

THE MINERAL INDUSTRIES OF ASIA AND THE PACIFIC

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Asia and the Pacific in Minerals Yearbook, Volume III—Area Reports: International 2003 covers 31 countries and territories. The total area of the region, which is about 29.9 million square kilometers, is about three times that of the United States (9.6 million square kilometers). In 2003, the region's population totaled about 3.5 billion, which accounted for about 56% of the world total and was about 12 times that of the United States. China and India, which were the world's two most populous countries, accounted for 67% of the region's total population and about 38% of the world total population. In 2003, Japan's economy, which ranked second in the world after the United States, amounted to \$4.3 trillion as measured by the total gross domestic product (GDP); that of the United States amounted to \$10.9 trillion. The economies of China and India, however, were the two fastest growing in the region in 2003 (tables 1, 2).

In 2003, Australia and China were among the world's leading mineral producers. Australia has large resources of bauxite, coal, cobalt, copper, diamond, gold, iron ore, lead, lithium, manganese, mineral sands, nickel, silver, tantalum, uranium, and zinc. China has large resources of antimony, arsenic, barite, coal, copper, fluorite, gold, graphite, iron ore, magnesium, mineral sands, rare earths, silver, strontium, tin, tungsten, and zinc. India also was one of the world's significant mineral producers with large resources of barite, bauxite, chromium, iron ore, manganese, rare earths, and salt. Other significant mineral producers in the region were Indonesia, which has large resources of coal, copper, gold, nickel, and tin; Mongolia, which has large resources of copper, fluorspar, and molybdenum; Papua New Guinea, which has large resources of copper and gold; the Philippines, which has large resources of gold and nickel; and Thailand, which has large resources of feldspar and gypsum.

Despite the large amount and wide variety of regional resources of nonfuel minerals and mineral fuels in Australia, China, India, Indonesia, Mongolia, Papua New Guinea, the Philippines, and Thailand, the regional supplies of numerous nonfuel minerals, such as aluminum, bauxite, copper, gold, diamond, iron ore, lead, platinum-group metals (PGM), phosphate rock, silver, and zinc, and major mineral fuels, such as coal, natural gas, crude petroleum, and refined petroleum products, were insufficient to satisfy the demand in the region. The situation was caused largely by a substantial increase in consumption of nonfuel minerals and mineral fuels by China and India; by such resource-poor industrialized countries as Hong Kong, Japan, the Republic of Korea, Singapore, and Taiwan; and by the growing economies of such middle-income developing countries as Indonesia, Malaysia, and Thailand. The Middle Eastern and North American regions supplied a large percentage of Asia and the Pacific requirements for coal, natural gas, crude petroleum, and refined petroleum products. Africa, North America, and South America supplied a substantial percentage of the region's raw material requirements for ferrous and nonferrous metals.

China and Japan were the two major regional markets for crude and processed minerals. Japan was the region's leading consumer of ferrous and nonferrous metals because of its large manufacturing sector and its poor indigenous resources. China, however, remained the region's strongest consumer in terms of growth in demand, especially for such mineral commodities as aluminum and bauxite, coal, copper, iron and steel, crude petroleum, and natural gas. India, Indonesia, the Republic of Korea, Malaysia, Singapore, Taiwan, Thailand, and Vietnam also were important consumers of such mineral commodities as aluminum, cement, copper, gold, iron ore, lead, phosphate rocks, silver, steel, and zinc.

To accelerate the regional economic growth, social progress, and cultural development and to promote regional peace and stability, the Association of Southeast Asian Nations (ASEAN) was established in 1967. As of 2003, ASEAN's member countries were Brunei, Burma, Cambodia, Indonesia, Laos, Malaysia, the Philippines, Singapore, Thailand, and Vietnam. In 2003, the ASEAN region had a population of about 550 million, a total area of about 4.5 million square kilometers, a combined GDP of \$737 billion, and trade valued at \$720 billion (Association of Southeast Asian Nations, 2003¹).

To enhance economic growth and prosperity for the region and to strengthen the Asia-Pacific community, the Asia-Pacific Economic Cooperation (APEC) was established in 1989. The APEC was the premier forum for facilitating regional economic cooperation, growth, investment and trade. As of 2003, the APEC's member-countries were Australia, Brunei, Canada, Chile, China, Hong Kong, Indonesia, Japan, the Republic of Korea, Malaysia, Mexico, New Zealand, Papua New Guinea, Peru, the Philippines, Russia, Singapore, Taiwan, Thailand, the United States, and Vietnam. The APEC region had a population of about 2.6 billion, a combined GDP of about 60% of the world's GDP (\$19.3 trillion) and about 47% of the world's trade (Asia-Pacific Economic Cooperation, 2003¹).

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For mineral production statistics:

- Australia—Australian Bureau of Agricultural and Resources Economics and Western Australia Department of Minerals and Petroleum Resources in Australia;
- Brunei—Prime Minister's Department, Petroleum Units;
- Cambodia—Ministry of Industry, Mines and Energy, Department of Mineral Resources Development;

¹References that include a section mark (§) are found in the Internet References Cited section.

- India—Indian Bureau of Mines;
- Japan—Ministry of Economy, Trade and Industry, Research and Statistics Department;
- Republic of Korea—Korea Institute of Geoscience and Mineral Resources;
- Laos—Ministry of Industry and Handicraft, Department of Geology and Mines;
- Malaysia—Ministry of Primary Industry, Minerals and Geoscience Department;
- Mongolia—Mineral Resources and Petroleum Authority; and
- Thailand—Ministry of Industry, Department of Primary Industries and Mines.

For key economic data:

- Asian Development Bank in Manila, the Philippines;
- International Monetary Fund in Washington, DC; and
- The World Bank in Washington, DC.

For exploration and other mineral-related information:

- Australian Bureau of Statistics in Canberra, Australia; and
- Metals Economics Group in Halifax, Nova Scotia, Canada.

The projected outlook for production of selected major mineral commodities for 2005 and beyond was based upon supply-side assumptions, such as announced plans for capacity expansion, ongoing new capacity construction, and bankable feasibility studies. No explicit consideration of any demand-side factors, such as price and economic growth, was made.

General Economic Conditions

In 2003, the overall performance of the region's economy was, in terms of the average rate of real GDP growth, about 4% compared with 3.6% in 2002. China's economy continued to rank the highest in the region at 9.1% followed by India, 7.2%, and Thailand, 6.8%. Japan, which was the world's second ranked economy, also registered growth of 2.5% compared with 0.2% in 2002. The economies of Australia and New Zealand and of such newly industrialized economies as the Republic of Korea, Singapore, and Taiwan experienced slower economic growth than in 2002. The economic performance of such developing countries as Fiji, Indonesia, Malaysia, Mongolia, Pakistan, Papua New Guinea, the Philippines, Sri Lanka, and Vietnam, however, was generally better than that of developed countries with real GDP growth rates of between 5% and 6% in 2003.

Of the 31 countries and territories in the region, Australia ranked the richest with a per capita GDP based on purchasing power parity of \$29,143 followed by Japan, \$28,162; Hong Kong, \$28,027; Singapore, \$24,480; and Taiwan, \$23,773. East Timor was the poorest with a per capita GDP based on purchasing power parity of \$543 following Afghanistan, with \$700; North Korea, \$1,308; Nepal, \$1,418; and Burma, \$1,519. China ranked as the region's largest economy, in terms of total GDP based on purchasing power parity, at about \$6.4 trillion followed by Japan at about \$3.6 trillion; India, at about \$3.1 trillion; the Republic of Korea, at about \$858 billion; and Australia, at about \$580 billion (table 2).

The economies of the developing Asian countries were expected to continue to perform better than the developed and newly industrialized Asian countries but could grow at a slower pace during the next 2 to 3 years. According to the International Monetary Fund, China's real GDP was projected to grow by 8% in 2006 followed by Vietnam, 7%; Laos, 6.5%; and India, 6.4% (table 2). Among the newly industrialized countries, the Republic of Korea was projected to grow by 5.2% in 2006 followed by Singapore, 4.5%, and Taiwan, 4.3%. Among the Southeast Asian countries, Malaysia and Thailand were projected to grow by 6.2% each in 2006 followed by Indonesia, 6%, and the Philippines, 4.5%. The economies of the Pacific countries were projected to grow at a much slower rate; Australia was projected to grow by 3.3% in 2006 followed by New Zealand, 2.6%, and Fiji and Papua New Guinea, 2.3% each.

Investment Interest and Political Risk

China continued to invest heavily in expanding its mineral industry's production capacity, especially in aluminum, cement, iron ore, and steel. To prevent duplicate investment and nonperforming loan problems and to maintain China's financial stability, the Ministry of Land and Resources froze land supply for building villas, and the Chinese Central Bank raised the required reserves ratio on commercial banks to 7% from 6%. In 2003, the Government issued a circular to commercial banks to curb credit and expansion investment projects related to the aluminum, cement, and iron and steel sectors. The State Council raised the lending criteria for aluminum, cement, and steel projects by requiring more equity investment. In 2003, the minimum equity ratio for steel rose to 40% from 25%, and that of aluminum and cement, to 35% from 20%.

In 2003, investment in Mongolia was focused mainly on copper and gold. The privately owned Ivanhoe Mines Ltd. of Canada and the state-owned China International Trust & Investment Corp. of China agreed to form a strategic alliance (joint venture) for mineral exploration, development, and production projects. In 2003, Ivanhoe completed the feasibility study for the development of two gold-rich open pit mines at Oyu Tolgoi in Umnogovi Aimag in the southern Gobi area. The initial capital investment of about \$530 million would be spent for the first stage of the project during which between 300,000 and 400,000 metric tons per year (t/yr) of copper concentrates and 12.5 t/yr of gold would be produced.

India continued to invest in expanding the aluminum smelter's capacity at Renukoot in the State of Uttar Pradesh. The country planned to double the capacities of the lead and zinc smelters at Chanderiya in the State of Rajasthan and to invest a total of about \$980 million in two phases to expand its steel production capacity in the State of Jharkhand. India also was to begin a \$390 million deepwater exploration campaign in the first quarter of 2004 and was expected to spend \$1.2 billion per year thereafter in oil exploration to increase its petroleum production from deepwater oilfields.

In the Republic of Korea, Pohang Iron and Steel Co. Ltd. planned to invest a total of \$11.3 billion during the next 5 years

to expand its steel production capacity, develop value-added steel products, and implement a next-generation ironmaking process called FINEX® technology, which had been developed by Voest-Alpine Industrieanlagenbau of Austria.

In Malaysia, MASCO Aluminum Sdn. Bhd. planned to build a \$3.42 billion aluminum smelter to produce 690,000 t/yr of primary aluminum in the State of Perak. In Laos, Oxiana Ltd. of Australia was expected to invest an additional \$235 million in late 2004 or early 2005 for the development of a copper mine and the building of a processing plant at the Khangong deposit adjacent to its Sepon gold mine to produce copper and gold. In Vietnam, Tiberon Minerals Ltd. of Canada was expected to invest about \$140 million during the next 2 to 3 years for the development of a tungsten-fluorite mine at the Nui Phao deposit.

Legislation

To attract foreign investment in mineral development and production in China, the Government urged the National People's Congress to amend the mineral resources law, which had been enacted in 1986 and amended previously in 1996. Under this law, prospectors have mining rights, but how such rights can be guaranteed is not explained clearly. In 2003, the Ministry of Land and Resources established a mineral resources law consultant committee to seek recommendations from domestic and overseas mining law experts for proposing changes to redefine mineral rights.

In India, the Government reduced the basic tariff on imported metallurgical coke to 5% from 15% and abolished the tariff on metallurgical coke imported from China. The Government also reduced import traffic on polished diamond and gemstones to 5% from 15% and reduced the custom duty on gold bars and coins to \$2.10 per 10 grams in 2003 from \$5.25 per 10 grams in 2002. In the Republic of Korea, the Government reduced the import tariff on such raw materials as coal and ore and concentrates of copper, iron, lead, manganese, titanium, and zinc and on such processed minerals as primary aluminum, refined copper, nickel oxide, and pig iron effective July 2003. By the end of December 2003, the Government was to submit an amendment to the National Assembly for approval to reduce the tariff to zero on raw materials for the production of ferrous and nonferrous metals.

