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The Mineral Industries of Asia and the Pacific

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The Asia and Pacific region, which includes 30 countries and territories, has a total area of about 30 million square kilometers, which accounts for about 20% of the world's total land mass. The total population of these countries and territories (about 3.9 billion) accounted for about 55% of the world's total in 2013. China and India, which were the world's two most populous countries, accounted for about 67% of the region's total population and about 37% of the world's total population. The economies of Burma, Cambodia, China, Laos, Mongolia, the Philippines, and Sri Lanka were the fastest growing in the region in 2013, with real gross domestic product (GDP) growth rates of more than 7% (tables 1, 2).

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, tantalum, and uranium. China has large resources of antimony, arsenic, barite, bauxite, coal, fluorite, gold, graphite, iron ore, magnesium, rare earths, strontium, tin, tungsten, and zinc. India was also one of the world's significant mineral producers; it has 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 bauxite, coal, copper, gold, nickel, and tin; Mongolia, which has large resources of copper, fluorspar, and molybdenum; New Caledonia, which has significant resources of nickel; Papua New Guinea, which has large resources of copper and gold; the Philippines, which has large resources of copper, gold, and nickel; and Thailand, which has large resources of feldspar, gypsum, and potash (table 4).

Despite the large amount and wide variety of resources of nonfuel minerals and coal in Australia, China, India, Indonesia, Mongolia, Papua New Guinea, the Philippines, and Thailand, in recent years, the region was unable to meet the demand for numerous nonfuel minerals [including copper, diamond, gold, iron ore, lead, phosphate rock, platinum-group metals (PGMs), and zinc] as well as such major mineral fuels as coal, natural gas, crude petroleum, and refined petroleum products. The shortfall was caused largely by a substantial increase in the consumption of nonfuel minerals and mineral fuels by China and India; by continued high levels of consumption by such resource-poor industrialized countries as Japan, the Republic of Korea, Singapore, and Taiwan; and by the growing economies of such middle-income developing countries as Indonesia, Malaysia, and Thailand. In 2013, the region of Africa and the Middle East supplied a large percentage of the Asia and Pacific region's requirements for 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 imported ferrous and nonferrous metals because of its large manufacturing sector and poor indigenous resources. China, however, remained the region's leader in terms of growth in consumption, especially for such mineral commodities as aluminum, cement, coal, copper, iron and steel, lead, natural gas, crude petroleum, phosphate rock, rare earths, tin, and zinc. India, Indonesia, Malaysia, the Republic of Korea, Singapore, Taiwan, Thailand, and Vietnam also were significant consumers of such mineral commodities as, aluminum, cement, coal, copper, gold, iron ore, lead, phosphate rock, silver, steel, and zinc.

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General Economic Conditions

The economies of countries in the Asia and Pacific region continued to grow during 2013, and the region was expected to maintain its momentum of GDP expansion during the next 2 years. The global economic outlook was positive for the next several years. The countries of the euro area continued to recover from the global financial crisis. The European Central Bank eased its monetary measures to launch a large-scale asset purchase program and lower oil prices could enable positive euro area growth in the next 2 years (International Monetary Fund, 2015, p. 1–20).

Economic growth among the member countries of the Association of Southeast Asian Nations (ASEAN) (Brunei, Burma, Cambodia, Indonesia, Laos, Malaysia, the Philippines, Singapore, Thailand, and Vietnam) plummeted during the worst of the global financial crisis in 2009 but rebounded quickly during the next several years. Robust domestic demand was a key factor in the region's ability to weather the global economic crisis. Before the crisis, these countries depended on exports of goods to developed countries in Europe and to the United States. During the past decade, however, the trade structure had changed. Total trade within ASEAN and with China and India increased by much more than did trade with the traditional partners. China was ASEAN's leading trading partner, and India had also become a significant trading partner with ASEAN. Consequently, the future economic development in these countries is likely to be affected by the economic activities in China and India. Foreign direct investment is important to innovation through technology and management skill and to link ASEAN to regional and global production networks. The 10 countries of ASEAN are planning to form a regional economic community by the end of 2015. The economies of Southeast Asia may experience accelerated growth if the business environment receives an immediate boost from reforms affecting customs, tariffs, or the movement of skilled labor. To capitalize on ASEAN's extensive production network, China and India were promoting the free flow of goods, investments, services, and skilled workers among China, India, and the ASEAN countries by 2020 (Asian Development Bank, 2015, p. 16).

The mining sector has been a key contributor to the Australian economy during the past decade. The Australian economy is expected to face a number of challenges in the coming years. China is the leading destination for Australia's mineral commodity exports. China's economy is in transition toward consumption-supported growth, and China is the world's leading consumer of most mineral resources. A slower rate of economic growth in China will have an effect on commodity markets. Commodity prices and investment in the mineral sector have declined, but production of key mineral commodities, such as coal and iron ore, increased in 2014. The tonnage of exports of coal and iron ore increased during the same period. Investment in housing construction in Australia has expanded recently but it has not been enough to offset the decrease in mining investment. The decrease in investment in the mineral sector is expected to be moderated by lower interest rates, the depreciation of the Australian dollar, and lower oil prices. The demand for commodities by emerging economies in the Asia and the Pacific region is projected to increase. Australia's economic growth is expected to be moderate during the next several years. However, sustained weak commodity prices and uncertainty about nonmining investments may affect Australia's economic growth (Department of Industry and Science, 2014, p. 11–45).

China's economic growth is expected to gradually slow as the structural transformation toward greater domestic consumption to support sustained economic growth continues. The Chinese Government decided to reform its state-owned enterprises, liberalize the banking sector, and develop financial markets. Economic growth is expected to be slower in the near future, reflecting tensions in a gradual transition from investment- to consumption-based growth. In 2014, the stabilization of the housing market and the elimination of excess production capacity in the country's heavy industry sector were the Government's priorities. China's economic growth is expected to decline to less than 7% during the next several years. Investment in manufacturing and infrastructure will continue at a moderate rate. Local governments will remain financially constrained. The Government's efforts on deregulation, service sector reform, and promotion of a private-public partnership business environment in the country were introduced to improve the investment environment. The Government planned to remove price controls on 24 commodities and services in 2015. As a result, the inflation rate is expected to increase, but declining global commodity prices may keep inflation at 2% during the next 2 years (World Bank, The, 2014, p. 110–112).

The Indian Government announced a series of reforms, including changes to labor law, privatization of the coal industry, and liberalization of state control on the price of diesel fuel. The Government is expected to remove barriers to investment by expediting environmental and forest permitting and by easing land acquisition policy regulations for building infrastructure and industrial corridors. The Government's "make in India" program is expected to boost investment in manufacturing by providing infrastructure and streamlining regulations. As a result, India's economy is expected to strengthen during the next several years. Low oil prices will increase real disposable incomes, particularly among poorer households, and help drive down inflation (International Monetary Fund, 2015, p. 54).

Exports are expected to remain the main component of economic growth in India and improved economic conditions in overseas markets are likely to increase demand. China has been the country's biggest export market and China's economic slowdown is expected to affect the volume of exports from the country. The country is diversifying its export markets, in particular toward the fast-growing emerging markets, such as the ASEAN. The Bank of Korea delayed the tightening of its monetary policy in 2013 to support the country's economic growth (Asian Development Bank, 2015, p. 154–157).

Mongolia's economic growth rate was again greater than 10% in 2013 but is expected to slow in the next few years. The economic growth was attributable mainly to growth in the mining sector, which accounted for more than 80% of export revenue and about 17% of Government revenue. Foreign direct investment in the mining sector has declined since the completion of the first phase of the Oyu Tolgoi copper mine. The country was facing a shortage of skilled workers and high

inflation. China was receiving more than 90% of Mongolia's mineral exports, and Mongolia's economic growth was expected to depend on stable global mineral commodity prices and economic growth in China. Mongolia's mining sector was expected to continue to grow slowly during the next several years (Asian Development Bank, 2015, p. 158–161).

Legislation

China's rapid, capital-intensive, export-oriented growth had been successful during the past three decades; however, the global markets it relied on were expected to be weaker in the future. The country's economic pattern of growth was energy- and natural-resource intensive and environmentally unsustainable. The constrained supply of major mineral commodities and environmental degradation were among the factors limiting the country's ability to maintain its past level of economic growth. The Government indicated that it intended to support and build a more energy-efficient and ecologically friendly society by upgrading the value chain in manufacturing while enhancing innovation and promoting the development of new strategic industries. Its plan to reduce carbon emissions was to be focused on the energy-intensive sectors, such as cement, chemicals, iron and steel, and nonferrous metals. The Government stated that the country's economic growth was expected to transform from one that is export focused to one that is consumer driven.

The State Council planned to reform the financial structure of local governments. In the past, local governments were responsible for most expenditures but received about one-half of their budget revenues through the Central Government and were officially restricted to borrowing small amounts. The reform would allow local governments to borrow directly to cover financial deficits. The Central Government allows local governments to issue bonds indirectly and adopt regulatory guidelines on debt management. The Central Government plans to open new avenues for infrastructure financing by improving the environment for public-private partnership.

