



# 2015 Minerals Yearbook

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**BHUTAN AND NEPAL [ADVANCE RELEASE]**

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# THE MINERAL INDUSTRIES OF BHUTAN AND NEPAL

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## BHUTAN

Bhutan, which is a landlocked Southeast Asian country located between China and India, produced coal, dolomite, ferrosilicon, iron ore, marble, and a variety of other industrial minerals used locally for construction or for export (table 1). The economy continued to grow steadily; according to the National Statistics Bureau of Bhutan, the gross domestic product (GDP) increased by 6.49% compared with a 5.75% (revised) increase in 2014. The mineral industry was not a significant contributor to the country's economy; the mining and quarrying sector contributed 3.4% to the country's GDP. The mineral industry of Bhutan was relatively undeveloped and was small in scale compared with the country's major industries, which included the construction sector (contributed 15.6% of the GDP) and the hydroelectric power generation sector (14.3% of the GDP). In 2015, the construction sector was the leading contributor to total GDP growth. The Government had been actively developing both the construction and the power generation sectors in recent years; this activity benefited the mineral industry, as it supplied much of the construction materials needed for the country's infrastructure projects. In 2015, only 0.6% of the total number of people employed in the country worked in the mining and quarrying sector (National Statistics Bureau of the Royal Government of Bhutan, 2016a, p. 10–12, 30; 2016b, p. 72, 135, 254–256).

Total trade in Bhutan consisted of \$23.1 billion in exports and \$67.8 billion in imports. The leading trading partners for exports were Bangladesh and India, and for imports, France and India. In 2015, Bhutan exported ferrosilicon (reported as production in table 1), and a variety of other commodities, including dolomite (94% of total production was exported), gypsum (88%), talc (60%), marble (15%), and coal (6%) (table 1; Department of Revenue and Customs, 2016, p. iv, vi–vii; National Statistics Bureau of the Royal Government of Bhutan, 2016b, p. 125).

### Production

In 2015, Bhutan's primary mineral commodity output was industrial mineral products, which included cement, clay, dolomite, granite, gypsum, limestone, marble, quartzite, stone (unspecified), and talc. Additionally, coal, ferrosilicon, and iron ore were produced. The largest reported increases in production were for iron ore (which increased by 127%), marble (58%), stone (unspecified, 49%), and dolomite (31%). The largest reported production decreases were for talc (54%), coal (30%), limestone (24%), and granite (11%). Data on mineral production are in table 1.

### Structure of the Mineral Industry

The mineral industry of Bhutan was relatively undeveloped, and only one-third of the country had been geologically mapped.

Identified mineral resources in Bhutan included coal, dolomite, gypsum, limestone, and slate. In addition, the country has small deposits of iron ore, granite, marble, pink shale, quartzite, and talc. Most mining facilities consisted of small operations owned and (or) operated by private companies, although others were owned and (or) operated by Government enterprises, such as Bhutan Ferro Alloys Ltd., Dungsam Cement Corp. Ltd., Natural Resources Development Corp. Ltd., and Penden Cement Authority Ltd. Table 2 is a list of major mineral industry facilities (Royal Audit Authority, 2014, p. 3; National Statistics Bureau of the Royal Government of Bhutan, 2016b, p. 135).

## Commodity Review

### *Industrial Minerals*

**Cement.**—In 2015, Dungsam Cement, which was wholly owned by Druk Holding & Investments Ltd. (DHI), produced 469,302 metric tons (t) of cement, of which 62% was sold to the domestic market and 38% was exported. Of the cement sold domestically, 50% was for use in the construction of hydropower projects and other infrastructure construction projects in the country. The company also produced 375,870 t of clinker (Druk Holding & Investments Ltd., 2015, p. 50–51).

Penden Cement Authority Ltd. produced 322,061 t of cement in 2015, of which 212,091 t of cement, or 66%, was exported to India. Penden Cement also produced 214,825 t of clinker (Penden Cement Authority Ltd., 2016a, b).

**Stone, Dolomite.**—In 2014, DHI, through its wholly owned subsidiary State Mining Corp. Ltd. (SMCL), announced that it had invested in a dolomite-manufacturing project that would produce dolomite refractory bricks, high-alumina-content refractory products in bricks, and castables to be used by the ferrous-metal and industrial manufacturing sectors. In 2014, the company completed a feasibility study for the plant, which would be located in Gomtu and managed by OCL India Pvt. Ltd. of India. In addition, DHI acquired an environmental clearance from the Government for the development of a dolomite mine to be located in Samtse District in the southwestern part of the country. The mine would be managed by OCL Bhutan Ltd., which was a joint venture between DHI and OCL India. In 2015, SMCL completed a topographical survey and a geologic study; however, the company announced that the projects would be kept on hold owing to unidentified unfavorable conditions and the decline in fuel prices. No other details were released regarding the future of the project (Druk Holding & Investments Ltd., 2014, p. 19; 2015, p. 20, 42).

