



# 2007 Minerals Yearbook

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## INDONESIA

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# THE MINERAL INDUSTRY OF INDONESIA

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Indonesia possesses some of the world's largest resources of coal, gold, and nickel and has globally significant resources of such other mineral commodities as bauxite, copper, silver, and tin. It was ranked among the top 10 global producers of copper, gold, and nickel. Its tin output was ranked second in the world after China (U.S. Geological Survey, 2008). The country was one of the world's leading liquefied natural gas (LNG) exporters after Qatar and one of Asia's main natural gas suppliers. Its natural gas production was ranked 10th in the world. Indonesia also exported thermal coal. However, the country continued to be a net oil importer in 2007.

Exploration spending in Indonesia increased considerably to \$94.6 million, which accounted for 22% of the Pacific and Southeast Asia region's expenditures for hard rock minerals in 2007, compared with \$59.9 million in 2006, which accounted for 21%. In some areas, small-scale mining operations continued without Government sanction whereas some Provincial governments levied illegal taxes on mining projects. The uncertainty of who was in control of Indonesia's mineral wealth deterred local and foreign investors. As a result, mining companies kept potentially large projects on hold, such as United Kingdom-based Rio Tinto plc's nickel mine and Australia-based BHP Billiton Ltd.'s coal mines. The Government tried to resolve a prolonged deadlock between PT Pertamina of Indonesia and Exxon Mobil Corp. of the United States to develop the \$2 billion Cepu Oilfield on Java Island (Wilburn, 2007, 2008).

## Minerals in the National Economy

The country's industrial output accounted for 46.7% of its gross domestic product (GDP). Indonesia's cement, metal mining, and oil and gas industries were the mainstays of the country's industrial sector. The development of minerals and oil and gas continued to be a vital part of the Government's economic growth plan. The value of mineral production accounted for 9.1% of the country's GDP. Exports of coal and natural gas contributed 20% of the Government revenues. The trade balance from oil and gas amounted to \$156 million in 2007 (Ministry of Industry, 2008).

## Government Policies and Programs

A new law regarding minerals and coal was discussed by the House of Representatives and enacted at the end of March 2007. This law will replace law No. 11/1967 regarding the main provisions of general mining. The new law also affects relations between the Government and the regional governments with respect to law No. 22/1999 regarding regional autonomy, which specifies that all sectoral laws must be adapted to the law of regional autonomy. No more direct agreements will be entered into between the Government and private investors. The mining contract will be changed into a license. The resolutions

for environmental management will be improved and made more concrete. A licensed company will be required to actively settle its land right disputes with the land owner. Minerals will no longer be classified into groups beyond those that identify whether they are radioactive, metals or nonmetals, or coal (Petrominer, 2007j).

The new mining law also requires the mining industry to process mined ore or concentrates into metal in Indonesia. Developing countries have come to recognize that the greatest financial value of the mineral industry lies not in mining, but in the downstream processing of minerals because smelters and refineries generate critical jobs and tax revenues long after mineral deposits have been exhausted. This practice gives added value for the mineral industry. As a result, more laws and regulations were being enacted to prevent mining companies from shipping raw minerals to other countries and refining concentrates elsewhere. In 2007, Indonesia had only one copper smelter, and PT International Nickel Indonesia Tbk (INCO) had a furnace to process nickel ore into nickel matte (Mineweb, 2007).

In 2007, the Government planned to issue a new export regulation drafted by the Ministry of Trade that would limit refined tin exports because of a quality problem. Only tin smelters with mining permits would be allowed to export refined tin. The Government would set up a Jakarta tin market to improve the value from the tin industry. Illegal smelters were operating on Bangka Island, and Indonesian authorities planned to take action against this unauthorized segment of the mining sector (Indonesia's Trade and Investment News, 2007).