In Indonesia, the mining law enacted in 2012 prohibits the export of unprocessed minerals from Indonesia beginning on January 12, 2014. The purpose of the new provision was to increase the value of commodity exports and encourage development of the mineral processing and smelting sector in the country. Halting exports of unprocessed minerals could affect the global mineral sector in the next several years. The Indonesian Government planned to modify the guidelines by allowing exports of concentrates of copper, iron, lead, and zinc if companies commit to building smelters in the country by 2017. Minerals that must be refined before export are bauxite, chromium, gold, nickel, silver, and tin. Mineral exports accounted for about 5% of the country's total exports.

The Indonesian Government decided to implement a new fuel pricing system to reduce the gasoline and diesel subsidy and to shift spending toward development priorities, especially infrastructure, agriculture, and social programs. The Government intends that a significant portion of the private sector would participate in the development of infrastructure projects, resulting in faster overall fixed investments, jobs, and economic growth. The Government implemented a "one stop service" under the Investment Coordinating Board to replace complicated business licenses for investment (World Bank, The, 2015, p. 15–20).

In 2013, the Government of Vietnam continued with the creation and approval of decrees in support of the implementation of the 2010 Mineral Law in order to attract international interest in the country's potential for mineral mining. The Government approved Decree 203/2013/ND-CP, which regulates the method to calculate fees for granting mineral mining rights, the method for the collection of fees, and the management and uses of fees. Under Decree 203, fees are calculated based on the rate of the mining right fee as a percentage of the value of crude ore in the licensed area. The value is calculated based on the geologic reserves, taxable royalty prices, cost ratio between mineral recovery, mining production method, and socioeconomic conditions. The fee associated with the granting of mining rights for construction materials was 5%; peat, 4%; limestone, refractory clay, serpentine, and white sand, 3%; and gemstones and unspecified metal minerals, 2%.

Exploration

Australia's total mineral exploration spending was $A2.5 billion (US$2.4 billion) in 2013, which was a decrease of about 28% from that of 2012. The decrease in exploration spending was the result of a decrease in exploration for base metals, coal, gold, and iron ore. About 65% of the country's total exploration expenditure was spent on known deposits, and the remaining 35% was spent on new exploration projects. The State of Western Australia accounted for 56% of total exploration spending; followed by Queensland, 24%; New South Wales, 8%; South Australia, 7%; and others, 5%. Iron ore accounted for 34% of the exploration spending followed by gold, 22%; coal, 17%; base metals, 16%; and other commodities, 10%. As a result of the spending on exploration, significant mineral resources were discovered, including the Nova copper-nickel deposit and the Dampier heavy-mineral sand deposit in Western Australia and the Mallee Bull copper-gold-silver deposit in New South Wales. In 2013, the natural gas and oil exploration expenditure was $A4.5 billion (US$4.3 billion), of which offshore accounted for 70% of the total. Australia's total fuel and nonfuel exploration spending was $A7.0 billion (US$6.7 billion) (Australian Bureau of Statistics, 2014, p. 7–12).

In 2013, China's exploration spending decreased to $20.3 billion from $21.0 billion in 2012, of which oil and gas accounted for $13.1 billion and the nonfuel sector accounted for $7.2 billion. The Ministry of Land and Resources (MLR) announced that 10 large mineral resource provinces had been discovered during the past several years. These mineral resource provinces included copper in Xizang; gold in Dachang; iron ore in Awulale; nonferrous metals in Nyainqentanghla, Qimantage, Tianshan, and Yunnan; potash in Lop Nor Lake; and uranium in northern China. At yearend 2013, China's mineral resources increased for coal by 52.0 billion metric tons (Gt); iron ore, 4.1 Gt; oil, 1.0 Gt; bauxite, 260 million metric tons (Mt); zinc, 11.8 Mt; lead, 5.4 Mt; copper, 3.1 Mt; molybdenum, 3.1 Mt;

gold, 761 metric tons (t); and natural gas, 620 billion cubic meters. The MLR encouraged companies to explore for and develop bauxite, copper, and iron ore deposits because China depended on imports of these mineral commodities. The Chinese Government would provide special funding for these projects (Ministry of Land and Resources, 2014, p. 9–10).

Commodity Overview

The estimates for the production of major mineral commodities for 2015 and beyond have been based upon supply-side assumptions, such as announced plans for increased production, new capacity construction, and bankable feasibility studies. The outlook tables (tables 5 through 20) in this summary chapter show historic and projected production trends; therefore, for historic and current year production data, no indication is made about whether the data are estimated or reported, and revisions are not identified. Data on individual mineral commodities in tables in the individual country chapters are labeled to indicate estimates and revisions. The outlook segments of the mineral commodity tables are based on projected trends that could affect current producing facilities and on planned new facilities that operating companies, consortia, or Governments have projected to come online within the indicated timeframes. Forward looking information, which includes estimates of future production, exploration and mine development, the cost of capital projects, and timing of the start of operations, is subject to a variety of risks and uncertainties that could cause actual events or results to differ significantly from expected outcomes. Projects listed in the following sections are presented as an indication of industry plans and are not a USGS prediction of what will take place.

Metals

Aluminum and Bauxite and Alumina.—The region's production of bauxite accounted for about 71% of the world total in 2013. Australia, which was the world's leading producer of bauxite, accounted for about 29% of the world total; it was followed by Indonesia (20%) and China (16%). Production of aluminum in the region accounted for about 56% of the world total in 2013. China, which was the world's leading producer of aluminum, accounted for about 48% of the world total; it was followed by Australia and India (about 3% each) (table 4).

Regional production of bauxite and aluminum was expected to continue to increase at an average annual rate of about 2.7% for bauxite and 2.2% for aluminum between 2013 and 2020 (tables 5, 6). The projected figure for bauxite is based on reported capacity expansions in Australia, China, Indonesia, and Vietnam, and that for aluminum is based on projected capacity expansions in China.

Owing to increased demand for bauxite in the world in recent years, Australian bauxite producers planned to expand their output capacities. Bauxite Resources Ltd. (BRL) had the Felicitas and Fortuna exploration projects at Darling Range in the State of Western Australia. The Felicitas bauxite project was a joint venture with Yankuang Resources Pty Ltd., which was a subsidiary of state-owned Yankuang Group Co. Ltd. of China. Rio Tinto Alcan was conducting a feasibility study and an environmental impact study to develop the bauxite resource in an area south of the Embley River and the existing Weipa Mine. The new operation would progressively replace depleted resources at the Andoom and the East Weipa mining areas in Weipa. The new development would increase output capacity to 50 million metric tons per year (Mt/yr) from the current 23 Mt/yr in the region south of the Weipa Peninsula, and it could extend the mine life in the area by 40 years. Whether Rio Tinto Alcan moves forward with the project depends on the demand for bauxite in the region. China's dependence on bauxite imports was expected to continue, and although Indonesia had been a source of bauxite for China, the Indonesian Government introduced regulations in 2012 to restrict the export of raw materials starting in January 2014. As a result, the supply of bauxite in the Asia and Pacific region could be constrained. Once all major Government approvals have been granted, Rio Tinto Alcan's decision about whether to proceed with the project south of the Embley River will likely depend on market conditions at that time (Bauxite Resources Ltd., 2014, p. 5–19).

In China, several bauxite mines were under construction in the Provinces of Guizhou, Henan, and Shanxi. China's bauxite production capacity was expected to increase by 7 Mt by 2020. Geologists continued to explore for bauxite resources in these Provinces and discovered several significant deposits in the Provinces of Guizhou and Henan that had bauxite resources of more than 1 Gt combined. China had a moderate amount of bauxite resources; however, diaspore (orthorhombic hydrous aluminum oxide) accounted for more than 90% of China's bauxite deposits and the remaining 10% was of the gibbsite (monoclinic aluminum hydroxide) type. Owing to the crystalline structure of diaspore, it is better for producing refractory grade alumina, therefore, China needed to import a large amount of gibbsitic bauxite for producing metallurgical alumina using the Bayer process (Huo and Guo, 2014).

To take advantage of investment incentives offered by China's Central and local governments, many aluminum companies, including Aluminum Corporation of China Ltd. (Chalco), China Power Investment Corp., Shandong Xinfa Group, Tianshan Aluminum-Power Co. Ltd., and Zhonghe Aluminum Co. Ltd., moved some of their operations to the northwestern part of the country. The government of Xinjiang Uygur Autonomous Region urged enterprises to develop an integrated coal-power-metallurgy industry in the region. Domestic analysts estimated that Xinjiang had about 4.7 Mt of output capacity and produced 2.46 Mt of aluminum in 2013, which ranked second behind Henan Province, China's leading aluminum producing Province. Primary aluminum output capacity in Xinjiang was expected to reach 8.0 Mt/yr of its proposed capacity of 13 Mt/yr by yearend 2015. The Ministry of Industry and Information Technology (MIIT) approved nine aluminum producers to build a total of 9.1 Mt of aluminum capacity out of a proposed 19 Mt of new capacity in Xinjiang. In 2013, the combined aluminum output from three northwestern Provinces (Gansu, Qinghai, and Xinjiang) accounted for about 30% of the country's total aluminum output compared with less than 10% in 2010. China's aluminum output capacity was expected to increase to more than 40 Mt/yr by 2020 if all proposed

aluminum projects were constructed (Alumina and Aluminum Monthly, 2014).

