



2006 Minerals Yearbook

MALAYSIA

THE MINERAL INDUSTRY OF MALAYSIA

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In 2006, owing to the positive economic growth in many parts of the world and an increased demand for electronics and tin, Malaysia's real gross domestic product (GDP) increased by 5.9% compared with that of the previous year. The strong external environment was supported by strong domestic activity—private consumption increased by 7.0% and accounted for 3.5% of the total GDP growth. Total industrial output increased by 5.3%; this increase was aided by increased output in the manufacturing sector of 7.5% in 2006 compared with only 5.1% in 2005, and by growth in the export-oriented sectors, such as chemicals and chemical products, electronics and electrical products, fabricated metal products, petroleum products, and rubber products. The domestic construction and mining sectors, however, contracted by 0.5% and 0.2%, respectively, in 2006. The decline of commercial activity in Malaysia was the main reason for the contraction in the construction sector. In 2006, the Government outlined the Ninth Malaysia Plan projects that might help Malaysia's construction sector to expand construction activities during the next several years. Owing to shutdowns of production facilities for scheduled maintenance, the output of crude oil and natural gas was lower in 2006 (Bank Negara Malaysia, 2007, p. 6-28).

Minerals in National Economy

Malaysia's identified mineral resources were barite, bauxite, clays, coal, copper, gold, natural gas, ilmenite, iron ore, monazite, petroleum, silica, silver, struverite, tin, and zircon. During the twentieth century, mineral production played an important role in Malaysia's national economy; after many years of exploitation, such minerals as barite, bauxite, copper, ilmenite, iron ore, and tin were either depleted or the capacity to produce them had decreased significantly in recent years. In terms of contributing to the country's economy, the share of mining decreased to 6.7% in 2005 from 7.0% in 2004. The manufacturing and service sectors were expected to remain the engines of growth. The service sector, which accounted for more than 50% of the GDP, was expected to grow because of increased domestic consumption and foreign trade. Activity in the mining and mineral fuel sectors was expected to increase during the next several years because the new oilfields and gasfields discovered during the past several years in the State of Sabah were expected to begin production soon. Owing to new infrastructure projects called for in the Ninth Malaysia Plan, the construction sector was expected to expand in the next several years (Bank Negara Malaysia, 2007, p. 27).

Government Policies and Programs

The Malaysian Government continued its policy of pursuing balanced growth and a stable political and social environment. The Ninth Malaysia Plan calls for the construction of 880 new infrastructure projects. The Government's 15-year Third

Industrial Master Plan is directed at making the manufacturing and service sectors more knowledge-intensive and productive and, as a result, more globally competitive (Malaysia External Trade Development Corp., 2006).

Production

Malaysia produced bauxite, coal, feldspar, gold, ilmenite, iron ore, mica, natural gas, petroleum, tin, and zircon. Malaysia was one of the major tin producing countries in the world; owing to depleted ore resources and lower ore grades, however, tin concentrate production has decreased in recent years. The country depended on imported tin concentrates and crude tin mainly from Indonesia and Vietnam to meet its demand for feedstocks for its smelter and refinery. Malaysia's mineral production was expected to remain at the current level for the next several years (table 1).

Structure of the Mineral Industry

Malaysia's mineral industry consisted of a small mining sector of coal and ferrous and nonferrous metals. Metallic and nonmetallic processing facilities were operated by private companies incorporated in Malaysia. Oil and gas exploration, production, and processing activities were owned and operated by Petroliaam Nasional Berhad (Petronas), which was a state-owned company, and by joint ventures of Petronas and foreign companies (table 2).

Mineral Trade

The major export products were automotive parts, chemicals, electronics, and machinery. The volume of mineral commodity exports has declined in recent years. Owing to higher prices of metals and mineral fuels in the world, however, the share of mineral exports, which included petroleum and natural gas, to total exports (in terms of value) increased to 9.7% in 2006 from 7.2% in 2000. The value of exports was projected to increase by 2.7 times by 2020.