## Production

The major mineral commodities produced in Indonesia included bauxite, cement, coal, copper, natural gas, nickel, petroleum, and tin. Production of bauxite and primary aluminum decreased by 17% and 3%, respectively, owing to the shortage of electricity. Output of mined copper and gold also decreased as a result of the mining of lower grade ore at Grasberg and the development of the Deep Ore Zone. Production of mined nickel increased by 46% owing to higher grade ore mined by PT Antam Tbk (Antam), and that of mined tin declined by 18% because of reduced output by PT Tambang Timah Tbk (Timah) and small-scale tin miners. Output of zircon concentrate increased by 71% in anticipation of the operation of Olympia Resources Ltd. of Australia's zircon processing plant in Central Kalimantan. Indonesia produced 175 million metric tons (Mt) of bituminous coal and an average of 954,000 barrels per day (bbl/d) of oil in 2007 (table 1).

## Structure of the Mineral Industry

Majority-owned state companies dominated the mining industry and the mineral fuels sector. Antam was engaged in the mining of bauxite, gold, nickel, and silver; Timah, in the output

of tin; PT Krakatau Steel, in the manufacturing of steel; and PT Tambang Batubara Bukit Asam (PTBA) Tbk and Pertamina, in the production of coal and oil (table 2).

## Mineral Trade

In 2007, Indonesia's total exports increased by 13% to \$114.1 billion, whereas total imports increased by 22% to \$74.5 billion. The country exported mostly bauxite, coal, copper ores and concentrates, nickel ores and concentrates, and LNG. It imported chemicals, crude oil, mining machinery and equipment, and petroleum products. Indonesia's coal exports increased to 158.5 Mt in 2007 compared with 148 Mt in 2006. Most of the coal went to China, Hong Kong, Japan, Malaysia, the Republic of Korea, Taiwan, and the United States.

## Commodity Review

### Metals

**Aluminum.**—Antam prepared an \$80 million capital expenditure to operate its chemical-grade alumina project at Tayan in West Kalimantan Province. The alumina plant was expected to be completed in 2009 and to begin production by 2010. A mining area of 36,410 hectares (ha) had reserves of 100 Mt of bauxite as of 2007. Production was planned for 300,000 to 500,000 metric tons per year (t/yr) of alumina from 850,000 t/yr of bauxite. The life of the project was estimated to be 50 years. Antam (49%), together with Japan's Showadenco and Marubeni Corp. (36%) and Malaysian Smelting Corp. Bhd. (MSC) (15%) formed a joint-venture company (PT Indonesia Chemical Alumina) to develop the project. The project was likely to be funded through 35% equity and 65% debt (Petrominer, 2007p).

**Copper.**—Asia Gold Corp. reported new trench results from the Kaputusan deposit on Bacan Island, Maluku Province, that expanded the zones of porphyry copper-gold mineralization in the North and South Zones. A 3,000-meter (m) diamond drilling program to test the extensions was scheduled to begin in February 2007. Asia Gold earned an 85% interest in a joint-venture company that controlled Kaputusan. The other partner was PT Harita Multi Karya Mineral (15%) (Asia Gold Corp., 2007).

Finders Resources Ltd. was the operator of the Wetar copper project (72.4% equity) and the Ojolali gold-silver (72% equity) project in Indonesia. The Wetar copper project, which was located at the Kali Kuning and the Lerokis deposits, was in the feasibility stage. Detailed flotation concentrate test work indicated an estimated copper recovery of 89.1% at a concentrate grade of 16.3% copper. Alternative heap-leach test work was ongoing. The Ojolali gold-silver project had two prospects: the Jambi prospect, which had an inferred resource of 3,100 kilograms (kg) of gold, and the Tambang prospect, which had an inferred resource of 5,300 kg of gold and 1.24 million kg of silver. Bonanza grade veins were targeted in the underexplored mining district (London Stock Exchange, 2007b).

Two thousand employees of PT Freeport Indonesia at Timika in Papua Province staged a strike in April 2007 and demanded a

pay increase for all the company's employees. The wages paid to workers who came from outside of Papua Province were relatively higher than the Papuanese. The number of indigenous Papuanese who worked for the company increased to 3,000 in 2007. The 4-day strike reduced the production activities to 20% in open pit mining operations and to 60% in underground mining operations (Petrominer, 2007g).

Freeport Indonesia and Rio Tinto planned to spend between \$100 million and \$340 million for infrastructure development and the development of the underground copper and gold mine at Grasberg, which would exploit its Ertzberg stockwork. Current underground mining was in the Deep Ore Zone. Mining in the open pit would be ended by 2015. As of December 2006, the Grasberg Mine was estimated to have resources of 2,800 Mt of ore grading 1.04% copper and 0.9 gram per metric ton gold (Petrominer, 2007k).

