



# 2009 Minerals Yearbook

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## BURMA

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# THE MINERAL INDUSTRY OF BURMA

By Yolanda Fong-Sam

In 2009, Burma, also known as Myanmar, produced a variety of mineral commodities, including cement, coal, copper, lead, natural gas, petroleum, petroleum products, precious and semiprecious stones, tin, tungsten, and zinc.

In 2009, Bangladesh, Burma, and India were involved in maritime boundary disputes over their respective sovereignty in the Bay of Bengal. In October, Bangladesh claimed its maritime boundary before the United Nations courts, under the arbitration of the United Nations Convention on the Law of the Sea (UNCLOS) of 1982. The dispute amongst the three countries limits further exploration of resources in the disputed area. At the end of 2008, the situation intensified when Daewoo International Corp. of the Republic of Korea, which has a gas sale and purchase agreement with Burma, started oil and gas exploration in the disputed maritime zone, and Bangladesh and Burma each stationed naval warships and troops along their coastal borders. Daewoo was exploring offshore Burma at Block AD-7 as part of the agreement with Burma in which Daewoo was the main operator of a three-block project (Blocks A-1, A-3, and AD-7) (Burma News International, 2008; Choudhury, 2009).

According to UNCLOS, a nation can claim 12 nautical miles of territorial sea, 200 nautical miles of exclusive economic zone, and 200 nautical miles of continental shelf (United Nations, 1982). In the case of Bangladesh, Burma, and India, their coastlines follow a curve, which causes overlaps in their maritime territories and makes it difficult to delimit their maritime boundary. Since 1974, Burma and India had aggressively explored their coasts, which resulted in the discovery of significant petroleum resources, including Burma's discovery of 7 trillion cubic feet (198 billion cubic meters) of gas and India's discovery of 100 trillion cubic feet (2.8 trillion cubic meters) of gas in 2005-06 (Mizzima News, 2008; Choudhury, 2009).

In 1974, after Bangladesh declared its jurisdiction with respect to territorial waters, exclusive economic zone, and continental shelf as outlined in the Territorial and Maritime Zones Act of 1974, Burma held negotiation meetings with Bangladesh and India and subsequently with Bangladesh in 1986 but no consensus was reached. In December 1986, Burma and India signed a maritime territory agreement, which was later implemented in September 1987, that established the line of demarcation between the two countries' territories based on the principal of an equidistant boundary. In 2008, the three countries met again to settle the boundary dispute, but little progress was achieved, and the meetings ended inconclusively. In October 2009, Bangladesh submitted a notification requesting arbitration under the UNCLOS and was due to file a formal objection claim or a resolution claim before the United Nations by July 27, 2011, to contest Burma's and India's line of demarcation. Bangladesh demanded that the demarcation of the boundary be based on the equity principle, which results in overlapping maritime areas. Burma also holds maritime

boundary agreements with Thailand that were signed in October 1980 and implemented in April 1982, and additional agreements between Burma, India, and Thailand that were signed in October 1993 and implemented in May 1995 (Mizzima News, 2008; Choudhury, 2009).

## Government Policies and Programs

The Burmese Government's policy and legislation on investment in minerals is designed to attract technical knowledge and investments from foreign and local investors. The Union of Myanmar's Mineral Law went into effect in September 1994, and the rules related to the law were implemented in December 1996. The Ministry of Mines is the Government entity responsible for implementing the Government's mineral policy and for enforcing the laws, rules, and regulations related to the mining sector. The ministry also evaluates and processes all applications for prospecting, production, and beneficiation of minerals in accordance with the country's mineral law and rules, monitors production operations, and promotes investments in the mineral sector. According to the country's mineral law, any naturally occurring minerals found on or under the soil of the continental shelf belong to the state [Ministry of Mines (Myanmar), undated a, b].

## Production

During 2009, most of Burma's mineral industry showed a significant decline in mineral production. Production of tungsten and tin (both from tin-tungsten concentrate) decreased by 36.6% and 36.4%, respectively; production of petroleum refinery products decreased by 11.2%. On the other hand, increases in production were reported for lead mine output, which increased by 150%; zinc, by 125%; and refined copper, by 15.9%. Other increases were reported in the industrial minerals sector, including barite, 34.2%; gypsum, 18.6%; and dolomite, 3% (table 1).

## Mineral Trade

Burma's total trade value for 2009 was \$11.10 billion,<sup>1</sup> of which exports were valued at \$6.71 billion, and imports, \$4.394 billion, or the equivalent of 60.4% and 39.6% of total trade, respectively. The total value of exports in 2009 decreased by 4.1% compared with the total value in 2008 of \$7 billion, and that of imports increased by 1.7% compared with the total value in 2008 of \$4.32 billion (percentages might not add owing to independent rounding) (Central Statistical Organization, 2010, p. 1, 50).