Vietnam National Coal Mineral Industries Holding Co. Ltd. completed the construction of the Tan Rai alumina and bauxite complex in 2013. Bauxite output was expected to be sufficient for the production of 600,000 metric tons per year (t/yr) of alumina, which would meet the demand in Vietnam. Owing to weak alumina market conditions, the Government of Vietnam decided to delay its decision on expanding bauxite development until 2020 (Vietnam National Coal Mineral Industries Holding Co. Ltd., 2012a–c; 2013a, b).

Cobalt.—The region's mined cobalt output accounted for about 23% of the world total in 2013. Most of the region's cobalt is produced as either a byproduct or coproduct of nickel operations. Regional production of mined cobalt was expected to continue to increase at an average annual rate of about 1.6% between 2013 and 2020 (table 7). In New Caledonia, the Goro and the Koniambo nickel/cobalt projects were expected to reach their full output capacity in 2018. In Papua New Guinea, the Ramu nickel/cobalt project started production in 2012 and was expected to reach its full production capacity in 2016. The Coral Bay Nickel Corp. planned to expand its Rio Tuba Nickel Mine production capacity at Palawan in the Philippines (Vale S.A., 2013, p. 7; Glencore Xstrata Plc, 2014).

China was the leading cobalt-producing country in the region. China was one of the leading mobile phone producers in the world. The demand for cobalt batteries has driven the rapid expansion of cobalt-refining facilities in China. Despite limited cobalt resources, China continued to expand its refined cobalt output capacity during the past several years. In 2013, China's imports of cobalt concentrates increased to 180,080 t and intermediate cobalt products from hydrometallurgical processing increased to 108,995 t. In 2013, China consumed about 35,000 t of cobalt, of which the battery sector accounted for 67% of the total, followed by cemented carbide, 7%; ceramics, magnetic, and petrochemical, 5% each; superalloys and binder, 2% each; and other, 5%. As the global economy recovers during the next several years, the demand for cobalt batteries is expected to increase sharply. The country is expected to increase its imports of cobalt concentrates and metal to meet future demand (Li, 2013; General Administration of Customs of the People's Republic of China, 2014; Minor Metals Monthly, 2014).

Copper.—The region's production of mined copper accounted for about 20% of the world total in 2013. China was the leading regional producer followed by Australia and Indonesia. Production of primary refined copper accounted for about 44% of the world's total output in 2013. China was the leading world and regional producer of primary and secondary refined copper. Australia, India, Japan, and the Republic of Korea were also significant producers of refined copper in the region (table 4).

Between 2013 and 2020, regional production of mined and refined copper was expected to continue to increase at an average annual rate of about 3% and 2%, respectively. This estimate is based on reported capacity expansions of mined copper in Australia, China, Mongolia, and Pakistan and on reported capacity expansions of refined copper in China (tables 8, 9).

The increase in Australia's copper mine production in 2013 compared with that of 2012 was the result of higher production rates at existing mines without any major new mine starting up during the year. The Ernest Henry and Mount Isa operations increased their outputs compared with those of the previous year. Increased production at the Cadia Valley and the Lady Annie were also recorded. Copper production at the Olympic Dam operation had been affected by smelter disruptions in September. Several new mines were expected to be in full operation, including Sandfire Resources NL's Degrussa and MMG Ltd.'s Golden Grove operations, and, as a result, mined copper output was expected to increase during the next 2 years. The slightly increased refined copper production was the result of the Lady Annie's solvent-extraction and electrowinning processing facility reaching full operation. Glencore plc (formerly Glencore Xstrata plc) planned to close its Townsville copper refinery in 2016 and was expected to decrease its refined copper production in Australia in the future. Australia exported a total of 2.1 Mt of copper concentrates in 2013 compared with 2.0 Mt in 2012. China was the leading destination for exports of Australia's copper concentrates and received 47% of the total exported; India, 21%; Japan, 19%; the Republic of Korea, 8%; and others, 5%. Australia increased its refined copper exports to 404,000 t in 2013 from 370,000 t in 2012. China was the leading destination and received 66% of the total exported; Malaysia, 20%; Thailand, 4%; and others, 10% (Australian Bureau of Resources and Energy Economics, 2014, p. 188; BHP Billiton Ltd., 2014b, p. 14).

In Mongolia, the Turquoise Hill Resources Ltd.'s Oyu Tolgoi mining complex planned to produce up to about 195,000 t/yr of copper in concentrates for the first several years of full operation starting in 2013. Mongolia was expected to export more than 90% of its output of copper concentrates, probably to China. Also, Tethyan Copper Co. in Pakistan planned to start producing 200,000 t/yr of copper in 2015 (Turquoise Hill Resources Ltd., 2014, p. 2–3).

China's refined copper production continued to expand despite the constrained supply of copper concentrates on the world market. In 2013, China's copper smelting and refining output capacities increased by 720,000 t/yr and 1.08 Mt/yr from 2012, respectively, and reached about 4.9 Mt/yr and 9.0 Mt/yr, respectively. The smelting and refining capacity of China was expected to continue to increase during the next few years. Several greenfield and brownfield copper projects were recently completed or under construction. Yuanqu Smelter of Zhongtiashan Nonferrous Metals Group Co. Ltd. planned to complete upgrading its smelting and refining capacity to 100,000 t/yr in 2014. Jiangxi Copper Co. Ltd. intended to increase its refining capacity to 1.5 Mt/yr by 2015 and 1.8 Mt/yr by 2020. Zhangjiagang United Copper Co. started construction on its capacity expansion project in 2012 and was expected to add 100,000 t/yr capacity in 2014. Jinchuan Nonferrous Metal Corp. completed the first phase of construction on its copper-nickel plant, which had output capacity of 400,000 t/yr of refined copper and 110,000 t/yr of nickel products at Fangchenggang in Guangxi Zhuangzu Autonomous Region in 2013. Yantai Penghui Copper Co. Ltd. planned to build a 180,000-t/yr smelting and refining plant to replace an obsolete

120,000-t/yr plant. China Gold Nei Mongol Mining Co. (a subsidiary of China National Gold Co.) started construction on its 100,000-t/yr smelting and refining plant at Manzhouli in Nei Mongol in 2014 and was scheduled to be completed in 2015 (Copper Monthly, 2014a–b).

Gold.—The region's production of mined gold accounted for about 31% of the world total in 2013 (table 4). China was the leading producer of mined gold in the region, followed by Australia, Indonesia, and Papua New Guinea. Between 2013 and 2020, regional production of mined gold was expected to continue to increase at an average annual rate of about 2.4% (table 10).

Australian gold production was expected to increase in the next few years. Despite declining ore grades and closure of some mining capacity, gold production at existing mines, such as Cadia Valley, continued. Vista Gold Corp.'s Mount Todd project, Citigold Ltd.'s Charters Town project, and YTC Resources Ltd.'s Hera project were expected to be brought onstream during the next several years. Gold production in Mongolia could increase because of access to exceptionally high-grade ore from the Oyu Tolgoi copper-gold mine, and output was expected to remain steady after 2013. The increase in gold production in Papua New Guinea would depend upon when the Frieda River Mine and the Yandera Mine are put into operation.

China was the leading mined-gold-producing country in the world. Gold production was expected to increase by only about 2.5% per year, as the country was unlikely to have the strong production growth rate of the past several years. Many of China's gold mines had relatively high production costs and were small in scale (Australian Bureau of Resources and Energy Economics, 2014, p. 190; Ministry of Industry and Information Technology, 2014; Tropicana Joint Venture, 2015).

The Asia and Pacific region was the world's major market for gold and the region's demand for gold increased to about 63% of the world's total in 2013. China overtook India as the leading gold-consuming country in 2013, accounting for about 28% of the world total. Owing to regulations issued by the Indian Government to limit consumption, including establishing higher import duties and a quota on imports, India became the second-ranked gold consumer, and its share of the world total increased to about 25%. Worldwide, jewelry accounted for about 59% of the world's gold consumption; investment (bar and coin) accounted for about 21% and industry (electronics, dentistry, and others), about 11%. The growth in consumption in the Asia and Pacific region is attributable to increased demand for gold jewelry in China and India. Rising incomes in the region were expected to increase the affordability of jewelry and other fabricated gold products. China and India were likely to continue to be the driving forces behind the increase in jewelry demand (World Gold Council, 2014, p. 16–21).

