

The Mineral Industry of Burma

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Burma was not a major world producer of any mineral commodity in 1982. At least 30 minerals, however, were exploited commercially during the year. Most of these were consumed domestically. The most important minerals or mineral-based commodities to the Burmese economy were crude oil, natural gas, tin, gem stones, tungsten, fertilizer, cement, lead, and silver.

Approximately 71,000 persons were employed in the mining industry at the beginning of 1982. Only 2,000 were employed by the private or joint private-government sector; the remaining 69,000 were employed in state-owned mining operations. Mining personnel were 0.5% of the country's active labor force. They accounted for 2.2% of the net output of goods and services, contributing to one of the most efficient sectors of the economy.²

The main objectives set by the Government for the mining sector during the third 4-year plan, fiscal year (FY) 1977 through FY 1980,³ were to exploit mineral resources to the optimum, extend mineral exploratory surveying, prepare to supply the primary raw materials required for establishing a mineral-based heavy industry, boost crude oil and industrial mineral production to save foreign exchange, and minimize losses and waste. The production of crude oil was given top priority.

The public investment in the mining sector increased annually during the third 4-year plan from \$45 million in the base year to \$129 million in the final year.⁴ The aggregate investment for the third 4-year plan was \$415 million, more than double the planned amount, and constituted 12.4% of the public investment during the period. The planned public investment in the mining sector for FY 1982 was \$137 million or 11.5% of total investment. Only the

processing-manufacturing sector surpassed that percentage in the Government's plan.

Between FY 1975 and FY 1981, Burma's economy grew at an average annual rate of 7%, after over a decade of economic stagnation. Changes in Government policies since 1975 have been instrumental in that growth.

Prior to the mid-1970's, Burma had an isolationist policy with emphasis on import-substituting industrial development, with tight Government control of the marketplace. By the mid-1970's, the Government realized the necessity for increasing international trade, loosening market controls, and increasing agricultural production.

The acceptance of foreign loan capital and expertise promoted growth. From 1977 through 1981, foreign lenders committed over \$2 billion to Burma. These loans financed projects that modernized existing capital stock, developed basic infrastructure, and added new industries.

Economic growth has slackened considerably from the recent trend. Gross domestic product (GDP) for FY 1981 was about \$5.9 billion, about the same as that of FY 1980.⁵ The real increase in GDP for FY 1982 reportedly will be lower than the Government's target of 6%, probably less than 5%.

The turnaround was attributed in part to a substantial drop in export earnings and to a rapidly worsening domestic energy shortage. The 1982 production of domestic crude oil was significantly lower than the target of 16.5 million barrels. The decline, coming at a time of increasing domestic demand, prevented Burma from fulfilling a 1-million-barrel commitment to Japan. Construction of roads and other development projects has been adversely affected because of diesel oil shortages.

The Government's policy for the past several years has been to refrain from importing crude oil mainly because of the drain on foreign exchange reserves. It ap-

pears that domestic production cannot meet the country's needs and therefore some imports will be necessary.

PRODUCTION

The performance of the mining sector continued to be satisfactory during FY 1981. The \$122 million output of the mining industry increased for the sixth consecutive year.^a In FY 1981, the mining sector accomplished 83.5% of the Government's planned production goal. While not meeting the goal, the increase in production value still showed a growth rate of 15.8% over the FY 1980 figure and an average growth rate for the third 4-year plan of 8.2% per year. The increase in product value for the mining sector for FY 1982 at constant 1969 prices was set at 13.1%.⁷

The most important mineral in aggregate value was crude oil by far. Also important, but much lower in value, were gem minerals, tin, lead, silver, cement, and natural

gas. In the near future, copper concentrate from the Monywa project is expected to take on a prominent position in the value listings and, according to Government plans, refined tin metal was to be produced for the first time in 1982.^a

The FY 1981 statistics for natural gas, tin, lead, silver, zinc, barite, graphite, feldspar, coal, and limestone showed significant production increases over those of FY 1980. These statistics show the trend of increased mineral output. Crude oil showed an unrealistically high increase for the period reflecting abnormally high water content of the oil resulting from previous overpumping of the wells. The water content at the wellhead was more than 20% of the gross volume.