In Indonesia, the drafting of a proposed new mining law was completed by the Ministry of Energy and Resources (MER) and submitted to the State Secretariat for approval before submission to the House of Representatives to be legislated into law. The new mining law would replace General Mining Law No. 11/1967. The replacement was considered to be necessary because the old law was not compatible with conditions in the mining sector. The MER withdrew the draft at yearend 2003, however, but planned to set up a technical team to redraft a new mining law.

In Mongolia, the Parliament approved amendments to the Law of Corporate Income Tax. The corporate income tax ceiling under the amendment was to be reduced to 30% from 40% effective January 1, 2004. Various tax incentives for foreign investment companies, however, would be terminated.

The Government submitted a proposed amendment to the Parliament in December 2003 that would abolish the 10% value-added tax on gold sales and change the royalty for extraction of hard-rock minerals deposits to 2.5% and of placer gold deposits to 7.5%. In Sri Lanka, the Parliament approved the Petroleum Resources Bill, which allows the private sector to invest in oil and gas exploration to exploit the country's petroleum resources and to share profits with foreign and local companies.

Exploration

Exploration activity in much of Asia and the Pacific increased slightly in 2003 from the 2002 levels but remained at significantly lower levels than the high levels of 1997. Data derived from the Metals Economics Group (MEG) annual survey suggest that the 2003 proposed budget for Australian exploration activity of about \$339 million was 11% higher than the \$304 million reported by the MEG in its 2002 survey. Similarly, the 2003 budget for the Pacific region countries (excluding Australia) of about \$93 million was about 9% higher than the corresponding 2002 exploration budget. The estimate for the exploration budget for Asia was reported to be \$84 million in 2003 by the MEG, which was up by about 50% from the \$56 million reported for 2002 (Metals Economics Group, 2003a, b).

Although the MEG estimates of recent Australian mineral exploration expenditures showed a slight increase in 2003, Australian activity has declined from a 1997 peak period of activity. The MEG estimate for the 2003 Australian exploration budget allocations declined to 15.5% of the total world exploration budget in 2003 from 17.6% in 2002. The Western Australia Department of Industry and Resources (2003a) reported minerals exploration expenditures for 2002 to be \$442 million, as compiled by the Australian Bureau of Statistics (ABS); exploration in Western Australia accounted for 58% of these expenditures, or about \$258 million.

According to the ABS, as reported by the Australian Bureau of Agricultural and Resource Economics (2004§), gold accounted for 52% of Australia's mineral exploration expenditure in 2002-03. Exploration allocations for base-metal targets in Australia accounted for about 16% during the same period. Comparing the periods from June 2001 to June 2002 and June 2002 to June 2003, Australian minerals exploration expenditures varied significantly by mineral sector. The largest expansion in exploration expenditure was in the gold sector, which increased by 12%, or about \$18 million for this period. Gains also were made in the iron ore sector, which increased by 42%, or about \$5.1 million, and the base-metal and silver sectors, which increased by 17%, or \$6.8 million. The diamond exploration sector decreased by 41%, or about \$8.1 million for the period. Other sectors remained close to their 2001-02 levels (Western Australia Department of Industry and Resources, 2003b).

After Western Australia, exploration in Australia was focused on the States of Queensland, New South Wales, and South Australia and the Northern Territory. South Australia saw gains in 2003 as a result of extensive work conducted on the

Prominent Hill copper/gold project and the completion of the Targeted Exploration Initiative South Australia program conducted by the Department of Primary Industries and Resources, South Australia (MineBox, 2003c§). The site data compiled by the USGS for this report also suggest these areas had the highest level of exploration activity in Australia.

Native title claims issues continued to affect Australian exploration and mining. The Native Title Act of 1993 provided the framework for determinations of native title. The process for determining whether native title applies and the resolution of native title claims, however, have been slow. As of September 22, 2003, 46 native title determinations have taken place in Australia; about two-thirds of these supported the rights of native title claimants. As of October 8, 90 indigenous land-use agreements had been negotiated in Australia, of which 60% related to Queensland (Fooks and Sun, 2003). In 2003, Queensland adopted an expedited process for dealing with mining exploration permits in return for guaranteed protection for cultural heritage values on land subject to native title (MineBox, 2003b§). The Western Australia State Government has invested more than \$1.8 million to speed up the processing of mineral tenement applications on land under native title claim. The Northern Territory State Government committed \$9.9 million to enhance understanding of the regional geology; to improve community education, land access, and mineral tenure; and to strengthen interest in onshore and offshore petroleum acreage. The maximum exploration expenditure deduction on mineral royalties in the Northern Territory was reduced from 25% to 35% during 2003 (MineBox, 2003a§).

Budget allocations for mineral exploration in other countries in Asia and the Pacific expressed as a percentage of the world's exploration budget continued to decrease in 2003 to 4.2%, which was about one-half of the level of this region in 2000. The exploration budget allocation for 2003 reported by the MEG was about \$93 million, which was up slightly in dollar terms from the 2002 level of \$85 million. Gold budgets for Asia and the Pacific rose slightly to \$43 million in 2003 from \$31 million in 2002 after declining steadily for several years. Risk aversion caused largely by political instability was primarily responsible for the drop in dollar allocation for gold exploration in the region from a high of \$319 million in 1997 (Metals Economics Group, 2003a). In Southeast Asia, aggressive drilling programs were reported in Laos at the Sepon gold-copper deposit, in the Philippines at the Boyongan gold-copper deposit, and in Thailand at the Chatree/Prospect A gold-silver deposit.

On the basis of data collected during 2002 and 2003, exploration activity in Asia and the Pacific (excluding Australia) was greatest in the Philippines, where it was associated mostly with established or developing mining areas. Other activity also took place in Indonesia and Papua New Guinea. Gold targets accounted for about 80% of all exploration interest in the Pacific region, and base-metal targets accounted for 13% of the reported activity in 2003.

Japan announced plans to spend \$88 million to conduct a large-scale marine minerals survey of the continental shelves off the coast of Japan. Under the 1983 U.N. Convention on the Law of the Sea, a coastal state may claim rights to the resources

of a continental shelf beyond its 200-nautical-mile exclusive economic zone provided there is geographical continuity of the seabed (Pay Dirt, 2003).

Within Asia, base-metals and gold exploration was focused on China and Mongolia. Mineral exploration in China has increased since the country opened its mining sector to foreign investment during the 1990s. China's manufacturing base relies on raw materials, and its domestic mining industry is unable to develop fast enough to keep pace with increased mineral demand generated by its high rate of economic growth. Between January and June 2003, 2,693 exploration and mining licenses were issued compared with 20 exploration licenses and 320 mining licenses between 1998 and 2001 (Mining Journal, 2003).

Chinese mining laws and regulations that pertain to joint ventures with foreign mining companies continued to evolve slowly but positively from an international investment perspective (Mining Journal, 2003). The Government has issued guidelines to allow foreign enterprises to conduct Chinese mineral exploration activities. The Ministry of Land and Resources has developed a long-term program for mineral development; 10 major areas in western China have been designated for exploration and exploitation.

Commodity Overview

The outlook tables in this summary chapter show historic and projected production trends; therefore, no indication is made about whether the data are estimated or reported, and revisions are not identified.

Metals

Aluminum and Bauxite and Alumina.—The region's production of bauxite accounted for about 54% of the world total in 2003. Australia, which was the world's leading producer of bauxite, accounted for 38% of the world total; it was followed by China, 9%, and India, 7%. Production of primary aluminum accounted for about 32% of the world total in 2003. China, which was the world's leading producer of primary aluminum, accounted for 18% of the world total; it was followed by Australia, 6%, and India, 2% (table 4).

Japan produced no bauxite and insignificant amounts of primary aluminum but continued to be one of the region's leading consumers of bauxite and one of the world's major consumers of primary aluminum in 2003. Japan imported more than 2 million metric tons (Mt) of bauxite mainly from Australia (56%), Indonesia (34%), and India (7%). Japan imported 2.9 Mt of primary aluminum mainly from Australia (20%), China (9%), New Zealand (7%), and Indonesia (5%) within Asia and the Pacific and from Russia (24%) in Europe and Central Eurasia; about 46% of Japan's imported primary aluminum was from Japan's 11 overseas aluminum smelter projects in which Japanese aluminum and major trading companies held substantial equity shares. Japan, which was the region's leading producer of secondary aluminum, accounted for 76.4% of the regional total and about 16% of the world total in 2003.

Regional production of primary aluminum and bauxite was expected to continue to grow at an average annual rate of about 6% and 4%, respectively, between 2003 and 2009 (tables 5, 6). This prediction was based on reported capacity expansions in Australia, China, and India. Regional production of secondary aluminum was predicted to remain at the 1.5-Mt level with a slight decrease in estimated production in Japan and a gradual increase in estimated production in China (table 7).

In Australia, capacity expansions included the construction of a 1.4-million-metric-ton-per-year (Mt/yr) alumina refinery and a 450,000-t/yr aluminum smelter by Comalco Ltd. at Gladstone, Queensland. In China, capacity was expanded at several enterprises, which included an alumina refinery to 850,000 t/yr in 2003 from 800,000 t/yr in 2002 at Pingguo, Guangxi Province, by Aluminum Corp. of China Co. Ltd. (Chalco); a 150,000-t/yr smelter to be constructed by 2005 in Lanzhou, Gansu Province, by Lanzhou Aluminum Co. Ltd.; an aluminum smelter to 380,000 t/yr from 130,000 t/yr by 2006 at Pingguo, Guangxi Zhang Autonomous Region, by a joint venture of Chalco and Alcoa Inc. of the United States; and the development of a bauxite mine, construction of an 800,000-t/yr alumina refinery, and completion of a 250,000-t/yr aluminum smelter by 2006 in Bose, Guangxi Zhang Autonomous Region, by Guangxi Guixi Huayin Aluminium Corp., which was a joint venture of Chalco, Minmetals Nonferrous Metals Co. Ltd., and Guangxi Investment Ltd. In the State of Orissa in India, capacity expansions included the ongoing expansions of a bauxite mine and an alumina refinery to 4.8 Mt/yr and 1.6 Mt/yr, respectively, at Dhamanjodi; an aluminum smelter to 525,000 t/yr at Angul by National Aluminium Co. Ltd.; and an aluminum smelter to 57,200 t/yr from 30,000 t/yr in 2003 by Indian Aluminium Co. Ltd. at Hirakud. Hindalco Industries Ltd. expanded the capacity of an aluminum smelter at Renu Koot, State of Uttar Pradesh, to 342,000 t/yr in 2003 and planned to expand it to 360,000 t/yr in 2005. Bharat Aluminium Co. Ltd. proposed to expand the capacities of an alumina refinery to 830,000 t/yr from 200,000 t/yr and an aluminum smelter to 334,000 t/yr from 100,000 t/yr; both facilities were located at Korba, State of Chhattisgarh.

Copper.—The region's production of mined copper accounted for about 21% of the world total in 2003. Indonesia, which was the leading regional producer and the world's third ranked producer of mined copper, accounted for 7% of the world total; it was followed by Australia, 6%, and China, 5%. Production of primary refined copper metal accounted for about 33% of the world total primary refined copper production in 2003. Among the region's refined copper producers, China, which was the world's second ranked producer of primary and secondary refined copper metal, accounted for 12% of the world total in 2003; Japan, which ranked third, accounted for 9%. Australia and the Republic of Korea, which also were important producers of refined copper metal, accounted for 4% and 3%, respectively, of the world total in 2003 (table 4).

Japan was one of the world's major import markets for copper concentrates. The country imported more than 4 Mt of copper concentrates and accounted for more than 30% of copper concentrates traded in the world in 2003. China was one of the world's major import markets of copper concentrates and refined copper. China imported about 2.7 Mt of copper concentrates

and about 1.4 Mt of refined copper and accounted for about 20% each for copper concentrates and refined copper traded in the world in 2003. Another important consumer of copper concentrates in the region was the Republic of Korea, which imported about 1.3 Mt of copper concentrates and accounted for 10% of copper concentrates traded in the world in 2003. Australia, Indonesia, Mongolia, and Papua New Guinea were the major regional suppliers of copper concentrates to China, Japan, and the Republic of Korea. Japan, Indonesia, and the Philippines were the region's major suppliers of refined copper to China and other Southeast Asian countries.

