



2011 Minerals Yearbook

PAKISTAN

THE MINERAL INDUSTRY OF PAKISTAN

By Chin S. Kuo

Pakistan is rich in such mineral resources as barite, coal, copper, iron ore, limestone, and salt, and the identified resources of copper and iron ore are large. The country produced a variety of industrial minerals and some metallic minerals. Pakistan also has extensive energy resources and is known to have moderate oil reserves, sizable gas reserves, the potential for coal, and large hydropower potential. In the past several years, gas and oil production met only about one-half of the country's energy needs, but exploitation of energy resources continued to be slow owing to a shortage of capital and to political instability.

The Pakistan National Tariff Commission announced a tax to control the exportation of scrap metals, such as copper, zinc, and other metals. China was a major importer of such materials from Pakistan. The recent increase in Pakistan's exports of these materials led to increased domestic metal prices, which damaged the interests of domestic manufacturers (Ni, 2011).

Minerals in the National Economy

In 2011, Pakistan's economy was dominated by the services, industrial, and agriculture sectors, which accounted for 53%, 26%, and 21% of the gross domestic product (GDP), respectively. Industrial output increased at a rate of 3%, and construction materials accounted for much of that output. Production from mining and quarrying accounted for 10% of industrial production and increased by 16% compared with that of 2010. The value of output from the mineral industry accounted for 2.5% of the GDP, which posted a growth rate of 2.4% in 2011.

Cement and jewelry were the country's major export items in 2010. Pakistan's oil production was not sufficient to meet its domestic demand. Aluminum, crude petroleum, iron and steel, and petroleum products were the major import commodities (State Bank of Pakistan, 2012).

Production

The metallic minerals mined in Pakistan included bauxite, chromite, copper, and iron ore. Production of crude steel was estimated to have increased by 9.1% in 2011 owing to higher capacity utilization. The country produced lead and zinc concentrates for the first time in 2009; production was from the Duddar Mine. Zinc in concentrate from the mine was reported to be only 10 metric tons (t) in 2010 and was estimated to have increased to 15 t in 2011. Pakistan produced a variety of industrial minerals, including aragonite, barite, clays, dolomite, gypsum, limestone, and salt. In 2011, the estimated increased output of limestone was used mainly in the cement industry. Production of chalk was estimated to have increased by 51% in 2011 after steady increases followed by a sharp drop in 2010, and production of fuller's earth and caustic soda was also estimated to have increased. Output of talc, magnesite, and phosphate rock was estimated to have decreased by 18%, 16%, and 9%, respectively (table 1).

Structure of the Mineral Industry

The Mineral Department of the Ministry of Petroleum and Natural Resources is responsible for the exploration, planning, development, and operation of mining ventures that are controlled by the state-owned companies. The Ministry's Petroleum Department is responsible for the exploration and production of hydrocarbons and for the transmission and distribution of natural gas. State-owned companies control the production and marketing of chromite, coal, copper, iron ore, and steel. Private-sector companies are allowed to own and produce nonfuel minerals—mainly industrial minerals, including cement. Despite the Government's efforts to privatize large-scale state-owned companies, the public sector companies continued to account for a significant amount of mineral production. Table 2 is a list of major mineral producing facilities in the country.

Commodity Review

Metals

Copper and Gold.—The Provincial government of Balochistan rejected a mining lease application for the Reko Diq copper-gold project from Antofagasta Minerals of Chile and Barrick Gold Corp. of Canada owing to an incomplete feasibility report submitted in February 2011. The joint-venture company set up by Antofagasta and Barrick, Tethyan Copper Co. Pty. Ltd., filed a notice of dispute with the Province regarding the project. Tethyan Copper had a 75% interest in the project. The Reko Diq deposit held an estimated mineral reserve of 5,900 million metric tons (Mt) with an average grade of 0.41% copper and 0.22 gram per metric ton (g/t) gold. The joint-venture partners had spent \$200 million in 2006 to buy the exploration license from BHP Billiton Ltd. of Australia. The construction cost for the Reko Diq project was projected to be \$3.3 billion. The project was likely to employ 11,000 people at its peak operation and was expected to produce 200,000 metric tons per year (t/yr) of copper and about 7,800 kilograms per year (kg/yr) of gold. The start of production was originally scheduled for 2015 (Ferreira-Marques, 2011).