Table 1.—Burma: Production of mineral commodities¹

(Metric tons unless otherwise specified)

Commodity ²	1978	1979	1980	1981 ^b	1982 ^c
METALS					
Antimony, mine output:					
Gross weight -----	1,477	1,690	1,094	875	--
Sb content ^e -----	590	680	440	350	--
Copper:					
Mine output, metal content -----	56	67	56	77	101
Matte, gross weight -----	125	148	123	170	223
Iron and steel: Crude steel ^e -----	40,000	--	--	2,794	13,542
Lead:					
Mine output, metal content ^e -----	9,900	15,000	14,200	16,100	16,050
Metal:					
Refined including secondary -----	4,975	6,237	6,014	4,068	7,829
Antimonial lead (18% to 20% Sb) -----	127	185	185	254	279
Nickel:					
Mine output, metal content ^e -----	18	18	14	20	20
Speiss, gross weight -----	70	67	57	80	81
Silver, mine output ----- thousand troy ounces	377	340	587	450	526
Tin, mine output, metal content:					
Of tin concentrate -----	346	573	540	596	804
Of tin-tungsten concentrate -----	411	660	750	842	877
Total -----	757	1,233	1,290	1,438	1,681
Tungsten, mine output, metal content:					
Of tungsten concentrate -----	189	276	305	248	243
Of tin-tungsten concentrate -----	282	416	518	577	601
Total -----	471	692	823	825	844
Zinc, mine output, metal content -----	2,645	3,028	4,079	3,556	5,382
NONMETALS					
Barite ³ -----	35,320	39,486	4,819	*10,200	19,915
Cement, hydraulic -----	254,000	390,606	386,159	317,434	344,225
Clays: ³					
Ball clay -----	4,573	4,294	4,390	793	409
Bentonite -----	1,377	1,446	1,347	2,317	1,463
Fire clay ⁴ -----	4,878	4,413	3,711	1,755	1,633
Industrial white clay -----	2,000	6,876	4,626	813	813
Feldspar ³ -----	2,000	2,004	1,689	4,267	2,540
Graphite ³ -----	280	268	199	1,422	279

See footnotes at end of table.

Table 1.—Burma: Production of mineral commodities¹—Continued

(Metric tons unless otherwise specified)

Commodity ²	1978	1979	1980	1981 ^b	1982 ^c
NONMETALS—Continued					
Gypsum ³ -----	35,431	38,265	37,132	31,095	26,079
Pigments, mineral, natural: Iron oxide-----	461	369	330	350	350
Precious and semiprecious stones: Jadeite ³ -----	12,454	7,707	7,953	8,891	9,682
Salt-----	304	258	268	270	280
Stone ³ -----					
Dolomite-----	1,616	1,882	2,450	6,381	3,250
Limestone, crushed and broken-----	1,437	1,259	1,151	1,219	1,221
Quartz-----		122	143	37	39
Talc and related materials: Soapstone ³ -----	391	394	333	128	128
MINERAL FUELS AND RELATED MATERIALS					
Coal (lignite)-----	33,113	36,064	26,919	38,100	38,200
Gas, natural:-----					
Gross ³ -----	17,000	18,000	24,000	28,000	28,000
Marketed ³ -----	9,892	12,030	14,837	23,000	24,640
Petroleum:-----					
Crude (gross wellhead)-----					
thousand 42-gallon barrels-----	9,995	10,822	10,110	10,447	10,549
Refinery products: ⁵ -----					
Gasoline-----	1,864	2,008	^e 2,080	^e 2,060	2,000
Jet fuel-----	^e 280	^e 300	^e 300	^e 300	300
Kerosine-----	744	548	^e 450	^e 570	500
Distillate fuel oil-----	2,500	2,626	^e 2,570	^e 2,770	2,400
Residual fuel oil-----	1,532	1,396	^e 1,540	^e 1,610	1,500
Lubricants-----	140	^e 140	^e 140	^e 140	100
Other-----	^e 223	^e 220	^e 220	^e 220	200
Total-----	7,283	7,238	^e 7,300	^e 7,670	7,000

^aEstimated. ^bPreliminary. ^cRevised.¹Table includes data available through June 17, 1983.²In addition to the commodities listed, pottery clay, common sand, glass sand, other varieties of crude construction stone, and other varieties of gem stones are produced, but available information is inadequate to make reliable estimates of output levels.³Data are for fiscal years beginning Apr. 1 of that stated.⁴Includes fire clay powder.⁵Data exclude products used as fuel in refineries.