### *Mineral Fuels and Other Sources of Energy*

**Coal.**—In 2015, SMCL made progress with its Habrang coal project by completing a topographical survey, a geologic study, a final mine feasibility study, and an environmental

impact assessment for a mine. The Habrang coal mine is located in Bhangtar, Samdrup Jongkhar Dzongkhag District in southeastern Bhutan. Additionally, SMCL obtained the clearance to start work for the revitalization of the Tshophangma coal mine (also known as the Samrang coal mine), which is located in Bhangtar District. SMCL also completed a topographical survey, a geologic study, and a final mine feasibility study for the Tshophangma Mine (Druk Holding & Investments Ltd., 2015, p. 20; State Mining Corp. Ltd., 2015, p. 18).

**Renewable Energy.**—According to the National Statistics Bureau of Bhutan, in 2015, the total installed electricity generation capacity of the country was 1,614 megawatts (MW), which was an increase of about 8% compared with that of 2014. Most of the electricity was generated in the following hydropower facilities—Basochu I, Basochu II, Chhukha, Dagachhu, Kurichu, and the Tala Hydropower Project Authority (National Statistics Bureau of the Royal Government of Bhutan, 2016b, p. 130).

In February 2015, the first phase of the Dagachhu hydroelectric facility was commissioned. The facility's total designed capacity was 126 MW; the first phase had a production capacity of 63 MW, and the second phase, which would account for the remaining 63 MW of capacity, was scheduled to be commissioned later. The \$195 million Dagachhu project, for which construction was started in 2008, is located in Dagachhu River in southwestern Bhutan. The project was a joint venture between Druk Green Power Corp. of Bhutan (DGPC) (59%), Tata Power Co. Ltd. of India (26%), and National Pension & Provident Fund of Bhutan (NPPF) (15%). Tata Power would import all the power generated at the Dagachhu plant through a 25-year power purchase agreement with Tata Power Trading Co. Ltd. By exporting most of the electricity generated, Bhutan would create export revenue and promote the economic growth of the country (Poindexter, 2015).

In 2015, the Asian Development Bank (ADB) continued with its commitments to improve Bhutan's energy sector by investing in the development of the hydropower industry. As of December, the ADB was providing assistance for the construction of the Dagachhu hydropower development project (commissioned in 2015), the Nyera Amari River hydropower plant (expected to be commissioned in 2018), and the Nikacchu hydropower plant (expected to be commissioned in 2019) (Asian Development Bank, 2016, p. 2).

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## NEPAL

Nepal is a landlocked Southeast Asian country located between China and India. The country produced coal, gemstones, and a variety of industrial minerals, such as cement, clay, limestone, marble, quartzite, and talc. In September 2015, Nepal proclaimed a new constitution. According to the Central Bureau of Statistics of Nepal, the GDP growth rate was 2.7% in 2015 compared with 6% (revised) in 2014. The mineral industry was not a significant contributor to the country's economy, as the mining and the quarrying sector contributed less than 1% to the country's GDP. The mineral industry of Nepal was small in scale relative to other major industries, such as the construction sector, which contributed 5.6% to the country's GDP. The mineral industry in Nepal was mostly undeveloped owing mainly to the country's steep topography; however, it was thought that Nepal has small deposits of metals, such as cobalt, copper, iron ore, lead, magnesite, and zinc. In 2015, total trade in Nepal consisted of \$844 million in exports, and \$7.7 billion in imports. Nepal's leading trading partners for exports were India (61.3%) and the United States (9.4%); its leading trading partners for imports were India (61.5%) and China (15.4%) (table 1; Asian Development Bank, 2016a; 2016b, p. 3, 7; Central Bureau of Statistics, 2016).

In 2015, two major earthquakes struck Nepal on April 25 (magnitude 7.8) and May 12 (magnitude 7.3). During 2015, the country faced the challenges of recovering from these seismic events. In the wake of the earthquakes, the Asian Development Bank (ADB) approved a \$308 million assistance package for relief efforts that included the reconstruction of basic infrastructure, such as public buildings and roads. In 2015, the ADB also continued its commitment to assist Nepal with infrastructure development through the ADB country partnership strategy that determined priorities in assistance in the energy, transport and water, and urban infrastructure sectors.

Assistance from the ADB was also focused on easing the country's acute power shortages in generation, transmission, and distribution of energy and helping to support the construction of a road network to connect the country to other regional markets. Other infrastructure development supported by the ADB included two hydropower projects and upgrades to airports (Asian Development Bank, 2016a; United Nations Refugee Agency, The, 2015).