Regional production of refined copper metal and mined copper was expected to continue to increase at an average annual rate of 5% and 4%, respectively, between 2003 and 2009. This prediction was based on reported capacity expansions of mined copper in Australia and Indonesia, as well as Burma, Laos, Thailand, and Vietnam, and on reported capacity expansions of refined copper metal in China and Japan, as well as Burma, Laos, Thailand, and Vietnam (tables 8, 9).

In Australia, gradual capacity expansions were to be undertaken by MIM Holdings Ltd. at Mount Isa in Queensland and by WMC Olympic Dam Operations Pty., Ltd. at Olympic, State of South Australia. In Indonesia, gradual capacity expansions were to be undertaken by P.T. Freeport Indonesia Co. at Grasberg, Province of Papua, and by P.T. Newmont Nusa Tenggara at Batu Hijau on Sunbawa Island, Province of West Nusa Tenggara. In China, Jiangxi Copper Co. Ltd. increased its refining capacity to 400,000 t/yr in 2003 from 200,000 t/yr in 2002 at Guixi, Jiangxi Province; Yunan Copper Group Co. Ltd. planned to increase its refinery capacity to 350,000 t/yr from 160,000 t/yr at Kunming, Yunnan Province, by 2005. Refined copper capacity increases of 6,000 t/yr, 30,000 t/yr, and 50,000 t/yr would be added by Shanghai Xinfengneng Industrial Co. Ltd. in Hami, Xinjiang Uygur Autonomous Region, in 2004, 2006, and 2007, respectively; and 200,000 t/yr of blister copper by Baotou Huading Copper Development Co. Ltd. in Baotou, Nei Mongol Autonomous Region, in 2004. Tongling Nonferrous Metals Co. planned to expand its copper refining capacity to 450,000 t/yr from 310,000 t/yr in the next 3 years. In Japan, Sumitomo Metal Mining Co. Ltd. expanded the capacity of its Toyo Smelter and Refinery to 300,000 t/yr in 2003 and planned to increase the capacity gradually to 450,000 t/yr by 2008. In Burma, Myanmar Ivanhoe Copper Co. Ltd. planned to develop the Letpadaung deposit in the Monywa area and to increase its capacity to 125,500 t/yr of copper cathodes from 25,000 t/yr in five stages between 2005 and 2009. In Laos, Oxiana Ltd. of Australia planned to develop a copper mine and to build a processing plant at the Khanong deposit to produce 60,000 t/yr of copper cathodes by 2006. In Thailand, Pan Australian Resources N.L. of Australia, in joint venture with Padaeng Industry Public Co. of Thailand, planned to develop a copper mine and to build a processing plant at their PUT 1 deposit, which could begin operations at the capacity of 30,000 t/yr of copper cathodes by 2008. Thai Copper Industries PLC planned to commission its new 165,000-t/yr copper smelter and refinery in Rayong by mid-2004. In Vietnam, Vietnam National Minerals Corp. began construction work on a copper mine and smelter at Sin Queyen, Province of Lao Cai, to produce 42,000

t/yr of copper concentrate and 10,500 t/yr of refined copper by 2005 or 2006.

Gold.—The region's production of mined gold accounted for about 31% of the world total in 2003. Australia, which ranked third in production of mined gold, accounted for 11% of the world total; it was followed by China, which was ranked fourth in the world and accounted for 8%, and Indonesia, which was ranked seventh in the world and accounted for 5% in 2003. The region's production of mined gold increased by 68% between 1990 and 2000 and by 8% between 2000 and 2003 (table 10).

In 2003, Australia's gold reserves ranked second after those of South Africa. Production of mined gold in Australia was mainly from several large-scale open pit gold mines in Western Australia and from more than 40 active gold and copper mines located in almost every State of Australia. In 2003, production of mined gold in China reached a record high of more than 200 metric tons (t), and that of Indonesia declined slightly. Production of mined gold in Japan, Mongolia, New Zealand, Papua New Guinea, and the Philippines remained steady in 2003. Laos opened its first gold mine with a capacity of 5 t/yr at Sepon, Province of Savannakhet, in 2003. In 2001, Thailand had opened a small gold mine at Chatree, Province of Phichit, with a capacity of 4.5 t/yr and was expanding its capacity in 2003.

Asia and the Pacific was the world's major market for gold. India was the world's leading consumer of gold; it was followed by Japan and China. In 2003, India was estimated to consume about 570 t of gold; Japan, about 360 t; and China (including Hong Kong), about 320 t.

Regional production of mined gold was expected to continue to increase at an average annual rate of 2.5% between 2003 and 2009. This prediction was based on gradual capacity expansions mainly at the major copper and gold mines in Australia, China, and Indonesia. Production of mined gold in Japan, Mongolia, New Zealand, Papua New Guinea, the Philippines, Laos, and Thailand was predicted to hold steady from 2003 to 2006 and to increase slightly with gradual capacity expansions of gold and copper mines between 2007 and 2009 (table 10).

Iron and Steel.—The region's production of iron ore was estimated to account for, in terms of metal content, about 40% of the world total in 2003. Australia ranked second in the world as a producer of iron ore; it was followed by China and India. The region's production of pig iron and direct-reduced iron (DRI) was estimated to account for about 58% of the world total. China, which ranked as the world's leading producer of pig iron, accounted for 29% of the world total; it was followed by Japan, which accounted for 12%. The region's production of crude steel was estimated to account for about 49% of the world total. China, which was by far the world's leading producer of crude steel, accounted for 23% of the world total; it was followed by Japan, which accounted for 12% (table 4).

China was the world's leading consumer and importer of iron ore in 2003. The country imported more than 148 Mt of iron ore to meet the raw material requirements of its expanding steel industry. Japan produced almost no iron ore but was the world's second ranked consumer and importer of iron ore; more than 130 Mt of iron ore was imported in 2003. The Republic of Korea was another significant consumer and importer of iron

ore in the region; about 43 Mt of iron ore was imported in 2003. Australia was the region's leading supplier of iron ore in Asia and the Pacific; it was followed by India.

Regional production of iron ore was expected to increase at an average annual rate of 3.5% between 2003 and 2009. This prediction was based on gradual capacity expansions in Australia, China, and India. Such expansions in Western Australia would be at the Channar and the Hamersley operations of Hamersley Iron Pty. Ltd.; the Mount Goldsworthy, the Mount Newman, and the Yandi operations of BHP Billiton Iron Ore Pty. Ltd.; the Mesa J and the West Angeles (Pannawonica) operations of Robe River Iron Associates; and the Jumblebar operation of BHP Iron Ore (Jumblebar) Pty. Ltd. In China, gradual expansion would be at Qian'an, Hebei Province, by Shoudu Mining Co.; at Ansan and Benxi, Liaoning Province, by Ansang Mining Co. and Benxi Iron and Steel Co., respectively; at Baotou, Nei Mongol Autonomous Region, by Baotou Iron and Steel and Rare Earth Co.; at Panzhihua, Sichuan Province, by Panzhihua Mining Co.; at Maanshan, Anhui Province, by Maanshan Iron and Steel Co.; and at Changjiang, Hainan Province, by Hainan Iron Mine. Other reported iron-ore-capacity expansions in China included the Dahongshan Mine at Yuxi, Yunnan Province; at the Jinshandian Mine, Hubei Province; at the Baima Mine, Sichuan Province; at the Menjiagou Mine, Qian'an Province; at the Heigou Mines, Gansu Province; and at the Caolou Mine, Anhui Province. In India, a large new iron ore mine at Gandhamardan Malanjtoli, State of Orissa, was scheduled to start production in 2006 (table 11).

China was the world's leading consumer of iron and steel products. The country imported more than 45 Mt of iron and steel products in 2003. Japan was the world's leading exporter and the region's major supplier of iron and steel products to China and such major consumers in the region as the Republic of Korea, Singapore, Taiwan, and Thailand.

Regional production of pig iron and DRI was expected to increase at an average annual rate of 4% between 2003 and 2009. This prediction was based on the reported capacity expansions mainly at Caofeidian and Qian'an, Hebei Province, by Shoudu Iron and Steel Group Co. and at Ningbo, Zhejiang Province, by Hangzhou Iron and Steel Co. Ltd., in China and at Nagamar, State of Chhattisgarh, and Jamshedpur, State of Bihar, in India. Pig iron production in Japan and the Republic of Korea was expected to hold steady between 2003 and 2009 (table 12).

Regional production of crude steel was expected to increase at an average annual rate of 3.5% between 2003 and 2009. This prediction was based on reported capacity expansions mainly at Caofeidian and Qian'an, Province of Hebei, by Shoudu Iron and Steel Group and at Hangzhou and Ningbo, Province of Zhejiang by Hangzhou Iron and Steel Group Co. in China and at Jamshedpur, State of Bihar, and in the State of Jharkhand by Tata Iron and Steel Co. Lt. in India (table 13).

Lead and Zinc.—The region's production of mined lead and zinc accounted for about 54% and 41%, respectively, of the world total in 2003 (table 4). Australia's lead reserves ranked as the world's largest; those of China ranked second. Australia's zinc reserves were the world's largest, and those of China were estimated to be about the same as those of Australia in 2003.

China, which ranked as the world's leading producer of mined lead and zinc, accounted for more than 29% and 21%, respectively, of the world total in 2003; it was followed by Australia, which accounted for more than 21% and 17%, respectively. India and North Korea were the region's other important producers of mined lead and zinc; their production levels held steady in 2003 (table 4).

China, which ranked as the world's leading producer of primary lead and primary zinc, accounted for more than 36% and 23% of the world total, respectively, in 2003. Australia, India, Japan, and the Republic of Korea were the region's other important producers of primary lead and slab zinc. China and Japan were among the world's major producers of secondary lead in 2003 (table 4).

China was the world's second ranked consumer of primary and secondary lead after the United States in 2003. Consumption of primary and secondary lead in China reached a record high of more than 1 Mt. The substantial growth in demand for lead during the past several years was due to the continuing increase in demand for storage batteries by the growing number of automobile producers in China. Consumption of primary slab zinc in China reached 2 Mt, which also was a record high. Japan and the Republic of Korea were the region's other important consumers of primary and secondary lead and primary slab zinc; their demands for lead and zinc have remained relatively steady during the past several years.

Regional production of mined zinc and lead was expected to increase at an average annual rate of 3% and 2%, respectively, between 2003 and 2009. This prediction was based on reported capacity expansions in Australia, China, and India (tables 14, 25). Regional production of zinc metal and primary and secondary refined lead was expected to increase at an average annual rate of 2.5%, 2.2 %, and 2.0 %, respectively, between 2003 and 2009. This prediction was based on gradual capacity expansions mainly in China (tables 15, 16, 26).

In Australia, gradual capacity expansions were expected to be carried out at the Cannington Mine in Queensland by BHP Minerals Ltd. and at the George Fisher and the Hilton Mines at Mount Isa, Queensland, by MIM Holdings Ltd.

In China, reported capacity expansions were for a new lead-zinc mine in Nei Mongol Autonomous Region by Dongshenmiao Lead and Zinc Mining Co.; a new lead-zinc mine at Lanping, Yunnan Province, by Yunnan Jinding Zinc Co. Ltd.; the lead smelter and refinery at Jiyuan, Henan Province, by Yuguang Gold and Lead Co. Ltd.; the zinc smelter in Hunan Province by Jinshi Mining Co. Ltd.; the zinc smelter and refinery at Chifeng, Nei Mongol Autonomous Region, by a joint venture of Biyinnuoer Lead and Zinc Co., Chifeng Hongye Zinc Smelter Co. Ltd., and Kumba Resources Ltd. of South Africa; the lead and zinc smelters and refineries at Baiyin, Gansu Province, by Baiyin Nonferrous Metals Co. Ltd.; and the lead smelter at Hengyang, Hunan Province, by Shuikoushan Nonferrous Metals Co. Ltd.

In India, reported capacity expansions were for the Rampura Agucha lead and zinc mine in the State of Rajasthan and for the lead and zinc smelters at Chanderiya, State of Rajasthan, by Hindustan Zinc Ltd. Three shuttered secondary lead plants, of

which two were in Maharashtra and one was in West Bengal, were reported to have been restarted by Indian Lead Co. Ltd.

Nickel.—The region's production of mined nickel, in terms of metal content, accounted for about 39% of the world total in 2003. Australia ranked first in nickel reserves and was the world's second ranked producer of mined nickel after Russia in 2003. Indonesia and New Caledonia, which were the region's other major producers of mined nickel, accounted for 10% and 9%, respectively, of the world total (table 4).

