



2007 Minerals Yearbook

CAMBODIA [ADVANCE RELEASE]

THE MINERAL INDUSTRY OF CAMBODIA

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In 2007, Cambodia's mineral resources remained, to a large extent, unexplored. During the past 5 years, the Cambodian Government had aggressively promoted and facilitated investment in Cambodia's mining sector owing to the discovery of several important minerals (including bauxite, copper, gold, iron ore, nickel, and tungsten) by foreign investors from neighboring countries (Laos, Thailand, and Vietnam). The major foreign companies that participated in Cambodian minerals exploration and development for land-based minerals and offshore oil and gas were BHP Billiton Plc, Great Australian Resources Ltd., Oxiana Ltd., and Southern Gold Ltd. of Australia; China Forwin International Investment Co. Ltd., China Petrotech Holdings Ltd., Wuhan Iron and Steel (Group) Co., and Zhong Xin Industrial Investment Co. Ltd. of China; Mitsubishi Corp. and Mitsui Oil Exploration Co. Ltd. of Japan; GS Caltex Corp., Kenertec Co., and Seoul Digem Cambodia Co. Ltd. of the Republic of Korea; Thai Boon Roon Cement Co. Ltd., and Siam Cement Industry Ltd. of Thailand; and Chevron Corp. of the United States (table 3).

In 2007, none of Cambodia's mineral production was of world significance. According to Cambodia's Government, during the past 5 years, the country produced mostly industrial minerals; these included sand and gravel and crushed stone for domestic consumption by the construction industry, and limestone for cement production in Kampot Province and road construction. Other, more valuable, minerals, such as gemstone and gold, were also produced by small-scale operators and many illegal miners. Gold and gemstone mine production data were not officially recorded.

The Ministry of Industry, Mines and Energy (MIME) is the main Government agency that implements the country's mineral law and policy. The MIME's Department of Geology and Mines and Department of Energy are responsible for developing the country's mineral resources, providing mining assistance to the private sector, and administering mining-related regulations and inspections. The Cambodian Development Council (CDC) is the Government agency that grants exploration licenses to investors. If exploration is successful, investors are required to present a master project plan to the CDC before they can be granted a mining license. According to the CDC, the amount of investment approved for mining projects by the CDC rose by 122.7% to \$403 million in 2006 from \$181 million in 2005 (World Investment News, 2004; International Monetary Fund, 2007, p. 65).

Minerals in National Economy

The mining and quarry sector, which grew by 16% in 2006 (the latest year for which data were available), contributed 0.41% to Cambodia's real gross domestic product (GDP) in 2006 compared with 0.39% in 2005. The sector employed an estimated 20,000 people and accounted for only 0.3% of the country's total employment in 2006 (the latest year for

which data were available) compared with an estimated 19,000 people in 2005, which accounted for 0.2% of Cambodia's total employment in that year (International Monetary Fund, 2007, p. 44, 69). Cambodia was a net minerals importing country. According to Cambodian authorities, the total value of taxable imports in 2006 (the latest year for which data were available) was \$1,179 million and the major mineral commodity imports were petroleum products, \$212 million; cement, \$53 million; and steel, \$33 million (International Monetary Fund, 2007, p. 64).

Production

According to official statistics provided by the Department of Geology and Mines, the mining activities in Cambodia during the past 2 years involved the production of sand and gravel and crushed stone for construction material (table 1). Other minerals, such as clay, gemstones, gold, iron ore, limestone, and salt, presumably were produced in the central Province of Kampong Cham, the northcentral Province of Preah Vihear, the northeastern Provinces of Mondol Kiri and Rotanah Kiri, and the coastal Province of Kampot. Production data for clay, gemstones, gold, and iron ore, however, were not available.

Structure of the Mineral Industry

Cambodia's mineral industry was still in its infant stage, and most mining companies were small-scale quarries that produced such construction materials as limestone, sand and gravel, and other construction aggregates. Production capacity data were not available for each of these small miners (table 2).