In rejecting the Reko Diq mining lease application, the government of Balochistan said that metal refining must be done in the Province, that any agreement must specify what would be extracted and exported, and that the agreement must be beneficial for the local people. The Provincial government indicated that a financially better deal was being sought. This decision could clear the way for Metallurgical Construction Corp. (MCC) of China, which had started the Saindak copper-gold project in Chagai District, to secure a mining lease for Reko Diq. MCC would give the Balochistan government a 25% share in the income and 5% royalty. MCC also offered to construct roads and set up a powerplant

at the mine site. Tethyan Copper commenced international arbitration proceedings regarding the dispute. The arbitration body could not force the Balochistan government to award the mining lease to the company, but could help Tethyan Copper secure compensation for funds it had invested in the project (Fazi-e-Haider, 2011).

Iron and Steel.—Pakistan Steel Mills Corp. Ltd. (PSM) reported that a large quantity of steel products, such as hot-rolled coils and galvanized coils, was being smuggled into Pakistan across the Afghanistan and Iran borders and sold at much lower prices on the black market. As a result, the sale of PSM steel products was severely affected, and the Government lost revenues owing to nonpayment of duties and taxes. Imports of scrap were not subject to the customs duty and sales tax (Steelguru.com, 2011).

Lead and Zinc.—Extensive lead-zinc-barite mineralization was discovered in the ophiolite thrust belt on the upper part of the lower Jurassic Shirinab Formation at Las Bela in Balochistan Province. Mineralization was identified at Duddar, Gunga, Mal Khor, Rang Laki, Shekran, and Surmai. Deposits at Duddar, Gunga, and Surmai had been explored and evaluated. At Duddar, barite was an indicator of sulfide mineralization. Pakistan Mineral Development Corp. and MCC were developing the mine and constructing the beneficiation plant at Duddar. The mine was expected to produce 5,000 t/yr of zinc and between 25,000 and 30,000 t/yr of lead in concentrate, and the plant would have a processing capacity of 660,000 t/yr of ore (MBendi.com, 2011).

Industrial Minerals

Cement.—In 2011, Pakistan's exports of cement decreased by 12.5% to 9.4 Mt. Cement exports went mainly to countries of the Middle East as well as to the neighboring countries of Afghanistan and India. The leading exporters were Askari Cement Co. Ltd., Bestway Cement Co. Ltd., Cherat Cement Co. Ltd., DG Khan Cement Co. Ltd., Kohat Cement Co. Ltd., and Lucky Cement Ltd. Bestway Cement bought additional shares of Mustehkam Cement Ltd. and increased its stake in the company to 95.03%. Bestway Cement had acquired an 85.29% interest in Mustehkam Cement in 2005. Mustehkam Cement operated a 600,000-t/yr cement plant at Haripur in Khyber-Pakhtunkhwa. Bestway Cement planned to increase the plant's capacity to 1.2 million metric tons per year (Mt/yr) (International Cement Review, 2011).

All Pakistan Cement Manufacturers Association appealed to the Government to rescue the ailing cement industry. The cement industry suffered losses mainly owing to increases in production costs, including the prices of coal, diesel, electricity, furnace oil, paper bags, and transportation, as well as higher interest rates. Stagnant domestic demand and decreased exports also hurt the performance of the industry. Capacity utilization was low at 75% (Global Cement Weekly, 2011).

Fauji Cement Co. Ltd. opened its new cement plant at Jhang Bahtar, which had an installed capacity of 7,200 metric tons per day (t/d) of clinker, and increased its cement production capacity to 2.2 Mt/yr from 1.1 Mt/yr. The cement plant was located near a new powerplant that had been built at the Diamer Bhasha dam.

