment of foreign companies, Indonesia is expected to increase petroleum exploration, development, and production. New oil discoveries are expected to be made, new oilfields to be developed, and increased output under the production-sharing contracts to be launched in the next 2 to 3 years. Indonesia will continue to exploit its vast resources of bituminous coal, and the country is expected to build more coal-fired powerplants and generate more electricity.

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TABLE I
INDONESIA: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons unless otherwise specified)

Commodity	2002	2003	2004	2005	2006	
METALS						
Aluminum:						
Bauxite, wet basis, gross weight	thousand metric tons	1,283	1,263	1,331	1,082 ^r	1,502
Metal, primary		160,000 ^e	200,000 ^e	247,000	252,300 ^r	250,300
Chromite sand, dry basis ^c		1,000	1,000	1,000	1,000	1,000
Copper:						
Mine, Cu content		1,171,726	1,005,837	840,318	1,064,200 ^r	793,000
Metal						
Smelter, primary		211,200	247,400	211,600	275,000	201,200
Refinery, primary		192,400	223,300	210,500	262,900	217,600
Gold, mine output, Au content ²	kilograms	142,238	141,019	91,710	130,620	164,400
Iron and steel:						
Iron sand, dry basis		378,376	245,409	89,664	32,203 ^r	10,963
Metal:						
Ferroalloys:						
Ferronickel		42,306	43,894	39,538	36,690	32,445
Ferromanganese ^c		12,000	12,000	12,000	12,000	12,000
Silicomanganese ^c		7,000	7,000	7,000	4,000	5,000
Pig iron, direct reduced iron	thousand metric tons	1,500 ^r	1,230 ^r	1,470 ^r	1,390 ^r	1,290
Steel, crude	do.	2,462	2,042	3,682	3,675	2,500
Nickel:						
Mine output, Ni content ³		143,000 ^r	144,000 ^r	136,000 ^r	135,000 ^r	140,000
Matte, Ni content		59,500	70,200	81,120	77,471 ^r	72,782
Ferronickel, Ni content		8,804 ^r	8,933	7,945	7,003 ^r	6,489
Silver, mine output, Ag content	kilograms	293,520	285,206	261,960	328,749 ^r	327,557
Tin:						
Mine output, Sn content		88,142	71,694	65,772	78,404 ^r	80,933
Metal ⁴		67,455	66,284	49,872	65,300	63,200
Zirconium concentrates, gross weight		250	250	200	200	200
INDUSTRIAL MINERALS						
Cement, hydraulic	thousand metric tons	34,600 ^r	35,500 ^r	33,230	33,917	34,000
Clays:^c						
Bentonite		5,000	5,000	5,000	5,000	5,500
Fire clay	thousand metric tons	1,900	1,900	1,900	2,000	2,000
Kaolin powder		15,000	15,000	15,000	15,000	15,000
Diamond:^c						
Industrial stones	thousand carats	23	23	23	23	23
Gem	do.	7	7	7	7	7
Total	do.	30	30	30	30	30
Feldspar ^c		24,000	24,000	24,000	24,000	25,000
Gypsum ^c		6,000	6,000	6,000	6,000	6,000
Iodine ^c		75	75	75	75	75
Nitrogen, N content of ammonia	thousand metric tons	4,200	4,250	4,120	4,400 ^e	4,300 ^e
Phosphate rock ^c		600	600	600	600	600
Salt, all types ^c	thousand metric tons	680	680	680	680	700
Stone:						
Dolomite ^c		3,100	3,100	3,100	3,100	3,200
Granite	thousand metric tons	4,966	3,939	3,340	4,170	4,200
Limestone ^c	cubic meters	16,500	16,000	16,000	16,500	16,000
Marble ^c	do.	1,000	1,000	1,000	1,000	1,000
Quartz sand and silica stone ^c	do.	145,000	150,000	150,000	150,000	155,000
Sulfur, elemental ^c		73,500	78,500	83,500	83,000	82,000
Zeolite ^c		400	400	400	400	400

See footnotes at end of table.

TABLE 1--Continued
INDONESIA: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons unless otherwise specified)

Commodity	2002	2003	2004	2005	2006
MINERAL FUELS AND RELATED MATERIALS					
Coal:					
Anthracite ^c	42,690 ⁵	50,000	50,000	50,000	52,000
Bituminous	103,329	114,000 ^c	131,530	142,920	153,400
Gas, natural:					
Gross	85,959	89,324	83,740	85,830	86,000
Marketed ^c	51,000	54,000	52,000	53,000	52,000
Petroleum, crude including condensate	432,000	413,000	362,000	352,000	340,000

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

¹Table includes data available through September 6, 2007.