Japan was the world's leading consumer and importer of nickel ore and nickel matte; more than 4 Mt/yr of nickel ore (gross weight) was imported from Indonesia, New Caledonia, and the Philippines for the production of ferronickel. Japan imported more than 100,000 t/yr of nickel matte from Australia and Indonesia for the production of refined nickel metal and chemicals. The country was the world's second ranked producer after Russia of primary nickel, which included chemicals, ferronickel, nickel oxide sinter, and pure nickel metal. China also was a key regional consumer and importer of nickel ore, matte, and pure metal.

Regional production of mined nickel was expected to continue increasing at an average annual rate of 3% between 2003 and 2009. This prediction was based on reported gradual expansions of capacity and increases in productivity (table 17). In Western Australia, sulfide concentrates were being produced at Black Swan by Outokumpu Exploration Ventures Pty. Ltd., at Cosmos by Jubilee Mines NL, and at Kambala, Leinster, and Mount Keith by WMC Ltd. Anaconda Nickel Ltd. was using high-pressure acid leaching to extract nickel. In China, gradual capacity expansion was to be undertaken at Jinchuan, Gansu Province, by Jinchuan Nonferrous Metals Corp. In 2003, Baoshan Iron and Steel Group Co. and Yunnan Kunming Co. Ltd. reached an agreement to develop a nickel mine in Yuanjiang County, Yunnan Province, and to build a 10,000-t/yr nickel refinery by 2008. Sumitomo Metal Mining Co. Ltd. of Japan was constructing a greenfield hydrometallurgical plant to extract nickel from low-grade ores stockpiled at the Rio Tuba Mine on Palawan Island in the Philippines. Inco Limited of Canada began construction of a new large-scale mining and hydrometallurgical nickel-cobalt extraction complex at Goro in New Caledonia; the Goro complex was scheduled to be operational in September 2007. Falconbridge Ltd. was evaluating the Koniombo deposit near Kone in the Northern Province of New Caledonia.

Platinum-Group Metals.—The region's production of mined palladium and platinum was insignificant and accounted for only 0.7% and 0.3%, respectively, of the world total in 2003 (table 4). China produced palladium and platinum as byproduct of mined nickel by Jinchuan Nonferrous Metals from its nickel mining and refining operations at Jinchuan, Gansu Province. Australia was not a primary producer of PGM, although small amounts of palladium were produced from Western Australia's Eastern Goldfield at Kalgoorlie-Boulder and Kambalda as a byproduct of the nickel operations.

In 2003, Japan was by far the world's leading consumer and importer of PGM. The country imported about 59 t of palladium and 49 t of platinum and consumed about 43 t of platinum and 42 t of palladium. Its consumption of palladium

and platinum was estimated to account for 25.7% and 21.1%, respectively, of the world total.

Regional production of mined platinum was expected to increase at an average annual rate of 4% between 2003 and 2009. This prediction was based on gradual capacity expansion of mined nickel in China (table 18). Regional production of mined palladium was expected to increase at an average annual rate of 3% between 2003 and 2009. This prediction was based on gradual capacity expansion of mined nickel in Australia and China (table 19).

Silver.—The region's production of mined silver accounted for about 27% of the world total in 2003. Silver reserves in Australia and China were estimated to account for about 11% and 10%, respectively, of the world total. China and Australia, which ranked third and fourth among the world's top eight producers of mined silver, accounted for about 12% and 10%, respectively, of the world total in 2003.

In Asia and the Pacific, mined silver was produced mainly from Australia's sole primary silver mine at Cannington, Queensland, and from China's primary silver mines at Yintongzi, Shaanxi Province, and at Poshan, Henan Province. Most of the mined silver in the region, however, was produced as a coproduct of copper or gold or lead and zinc mining operations in Australia, China, Indonesia, Japan, and Papua New Guinea.

Japan was the world's second ranked consumer of silver after the United States. The country consumed about 2,700 t of silver metal, which accounted for about 10% of the world total in 2003.

Regional production of mined silver was expected to increase at an average annual rate of about 5% between 2003 and 2009. This prediction was based on reported gradual capacity expansions of copper, gold, and lead-zinc mines in Australia and China (table 20).

Tin.—Asia and the Pacific was the world's dominant producing region for mined tin and refined tin metal. Production of refined tin metal and mined tin accounted for about 74% and 71%, respectively, of the world total in 2003. Regional production of mined tin in 2003 was higher than that of 2002 because of higher prices, which resulted from shortages of tin concentrate and stronger demands for tin worldwide. China ranked first in production of mined tin and refined tin metal and was estimated to have accounted for about 39% and 36%, respectively, of the world total production in 2003. Indonesia, which ranked second, accounted for 27% and 24% of the world's production of mined tin and refined tin metal, respectively. Other important mined tin producers in the region were Australia, Malaysia, and Vietnam. Other significant refined tin metal producers were Malaysia and Thailand in 2003 (table 4).

In 2003, China, which was the world's second ranked consumer of refined tin metal, accounted for about 24% of the world total. Japan followed with 9%. The major exporters of refined tin were, in decreasing order, Indonesia, China, Malaysia, and Thailand. Japan, which was the world's second ranked importer of refined tin metal after the United States, was estimated to have accounted for about 16% of the world total of refined tin in 2003.

Regional production of mined tin was expected to increase at an average annual rate of only 0.5% between 2003 and 2009. This prediction was based on capacity expansions for mined tin at No. 105 deposit in Nandan, Guangxi Zhuang Autonomous Region, by Gaofeng Mining Co. Ltd. (table 21). Regional production of refined tin metal was expected to increase at an average annual rate of about 3% between 2003 and 2009. This prediction was based on reported capacity expansions at the Koba smelter of P.T. Koba Tin, several small local smelters on Bangka Island in Indonesia, and the Butterworth smelter of Malaysia Smelting Corp. Bhd. in Penang, Malaysia (table 22).

Titanium.—The region's production of mined ilmenite accounted for about 40% of the world total in 2003. Australia, which was the world's leading producer of ilmenite, accounted for about 24% of the world total; it was followed by China, 8%, and India, 6%. In Australia, ilmenite was produced from heavy mineral sands that contained ilmenite, leucoxene, and rutile mostly in Western Australia. The major ilmenite producers were Cable Sands (WA) Pty. Ltd., Iluka Resources Ltd., Kerr McGee Corp., and Ticor Ltd. In China, ilmenite was produced from heavy sands in the southeastern coastal area of the Provinces of Guangdong and Hainan and the Guangxi Autonomous Region and in the southwestern Provinces of Sichuan and Yunnan. In India, state-owned India Rare Earths Ltd. operated mines at Chavara, State of Kerala; at Ganjam, State of Orissa; and at Manavalakurichi and Kanyakumari, State of Tamil Nadu.

Japan was the region's leading consumer and importer of ilmenite. Other important consumers in the region were China, the Republic of Korea, and Taiwan. The region's leading suppliers of ilmenite to Japan, were, in decreasing order of amount, Vietnam, Australia, and India.

Regional production of mined ilmenite was expected to increase at an average annual rate of about 9% between 2003 and 2009. This prediction was based mainly on new capacity development in Australia—at the Ginkgo minerals sands deposit in the Murray Basin of New South Wales by BeMaX Resources NL, the Wemen Mine in Victoria by Murray Basin Titanium Pty. Ltd., and the Dardanup mineral sands deposit in Perth, Western Australia, by Doral Mineral Sands Pty. Ltd. (table 23).

Tungsten.—The region's production of mined tungsten accounted for about 88% of the world total. In 2003, China, which was the world's leading producer of mined tungsten, accounted for about 86% of the world total production. North Korea was another important producer of mined tungsten in the region (table 4).

The world's leading importer and consumer of mined tungsten and such intermediate products as ammonium paratungstate (APT), Japan imported about 420 t of tungsten ore and concentrate and 3,400 t of APT in 2003 for the production of tungsten metal powder and oxide to meet its raw material requirements for the iron and steel and tungsten metal industries. China was the world's dominant supplier of APT to Japan.

Regional production of mined tungsten was expected to increase at an average annual rate of about 1% between 2003 and 2009. This prediction was based on gradual capacity expansion through increased productivity at Nanchang, Jiangxi Province, by Xiamen Tungsten Co. Ltd. and other smaller producers in Hunnan Province (table 24).

Industrial Minerals

Diamond.—The region's production of diamond accounted for more than one-quarter of the world total in 2003. Australia, which was the world's second ranked producer of diamond, accounted for 26% of the world total. The Argyle Mine, which is located in the Ellendale diamond province of the western Kimberley region in Western Australia, was Australia's largest and the world's leading productive diamond mine. Diamond produced from the Argyle Mine by Rio Tinto Ltd. accounted for about 20% of the world total in 2003. Another diamond mine operated by Rio Tinto was at the Merlin Mine in the Northern Trough in the Northern Territory of Australia. Regional production of diamond was expected to stay in a narrow range of between 28 million and 31 million carats per year after reaching a peak level of 42 million carats in 1995 (table 27).

Phosphate Rock.—The region's production of phosphate rock, in terms of its phosphorus pentoxide (P_2O_5) nutrient content, accounted for about 20% of the world total in 2003. China was the world's second ranked producer of phosphate rock after the United States. Other important producers were Australia and India. Most of the region's production of phosphate rock was consumed within the region.

China was the world's leading consumer of phosphate rock. The country's demand for phosphate rock was expected to increase substantially in the next 5 years.

Regional phosphate rock production was expected to increase at an average annual rate of about 1%, which would lead to a shortage in the regional supply because the regional growth in demand for phosphate rock was predicted to grow at a much higher rate than 1% per year during the next 5 to 6 years (table 28).

Mineral Fuels

Coal.—The region's overall production of coal, which included anthracite, bituminous, and lignite, accounted for about 55% the world total in 2003. Production of anthracite coal, however, accounted for about 96% of the world total; production of bituminous coal accounted for about 61%; and production of lignite accounted for about 19%. China, which was by far the world's leading producer of anthracite and bituminous coals, accounted for about 82% and 39%, respectively, of the world total. In Asia and the Pacific, North Korea and Vietnam were the other significant producers of anthracite coal; Australia, India, and Indonesia were the other important producers of bituminous coal and lignite (table 4).

Japan was the world's leading importer and consumer of coal; virtually all its coal for its iron and steel and utility industries was imported. In 2003, the country imported more than 167 Mt of coal, of which 108 Mt was bituminous (steam); 54 Mt, metallurgical-grade bituminous (coking); and 5 Mt, anthracite. Australia ranked as the world's leading coal exporter. The major regional exporters (suppliers) of coking coal were Australia and China; those of steam coal, Australia, China, and Indonesia; and those of anthracite, China and Vietnam.

Regional overall coal production was expected to increase at an average annual rate of about 5% between 2003 and 2009.

This prediction was based on capacity expansions at the Hail Creek coking coal deposit in the northern Bowen Basin of central Queensland, Australis, by Rio Tinto; at the Shoushan coal mine in Henan Province, China, by Pingabo Coal Co.; at major coal mines in Shaanxi Province and the Nei Mongol and the Ningxia Autonomous Regions, China, by Shenhua Coal Corp.; and at six major coal mines in the Province of Quang Ninh, Vietnam, by Vietnam National Coal Corporation (table 29).

Natural Gas and Petroleum.—Asia and the Pacific lacks sufficient resources of natural gas and petroleum to meet the rapid regional growth in demand for hydrocarbons. The region's production of natural gas and crude petroleum accounted for about 11% and 10%, respectively, of the world total production in 2003 (table 4). Indonesia was the region's leading producer of natural gas; it was followed by Malaysia, Australia, and China. China was the leading producer of crude petroleum and was followed by Indonesia, Malaysia, and India. Australia, Brunei, Indonesia, and Malaysia were the major exporters of natural gas in the form of liquefied natural gas. Brunei, Indonesia, Malaysia, and Vietnam were the major exporters of crude petroleum.

Japan was the world's leading importer and consumer of natural gas and crude petroleum; about 80.2 billion cubic meters of natural gas and 1.6 billion barrels of crude petroleum were imported in 2003. Other important consumers of natural gas and crude petroleum in the region were China, India, the Republic of Korea, Thailand, and Taiwan. Australia, Indonesia, Malaysia, and Brunei were the major region's suppliers of natural gas and crude petroleum to Japan, the Republic of Korea, Singapore, and Taiwan.