## Production

Nepal's mineral industry was dominated by the production of industrial minerals, which were used mainly for domestic construction. Preliminary production data from the Department of Mines and Geology of Nepal reported significant decreases in the production of almost all the mineral commodities produced in the country, with the exception of quartz, which increased by 20.5%. The decreases in the production of mineral commodities ranged from 48% (talc) to 98% (kyanite). The decline in production could be related to the two earthquakes that struck the country in the first half of 2015 and affected essential infrastructure (table 1).

## Structure of the Mineral Industry

The production of cement and the generation of hydroelectric power were the two main industries in Nepal. The country had become almost self-reliant in domestic cement supply, and, as a result of cement manufacturers starting up production in recent years, the demand for electricity had increased. The country's cement operations were mainly privately owned. As of 2014, according to the Nepal Cement Manufacturers Association, 44 cement plants were operating in the country, of which 12 had their own clinker production units. Table 2 is a list of major mineral industry facilities (Kathmandu Post, The, 2014; Global Cement, 2015d).

## Commodity Review

### *Industrial Minerals*

**Cement.**—In recent years, the Government had prioritized infrastructure development, which included the construction of airports, hydropower plants, irrigation projects, and roads to be implemented in different parts of Nepal. The demand for construction materials and cement was expected to increase as a result of the increase in infrastructure development and the earthquake recovery efforts. In March 2015, Hongshi Holdings Ltd. of China (70%) and Nepal Shiva Cement (30%) signed a joint-venture agreement to invest \$360 million to set up a

cement plant in Nepal. The companies expected to source 95% of the raw material domestically. In July, the Government approved Hongshi Holdings's proposal to build a cement plant, although the location and timeline to commission the project were not specified (Global Cement, 2015c–e).

In June, Dangote Cement Plc. of Nigeria, through its subsidiary Dangote Cement Nepal, confirmed plans to build a cement plant in Makwanpur District in the central region of Nepal at a cost of \$400 million. The plant would have a designed production capacity of 2 million metric tons per year of cement and was expected to be commissioned by the end of 2017. In the wake of the earthquakes that struck Nepal, Dangote, through the Dangote Foundation, contributed \$1 million to Nepal's disaster relief fund (Global Cement, 2015a, b).

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TABLE 1  
BHUTAN AND NEPAL: PRODUCTION OF MINERAL COMMODITIES<sup>1</sup>

(Metric tons unless otherwise specified)

Country and commodity <sup>2</sup>	2011	2012	2013	2014	2015
BHUTAN					
Cement thousand metric tons	544	521	570 <sup>r</sup>	690 <sup>r</sup>	791
Clay	--	7,353	15,166	10,209	--
Coal, bituminous	108,904	98,731	77,744	121,891	85,164
Ferrosilicon <sup>3</sup>	96,711	107,819	110,000 <sup>e</sup>	110,000 <sup>e</sup>	110,000 <sup>e</sup>
Gypsum	352,234	313,173	351,421	414,148	389,265
Iron ore:					
Gross weight	--	3,742	20,506	18,997	43,202
Fe content	--	2,300	12,700	11,800	26,800
Stone:					
Dolomite	1,082,301	1,499,535	1,740,016	2,040,691	2,662,310
Granite	463	1,807	6,464	4,362	3,889
Limestone	649,291	677,129	1,006,235	1,122,825	850,431
Marble	71,582	59,542	60,708	61,921	97,648
Quartzite	95,016	88,631	90,909	83,907	79,819
Unspecified	1,842,679	1,494,467	38,542	1,474,395	2,203,065
Talc	8,562	16,063	9,584	12,601	5,807
NEPAL					
Cement <sup>e</sup> thousand metric tons	2,100 <sup>r</sup>	2,720 <sup>r</sup>	2,990 <sup>r</sup>	3,100 <sup>r</sup>	3,100
Clay, red <sup>4</sup> cubic meters	9,066	13,400	18,070	15,486 <sup>r</sup>	7,652 <sup>p</sup>
Coal, bituminous <sup>4</sup>	10,904	14,084	8,051	7,399 <sup>r</sup>	1,722 <sup>p</sup>
Gemstones: <sup>4</sup> kilograms					
Kyanite	2,980	1,934	1,187	659 <sup>r</sup>	15 <sup>p</sup>
Quartz	560	1,114	4,256	249 <sup>r</sup>	300 <sup>p</sup>
Tourmaline	--	--	696	24 <sup>r</sup>	1 <sup>p</sup>
Magnesite	NA	--	225	60	-- <sup>p</sup>
Stone: <sup>4</sup>					
Limestone	1,276,452	2,605,287 <sup>r</sup>	3,371,071	3,769,174 <sup>r</sup>	1,852,373 <sup>p</sup>
Marble:					
Aggregate cubic meters	13,593	--	--	--	-- <sup>p</sup>
Chips do.	1,969	2,995	2,436	4,523 <sup>r</sup>	317 <sup>p</sup>
Slab, cut do.	13,595	--	--	--	-- <sup>p</sup>
Quartzite, slab square meters	--	--	2,000	1,140 <sup>r</sup>	800 <sup>p</sup>
Talc	6,935	5,140	5,703	3,183 <sup>r</sup>	1,643 <sup>p</sup>

<sup>e</sup>Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. <sup>r</sup>Revised. <sup>p</sup>Preliminary. do. Ditto.