The Asian Development Bank invested \$4.5 billion in construction of the dam, which was projected to require 5 Mt/yr of cement for several years (Cemweek, 2011).

Lucky Cement was Pakistan's leading cement producer and exporter. The company's facility at Pezu had a production capacity of 13,000 t/d of dry-process cement, and the facility at Karachi had a production capacity of 12,000 t/d, for a total capacity of 25,000 t/d, or 7.75 Mt/yr. The company planned to form a joint venture with Groupe Rawji of the Democratic Republic of the Congo [Congo (Kinshasa)] to build a \$175 million 1-Mt/yr cement plant in that country. Lucky Cement would pay \$40 million for a 50% stake in the project (Sharif and Kavanagh, 2011).

Soda Ash.—ICI Pakistan, which was a subsidiary of Akzo Nobel N.V. of the Netherlands, planned to invest \$23.2 million in its Khewra soda ash plant in Jhelum. The money would be used to purchase two steam boilers powered by coal instead of natural gas. Interrupted gas supply was the major factor in the investment decision. Once the project is completed and commissioned in January 2013, the plant would have the capacity to produce 350,000 t/yr of soda ash. When powered with natural gas, the plant had a capacity of 285,000 t/yr after an expansion in 2007. ICI Pakistan supplied 70% of the domestic market and exported to neighboring countries (Lismore, 2011).

Mineral Fuels

Coal.—Oracle Coalfields plc of the United Kingdom planned to develop a 1,400-Mt coal resource in Sindh Province. Its 80%-owned subsidiary Sindh Carbon Energy Ltd. submitted an application for a 30-year mining lease with a 30-year extension for the Block VI Thar coalfield project. The application for the mining lease was submitted to the Thar Coal Energy Board of the Sindh Coal Authority. As part of the supporting technical documentation, an interim environmental and social impact assessment report was also included. The subsidiary had an exploration license for the block (London Stock Exchange plc, 2011).

Natural Gas and Petroleum.—BP p.l.c. was selling most of its assets in Pakistan to the Hong Kong-based United Energy Group for \$775 million. The sale was expected to be completed in the first half of 2011. The assets included nine producing and exploration blocks in Sindh Province and four offshore exploration blocks in the Arabian Sea. The blocks held energy resources of 43.1 million barrels of oil equivalent. BP produced 10,000 barrels per day of oil and 5.66 million cubic meters per day of gas in Pakistan (Petroleum Economist, 2011).

Outlook

Pakistan's Reko Diq copper-gold project was at the point of being developed, but the project now is expected to be delayed owing to the rejection of a mining lease by the Provincial government. MCC is likely to proceed with securing the mining lease because of its success in developing the Saindak copper-gold project. The country's production of lead and zinc concentrates is expected to increase gradually as the mining operation at Duddar (also operated by MCC) gets underway. The cement industry is expected to add production capacities by

expansions and new plants despite the sluggish cement demand and exports in 2011. Development and mining of coal resources in the Thar District in Sindh Province is expected to proceed. The supply of natural gas from domestic sources is expected to begin to decline in the next 2 to 3 years, as the existing fields are nearing depletion. The Government is reviewing its gas development policy and encouraging foreign companies to participate in gas production.

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TABLE 1
PAKISTAN: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons unless otherwise specified)