Between 1994 and 2006, the MIME had granted a total of 19 mineral exploration licenses to local and foreign companies, of which 3 projects were to explore for iron ore; 2, for gold; 2, for bauxite; 11, for metallic minerals; and 1, for coal. In 2005 and 2006, the MIME had granted mining licenses to 11 companies; 5 of the licenses were for gemstone (zircon) projects, 1 was for a granite project, and 5 were for limestone projects. Between late 2006 and early 2007, the MIME had granted four to five more exploration licenses for gold, iron ore, and nonferrous metals (copper, lead, nickel, and zinc) (table 3).

Commodity Review

Metals

Bauxite and Alumina.—A joint venture of BHP Billiton and Mitsubishi Corp. signed an agreement with the Government of Cambodia in October 2006 to explore for bauxite in the country's eastern Province of Mondol Kiri. According to BHP Billiton, the joint venture would investigate the potential for constructing an alumina refinery, if bauxite mining proves feasible. The prefeasibility and feasibility studies, which were

to be undertaken, would include an environmental impact assessment. Under the agreement, the two companies would have exclusive rights to negotiate a mining agreement with the Government once the initial studies and exploration work are completed by the end of 2008 (AFX News Ltd., 2006).

Copper, Iron Ore, and Zinc.—In November 2007, according to the Ministry of Commerce, Industry and Energy of the Republic of Korea, Kenertec Co., which was a Korean mineral resources developer, had won exclusive mining rights from the Cambodia Government for eight mining zones in northern Cambodia. The eight mining zones cover an area of 1,520 square kilometers (km²). The Ministry said that preliminary surface surveys indicated that the mining zones potentially could contain large quantities of copper, zinc, and iron ore. To discern the size of the mineral deposits, Kenertec planned to conduct more-detailed seismic studies beginning in 2008. Full-scale development of the region was to be followed by completion of the detailed survey and feasibility study. In 2002, China reportedly undertook a detailed survey of an area near Kenertec's concessions and discovered an estimated 600 million metric tons (Mt) of iron ore underground (Korean Culture and Information Service, 2007).

According to a news report by China Nonferrous Metals News on May 25, 2007, a Chinese joint venture led by Wuhan Iron and Steel (Group) Co. (Wugang), with partners [Anshan Iron and Steel Co., Baoshan Iron and Steel (Group) Co., and Shoudu Iron and Steel (Group) Co.] planned to conduct a geologic survey of iron ore resources in Cambodia's northern Province of Preah Vihear, where iron ore reserves were estimated earlier to be about 250 Mt. According to a local press (Changjian Daily) report, Wugang would be the leading shareholder in the joint-venture firm with a 50% interest (ABCmoney.co.uk, 2007; China Nonferrous Metals News, 2007).

Gold.—Southern Gold Ltd. of Australia, which signed a memorandum of understanding (MOU) with the Cambodian MIME in September 2006 to explore for copper, gold, and nickel in a 959-km² area in the country's eastern Provinces of Kracheh and Mondol Kiri, reportedly had identified several high-grade gold and base-metal targets from its preliminary geologic mapping and geochemical sampling programs in Cambodia. According to Southern Gold, assays of samples from the area covered by the Snuol MOU returned gold values of from 3.69 grams per metric ton (g/t) up to 71.2 g/t and copper values up to 0.94% from artisanal mine workings (Southern Gold Ltd., 2007b).

In November 2007, Southern Gold started its first drilling campaign in Cambodia at its 80% owned Snuol prospect in the southeastern Province of Kracheh. The company expected first assay results in early 2008. During the 18 months between 2006 and 2007, Southern Gold had signed a total of eight MOUs with the Government of Cambodia and obtained exploration and exploitation licenses for gold at its 100% owned O'Khtung, Preal Khlong, and Pnhum Khatong prospects and five additional prospects located within Southern Gold's 1,842-km² tenure in the eastern part of Cambodia (Monstersandcritics.com, 2007, Southern Gold Ltd., 2007a, p. 8-9).