NA Not available. -- Zero.

<sup>1</sup>Table includes data available through January 13, 2017.

<sup>2</sup>In addition to the commodities listed, metallic commodities, such as copper wire, lead, manganese, steel, and zinc; and crude construction materials, such as sand and gravel, presumably were produced in Bhutan and Nepal, but information was inadequate to make reliable estimates of output.

<sup>3</sup>Data compiled from the United Nations Comtrade database for all ferrosilicon exported from Bhutan.

<sup>4</sup>Data are for the fiscal year starting on July 16 of the year stated and ending on July 15 of the following year.



TABLE 2  
BHUTAN AND NEPAL: STRUCTURE OF THE MINERAL INDUSTRIES IN 2015

(Thousand metric tons unless otherwise specified)

Country and commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity <sup>e</sup>
<b>BHUTAN</b>			
Cement	Dungsam Cement Corp. Ltd. (Druk Holding & Investments Ltd., 100%)	Nganglam, Pemagatshel District	1,500
Do.	Penden Cement Authority Ltd. (Druk Holding & Investments Ltd., 40.3%)	Gomtu, Samtse District	375
Coal	Goop Sonam Drukpa	Eastern Bhutan coalfields	NA
Ferrosilicon	Bhutan Ferro Alloys Ltd. (Druk Holding & Investments Ltd., 25.7%) (Government of Bhutan, Marubeni Co., and Tashi Commercial Co.)	Phuentsholing, Lhukha District	34
Gypsum	Druk Satair Corp. Ltd.	Khothakpa Mine, Pemagatshel District	NA
<b>Stone:</b>			
Dolomite	Jigme Mining Corp. Ltd.	Chunaikhola Mine, Samtse District	2,000
Limestone	Bhutan Coal Co. Ltd.	Haurikhola Mine, Samtse District	NA
Do.	Dungsam Cement Corp. Ltd. (Druk Holding & Investments Ltd., 100%)	Kangrezi Mine, Pemagatshel District	NA
Do.	do.	Marung Ri Mine, Pemagatshel District	NA
Do.	Penden Cement Authority Ltd. (Druk Holding & Investments Ltd., 40.3%)	Penden Mine, Samtse District	NA
Do.	do.	Uttare Mine, Samtse District	NA
Quartzite	Bhutan Ferro Alloys Ltd.	Pakchina Mine, Chhukha District	NA
Do.	do.	Tintale Mine, Samtse District	NA
Unspecified	Natural Resources Development Corp. Ltd.	Homdhar quarry, Zhemgang District	NA
Do.	do	Ngangsing quarry, Pemagatshel District	NA
Do.	do.	Tsangkhhar quarry, Monggar District	NA
<b>NEPAL</b>			
Cement	Araniko Cement Industries	Jitpur factory	NA
Do.	metric tons per day Arghakhanchi Cement	Bhairahawa	1,200
Do.	Dang Cement Industries Pvt. Ltd. (Ambuja Cement Ltd., 85%)	NA	1,200
Do.	metric tons per day Chaudhary Group	Palpa, western Nepal	1,200
Do.	do. Jagdamba Cement	Bhairahawa	1,200
Do.	do. Do.	Birgunj	1,000
Do.	Lhaki Cement Pvt. Ltd.	Bhawani Khola	660
Do.	Hetauda Cement Industries Ltd.	Hetauda, Makwanpur District, Province No. 3	260
Do.	Manasa Cement Industry	Chandragadhi, Jhapa District, Province No. 1	37
Do.	Maruti Cement	NA	NA
Do.	Saurabh Group	Sarbotam Cement Industries	400
Lead and zinc	Nepal Metal Co. Ltd. (Government, 71%, and Khetan Group, 13%)	Lari	NA
Magnesite	metric tons Nepal Orind Magnesite Ltd. (Government, 75%; Khetan Group, 12.5%; Orissa Industries Ltd., 12.5%)	Dolakha District, Province No. 3	50
Stone, marble	Godawari Marble Industries Ltd.	Godawari, Latitpur District	1

<sup>e</sup>Estimated. Do., do. Ditto. NA Not available.