

The Mineral Industry of Burma

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Burma continued with a mineral development program that was constrained mainly by the country's paucity of capital funds and the policy of not allowing foreign private investment. Mineral development projects under way for many years, in most cases, have been completed and have resulted in increased production of minerals or in lower unit costs because of the renovation and improved technology.

Burma is well endowed with a variety of mineral resources. About 30 different minerals were produced in commercial quantities in 1985. Barite, cement, copper, gem stones, gypsum, lead, silver, steel ingots, tin, tungsten, and zinc were the most important of the nonfuel minerals.

The most critical mineral-related problem in the country has been inadequate crude oil production. A modest amount of development drilling has been under way for years by the Government-owned Myanma Oil Corp. (MOC). The level of exploration drilling, however, has increased considerably in recent years. Crude oil production peaked in 1980 and has generally declined slowly since then, giving the exploration drilling a sense of urgency as MOC tries to find new deposits. Also, since 1980, increased industrialization has forced the demand for petroleum to climb steadily. The Government has a policy of not importing crude oil, which has heightened the energy shortage and hindered economic progress.

To emphasize the importance of petroleum and natural gas, the Government removed the energy function from the Minis-

try of Industry No. 2 in 1985 and created the Ministry of Energy. The Ministry will contain the Minister's office, planning department, MOC, Petrochemical Industries Corp., Petroleum Products Supply Corp., and the Electric Power Corp.

Economically, Burma remained a country largely reliant on agriculture, with more than 60% of its labor force employed in agriculture and 40% of its foreign exchange earnings coming from rice exports. The economic growth rate, which averaged 6.5% annually between fiscal year (FY) 1977² and FY 1982, appears to have tapered off in 1984-85. The trade deficit, which declined slightly in FY 1983 (revised from reported surplus), exceeded \$300 million in FY 1984.³ Burma, notwithstanding the importance it places on self-reliance, has become more and more dependent on foreign assistance to finance imports and economic development. As a result, foreign debt has grown to over \$2.6 billion.⁴

The Government was considering the development of offshore natural gas reserves in the Gulf of Martaban to increase export earnings and to ease domestic energy shortages. The final decision awaited assessment of a feasibility study undertaken by Petro-Canada International Assistance Corp. The plan was to use the gas to produce ammonia, methanol, urea, and electric power. The fertilizer would be exported and the methanol would be converted to gasoline to ease the fuel shortage. Financing, which will be very expensive, had not yet been arranged.

PRODUCTION

In FY 1984, the mining sector produced 92% of the Government's planned output, and the net value of the mining sector product increased an estimated 32%. The executive branch report to the legislature stated that the value of nonfuel mining output at current prices was \$127 million in FY 1984. It also revised the FY 1983 figure of \$122 million to \$104 million.⁵ Crude oil and natural gas were the most valuable mineral commodities in 1985 despite the drop in world prices of crude oil. A rough

estimate of crude oil value was \$200 million. At a nominal value of \$3.00 per 1,000 cubic feet of natural gas, gas production was worth an additional \$60 million. Several minerals or mineral-based commodities showed gains in production despite a drop in world prices for some. These included cement, copper, fire clay, limestone, natural gas, nitrogen fertilizer, and salt. Those declining included barite, white clay, dolomite, feldspar, pig iron, silver, tin, tungsten, and zinc.

Table 1.—Burma: Production of mineral commodities¹

(Metric tons unless otherwise specified)