Regional production of natural gas was expected to increase at an average annual rate of about 2% between 2003 and 2009. This prediction was based on gradual capacity expansions at Arun, Aceh Special Region, by ExxonMobil Oil Indonesia and offshore East Kalimantan by Total Indonesia and HUFFCO Group in Indonesia; offshore Sarawak, Malaysia, by Sarawak Shell Bhd.; and in Sichuan Province, by China National Petroleum Corp. (table 30). China will likely to become one of the world's leading importers and consumers of natural gas during the next 5 to 10 years. The Chinese Government projected that demand for natural gas would be 63 billion cubic meters in 2005 and could reach 97 billion cubic meters by 2010.

Regional production of crude petroleum was expected to increase at an average annual rate of 2% between 2003 and 2009. This prediction was based on gradual capacity expansions at Duri, Mina, and other major oilfields in central Sumatra by PT Caltex Pacific Indonesia and several major oilfields offshore East Kalimantan in Indonesia; at Liaohe, Liaoning Province, by Liaohe Bureau; in Bohai by Bohai Offshore Oil Corp.; and offshore Nanhai (South Sea) by Nanhai East Corp. in China (table 31). Because of rapid growth in demand for crude petroleum, China's crude petroleum imports increased by 15% to 69 Mt in 2002 and by 32% to 91 Mt in 2003 and were expected to increase by 32% to 120 Mt in 2004. China may overtake Japan as the region's leading importer of crude petroleum in 2004.

Uranium.—The region's uranium resources were mainly in Australia, which ranked first in known recoverable resources of uranium in the world and accounted for 28% of the world total. The country, which ranked second after Canada in the production of mined uranium, accounted for 22% of the world total in 2003. In Australia, three active mines were operated, and two more were under development. China was thought to produce about 1,000 t/yr of mined uranium in 2003, and production was expected to increase gradually to 1,500 t/yr by 2009. Most mined uranium was enriched and consumed domestically in China.

Australia exported most of its mined uranium in the form of uranium oxide (U_3O_8) to Japan and the Republic of Korea within the region and to France, Spain, Sweden, the United Kingdom, and the United States.

Regional production of mined uranium was expected to increase at an average annual rate of about 2% between 2003 and 2009. This prediction was based mainly on capacity expansions at the Olympic Dam Mine by WMC Resources Ltd. and two in situ leach operations at Beverly by Heathgate Resources Pty. Ltd. and at Honeymoon by Southern Cross Resources Inc. in South Australia (table 32).

Environment

In response to the call made by the Government for a lead-free Brunei, Brunei Shell Petroleum Co. Sdn. Bhd., which was a major producer of oil and gas, shipped surplus lead compound and sludge taken from two tetra-ethyl-lead storage vessels that had been demolished at its Seria Oil Refinery to the United Kingdom. The surplus lead compound and sludge, which had been classified as hazardous waste, needed recovery, treatment, and disposal in a safe and environmentally approved manner.

In Japan following enactment of the Home Appliance Recycling Law, Matsushita Electric Industrial Co. Ltd., which was the country's leading producer of consumer electronics and electric products, built a \$43 million advanced recycling plant with four disassembly lines in Yashior, Hyogo Prefecture. The recycling plant was capable of handling 1 million units per year of discarded household appliances.

To reclaim tin mining land in Malaysia, a pilot program was launched by the Forest Research Institute of Malaysia at the 121.4-hectare tin mine site in Bidor, State of Perak. The purpose of the program was to change the condition of the soil by adding fertilizer and nutrients and to plant 13 species of trees

that have a high commercial value. The pilot program was funded by the Malaysian Government and the ASEAN—Korea Environmental Cooperation.

In Thailand, the adverse environmental impact of the proposed potash mining project in the Province of Udon Thani was again a major environmental issue in 2003. A six-member panel, which was named by the Ministry of Natural Resources and Environment, completed its review of the project's environmental impact assessment (EIA) report submitted by Asia Pacific Resources Ltd. and found that it failed to establish a level of operation to minimize the negative effects on nearby villagers and to alleviate the negative impact of potash tailings, which would be made up mainly of salt, on villagers' household equipment. As a result, a revised EIA was prepared and submitted by Asian Pacific Resources in 2003.

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TABLE 1
ASIA AND THE PACIFIC: AREA AND POPULATION IN 2003

Country	Area ¹ total (square kilometers)	Population ² total (thousands)
Afghanistan	647,500	28,766
Australia	7,687,850	19,890
Bangladesh	144,000	138,066
Bhutan	47,000	874
Brunei	5,770	356
Burma	678,500	49,362
Cambodia	181,040	13,404
China	9,596,960	1,288,400
Fiji	18,270	835
Hong Kong	1,092	6,816
India	3,287,590	1,064,399
Indonesia	1,919,440	214,471
Japan	377,835	127,210
Korea, North	120,540	22,612
Korea, Republic of	98,480	47,912
Laos	236,800	5,660
Malaysia	329,750	24,774
Mongolia	1,565,000	2,480
Nepal	140,800	24,660
New Caledonia	19,060	225
New Zealand	268,680	3,870
Pakistan	803,940	148,439
Papua New Guinea	462,840	5,502
The Philippines	300,000	81,503
Singapore	692	4,250
Solomon Islands	28,450	457
Sri Lanka	65,610	19,193
Taiwan	35,980	22,605
Thailand	514,000	62,014
Timor, East	15,007	810
Vietnam	329,560	81,314
Total		3,511,129
World total		6,271,698

¹Source: Central Intelligence Agency World Factbook 2004.

²Source: World Bank 2004, World Development Indicators Database, September.

TABLE 2
ASIA AND THE PACIFIC: ECONOMY IN 2003^{1,2}

Country	Gross domestic product based on purchasing power parity		Real gross domestic product growth rate (percentage)		
	Total	Per capita	2002	2003	2006
	(million dollars)	(dollars)			
Afghanistan ³	20,000	700	NA	NA	9.7
Australia	579,662	29,143	3.6	3.0	3.3
Bangladesh	246,526	1,786	4.9	5.4	5.9
Bhutan	1,847	2,113	7.7	6.5	11.5
Brunei	5,522	15,511	3.0	3.6	1.3
Burma	74,978	1,519	5.5	0.0	3.5
Cambodia	29,344	2,189	5.5	5.2	4.3
China	6,435,838	4,995	8.0	9.1	8.0
Fiji	4,607	5,517	4.4	5.2	2.3
Hong Kong	191,031	28,027	2.3	3.2	4.0
India	3,096,239	2,909	4.7	7.2	6.4
Indonesia	721,583	3,364	3.7	4.1	6.0
Japan	3,582,515	28,162	0.2	2.5	1.9
Korea, North ^{3,4}	29,580	1,308	1.2	1.8	NA
Korea, Republic of	858,028	17,908	6.3	3.1	5.2
Laos	10,734	1,896	5.9	5.3	6.5
Malaysia	240,210	9,696	4.1	5.3	6.2
Mongolia	4,470	1,802	3.9	5.3	NA
Nepal	34,964	1,418	-0.5	3.1	5.0
New Caledonia ⁵	4,670	20,756	NA	NA	NA
New Zealand	84,898	21,937	4.4	3.4	2.6
Pakistan	292,641	1,971	4.4	6.2	6.3
Papua New Guinea	13,783	2,505	-3.3	2.7	2.3
The Philippines	352,179	4,321	4.4	4.7	4.5
Singapore	104,042	24,480	2.2	1.1	4.5
Solomon Islands	749	1,639	-2	5.1	5.2
Sri Lanka	72,482	3,776	4.0	5.9	6.0
Taiwan	537,393	23,773	3.5	3.3	4.3
Thailand	470,086	7,580	5.3	6.8	6.2
Timor, East	440	543	3.0	-2.7	2.3
Vietnam	202,462	2,490	5.8	6.0	7.0
Total	18,303,503	XX	XX	XX	XX
World total	51,656,251	XX	XX	XX	XX

NA Not available. XX Not applicable.

¹Includes data as of January 1, 2004. Gross domestic product listed may differ from that reported in individual country owing to differences in source or date of reporting.

²Source: International Monetary Fund, World Economic Outlook Database, September 2004.

³Source: Central Intelligence Agency World Factbook 2004.

⁴Source: Bank of Korea, Gross Domestic Product of North Korea in 2003.

⁵Source: World Bank, World Development Indicators Database, September 2004.

TABLE 3
ASIA AND THE PACIFIC: SELECTED EXPLORATION SITES IN 2003¹

Country	Type ²	Site	Commodity	Company	Resources ³	Exploration ⁴
Australia	F	Bowdens	Ag, Pb, Zn	Silver Standard Resources Inc.	79 Moz Ag, 157,000 t Pb, 215,000 t Zn	Feasibility drilling.
Do.	F	Cowal	Au	Barrick Gold Corp.	2.5 Moz Au	Do.
Do.	E	Tomingley/Wyoming	Au	Alkane Exploration NL	439,000 oz Au	Extensive drilling.
Do.	E	Erye Peninsula/Barns	Au	Adelaide Resources Ltd.	Data not released.	Do.
Do.	P	Bronzewing South	Au	AuDax Resources Ltd.	do.	Do.
Do.	P	Minjar	Au	Gindalbie Gold NL	212,000 oz Au	Do.
Do.	F	Mt. Gibson	Au	Oroya Mining Ltd.	749,000 oz Au	Feasibility drilling.
Do.	P	St. Ives	Au	Gold Fields Ltd.	4.28 Moz Au	Do.
Do.	P	Sunrise Dam	Au	AngloGold Ltd.	4.59 Moz Au	Extensive work program.
Do.	P	Woodie Woodie	Mn	Consolidated Minerals Ltd.	Data not released	Extensive drilling.
China	E	Boka	Au	Southwestern Resources Corp.	do.	Do.
Do.	F	Jinfeng	Au	Sino Gold Ltd.	2.6 Moz Au	Do.
Laos	P	Sepon Gold	Au, Ag	Oxiana Resources NL	4 Moz Au, 7 Moz Ag	Do.
Mongolia	E	Oyu Tolgai	Cu, Au	Ivanhoe Mines Ltd.	14 Mt Cu, 6.4 Moz Au	Do.
Pakistan	E	Reko Diq	Cu, Au	Tethyan Copper Company Ltd.	577,000 t Cu	Extensive work program.
Philippines	E	Boyongan	Cu, Au	Anglo American Exploration B.V.	1.1 Mt Cu, 5.1 Moz Au	Extensive drilling.
Do.	E	Tampakan	Cu, Au	Indophil Resources NL	6.7 Mt Cu, 8.6 Moz Au	Do.
Thailand	P	Chatree/Prospect A	Au, Ag	Kingsgate Consolidated Ltd.	1.6 Moz Au, 11 Moz Ag	Do.

¹Abbreviations used for commodities in this table include the following: Ag-silver; Au-gold; Cu-copper; Mn-manganese; Pb-lead; Zn-zinc. Abbreviations used for units of measure include the following: Moz-million troy ounces; Mt-million metric tons; oz-troy ounces; t-metric tons.

²E-Active exploration; F-Feasibility work ongoing/completed; P-Exploration at producing site.

³Resources reported where available based on data from various sources and reflect unverified public information reported by trade journals.

⁴Sites where extensive (greater than 10,000 meters) drilling or significant (more than US\$5 million) expenditure have been reported.