Iron and Steel.—The region's production of iron ore was estimated to account for, in terms of gross weight, about 70% of the world total in 2013. China ranked first in the world in the production of iron ore (in terms of iron content), and Australia and India ranked second and third in the region, respectively. The region's production of pig iron and crude steel accounted for about 77% and 63%, respectively, of the world total. China, which was by far the world's leading producer of pig iron and crude steel, accounted for about 61% and 45%, respectively, of the world total, and Japan, India, and the Republic of Korea ranked among the top 10 producing countries in the world (tables 4, 11). China's crude steel output was more than the combined production total of, in order of output, Japan, the United States, India, Russia, and the Republic of Korea (World Steel Association, 2014, p. 1–3).

Regional production of iron ore and crude steel was expected to increase at an average annual rate of about 5.3% and 1.2%, respectively, between 2013 and 2020 (tables 11, 12). Australia is expected to replace China as the leading iron ore producer (iron content) in the region depending on the price of iron ore in the global market.

East Asian countries, such as China, Japan, and the Republic of Korea, were the world's leading consumers and importers of iron ore. Australia was the region's and the world's leading exporter of iron ore. As a result of an increase in investment during the past several years, mine expansions and new mines in Australia were expected to support strong growth in iron ore exports. Australian iron ore producers were expanding their production facilities to meet expected increased demand from neighboring countries. A number of greenfield and brownfield iron ore projects were at various stages of development. Rio Tinto Ltd. planned to expand the capacity of its Pilbara iron ore operations to a total of 360 Mt/yr in 2015. BHP Billiton Ltd. was expected to increase its production capacity to 220 Mt/yr in 2014. Fortescue Metals Group's Chichester Hub and Solomon Hub expansion projects were projected to increase the company's iron ore output capacity to 155 Mt/yr in 2014. Australia-based CITIC Pacific Mining Management Pty Ltd. had invested about $5 billion to develop its Sino iron ore project to produce about 24 Mt/yr of 67% iron in concentrates in 2013. Asia Iron Australia Pty Ltd., planned to develop the Extension Hill magnetite project in 2017, which could produce 10 Mt/yr of concentrate for 40 years. In China, the Government granted mining licenses for the development of iron ore mines in the Provinces of Anhui, Liaoning, and Sichuan, and in Xinjiang Uygur Autonomous Region (BHP Billiton Ltd., 2014a, p. 40; 2014b; Rio Tinto Ltd., 2013; Rio Tinto plc, 2014, p. 35).

In 2011, the Supreme Court of India suspended iron ore mining activities in the States of Karnataka and Goa because of massive illegal mining activities that were causing environmental damage. In April 2013, the Supreme Court lifted the ban on 63 mines in the State of Karnataka. It allowed mining to resume at the Karnataka mine at a capacity of 2.3 Mt/yr; however, many iron ore mines were still closed because they could not meet environmental standards (Komnenic, 2013; Siddiqui, 2013; Ministry of Steel, 2014, p. 2; Sesa Sterlite Ltd., 2015).

Brazil and South Africa would also continue to be major iron ore suppliers to the region. Imports of iron ore by East Asian countries were expected to continue to increase, especially by China and Japan to meet their steel industries' demand. China will continue to be the leading iron ore importing country while world iron ore prices are continuing to decline. The availability of high-grade ore at low prices will encourage China's iron and steel producers to keep their imports intact.

China is expected to lead in the expansion of crude steel production in the region but the rate of increase is expected to be much slower than in previous years, and the country's crude steel output is expected to peak during the next several years. Major iron and steel enterprises continued to expand their output capacity either by replacing smaller furnaces with larger furnaces or building steel complexes with larger output capacities. The Government approved Baogang and Wuhan Iron and Steel Group's construction of two iron and steel complexes in the Provinces of Guangdong and Guangxi, respectively. Tangshan Bohai Iron and Steel (Group) Co. Ltd. proposed building a 15-Mt/yr iron and steel complex in the coastal area of Hebei. The government of Shandong Province planned to build a 17.5-Mt/yr iron and steel complex at Dongjiakou (China Metals, 2013).

As China's economic growth slows down, manufacturing activity will likely decrease and the rate of growth for steel will slow. However, growth in the ASEAN countries is transitioning to and being driven by investment and export manufacturing. The Government of Indonesia plans to build more than 1,000 kilometers (km) of new toll roads, and the Government of Thailand intends to link industrial zones and key ports through efficient railway links. Steel demand for these countries is expected to increase. Chinese exports of finished steel products to these countries are expected to increase to fill the demand gap.

Nickel.—The region's production of mined nickel and refined nickel both accounted for about 47% and 38%, respectively, of the world total in 2013. Indonesia was the leading mined-nickel-producing country in the region, followed by the Philippines and Australia (tables 4, 13). Regional production of mined nickel was expected to continue to decrease by about 1.1% during the period 2013–2020.

The regional decline in mined nickel is expected to come from Indonesia, owing to the Indonesian Government banning the export of raw materials from the country, which could affect the development of Indonesia's nickel industry in the country and could lead to the shutting down of some operations. Production of mined nickel increased in Indonesia, New Caledonia, Papua New Guinea, and the Philippines. The Koniambo nickel-cobalt mine in New Caledonia started production in 2013. The Ramu nickel-cobalt mine in Papua New Guinea started operations in 2012 and was expected to reach its full output capacity in 2014. Also, the Tagaung Taung nickel mine in Burma started production in 2012.

Nickel is an important raw material for stainless steel production. China was the leading stainless-steel-producing country in the world. In recent years, China's nickel pig iron production had increased significantly. Nickel pig iron is produced by smelting low-grade nickel ore (laterite, which contains 1% to 2% nickel) as a substitute for conventional refined ferronickel (which contains 20% to 40% nickel) for stainless steel production. The Philippines and Indonesia were major suppliers of laterite ore to China for the production of nickel pig iron. The Indonesian Government was to ban the export of raw material starting in 2014, and Chinese nickel pig iron producers planned to obtain nickel raw material from New Caledonia and Papua New Guinea instead. Chinese nickel producers had also started construction of nickel smelters in Indonesia to secure a supply of nickel from that country. India's nickel consumption was expected to increase during the next several years to support the projected growth of India's iron and steel industry.

Tin.—The Asia and Pacific region was the dominant producer of mined tin and tin metal in the world. Production of mined tin and refined tin accounted for 76% and 84%, respectively, of the world total in 2013. China ranked first in the world in the production of mined tin and refined tin and Indonesia ranked second. Other significant refined tin producers in the region were Malaysia and Thailand (table 4). Regional production of refined tin was expected to continue to increase at an average annual rate of about 2.3% between 2013 and 2020 (table 17). Tin was used principally in the manufacturing of electronics, glass, iron and steel, and packaging.

Indonesia was one of the leading producers of mined and refined tin in the world and exported more than 90% of its refined tin output. During the past several years, owing to the excess supply of refined tin in the world market, prices of tin have decreased. Malaysia Smelting Corp. Bhd. of Malaysia decided to shut down its PT Koba Tin operation in Indonesia in 2013. State-owned PT Tambang Timah Tbk and 21 privately owned smelters in the Bangka Belitung region agreed to restrict their combined sales and exports of refined tin to 4,500 metric tons per month (t/mo). PT Tambang Timah will limit its monthly exports to 2,500 t, and the remaining balance will be divided among the 21 privately owned smelters. Indonesia's tin exports were more than 6,250 t/mo in 2013. The Indonesian Government also forced refined tin sales through the Indonesia Commodity and Derivative Exchange (Rusmana and Listiyorini, 2012; 2013).

Industrial Minerals

Lithium.—Lithium, the lightest metallic element, is widely used in the manufacture of batteries and electronics. Australia was the leading lithium producer in the Asia and Pacific region. Talison Minerals Group's lithium operation is located at Greenbushes in Western Australia. Talison planned to increase the output capacity of its processing plant to 740,000 t/yr of lithium concentrates in 2012. Chengdu Tianqi Industry (Group) Co. Ltd. of China through its subsidiary, Windfield Holding Pty Ltd., acquired Talison in 2013. In China, lithium was produced from both brine and spodumene. Qinghai CITIC Guoan Technology Development Co. Ltd., Tibet Mineral Development Co. Ltd., and Xinjiang Haoxin Lithium Salt Development Co. Ltd. were the major lithium producers in China. These companies all planned to expand their output capacities, although high production costs and low recovery rates forced the companies to source raw material from overseas. The Chinese Government approved Chengdu Tianqi to develop the Ya'an lithium mine in Sichuan Province. Australia supplied about 50% of China's lithium demand. In 2013, China's lithium carbonate output was estimated to be about 38,000 t and lithium hydroxide was about 19,000 t. The country had a total output capacity of lithium salt of about 100,000 t/yr and was expected to produce about 60,000 t of lithium salt in 2014. In 2013, China consumed about 63,000 t of lithium, of which about 50% of the

total was from imported materials. The lithium ion battery sector accounted for about 43% of the total consumption followed by lubricating greases (18%), glass and ceramics (15%), pharmaceutical (10%), air treatment (6%), catalyst (5%), and others (4%). Overall regional lithium production was expected to increase at an average annual rate of less than 1% between 2013 and 2020 (table 19; Galaxy Resources Ltd., 2014, p. 9; Luo Ningchuan and Wu Yanhua, 2014; Sichuan Tianqi Lithium Industries Inc., 2014, p. 13).

