

# THE MINERAL INDUSTRY OF BHUTAN

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The mineral resources of Bhutan include beryl, coal, copper, dolomite, graphite, gypsum, iron, lead, limestone, marble, mica, pyrite, quartzite, slate, silver, talc, tin, tungsten, and zinc.

Information about most of Bhutan's mineral resources was sparse, largely because much of the country is extremely mountainous and lacks roads. Systematic exploration and geologic mapping in Bhutan by the Division of Geology and Mines of the Ministry of Trade and Industry, assisted by the Geological Survey of India, were still at an early stage. However, the Himalayas were known to include thick sequences of carbonate rocks and mineral reserves of dolomite, limestone, and quartzite were considered to be quite large.

Bhutan's economy was one of the least developed in the world and was largely dependent on foreign financial and technical aid from India, Japan, and international organizations. Bhutan's economic development requires upgrading of its infrastructure, such as highway network improvement and expansion, telecommunication modernization, and hydroelectric power generation capacity expansion.

In 1995, the minerals production of Bhutan included coal, dolomite, gypsum, limestone, marble, quartzite, sand and gravel, slate, and talc. (*See table 1.*) Bhutan also processed some of its industrial minerals to produce cement and ferrosilicon for export. Most dolomite, gypsum, and limestone were mined for the manufacture of cement and calcium carbide. Quartzite was mined for the production of ferrosilicon and microsilica. Most cement and all calcium carbide were exported, mainly to India, and most ferrosilicon was exported, mainly to India and Japan.

According to the Division of Geology and Mines, most industrial minerals mining was by privately owned companies. Mining of coal was by Penden Drukpa Coal Mines, a joint venture of the Government and a local private company, at Bangtar, Chenangri and Deothang in the southeastern part of Bhutan. Mining of dolomite was by Chundu Enterprise at Khagrikhola and Pugli and by Bhutan Mining Enterprise at Pugli, all in the Samchi District in the southwestern part of Bhutan; by Tashi Commercial Corp. at Kalesore; and by Singye Dolomite Industries at Duarpani in the Samdrup-Mongar and Shemgang districts in the southeastern part of Bhutan. Mining of gypsum was by the State-owned Shumar Gypsum at Khothakpa near Pemagatsel in the southeastern part of Bhutan. Mining of marble was by Bhutan Marble and Minerals at Gidakhom. Mining of slate was by the state-owned Sha Slate Mine at Sha Bhel. Mining

of talc was by Penden Cement Authority at Kalapani.<sup>1</sup>

Quartzite mining for ferrosilicon production was by Bhutan Ferro Alloys Ltd.(BFAL) at Tintali, by Dendup Enterprise at Suktikhola, and by Bhutan Stone and Minerals Exporting Co. at Kamji. Limestone mining for calcium carbide production was by Bhutan Carbide and Chemical Ltd. at Haurie Khola and at Rongri. Limestone mining for cement production was by the state-owned Penden Cement Authority at Pugli, Yangzom Cement at Duarpani, Namgyel Cement at Kalesore, and Lhaki Cement at Titi.

Bhutan's cement industry, comprised of two state-owned companies and two privately owned small cement works, had a combined annual capacity of 160,000 metric tons (t). The state-owned Penden Cement Authority, the largest, operated a 300-metric-tons-per-day (t/d) rotary kiln with suspension preheater at Pugli in the southwestern part of Bhutan. Penden Cement also operated two 50-t/d vertical shaft kilns at Gomtu under the name of Lhaki Cement. The two privately owned cement companies were Namgyel Cement, operating a 100-t/d plant at Pasakha, and Yangzom Cement, operating a 30-t/d plant at Samchi. In 1995, a new cement plant with a designed capacity of 500-t/d was under construction at Nanglam in the southeastern part of Bhutan by a foreign investor from India.<sup>2</sup>

BFAL began operation of its 30,000-kilovolt-ampere electric furnace for production of ferrosilicon at Pasakha, near Punchholing in southwestern Bhutan in October 1994. The plant was officially inaugurated in March 1995 and began commercial production in April. According to TEX report, a Japanese trading journal, about 4,000 t of ferrosilicon had been produced between October 1994 and March 1995. Because of higher ferrosilicon prices in India, BFAL planned to export most of its output to India.<sup>3</sup>

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<sup>1</sup>Geological Survey of Japan (Tsukuba). "Industrial Mineral Resources of Bhutan and Their Development." By Yukio Togashi, in Chishitsu News, No. 485, Jan. 1995, p. 34.

<sup>2</sup>International Cement Review. "Bhutan, Where Dragons Thunder." Dec. 1995, p. 62.

<sup>3</sup>The TEX Report (Tokyo). "Bhutan Fe-Si Started Officially Commercial Production." V. 27, No. 6335, Apr. 14, 1995, p. 3.

## Major Source of Information

Ministry of Trade and Industry  
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TABLE 1  
BHUTAN: PRODUCTION OF MINERAL COMMODITIES 1/

(Metric tons unless otherwise specified)

Commodity 2/	1991	1992	1993	1994	1995
Cement	115,590 r/	116,420 r/	107,810 r/	120,000 r/ e/	140,000 e/
Coal	38,500	56,000	56,000	63,912	71,112
Dolomite	275,000 r/	270,000 r/	206,000 r/	212,629 r/	249,253
Ferrosilicon	--	--	--	2,000 e/	12,000 e/
Gypsum	26,700 r/	25,000 r/	20,000 e/	45,097 r/	52,102
Limestone	136,000 r/	167,000 r/	190,000 r/	232,317 r/	266,591
Marble	918	4,130	3,825	2,841	3,946
square meters					
Quartzite	--	--	--	15,647	49,900
Talc	--	--	--	169	3,332

e/ Estimated. r/ Revised.

1/ Table includes data available through Aug, 27, 1996.

2/ In addition to the commodities listed, crude construction materials, such as sand and gravel and a variety of stone, presumably are produced, but information is inadequate to make reliable estimates of output levels.

Sources: Ministry of Trade and Industry, Royal Government of Bhutan.