Industrial Minerals

Cement.—Construction work on a \$93 million (revised from \$80 million) cement project, which had been started in January 2006, reportedly was completed. The cement plant, which was located 130 kilometers (km) south of Phnom Penh in the Touk Mesa District of Kampot Province, was to be opened officially in January 2008. The cement plant, which had an estimated capacity of 1 million metric tons per year (Mt/yr) was scheduled to produce 960,000 metric tons (t) of cement in 2008. According to the owner and operator of the plant, Kampot Cement Co. Ltd. (KCC), the cement plant capacity would be doubled in 2009 and 2010. According to Government trade data, the country had been importing between 2 and 5 Mt/yr of cement. Domestic cement production was expected to gradually reduce the country's reliance on imports of cement to meet the construction boom that was reshaping its national capital, Phnom Penh. The construction boom, which was driven mostly by investment from the Republic of Korea, helped to boost Cambodian economic growth rate to nearly 10% in 2007 (Thomson Reuters, 2008). According to Global Cement Magazine, an industry trade journal, the first-stage construction of KCC's cement plant was actually completed and went into operation in the middle of 2006. The plant was scheduled to operate at its full capacity of 2.7 Mt/yr by 2012 to meet the country's growing demand for cement. KCC was a joint venture of Thai Siam Cement Industry Ltd. (90%) and Cambodian building company Khaou Chuly Group (10%). The total investment capital reportedly was \$127 million (Global Cement Magazine, 2008).

Mineral Fuels

Natural Gas and Petroleum.—Chevron Overseas Petroleum (Cambodia) Ltd. (COPCL) (an affiliated company of Chevron) reportedly completed a preliminary analysis of the results of its second drilling campaign in 2007 for four additional wells on Block A, which covers a 6,278-km² area of the Khmer Basin in the Gulf of Thailand. Chevron released a downbeat assessment, even though the drilling confirmed the presence of hydrocarbons (oil and gas). According to Chevron, certain technical challenges needed to be addressed before deciding to develop its offshore Block A, and the company was considering a third drilling campaign for late 2008 to 2009. Chevron said that the oil and gas in the reservoir is unique for the Gulf of Thailand, that the hydrocarbons are dispersed rather than concentrated in one core field. The Cambodian National Petroleum Authority, however, had indicated in January 2007 that the Government hoped to start pumping oil from offshore fields by 2009 or early 2010. The country's annual imports of refined petroleum product were estimated to be 1 Mt. The major suppliers were Singapore, Thailand, and Vietnam (Demongeot, 2007).

China Petrotech Holdings Ltd. (CPH) reportedly had completed a 3-dimensional seismic survey for Block D in early 2007. Following the survey, the company estimated that Block D contains about 227 million barrels of recoverable reserves of crude petroleum and about 14 billion cubic meters (496 billion cubic feet) of natural gas. CPH announced in April 2007 that

it would draft an exploration plan for its first exploration well-drilling program for Block D (Demongeot, 2007).

Outlook

The Cambodian mining sector is still in its infant stage, but growing. The rate of growth is expected to increase during the next 2 to 3 years because more foreign companies have increased their investment in exploring for gold, iron ore, and other metallic and nonmetallic minerals in the country during the past 2 years. The mining sector, however, is expected to remain small relative to other sectors of the Cambodian economy for the next 2 to 3 years unless the economically viable reserves of oil and natural gas in Block A are developed by Chevron and begin to produce oil and gas by 2009 or 2010. Cambodia's economy as measured by the GDP, which grew by 9.6% in 2007, was forecasted to grow at a slower pace of 7.2% in 2008 and 7.0% in 2009 (International Monetary Fund, 2008).

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TABLE 1
CAMBODIA: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons unless otherwise specified)

| Commodity ² | 2003 | 2004 | 2005 | 2006 | 2007 ^c |
|-----------------------------|---------|---------|-----------------|------------------------|-------------------|
| Gravel | 13,800 | -- | 22,500 | 45,625 ^r | 46,300 |
| Laterite, blocks | 240,700 | 118,400 | -- ^r | -- ^r | -- |
| Quartz sand | 1,000 | -- | -- | -- | -- |
| Salt | 36,000 | 40,000 | -- | 5,900 ^r | 76,700 |
| Sand, construction material | 248,400 | 363,700 | 763,900 | 2,043,500 ^r | 2,050,000 |
| Stones: | | | | | |
| Crude construction material | 786,100 | 501,600 | 1,079,400 | 676,800 ^r | 702,000 |
| Limestone | -- | -- | -- | -- | 1,000,000 |

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

¹Table includes data available through May 9, 2008.