**Gold and Silver.**—SouthGobi Energy Resources Ltd. discovered a low sulfidation epithermal gold and silver system on its 90% owned project area on Java Island. An initial trenching program identified numerous high-level epithermal veins in an area that was 520 m wide and 200 m long. The company planned a 3,000-m diamond drilling program in early 2008. Ivanhoe Mines Ltd. owned 87% of SouthGobi. SouthGobi participated in the project through its 100% owned subsidiary PT AGC Indonesia (Ivanhoe Mines Ltd., 2007).

PT Citra Palu Minerals, which was a subsidiary of PT Bumi Resources, planned to operate a gold mine at Poboya in Central Sulawesi Province in 2011. Gold was discovered in one of the six blocks in the mining area and resources were estimated to be about 62 metric tons (t) of contained gold. The company was exploring for more gold in five other blocks and was expected to complete the exploration program in 2008. The company had a mining concession area of 561,000 hectares at Palu in Central Sulawesi Province and the Poboya gold prospect had the greatest potential to be developed (Petrominer, 2007h).

PT Newmont Minahasa Raya's gold mine in South Sulawesi Province disposed of more than 4 Mt of mine waste in Buyat Bay between 1996 and 2004. PT Newmont Nusa Tenggara's Batu Hijau copper and gold mine on Sumbawa Island disposed of 120,000 metric tons per day of tailings in Senunu Bay. A criminal case brought against Newmont Minahasa Raya by the Government had been ongoing since 2005 and, in 2007, the court found the defendant not guilty of dumping charges. In 2007, an Indonesian environmental group filed a civil suit against the company and the Government, charging negligence in the dumping of mine waste into the ocean and negligence in overseeing and regulating mining and environmentally hazardous activities, respectively (Oxfam America, 2007).

**Nickel.**—Carnegie Minerals plc of the United Kingdom, which was a mineral sands resource company, entered into an agreement with Asia Resources Ltd. of Australia to fund a staged exploration program for iron and nickel laterite mineralization in the southern part of Obi Island. Obi Island is located midway between Papua and Sulawesi Islands and is part of the Sulawesi-Halmahera ophiolitic belt that hosts substantial nickel laterite deposits. By funding \$1 million of the project, Carnegie Minerals earned a 50% interest in the Obi Island project. Carnegie Minerals had the

option of converting its 50% interest to a gross sales royalty of 1% after expending \$1 million. Carnegie Minerals would be the operator of the exploration program. Antam found sizable nickel laterite deposits with grades ranging from 2.2% to 1.5% nickel and 43% iron within its tenement areas in the western part of Obi Island (London Stock Exchange, 2007a).

Rio Tinto was contemplating the construction of a \$1 billion nickel mine on Sulawesi Island and estimated that output of contained nickel could reach 46,000 t/yr. The development of the project remained on hold owing to regulatory problems between the Government and local authorities (Wright and Barta, 2007).

INCO, which was owned by Companhia Vale do Rio Doce of Brazil, planned to build two nickel processing plants at Bahudopi in Central Sulawesi Province and at Pomalaa in Southeast Sulawesi Province with a total investment of \$1 billion. INCO was conducting its feasibility study for the Bahudopi project with an investment of \$500 million. The construction of both plants was expected to raise INCO's nickel production by 136,000 t/yr in 2010 (Petrominer, 2007i).

In 2007, Antam's ferronickel production was estimated to be between 20,000 and 22,000 t of nickel following the reconditioning of the FeNi III plant and the overhaul of the FeNi I plant. The FeNi III project, which was valued at \$320 million and included a ferronickel plant and a powerplant, would increase the installed production capacity of ferronickel to 25,000 t/yr of nickel from 11,000 t/yr (Petrominer, 2007c).

**Tin.**—Timah planned to produce between 55,000 t and 60,000 t of tin in 2008, which was similar to the output level of 2007. PT Koba Tin would produce 15,000 t, and other miners would produce another 15,000 t. The country's tin production capacity was about 90,000 t/yr. Indonesia was one of the leading tin-exporting countries in the world. About 55% of the country's production volume was exported to Asia, and 30%, to Europe and the United States (Petrominer, 2007f).