Commodity ²	1981	1982	1983	1984	1985 ³
METALS					
Antimony, mine output:					
Gross weight	250	--	--	--	--
Sb content ⁴	100	--	--	--	--
Copper:					
Mine output, metal content	77	101	4,200	12,000	16,700
Matte, gross weight	170	223	173	173	173
Iron and steel: Pig iron	3,753	13,328	15,200	7,764	--
Lead:					
Mine output, metal content	*16,100	*16,050	23,146	21,937	21,935
Metal:					
Refined	4,068	7,829	7,636	6,996	9,585
Antimonial lead (18% to 20% Sb)	254	279	313	254	*300
Nickel:					
Mine output, metal content ⁴	20	20	20	20	20
Speiss, gross weight	80	81	80	80	*80
Silver, mine output	450	526	558	576	568
Tin, mine output, metal content:					
Of tin concentrate	596	804	629	745	622
Of tin-tungsten concentrate	842	877	1,013	1,283	1,129
Total	1,438	1,681	1,642	2,028	1,751
Tungsten, mine output, metal content:					
Of tungsten concentrate	248	243	235	216	171
Of tin-tungsten concentrate	577	601	695	880	774
Total	825	844	930	1,096	945
Zinc, mine output, metal content	3,556	5,382	4,537	5,320	4,353
INDUSTRIAL MINERALS					
Barite ³	6,933	16,029	9,989	*11,000	8,100
Cement, hydraulic	317,434	344,225	334,685	311,179	477,000
Clays: ³					
Ball clay	793	409	404	110	110
Bentonite	2,317	1,463	710	710	710
Fire clay ⁴	1,755	1,633	*1,780	1,020	1,370
Industrial white clay	813	813	810	810	610
Feldspar ³	4,267	2,540	*2,700	6,220	2,446
Graphite ³	1,422	279	200	234	234
Gypsum ³	31,095	26,079	34,278	39,200	38,594
Nitrogen: N content of ammonia ⁴	59,300	61,000	53,900	*56,916	125,795
Pigments, mineral, natural: Iron oxide	350	(⁵)	(⁵)	(⁵)	--
Precious and semiprecious stones: Jadeite ³					
kilograms	8,891	9,682	29,107	20,694	12,079
Salt ⁴	270	269	288	280	320
Stone: ³					
Dolomite	6,381	3,250	4,400	*4,000	2,383
Limestone, crushed and broken	1,219	1,221	1,247	1,210	1,541
Quartz	37	39	--	--	--
Talc and related materials: Soapstone ³	128	128	128	128	128

See footnotes at end of table.

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

(Metric tons unless otherwise specified)

Commodity ²	1981	1982	1983	1984	1985 ^P
MINERAL FUELS AND RELATED MATERIALS					
Coal, lignite-----	38,100	38,200	34,500	43,200	43,000
Gas, natural:					
Gross ^e -----million cubic feet--	16,000	19,000	20,000	26,000	34,000
Marketed ³ -----do-----	14,878	17,400	18,190	24,796	32,596
Petroleum:					
Crude (gross wellhead)-----					
thousand 42-gallon barrels--	10,447	9,789	10,168	11,761	11,302
Refinery products ^e -----do-----	7,670	7,000	7,000	8,000	8,000

^eEstimated. ^PPreliminary. ^rRevised.¹Table includes data available through June 5, 1986.²In 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.⁵Revised to zero.⁶Brine salt production as reported by the Burmese Government was as follows: 1981—83,795; 1982—73,901; 1983—200,944; 1984—81,166; and 1985—44,508.

TRADE

Burma's export earnings from minerals during FY 1984 totaled \$46 million, excluding gems, jade, and jewelry, a 12% increase over that of FY 1983. The percentage increase of minerals exported was much greater despite falling world prices. Proceeds from Burma's 21st Annual Gem Emporium in February 1984 were \$4.9 million, a large drop from \$8.8 million in 1983. However, the sales at the 22d Annual Gem Emporium in February 1985 rose to a record \$9.3 million.

The major sources of mineral revenue were tin-tungsten concentrates and tin metal, accounting for more than one-half the total. Silver was next in value, followed by copper matte, refined lead, and zinc concentrate.

Copper concentrate was produced for export, and the first sale was made in late 1984 or early 1985. After trial runs of the copper concentrator at Monywa, Sagaing Division, are completed and full-scale operation is under way, the value of copper exports are expected to equal the tin and tungsten values at current prices.

Overall exports for FY 1984 dropped to about \$350 million, a decline from \$422 million (revised) reported in FY 1983. Imports increased moderately to \$670 million in FY 1984. The main cause of the trade deficit was lower rice earnings. The increased earnings from mineral exports could not offset the earnings loss of the much larger agricultural and industrial sectors.