²In addition to the commodities listed, clay, gemstones, gold, and iron ore are presumably produced, but available information is inadequate to make reliable estimates of output.

Source: Cambodia's Ministry of Industry, Mines and Energy, General Department of Mineral Resources; U.S. Geological Survey Minerals Questionnaires for Cambodia 2003-06.

TABLE 2
CAMBODIA: STRUCTURE OF MINERAL INDUSTRY IN 2007

(Thousand metric tons unless otherwise specified)

| Commodity | | Main operating companies and main equity owners | Location of main facilities | Annual capacity ^c |
|-----------|-------|---|---|---------------------------------|
| Cement | | Kampot Cement Co. Ltd. ¹ (an affiliate of Saim Cement Industry Co. Ltd. of Thailand) | Touk Meas District, Kampot Province | 1,000 |
| Gemstone | carat | Jirech Intenational Cambodia Construction and Import-Export Co. Ltd. | Anlong Krapeu-Preak Bey, Samlot District, Batdambang Province | NA |
| Do. | | Seoul Digem Cambodia Co. Ltd. | Loamphat District, Ratanah Kiri Province | NA |
| Do. | | Sonuba Cahm Industries Co. Ltd. | Phnom Trop, Pailin City | NA |
| Do. | | Ultra Marine Kiri (Cambodia) Ltd. | Pating Thom Village, Ting Chak Commune, Borkeo District, Ratanah Kiri Province | NA |
| Do. | | do. | Sen Chauv, Samlot District, Batdambang Province | NA |
| Granite | | TTY-RITHYMEXICO | Svay Chreas District, Kracheh Province | NA |
| Limestone | | Kampot Cement Co. Ltd. | Tatung, Kampot Province | 1,500 |
| Do. | | Thai Boon Roon Cement Co. Ltd. | Phnom Laang Laan Commune, Donghtung District, Kampot Province | NA |
| Do. | | United International (Cambodia) Foreign Investment Group Company Ltd. | East Touk Meas, Banteay Meas District, Kampot Province | NA |

^cEstimated. Do., do. Ditto. NA Not available.

¹Cement plant was opened and began production in January 2008 and was projected to produce 960,000 metric tons of cement in 2008. The designed capacity would be increased to up to 2.7 million metric tons per year by 2010.