TRADE

Burma's exports of minerals reflected the worldwide downturn in the mineral commodities market. Export earnings for FY 1982 were \$30 million compared with \$46 million in FY 1981. Export volume increas-

ed for refined lead only, while export earnings from lead dropped from \$6.6 million to \$3.1 million. Other mineral exports declined in value as well as quantity.^a

COMMODITY REVIEW

METALS

Copper.—Production of copper concentrate started during 1982 at the Yugoslavian financed Monywa plant that has a designed output of 60,000 tons of 18% copper concentrate per year. Production figures were not released by the Burmese Government's No. 1 Mining Corp., which is the owner and operator of the plant.

At yearend 1982, Burmese officials were considering the development of the nearby Letpadaung ore body. This deposit contains 190 million tons of ore and the planned production is 140,000 tons of concentrate

per year. Burmese authorities would like to construct a copper smelter, but domestic financing was questionable because of the depressed world copper market. Alternate sources of capital were not available because of Burma's reluctance to accept foreign equity.¹⁰

Gold.—A Government official stated that Burma began small-scale manual mining of gold at a number of locations where it appeared to be commercially exploitable. Gold exploration was continuing simultaneously at the mining sites.¹¹

Lead, Zinc, and Silver.—Bawdwin Mine was the sole source of lead, zinc, and silver

in 1982. The large production increase shown in table 1 was the result of the refurbishing and expansion project conducted during the last few years. Further expansion of the mine was proceeding with aid from the Federal Republic of Germany. No. 1 Mining Corp. completed procurement of additional equipment and materials to start an open pit operation at Bawdwin.

Since the mine opened in 1905, it has had some of the richest lead-zinc-silver ore in the world. As the grade slowly declined through the decades, a plan was made to convert from underground to open pit mining. The lack of financing and local security problems delayed implementing the plan on several occasions. The increased production of lower grade ore from an open pit would also require expanding the ore dressing plant, rebuilt just 2 years ago. The FY 1986 goals for the Bawdwin operation are 390,000 tons of ore, 7,500 tons of refined lead, 10,500 tons of zinc concentrate, 656,000 ounces of silver, and production of several byproduct minerals.

Tin and Tungsten.—The Government was in the midst of an ambitious program to increase output of tin and tungsten. Several projects were under construction or recently completed and undergoing trial operations.

The No. 2 Mining Corp. completed a test run of the expanded Heinda fossil placer tin mine and mill. Full-scale production at the facility was to begin at 1,000 tons of tin concentrate per year.¹²

Production reportedly started at the Kazat gravel pump operation after a startup period of testing in 1981. Also, the refurbished Tavoy concentration plant apparently began production of tin, wolframite, and scheelite concentrates after a break in test period in 1981.

The new 0.34-cubic-meter-bucket ladder dredge, Heinze, was believed to be operating in the drowned tidal valley of the Heinze River during 1982. This area was an important source of dredged tin ore prior to World War II. The new dredge has an hourly capacity of 378 cubic meters or 1.5 to 2.0 million cubic meters per year. The dredge's output was expected to be about 600 tons of tin-in-concentrate per year.

Late in 1982, the Asian Development Bank approved a \$16 million interest-free loan to help rehabilitate Burma's tin industry. The money will finance the foreign exchange component of a group of mining operations in southern Burma. Facilities will be established for mining the alluvial tin deposits in the Tenasserim Div. along

the Andaman Sea coastline. Gravel pump mining operations will be started by No. 2 Mining at the following sites: Ahtwin Bokypin, Zadiwin, Kyaukmedaung-Onzin Chaung, Shanthé, and Thithladaw.

In addition, the loan will help pay for a foundry for gravel pump replacement parts, a central ore concentration plant, a central maintenance workshop (at Mergui), detailed deposit delineation, and training for management and technical personnel.

The Government reported that construction of the 1,000-ton-per-year tin smelter at Syriam, near Rangoon, was completed. The FY 1982 Government plan called for production of 750 tons of tin metal. This was the first report of tin metal production by the Government. The tin smelter was built with North Korean technical assistance and financed by a barter arrangement. The Government was reportedly considering having the North Koreans double the smelter capacity.

NONMETALS

Cement Raw Materials.—Clay, limestone, and gypsum production were scheduled to be increased to supply new cement plants either under construction or planned.

Approximately 30% of the new cement plant at Pa-an was completed. The dry-process plant was to have an 840-ton-per-day capacity and be completed in 1983.