Mineral Fuels

Coal.—The Asia and Pacific region's overall production of coal, which included anthracite, bituminous, and lignite, accounted for about 60% of the world total in 2013. Production of anthracite coal in the region, however, accounted for about 95% of the world total, and production of bituminous coal accounted for about 66%. China, which was by far the world's leading producer of anthracite and bituminous coals, accounted for about 61% and 47%, respectively, of the world total. Australia, India, and Indonesia were the other significant coal producers in the region (table 4). China overtook Japan to become the world's leading importer and the region's leading consumer of coal. Japan and the Republic of Korea imported virtually all the coal required by their iron and steel and utility industries. Australia and Indonesia ranked as the world's leading coal exporters.

Overall regional coal production was expected to increase at an average annual rate of less than 2% between 2013 and 2020 (table 20). Australia's export of coal is expected to increase because of the continued strong demand from China and India. The additional output would be made possible by the completion of expansions at Glencore's Rolleston Mine, Hancock Coal's Alpha operation, and Peabody Energy's North Goonyella and Middlemount operations.

China's coal output capacity and production were targeted by the Government to be 4.1 billion metric tons per year (Gt/yr) and 3.9 Gt/yr, respectively, at yearend 2015. The Government identified 1,725 coal mines that would be shut down in 2014, which would eliminate 117 Mt/yr of production capacity. In 2013, the country imported a total of 327 Mt of coal, which was an increase of 13% from that of 2012. The increase in coal imports was the result of the price of coal on the international market being lower than that on the domestic market. Also, the Government gradually eliminated import tariff rates on coal during the past several years and imposed tariff rates on coal exports. Coal-fired powerplants, especially those in the coastal Provinces, increased the use of imported coal to reduce their production costs (Citigroup Global Market Inc., 2013, p. 5−10; Csteelnews.com, 2013; General Administration of Customs of the People's Republic of China, 2014).

India ranks third in the production of thermal coal behind China and the United States. Demand for coal has exceeded domestic production and for the past several years the country depended on imports to fill the gap. Imports of thermal coal increased to 142 Mt in 2013 from 12 Mt in 2004. India's coal has a low-energy content compared with other internationally traded coals, such as those of Australia and Indonesia. India's coals also have a high ash content (between 30% and 50%) but a low sulfur content. Higher quality imported coal often is blended with domestic coal to increase the quality and the combustion efficiency for coal-fired powerplants. Coal washing could improve the quality of domestic coal and reduce pollution; however, washed coal capacity only reached 125 Mt/yr, which remains short of the target of 175 Mt/yr in 2017. The majority of India's coal-fired powerplants are located in the northern and western part of the country and most coal production facilities are located in the eastern region. Transportation is a major issue for coal producers because of a shortage of rail infrastructure to transport domestic coal from mines to powerplants. During the past several years, China was the driving force in the international coal markets but India was expected to become a more important buyer in these markets. Coal producers in Australia and Indonesia were expected to be the principal sources for India's coal imports. By 2020, the total coal output from Australia, China, India, and Indonesia is expected to account for 70% of the world total (Department of Industry and Science, 2015, p. 27–51).

Trade Review

During the past three decades, the main source of economic growth in the Asia and Pacific region has shifted from the export of manufactured goods toward the export of machinery. This shift was initially led by Japan, followed by the newly industrialized economies of Hong Kong, the Republic of Korea, Singapore, and Taiwan, and, more recently, by China, Indonesia, Malaysia, the Philippines, and Thailand. Trade liberalization and investment policy reforms in developing countries in the region have reduced barriers to trade and investment. Both the cross-border transshipment of production components and assembly within the region increased during the past several years, and the composition of exports shifted toward intermediate goods. The share of parts and components in manufactured imports also was trending upward in the region. The volume of imports of parts and components had more than doubled in China, the Philippines, Thailand, and Vietnam. China had become one of the major export destinations for all economies in the region.

The ASEAN Comprehensive Investment Agreement, which took effect in 2012, laid out the rules for investment to enhance the business environment and to attract more domestic and international investment. The intraregional trade agreement of the ASEAN was strengthened through the implementation of the National Single Window, which provided a single platform for electronic trade and the Common Effective Preferential Tariffs, which set the tariff rate close to 0%. Also, the multilateral currency swap arrangement between the ASEAN and China, Japan, and the Republic of Korea should strengthen the region's ability to respond to liquidity problems when necessary.

Outlook

The global economy is expected to improve during the next several years and the Asia and Pacific region is expected to benefit from that recovery. The Chinese Government's long-term development policy is focused on more sustainable

economic growth that includes improving air and water quality and reducing the growth of greenhouse gas emissions. The Chinese Government plans to promote market-based reforms by setting interest rates and foreign exchange rates and instituting tax reform. The Government plans to continue with the expansion of industrial production and infrastructure development in China. As a result, the demand for energy and minerals is expected to continue to increase at a moderate rate during the medium term. Australia, which is the leading exporter of mineral commodities in the region, is likely to continue to benefit from increased demand for minerals from China. The Indonesian Government's restrictions on the export of raw materials could affect the country's economic growth during the next several years and could cause mining companies to phase out their operations in Indonesia.

Economic growth in Mongolia will depend in large measure on the development of its mineral industry. Foreign direct investment in both the mining and nonmining sectors in the country is expected to increase following the Parliament's enactment of a new investment law in 2013. The Parliament also plans to amend the Mineral Law and to issue guidelines for implementing the Mineral Law, the Petroleum Law, and the Law on Specially Protected Lands in 2014. The Government of Mongolia appears to be taking a pragmatic approach to promoting a more favorable environment for foreign investors to invest in the mining sector. The construction of railways between China and Mongolia is planned to reduce the cost of shipping coal and copper ore to China from Mongolia.

The Indian Government announced a number of ambitious policy and program targets over the next several years to achieve its economic, social, and environmental goals. The Government plans to transform India into a manufacturing hub through the "Make in India" program. The Government has recognized that a key part of increasing investment in the mining sector will require private sector participation in the development of the fuel and nonfuel industry, which was dominated by state-owned companies. In order to promote an increase in domestic mineral and metal production, a series of legislative actions were proposed, which require parliamentary approval.

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TABLE 1
ASIA AND THE PACIFIC: AREA AND POPULATION IN 2013

Country	Area[1] (square kilometers)	Estimated population[2] (thousands)
Afghanistan	652,230	30,552
Australia	7,741,220	23,131
Bangladesh	148,460	156,595
Bhutan	38,394	754
Brunei	5,765	418
Burma	676,578	53,259
Cambodia	181,035	15,135
China	9,596,960	1,357,380
Fiji	18,274	881
India	3,287,263	1,252,140
Indonesia	1,904,569	249,866
Japan	377,915	127,339
Korea, North	120,538	24,895
Korea, Republic of	99,720	50,220
Laos	236,800	6,770
Malaysia	329,847	29,717
Mongolia	1,564,116	2,839
Nepal	147,181	27,797
New Caledonia	18,575	262
New Zealand	267,710	4,471
Pakistan	796,095	182,143
Papua New Guinea	462,840	7,321
Philippines	300,000	98,394
Singapore	697	5,399
Solomon Islands	28,896	561
Sri Lanka	65,610	20,483
Taiwan	35,980	23,374 [3]
Thailand	513,120	67,011
Timor-Leste	14,874	1,178
Vietnam	331,210	89,709
Total	29,962,472	3,909,994
World total	510,072,000	7,125,000

[1]Source: U.S. Central Intelligence Agency, The World Factbook 2013.

[2]Source: The World Bank, 2014 World Development Indicators Database.

[3]Source: Statistical Bureau of the Republic of China (Taiwan).