MSC, which owned 75% of Koba Tin, expected the Government to allow the company to collect tin ores from small-scale miners on Bangka Island in Bangka-Belitung Province. Koba Tin was 25% owned by Timah. MSC could export 1,000 to 1,500 metric tons per month (t/mo) of tin ore from the current 500 to 600 t/mo of its own production, owing to additional ore collected. The company was given the license to resume production from its 41,680-ha mining area on Bangka Island; the license was expected to be terminated in 2013 (Petrominer, 2007m).

Yunnan Tin Corp. Ltd. of China planned to invest a total of \$9.69 million for a 51% share to build a tin smelting plant (\$8.67 million) and to develop tin mining (\$1.02 million) on Bangka Island. The total cost of a tin smelter was \$17 million, of which KJP Investment Pvt. Ltd. shared 48.41% and PT Banka Global Mandiri International shared 0.59%. Tin mining with an investment of \$2 million was planned with a joint-venture partner that would share the remaining \$0.98 million (Petrominer, 2007n).

**Zirconium.**—Small-scale zircon mining was centered on Kalimantan Island, where zircon was produced as a byproduct of gold operations. Zircon concentrates produced by artisanal miners contained between 75% and 80% zircon with low iron content. Zircon was abundant in heavy-mineral sands. In 2006,

Olympia Resources Ltd. planned to construct a 25,000-t/yr zircon processing plant at Banjarmasin on Kalimantan Island. The plant would be run by PT Olympia Indonesia, which was 90% owned by Olympia Resources and 10% owned by Indonesian partner Ali Susanto. Construction of the plant was expected in the first half of 2007 for production startup in July 2007 (Industrial Minerals, 2007).

### **Industrial Minerals**

**Cement.**—In 2007, Indonesia's cement exports increased at a modest rate and consumption increased considerably. The increases were attributable to economic stability, a reduction in interest rates, and improvements in public purchasing power. A boom in infrastructure construction would keep demand for cement high for the near future, but based on the current consumption trend, the country might face a shortage of cement supply in the next 3 to 5 years (World Cement, 2007).

### **Mineral Fuels**

**Coal.**—PT Lahai Coal, which was a subsidiary of BHP Billiton, planned to invest \$50 million to develop a coal mine at Nuara Teweh in the Laung Tuhup District in Central Kalimantan Province. The mine was expected to produce coal with an initial capacity of between 720,000 t/yr and 1 million metric tons per year (Mt/yr) in late 2007. The concession area was estimated to have a coal deposit of mixed quality—coking coal (60%) and thermal coal (40%). Coal would be exported to France, Italy, Japan, the Republic of Korea, and Thailand. PT Manunggal Multi Energi discovered coal reserves of 55.32 Mt at Darmon in South Sumatra Province. The calorific value of the coal was between 4,733 kilocalories per kilogram (kcal/kg) and 6,212 kcal/kg, with an average of 5,500 kcal/kg. Initial production would be between 1 and 2 Mt/yr. Coal would be used for the \$200 million, 250-megawatt (MW) Kuala Tanjung thermal powerplant in North Sumatra Province (Petrominer, 2007o).

Tata Power Co. of India acquired a 30% stake each in Bumi Resources' PT Kaltim Prima Coal (KPC) and PT Arutmin Indonesia for a total of \$1.3 billion. Other bidders were Kepco of the Republic of Korea, Marubeni Corp. and Mitsubishi Corp. both of Japan, and Reliance Energy Ltd. of India. Tata Power wanted to secure the coal supply for its powerplants, which were being built at Mundra in the State of Gujarat, India. Tata Power would require 21 Mt/yr of coal for its new powerplants. By holding Arutmin Indonesia and KPC, Tata Power would be able to meet nearly 50% of its need for coal. Bumi Resources planned to use the cash fund for the development of noncoal assets and started expanding to mining ventures of copper, gold, and iron ore. Bumi Resources owned 100% of Arutmin Indonesia and 95% of KPC before Tata Power's acquisition. Bumi Resources produced 70 Mt of coal in 2007 and planned to increase output to 90 Mt in 2010 (Petrominer, 2007d).