Commodity Review

Metals

Aluminum.—Malaysia did not have an aluminum refinery and smelter; all bauxite output, therefore, was exported to countries in Southeast Asia, and Malaysia imported unwrought aluminum to meet its demand. In 2005, Malaysia imported 434,254 metric tons (t) of unwrought aluminum. Malaysian Cahya Mata Sarawak Berhad (CMS) and Rio Tinto plc of the United Kingdom signed an agreement to build an aluminum smelter in the State of Sarawak. The feasibility study for the construction of the aluminum smelter would take 12 to 18

months to complete. Rio Tinto Aluminum Ltd., a subsidiary of Rio Tinto, would have a 60% share and CMS would hold a 40% share of the Sarawak Aluminum Co. The proposed smelter would be located in Similajau, about 60 kilometers (km) from the town of Bintulu. The initial production capacity would be 550,000 metric tons per year (t/yr) and could be expanded to 1.5 million metric tons per year (Mt/yr). In the first stage, the smelter was expected to commence operations by the fourth quarter of 2010 and to reach full production in 2011. Raw material (alumina) would be imported from Australian Yarwun Alumina Refinery in Gladstone, Queensland. The electricity for the smelter would come from the Bakun Hydroelectric Dam, which was under construction. Under the Ninth Malaysia Plan, the government of the State of Sarawak planned to establish energy-intensive industries in the central region to use energy resources, which included coal, hydropower, natural gas, and oil in Sarawak (Rio Tinto plc, 2007). Aluminum Corporation of China and BHP Billiton Ltd. of Australia were also interested in building aluminum smelters in Sarawak. The 2,400-megawatt Bakun Hydroelectric Dam would be able to generate enough electricity to power these aluminum smelters.

Copper.—Since the shutdown of Mamut Mine in Ranau, State of Sabah, in 1999, Malaysia relied on imported copper to meet its demand. Imports of refined copper increased to 285,706 t in 2005 (the latest year for which data were available) from 136,914 t in 2003 owing to increased demand in the electronics sector. Several copper prospects have been found in Bambangan, Bidu-Bidu Hill, Gunung Nungkok, Karang, Kiabau, Pinanduan, and Tampang in Sabah. The government of the State of Sabah had not approved the development of any of these copper deposits (Minerals and Geoscience Department, 2006, p. 17-21).

Gold.—During the past several years, gold was produced mainly from the Penjom Mine in the State of Pahang and at other small-scale gold operations in the States of Kelantan, Pahang, and Terengganu. The Penjom Mine was operated by Specific Resources Malaysia Sdn. Bhd., which was a wholly owned subsidiary of Avocet Mining Plc of the United Kingdom. Despite the difficulties of land acquisition and the discouragement of mining by the State governments, Avocet Mining planned to continue gold exploration and production in Malaysia. The company completed 1,000 meters (m) of drilling at Panau, which is located northwest of Penjom. Mining is a capital-intensive business that involves many risks, and mining projects must be of sufficient size to warrant the costs of financing and subsequent long-term capital return. The company urged the Malaysian Government to provide more incentives, such as tax and rebate incentives, to attract foreign investors and to encourage the State governments to promote large-scale mining and to consider mining a priority sector in their States (Star, The, 2006).

Zedex Minerals Ltd. of New Zealand signed an agreement with Gladioli Enterprises Sdn Bhd. to earn a 50.05% share in the Bau gold project. The Bau project is located in the township of Bau, which is about 37 km from the capital city, Kuching, in the State of Sarawak. The exploration area was about 825 square kilometers (km²). The Bau area had been an important mining center from 1820 to 1997. Reportedly, Bukit Young Goldmines mined about 29 t (933,000 ounces) of gold in the area. Recent

exploration results indicated that a number of highly prospective targets were found in the area. Zedex planned to review previous exploration data and to undertake further drilling to confirm the validity of existing data. Zedex was responsible for financing 100% of project development upon a decision to mine (Zedex Minerals Ltd., 2006).

Iron and Steel.—Malaysia produced small amounts of low-grade iron ore from the States of Pahang, Perak, and Terengganu. Domestic iron ore output was consumed by domestic pipecoating plants and cement plants and part of the iron ore, 251,225 t, was exported to China in 2005 (the latest year for which data were available). The increase of iron ore production in 2005 was the result of adding two new operating mines, one each in the States of Johor and Pahang. In the same year, the country imported a total of 1.89 million metric tons (Mt) of high-grade iron ore from, in descending order of amount received, Brazil, Chile, Bahrain, and Sweden. The country also imported 1.07 Mt of pig iron and 980,585 t iron and steel scrap for steelmaking (Minerals and Geoscience Department, 2006, p. 29-31).