Engineering survey work on a 1,400-ton-per-day wet-process plant was completed in FY 1981 at the old Kyangin cement mill. The planned completion date was also in 1983. A second, similarly sized plant was also planned. It was not clear whether the old mill would continue to be operated, refurbished, or scrapped.

Fertilizer Materials.—Much of Burma's natural gas was used to produce ammonia and urea fertilizer at Pagan and Sale. The plant at Sale was being expanded with the help of a loan from Austria. The plant, scheduled for completion in 1982, was to have a new capacity of 83,000 tons of urea fertilizer per year. Construction of the long planned No. 3 fertilizer plant near Prome, financed by a loan from the Federal Republic of Germany, started in FY 1981. The capacity was reported to be 91,000 tons per year of nitrogen content. The plant was to begin production in late 1984. Completion of these projects was expected to make Burma self-sufficient in nitrogenous fertilizer for several years.

Gem Stones.—Burma has historically been an important producer of fine quality gem stones and jade. Rubies and sapphires come mainly from the Mogoke area, about

100 kilometers north-northeast of Mandalay. Jade occurs in the northern State of Kachin. Kamaing, in the same State, is the world's only source of the semitransparent, emerald green variety of jadeite known as Imperial Jade. Spinel and amber are also found in northern Burma.¹³

The Government's annual report showed that the gross sales proceeds from the annual gem and pearl emporium have increased each year but one since 1975.

Burma's 20th annual gem emporium held at the end of FY 1982 had sales of \$8.6 million worth of jade, gems, and pearls, the largest sale to date. Over 200 gem merchants from 12 countries attended the emporium. The bidding for jade accounted for nearly 59% of the sales. A 33-ton boulder of raw jade, found last year, was displayed but not offered for sale. Sales of ruby, sapphire, and other precious stones brought \$375,000, down nearly \$200,000 from those of FY 1981. It was reported that a considerable proportion of Burma's gem stones are black marketed into Thailand. The Government may also retain gems as a form of hard currency.¹⁴

Other Nonmetals.—Production was started at a new sheet glass plant at Bassein, and a bottle glass plant expansion at the Syriam glass factory and a household glasswares plant were completed in FY 1981.

Feldspar and several types of clay minerals were mined for domestic consumption in the ceramics industry. In addition, a sizable amount of crude clay, probably exceeding 90,000 tons per year, was mined for use in local brick kilns.

MINERAL FUELS

Coal.—Coal has never been produced in large tonnages in Burma. There are, however, coal deposits near Kalewa in the Chin Hills and in the vicinity of the Bawdwin complex in northern Shan State. Most of the coal is produced at the Kalewa underground mine. The Ministry of Mines was reportedly striving to increase utilization of coal from these deposits in order to save \$10 million in foreign exchange currently spent on coal imports each year, mostly from India and China.

Preliminary Government figures confirm a sizable production increase in the last 2 years. The Government's FY 1982 plan called for production of 44,000 tons. Also, as part of the expansion program, tenders were offered for coal briquetting plants to feed thermal powerplants and coal-fired

steam railroad locomotives. The direct-reduction steel plants could also use a significant amount of domestic coal if available.

Petroleum and Natural Gas.—Burma's crude oil production continued to level off at a time when domestic demand for diesel and other petroleum fuels was being stimulated by the growth of the Burmese economy. Shortages in refined products, resulting from the crude oil shortfall, have delayed work on some important development projects.

Reliable current production statistics were not available. The Government's preliminary FY 1981 estimate of 12 million barrels was later revised to 10.4 million barrels; a non-Government estimate was 9.7 million barrels. The Government's production target for FY 1982 was 16.5 million barrels, which appears to be overly optimistic.

Hopes for greatly increased crude oil production were raised in November 1981 when the Prime Minister announced the discovery of three major oilfields. It now appears that the reports were optimistic. The Kyontani Oilfield in the Irrawaddy Delta has good potential but development is difficult because of flooding during the monsoon season between June and November. No oil has been produced from the three wells drilled thus far. Four wells have been completed at the second field located at Tuyintaung, 8 kilometers southeast of Pagan. The Government-owned Myanma Oil Corp. (MOC) reportedly struck oil in the first well. Despite enthusiastic reports, the well produced crude so thick it could not be economically recovered. To find better crude, MOC was drilling several kilometers both south and north of Pagan. The third field, the only successful one to date, is located at Tantabin, near Kyangin. It has the possibility of becoming mainly a natural gasfield. Production in early 1982 was 600 barrels of condensate and 6.7 million cubic feet of gas per day. By yearend 1982, 22 wells had been sunk at Tantabin and development drilling continued.