PT Adaro Indonesia operated two open pit mines at the Paringin and the Tutupan deposits in South Kalimantan Province and produced 36 Mt of coal in 2007 compared with 34.4 Mt in 2006. The coal was ultra clean and environmentally friendly envirocoal. About 70% of coal output was exported to China,

Europe, India, Japan, New Zealand, Taiwan, and the United States. Adaro Indonesia also supplied coal to the Cilacap, the Jawa-Bali, and the Paiton powerplants. Its total coal reserves were estimated to be 3,000 Mt (Petrominer, 2007a).

PTBA planned to acquire 11 coal mining companies in Central, East, and South Kalimantan Provinces. The acquisition at \$176 million would be made through its subsidiary, PT Bukit Asam Prima, which sold and purchased coal. The current coal production of PTBA was 11 Mt/yr and with the acquisition of the additional coal companies, production would increase to 20 Mt/yr. PTBA also planned to develop the 4x600-MW Banko Tengah thermal powerplant (Petrominer, 2007l).

PTBA planned to supply PT Indonesia Power's Suralaya powerplant in Banten Province with 6.1 Mt of coal from its mines on Kalimantan and Sumatra Islands in 2008. The powerplant would require between 11 Mt and 14 Mt of coal, and the shortage would be met by a tender of 2.5 Mt and by buying on the spot market. Owing to the transportation problem with freight, PTBA supplied 5.5 Mt of coal in 2007. Meanwhile, Arutmin Indonesia's Asam-Asam Mine in East Kalimantan Province received an order to supply 10 Mt/yr of coal to the projects of the 10,000-MW crash program. The crash program included 11 powerplants. The mine was estimated to contain more than 200 Mt of low-calorie coal. Low-calorie coal also would be supplied from its Mulia and Satui Mines in South Kalimantan Province. Arutmin Indonesia produced 18 Mt of coal in 2007 (Petrominer, 2007b).

Kenertec Corp. of the Republic of Korea signed an agreement to invest in a coal liquefaction project worth \$5.5 billion in East Kalimantan Province. The company formed a consortium made up of Posco Engineering and Construction, PT Nuansa Cipta Coal Investment, and Samsung Securities for the project. In the first stage, the consortium would invest \$2 billion to produce 30,000 bbl/d of liquefied coal for 5 years. Kenertec was expected to process 1 Mt/yr of coal. In the second stage, the consortium would invest \$3.5 billion to increase production by 70,000 bbl/d to 100,000 bbl/d (Petrominer, 2007e).

**Natural Gas.**—Total S.A. of France made two gas discoveries in the offshore Mahakam Block. The company and its partner, Inpex Corp. of Japan, planned to start production in 2012. Total supplied gas to the 22.6-Mt/yr Bontang LNG export terminal in East Kalimantan Province. Indonesia's installed capacity of LNG was 30 Mt/yr. The \$5 billion Tangguh LNG export project in Papua Province was in progress, and first production was expected in late 2008. Tangguh would add 7.6 Mt/yr to the country's LNG production because two trains at the 6.8-Mt/yr Arun plant were shut down in 2000. Tangguh had a 2.6-Mt/yr LNG contract to supply China's Fujian terminal and a 3.7-Mt/yr agreement with Sempra Energy to supply a terminal in Baja California, Mexico (Petroleum Economist, 2007b).

PT Elnusa expected to begin gas production in 2008-09 from its only gasfield in the Bangkanai Block in Central Kalimantan Province. Gas output would be sold to state power company Perusahaan Listrik Negara and to the local market and, if possible, to the Bontang LNG plant. The field had a gas reserve of 28.3 billion cubic meters. Four wells had been drilled followed by two more wells in 2007. About \$10 million would be needed to drill a well with a depth of 2,740 m (Rigzone.com, 2007).

**Petroleum.**—Pertamina and ExxonMobil planned to drill two appraisal wells at the Banyu Urip oil discovery in the Cepu Block and three exploration wells in Cepu's other fields. The Cepu Block was estimated to contain 0.6 billion barrels of oil and 48.1 billion cubic meters of gas. Pertamina expected oil production from Cepu to begin at the rate of between 10,000 and 20,000 bbl/d in 2008 (Petroleum Economist, 2007a).