<sup>1</sup>Where necessary, values have been converted from Myanmar kyat (K) to U.S. dollars (US\$) at the rate of K 5.53=US\$1.00 for 2009.

In 2009, the value of natural gas exports was approximately \$2.38 billion, which represented 35.5% of total exports and a decrease of 2.9% compared with the value in 2008 of \$2.45 billion. Exports of base metals and ores were valued at \$40.9 million, which represented 0.6% of total exports and an increase of about 148% compared with the value in 2008 of \$16.5 million. The principal mineral commodities imported by Burma in 2009 were base metals and manufactures, which were valued at \$408.7 million compared with \$272.3 million in 2008 (an increase of about 50%); cement, which was valued at \$45.2 million compared with \$25.4 million in 2008 (an increase of about 78%); and coal and coke, which together were valued at \$2.15 million compared with \$2.47 million in 2008 (a decrease of about 13%) (percentages might not add owing to independent rounding) (Central Statistical Organization, 2010, p. 5-7, 16).

Thailand was Burma's main export partner in 2009, followed by India and Hong Kong. Total Burmese exports to Thailand were valued at \$2.65 billion (about 40% of the country's total exports); exports to India were valued at \$942.3 million (14% of total exports); and exports to Hong Kong were valued at \$810.5 million (approximately 12% of total exports). In 2009, Burma's major import partners were Singapore, China, and Thailand. Burmese imports from Singapore totaled about \$1.3 billion (which represented about 30% of total imports); China, \$1.26 billion (about 28.7% of total imports); and Thailand, \$376.5 million (about 8.6% of total imports) (Central Statistical Organization, 2010, p. 9-10, 18-19).

## Structure of the Mineral Industry

Burma's major mineral industry facilities are listed in table 2.

## Commodity Review

### Metals

**Copper.**—Burma's sole copper mine—the Monywa copper project—halted operations in April 2008 for undisclosed reasons. Operations restarted in the second quarter of 2009, and by midyear, the project's managing company [Myanmar Ivanhoe Copper Company Ltd. (MICCL)] reported that it had processed about 6,000 metric tons (t) of stockpiled copper cathode (Intellasia.net, 2009).

**Nickel.**—In April, the Chinese mining group China Nonferrous Metal Mining (Group) Co., Ltd. announced that it had committed to invest \$800 million to develop the Tagaung Taung (Dagongshan) nickel mine. The mine, which was under construction, is located in Thabeikkyin, Mandalay Division. The project would include an 80,000-metric-ton-per-year (t/yr)-capacity ferronickel plant that could lead to the production of 22,000 t/yr of nickel metal. The project was expected to be commissioned in early 2011 (China Nonferrous Metal Mining (Group) Co., Ltd., 2009; Mining Journal, 2009).

### Industrial Minerals

**Gemstones.**—About 1 year after the U.S. President signed into law the Tom Lantos Block Burmese JADE (Junta's

Anti-Democratic Efforts) Act of 2008 (Pub. L. 110-286), which prohibits the importation of gemstones and hardwoods from Burma to the United States, the prices and demand for gemstones have significantly decreased, according to jade traders in Burma's second largest city, Mandalay. In 2009, jade prices had fallen by as much as 50% from the stone's previous value, and the trade of jade and other semiprecious gemstones in Mandalay was dominated by Chinese traders. Production of semiprecious stones, such as spinel, decreased by 48.1% in 2009 compared with production in 2008; sapphire, by 29.6%; jade, by 17.7%; and ruby, by 10.4% (table 1). The decrease in production in the gemstone sector might also be linked to the general slowdown in business resulting from the global economic crisis. Gem-quality semiprecious stones are mined in six areas of the country: Hpakant, Moe-Nyin, and Namya in Kachin State, Khamti in Sagaing Division, Mogok in Mandalay Division, and Mongshu in Shan State. In 2009, high operation costs, in addition to the decrease in demand for jade and rubies, forced some smaller mine fields in the Mogok region (where most of the jade and rubies are mined) to halt operations or to face closure (Kyaw-Zaw, 2009; Lwin, 2009).