In 2006, Malaysia's steel products consumption was 7.7 Mt. Under the Ninth Malaysia Plan, the Government would invest \$12.8 billion on infrastructure projects, and steel products consumption was expected to increase to 8.1 Mt in 2007 and 8.4 Mt in 2008 as a result. During the past 2 years, the demand for structural steel in the construction sector decreased, owing to lack of Government construction projects. The trend of decline was expected to level off during the next 2 years (Business Times, 2006).

JFE Steel Corp. of Japan signed a technical agreement with Mycron Steel Bhd. to provide technical assistance to upgrade Mycron's cold-rolled products. Malaysia consumed about 1.2 Mt/yr of cold-rolled products, of which about 700,000 t/yr was imported. Mycron was Malaysia's second ranked cold-rolled products producer; the company produced 140,000 t of cold-rolled products in 2006, and the output capacity was expected to increase to 240,000 t/yr in 2008. JFE Steel would help Mycron produce thin-gauge cold-rolled sheets to 0.2 millimeters (mm) in thickness from 0.3 mm previously produced, improve production efficiency, and make better quality sheet with better profile and surface appearance. Under Malaysian regulations, cold-rolled products producers were required to source 40% of their hot-rolled products from the sole domestic producer, Megasteel Sdn Bhd, at floor prices set by the Government before the producers could apply for permission to import the remaining 60%, mainly from Japan. Mycron and other cold-rolled products producers urged the Government to increase the import quota for hot-rolled products and to upgrade the quality of domestic hot-rolled products (Southeast Asia Iron and Steel Institute, 2006b; Metal Bulletin, 2007b).

The Lion Group was the leading iron and steel producer in Malaysia. The Group's several operating facilities—Amsteel Mills Sdn Bhd, Antara Steel Mills Sdn. Bhd., Bright Steel Sdn Bhd, Lion Steelworks Sdn Bhd, and Megasteel Sdn Bhd—had a total annual output capacity of 4.4 Mt of crude steel, 800,000 t of hot-briqueted iron (HBI), 2.0 Mt of hot-rolled coils, and 1.4 Mt of cold-rolled coils. The Group signed a supply agreement with Midrex Technologies Inc. of the United States to set up a

direct-reduced iron (DRI) plant that was designed to produce 1.57 Mt/yr of DRI in Banting, State of Selangor, and was expected to be put into operation in early 2007. The output of DRI was expected to supply steelmaking at Megasteel Sdn Bhd and to enable the production of high-grade steel for downstream products. The HBI from the Group's Labuan Island facility in the State of Sabah would be mainly for export. The Lion Group also planned to build a 2.5-Mt/yr blast furnace in the future (Southeast Asia Iron and Steel Institute, 2006a).

Grange Resources Ltd. of Australia's iron ore pellet plant at Kemaman, State of Terengganu, received environmental approval and a manufacturing license from the Malaysian Government and applied to the Ministry of Natural Resources and Environment for a material storage license. Grange Resources planned to produce 6.5 Mt/yr of iron concentrates with iron content of 69% at its Southdown magnetite project in Western Australia; the concentrates would be transported through a slurry pipeline to Port Albany and then shipped to Kemaman for pelleting. Road Builder Holdings Bhd and Grange Resources discussed the possibility of Road Builder becoming a joint-venture partner to build the pellet plant. Road Builder had a 39% share in the Kemaman Port Consortium and was the sole owner of the Kemaman Port's Westwharf, which had a loading capacity of 9 Mt/yr. Grange Resources completed the construction of its Bukit Ibam Iron Ore Mine in Kuantan. Initial ore output was about 20,000 metric tons per month and Grange Resources continued drilling at the area during the mining operation (Metal Bulletin, 2007a).