²Includes Au content of copper ore and output by Government-controlled foreign contractors' operations. Gold output by operators of so-called people's mines and illegal small-scale mines is not available but may be as much as 20 metric tons per year.

³Includes a small amount of cobalt that was not recovered separately.

⁴Output by Central Government-controlled foreign contractors operations. Tin output from small tin smelters is not available but may be as much as 40,000 metric tons per year.

⁵Reported figure.

TABLE 2
INDONESIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2006

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Locations of main facilities	Annual capacity ^e
Aluminum:			
Bauxite	PT Antam Tbk (Government, 65%)	Kijang, Bintan Island, Riau	1,300
Metal	PT Indonesia Asahan Aluminium (Nippon Asahan Aluminium Co. Ltd. of Japan, 59%, and Government, 41%)	Kual Tanjung, North Sumatra	250
Cement	PT Indocement Tunggak Prakarsa Tbk	Cirebon and Citeureup, West Java; Tarjun, South Kalimantan	15,600
Do.	PT Semen Andalas Indonesia	Aceh Besar	1,400
Do.	PT Semen Baturaja (Persero)	Baturaja-Ogan Komering Ulu, South Sumatra	1,250
Do.	PT Semen Bosowa Maros	Kabupaten Maros, Sulawesi Selatan	1,800
Do.	PT Holcim Tbk (former known as PT Semen Cibinong)	Narogong, East Java	9,700
Do.	PT Semen Gresik (Persero) Tbk	Gresik and Tubar, East Java	8,200
Do.	PT Semen Padang (Persero)	West Sumatra	5,440
Do.	PT Semen Tonasa (Persero)	Pangkep, Sulawesi Selatan	3,480
Coal	PT Adaro Indonesia (New Hope Corp, 50%; PT Asminco Bara Utama, 40%; Mission Energy, 10%)	Paringin and Tutupan, South Kalimantan	22,000
Do.	PT Arutmin Indonesia (PT Bumi Resources Tbk, 80%, and Bakrie Group, 20%)	Mulia, Senakin, and Satui, South Kalimantan	11,000
Do.	PT Berau Coal (PT United Tractor, 60%; PT Armadian, 30%; Nissho Iwai, 10%)	Berau, East Kalimantan	13,000
Do.	PT Kaltim Prima Coal Co. (PT Bumi Resources Tbk, 100%)	East Kutai Regency, East Kalimantan	36,000
Do.	PT Kideco Jaya Agung (Samtan Co. Ltd. of the Republic of Korea, 100%)	Pasir, East Kalimantan	12,000
Do.	PT Tambang Batubara Bukit Asam (state-owned)	Tanjung Enim and Ombilin, South Sumatra	19,000
Copper:			
Concentrate	PT Freeport Indonesia Co. (Freeport-McMoRan Copper & Gold Inc. of the United States, 81.28%; Government, 9.36%; others, 9.36%)	Ertzberg and Grasberg, Papua	800
Do.	PT Newmont Nusa Tenggara (Newmont Gold Mining Co. of the United States, 45%; Sumitomo Corp., 35%; PT Pukuafu Indah, 20%)	Sumbawa Island, West Nusa Tenggara	300
Metal	PT Smelting Co. (Mitsubishi Materials Corp., 60.5%; PT Freeport Indonesia Co., 25%; others, 14.5%)	Gresik, East Java	210
Gas:			
Natural	ExxonMobil Oil Indonesia	Arun and Aceh, North Sumatra	1,700
Do.	Roy M. Huffington (subsidiary of HUFFCO Group of the United States)	Badak, East Kalimantan	1,000
Do.	Total Indonesia	Offshore, East Kalimantan	2,100
Liquefied	PT Arun LNG Co. Ltd. (Government, 55%; Mobil Oil, 30%; Japan Indonesia LNG Co., 15%)	Balang Lancang and Aceh, North Sumatra	10,000
Do.	PT Badak LNG Co. Ltd. (Government, 55%; HUFFCO Group, 30%; Japan Indonesia LNG Co., 15%)	Bontang, East Kalimantan	7,900
Gold	Aurora Gold Ltd. (100%)	Balikpapan, Central Kalimantan	60
Do.	PT Antam Tbk (Government, 65%)	Bogor, West Java	3
Do.	PT Freeport Indonesia Co. (Freeport-McMoRan Copper & Gold Inc. of the United States, 81.28%; Government, 9.36%; others, 9.36%)	Ertzberg and Grasberg, Papua	110
Do.	PT Newmont Nusa Tenggara (Newmont Gold Mining Co. of the United States, 45%; Sumitomo Corp., 35%; PT Pukuafu Indah, 20%)	Sumbawa Island, West Nusa Tenggara	16
Do.	PT Nusa Halmahera (PT Aneka Tambang Tbk, 17.5%, and PT Newcrest Mining Ltd. 82.5%)	Halmahera Island, Maluku	24
Do.	PT Prima Lirang Mining (Billiton BV of the Netherlands, 90%, and PT Prima Maluku Indah of Indonesia, 10%)	Lerokis, Wetar Island	3

