



2007 Minerals Yearbook

PAKISTAN [ADVANCE RELEASE]

THE MINERAL INDUSTRY OF PAKISTAN

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The Government's wide-ranging privatization program and a large increase in bank lending to the business sector helped increase the country's economic growth. In 2007, the industrial sector grew by 14% and accounted for 27% of the gross domestic product (GDP) based on purchasing power parity. Foreign direct investment in mining and quarrying and oil and gas exploration increased by 34% and 74%, respectively, in 2007 compared with that of 2006. Pakistan is rich in such mineral resources as coal, copper, iron ore, limestone, and salt. The country was known to have moderate oil and gas reserves in addition to significant copper resources and vast iron ore resources.

Minerals in National Economy

The value of the mining and quarrying sector's mineral production contributed 3.1% to the country's GDP. Employment in the mineral industry accounted for 1.8% of the labor force. Exports of coal and petroleum products decreased in 2007, and those of cement and gemstones increased slightly. Imports of crude petroleum and iron and steel decreased slightly in 2007.

Production

Mineral commodities that were mined in 2007 included antimony, aragonite, barite, celestite, chromium, clays, copper, gypsum, marble, salt, and sodium compounds. Cement was manufactured using easily mined indigenous limestone. Saindak Metals Ltd. mined copper ore at Chagai. Pakistan produced small amounts of oil. Natural gas was produced from several large gasfields at Mari and Sui (table 1).

Structure of the Mineral Industry

The Ministry of Petroleum and Natural Resources is primarily responsible for the exploration and production of hydrocarbons and the transmission and distribution of natural gas. The Ministry's mineral department conducts exploration and plans, develops, and operates mining ventures. State-owned companies dominated the production of gas and oil; nonfuel minerals were owned, produced, and marketed mainly by private-sector local companies (table 2).

Commodity Review

Metals

Copper.—Barrick Gold Corp. of Canada and Antofagasta plc of Chile owned a 50% interest each in Tethyan Copper Co., which, in turn, had a 75% interest in the Reko Diq project at Chaghi in Balochistan Province. The project, which includes the Western Porphyry deposit and the H4 deposit, and their prospects, are in the Tethyan metallogenic belt, which is prospective for large copper-gold porphyry mineralization.

Western Porphyry had an inferred resource of 703 million metric tons (Mt) at grades of 0.64% copper and 0.4 grams per metric ton gold. H4 had an indicated resource of 94 Mt at a grade of 0.73% copper. The project was in the feasibility stage and was expected to be completed in the first half of 2009. Drillings were ongoing and results continued to confirm the exploration potential (Barrick Gold Corp, 2007).

Iron and Steel.—The Kalabagh iron ore deposit in the Kalabagh region in western Punjab Province had a resource of 300 Mt, which made it the largest iron ore deposit in Pakistan. The iron ore was mostly of low grade, however (the iron content varied between 32% and 34%). Other low-grade iron ore resources were found in Hazara in North-West Frontier Province, and small high-grade iron ore resources were identified in Chilghazi and Chitral in Balochistan Province. In the past, the Chiniot iron ore deposit in Punjab Province was estimated to contain a resource of 109 Mt, and the Dilband iron ore deposit in Balochistan Province was estimated to have a resource of 200 Mt. The Pachin Koh-Chigendik iron ore deposit, which is also located in Balochistan Province, had a resource of more than 100 Mt (MBendi Information Services (Pty) Ltd., 2007).

The annual production of iron ore in Punjab Province was increased to 60,000 metric tons (t) in 2007 and was expected to be increased further with the discovery of new reserves in 2008. In 2006, more than 30 licenses were issued for exploration in various areas of the Province, and 15 leases were signed. Imported iron ore was supplied to Pakistan Steel Mills Corp. Ltd., which operated the only integrated steel mill in the country; the mill had a capacity of 1.1 million metric tons per year (Mt/yr) (Associated Press of Pakistan, 2007).