### Mineral Fuels

**Oil and Gas.**—On December 24, 2008, China National Petroleum Corp. (CNPC) announced the signing of a gas sales and purchase agreement with the Government of Burma. The 30-year agreement allows the Chinese corporation to buy natural gas from Burma's Block A-1 (Shwe field), Block A-3 (Mya field), and Block AD-7, all of which are located along the Rakhine coast on the Bay of Bengal. In November 2009, work started on the development phase of Blocks A-1 and A-3; this phase was expected to be completed by 2013. Ownership for Blocks A-1 and A-3 consisted of Daewoo (operator, 51%), ONGC Videsh Ltd. (OVL) of India (17%), Myanmar Oil and Gas Enterprise (MOGE) (a state-owned company) (15%), GAIL India Ltd. (8.5%), and Korea Gas Corp. of the Republic of Korea (8.5%). Block AD-7 was fully owned and operated by Daewoo (100%). Daewoo and its consortium were committed to invest an estimated \$5.6 billion to develop the gasfields; when completed, the consortium would supply China with an estimated 500 million cubic feet per day of gas for 30 years after the project is commissioned in 2013 (Moe, 2008; Kang, 2009; Kim, 2009; Petroleum Economist, 2009; Daewoo International Corp., 2010; ONGC Videsh Ltd., 2010a, b).

In addition to the gas sales and purchase agreement, the Governments of Burma and China signed an agreement during the first quarter of 2009 that awarded China the right to build and manage parallel pipelines that will transport crude oil and natural gas from the Bay of Bengal across Burma to southwest China. The Burma-China pipeline offers China an alternative direct route to the sea, and will potentially reduce its dependence on oil imports through the Straits of Malacca. The construction and operation of the Burma-China pipeline was proposed to be constructed by a subsidiary consortium made up of CNPC (50.9%) and state-owned MOGE (49.1%). The project would require the construction of railways, roads, and waterways, and would include a gas collection terminal, an

upgrade to the Kyaukpyu Port located in the Bay of Bengal, and the two pipelines—one to transport oil carried by tankers from Africa and the Middle East, and the second to carry gas from Block A-1 and Block A-3. The pipelines would extend to large cities, such as Kyaukpyu, to Mandalay in central Burma, and to Kunming in the Yunnan Province of China. The cost of the oil pipeline was estimated to be \$1.5 billion and the cost of the gas pipeline was estimated to be \$1.04 billion (ChinaDaily.com, 2009; Moe, 2009; Smith, 2009).

## Outlook

Burma's mineral production for 2010 will most likely be dependent on the performance of neighboring economies, as well as on the global mineral commodity markets. The decrease in production in much of the mineral sector during 2009 might be linked to the general slowdown in business brought about by the global economic crisis.

The gemstone industry was affected by decreased demand resulting in part from the importation ban imposed by the JADE Act. High operational costs have forced mines to halt operations or face closing the mining facilities altogether. Based on the circumstances surrounding the gemstone sector during 2009, it is likely that the demand for and production of Burmese gemstones will remain unchanged in 2010.

Although global markets for many mineral commodities reflected a decrease in demand, copper production in Burma for 2010 is expected to increase when the Monywa copper project resumes operations. A similar situation is expected for the nickel industry once the Tagaung Taung Mine is commissioned in 2011.

In 2010, oil and gas exploration activities are expected to continue to increase, mainly as a result of the many exploration projects that started in 2008 and 2009. Further exploration for oil and gas in new areas of the Bay of Bengal will be highly dependent on the resolution that Bangladesh, Burma, and India reach regarding the delimitation of their respective maritime boundaries. Meanwhile, business ties between Burma and China are likely to strengthen as a result of the agreements and projects that the two countries have committed to in the oil and gas sector, such as the construction of the oil and gas pipeline that will connect the two countries.

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

(Metric tons unless otherwise specified)

