

THE MINERAL INDUSTRY OF

PAKISTAN

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Pakistan's gross domestic product (GDP) in 1994 was \$50 billion² with a growth rate of 6.4% compared with that of 1993. The manufacturing sector accounted for 18.3% of GDP. The contribution of the mining sector towards the national economy was negligible, less than 1% of GDP. Mining has been essentially run by each province. The Government wanted all four provinces to offer standardized policies for foreign investment in this sector. With a population of 124 million, the per capita income was only \$417.

The Government adopted a policy to expand and accelerate oil and natural gas exploration. Under the new petroleum policy, the country offered a comprehensive package of incentives to lure private sector participation and increase output of petroleum products.

In the national development program, top priority had been assigned to the power sector. The Government enacted legislation to privatize the state-owned Water and Power Development Authority (WAPDA). It planned to sell two thermal powerplants and a distribution system in Faisalabad, Punjab Province. The Government also moved to turn power generation over to private companies and encourage foreign investment. Power companies are allowed to borrow up to 80% of their operating capital and foreign banks are permitted to underwrite share and bond issues. They are exempt from a variety of smaller taxes and surcharges and will pay lower stamp duty and registration fees.

The Government relaxed its policy for gold imports so that reputable companies would be permitted to buy and sell gold on the open market using their own foreign exchange facilities. There would be no restrictions on the amount imported or resold within the country. Pakistan and Iran agreed to broaden cooperation in business that covered the transfer of gas and fuels from Iran to Pakistan, the building of a joint oil refinery in Pakistan, and cooperation in mineral exploration.

Pakistan Chrome Mines planned to expand ore output and to start producing high carbon ferrochrome by converting the three furnaces at a cost of \$3 million. Chrome ore production at the Muslimbagh mines in Baluchistan Province was only 5,000 metric tons per year (mt/a) of metallurgical grade and 5,000 mt/a of nonmetallurgical grade and magnesite. The metallurgical grade ore was sold to China and the nonmetallurgical material was consumed domestically. The plan was to expand output of metallurgical grade ore to 30,000 mt/a to produce 10,000

mt/a of high carbon ferrochrome at the People Steel Mills in Karachi. Special steel production would consume one-third of the high carbon ferrochrome and the rest was to be exported to Europe and the United States. Pakistan Chrome Mines is majority-owned by Pacific Energy and Mining of the United States.

The Government restored \$40 million to the Saindak copper-gold mining project after the previous administration had cut funding by \$33 million. The project was expected to begin commercial production in May 1995 and output was targeted at 15,810 mt/a of copper, 1.47 mt/a of gold, and 2.76 mt/a of silver. The mine was being developed by China Metallurgical Construction Corp. (MCC) and Siemens AG of Germany was building a 50-megawatt (MW) thermal power station onsite. Project expenses rose to \$530 million.

A \$5-million copper refinery at the mine site was planned to treat blister copper from the Saindak project and extract the precious metal content. If the private sector did not want to put up the money for the project, the refinery would be constructed as a joint venture between MCC and Saindak Metals Ltd.

The joint venture between the Baluchistan provincial government and BHP Minerals of Australia explored and evaluated the gold potential of the Chagai District. BHP Minerals would provide loans to the Baluchistan Development Authority (BDA) for its 75% equity in the project. The area under study, covering a 5,000-square-kilometer (km²) area and stretching from Hamum Lora to Saad Koh, reportedly showed considerable potential for gold mineralization.

Pakistan Mineral Development Corp. (PMDC) continued survey work at the newly discovered Kirana Hills deposit near Sargodha in Punjab Province. The deposit contained ore averaging 60% to 65% iron. Meanwhile, the Government was considering building an iron ore pelletizing plant to treat ore from the Nokkundi deposit in northwestern Baluchistan Province. Pakistan Steel Mills planned to form a joint venture with the provincial government to build a railroad to transport the pellets to its steelworks in Karachi. Currently, the steelworks used ore imported from Australia, Brazil, and India.

Pakistan Steel Mills sought approval to transfer its ownership to the private sector to raise an initial capital base of \$827 million. The company signed a contract with Voest Alpine Industries of Austria to revamp its sinter plant in Karachi as part of a modernization program. Production

capacity of steel would rise from 1.5 to 1.85 million metric tons per year (Mmt/a) upon completion. The company also undertook to increase capacity at its Bin Oasim plant by 1.7 Mmt/a in 1996.

PMDC was negotiating with the Baluchistan government to establish a company for lead and zinc mining operations in the province. A pre-feasibility study undertaken under the auspices of the UN Development Program (UNDP) indicated that the province had 4.27 Mmt of lead and zinc ores and 2 Mmt of barite.³ The lead/zinc belt comprises 50 sites and runs across the Khuzdar and Kalat areas of Baluchistan. The province, according to the Geological Survey of Pakistan, had 6 Mmt of low-grade lead-zinc reserves with an average grade of 1% lead and 4.5% zinc.⁴ The construction of a 25,000-mt/a lead-zinc concentration and production plant was to be evaluated.

Pasminco Ltd. of Australia signed a joint venture worth \$100 million with PMDC and the provincial BDA to explore and develop lead and zinc deposits in the province. Pasminco was to invest \$10 million on a feasibility study of the Duddar Mine. Upon completion of the study, Pasminco would fund 75% of the estimated \$100 million required to develop the mine. The venture partners also would undertake regional exploration within a 3,000-km² area near Duddar at More Range and Piaro Range. The Duddar deposits were investigated by PMDC in collaboration with UNDP in the past 3 years.