TABLE 4
ASIA AND THE PACIFIC: PRODUCTION OF SELECTED COMMODITIES IN 2003¹

(Thousand metric tons unless otherwise specified)

Country	Metals												
	Aluminum			Copper		Gold, mine output,		Iron and steel			Lead, mine output,		
	Alumina	Bauxite	Metal ²	Mine output, Cu content	Refined, primary	Au content (kilograms)	Ore	Iron	Pig	Steel, crude	Pb content (metric tons)		
Afghanistan	--	--	--	5	--	--	--	--	--	--	--	--	
Australia	16,529	55,602	1,984	830	484	282,000	187,219	116,355	9,660	9,660	688,000	--	
Bangladesh ^e	--	--	--	--	--	--	--	--	25	--	--	--	
Bhutan	--	--	--	--	--	--	--	--	--	--	--	--	
Brunei	--	--	--	--	--	--	--	--	--	--	--	--	
Burma ^e	--	--	--	28	28	100	--	--	2	25	500	--	
Cambodia	--	--	--	--	--	--	--	--	--	--	--	--	
China ^e	6,110	13,000	5,970	610	1,420	205,000	261,000	83,000	213,670 ³	222,340 ³	955,000	--	
Christmas Island	--	--	--	--	--	--	--	--	--	--	--	--	
Fiji	--	--	--	--	--	3,250	--	--	--	--	--	--	
Hong Kong	--	--	--	--	--	--	--	--	--	--	--	--	
India ^e	2,500	10,002 ³	798 ³	28 ³	394	3,100 ³	85,000	54,400	24,000	31,779 ³	33,100	--	
Indonesia	--	1,094	180 ^e	979	223	141,000	245	140	1,230	2,040 ^e	--	--	
Japan	330 ^e	-- ^e	1,250	--	1,252	8,143	1 ^e	(4) ^e	82,091	110,511	5,660	--	
Korea, North ^e	--	--	--	13	14	2,000	4,430	1,260	900	1,090	60,000	--	
Korea, Republic of	--	--	--	--	510	207	365	161	27,314	46,310	--	--	
Laos ^e	--	--	--	--	--	5,140	--	--	--	--	--	--	
Malaysia	--	6	--	--	--	4,739	597	383	--	4,700 ^e	--	--	
Mongolia	--	--	--	130	2	11,100	--	--	--	16	--	--	
Nauru	--	--	--	--	--	--	--	--	--	--	--	--	
Nepal	--	--	--	--	--	--	--	--	--	--	--	--	
New Caledonia	--	--	--	--	--	--	--	--	--	--	--	--	
New Zealand ^e	--	10	356 ³	--	--	9,305	--	--	600	800	--	--	
Pakistan ^e	--	--	--	--	--	--	--	--	1,600	550	--	--	
Papua New Guinea ^e	--	--	--	204	--	70,000	--	--	--	--	--	--	
Philippines	--	--	--	20	171	37,840	--	--	--	550 ^e	--	--	
Singapore	--	--	--	--	--	--	--	--	--	--	--	--	
Solomon Islands	--	--	--	--	--	--	--	--	--	--	--	--	
Sri Lanka	--	--	--	--	--	--	--	--	--	--	--	--	
Taiwan	--	--	--	--	--	4,269	10	5	10,779	18,563	--	--	
Thailand	--	--	--	--	--	2,000	--	--	--	3,572	--	--	
Vietnam ^e	--	--	--	--	--	2,000	--	--	--	544	1,100	--	
Total	25,500	79,700	10,500	2,850	4,500	789,000	539,000	256,000	372,000	453,000	1,740,000	--	
Share of 2003 world total	46.0%	54.3%	31.5%	20.8%	32.6%	31.0%	46.2%	39.7%	58.3%	48.6%	53.5%	--	
Share of 2002 world total	45.9%	53.5%	28.5%	22.4%	30.6%	30.0%	46.0%	40.1%	56.1%	46.5%	47.9%	--	
United States	4,380	NA	2,700	1,120	1,250	277,000	46,400	29,300	40,600	93,700	460,000	--	
World total	55,400	147,000	33,400	13,700	13,800	2,540,000	1,170,000	644,000	638,000	932,000	3,260,000	--	

See footnotes at end of table.

TABLE 4--Continued
ASIA AND THE PACIFIC: PRODUCTION OF SELECTED COMMODITIES IN 2003¹

(Thousand metric tons unless otherwise specified)

Country	Metals												
	Lead, refined, primary (metric tons)	Manganese ore, mine output, Mn content		Mercury, mine output, Hg content (metric tons)		Nickel		Tin, metric tons		Tungsten, mine output, W content (metric tons)		Zinc, metric tons	
		Mn content	Mn content	Hg content (metric tons)	Hg content (metric tons)	Mine output, Ni content	Mine output, Ni content	Refined	Mine output, Sn content	Mine output, Sn content	W content (metric tons)	W content (metric tons)	Mine output, Zn content
Afghanistan	--	--	--	--	--	--	--	--	--	--	--	--	--
Australia	270,000	1,247	--	--	179	209	3,819	597	--	--	--	1,479,000	557,500
Bangladesh ^e	--	--	--	--	--	--	--	--	--	--	--	--	--
Bhutan	--	--	--	--	--	--	--	--	--	--	--	--	--
Brunei	--	--	--	--	--	--	--	--	--	--	--	--	--
Burma ^e	1,000	(4)	--	--	(4)	--	210	30	500	30	--	--	--
Cambodia	--	--	--	--	--	--	--	--	--	--	--	--	--
China ^e	1,290,000	920	610	61	65	102,000	98,000	2,030,000	2,320,000	50,000	--	--	--
Christmas Island	--	--	--	--	--	--	--	--	--	--	--	--	--
Fiji	--	--	--	--	--	--	--	--	--	--	--	--	--
Hong Kong	--	--	--	--	--	--	--	--	--	--	--	--	--
India ^e	61,500	620	--	--	--	--	--	--	162,000	--	--	--	278,000
Indonesia	--	--	--	--	143	--	70,000 ^e	65,000 ^e	--	--	--	--	--
Japan	105,460	--	--	--	35	--	662	--	44,574	600	--	100,000	686,115
Korea, North ^e	75,000	--	--	--	--	--	--	--	100,000	--	--	--	100,000
Korea, Republic of	169,297	--	--	--	31	--	--	--	644,218	--	--	--	644,218
Laos	--	--	--	--	--	--	360 ^e	--	1,000 ^e	--	--	--	--
Malaysia	--	--	--	--	--	--	3,359	18,250	--	--	--	--	--
Mongolia	--	--	--	--	--	--	--	--	40	--	--	--	--
Nauru	--	--	--	--	--	--	--	--	--	--	--	--	--
Nepal	--	--	--	--	--	--	--	--	--	--	--	--	--
New Caledonia	--	--	--	--	112	--	--	--	--	--	--	--	--
New Zealand ^e	--	--	--	--	--	--	--	--	--	--	--	--	--
Pakistan ^e	--	--	--	--	--	--	--	--	--	--	--	--	--
Papua New Guinea ^e	--	--	--	--	--	--	--	--	--	--	--	--	--
Philippines	--	--	--	--	27	--	--	--	--	--	--	--	--
Singapore	--	--	--	--	--	--	--	--	--	--	--	--	--
Solomon Islands	--	--	--	--	--	--	--	--	--	--	--	--	--
Sri Lanka	--	--	--	--	--	--	--	--	--	--	--	--	--
Taiwan	--	--	--	--	--	11 ^e	--	--	--	--	--	--	--
Thailand	2,000	--	--	--	--	793	15,763	37,100 ^e	69,600	208 ^e	--	37,100 ^e	69,600
Vietnam ^e	--	--	--	--	--	4,600	1,300	12,000	--	--	--	12,000	--
Total	1,970,000	2,790	610	522	351	185,000	200,000	50,900	3,870,000	4,660,000	50,900	3,870,000	4,660,000
Share of 2003 world total	57.0%	30.8%	52.3%	39.2%	39.2%	71.3%	74.3%	87.6%	41.1%	47.2%	87.6%	41.1%	47.2%
Share of 2002 world total	51.3%	30.2%	52.3%	36.6%	32.2%	70.0%	75.5%	88.2%	38.0%	45.3%	88.2%	38.0%	45.3%
United States	245,000	--	NA	--	--	--	--	--	738,000	303,000	--	738,000	303,000
World total	3,460,000	9,040	1,170	1,330	895	259,000	269,000	58,100	9,400,000	9,850,000	58,100	9,400,000	9,850,000

See footnotes at end of table.

TABLE 4--Continued
 ASIA AND THE PACIFIC: PRODUCTION OF SELECTED COMMODITIES IN 2003¹
 (Thousand metric tons unless otherwise specified)

Country	Industrial minerals										Mineral fuels				Natural gas, marketed/dry (million cubic meters) ⁵	Petroleum, crude (thousand 42-gallon barrels)
	Cement hydraulic	Fluorspar (metric tons)	Graphite (metric tons)	Magnesite	Mica (metric tons)	Salt	Coal			Lignite						
							Anthracite	Bituminous	Bituminous							
Afghanistan	120	--	--	--	--	13	--	185	--	--	2,500	--	--			
Australia	8,000 ^e	--	--	473	--	10,400	--	357,790	67,000	--	30,000 ^e	250,000 ^e	1,800			
Bangladesh ^e	5,000	--	--	--	--	350 ^e	--	--	--	--	7,300	--	--			
Bhutan	160 ^e	--	--	--	--	--	--	66 ^e	--	--	--	--	--			
Brunei	235	--	--	--	--	--	--	--	--	--	12,024	75,642	--			
Burma ^e	600	--	--	--	--	35 ^e	--	--	57	--	8,500	5,000	--			
Cambodia	--	--	--	--	--	50 ^e	--	--	--	--	--	--	--			
China ^e	862,080 ³	2,650,000	710,000	3,700	--	34,377 ³	218,000	1,470,000	52,000	--	28,000	1,260,000	--			
Christmas Island	--	--	--	--	--	--	--	--	--	--	--	--	--			
Fiji	100 ^e	--	--	--	--	--	--	--	--	--	--	--	--			
Hong Kong	--	--	--	--	--	--	--	--	--	--	--	--	--			
India ^e	100,000	4,200	110,000	380	3,600	15,000 ³	--	328,000	25,000	--	25,000	241,000	--			
Indonesia	35,500 ^e	--	--	--	--	680 ^e	50	114,000	--	--	54,000	413,000	--			
Japan	68,766	--	--	--	--	1,263	--	1,400 ^e	--	--	3,011	5,161	--			
Korea, North	5,540	25,000	25,000	1,000	--	500	16,000	--	--	--	6,300	--	--			
Korea, Republic of	59,199	--	58	--	33,645	800	3,298	--	--	--	--	--	--			
Laos	250 ^e	--	--	--	--	5	--	--	230 ^e	--	--	--	--			
Malaysia	17,243	--	--	--	3,609	--	--	173	--	--	51,813	269,370	--			
Mongolia	150	275,000	--	--	--	1	--	5,900	--	--	--	150	--			
Nauru	--	--	--	--	--	--	--	--	--	--	--	--	--			
Nepal	295 ^e	--	--	--	--	5	--	10	--	--	--	--	--			
New Caledonia	100	--	--	--	--	--	--	--	--	--	--	--	--			
New Zealand ^e	950	--	--	--	--	70	724 ³	4,173 ³	283 ³	--	5,000	8,711	--			
Pakistan ^e	10,300	1,000	--	5	--	1,723	--	3,800	--	--	22,000	24,000	--			
Papua New Guinea ^e	--	--	--	--	--	--	--	--	--	--	1,450	20,000	--			
Philippines	8,500 ^e	--	--	--	--	429 ^e	--	2,025	4	--	--	2,000	--			
Singapore	--	--	--	--	--	--	--	--	--	--	--	--	--			
Solomon Islands	--	--	--	--	--	--	--	--	--	--	--	--	--			
Sri Lanka	1,164	--	3,387	--	1,174	79	--	--	--	--	760	288	--			
Taiwan	18,474	--	--	--	3,237	(4)	--	--	--	--	--	--	--			
Thailand	32,530	2,368	--	--	--	892	--	--	--	--	18,830	35,158	--			
Vietnam	23,282	3,000	--	--	--	800	18,963	--	--	--	3,450	125,281	--			
Total	1,260,000	2,960,000	848,000	5,560	45,300	67,500	257,000	2,290,000	169,000	277,000	2,620,000	2,740,000	--			
Share of 2003 world total	64.0%	58.1%	55.1%	41.7%	16.5%	30.9%	96.4%	60.5%	18.7%	10.6%	10.6%	10.2%	--			
Share of 2002 world total	61.5%	56.7%	52.7%	41.1%	16.2%	32.4%	87.9%	52.6%	19.0%	10.3%	10.3%	10.7%	--			
United States	94,329	--	--	W	78,600	43,700	1,070	892,000	78,400	567,000	2,070,000	--	--			
World total	1,970,000	5,100,000	1,540,000	13,300	275,000	219,000	267,000	3,780,000	906,000	2,620,000	26,800,000	--	--			

See footnotes at end of table.

TABLE 4--Continued
ASIA AND THE PACIFIC: PRODUCTION OF SELECTED COMMODITIES IN 2005¹

⁰Estimated; estimated data, U.S. data, and world totals are rounded to no more than three significant digits. NA Not available. W Withheld to avoid disclosing company proprietary data; not included in world total. -- Zero or zero percent.

