



2008 Minerals Yearbook

PAKISTAN

THE MINERAL INDUSTRY OF PAKISTAN

By Chin S. Kuo

Pakistan is rich in such mineral resources as coal, copper, iron ore, limestone, and salt. Copper and iron ore resources are large and significant in terms of deposits already discovered. New high-grade iron ore deposits were estimated to contain 400 million metric tons (Mt) of ore in Balochistan and Northwest Frontier Provinces. The country also is known to have moderate oil and gas reserves estimated to be 289 million barrels and 792 billion cubic meters, respectively (U.S. Energy Information Administration, 2009). In 2008, Pakistan's economy was dominated by the services, industrial, and agriculture sectors, which accounted for 53%, 27%, and 20% of the gross domestic product (GDP), respectively. Industrial output grew at a rate of 20%. Mining and quarrying accounted for 12% of the industrial production (State Bank of Pakistan, 2008).

Minerals in the National Economy

The value of output from the mineral industry accounted for 3.1% of the GDP, which posted a growth rate of 5.8% in 2008. Employment in the mineral industry accounted for 1.6% of the labor force of 50 million. Exploitation of energy resources had been slow owing to a shortage of capital and political instability. As a result, energy imports, such as crude oil and petroleum products, accounted for about 30% of the country's total imports in the past several years. Weak demand in the world market for Pakistan's mineral products and raw materials and uncertain domestic policies contributed to the country's decreased exports and high trade deficit.

Government Policies and Programs

The National Mineral Policy (1995) provides the institutional and regulatory framework for ensuring an equitable and internationally competitive fiscal regime. The goal of the policy is to expand mining sector activities and attract foreign investment. Because of the importance of minerals to the development of remote areas of the country, and thus to alleviating poverty, the Government has made development of the mineral sector a national priority (Ministry of Petroleum and Natural Resources, 2007).

Production

Pakistan produced a variety of industrial minerals, including aragonite, barite, celestite, clays, gypsum, limestone, and salt. Indigenous limestone was used mainly in the cement industry. Metallic minerals mined included bauxite, chromite, copper, and iron ore. Copper ore was mined at Chaghi by Saindak Metals Ltd. Pakistan's oil production was not sufficient to meet its domestic demand. Output of natural gas came from large fields at Mari and Sui (table 1).

Structure of the Mineral Industry

The Mineral Department of the Ministry of Petroleum and Natural Resources is responsible for Pakistan's exploration, planning, development, and operation of mining ventures. 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. The Ministry itself is responsible for the exploration and production of hydrocarbons and for the transmission and distribution of natural gas (table 2).

Commodity Review

Metals

Copper and Gold.—Tethyan Copper Co., which had a 75% interest in the Reko Diq project at Chaghi in Balochistan Province, was owned by Barrick Gold Corp. of Canada and Antofagasta PLC of Chile. The government of Balochistan Province held the remaining 25% interest. The porphyry deposit at Reko Diq was estimated to contain 12.3 Mt of copper and 650 metric tons (t) of gold. The project was in the prefeasibility stage, and the prefeasibility study was scheduled to be completed in the third quarter of 2009. Work on a full feasibility study had begun and was expected to be completed in the first half of 2010. Production of 250,000 metric tons per year (t/yr) of copper and 12 t/yr of gold was planned (Barrick Gold Corp., 2008).

Saindak Metals Ltd., which was wholly owned by the Government, produced copper, gold, silver, and magnetite concentrate from the copper-gold project in Chaghi District in Balochistan Province. The project was being run by Metallurgical Construction Corp. (MCC) of China on a 10-year lease, which was due to expire in September 2012. Under the lease agreement, MCC paid an annual rent of \$500,000 and a 50% share of copper sales to the Government (Free Library, The, 2009).