TABLE 2

ASIA AND THE PACIFIC: GROSS DOMESTIC PRODUCT IN 2013[1, 2]

Country	Gross domestic product based on purchasing power parity		Real gross domestic product growth rate (percent)		
	Gross value (million dollars)	Per capita (dollars)	2011	2012	2013
Afghanistan	58,769	1,924	6.5	14.0	3.6
Australia	1,052,600	45,138	2.6	3.6	2.3
Bangladesh	496,013	3,167	6.5	6.3	6.1
Bhutan	5,426	7,197	10.1	6.5	5.0
Brunei	29,987	73,823	3.4	0.9	-1.8
Burma	221,479	4,345	5.9	7.3	8.3
Cambodia	46,111	3,056	7.1	7.3	7.4
China	16,149,090	11,868	9.3	7.7	7.7
Fiji	6,906	7,838	2.7	1.8	4.6
India	6,775,970	5,450	6.6	4.7	5.0
Indonesia	2,388,950	9,635	6.5	6.3	5.8
Japan	4,667,550	36,654	-0.5	1.5	1.5
Korea, North[3]	14,411	583	-0.5	0.3	NA
Korea, Republic of	1,697,000	33,791	3.7	2.3	3.0
Laos	31,586	4,666	8.0	7.9	8.0
Malaysia	693,594	23,160	5.2	5.6	4.7
Mongolia	26,786	9,293	17.5	12.4	11.7
Nepal	62,399	2,245	3.4	4.8	3.9
New Caledonia[4]	7,780	30,380	1.3	2.2	NA
New Zealand	150,697	33,626	1.9	2.5	2.8
Pakistan	835,075	4,574	3.6	3.8	3.7
Papua New Guinea	16,824	2,290	10.7	8.1	5.5
Philippines	643,076	6,597	3.7	6.8	7.2
Singapore	425,251	78,762	6.1	2.5	3.9
Solomon Islands	1,028	1,829	10.7	3.8	3.0
Sri Lanka	199,544	9,583	8.2	6.3	7.3
Taiwan	970,909	41,539	4.2	1.5	2.1
Thailand	964,500	14,136	0.1	6.5	2.9
Timor-Leste	9,159	7,678	14.7	7.8	5.4
Vietnam	474,950	5,295	6.2	5.2	5.4
Total	39,123,420	10,006[5]	8.2[6]	7.3[6]	7.0[6]
World total	101,933,870	14,307[5]	4.1	3.4	3.3

NA Not available.

[1]Source: International Monetary Fund, World Economic Outlook Database, October 2014.

[2]Gross domestic product listed may differ from that reported in individual country chapters owing to differences in source or date of reporting.

[3]Source: United Nations Data 2012.

[4]Source: New Caledonia Institute of Statistics 2012.

[5]Gross domestic product/population.

[6]Annual change in regional gross domestic product.

TABLE 3

ASIA AND THE PACIFIC: SELECTED EXPLORATION SITES IN 2013[1]

Country	Type[2]	Site	Commodity	Company	Resources[3]
Australia	E	Browns Range	REE	Northern Minerals Ltd.	18,000 t REE (D).
Do.	F	Castle Hill (Kunanalling)	Au	Phoenix Gold Ltd.	1.16 Moz Au (R).
Do.	F	Gidgee	Au	Panoramic Resources Ltd.	1.3 Moz Au (D).
Do.	E	Hillside	Cu, Au, Fe	Rex Minerals Ltd.	938,000 t Cu, 757,000 oz Au, 26 Mt Fe (PR).
Do.	E	Matilda	Au	Blackham Resources Ltd.	520,000 oz Au (D).
Do.	E	McPhyllamys	Au	Regis Resources Ltd.	1.7 Moz Au (D).
Do.	P	St Ives	Au	Gold Fields Ltd.	2 Moz Au (R).
Do.	E	Tennant Creek (Chariot)	Au, Cu	Emmerson Resources Ltd.	137,000 oz Au, 36,000 t Cu (D).
Do.	D	Tomingley	Au	Alkane Resources Ltd.	210,000 oz Au (R).
China	P	White Mountain	Au	Eldorado Gold Corp.	477,000 oz Au (R).
Do.	P	Ying	Ag, Pb, Zn, Au	Silvercorp Metals Inc.	83 Moz Ag, 380,000 t Pb, 127,000 t Zn, 29,000 oz Au (R).
Cambodia	E	Okvau	Au	Renaissance Minerals Ltd.	1.1 Moz Au (ID).
Indonesia	P	Martabe	Au, Ag	G-Resources Group Ltd.	2.6 Moz Au, 21 Moz Ag (R).
Papua New Guinea	P	Lihir	Au	Newcrest Mining Ltd.	29 Moz Au (R).
Philippines	P	CoO	Au	Medusa Mining Ltd.	567,000 oz Au (PR).
Do.	E	Masbate	Au	B2Gold Corp.	3.6 Moz Au (R).

Do. Ditto

[1]Abbreviations used for commodities in this table include the following: Ag—silver; Au—gold; Cu—copper; Fe—iron ore; Pb—lead; REE—rare-earth elements; Zn—zinc. Abbreviations used for units of measure include the following: Moz—million troy ounce; Mt—million metric ton; oz—troy ounce; t—metric ton.

[2] D—Approved for development; E—Active exploration; F—Feasibility work ongoing or completed; P—Exploration associated with producing site.

[3]Expressed in terms of contained metal in ore based on 2013 data reported from various sources; D—measured + indicated; ID—indicated; PR—probable; R—proven + probable. Resource data have not been verified by the U.S. Geological Survey.

In cases where resource data have not been released, the site was considered noteworthy based on the level of exploration activity or regional significance.

TABLE 4

ASIA AND THE PACIFIC: PRODUCTION OF SELECTED COMMODITIES IN 2013[1]

(Thousand metric tons unless otherwise specified)

	Metals										
				Copper		Gold, mine output, Au content (kilograms)	Iron and steel			Lead	
							Iron				
	Aluminum			Mine output, Cu content	Refined, primary		Ore, gross weight	Pig iron	Steel, crude	Mine output, Pb content	Refined, primary
Country	Alumina	Bauxite	Metal[2]								
Afghanistan	--	--	--	--	--	NA	--	--	--	--	--
Australia	21,528	81,109	1,778	990	475	265,000	609,000 e	3,430	4,640	711	177
Bangladesh	--	--	--	--	--	--	--	--	--	--	--
Bhutan	--	--	--	--	--	--	21	--	--	--	--
Brunei	--	--	--	--	--	--	--	--	--	--	--
Burma e	--	--	--	25	25	--	--	--	--	12	(3)
Cambodia	--	--	--	--	--	NA	NA	--	--	--	--
China e	44,400	46,000	27,300	1,600	4,340	430,000	1,450,000	708,970 [4]	779,040 [4]	2,940	3,280
Fiji	--	800 e	--	--	--	1,240	--	--	--	--	--
India	3,739	15,360	1,606	36	692	--	117,000	51,359	81,300	105	44
Indonesia	--	55,655	255	504	214	61,357	11,500 e	757	2,644	--	--
Japan	250 e	--	172	--	1,210	7,411	--	83,849	110,595	--	91
Korea, North	--	--	--	6	12 e	2,000 e	3,000	250	1,250	59	3
Korea, Republic of	--	--	--	NA	586	413	663	41,045	66,061	3	228
Laos	--	--	--	65	90	6,838	50 e	--	--	5 e	--
Malaysia	--	209	291	--	--	3,822	12,134	1,399	4,693	--	--
Mongolia	--	--	--	187	NA	8,904	6,011	--	68 e	--	--
Nepal	--	--	--	--	--	--	--	--	--	--	--
New Caledonia	--	--	--	--	--	--	--	--	--	--	--
New Zealand	--	--	325	--	--	12,468	--	680 e	900 e	--	--
Pakistan	--	25	--	14	--	--	412	201	1,359	12 e	--
Papua New Guinea	--	--	--	122	--	56,035	--	--	--	--	--
Philippines	--	--	--	91	156	17,248	1,300	--	1,308	--	--
Sri Lanka	--	--	--	--	--	--	--	--	--	--	--
Taiwan	--	--	--	--	--	--	--	13,400	21,466	--	--
Thailand	--	--	--	--	--	9,039	390	--	5,474	--	--
Vietnam e	--	250	--	12	8	3,500	2,830 [4]	NA	3,000	6	--
Total	69,917	199,408	31,727	3,651	7,808	885,275	2,214,310	905,340	1,083,798	3,852	3,823
Share of world total	68.6%	70.5%	56.3%	20.1%	44.2%	31.0%	69.7%	77.2%	67.4%	71.0%	77.8%
United States	4,388	NA	1,946	1,248	993	229,703	53,018	30,308	86,876	340	114
World total	101,908	282,876	56,401	18,125	17,682	2,859,066	3,177,581	1,172,249	1,608,297	5,424	4,915

See footnotes at end of table.