Tin.—Owing to depleted resources and lower ore grades after more than 100 years of active mining operations, Malaysia's tin mine production decreased to less than 3,000 t annually during the past 3 years despite a higher tin price during the past several years. The demand for tin was rising because it is used as raw material in the manufacture of flame retardants, industrial paint pigments, and lead-free solders for the electronics industry. Owing to an increase in tin mine operating costs, Malaysian tin miners had difficulty operating profitably despite the higher demand for and price of tin. Malaysia Smelting Corp. Bhd. (MSC) was Malaysia's sole integrated tin producer and produced only 22,850 t of refined tin at its Butterworth smelter in Malaysia owing to a shortage of raw materials. In 2006, Malaysia imported 15,064 t of tin concentrates compared with 17,708 t in 2005, mainly from Indonesia, Thailand, and Vietnam. In 2006, the Indonesian Government clamped down on small-scale miners and independent smelters operating on Bangka Island, Indonesia, which led to a decrease in crude tin exports from Indonesia. As a result, tin production at MSC's smelter in Butterworth decreased (Malaysia Smelting Corp. Bhd., 2007, p. 14, 106).

Industrial Minerals

Sand and Gravel.—In 2004, the Malaysian Government stopped issuing licenses to companies to dredge sand along the coastal areas. Existing sand licenses issued by the Land and Cooperative Development Ministry would not be renewed when they expired because the operations posed threats to marine ecology in Malaysia. In 2005, there were 785 sand and

gravel mining permits in Malaysia, which was a decrease from 877 in 2004 and 921 in 2003. Exports of sand and gravel from Malaysia decreased to 2,744 t in 2005 from 13,613 t in 2004 and imports of sand and gravel to Malaysia increased to 86,041 t in 2005 from 80,377 t in 2004. In 2006, the State of Selangor government planned to lift its ban on sand mining in Selangor because the government had insufficient funds to desilt the three rivers in the State regularly. The sand mining permit would be awarded to a state-owned company for 30 years. The company would be allowed to harvest sand from the rivers as well as to initiate controlled and sustainable commercial development. Asserting that the rivers were public property, the Malaysian Nature Society urged the Malaysian Government to intervene in the State of Selangor government's decision (Teoh, 2006).

Mineral Fuels

Coal.—Malaysia's coal resources are located in the States of Perak, Perlis, Sabah, Sarawak, and Selangor. Coal was produced from the areas of Bintulu, Merit-Pila, Silantek, and Tutoh in the State of Sarawak. The country has coal reserves of 1.7 billion metric tons (Gt), of which about 1.4 Gt is located in Sarawak. Mining and exploration for coal were conducted only in Sarawak. Merit-Pila was the largest coalfield in Malaysia. Owing to increased mine output, Malaysia's coal production increased by about 14% in 2006 compared with that of 2005. Most of the coal produced was used at the Sejingkat Power Station in Sarawak, which consumed about 300,000 t/yr.

Power-generating plants consumed about 70% of the total supply of coal (domestic production and imports) and the remaining was consumed by the cement and iron and steel sectors. In 2006, the State government of Sarawak approved the construction of a 270-megawatt coal-fired plant at Mukah, Sarawak. The powerplant would be located near the coal mines between Mukah and Balingian. Two other coal-fired powerplants under construction included the SKS Tanjung Bin in Johor and the Jimah in Port Dickson. The SKS Tanjung Bin powerplant was scheduled to be completed in 2006, and the Jimah powerplant, in 2009.

Coal demand was expected to increase to 19.5 Mt in 2010. Tenaga Nasional Berhad planned to decrease the usage of natural gas in its powerplants to 49% from 72% and to shift to the use of coal because of the shortage in the supply of natural gas. Because domestic coal could not meet the demand, the country was expected to increase coal imports to fill the gap. Most imported coal was from Australia, China, and Indonesia (Minerals and Geoscience Department, 2006, p. 101).

Natural Gas and Petroleum.—Malaysia remained a net exporter of natural gas and crude oil. Production of natural gas decreased to 163 million cubic meters per day in 2006 from 164 million cubic meters per day in 2005. Production of crude oil and condensate decreased to an average of 699,796 barrels per day (bbl/d) in 2006 from 727,000 bbl/d in 2005. The lower production of crude oil was caused by the shutdown of several oil installation facilities during the year for repair and maintenance. The output of condensate accounted for about 20% of the total production. The decline in the production of natural gas was caused by the sequenced shutdown of

facilities at the liquefied natural gas (LNG) 2 plant in the State of Sarawak for upgrading and expansion of the LNG output capacity. The country exported about 50% of its natural gas in the form of LNG and crude oil and condensate (Bank Negara Malaysia, 2007, p. 28).