Santos Ltd. of Australia began oil production from its Oyong Field offshore Surabaya in East Java Province. Production was expected to be between 8,000 and 10,000 bbl/d. Gas production of 1.6 million cubic meters per day was expected to be delivered to the Grati powerplant in East Java Province in the first half of 2009. The partners in the project were Santos (45%) as operator, Singapore Petroleum (40%), and Cue Sampang (15%) (Petroleum Economist, 2007b).

Pertamina planned to team up with Mitsui Corp. of Japan to revamp its Citacap oil refinery in Central Java Province. The \$1.8 billion upgrade would increase refining capacity by between 62,000 and 410,000 bbl/d. Equity financing of \$0.5 billion would come from Pertamina and Mitsui, and the remaining \$1.3 billion would come from banks (Petroleum Economist, 2007a).

## Outlook

Despite the increased prices of mineral commodities in the world market in 2007, Indonesia's mining industry was stalling without a single large new mine coming onstream. The Government and local authorities were in a fight for control of the country's mineral resources. Until the regulatory issues are resolved or a new mining draft is finalized, mining in Indonesia is expected to remain at the same level of output as 2007 for the foreseeable future. The development of the underground mine at Grasberg is expected to increase Freeport Indonesia's production of copper and gold by 2015 when the open pit mining is phased out. Tin exports are expected to increase from the current 85% of output to 87%. The country's coal (including envirocoal) is expected to continue to be exported and used in the thermal powerplants. In the mineral fuels sector, owing to the discovery of new gasfields, the production of natural gas is expected to increase, as is the output and export of LNG.

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TABLE 1  
INDONESIA: PRODUCTION OF MINERAL COMMODITIES<sup>1</sup>

(Metric tons unless otherwise specified)

Commodity	2003	2004	2005	2006	2007
<b>METALS</b>					
<b>Aluminum:</b>					
Bauxite, wet basis, gross weight					
thousand metric tons	1,263	1,331	1,442 <sup>r</sup>	1,502	1,251
Metal, primary	200,000 <sup>e</sup>	247,000	252,300	250,300	242,400
Chromite sand, dry basis <sup>e</sup>	1,000	1,000	1,000	1,000	1,000
<b>Copper:</b>					
Mine, Cu content	1,005,837	840,318	1,064,200	818,000 <sup>r</sup>	796,900
<b>Metal</b>					
Smelter, primary	247,400	211,600	275,000	201,200	224,000
Refinery, primary	223,300	210,500	262,900	217,600	221,400
Gold, mine output, Au content <sup>2</sup>					
kilograms	141,019	91,710	130,620	93,176 <sup>r</sup>	117,851
<b>Iron and steel:</b>					
Iron sand, dry basis	245,409	89,664	32,203	87,970 <sup>r</sup>	61,077
<b>Metal:</b>					
<b>Ferroalloys:</b>					
Ferronickel	43,894	39,538	36,690	32,445	34,000
Ferromanganese <sup>e</sup>	12,000	12,000	12,000	12,000	12,000
Silicomanganese <sup>e</sup>	7,000	7,000	4,000	5,000	6,000
Pig iron, direct reduced iron					
thousand metric tons	1,230	1,470	1,390	1,290	1,400
Steel, crude					
do.	2,042	3,682 <sup>r</sup>	3,675	3,759 <sup>r</sup>	3,900
Steel, semimanufactured					
do.	3,719	4,238	4,859	5,150	5,400
<b>Nickel:</b>					
Mine output, Ni content <sup>3</sup>	144,000	136,000	135,000	157,200 <sup>r</sup>	229,200
Matte, Ni content	70,200	81,120	77,471	72,782	77,928
Ferronickel, Ni content	8,933	7,945	7,003	7,572 <sup>r</sup>	9,498
Silver, mine output, Ag content					
kilograms	285,206	261,960	320,590 <sup>r</sup>	261,398 <sup>r</sup>	268,967
<b>Tin:</b>					
Mine output, Sn content	71,694	65,772	78,404	80,933	66,137
Metal <sup>4</sup>	66,284	49,872	65,300	65,357 <sup>r</sup>	64,127
Zirconium concentrates, gross weight	200 <sup>r</sup>	500 <sup>r</sup>	2,600 <sup>r</sup>	65,000 <sup>r</sup>	111,000

See footnotes at end of table.