TABLE 4—Continued
ASIA AND THE PACIFIC: PRODUCTION OF SELECTED COMMODITIES IN 2013[1]

(Thousand metric tons unless otherwise specified)

	Metals								
			Nickel, metal content		Tin (metric tons)			Zinc (metric tons)	
Country	Manganese ore, mine output, Mn content	Mercury, mine output, Hg content (metric tons)	Mine output	Refined metal	Mine output, Sn content	Metal, primary	Tungsten, mine output, W content (metric tons)	Mine output, Zn content	Metal[2]
Afghanistan	--	--	--	--	--	--	--	--	--
Australia	2,970	--	234	142	6,472	--	320	1,523,000	498,000
Bangladesh	--	--	--	--	--	--	--	--	--
Bhutan	--	--	--	--	--	--	--	--	--
Brunei	--	--	--	--	--	--	--	--	--
Burma[e]	160	--	9 [p]	--	45,200	30	130	5,000	--
Cambodia	--	--	--	--	--	--	--	--	--
China[e]	3,000	1,600	93	245	120,000	155,000	68,000	5,000,000	5,300,000
Fiji	--	--	--	--	--	--	--	--	--
India	850	--	--	--	--	38	--	763,707	788,000
Indonesia	38 [e]	--	834	23	37,100 [e]	63,000 [e]	--	--	--
Japan	--	--	--	42 [e]	--	1,786	--	--	587,291
Korea, North[e]	--	--	--	--	--	--	65	36,000	32,000
Korea, Republic of	--	--	--	--	--	--	--	1,749	1,044
Laos	--	--	--	--	800 [e]	--	--	5,500 [e]	--
Malaysia	440	--	--	--	3,697	32,668	--	--	--
Mongolia	--	--	--	--	--	--	--	52,050	--
Nepal	NA	--	--	--	--	--	--	--	--
New Caledonia	--	--	164	--	--	--	--	--	--
New Zealand	--	--	--	--	--	--	--	--	--
Pakistan	--	--	--	--	--	--	--	10,024	--
Papua New Guinea	--	--	11	--	--	--	--	--	--
Philippines	1	--	446	--	--	--	--	16,730	--
Sri Lanka	--	--	--	--	--	--	--	--	--
Taiwan	--	--	--	11 [e]	--	--	--	--	--
Thailand	7	--	--	--	132	19,088	157	29,300	76,576
Vietnam[e]	4	--	--	--	5,400	4,000	1,100	25,000	18,000
Total	7,470	1,600	1,792	463	218,801	275,610	69,772	7,468,060	7,300,911
Share of world total	44.2%	89.3%	47.0%	37.7%	76.3%	83.7%	86.3%	55.5%	60.3%
United States	--	--	--	--	--	--	NA	784,355	233,222
World total	16,910	1,792	3,814	1,227	286,692	329,374	80,820	13,462,676	12,105,672

See footnotes at end of table.

TABLE 4—Continued
ASIA AND THE PACIFIC: PRODUCTION OF SELECTED COMMODITIES IN 2013[1]

(Thousand metric tons unless otherwise specified)

	Industrial minerals					Mineral fuels			
						Coal		Natural gas, dry, marketed/ marketable (million	Petroleum, crude (thousand
Country	Cement, hydraulic	Fluorspar (metric tons)	Graphite (metric tons)	Magnesite	Salt	Anthracite	Bituminous	cubic meters)	42-gallon barrels)
Afghanistan[e]	40	--	--	--	145	--	936	141	68 [4]
Australia	8,400 [e]	--	--	450 [e]	11,000 [e]	--	296,000	61,217	128,600
Bangladesh	15,000 [e]	--	--	--	1,460	--	1,218	23,055	--
Bhutan	500 [e]	--	--	--	--	--	78	--	--
Brunei	300 [e]	--	--	--	--	--	--	11,400	48,200
Burma[e]	600	--	--	--	210	--	--	12,894 [4]	5,857 [4]
Cambodia	1,000 [e]	--	--	--	NA	--	--	--	--
China[e]	2,416,000 [4]	4,400,000	750,000	17,000	64,600 [4]	500,000	2,850,000	100,000	1,520,000
Fiji	130 [e]	--	--	--	--	--	--	--	--
India[e]	280,000	14,000	142,546 [4]	213	18,000	--	563,000	34,400	265,000
Indonesia	65,000 [e]	--	--	--	650 [e]	187,000	263,000	70,400	302,079
Japan	57,962	--	--	--	1,000 [e]	--	800 [e]	2,995	4,943
Korea, North[e]	6,400	12,500	10,000	--	500	42,000	--	--	--
Korea, Republic of	53,252	--	--	--	421	2,500	--	--	--
Laos	1,500 [e]	--	--	--	12 [e]	135 [e]	--	--	--
Malaysia	21,457	--	--	--	--	--	2,894	62,000	208,141
Mongolia	350	226,000	--	--	2 [e]	--	26,001	--	3,600 [e]
Nepal	3,000 [e]	--	--	--	--	--	7 [p]	--	--
New Caledonia	125 [e]	--	--	--	--	--	--	--	--
New Zealand	1,200 [e]	--	--	--	100 [e]	--	4,625	4,866	12,325
Pakistan	31,098	1,800 [e]	--	7	2,457	--	2,813	51,383	29,000
Papua New Guinea	NA	--	--	--	--	--	--	100	8,500
Philippines	20,150	--	--	--	993	--	10,732	4,000 [e]	2,500 [e]
Sri Lanka[e]	3,000	--	4,200	--	13	--	--	--	--
Taiwan	16,553	--	--	--	--	--	--	340 [e]	66
Thailand	42,000	NA	--	--	1,300 [4]	--	--	22,000 [e]	40,000 [e]
Vietnam[e]	58,000	--	NA	--	1,200	45,000	--	9,400 [4]	123,000
Total	3,103,017	4,654,300	906,746	17,670	104,064	776,635	4,022,103	470,591	2,701,879
Share of world total	75.8%	69.7%	82.6%	69.5%	38.6%	95.3%	66.5%	13.9%	9.5%
United States	77,415	--	--	W	40,348	2,362	998,109	687,666	2,716,148
World total	4,091,576	6,673,566	1,097,352	25,421	269,731	815,246	6,044,143	3,388,005	28,551,753

See footnotes at end of table.

TABLE 4—Continued
ASIA AND THE PACIFIC: PRODUCTION OF SELECTED COMMODITIES IN 2013[1]

[e]Estimated; 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. NA Not available. -- Zero or zero percent.

[1]Totals may not add due to independent rounding. Percentages are calculated on unrounded data. Includes data available as of October 16, 2015.

[2]Primary and secondary production.

[3]Less than ½ unit.

[4]Reported figure.

[5]Natural gas, gross production.

TABLE 5

ASIA AND THE PACIFIC: HISTORIC AND PROJECTED BAUXITE MINE PRODUCTION, 2005–2020[1]

(Thousand metric tons, gross weight)

Country	2005	2010	2012	2013	2016[e]	2018[e]	2020[e]
Australia	59,960	68,414	76,282	81,109	83,000	96,000	98,000
China	22,000	44,000	47,000	46,000	49,000	51,000	52,000
India	12,385	14,124	13,600	15,360	17,000	19,000	19,000
Indonesia	1,442	27,410	31,443	55,655	60,000	65,000	65,000
Malaysia	5	124	122	209	300	300	300
Other	33	90	130	270	1,500	3,500	3,800
Total	95,800	154,000	169,000	199,000	211,000	235,000	238,000

[e]Estimated.

[1]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 AND SECONDARY ALUMINUM METAL PRODUCTION, 2005–2020[1]

(Thousand metric tons)

Country	2005	2010	2012	2013	2016[e]	2018[e]	2020[e]
Australia	2,030	2,060	1,864	1,778	1,900	1,900	1,900
China	9,740	20,200	24,500	27,300	29,000	30,000	31,000
India	942	1,607	1,700	1,606	1,800	1,900	2,000
Indonesia	252	253	248	255	260	270	280
Japan	240	180	168	172	168	170	170
New Zealand	373	343	327	325	330	330	330
Other	--	--	120	290	800	1,000	1,000
Total	13,600	24,600	28,900	31,700	34,300	35,600	36,700

[e]Estimated. -- Negligible or no production.

[1]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 COBALT MINE PRODUCTION, 2005–2020[1]

(Metal content in metric tons)

Country	2005	2010	2012	2013	2016[e]	2018[e]	2020[e]
Australia	5,600	3,850	5,882	6,400	6,000	6,000	6,000
China	2,100	6,000	7,500	7,200	7,000	7,000	7,000
Indonesia	1,600	1,600	3,600	4,000	4,000	4,000	4,000
New Caledonia	--	--	3,500	3,190	3,500	4,000	4,000
Papua New Guinea	--	--	469	1,013	2,200	2,800	2,800
Philippines	300	2,100	2,600	3,000	3,000	4,000	4,000
Total	9,600	13,600	24,000	24,800	26,000	28,000	28,000

[e]Estimated. -- Negligible or no production.

[1]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, 2005–2020[1]

(Metal content in thousand metric tons)

Country	2005	2010	2012	2013	2016[e]	2018[e]	2020[e]
Australia	930	870	914	990	1,100	1,300	1,200
China	762	1,160	1,550	1,600	1,700	1,800	1,900
Indonesia	1,064	878	360	504	550	550	600
Mongolia	127	125	122	187	200	200	200
Papua New Guinea	193	160	125	122	125	130	150
Philippines	16	58	65	91	100	100	100
Other	73	50	60	60	100	150	250
Total	3,170	3,300	3,200	3,550	3,880	4,230	4,400

[e]Estimated.