Industrial Minerals

Cement.—The cement industry was expanding in response to strong demand from domestic and export markets. The total cement production capacity would be increased by 42% when the various expansion projects planned and in progress were completed in the next 3 years. Current production capacity was 27.5 Mt/yr and was expected to be increased to 39 Mt/yr by the end of 2009. Current domestic consumption was 24.2 Mt/yr and was forecast to grow to 35 Mt/yr by yearend 2009. The city of Karachi and Punjab Province were the two hubs of the domestic cement market. Lucky Cement Ltd., which was the leading cement producer in Pakistan, accounted for 19% of the total output, followed by D.G. Khan Cement Co. Ltd. (10%) and Bestway Cement Ltd. (9%) (Global Cement Magazine, 2007).

Mineral Fuels

Coal.—Coal played a minor role in Pakistan's energy mix. The country was estimated to have a coal resource of 3,050 Mt. A low-ash, low-sulfur lignite reserve of 1,750 Mt is located in the Tharparkar (Thar) Desert in Sindh Province. A feasibility

study was carried out for the construction of a coal-fired powerplant near the Thar coal mines. Coal would make up more than 1% of electricity generation in Pakistan.

Three coal-fired powerplants in the Jamshoro, the Tharparkar, and the Thatta Districts in Sindh Province were expected to begin construction in 2007 and to start operation in late 2009. They were the \$450 million 300-megawatt (MW)-capacity powerplant at the Sonda Coalfield in the Thatta District; the \$250 million 150-MW-capacity powerplant at the Lakhra Coalfield in the Jamshoro District; and the \$1.2 billion 1,000-MW-capacity powerplant in the Tharparkar District. The three projects would employ at least 8,000 people once they became operational (Daily Times, The, 2007).

Natural Gas.—OMV of Australia successfully tested gas wells in northern Sindh Province in an area where two major gasfields—the Miano and the Sawan—were brought onstream. OMV (Pakistan) Exploration Ltd., which was a 100% owned subsidiary of OMV, made the discovery. Further exploration using three-dimensional seismic survey and additional drilling was expected. OMV and its joint-venture partners ENI AEP and Pakistan Petroleum Ltd. held about one-third of the Latif exploration license. OMV planned to deliver gas to the networks of Sui Northern Gas Pipelines and Sui Southern Gas Co. and was responsible for producing 100,000 barrels per day of oil-equivalent, which would meet 16% of Pakistan's demand for natural gas (Alexander's Gas & Oil Connections, 2007b).

Jura Energy Corp. of Canada completed acquisition of a 66.7% interest in Pyramid Energy International Inc.'s producing oil and gas assets from Asia Resources Oil Ltd. and Industrial Support Ltd. for \$4.8 million. Pyramid Energy International's asset was a 15.8% interest in Block 22, which is located in the Central Gas Basin, and comprises the Hasan, the Khanpur, and the Sadiq gasfields. The gasfields produced 453,000 cubic meters per day of gas. Two new production wells were planned and drilled in the first half of 2007. Block 22 was operated by Petroleum Exploration Pvt. Ltd., which owned the remaining 33.3% interest in Pyramid Energy International (Rigzone.com, 2007).

Pakistan planned to build its first floating liquefied natural gas (LNG) terminal by the end of 2008. The terminal would cost \$162 million and have a capacity of 2.5 Mt/yr. It would be built at a location off the country's southern coast. The LNG would be imported from abroad. Meanwhile, Pakistan planned to announce a new petroleum exploration licensing policy by July 2007 that would offer better incentives to investors and raise the price at which gas was sold locally because gas was subsidized for domestic consumers and fertilizer units (Alexander's Gas & Oil Connections, 2007d).

Sui Northern Gas Pipeline Ltd.'s three gas projects—the Burewala, the Mailsi, and the Vehari—were under construction and nearing completion. The aim was to bring gas to more than 200,000 people in remote areas. The transmission pipeline had been linked to Pakhi More and Iqbal Nagar; from Iqbal Nagar, it would be linked to Hasilpur and Haroonabad (Alexander's Gas & Oil Connections, 2007e).