| Commodity <sup>2</sup>  | 2005             | 2006       | 2007             | 2008               | 2009               |
|---|------------------|------------|------------------|--------------------|--------------------|
| METALS  |                  |            |                  |                    |                    |
| Chromium, chromite, gross weight <sup>c</sup>                   | 409 <sup>3</sup> | --         | --               | --                 | --                 |
| Copper:   |                  |            |                  |                    |                    |
| Mine output, Cu content   | 34,500           | 19,500     | 15,100           | 6,900              | 8,000 <sup>p</sup> |
| Matte, gross weight <sup>c,4</sup>                              | 80               | 80         | 80               | 80                 | 80                 |
| Metal, refined  | 34,500           | 19,500     | 15,100           | 6,900              | 8,000 <sup>p</sup> |
| Gold, mine output, Au content <sup>c</sup>                      | 90               | 100        | 100              | 100                | 100                |
| Iron and steel: <sup>c,4</sup>                                  |                  |            |                  |                    |                    |
| Pig iron  | 1,500            | 1,500      | 1,500            | 1,500              | 1,500              |
| Direct-reduced iron   | 40,000           | 40,000     | 40,000           | 40,000             | 40,000             |
| Steel, crude  | 25,000           | 25,000     | 25,000           | 25,000             | 25,000             |
| Lead:   |                  |            |                  |                    |                    |
| Mine output, Pb content <sup>c,5</sup>                          | 2,000            | 2,000      | 2,000            | 3,000 <sup>r</sup> | 7,500 <sup>p</sup> |
| Metal:  |                  |            |                  |                    |                    |
| Refined   | 907              | 537        | 165              | 202                | 200                |
| Antimonial lead (93% Pb)  | -- <sup>e</sup>  | NA         | NA               | NA                 | NA                 |
| Manganese, mine output, Mn content <sup>c</sup>                 | 50               | 50         | 50               | 50                 | 50                 |
| Nickel: <sup>c</sup>  |                  |            |                  |                    |                    |
| Mine output, Ni content   | 10               | 10         | 10               | 10                 | 10                 |
| Speiss (matte), gross weight <sup>4</sup>                       | 10               | 10         | 10               | 10                 | 10                 |
| Silver, mine output, Ag content <sup>5</sup>                    | 2,302            | 684        | 218              | --                 | 249                |
| Tin, mine output, Sn content: <sup>5</sup>                      |                  |            |                  |                    |                    |
| Of tin concentrate  | 402              | 566        | 499              | 499                | 518                |
| Of tin-tungsten concentrate                                     | 306              | 357        | 331              | 242                | 154                |
| Total   | 708              | 923        | 830              | 741                | 672                |
| Metal, refined <sup>c</sup>                                     | 30               | 30         | 30               | 30                 | 30                 |
| Tungsten, mine output, W content: <sup>5</sup>                  |                  |            |                  |                    |                    |
| Of tungsten concentrate   | 2                | 4          | 4                | 5                  | 4                  |
| Of tin-tungsten concentrate                                     | 166              | 193        | 179              | 131                | 83                 |
| Total   | 168              | 197        | 183              | 136                | 87                 |
| Zinc, mine output, Zn content <sup>5</sup>                      | 78               | 46         | 10               | 20                 | 45                 |
| INDUSTRIAL MINERALS   |                  |            |                  |                    |                    |
| Barite  | 2,058            | 2,930      | 6,813            | 5,679              | 7,623              |
| Cement, hydraulic   | 543,072          | 570,031    | 608,192          | 675,788            | 669,941            |
| Clays: <sup>e,4</sup>   |                  |            |                  |                    |                    |
| Bentonite   | 602              | 904        | 971 <sup>r</sup> | 1,000 <sup>r</sup> | 1,000 <sup>r</sup> |
| Fire clay and fire clay powder                                  | 97               | --         | -- <sup>r</sup>  | --                 | --                 |
| Feldspar: <sup>c,4</sup>  | 10,000           | 10,000     | 10,000           | 10,000             | 10,000             |
| Gypsum  | 67,522           | 68,651     | 75,116           | 82,224             | 97,518             |
| Nitrogen, N content of ammonia <sup>c</sup>                     | 30,000           | 30,000     | 30,000           | 30,000             | 30,000             |
| Precious and semiprecious stones:                               |                  |            |                  |                    |                    |
| Jade kilograms  | 19,445,758       | 20,646,832 | 20,003,409       | 30,896,440         | 25,427,237         |
| Diamond <sup>e</sup> carats                                     | 5                | 5          | 5                | 5                  | 5                  |
| Ruby do.  | 2,710,002        | 1,685,481  | 1,394,939        | 1,868,696          | 1,674,579          |
| Sapphire do.  | 495,192          | 422,806    | 608,008          | 1,129,039          | 795,228            |
| Spinel do.  | 2,014,623        | 908,555    | 843,680          | 572,308            | 296,956            |
| Salt: <sup>6</sup> thousand metric tons                         | 35               | 35         | 35               | 35                 | 35                 |
| Stone:  |                  |            |                  |                    |                    |
| Dolomite  | 3,980            | 4,460      | 4,674            | 4,264              | 4,390              |
| Limestone, crushed and broken <sup>c</sup> thousand metric tons | 3,400            | 3,500      | 3,800            | 4,000              | 4,000              |
| MINERAL FUELS AND RELATED MATERIALS                             |                  |            |                  |                    |                    |
| Coal, lignite   | 229,647          | 331,445    | 283,703          | 249,442            | 245,418            |
| Gas, natural, marketed million cubic meters                     | 11,648           | 12,501     | 13,315           | 12,445             | 11,555             |
| Petroleum:  |                  |            |                  |                    |                    |
| Crude thousand 42-gallon barrels                                | 8,133            | 7,675      | 7,625            | 7,242              | 6,881              |
| Refinery products <sup>7</sup> do.                              | 4,638            | 4,867      | 4,885            | 4,661              | 4,139              |

See footnotes at end of table.