[1]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, 2005–2020[1]

(Thousand metric tons)

Country	2005	2010	2012	2013	2016[e]	2018[e]	2020[e]
Australia	461	417	460	475	500	310	310
China	2,600	4,650	5,880	6,540	7,000	7,300	7,500
India	497	664	671	617	700	720	740
Indonesia	263	279	197	214	360	380	400
Japan	1,395	1,549	1,516	1,468	1,500	1,600	1,600
Korea, Republic of	519	565	593	586	600	600	600
Other	270	266	220	280	300	310	330
Total	6,010	8,390	9,540	10,200	11,000	11,200	11,500

[e]Estimated.

[1]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, 2005–2020[1]

(Metal content in kilograms)

Country	2005	2010	2012	2013	2016[e]	2018[e]	2020[e]
Australia	263,000	261,000	252,000	265,000	280,000	285,000	290,000
China	225,000	345,000	403,000	430,000	450,000	470,000	480,000
Indonesia	130,620	119,726	69,291	61,357	60,000	80,000	100,000
Japan	8,318	8,544	7,233	7,411	7,000	6,500	6,000
Laos	6,232	5,061	6,415	6,838	7,000	8,000	8,000
Mongolia	24,120	6,000	5,995	8,904	10,000	20,000	20,000
New Zealand	10,583	13,494	10,164	12,468	12,000	12,000	12,000
Papua New Guinea	68,483	58,983	59,100	56,035	57,000	60,000	73,000
Philippines	37,490	40,847	14,596	17,248	25,000	30,000	30,000
Other	19,000	19,800	25,500	23,000	29,000	33,000	34,000
Total	793,000	878,000	853,000	888,000	937,000	1,000,000	1,050,000

[e]Estimated.

[1]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 BENEFICIATED IRON ORE PRODUCTION, 2005–2020[1]

(Metal content in thousand metric tons)

Country	Average ore grade (% Fe)	2005	2010	2012	2013	2016[e]	2018[e]	2020[e]
Australia	62	163,000	271,000	315,000	377,000	450,000	550,000	590,000
China	64	134,000	350,000	406,000	435,000	460,000	480,000	500,000
India	64	97,500	134,000	92,000	75,000	100,000	130,000	170,000
Other		3,000	5,000	8,200	11,000	11,000	11,000	12,000
Total		398,000	760,000	821,000	898,000	1,020,000	1,170,000	1,270,000

[e]Estimated.

[1]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 CRUDE STEEL PRODUCTION, 2005–2020[1]

(Thousand metric tons)

Country	2005	2010	2012	2013	2016[e]	2018[e]	2020[e]
Australia	7,790	7,408	4,904	4,640	5,000	5,000	5,000
China	353,240	637,230	723,880	779,040	820,000	840,000	850,000
India	45,800	69,000	77,300	81,300	90,000	95,000	100,000
Japan	112,470	109,599	107,232	110,595	112,000	115,000	120,000
Korea, Republic of	47,820	58,914	69,073	66,061	69,000	69,000	69,000
Malaysia	5,296	5,693	5,612	4,693	6,500	7,000	7,000
Taiwan	18,567	20,498	21,083	21,466	23,000	23,000	23,000
Other	13,000	15,000	14,000	15,000	15,000	20,000	25,000
Total	604,000	923,000	1,020,000	1,080,000	1,140,000	1,170,000	1,200,000

[e]Estimated.

[1]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 NICKEL MINE PRODUCTION, 2005–2020[1]

(Metal content in metric tons)

Country	2005	2010	2012	2013	2016[e]	2018[e]	2020[e]
Australia	189,000	170,000	244,000	234,000	250,000	250,000	260,000
Burma	10	--	5,000	9,300	25,000	25,000	25,000
China	72,700	80,000	93,300	93,300	100,000	105,000	110,000
Indonesia	135,000	300,800	648,400	834,200	600,000	600,000	600,000
New Caledonia	111,939	129,800	131,700	163,866	164,000	185,000	185,000
Papua New Guinea	--	--	5,283	11,369	32,000	32,000	32,000
Philippines	26,636	150,000	322,000	446,000	450,000	450,000	450,000
Total	535,000	831,000	1,450,000	1,790,000	1,620,000	1,650,000	1,660,000

[e]Estimated. -- Negligible or no production.

[1]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 PALLADIUM MINE PRODUCTION, 2005–2020[1]

(Metal content in kilograms)

Country	2005	2010	2012	2013	2016[e]	2018[e]	2020[e]
Australia	550	650	550	610	600	600	600
China	450	650	650	650	650	700	700
Total	1,000	1,300	1,200	1,260	1,250	1,300	1,300

[e]Estimated.

[1]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 PLATINUM MINE PRODUCTION, 2005–2020[1]

(Metal content in kilograms)

Country	2005	2010	2012	2013	2016[e]	2018[e]	2020[e]
Australia	111	130	156	176	100	100	100
China	700	750	700	700	700	700	750
Total	811	880	856	876	800	800	850

[e]Estimated.

[1]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 TIN MINE PRODUCTION, 2005–2020[1]

(Metric tons)

Country	2005	2010	2012	2013	2016[e]	2018[e]	2020[e]
Australia	2,819	18,263	6,158	6,472	6,000	6,000	6,000
Burma	708	4,030	10,630	45,230	45,000	45,000	45,000
China	126,000	115,000	110,000	120,000	120,000	110,000	110,000
Indonesia	78,404	97,796	44,202	37,100	41,000	42,000	40,000
Malaysia	2,857	2,668	3,726	3,697	2,500	2,500	2,500
Vietnam	5,400	5,400	5,400	5,400	5,400	5,400	5,400
Other	1,000	1,200	1,000	1,000	1,000	1,000	1,100
Total	217,000	244,000	181,000	219,000	221,000	212,000	210,000

[e]Estimated.

[1]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 TIN METAL PRODUCTION, 2005–2020[1]

(Metric tons)

Country	2005	2010	2012	2013	2016[e]	2018[e]	2020[e]
China	122,000	149,000	148,000	155,000	165,000	170,000	180,000
Indonesia	65,300	64,200	79,800	63,300	60,000	60,000	65,000
Japan	950	1,050	1,338	2,096	2,100	2,200	2,200
Malaysia	36,924	38,737	37,792	32,668	40,000	40,000	40,000
Thailand	31,600	20,000	19,996	19,088	20,000	23,500	30,000
Other	2,800	3,500	4,400	4,400	4,500	4,500	4,500
Total	259,000	276,000	291,000	277,000	292,000	300,000	322,000

[e]Estimated.

[1]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 DIAMOND PRODUCTION, 2005–2020[1]

(Thousand carats)

Country	2005	2010	2012	2013	2016[e]	2018[e]	2020[e]
Australia	34,307	10,000	11,960	11,482	11,000	11,000	11,000
China	100	100	100	100	100	100	120
India	58	50	63	73	75	75	75
Indonesia	30	37	38	37	40	40	40
Total	34,500	10,200	12,200	11,700	11,200	11,200	11,200

[e]Estimated.

[1]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 LITHIUM PRODUCTION, 2005–2020[1]

(Metal content in metric tons)

Country	2005	2010	2012	2013	2016[e]	2018[e]	2020[e]
Australia	4,800	8,200	12,700	12,400	13,000	13,500	14,000
China	3,600	6,000	9,500	10,500	10,000	10,000	10,000
Total	8,400	14,200	22,200	22,900	23,000	23,500	24,000

[e]Estimated.

[1]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 SALABLE COAL PRODUCTION, 2005–2020[1]

(Thousand metric tons)

Country	2005	2010	2012	2013	2016[e]	2018[e]	2020[e]
Australia	370,000	499,000	430,000	362,000	530,000	540,000	560,000
China	2,260,000	3,240,000	3,660,000	3,680,000	3,850,000	4,000,000	4,100,000
India	360,000	507,000	580,000	590,000	600,000	620,000	640,000
Indonesia	192,920	325,326	466,307	443,000	260,000	280,000	300,000
Korea, North	23,500	41,000	41,492	42,000	42,000	42,000	42,000
Mongolia	8,256	25,246	31,139	26,001	45,000	58,000	55,000
New Zealand	5,267	5,335	4,926	4,625	6,000	6,000	6,000
Pakistan	3,367	3,429	4,000	2,813	4,100	4,200	4,300
Philippines	3,165	6,650	9,600	10,732	11,000	12,000	12,000
Thailand	21,429	17,907	18,069	18,111	19,000	20,000	21,000
Vietnam	34,093	44,835	42,383	45,000	50,000	50,000	50,000
Other	5,390	7,000	8,100	8,200	8,100	8,100	8,000
Total	3,290,000	4,720,000	5,300,000	5,230,000	5,430,000	5,640,000	5,800,000

[e]Estimated.

[1]Estimated data and totals are rounded to no more than three significant digits; may not add to totals shown.