Under the National Depletion Policy on sustainable development of the country's natural gas and oil resources, the new discovery of natural gas and oil reserves and the production level of natural gas and oil have contributed towards increasing the lifespan of the country's natural gas and oil reserves. Based on this policy, the lifespan of natural gas and oil reserves were 34 years and 21 years, respectively, in 2006 compared with 34 years for natural gas and 20 years for oil in 2005. The increased lifespan of oil was the result of decreased oil production in 2006. At yearend 2006, Malaysia's natural gas reserve was 2.5 trillion cubic meters and the oil reserve was 5.25 billion barrels (Bank Negara Malaysia, 2007, p. 28).

Petronas awarded BHP Billiton two offshore blocks, Block N and Block Q, which are located 175 km offshore Kota Kinabalu in the State of Sabah. The depth of water in the areas ranged from 1,600 m to 2,800 m. BHP Billiton held a 60% share in both blocks and Petronas's subsidiary, Petronas Carigali Sdn. Bhd., held the remaining 40% share (BHP Billiton, 2007).

Malaysia planned to build a \$7 billion 300-km transpeninsular oil pipeline from Kedah on the northwestern coast to Kelantan on the eastern coast. The oil would then be loaded onto tankers bound for China, Japan, and the Republic of Korea, completely bypassing Singapore and the Malacca Strait. The Malacca Strait is notorious for piratings and hijackings. Since the Governments of Indonesia, Malaysia, and Singapore increased their patrols of the waterway, the number of attacks had fallen. The construction of the pipeline would begin in 2008 and would be completed in 2014. Malaysia also planned to build two petroleum refineries in Kedah by 2010; the refineries would have a combined refining capacity of 450,000 barrels per day (Borneo Post, The, 2007).

Outlook

Malaysia's economy is projected to grow at a moderate rate during the next 3 years. Private spending will continue to support the economic growth. The construction sector is expected to expand as a result of increased investment by the Government in infrastructure under the Ninth Malaysia Plan,

and the demand for construction steel products will also likely increase. Several natural gas and oil projects are set to come onstream during the next several years and production of natural gas and oil is expected to increase. Under the Ninth Malaysia Plan, the Government intends to increase the output of value-added products from the country's manufacturing and service sectors in such fields as biotechnology, communications, and information technology; however, the challenge for the Malaysian Government is to have a workforce skilled in these areas.

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TABLE 1
MALAYSIA: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons unless otherwise specified)

Commodity ²	2002	2003	2004	2005	2006
METALS					
Aluminum, bauxite, gross weight	39,975	5,732	2,040	4,735	91,806
Gold, mine output, Au content ³	4,289	4,739	4,221	4,250	3,497
Iron and steel:					
Iron ore, gross weight	404,350	596,612	663,732	949,605	667,082
Pig iron, direct-reduced iron and hot-briqueted iron	1,061	1,600	1,710	1,349	1,540
Steel, crude	4,722	3,960	5,698	5,296	5,500 ^c
Lead metal, secondary ^c	40,000	40,000	40,000	40,000	42,000
Niobium (columbium)-tantalum metals, struverite, gross weight	2,298	2,619	121	552	93
Rare-earth metals, monazite, gross weight	441	795	1,683	320	894
Silver, mine output, Ag content ³	--	--	364	401	410
Tin:					
Mine output, Sn content	4,215	3,359	2,745	2,857	2,398
Metal, smelter	30,887	18,250	33,914	36,924	22,850
Titanium:					
Ilmenite concentrate, gross weight	106,046	95,148	61,471	38,196	45,649
Dioxide ^c	56,000	56,000	56,000	56,000	56,000
Zirconium, zircon concentrate, gross weight	5,292	3,456	6,886	4,954	1,690
INDUSTRIAL MINERALS					
Barite	3,082	--	--	--	910
Cement, hydraulic	14,336	17,243	15,692	17,860	17,860
Clays and earth materials	23,092	23,909	24,221	28,757	23,921
Clays, kaolin	323,916	425,942	326,928	494,511	341,223
Feldspar	30,819	42,662	79,220	117,180 ^r	142,358
Mica	3,669	3,609	3,544	4,542	5,152
Nitrogen, N content of ammonia	847,900	909,500	842,500	920,000 ^{r,c}	950,000 ^c
Sand and gravel	19,574	17,955	18,371	17,072	25,225
Silica sand, peninsular Malaysia and Sarawak	447,398	533,617	631,402	531,891	512,277
Stone:					
Aggregate	84,934	85,142	51,236	62,761 ^r	79,912
Dolomite	--	--	27,500	38,500	37,702
Limestone	27,450	33,397	31,598	30,868	33,471
MINERAL FUELS AND RELATED MATERIALS					
Coal	352,513	172,820	389,176	789,356	901,801
Gas, natural: ⁴					
Gross	56,843 ^r	60,941 ^r	63,165 ^r	70,471 ^r	70,191
Net ⁵	48,317 ^r	51,800 ^r	53,691 ^r	59,901 ^r	59,663
Liquefied natural gas	15,007	17,311	20,729	21,948	21,948
Petroleum: ⁴					
Crude and condensate	254,770	269,370	279,009	267,720	255,425
Refinery products ^{c,6}	186,000 ^r	200,000 ^r	225,000 ^r	218,000 ^r	208,000