TABLE 1—Continued  
INDONESIA: PRODUCTION OF MINERAL COMMODITIES<sup>1</sup>

(Metric tons unless otherwise specified)

Commodity	2003	2004	2005	2006	2007	
<b>INDUSTRIAL MINERALS</b>						
Cement, hydraulic	thousand metric tons	35,500	33,230	33,917	35,000 <sup>†</sup>	36,000
Clays: <sup>c</sup>						
Bentonite		5,000	5,000	5,000	5,500	5,500
Fire clay	thousand metric tons	1,900	1,900	2,000	2,000	2,100
Kaolin powder		15,000	15,000	15,000	15,000	15,000
Diamond: <sup>c</sup>						
Industrial stones	thousand carats	23	23	23	23	23
Gem	do.	7	7	7	7	7
Total	do.	30	30	30	30	30
Feldspar <sup>c</sup>		24,000	24,000	24,000	25,000	25,000
Gypsum <sup>c</sup>		6,000	6,000	6,000	6,000	6,000
Iodine <sup>c</sup>		75	75	75	75	75
Nitrogen, N content of ammonia	thousand metric tons	4,250	4,120	4,400 <sup>e</sup>	4,300 <sup>e</sup>	4,400 <sup>e</sup>
Phosphate rock <sup>c</sup>		600	600	600	600	600
Salt, all types <sup>c</sup>	thousand metric tons	680	680	680	700	700
Stone:						
Dolomite <sup>c</sup>		3,100	3,100	3,100	3,200	3,200
Granite	thousand metric tons	3,939	3,340	4,170	4,200	4,300
Limestone <sup>c</sup>	cubic meters	16,000	16,000	16,500	16,000	17,000
Marble <sup>c</sup>	do.	1,000	1,000	1,000	1,000	1,000
Quartz sand and silica stone <sup>c</sup>	do.	150,000	150,000	150,000	155,000	155,000
Sulfur, elemental <sup>c</sup>		78,500	83,500	83,000	82,000	81,000
Zeolite <sup>c</sup>		400	400	400	400	400
<b>MINERAL FUELS AND RELATED MATERIALS</b>						
Coal:						
Anthracite <sup>c</sup>		50,000	50,000	50,000	52,000	53,000
Bituminous	thousand metric tons	114,000 <sup>e</sup>	131,530	142,920	181,061 <sup>†</sup>	174,833
Gas, natural:						
Gross	million cubic meters	89,324	83,740	85,830	102,300 <sup>†</sup>	95,020
Marketed <sup>c</sup>	do.	54,000	52,000	53,000	52,000	53,000
Petroleum, crude including condensate	thousand 42-gallon barrels	413,000	362,000	352,000	367,000 <sup>†</sup>	381,000

<sup>c</sup>Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. <sup>†</sup>Revised. do. Ditto.

<sup>1</sup>Table includes data available through October 8, 2008.

<sup>2</sup>Includes 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.

<sup>3</sup>Includes a small amount of cobalt that was not recovered separately.

<sup>4</sup>Output 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.