¹Totals may not add owing to independent rounding. Percentages are calculated on unrounded data. Table includes data available as of April 2005.

²Primary and secondary production.

³Reported figure.

⁴Less than 1/2 unit.

⁵Data not found on country table is based on the following source: Energy Information Administration, International Energy Annual 2002, World Natural Gas Production 2001 Table 4.1

TABLE 5
ASIA AND THE PACIFIC: HISTORIC AND PROJECTED BAUXITE MINE PRODUCTION, 1990-2009¹

(Thousand metric tons, gross weight)

Country	1990	1995	2000	2003	2005 ^c	2007 ^c	2009 ^c
Australia	41,400	42,700	53,800	55,600	55,000	57,000	60,000
China	2,400	5,000	9,000	13,000	16,000	20,000	22,000
India	4,850	5,240	7,560	10,000	11,000	12,000	13,000
Indonesia	1,210	899	1,150	1,094	1,200	1,200	1,400
Malaysia	398	184	123	6	6	--	--
Other	403	190	131	74	74	74	74
Total	50,700	54,200	71,800	79,800	83,300	90,000	96,000

^cEstimated. -- Negligible or no production.

¹Historic data, estimated data, and totals are rounded to no more than three significant digits; may not add to totals shown.

TABLE 6
ASIA AND THE PACIFIC: HISTORIC AND PROJECTED PRIMARY ALUMINUM METAL PRODUCTION, 1990-2009¹

(Thousand metric tons)

Country	1990	1995	2000	2,003	2005 ^c	2007 ^c	2009 ^c
Australia	1,230	1,300	1,770	1,860	2,000	2,200	2,500
China	847	1,750	2,800	5,700	6,600	7,000	7,500
India	433	537	644	798	830	860	890
Indonesia	186	220	160	180	220	220	220
New Zealand	260	273	328	350	350	350	350
Other	34	18	7	7	410	410	610
Total	2,990	4,100	5,710	8,900	10,400	11,000	12,100

^cEstimated.

¹Historic data, estimated data, and totals are rounded to no more than three significant digits; may not add to totals shown.

TABLE 7
ASIA AND THE PACIFIC: HISTORIC AND PROJECTED SECONDARY ALUMINUM METAL PRODUCTION, 1990-2009¹

(Thousand metric tons)

Country	1990	1995	2000	2003	2005 ^c	2007 ^c	2009 ^c
China	7	12	175	270	330	350	400
Japan	1,100	1,200	1,210	1,200	1,000	1,000	1,000
Other	100	100	100	100	100	100	100
Total	1,210	1,310	1,490	1,570	1,400	1,450	1,500

^cEstimated.

¹Historic data, estimated data, and totals are rounded to no more than three significant digits; may not add to totals shown.

TABLE 8
ASIA AND THE PACIFIC: HISTORIC AND PROJECTED COPPER MINE PRODUCTION, 1990-2009¹

(Metal content in thousand metric tons)

Country	1990	1995	2000	2003	2005 ^c	2007 ^c	2009 ^c
Australia	327	398	829	830	910	910	1,000
China	285	445	593	610	640	650	660
India	58	47	32	28	28	26	26
Indonesia	164	444	1,010	979	1,200	1,250	1,260
Mongolia	124	122	125	130	130	130	180
Papua New Guinea	170	213	203	200	210	210	200
Other	239	152	171	60	150	210	310
Total	1,370	1,820	2,960	2,840	3,270	3,390	3,600

^cEstimated.

¹Historic data, estimated data, and totals are rounded to no more than three significant digits; may not add to totals shown.

TABLE 9
ASIA AND THE PACIFIC: HISTORIC AND PROJECTED REFINED COPPER METAL PRODUCTION, 1990-2009¹

(Thousand metric tons)

Country	1990	1995	2000	2003	2005 ^c	2007 ^c	2009 ^c
Australia	274	248	488	484	650	650	700
China	560	1,080	1,370	1,850	2,300	2,600	2,800
India	42	40	243	394	440	480	520
Indonesia	--	--	158	224	240	240	240
Japan	1,010	1,190	1,440	1,430	1,450	1,540	1,600
Korea, Republic of	186	235	468	510	510	530	530
Other	160	185	180	180	350	400	500
Total	2,230	2,980	4,350	5,070	5,940	6,440	6,900

^cEstimated. -- Negligible or no production.

¹Historic data, estimated data, and totals are rounded to no more than three significant digits; may not add to totals shown.

TABLE 10
ASIA AND THE PACIFIC: HISTORIC AND PROJECTED GOLD MINE PRODUCTION, 1990-2009¹

(Metal content in kilograms)

Country	1990	1995	2000	2003	2005 ^c	2007 ^c	2009 ^c
Australia	244,000	254,000	269,000	282,000	270,000	270,000	300,000
China	100,000	140,000	180,000	205,000	210,000	215,000	220,000
Indonesia	11,200	64,000	125,000	141,000	185,000	195,000	200,000
Japan	7,300	9,190	8,400	8,140	8,200	8,200	8,200
Mongolia	1,000	4,500	11,800	11,100	13,000	16,000	18,000
New Zealand	4,630	12,100	9,880	10,000	11,000	11,000	12,000
Papua New Guinea	31,900	51,700	74,500	70,000	71,000	72,000	74,000
Philippines	24,600	27,000	36,500	35,000	35,000	36,000	38,000
Other	9,940	19,000	16,300	21,400	23,000	23,500	25,000
Total	435,000	581,000	731,000	784,000	830,000	850,000	900,000

^cEstimated.

¹Historic data, estimated data, and totals are rounded to no more than three significant digits; may not add to totals shown.

TABLE 11
ASIA AND THE PACIFIC: HISTORIC AND PROJECTED IRON ORE MINE PRODUCTION, 1990-2009¹

(Metal content in thousand metric tons)

Country	Average ore grade (% Fe)	1990	1995	2000	2003	2005 ^c	2007 ^c	2009 ^c
Australia	62	69,800	88,700	107,000	116,000	140,000	147,000	160,000
China	33	55,000	82,300	73,600	86,000	92,000	92,000	92,500
India	64	34,400	41,700	48,600	54,400	56,000	57,000	58,000
Korea, North	30	4,700	2,000	1,100	1,300	1,500	1,500	1,500
Other		1,300	1,300	1,300	1,500	1,600	1,600	1,600
Total		165,000	216,000	232,000	259,000	291,000	299,000	314,000

^cEstimated.

¹Historic data, estimated data, and totals are rounded to no more than three significant digits; may not add to totals shown.

TABLE 12
ASIA AND THE PACIFIC: HISTORIC AND PROJECTED DIRECT-REDUCED IRON AND PIG IRON PRODUCTION, 1990-2009¹

(Thousand metric tons)

Country	1990	1995	2000	2003	2005 ^e	2007 ^e	2009 ^e
Australia	6,130	7,860	6,110	9,660	10,000	10,000	10,000
China	62,400	105,000	131,000	202,300	230,000	260,000	280,000
India	13,400	22,900	26,800	29,800	30,000	31,000	32,000
Japan	80,200	74,900	81,070	82,100	82,500	82,000	82,000
Korea, Republic of	15,300	22,300	24,900	27,500	28,000	28,000	28,000
Taiwan	5,470	6,060	9,970	10,500	10,500	11,000	11,500
Other	2,000	2,400	4,000	4,000	4,100	4,200	4,200
Total	185,000	241,000	284,000	366,000	395,000	430,000	450,000

^eEstimated.

¹Historic data, estimated data, and totals are rounded to no more than three significant digits; may not add to totals shown.

TABLE 13
ASIA AND THE PACIFIC: HISTORIC AND PROJECTED CRUDE STEEL PRODUCTION, 1990-2009¹

(Thousand metric tons)

Country	1990	1995	2000	2003	2005 ^e	2007 ^e	2009 ^e
Australia	6,670	8,450	7,300	9,660	10,000	10,000	10,000
China	66,100	95,400	129,000	220,000	260,000	280,000	300,000
India	15,000	22,800	26,900	31,800	32,000	34,000	36,000
Japan	110,000	102,000	106,000	111,000	110,000	110,000	100,000
Korea, Republic of	23,100	36,800	43,100	46,300	48,000	49,000	50,000
Malaysia	1,200	2,450	2,430	4,700	4,700	4,500	5,000
Taiwan	9,750	11,600	17,300	18,500	19,000	19,500	20,000
Thailand	685	2,134	2,100	3,570	3,600	3,600	4,000
Other	19,000	15,000	14,500	14,200	15,200	16,000	29,000
Total	252,000	297,000	349,000	460,000	500,000	530,000	550,000

^eEstimated.

¹Historic data, estimated data, and totals are rounded to no more than three significant digits; may not add to totals shown.

TABLE 14
ASIA AND THE PACIFIC: HISTORIC AND PROJECTED LEAD MINE PRODUCTION, 1990-2009¹

(Metal content in metric tons)

Country	1990	1995	2000	2003	2005 ^e	2007 ^e	2009 ^e
Australia	570,000	455,000	739,000	688,000	716,000	716,000	718,000
China	315,000	520,000	660,000	955,000	960,000	1,000,000	1,000,000
India	23,200	34,000	28,900	33,100	34,000	35,000	36,000
Japan	18,700	9,660	8,840	5,700	5,500	5,000	5,000
Korea, North	80,000	75,000	60,000	60,000	60,000	60,000	60,000
Vietnam	--	1,000	1,000	1,000	1,000	1,000	1,000
Other	44,000	17,000	21,000	3,000	3,000	3,000	3,000
Total	1,050,000	1,110,000	1,520,000	1,750,000	1,780,000	1,800,000	1,800,000

^eEstimated. -- Negligible or no production.

¹Historic data, estimated data, and totals are rounded to no more than three significant digits; may not add to totals shown.

TABLE 15
ASIA AND THE PACIFIC: HISTORIC AND PROJECTED PRIMARY REFINED LEAD PRODUCTION, 1990-2009¹

(Thousand metric tons)

Country	1990	1995	2000	2003	2005 ^c	2007 ^c	2009 ^c
Australia	212	215	223	270	240	240	250
China	260	458	998	1,290	1,350	1,400	1,500
India	29	62	57	62	62	64	64
Japan	205	148	130	105	100	100	100
Korea, North	70	65	60	60	60	60	60
Korea, Republic of	61	130	171	170	170	170	170
Other	7	10	4	2	2	2	2
Total	844	1,090	1,640	1,960	1,980	2,050	2,150

^cEstimated.

¹Historic data, estimated data, and totals are rounded to no more than three significant digits; may not add to totals shown.

TABLE 16
ASIA AND THE PACIFIC: HISTORIC AND PROJECTED SECONDARY REFINED LEAD PRODUCTION, 1990-2009¹

(Thousand metric tons)

Country	1990	1995	2000	2003	2005 ^c	2007 ^c	2009 ^c
Australia	17	26	28	40	40	40	40
China	36	150	102	290	300	320	340
India	17	28	21	25	25	24	24
Japan	122	140	182	190	195	195	200
Malaysia	16	34	35	42	42	42	42
Philippines	12	17	16	16	16	16	17
Thailand	11	11	24	23	23	23	23
Other	24	34	37	37	37	55	55
Total	255	440	445	663	680	715	740

^cEstimated.

¹Historic data, estimated data, and totals are rounded to no more than three significant digits; may not add to totals shown.

TABLE 17
ASIA AND THE PACIFIC: HISTORIC AND PROJECTED NICKEL MINE PRODUCTION, 1990-2009¹

(Metal content in metric tons)

Country	1990	1995	2000	2003	2005 ^c	2007 ^c	2009 ^c
Australia	67,800	103,000	167,000	179,000	220,000	230,000	250,000
China	33,000	41,800	50,300	61,000	63,000	66,000	67,000
Indonesia	68,300	88,200	98,200	143,000	160,000	160,000	180,000
New Caledonia	85,100	120,000	123,000	122,000	124,000	125,000	150,000
Philippines	15,800	15,100	17,400	29,000	29,000	30,000	32,000
Total	270,000	368,000	456,000	534,000	596,000	610,000	680,000

^cEstimated.

¹Historic data, estimated data, and totals are rounded to no more than three significant digits; may not add to totals shown.