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

¹Table includes data available through September 29, 2007.

²In addition to the commodities listed, a variety of crude construction materials, which include clays and stone, fertilizers, and salt, is produced but not reported, and information is inadequate to make reliable estimates of output.

³Includes byproduct from tin mines in peninsular Malaysia and gold mines in peninsular Malaysia and the State of Sarawak.

⁴Includes production from peninsular Malaysia and the States of Sabah and Sarawak.

⁵Gross less volume of reinjected and flared.

⁶Includes liquefied petroleum gas, naphthas, and lubricants.

Sources: Ministry of Primary Industry, Minerals and Geoscience Department (Kuala Lumpur), Malaysian Minerals Yearbook 2005; U.S. Geological Survey Minerals Questionnaire, 2006; and Southeast Asia Iron and Steel Institute, Steel Statistical Yearbook, 2005.

TABLE 2
MALAYSIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2006

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Bauxite		Johore Mining and Stevedoring Co. Sdn. Bhd. (Alcan Ltd. of Canada, 61%, and local investors and others, 39%)	Teluk Rumania and Sg. Rengit, Johor	400.
Cement ¹		Cement Industries of Malaysia Bhd. (United Engineers Malaysia Bhd., 53.97%, and others, 46.03%)	Kangar, Perlis	2,000 cement; 1,600 clinker.
Do.		Lafarge Malayan Cement Bhd. (majority owned subsidiary of Lafarge S.A.)	Rawang, Selangor; Kanthan, Perak, Langkawi, Kedah; and Pasir Gudang, Johor	12,800 cement; 7,900 clinker.
Do.		Negeri Sembilan Cement Industries Sdn. Bhd. (wholly owned subsidiary of Cement Industries of Malaysia Berhad)	Bahau, Negeri Sembilan	1,400 cement; 1,200 clinker.
Do.		Pahang Cement Sdn Bhd. (50-50 joint venture of Pahang State government and YTL Cement Berhad)	Bukit Sagu, Pahang	1,300 cement; 1,200 clinker.
Do.		Perak-Hanjoong Simen Sdn. Bhd. (Gopeng Bhd., 45%, and Korea Heavy Industries and Construction Co. and others, 55%)	Padang Rengas, Perak	3,400 cement; 3,000 clinker.
Do.		Tasek Corp. (publicly owned company)	Ipoh, Perak	2,300 cement; 2,300 clinker.
Gas:				
Natural	million cubic meters per day	ExxonMobil Exploration and Production Malaysia, Inc.	Offshore Terengganu	45.
Do.	do.	Sabah Shell Petroleum Co. Ltd.	Offshore Sabah	3.
Do.	do.	Sarawak Shell Bhd.	Offshore Sarawak	80.
Liquefied		Malaysia LNG Sdn. Bhd. (Petroliam Nasional Berhad, 65%; Shell Gas N.V., 15%; Mitsubishi Corp., 15%; Sarawak State government, 5%)	Tanjung Kidurong, Bintulu, Sarawak	8,100.
Do.		Malaysia LNG Dua Sdn. Bhd. (Petroliam Nasional Berhad, 60%; Shell Gas N.V., 15%; Mitsubishi Corp., 15%; Sarawak State government, 10%)	do.	7,800.
Do.		Malaysia LNG Tiga Sdn. Bhd. (Petroliam Nasional Berhad, 60%; Shell Gas N.V., 15%; Nippon Oil LNG (Netherlands) BV, 10%; Sarawak State government, 10%; Diamond Gas Netherlands BV, 5%)	do.	6,800.