The production of natural gas has been satisfactory. According to a National Assembly report,¹⁵ natural gas output has risen from 8.5 billion cubic feet in FY 1976 to 14.8 billion cubic feet in FY 1980. A substantial increase in gas was expected in FY 1981 from the new Tantabin Field and from increased utilization of previously flared gas in new gas-turbine-powered gen-

erators at Promé and other installations.

In February 1982, the Tokyo-based Burma Petroleum Development Co. (BPDC) signed a \$17 million agreement with MOC for funding two exploration wells in the Gulf of Martaban. BPDC is a joint venture headed by Idemitsu Oil Development Co., Japan National Oil Corp., and 11 Japanese trading houses.

BPDC began drilling in November after the monsoon season. The plan was to drill in exploration blocks previously leased by Esso and Martaban-City Service. However, the initial well was spudded in shallow water off the Irrawaddy Delta in blocks MOC had reserved for itself, which had not been leased previously to a foreign concession holder. A well was drilled to 2,076 meters where natural gas was struck in a Miocene limestone formation. A production test yielded a flow rate equivalent to 39 million cubic feet per day. This was the first gas found offshore Burma in a limestone reservoir. Although encouraging, the discovery did not solve Burma's petroleum shortage. With Burma already producing onshore natural gas sufficient to satisfy domestic needs, the development of the offshore field, which would require a large capital investment, was unlikely. The search for offshore oil, however, was continuing.

MOC was expected to announce new production sharing contracts in early 1983 to enhance foreign participation offshore. The contract terms were said to be favorable. The Government was not expected to release geological or geophysical data on the exploration blocks until a contract is signed.¹⁶

Mitsubishi Heavy Industries Corp. of Japan completed construction of a 25,000-

barrel-per-day oil refinery at Mann and handed it over to Petrochemical Industries Corp. (PIC). As of July 1982, Mitsubishi had not tested the equipment because of the crude oil shortage.

With the Mann refinery, PIC's capacity was 57,000 barrels per day. At yearend 1982, PIC was operating at less than 50% capacity.

Despite PIC's surplus refining capacity, the crude production shortfall, and growing demand for petroleum products for Burma's economic development, Burma has not imported crude oil since 1974. The Government policy has been to remain independent of crude oil imports. No change in this policy has been indicated.¹⁷

¹Physical scientist, Division of Foreign Data.

²Ministry of Planning and Finance. Report to the Pyithu Hluttaw on the Economic and Social Conditions of the Socialist Republic of the Union of Burma for 1982-83, 1982, pp. 18, 25.

³The Burmese fiscal year begins Apr. 1 of the year stated.

⁴Values have been converted from Burmese kyats (K) to U.S. dollars at the average rate of FY 1977-78, K6.787 = US\$1.00; FY 1978-79, K7.184 = US\$1.00; FY 1979-80, K6.57 = US\$1.00; FY 1980-81, K6.62 = US\$1.00; and FY 1981-82, K7.30 = US\$1.00.

⁵U.S. Embassy, Rangoon, Burma. Economic Trends Report for Burma. Department of State Airgram A-15, Mar. 6, 1983, p. 2.

⁶Page 25 of work cited in footnote 2.

⁷Page 327 of work cited in footnote 2.

⁸Page 343 of work cited in footnote 2.

⁹U.S. Embassy, Rangoon, Burma. Industrial Outlook Report—Minerals. Department of State Airgram A-2, Mar. 10, 1983, p. 5.

¹⁰Page 3 of work cited in footnote 9.

¹¹Summary of World Broadcasts—FE/W1212/A/18, Nov. 24, 1982. Tanjug (radio) in English 1724 GMT, Nov. 11, 1982.

¹²Page 229 of work cited in footnote 2.

¹³World Mining. V. 35, No. 5, May 1982, p. 53.

¹⁴U.S. Embassy, Rangoon, Burma. Department of State Telegram 01165, dated R181022Z, March 1983, p. 1.

¹⁵Page 134 of work cited in footnote 2.

¹⁶Petroleum News. V. 13, No. 10, January 1983, p. 9.

¹⁷U.S. Embassy, Rangoon, Burma. Petroleum Outlook Report—Burma. Department of State Airgram A-26, July 8, 1982, pp. 1-7.