TABLE 3
MINERAL EXPLORATION AND MINING PROJECTS IN CAMBODIA AS OF JUNE 2007

| Commodity | Activity | Company | Type of company ¹ | Location | Year license granted |
|----------------------------------|-------------------|--|------------------------------|--|----------------------|
| Bauxite | Exploration | AZ Distribution Co. Ltd. | L | Tou Poy, O Raing District, Mondol Kiri Province | 2005. |
| Do. | do. | Sonuba Paul Cham Co. Ltd. | L | O Raing District, Mondol Kiri Province | 2004. |
| Do. | do. | Joint venture of BHP Billiton Plc and Mitsubishi Corp. of Japan | JV | Mondol Kiri Province | October 2006. |
| Coal | do. | Rantanak Stone Cambodia Development Co. Ltd. | JV | Pharv, Anglong Veng-Trapaing Prasath District, Siemreab-Otar Meanchey Province | April 2006. |
| Gemstone | Mining | Jirech International Cambodia Construction and Import-Export Co. Ltd. | JV | Anlong Krapeu-Preak Bey, Samlot District, Batdambang Province | 2005. |
| Do. | do. | Seoul Digem Cambodia Co. Ltd. | JV | Lomphat District, Ratanah Kiri Province | Mid-2005. |
| Do. | do. | Sonuba Cham Industries Co. Ltd. | L | Phnom Trop, Pailin City | 2005. |
| Do. | do. | Ultra Marine Kiri (Cambodia) Ltd. | JV | Pating Thom Village, Ting Chak Commune Borkeo District, Ratanah Kiri Province | Mid-2005. |
| Do. | do. | do. | JV | Sen Chauv, Samlot District, Batdambang Province | Early 2006. |
| Gas, natural | Exploration | Joint venture of Chevron Corp., Mitsui Oil Exploration Co. Ltd., and GS Caltex Corp. | F | Block A, about 120 kilometers off Cambodia's west coast | 2002. |
| Gold | Exploration | Decom Cambodia Co. Ltd. | JV | Phnom Dek, Rovieng District, Preah Vihear Province | 1994. |
| Do. | do. | Vannimex Co. Ltd. | JV | Phnom Chi, Sandan District, Kampong Thum Province | 2000. |
| Gold and other metallic minerals | do. | Angkor Wat Cement Co. Ltd. | JV | Andong Bor area-2, Ampil District, Siemreab-Otar Meanchey Province | 2001. |
| Granite | Mining | TTY-RITHYMEXICO | F | Svay Chreas District, Kracheh Province | 2006. |
| Iron ore | do. | Ratanak Stone Cambodia Development Co. Ltd. | JV | Phnom Koh Keo, Rovieng District, Preah Vihear Province | 2004. |
| Do | do. | do. | JV | Phnom Thmar, Rovieng District, Preah Vihear Province | 2005. |
| Do. | do. | Try Pheap Co. Ltd. | L | Thalaborivath, Stoeng Treng Province | 2005. |
| Limestone | Mining | Kampot Cement | JV | Tatung, Kampot Province | 2006. |
| Do. | Feasibility study | Khou Chuly Development Co. Ltd. and Tong Yang | L | West Touk Meas, Banteay Meas District, Kampot Province | 2006. |
| Do. | Feasibility study | Pheapimex Co. Ltd. | L | Kampong Trabek, Kampot Province | 2006. |
| Do. | Mining | Thai Boon Roon Cement Co. Ltd. | F | Phnom Laang Laan Commune, Dongtung District, Kampot Province | 2006. |
| Do. | Mining | United International (Cambodia) Foreign Investment Group Company Ltd. | F | East Touk Meas, Banteay Meas District, Kampot Province | 2006. |
| Metallic minerals | Exploration | Anquing (Cambodia) Invest Company Ltd. | JV | Phnom Kus and Keo Seima, Mondol Kiri Province | 2005. |
| Do. | do. | China Forwin International Investment Phnom Penh Mining Co. Ltd. | F | Phnom Rohal, Keo Seima District, Mondol Kiri Province | 2005. |
| Do. | do. | Chhung Kor Chean Pean Co. Ltd. | L | Koh Khnge, Sambo District, Kracheh Province | 2001. |
| Do. | Mining | Kenertec Co. | F | In northern Cambodia | 2007. |
| Do. | Exploration | Great Australian Resources Ltd. | F | Ban Lung District, Ratanah Kiri Province | 2006. |
| Do. | do. | do. | F | Oyadav District, Ratanah Kiri Province | 2006. |
| Do. | do. | Mom Good Luck Mining Co. Ltd. | L | Thalabarivat, Stoeng Treng Province | 2006. |
| Do. | do. | Oksan Cambodia Ltd. | F | Antrong, Keo Seima District, Modol Kiri Province | 2003. |
| Do. | do. | Oxiana Cambodia Ltd. | F | Okhvao and Ochhung, Koe Seima District, Mondol Kiri Province | Late 2006. |
| Do. | do. | Southern Gold Ltd. | F | Mondol Kiri Province | September 2006. |
| Do. | do. | Zhong Xin Industrial Investment (Cambodia) Co. Ltd. | F | Me Som, Mondol Kiri Province | 2004. |
| Do. | do. | do. | F | O Click, Kracheh Province | 2004. |
| Petroleum, crude | Exploration | Joint venture of Chevron Corp., Mitsui Oil Exploration Co. Ltd. and GS Caltex Corp. | F | Block A, about 120 kilometers off Cambodia's west coast | 2002. |

¹Type of company, L--local, F--foreign, JV--joint venture.

Source: Ministry of Industry, Mines and Energy, Cambodia, June 2006. Chevron Corp., 2002. Dow Jones Newswires, 2006. Schlumberger Ltd., 2006.