Commodity	2007	2008	2009	2010	2011 ^e
METALS					
Bauxite, gross weight	27,382	25,000 ^e	11,300 ^r	9,576 ^r	10,000
Chromium ore:					
Gross weight	108,000 ^e	104,000	133,000 ^r	252,000 ^r	250,000
Cr ₂ O ₃ content	48,600 ^e	46,800	59,900 ^r	113,400 ^r	112,000
Copper, mine, Cu content ^e	18,800	18,700	18,500	18,000	19,000
Iron and steel: ^e					
Iron ore, gross weight	207 ²	250	333 ^{r,2}	418 ^{r,2}	400
Pig iron	1,001 ²	1,000	700 ^r	483 ^{r,2}	500
Steel, crude	1,090 ²	1,100	1,100	1,100	1,200
Lead: ^e					
Pb content in concentrate	--	--	26,000	26,000	27,000
Refined, secondary	3,000	3,000	85 ^{r,2}	2,889 ^{r,2}	2,800
Zinc, Zn content in concentrate	--	--	1	10	15
INDUSTRIAL MINERALS					
Abrasives, natural, emery ^e	150	150	150	150	150
Barite	48,044	56,500	56,333 ^r	49,038 ^r	50,000
Cement, hydraulic ^e	25,745 ²	26,000	28,000	30,000	32,000
Chalk	2,892	5,000 ^e	8,343 ^r	1,322 ^r	2,000
Clays:					
Bentonite	32,382	31,500	33,300 ^r	42,100 ^r	40,000
Fire clay	337,071	359,500	359,200 ^r	307,300 ^r	300,000
Fuller's earth	12,884	10,500	11,055 ^r	6,370 ^r	8,000
Kaolin, china clay	25,654 ^r	24,500	15,318 ^r	27,265 ^r	26,000
Other ^e	218,000	220,000	250,000	240,000	260,000
Feldspar	13,236	28,500	61,858 ^r	68,018 ^r	65,000
Fluorspar ^e	2,082 ²	1,700	1,400	1,500	1,600
Gypsum, crude	703,137	730,000	856,000 ^r	946,000 ^r	950,000
Magnesite, crude	2,370	3,500	3,918 ^r	8,330 ^r	7,000
Nitrogen, N content of ammonia ^e	2,250,000	2,300,000	2,350,000	2,400,000	2,450,000
Phosphate rock:					
Gross weight	3,840	3,900	30,467 ^r	87,807 ^r	80,000
P ₂ O ₅ content ^e	690	700	5,480 ^r	15,800 ^r	14,400
Pigments, mineral, natural, ocher ^e	6,000	6,000	6,200	6,000	6,100
Salt:					
Rock	1,833	1,883	1,941 ^r	2,058 ^r	2,000
Marine ^e	18	50 ^r	93 ^{r,2}	190 ^{r,2}	200
Total ^e	1,850	1,930 ^r	2,034 ^{r,2}	2,248 ^{r,2}	2,200
Sodium compounds, n.e.s.: ^{e,3}					
Caustic soda	230,000	240,000	250,000	177,000 ^r	200,000
Soda ash, manufactured	260,000	250,000	260,000	394,000 ^r	400,000
Stone:					
Aragonite and marble	1,581,369	1,341,000	1,223,387 ^r	1,471,014 ^r	1,500,000
Dolomite	333,082	305,000	150,619 ^r	306,940 ^r	300,000
Limestone	31,046	32,488	35,375 ^r	17,984 ^r	25,000
Other, as "ordinary stone" ^e	5	6	7 ^r	7 ^r	8
Strontium minerals, celestite	1,476	1,000	--	--	--
Sulfur, native ^e	22,000	28,000	29,000	30,000	31,000
Talc and related materials, soapstone	32,675	26,000	40,792 ^r	121,800 ^r	100,000

See footnotes at end of table.

TABLE 1—Continued
PAKISTAN: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons unless otherwise specified)

Commodity	2007	2008	2009	2010	2011 ^e	
MINERAL FUELS AND RELATED MATERIALS						
Coal, all grades	thousand metric tons	3,926	3,691	3,292 ^r	3,429 ^r	3,600
Coke	do.	308	310	320	322 ^r	330
Gas, natural:						
Gross production	million cubic meters	40,579	41,261	41,658	42,000 ^e	43,000
Marketed production, sales ^e	do.	37,000	38,000	39,000	40,000	41,000
Natural gas liquids ^e	thousand 42-gallon barrels	750	750	750	760	760
Petroleum:						
Crude	do.	25,109	24,818	23,870	71,700 ^r	70,000
Refinery products: ^e						
Gasoline	do.	11,000	11,152 ²	11,161 ²	11,000	12,000
Jet fuel	do.	9,800	7,868 ²	7,584 ²	7,100 ^{r,2}	7,000
Kerosene	do.	1,100	1,527 ²	1,217 ²	990 ^{r,2}	1,000
Distillate fuel oil	do.	30,000	32,000	31,000	32,000	31,000
Residual fuel oil	do.	23,500	21,369 ²	18,615 ²	20,000	21,000
Lubricants	do.	1,500	3,759 ²	3,689 ²	1,375 ^{r,2}	2,000
Other	do.	14,000	15,000	16,000	17,000	18,000
Total	do.	90,900	92,700	89,300	89,500 ^r	92,000

^eEstimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. ^rRevised. do. Ditto. -- Zero.

¹Table includes data available through August 8, 2012.

²Reported figure.

³Not elsewhere specified.

TABLE 2
PAKISTAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2011

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity ^e
Barite		Bolan Mining Enterprises	Khuzdar, Balochistan Province	24
Do.		Razvi Mining (Private) Ltd.	Gandori, Kalan, and Retri	30
Cement		Askari Cement Co. Ltd.	Nizampur	1,200
Do.		Attock Cement Pakistan Ltd.	Hub Chowki	800
Do.		Cherat Cement Co. Ltd.	Nowshera	750
Do.		Dandot Cement Co. Ltd.	Dandot	500
Do.		Fauji Cement Co. Ltd.	Jhang Bahtar	1,170
Do.		do.	do.	2,200
Do.		Gharibwal Cement Ltd.	Jhelum	540
Do.		Javedan Cement Ltd.	Karachi	600
Do.		D.G. Khan Cement Co. Ltd.	Chakwal and Dera Ghazi Khan	1,650
Do.		Kohat Cement Co. Ltd.	Kohat	700
Do.		Lucky Cement Ltd.	Karachi	3,750
Do.		do.	Pezu	4,000
Do.		Maple Leaf Cement Factory Ltd.	Daudkhel	1,500
Do.		Mustehkam Cement Ltd.	Haripur	600
Do.		Pakistan Cement Co.	Between Islamabad and Lahore, Punjab Province	2,200
Do.		Pioneer Cement Ltd.	Chenki	1,300
Do.		Thatta Cement Co. Ltd.	Thatta	300
Do.		Zeal Pak Cement Factory Ltd.	Hyderabad	1,080
Chromite		Pakistan Chrome Mines Ltd.	Gwal, Khanozai, Muslim Bagh, and Nisai, Balochistan Province	20
Coal		Sindh Coal Authority	Dadu, Sindh Province	4,000
Do.		do.	Tharparkar, Sindh Province	NA
Copper, metal		Saindak Metals Ltd. [Metallurgical Construction Corp. (MCC), operator]	Chaghi, Balochistan Province	22
Gas, natural	million cubic meters per day	Pakistan Petroleum Ltd. (PPL)	Adhi, Punjab Province; Kandhkot and Mazarani, Sindh Province; and Sui, Balochistan Province	24
Do.	do.	Oil and Gas Development Co. Ltd. (OGDC)	37 oilfields and gasfields, including Mari, Sindh Province	31
Lead and zinc, ore		MCC Duddar Minerals Development Co. Pvt.	Duddar, Balochistan Province	660
Petroleum:				
Crude	42-gallon barrels per day	Pakistan Petroleum Ltd. (PPL)	Adhi, Punjab Province	1,600
Do.	do.	Oil and Gas Development Co. Ltd. (OGDC)	37 oilfields and gasfields	46,000
Refined	do.	Bosicor Pakistan Ltd.	Karachi	30,000
Do.	do.	Pak-Arab Refinery Co. Ltd. (joint venture of the Governments of Pakistan and the Emirate of Abu Dhabi in the United Arab Emirates)	Mahmood Kot, Punjab Province	100,000
Steel, crude		Pakistan Steel Mills Corp. (Pvt) Ltd. (PSM)	Karachi	1,100

^eEstimated. Do., do. Ditto. NA Not available.