The \$3.5 billion pipeline project to import natural gas from Qatar through a 1,830-kilometer (km) pipeline was put on

hold by the Government, which was concentrating on the Iran-Pakistan-India pipeline project instead. Gas quantities of 73.6 million cubic meters per day required under the agreement with Qatar would not be available in Qatar for the next 8 to 10 years. The pipeline's relatively higher cost and technical complexities owing to its deep sea route were also a concern. For the Iran-Pakistan-India project, Pakistan had agreed with Iran on a gas pricing formula and was in the process of consulting on a transit fee that would be charged to India to let the gas pipeline pass through 650 km of Pakistani territory. Pakistan could earn about \$70 million annually in transit fees. Iran offered to cover 60% of the construction costs of the pipeline (Alexander's Gas & Oil Connections, 2007c).

In infrastructure development in Pakistan, the International Finance Corp. proposed an investment of \$70.2 million in loan and equity in Engro Energy Pvt. Ltd. of Pakistan. The project would use natural gas to generate electricity. The term of the gas supply agreement with the gasfield operator was 10 years, and the term of the power purchase agreement was 25 years. The terms of the agreements were in line with the Government program for independent power producers that aimed to attract private investment in the energy sector (International Finance Corp., 2007, p. 5).

Petroleum.—Inadequate oil refinery capacity was affecting Pakistan's balance of payments and was the major reason for the increase in the country's imports of petroleum products. The Government introduced policies to guide the restructuring, deregulation, and privatization of the petroleum sector. The public sector oil and gas companies would have vast potential and diversified expertise to participate in hydrocarbon exploration and pipeline projects abroad. The Government planned an ambitious program to exploit indigenous hydrocarbon and coal resources aimed at reducing petroleum imports (Alexander's Gas & Oil Connections, 2007a).

British Petroleum withdrew from a consortium with Kohinoor Group of Pakistan that was bidding for a 51% stake in Pakistan State Oil Co. Ltd., which was an oil marketing company. The sale of the 51% stake was expected to generate \$800 million. The privatization program suffered a setback in July when the Supreme Court ordered a delay in the process because of the bidding eligibility in another case (Petroleum Economist, 2007).

Outlook

Pakistan's increased production of iron ore is expected to generate interest among private investors in increasing the country's installed capacity of steelmaking. Owing to strong demand for cement in the domestic market and exports to Afghanistan, the cement industry is expected to expand its production capacities in the next 2 to 3 years. The country's abundant lignite coal reserves are expected to prompt an increase in the generating capacities of coal-fired powerplants. The discovery of natural gas in Sindh Province, which could be transported through the Sui pipeline network, along with gas that could be imported from Iran through a proposed pipeline, is expected to increase gas supply to rural areas in the near future.

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TABLE 1
PAKISTAN: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons unless otherwise specified)

Commodity	2003	2004	2005	2006 ^c	2007 ^c
METALS					
Bauxite, gross weight	4,098	4,847	6,504	7,000	7,500
Chromium ore:					
Gross weight	30,657	29,230	46,359	48,000	49,000
Cr ₂ O ₃ content ^c	13,800	13,200	20,900	21,600	22,100
Copper, mine, Cu content	3,200	15,000	17,700	19,100	18,700
Iron and steel:					
Iron ore, gross weight ^e thousand metric tons	40	50	50	130 ^{r,2}	207
Pig iron do.	11,773	84,946	104,278	105,000	106,000
Steel, crude ^c do.	550 ^r	600 ^r	700 ^r	933 ^{r,2}	900
Lead, refined, secondary ^c	2,330	3,000 ²	3,200	3,100	3,000
INDUSTRIAL MINERALS					
Abrasives, natural, emery ^c	150	150	150	150	150
Barite	40,745	44,207	42,087	45,169 ^{r,2}	44,000
Cement, hydraulic ^c thousand metric tons	13,000 ^r	15,000 ^r	17,000 ^r	20,652 ^{r,2}	21,000
Chalk	7,752	7,735	8,146	6,039 ^{r,2}	6,000
Clays:					
Bentonite	11,290	6,316	15,671	23,773 ^{r,2}	24,000
Fire clay	120,243	192,728	253,501	332,136 ^{r,2}	340,000
Fuller's earth	16,670	13,986	17,001	18,000	19,000
Kaolin, china clay	39,575	25,204	37,732	38,000	39,000
Other ^c	210,000	212,000	215,000	216,000	218,000
Feldspar	37,344	30,373	25,032	15,085 ^{r,2}	22,000
Fluorspar ^c	1,000	1,026 ²	1,040	2,839 ^{r,2}	1,500
Gypsum, crude	424,107	467,065	552,496	649,944 ^{r,2}	620,000
Magnesite, crude	2,645	6,074	3,029	1,884 ^{r,2}	1,400
Nitrogen, N content of ammonia	2,356,500	2,114,000	2,114,000	2,200,000	2,250,000
Phosphate rock:					
Gross weight	2,562	4,614	2,687	2,048 ^{r,2}	1,800
P ₂ O ₅ content ^c	470	840	490	370 ^r	320
Pigments, mineral, natural, other ^e	5,000	5,000	5,500	5,500	6,000
Salt:					
Rock thousand metric tons	1,426	1,640	1,648	2,008 ^{r,2}	1,620
Marine do.	17	12	14	13	13
Total do.	1,443	1,652	1,662	2,020 ^r	1,630
Sand, glass	75,000	--	--	-- ²	-- ²
Sodium compounds, n.e.s.: ^{e,3}					
Caustic soda	230,000	230,000	250,000	240,000	230,000
Soda ash, manufactured	240,000	240,000	260,000	250,000	260,000
Stone:					
Aragonite and marble	1,066,276	993,558	1,280,304	2,420,737 ^{r,2}	2,500,000
Dolomite	340,864	297,419	199,653	252,390 ^{r,2}	260,000
Limestone thousand metric tons	11,880	13,150	14,857	22,420 ^{r,2}	25,000
Other, as "ordinary stone" do.	2	4	6	5	5
Strontium minerals, celestite	402	570	1,855	1,466 ^{r,2}	1,600
Sulfur, native	19,402	23,873	24,158	23,000	22,000
Talc and related materials, soapstone	65,813	52,483	20,564	24,529 ^{r,2}	28,000