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

<sup>6</sup>Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. <sup>P</sup>Preliminary. <sup>R</sup>Revised. do. Ditto.  
NA Not available. -- Zero.

<sup>1</sup>Table includes data available through October 25, 2010.

<sup>2</sup>In addition to the commodities listed, construction aggregates, sand and gravel, and silica sand are produced, but available information is inadequate to make reliable estimates of output.

<sup>3</sup>Reported figure.

<sup>4</sup>Data are for fiscal year ending March 31 of the following year.

<sup>5</sup>Data are for the production by the state-owned mining enterprises under the Ministry of Mines.

<sup>6</sup>Brine salt production, in metric tons (t), reported by the Government was 2005—116,768 t; 2006—84,208 t; 2007—71,323 t; 2008—54,355 t; and 2009—133,358 t.

<sup>7</sup>Includes diesel, distillate fuel oil, gasoline, jet fuel, kerosene, and residual fuel oil.

Sources: Ministry of Mines and Central Statistical Organization (Yangon), Statistical Yearbook 2008; Selected Monthly Economic Indicators, December 2005, January 2007, May 2008, January 2009, January 2010; World Bureau of Metal Statistics, December 2009.

TABLE 2  
BURMA: STRUCTURE OF THE MINERAL INDUSTRY IN 2009

(Metric tons unless otherwise specified)

| Commodity             |                            | Major operating companies and major equity owners   | Location of main facilities   | Annual capacity |
|-----------------------|----------------------------|---|---|-----------------|
| Cement                |                            | Union of Myanmar Economic Holdings Ltd.   | Hsinmin cement plant in Kyaukse, Mandalay Division                                    | 146,000         |
| Coal                  |                            | Mining Enterprise No. 3 (ME-3)  | Kalewa coal mine in Sagaing Division, near Kalewa                                     | 13,000          |
| Copper                |                            | Ivanhoe Myanmar Holdings Ltd., 50%, and Mining Enterprise No. 1, 50%  | Monywa copper project, S&K Mine, and Monywa refinery, in Monywa region, central Burma | 40,000          |
| Fertilizer, N content |                            | Myanma Petrochemical Enterprise (Government, 100%)  | No. 1 fertilizer plant at Sales, 190 kilometers southwest of Mandalay                 | 94,900          |
| Do.                   |                            | do.   | No. 2 fertilizer plant at Kyun Chung, central Burma                                   | 75,555          |
| Do.                   |                            | do.   | No. 3 fertilizer plant at Kyaw Zwar, central Burma                                    | 219,000         |
| Natural gas           | million cubic meters       | Total E&P Myanmar, 31.24%; Unocal Myanmar, 28.26%; PTT Exploration and Production Public Company Ltd., 25.5%; Myanma Oil and Gas Enterprise (MOGE), 15%   | Yadana gasfield in Moattama, Gulf of Martaban   | 7,227           |
| Do.                   | do.                        | Petronas Carigali Myanmar Inc., 40.91%; Myanma Oil and Gas Enterprise (MOGE), 20.45%; PTT Exploration and Production Public Company Ltd., 19.32%; Nippon Oil Exploration (Myanmar) Ltd., 19.32% | Yetagun gasfield in Tanintharyi, Gulf of Martaban                                     | 4,635           |
| Do.                   | do.                        | Myanmar Petroleum Resources Ltd. and Myanma Oil and Gas Enterprise (MOGE)   | Mann oilfield, south of Yangon  | 37              |
| <b>Petroleum:</b>     |                            |   |   |                 |
| Crude                 | thousand 42-gallon barrels | do.   | do.   | 876             |
| Refined               | do.                        | Myanma Petrochemical Enterprise (Government, 100%)  | No. 1 refinery at Thanlyin (near Yangon)  | 9,490           |
| Do.                   | do.                        | do.   | No. 2 refinery at Chauk, central Burma  | 2,190           |
| Do.                   | do.                        | do.   | No. 3 refinery at Thanbayakan, central Burma  | 9,125           |
| Steel                 |                            | Pohang Iron and Steel Co. (POSCO), 70%  | Steel plant in Yangon   | 30,000          |
| Do., do. Ditto.       |                            |   |   |                 |