See footnote at end of table.

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

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Locations of main facilities	Annual capacity ^c
Nickel:			
In ore	PT Antam Tbk (Government, 65%)	Pomalaa, South Sulawesi and on Gebe Island	80
Do.	PT International Nickel Indonesia Tbk (Inco Ltd. of Canada, 59%; Sumitomo Metal Mining Co. Ltd. of Japan, 20%; others, 21%)	Soroako, South Sulawesi	70
In matte	PT Antam Tbk (Government, 65%)	Pomalaa, South Sulawesi	24
Do.	PT International Nickel Indonesia (Inco Ltd. of Canada, 59%; Sumitomo Metal Mining Co. Ltd. of Japan, 20%; others, 21%)	Soroako, South Sulawesi	68
Nitrogen	PT Aseah-Aech Fertilizer (Government, 60%, and other members of the Association of Southeast Asian Nations, 40%)	Lhokseumawe, North Sumatra	506
Do.	PT Pupuk Iskandar Muda (Government, 100%)	do.	506
Do.	PT Pupuk Kalimantan Timur (Government, 100%)	Bontang, East Kalimantan	1,010
Do.	PT Pupuk Kujang	Cikampek, West Java	330
Do.	PT Pupuk Sriwijawa (Government, 100%)	Palembang, South Sumatra	1,440
Petroleum, crude thousand barrels per day	Atlantic Richfield Indonesia, Inc. (subsidiary of Arco Co. of the United States)	Arjuna and Arimbi, offshore West Java	170
Do.	China National Offshore Oil Co.	Off of southeast Sumatra	100
Do.	Maxus Southeast Asia Ltd. (subsidiary of Maxus Energy of the United States)	Cinta and Rama, offshore Southeast Sumatra	95
Do.	P.T. Pertamina (Government, 100%)	Jatibarang, West Java, and Bunyu, offshore East Kalimantan	80
Do.	PT Caltex Pacific Indonesia (Texaco Inc., 50%, and Chevron Corp., 50%, both of the United States)	Minas, Duri, and Bangko, central Sumatra	700
Do.	Total Indonesia (subsidiary of Compagnie Francaise des Petroles of France)	Handi and Bakapai onshore and offshore East Kalimantan	180
Silver	PT Antam Tbk (Government, 65%)	Bogor, West Java	25
Do.	PT Freeport Indonesia Co. (Freeport-McMoRan Copper & Gold Inc. of the United States, 81.28%; Government, 9.36%; others, 9.36%)	Ertzberg and Grasberg, Papua	220
Do.	PT Kelian Equatorial Mining (Rio Tinto Group, 90%; PT Harita Jaya Raya, 10%)	180 kilometers west of Samarinda	10
Steel, crude	PT Ispat Indo	Sidoarjo, Surabaya	700
Do.	PT Krakatau Steel (Government, 100%)	Cilegon, West Java	2,400
Do.	PT Komatsu Indonesia Tbk	Jakarta	8
Do.	PT Wahana Garuda Lestari	Pulogadung, Jakarta	410
Tin:			
In ore	PT Koba Tin (Malaysia Smelting Corp., 75%, and PT Tambang Timah Tbk, 25%)	Koba, Bangka Island	25
Do.	PT Tambang Timah Tbk (Government, 65%)	Onshore and offshore islands of Bangka, Belitung, and Singkep	60
Metal	Mentok Tin Smelter (PT Tambang Timah Tbk)	Mentok, Bangka Island, South Sumatra	68
Do.	Koba Tin Smelter (PT Koba Tin)	Koba, Bangka Island, South Sumatra	25

^cEstimated; estimated data are rounded to no more than three significant digits.