Gold, refined	kilograms	Specific Resources Malaysia Sdn. Bhd. (joint venture of Pahang State Development Corp. and Avocet Mining Plc of the United Kingdom)	Penjom, Pahang	4,000.
Iron and steel:				
Hot-briqueted iron		Amsteel Mills Sdn Bhd (Lion Group)	Labuan Island, offshore Sabah	800.
Direct-reduced iron		Perwaja Steel Sdn. Bhd. (Lion Group, 51%, and Maju Holdings Sdn. Bhd., 49%)	Kemaman, Terengganu	1,200.
Crude steel		Amsteel Mills Sdn Bhd (Lion Group)	Klang and Banting, Selangor	1,300.
Do.		Antara Steel Sdn. Bhd. (Lion Grop)	Pasir Gudang, Johr	600.
Do.		Kinsteel Sdn Bhd (Lion Group)	Kuantan, Pahang	500.
Do.		Megasteel Sdn Bhd (Lion Group)	Banting, Selangor	2,500.
Do.		Perwaja Steel Sdn. Bhd. (Lion Group 51%, and Maju Holdings Sdn. Bhd., 49%)	Kermaman, Terengganu	900.
Do.		Southern Steel Bhd. (Camerlin [a member of Hong Leong Group Malaysia], 40.75%; Natsteel Ltd., 27.03; others, 32.22%)	Prai, Penang	1,200.
Nitrogen, ammonia		Asean Bintulu Fertilizer Sdn. Bhd. (Petroliam Nasional Berhad, 63.5%; P.T. Pupuk Sriwidjaja Indonesia, 13%; Thai Ministry of Finance, 13%; Philippines National Development Co., 9.5%; Singapore Temasek Holdings Pte. Ltd., 1%)	Bintulu, Sarawak	395.
Do.		Petronas Fertilizer Kedah Sdn. Bhd. (wholly owned subsidiary of Petroliam Nasional Berhad)	Gurun, Kedah	378.
Do.		Petronas Ammonia Sdn. Bhd. (wholly owned subsidiary of Petroliam Nasional Berhad)	Kerth, Terengganu	370.
Petroleum, crude	thousand 42-gallon barrels per day	ExxonMobil Exploration and Production Malaysia, Inc.	Offshore Terengganu	390.
Do.	do.	Sabah Shell Petroleum Co. Ltd.	Offshore Sabah	100.
Do.	do.	Sarawak Shell Bhd.	Offshore Sarawak	184.

See footnote at end of table.

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

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Petroleum, crude--Continued:	thousand 42-gallon barrels per day	Sarawak Shell Bhd.	Offshore Sarawak	184.
Do.	do.	Petronas Carigali Sdn. Bhd.	Offshore Terengganu	22.
Do.	do.	Murphy Sarawak Oil Co. Ltd.	Offshore Sarawak	15.
Tin:				
Concentrate		Delima Industries Sdn. Bhd.	Dengkil, Selangor	1.1.
Do.		Maiju Sama Sdn. Bhd.	Puchong, Selangor	1.6.
Do.		New Lahat Mines Sdn. Bhd.	Lahat, Perak	0.3.
Do.		Omsam Telecommunication Sdn. Bhd.	Bakap and Batu Gajah, Perak	0.5.
Do.		Rahman Hydraulic Tin Bhd.	Klian Intan, Perak	1.2.
Do.		S.E.K. (M) Sdn. Bhd.	Kampar, Perak	0.4.
Do.		Tasek Abadi Sdn Bhd.	Senudong and Kampar, Perak	0.5.
Refined		Malaysia Smelting Corp. Bhd. (The Straits Trading Co. Ltd., 37.44%; Malaysia Mining Corp., 37.44%; others, 25.12%)	Butterworth, Penang	35.
Titanium dioxide		Huntsman Tioxide Sdn. Bhd. (a subsidiary of Huntsman Trioxide of the United Kingdom)	Kemaman, Terengganu	56.

¹All companies operated integrated plants.