Iron and Steel.—In 2008, about 15,000 t of iron ore from Chaghi was supplied by AMCO Minerals (a local company) to Pakistan Steel Mills Corporation (Pvt) Ltd. (PSM) to be blended with the imported iron ore to meet PSM's requirements. PSM imported iron ore and coke from Australia, India, and Iran. The steel sector faced problems owing to high iron ore prices in the international market. Iron ore reserves in Pakistan's Punjab Province were 350 Mt at a grade of 30% iron content in Chichali and Kalabagh, Mianwali District; 200 Mt at a grade of 30% to 35% iron in Kallat District; 110 Mt at a grade of 60% iron in Kirana, Sargodha District. Iron ore reserves in Northwest Frontier Province were 100 Mt at a grade of 25% to 35% iron in Nazampur District and 66 Mt at a grade of 30% to 34% iron in Pezu District. PSM was the only integrated steel plant

in Pakistan; the plant had the capacity to produce 1.1 million metric tons per year (Mt/yr) of steel (Business Recorder, 2008).

A consortium of four local steel manufacturers planned to develop iron ore deposits at Chiniot and Kalabagh and to establish a steel plant with a capacity of 1 Mt/yr at Kalabagh, Punjab Province. The consortium comprised Ittehad Steel Mills, Mughal Steel, Pak Steel, and Star Cotton Corp. A Chinese company had expressed interest in transferring technology related to the extraction of iron ore. Issues that needed to be resolved were the acquisition of land leased and the development of infrastructure, including gas and powerplants, rails, roads, and other infrastructure-related facilities. In Pakistan, 20% of steel demand was met by domestic sources and the remaining 80% was met through imports (UrbanPK.com, 2008).

Lead and Zinc.—Hunan Zhuzhou Nonferrous Metals Corp. Ltd. of China planned to start production at its partly owned lead and zinc mine at Duddar in the Lasbela District in mid-November. The mine was designed to produce 100,000 t/yr of zinc in concentrate and 32,000 t/yr of lead in concentrate. All the lead and zinc concentrate would be supplied to the company's smelter in China (Reuters India, 2008).

Industrial Minerals

Stone, Dimension.—Pakistan is endowed with high-quality marble reserves. In particular, Ziarat in Northwest Frontier Province has rich reserves of the best-quality marble in the world; this marble was in great demand in the international market. However, the country was not benefiting from the demand for the marble owing to the lack of modern practices used in the quarrying and processing of the marble. The worsening security situation in the quarried area was also a significant concern. The mines also were disadvantaged by large losses of material that resulted from using blasting in production. The Government was considering increasing the country's exports of dimension stone and value-added products made from dimension stone as a means of strengthening the national economy (Stone Roc, 2008).

Mineral Fuels

Coal.—Oracle Coalfields plc reported that Deep Rock Drilling (pvt) Ltd. began drilling the first of a seven-hole program on Block VI of the Thar coalfield in the Province of Sindh. The goal of the program was to validate the drilling results of the China North East Geological Survey Bureau, which had completed a 35-hole drilling program in 2005, and to bring Block VI to an internationally recognized standard. A total length of 9,852 meters (m) was drilled, of which 5,986 m was cored. All holes were geophysically logged, and 271 lignite samples were analyzed for quality (PLUS Markets Group, 2008).

Proposals were being sought for a feasibility study of power generation based on coal from two leases in the Lakhra coalfield. Habibullah Mines Ltd. planned to modernize its coal mining operations in anticipation of increasing its coal supply to the power generation project. The feasibility study would help determine which combustion technology and

which plant configuration [two 75-megawatt (MW) units or a single 150-MW unit] should be used. Both decisions would be influenced by the quality of the coal that would be supplied to the plant (U.S. Trade and Development Agency, 2008).

The Government approved proposals for five power projects that would have a combined capacity of 1,365 MW. The approved proposals were for three power projects with a combined capacity of 929 MW that would be constructed by independent power producers and two rental plants with a combined capacity of 436 MW. The independent power projects would come onstream in December 2009; the rental plants would come onstream 6 to 7 months thereafter (Alexander's Gas & Oil Connections, 2008b).