See footnotes at end of table.

TABLE 1--Continued
PAKISTAN: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons unless otherwise specified)

Commodity		2003	2004	2005	2006 ^c	2007 ^c
MINERAL FUELS AND RELATED MATERIALS						
Coal, all grades	thousand metric tons	3,609	3,325	3,367	4,313 ^{r, 2}	4,000
Coke ^c	do.	500	-- ²	-- ²	242 ^{r, 2}	260
Gas, natural:						
Gross production	million cubic meters	28,111	34,063	38,089	39,813 ^{r, 2}	40,000
Marketed production, sales ^c	do.	24,000	30,000	34,000	36,000	37,000
Natural gas liquids ^c	thousand 42-gallon barrels	650	650	700	700	750
Petroleum:						
Crude	do.	23,458	22,625	24,119	24,275 ^{r, 2}	25,000
Refinery products:						
Gasoline	do.	8,013	9,616	9,959	10,000	11,000
Jet fuel	do.	6,388	7,432	8,833	9,000	9,800
Kerosene	do.	2,118	1,794	1,511	1,300	1,100
Distillate fuel oil	do.	21,893	24,315	26,857	28,000	30,000
Residual fuel oil	do.	22,832	22,794	23,346	23,000	23,500
Lubricants	do.	1,319	1,334	1,401	1,500	1,500
Other	do.	7,066	9,251	10,264	12,000	14,000
Total	do.	69,629	76,536	82,171	84,800	90,900

^cEstimated; 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 September 9, 2008.

²Reported figure.

³Not elsewhere specified.

TABLE 2
PAKISTAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2007

(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.	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.	Chagai, Balochistan Province	22
Gas, natural	million cubic meters per day Pakistan Petroleum Ltd.	Adhi, Punjab Province; Kandhkot and Mazarani, Sindh Province; and Sui, Balochistan Province	24
Do.	do. Oil and Gas Development Co. Ltd.	37 oilfields and gasfields	31
Petroleum, crude	42-gallon barrels per day Pakistan Petroleum Ltd.	Adhi, Punjab Province	1,600
Do.	do. Oil and Gas Development Co. Ltd.	37 oilfields and gasfields	46,000
Petroleum, refined	do. Bosicor Pakistan Ltd.	Karachi	30,000
Do.	do. Pak-Arab Refinery Co. Ltd.	Mahmood Kot, Punjab Province	100,000
Steel, crude	Pakistan Steel Mills Corp. Ltd.	Karachi	1,100

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