COMMODITY REVIEW

METALS

Copper.—The Monywa copper mine and flotation plant began exporting sizable amounts of 20% copper concentrate after 5 years of construction. The mill, however, was still operating on a trial basis by Burmese officials. The copper exports will provide a much-needed source of foreign exchange despite the depressed world market for copper. The mine was producing 4,200 tons of ore per day, with production targeted for 8,000 tons per day. The mine and plant were designed and constructed with Yugoslav assistance. No decision has been made on whether to build the long-

discussed copper smelter at Monywa. Although there are additional copper reserves at Letpaduang, near the present mine, no plans had been made to develop the mine pending an economic feasibility study by the Department of Geological Survey and Exploration.

Gold.—The Geological Survey carried out gold surveys and preliminary development work during FY 1984 at Namtu and Kawlin. The work was done with technical assistance provided by the Government of Australia. Twenty Burmese trainees were scheduled to go to Australia for a detailed training course on gold mining.⁶

Iron and Steel.—The second unit of the

direct-reduction steel plant at Anisakan in Maymyo Township was believed to have been completed. Burmese officials planned to use the second 20,000-ton-per-year Kinglor-Metor unit for feedstock to an electric arc furnace for steel production. The first unit's output would continue to be smelted for pig iron production.

Japanese firms reportedly signed a \$14 million contract with the Metal Industries Corp. of Burma to renovate its Ywama steel mill at Insein in the Rangoon suburbs.⁷ The goal was to achieve a rerolling capacity of 43,000 tons per year by expanding the capacity of the electric arc furnace, the rolling mill, wire mill, and peripheral facilities. In addition, a continuous billet caster was to be installed. The project was expected to be financed by a loan from the Government of Japan.

According to a Government report,⁸ the No. 1 iron and steel plant began construction of a unit to make steel grinding balls for the mining industry. All of Burma's ore concentration and cement plants currently use imported grinding balls. The plant was scheduled for completion in FY 1988 and will save on foreign exchange and furnish additional local employment opportunities.

Lead and Zinc.—Expansion of the lead ore concentrating plant at the Bawdwin Mine in Shan State began in 1981 with a loan from the Federal Republic of Germany. Assembly of the plant began in 1984 with delivery of the ore-dressing equipment, electrical and mechanical equipment, and construction materials. Construction was in progress during 1985. Although most ore presently comes from underground workings, the capacity of the open pit mine was being expanded from 500 to 1,000 tons per day to coincide with the concentrator expansion.⁹

INDUSTRIAL MINERALS

Expansion of the cement industry has been given high priority by the Government. Chronic shortages of cement at major construction sites have delayed building schedules and caused increases in overall construction costs. The Government-owned Cement Mills Industrial Development Corp. completed two 400-ton-per-day wet-mill kilns during the year at the Kyangin cement complex near Mandalay. One kiln went on-line in February; the other was scheduled for commissioning in midyear. Japan's Kawasaki Heavy Industries Ltd. supplied the equipment and expertise.

The Federal Republic of Germany's Dyckerhoff Zementwerke AG reportedly was asked to study the economic feasibility of rehabilitating the three old production lines at the Thayetmyo cement plant in Magwe Division. The mill was running three shifts per day producing only 600 tons of cement from the 980-ton-per-day-capacity plant. The antiquated equipment consisted of three kilns. The oldest kiln was built in 1935 by the United Kingdom. The second was built in 1956 and installed by the German Democratic Republic. The newest kiln was built by Japan in 1964 and has a capacity of 400 tons per day. The old British mill was no longer running, and Burmese officials did not believe that it was worth rehabilitating.

Repairs have been started on the Myaing-alay mill near Pa-an in Karen State. The plant was nearly ready to begin production in late 1984 when it was damaged by an anti-Government group. When this plant begins operating, Burma's cement production was forecast to increase to over 500,000 tons.