Natural Gas.—OMV of Austria farmed in to two exploration blocks operated by Pakistan Petroleum Ltd. (PPL) and took over 30% of the Kalat Block and 15% of the Barkhan Block in southwestern Pakistan. The Government planned to sell a 51% controlling interest in PPL. OMV, which was Pakistan's leading foreign natural gas producer, was considering acquiring the 51% stake in PPL (Petroleum Economist, 2008).

Three hydrocarbon discoveries were made in Sindh Province in 2008. Petronas Carigali (Pakistan) drilled its Saqib-1A well on the Mubarak Block to 3,605 m and discovered gas and condensate. Oil and Gas Development Co. Ltd. (OGDCL) drilled its Moolan North-1 well in the Lashari development and production lease to 2,329 m and discovered oil. OGDCL also drilled its Pakhro-1 well on the Nim Block to 3,692 m and found gas and condensate (Alexander's Gas & Oil Connections, 2008d).

A joint venture led by Eni Pakistan Ltd. began gas production from the Badhra field, which is located southeast of the Bhit field in Sindh Province, and commissioned the third train at the Bhit gas treatment plant. The \$50 million development and acceleration project would boost the Bhit plant's capacity by 17% to 9 million cubic meters per day. The joint venture was composed of Eni Pakistan Ltd. (40%), Kirthar Pakistan BV (28%), OGDCL (20%), PKP Kirthar 2 BV (6%), and PKP Kirthar BV (6%) (Oil and Gas Journal, 2008a).

Gas production continued at the Chachar field in which Tullow Oil plc of the United Kingdom had a 75% interest, whereas output at its Sara/Suri field decreased and was near the end of its life. In September 2008, Tullow started seismic operations on the Kalchas Block and transferred operatorship of the Kohat Block to OGDCL. A drilling operation was expected in 2010 (Tullow Oil plc, 2009).

The Government approved a plan to privatize OGDCL's Qadirpur gasfield with the sale of 37% of the Government's shares along with the transfer of operational control. OGDCL was currently the operator and held a 75% share. PPL held a 7% interest. A total of 29 wells had been drilled in the Qadirpur field, of which 24 were producing. At the end of the first phase of development, the field's capacity was 14.15 million cubic meters per day. By December 2007, the capacity had increased to 16.98 million cubic meters per day. The gas was supplied to Sui Southern Gas Co. Ltd. (Oil and Gas Journal, 2008c).

Owing to limited gas production, the share of natural gas in the total energy mix declined to 48.5% in 2007 from 50.4% in 2006. Gas production was only 113 million cubic meters per day whereas consumption was 139 million cubic meters per day.

Increasing the volume of imported gas was viewed as the most viable solution to overcoming the energy shortage (Alexander's Gas & Oil Connections, 2008c).

Iran and Pakistan reached an agreement to form a joint venture to build a 2,700-kilometer gas pipeline from the South Pars field in Iran to Multan Province in Pakistan. The joint venture would secure the necessary financing for the project, which was estimated to be \$7.5 billion (Alexander's Gas & Oil Connections, 2008a).

Petroleum.—Pakistan planned to auction fields for oil and gas exploration under the new Petroleum Exploration and Production Policy of 2007. A clause in the new policy allows the Government to resell leased land after its expiry. The clause is intended to ensure that leaseholders develop their fields in a timely manner. Another clause concerns the levying of a windfall profits tax. The country's consumption of oil was on the rise. The increase was led by increased consumption of furnace oil by the power sector (Alexander's Gas & Oil Connections, 2008c).

Pakistani refineries reduced gasoline production in September 2008 following changes in the pricing formula, the availability of stocks, and a drop in consumption. National Refinery Ltd. reduced its output to between 9,000 and 10,000 metric tons per month (t/mo); Pakistan Refinery Ltd., to 7,500 t/mo; Attock Refinery Ltd., to between 21,000 and 22,000 t/mo; and Boscior Refinery Ltd., to 4,000 t/mo (Oil and Gas Journal, 2008b).