TABLE 2  
INDONESIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2007

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Locations of main facilities	Annual capacity <sup>e</sup>
<b>Aluminum:</b>				
Bauxite		PT Antam Tbk (Government, 65%)	Kijang, Bintan Island, Riau	1,300
Metal		PT Indonesia Asahan Aluminum (Nippon Asahan Aluminum Co. Ltd., 59%, and Government, 41%)	Kual Tanjung, North Sumatra	250
Cement		PT Indocement Tunggal 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 (formerly 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	35,000
Do.		PT Arutmin Indonesia (PT Bumi Resources Tbk, 80%, and Bakrie Group, 20%)	Mulia, Senakin, and Satui, South Kalimantan Asam-Asam, East Kalimantan	20,000
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., 100%)	Pasir, East Kalimantan	12,000
Do.		PT Tambang Batubara Bukit Asam (state-owned)	Tanjung Enim and Ombilin, South Sumatra	19,000
<b>Copper:</b>				
Concentrate		PT Freeport Indonesia Co. (Freeport-McMoRan Copper & Gold Inc., 81.28%; Government, 9.36%; others, 9.36%)	Ertsberg and Grasberg, Papua	800
Do.		PT Newmont Nusa Tenggara (Newmont Gold Mining Co., 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
<b>Gas:</b>				
Natural	million cubic feet per day	ExxonMobil Oil Indonesia	Arun and Aceh, North Sumatra	1,700
Do.	do.	Roy M. Huffington (subsidiary of HUFFCO Group)	Badak, East Kalimantan	1,000
Do.	do.	Total Indonesia	Offshore, East Kalimantan	2,100
Liquefied		PT Arun LNG Co. Ltd. (Government, 55%; Mobil Oil Co., 30%; Japan Indonesia LNG Co., 15%)	Balang Lancang and Aceh, North Sumatra	12,500
Do.		PT Badak LNG Co. Ltd. (Government, 55%; HUFFCO Group, 30%; Japan Indonesia LNG Co., 15%)	Bontang, East Kalimantan	22,500
Gold	metric tons	Aurora Gold Ltd. (100%)	Balikpapan, Central Kalimantan	60
Do.	do.	PT Antam Tbk (Government, 65%)	Bogor, West Java	3
Do.	do.	PT Freeport Indonesia Co. (Freeport-McMoRan Copper & Gold Inc., 81.28%; Government, 9.36%; others, 9.36%)	Ertsberg and Grasberg, Papua	110
Do.	do.	PT Newmont Nusa Tenggara (Newmont Gold Mining Co., 45%; Sumitomo Corp., 35%; PT Pukuafu Indah, 20%)	Sumbawa Island, West Nusa Tenggara	16
Do.	do.	PT Nusa Halmahera (PT Aneka Tambang Tbk, 17.5%, and PT Newcrest Mining Ltd., 82.5%)	Halmahera Island, Maluku	24
Do.	do.	PT Prima Lirang Mining (Billiton BV, 90%, and PT Prima Maluku Indah, 10%)	Lerokis, Wetar Island	3
<b>Nickel:</b>				
In ore		PT Antam Tbk (Government, 65%)	Pomalaa, South Sulawesi and on Gebe Island	80
Do.		PT International Nickel Indonesia Tbk (Inco Ltd., 59%; Sumitomo Metal Mining Co. Ltd., 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., 59%; Sumitomo Metal Mining Co. Ltd., 20%; others, 21%)	Soroako, South Sulawesi	68

See footnote at end of table.



TABLE 2—Continued  
INDONESIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2007

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Locations of main facilities	Annual capacity <sup>e</sup>
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.)	Arjuna and Arimbi, offshore West Java	170
Do.	do. China National Offshore Oil Co.	Off of southeast Sumatra	100
Do.	do. Maxus Southeast Asia Ltd. (subsidiary of Maxus Energy)	Cinta and Rama, offshore Southeast Sumatra	95
Do.	do. P.T. Pertamina (Government, 100%)	Jatibarang, West Java, and Bunyu, offshore East Kalimantan	80
Do.	do. PT Caltex Pacific Indonesia (Texaco Inc., 50%, and Chevron Corp., 50%)	Minas, Duri, and Bangko, central Sumatra	700
Do.	do. Total Indonesie (subsidiary of Compagnie Francaise des Petroles of France)	Handi and Bakapai onshore and offshore East Kalimantan	180
Petroleum, refined	do. P.T. Pertamina (Government, 100%)	6 various locations	1,047
Silver	PT Antam Tbk (Government, 65%)	Bogor, West Java	25
Do.	PT Freeport Indonesia Co. (Freeport-McMoRan Copper & Gold Inc., 81.28%; Government, 9.36%; others, 9.36%)	Ertzberg and Grasberg, Papua	220
Do.	PT Kelian Equatorial Mining (Rio Tinto Group, 90%, and 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

<sup>e</sup>Estimated; estimated data are rounded to no more than three significant digits. Do., do. Ditto.