MINERAL FUELS

An anticipated major increase in domestic crude oil production by the Government has not materialized, forcing its four refineries to run at 50% of their 57,000-barrel-per-day (bbl/d) capacity. Crude output was reported at 27,000 bbl/d in 1985, down from a peak of 30,000 bbl/d in 1980. The reported production, based on well-head readings, was often far less than that in usable oil because of the high water and mud content, reportedly 10% of flow.

The Government continued its policy of not importing crude oil despite the recent substantial decreases in the worldwide price of oil. This policy has therefore resulted in the 4-year shortage in the Burmese market. Two small refineries in central Burma, Chauk (5,000 bbl/d) and Malun (2,000 bbl/d), were closed during the year, as was a 23,000-bbl/d refining unit at the three-unit Syriam refinery near Rangoon. Only the 25,000-bbl/d Mann refinery in central Burma and the remaining two units at Syriam continued operating.

The Government of Burma continued to be committed to a vigorous program of exploration in order to increase oil production. The Government's economic guidelines since 1973 have been that it would consider mutually beneficial economic cooperation with foreign countries or economic

interests. Regardless of the stated policy, foreign participation in petroleum exploration remained limited to one offshore contract with the Japanese National Oil Corp.

MOC has been drilling in the Gulf of Martaban for a number of years and reportedly has discovered large deposits of low-sulfur natural gas. An International Bank for Reconstruction and Development study was being conducted during the year to recommend the best way to develop the gas resources and build related downstream industries. Depending on the sources of the estimate, reserves range from 3 to 9 trillion cubic feet. Plans for ammonia, methanol, and urea plants and a thermal powerplant appeared to be progressing well during 1985. A 90-kilometer, 46-centimeter-diameter pipeline was planned to be built to bring the gas onshore. Development of the Martaban Field was expected to be expensive, but the fertilizer produced would be exported and supply much-needed foreign exchange. The electric power and methanol, converted to gasoline, would serve the domestic market.

Three wells drilled in the Gulf of Martaban during 1985 did not strike commercial quantities of natural gas. A fourth was under way at yearend.¹⁰ These disappointing wells were apparently on a different geologic structure than the one discovered in 1982 and considered for development. The recently drilled wells are not expected to affect the development of the first structure.

Exploration continued onshore in the Middle Irrawaddy Basin and in the Prome Valley. Four seismic and four geologic

teams were working in these areas during the year. Altogether, 215 new wells were drilled onshore, an increase of 14 over that of 1984. Over one-half of Burma's 45 drilling rigs were working in the Htaukshabin Oilfield at yearend. The new wells resulted in nearly doubling production to 10,000 bbl/d in the first half of 1985. The Mann Oilfield, 12 miles north of Htaukshabin, continued as the most productive field in Burma with 16,000 bbl/d. Water injection was being used in both of these fields to enhance oil flow.

Drilling was continuing at the Payagon Field where a small amount of oil and 12 million cubic feet per day of gas were being produced. The gas supplied a brick factory, a steel rolling mill, and three electric powerplants.

The 1981 discovery at Tantabin in the Irrawaddy Delta was thought to be an important discovery at that time. Three confirmation wells have been drilled since then with disappointing results.

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²The Burmese fiscal year begins Apr. 1 of the year stated.

³Values have been converted from Burmese kyats (K) to U.S. dollars at the rate in FY 1983 of K8.02=US\$1.00 (revised); FY 1984, K8.36=US\$1.00; and FY 1985, K8.51=US\$1.00 (estimated).

⁴U.S. Embassy, Rangoon, Burma. State Dep. Airgram A-11, July 9, 1985, p. 3.

⁵Ministry of Planning and Finance. Report to the Pyithu Hluttaw on the Economic and Social Condition of the Socialist Republic of the Union of Burma for 1985/86. 1985, p. 27.

⁶Mining International. V. 2, No. 9, Sept. 1985, p. 84.

⁷Minerals and Metals Review. V. 10, No. 12, Dec. 1984, p. 41.

⁸Page 258 of work cited in footnote 5.

⁹International Mining. V. 2, No. 11, Nov. 1985, p. 56.

¹⁰Petroleum News. V. 16, No. 10, Jan. 1986, p. 12.