TABLE 18
ASIA AND THE PACIFIC: HISTORIC AND PROJECTED PLATINUM MINE PRODUCTION, 1990-2009¹

(Metal content in kilograms)

Country	1990	1995	2000	2003	2005 ^c	2007 ^c	2009 ^c
Australia	100	100	171	225	230	230	230
China	260	300	650	750	790	850	900
Total	360	400	821	975	1,020	1,080	1,130

^cEstimated.

¹Historic data, estimated data, and totals are rounded to no more than three significant digits; may not add to totals shown.

TABLE 19
ASIA AND THE PACIFIC: HISTORIC AND PROJECTED PALLADIUM MINE PRODUCTION, 1990-2009¹

(Metal content in kilograms)

Country	1990	1995	2000	2003	2005 ^c	2007 ^c	2009 ^c
Australia	400	400	812	820	950	950	1,000
China	130	170	350	430	470	500	550
Total	530	570	1,160	1,250	1,420	1,450	1,550

^cEstimated.

¹Historic data, estimated data, and totals are rounded to no more than three significant digits; may not add to totals shown.

TABLE 20
ASIA AND THE PACIFIC: HISTORIC AND PROJECTED SILVER MINE PRODUCTION, 1990-2009¹

(Metal content in metric tons)

Country	1990	1995	2000	2003	2005 ^c	2007 ^c	2009 ^c
Australia	1,170	939	2,060	1,870	2,400	2,500	2,750
China	130	910	1,600	2,400	2,800	2,800	2,900
India	33	38	40	54	54	55	55
Indonesia	107	276	256	163	400	410	410
Japan	150	100	104	79	80	80	80
New Zealand	5	28	23	24	25	25	30
Papua New Guinea	115	65	79	71	71	72	75
Philippines	47	27	24	35	35	36	38
Other	40	18	29	32	33	35	40
Total	1,800	2,400	4,220	4,730	5,900	6,000	6,400

^cEstimated.

¹Historic data, estimated data, and totals are rounded to no more than three significant digits; may not add to totals shown.

TABLE 21
ASIA AND THE PACIFIC: HISTORIC AND PROJECTED TIN MINE PRODUCTION, 1990-2009¹

(Metal content in metric tons)

Country	1990	1995	2000	2003	2005 ^c	2007 ^c	2009 ^c
Australia	7,380	8,660	9,150	3,820	5,000	5,000	5,000
China	42,000	61,900	99,400	102,000	110,000	110,000	110,000
Indonesia	30,200	46,100	51,600	70,000	62,000	64,000	65,000
Malaysia	28,500	6,400	6,310	3,400	3,600	3,600	3,600
Thailand	14,600	2,200	1,930	800	900	900	900
Vietnam	850	4,500	4,100	4,600	4,500	4,500	4,500
Other	400	300	500	500	500	500	500
Total	124,000	130,000	173,000	185,000	187,000	189,000	190,000

^cEstimated.

¹Historic data, estimated data, and totals are rounded to no more than three significant digits; may not add to totals shown.

TABLE 22
ASIA AND THE PACIFIC: HISTORIC AND PROJECTED REFINED TIN PRODUCTION, 1990-2009¹

(Metric tons)

Country	1990	1995	2000	2003	2005 ^c	2007 ^c	2009 ^c
Australia	512	870	1,030	997	1,500	1,500	1,500
China	35,000	67,700	112,000	98,000	100,000	100,000	105,000
Indonesia	30,400	38,600	46,400	65,000	66,000	70,000	72,000
Japan	816	630	593	660	650	650	650
Malaysia	49,100	39,400	26,200	18,300	32,000	32,000	32,000
Thailand	15,500	8,240	17,100	16,000	18,000	18,000	18,000
Vietnam	1,800	2,400	1,800	1,300	1,400	1,400	1,400
Total	133,000	158,000	205,000	200,000	220,000	224,000	231,000

^cEstimated.

¹Historic data, estimated data, and totals are rounded to no more than three significant digits; may not add to totals shown.

TABLE 23
ASIA AND THE PACIFIC: HISTORIC AND PROJECTED ILMENITE MINE PRODUCTION, 1990-2009¹

(Thousand metric tons)

Country	1990	1995	2000	2003	2005 ^e	2007 ^e	2009 ^e
Australia	1,620	1,980	2,150	2,000	3,000	3,000	4,000
China	150	150	250	800	850	850	900
India	280	290	380	500	480	480	460
Malaysia	530	152	125	95	100	100	120
Vietnam	--	--	174	200	230	230	250
Other	100	90	90	90	90	90	90
Total	2,680	2,660	3,170	3,690	4,800	4,800	5,800

^eEstimated. -- Negligible or no production.

¹Historic data, estimated data, and totals are rounded to no more than three significant digits; may not add to totals shown.

TABLE 24
ASIA AND THE PACIFIC: HISTORIC AND PROJECTED TUNGSTEN MINE PRODUCTION, 1990-2009¹

(Metal content in metric tons)

Country	1990	1995	2000	2003	2005 ^e	2007 ^e	2009 ^e
China	32,000	27,400	37,000	50,000	52,000	53,000	53,000
Korea, North	1,000	900	500	600	600	600	600
Other	4,000	670	160	100	100	100	100
Total	37,000	29,000	37,700	50,700	52,700	53,700	53,700

^eEstimated.

¹Historic data, estimated data, and totals are rounded to no more than three significant digits; may not add to totals shown.

TABLE 25
ASIA AND THE PACIFIC: HISTORIC AND PROJECTED ZINC MINE PRODUCTION, 1990-2009¹

(Metal content in thousand metric tons)

Country	1990	1995	2000	2003	2005 ^e	2007 ^e	2009 ^e
Australia	933	937	1,420	1,480	1,600	1,600	1,800
China	619	1,010	1,780	2,030	2,200	2,300	2,500
India	74	155	144	162	164	166	168
Japan	127	95	64	45	43	43	40
Korea, North	230	150	100	100	100	100	100
Thailand	11	23	27	37	37	35	35
Other	34	22	34	42	41	40	40
Total	2,030	2,390	3,570	3,900	4,190	4,300	4,700

^eEstimated.

¹Historic data, estimated data, and totals are rounded to no more than three significant digits; may not add to totals shown.

TABLE 26
ASIA AND THE PACIFIC: HISTORIC AND PROJECTED ZINC METAL PRODUCTION, 1990-2009¹

(Thousand metric tons)

Country	1990	1995	2000	2003	2005 ^e	2007 ^e	2009 ^e
Australia	303	320	490	553	565	600	700
China	550	1,080	1,980	2,300	2,500	2,600	2,800
India	79	171	201	278	280	282	284
Japan	732	711	699	686	690	690	700
Korea, Republic of	248	279	591	644	685	685	700
Thailand	63	56	101	114	110	110	120
Other	210	170	120	120	120	120	120
Total	2,190	2,790	4,180	4,700	4,950	5,100	5,400

^eEstimated.

¹Historic data, estimated data, and totals are rounded to no more than three significant digits; may not add to totals shown.

TABLE 27
ASIA AND THE PACIFIC: HISTORIC AND PROJECTED DIAMOND PRODUCTION, 1990-2009¹

(Thousand carats)

Country	1990	1995	2000	2003	2005 ^e	2007 ^e	2009 ^e
Australia	34,600	40,700	26,600	31,100	27,500	28,000	30,000
China	1,000	1,130	1,150	1,200	1,250	1,300	1,300
India	15	21	16	18	16	20	22
Indonesia	23	22	23	23	23	23	23
Other	10	10	10	10	10	10	10
Total	35,600	41,900	27,800	32,400	28,800	29,400	31,000

^eEstimated.

¹Historic data, estimated data, and totals are rounded to no more than three significant digits; may not add to totals shown.

TABLE 28
ASIA AND THE PACIFIC: HISTORIC AND PROJECTED PHOSPHATE ROCK PRODUCTION, 1990-2009¹

(P₂O₅ content in thousand metric tons)

Country	1990	1995	2000	2003	2005 ^e	2007 ^e	2009 ^e
Australia	--	1	225	545	550	550	600
China	6,400	7,960	5,820	7,550	7,700	7,700	7,800
India	181	360	336	350	360	360	360
Philippines	3	8	109	113	115	115	120
Vietnam	96	178	236	210	220	220	250
Other	562	510	510	300	250	220	200
Total	7,240	9,020	7,010	8,520	8,650	8,620	9,330

^eEstimated. -- Negligible or no production.

¹Historic data, estimated data, and totals are rounded to no more than three significant digits; may not add to totals shown.

TABLE 29
ASIA AND THE PACIFIC: HISTORIC AND PROJECTED SALABLE COAL PRODUCTION, 1990-2009¹

(Thousand metric tons)

Country	1990	1995	2000	2003	2005 ^e	2007 ^e	2009 ^e
Australia	199,000	194,000	313,000	325,000	350,000	352,000	355,000
China	1,010,000	1,310,000	957,000	1,740,000	2,100,000	2,250,000	2,400,000
India	226,000	290,000	335,000	353,000	360,000	370,000	380,000
Indonesia	10,000	40,000	77,200	114,000	120,000	130,000	140,000
Japan	7,980	6,260	3,130	1,400	1,400	--	--
Korea, North	68,000	70,000	22,500	22,300	26,000	26,000	26,000
Korea, Republic of	17,200	5,720	4,170	3,300	3,400	3,400	3,400
Philippines	1,190	1,200	1,300	1,600	1,600	1,700	1,700
Thailand	14,200	18,400	17,786	18,800	19,600	19,600	20,000
Vietnam	4,020	8,350	11,600	19,000	22,000	23,000	23,000
Other	311	382	663	880	890	950	950
Total	1,560,000	1,940,000	1,740,000	2,600,000	3,000,000	3,180,000	3,350,000

^eEstimated. -- Negligible or no production.

¹Historic data, estimated data, and totals are rounded to no more than three significant digits; may not add to totals shown.

TABLE 30
ASIA AND THE PACIFIC: HISTORIC AND PROJECTED NATURAL GAS PRODUCTION, 1990-2009¹

(Million cubic meters)

Country	1990	1995	2000	2003	2005 ^e	2007 ^e	2009 ^e
Australia	20,700	29,700	30,800	30,000	32,000	35,000	40,000
Brunei	9,450	11,200	10,800	10,000	12,000	12,000	12,000
China	15,000	18,000	22,000	34,000	36,000	38,000	40,000
India	10,200	17,800	30,000	27,000	28,000	28,000	28,000
Indonesia	61,000	85,100	82,300	89,300	92,000	92,000	94,000
Malaysia	18,500	36,500	56,900	65,000	65,000	70,000	70,000
Thailand	7,210	11,400	20,200	21,800	22,000	22,000	25,000
Other	7,810	10,500	14,100	19,500	19,700	19,700	20,000
Total	150,000	220,000	267,000	297,000	307,000	317,000	329,000

^eEstimated.

¹Historic data, estimated data, and totals are rounded to no more than three significant digits; may not add to totals shown.

TABLE 31
ASIA AND THE PACIFIC: HISTORIC AND PROJECTED CRUDE PETROLEUM PRODUCTION, 1990-2009¹

(Million 42-gallon barrels)

Country	1990	1995	2,000	2003	2005 ^e	2007 ^e	2009 ^e
Australia	211	185	264	250	230	230	240
China	1,010	1,100	1,200	1,260	1,300	1,400	1,400
India	250	258	238	241	242	245	247
Indonesia	534	580	516	413	450	460	490
Malaysia	227	257	249	260	260	260	260
Vietnam	20	64	115	125	160	170	170
Other	50	64	72	74	75	75	75
Total	2,300	2,510	2,650	2,620	2,720	2,850	2,900

^eEstimated.

¹Historic data, estimated data, and totals are rounded to no more than three significant digits; may not add to totals shown.

TABLE 32
ASIA AND THE PACIFIC: HISTORIC AND PROJECTED URANIUM MINE PRODUCTION, 1990-2009¹

(Metal content in metric tons)

Country	1990	1995	2000	2003	2005 ^e	2007 ^e	2009 ^e
Australia	3,530	3,700	7,580	9,000	9,000	9,000	9,100
China	100	500	1,000	1,000	1,300	1,500	1,500
Other	50	50	50	50	50	50	50
Total	3,680	4,250	8,630	10,100	10,400	10,600	10,700

^eEstimated.

¹Historic data, estimated data, and totals are rounded to no more than three significant digits; may not add to totals shown.