TransAsia Refinery Ltd. planned to relocate a 100,000-barrel-per-day refinery from Naples, Italy, to Port Qasim near Karachi. The company sought formal approval from the Environmental Protection Agency and the government of the Province of Sindh to implement the project. The company awarded a contract to Descon Engineering of Lahore for the engineering, design, and construction of products and utilities pipelines, crude and export products storage-handling facilities, and utilities and offsite facilities. The project was scheduled to be completed by April 2010 (Oil and Gas Journal, 2008d).

Outlook

Pakistan's newly discovered iron ore deposits and increased production of iron ore are expected to reduce the imports of iron ore for blending from abroad and provide sufficient supply of iron ore for a second steel mill that was planned to be built in the near future. The Reko Diq project is still being developed and is expected to produce copper and gold in 2010 in addition to copper output from the Sandaik Metals project in Chaghi. Abundant lignite found in the Thar District in Sindh Province is expected to be used in coal-fired powerplants being planned or under construction to increase the power-generating capacity in the next 2 to 3 years. The Government encourages the independent power producers to generate electricity by using natural gas, which also is abundant in the country.

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TABLE 1—Continued
PAKISTAN: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons unless otherwise specified)

Commodity	2004	2005	2006 ^e	2007 ^e	2008 ^e	
MINERAL FUELS AND RELATED MATERIALS						
Coal, all grades	thousand metric tons	3,325	3,367	4,313 ²	4,000	4,200
Coke	do.	--	--	242 ²	260	250
Gas, natural:						
Gross production	million cubic meters	34,063	38,089	39,813 ²	40,000	41,000
Marketed production, sales ^c	do.	30,000	34,000	36,000	37,000	38,000
Natural gas liquids ^c	thousand 42-gallon barrels	650	700	700	750	750
Petroleum:						
Crude	do.	22,625	24,119	24,275 ²	25,000	26,000
Refinery products:						
Gasoline	do.	9,616	9,959	10,000	11,000	12,000
Jet fuel	do.	7,432	8,833	9,000	9,800	9,900
Kerosene	do.	1,794	1,511	1,300	1,100	1,000
Distillate fuel oil	do.	24,315	26,857	28,000	30,000	32,000
Residual fuel oil	do.	22,794	23,346	23,000	23,500	23,000
Lubricants	do.	1,334	1,401	1,500	1,500	1,600
Other	do.	9,251	10,264	12,000	14,000	15,000
Total	do.	76,536	82,171	84,800	90,900	94,500

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

¹Table includes data available through August 17, 2009.

²Reported figure.

³Not elsewhere specified.

TABLE 2
PAKISTAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2008

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity ^c
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.		Gharibwal Cement Ltd.	Jhelom	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.	Pezu	1,660
Do.		Maple Leaf Cement Factory Ltd.	Daudkhel	1,500
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	20
Coal		Sindh Coal Authority	Dadu, Sindh Province	4,000
Do.		do.	Thar, Sindh Province	NA
Copper, metal		Saindak Metals Ltd.	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. (OGDCL)	37 oilfields and gasfields	31
Petroleum, crude	42-gallon barrels per day	Pakistan Petroleum Ltd. (PPL)	Adhi, Punjab Province	1,600
Do.	do.	Oil and Gas Development Co. Ltd. (OGDCL)	37 oilfields and gasfields	46,000
Petroleum, refined		Bosicor Pakistan Ltd.	Karachi	30,000
Do.	do.	Pak-Arab Refinery Co. Ltd.	Mahmood Kot, Punjab Province	100,000
Steel, crude		Pakistan Steel Mills Corporation (Pvt) Ltd. (PSM)	Karachi	1,100

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