Pakistan's cement industry continued its growth in 1994. The country has 22 cement companies with a total capacity of 8.6 Mmt/a. The Cherat Cement Co. plant was shut down for 3 months as its capacity was increased to 2,300 metric tons per day (mt/d) with the addition of a precalciner. As part of a program to modernize its facilities, the State Cement Corp. of Pakistan was to convert one plant from the wet process to the dry process and rehabilitate five others. F.L. Smidth & Co. of Denmark was awarded contracts for two new cement production lines at the Maple Leaf plant and at D.G. Khan Cement Co. The two new production lines would each have a capacity of 1 Mmt/a. The two projects reportedly would be partially financed by the International Finance Corp.

Fauji Fertilizers Co. at Port Qasim planned to build plants for diammonium phosphate (DAP) and urea. The DAP plant, which was due for completion in October 1997, would have a capacity of 450,000 mt/a. Jordan Phosphates Mining Co. was to hold a 10% stake and Fauji Fertilizers 30%. The other 60% would be held by the employees, the Government, and the public. The \$400 million project included fertilizer manufacturing facilities as well as several utilities, such as water treatment, power generation, and storage. The urea plant would have a capacity of 550,000 mt/a.

Capacity at Engro Chemical Pakistan's urea fertilizer plant near Daharki was planned to be expanded in two phases, from 0.6 to 1 Mmt/a. The first phase would be expanded to 750,000 mt/a by mid-1995 and required 424,500 cubic meters per day (m³/d) of natural gas. The second phase needed an extra 1.84 million m³/d of natural gas. The

company also was to build a phosphate fertilizer plant at Port Qasim.

The country has two soda ash plants with a combined capacity of 200,000 mt/a. Sind Alkalis operated a 50,000-mt/a plant, while ICI Ltd. of the United Kingdom was expanding capacity at its Khewra plant from 150,000 to 194,000 mt/a by the end of 1994.

The Thar Desert coalfields, spread over an area of 7,200 km², have huge lignite coal reserves of 90,000 Mmt⁵ with a seam thickness of 25 to 27 meters (m) at a depth of 125 to 200 m. The U.S. Agency for International Development and the U.S. Geological Survey have done work in exploring and assessing the Thar fields. The Sind government is responsible for mineral development, except oil and gas, and has encouraged private, especially foreign, investment by companies for coal mining and coal-fired power generation. The Sind Coal Authority (SCA) was established in late 1993 with the intent of expediting the development of the Thar fields. It received 50 applications from foreign companies interested in building a powerplant. The provincial government set a goal of generating 8,000 MW of electricity with coal-fired powerplants by the year 2000, more than doubling its current output.

SCA and Powerbridge Inc. of the United States signed a memorandum of understanding to develop a coal mine and coal-fired powerplant near Thatta in the Jherruck-Sonda Coal District, Sind Province. Powerbridge would conduct its own feasibility study and submit a final technical proposal. The company planned to construct a 200-MW powerplant on-site, with possible expansion to 1,000 MW. It would arrange all financing for the project and sell power directly to WAPDA.

Hopewell Energy Ltd. of Hong Kong was considering mining coal from a reserve in Sind Province to fuel coal-fired powerplants. The site reportedly contained coal low in ash and sulfur and suitable for power generation. The multibillion-dollar project was proposed to solve the country's chronic power shortage.

Pakistan produced 45 million m³/d of natural gas, providing 38% of primary energy needs. Of this amount, in descending order, 40% was used to generate power, 23% to run various industries, 20% was used for fertilizer plants, and 17% to supply to domestic and commercial consumers. The country also produced 60,000 barrels per day (bbl/d) of oil, or 22% of its total oil requirement.

The Government was to sell 30% of its holding in the proposed privatization of Sui Southern Gas Company by June 1994 under the terms of a \$160-million loan from the Asia Development Bank. The loan was being used to modernize and expand the gas company and the bank wanted a \$5 million participation in the equity of the company in addition to the 26% equity to be offered to foreign utilities. The \$655-million expansion project involved laying 50.8- and 61.0-centimeter (cm) pipelines from the Kadanwari Gasfield to Karachi, installing two 3.4-million-m³/d gas purification plants at Sui, and laying a 50.8-cm loop line between Shirkarpur and Larkana. The project was due for

completion by mid-1996.

The Government approved building a \$30-million liquefied petroleum gas (LPG) extraction plant at Hyderabad. A 100-kilometer (km) gas line from the Badin Gasfield to Hyderabad had been completed. Estimated potential output at Badin was 10.3 m³/d, from which 250 metric tons per day (mt/d) of LPG could be extracted. The country's LPG demand was 600 mt/d, but only 289 mt/d was being extracted from the gasfields.

Brown & Root of the United States and TransCanada Pipelines of Canada joined Crescent Petroleum of Pakistan in the Gulf-South Asia Gas project to build a gas pipeline from Qatar's North Field to a terminal near Karachi. The \$3.2-billion first phase of the project, which included a 1,600-km pipeline and gas transmission facilities, was expected to be completed by the end of the decade.

Oil and Gas Development Corp. (OGDC) was expected to bring on-stream 17 million m³/d of natural gas over the next 3 years, raising the country's output to 62.3 million m³/d. The company invited bids for 29 exploration blocks in Baluchistan Province for oil and gas. Union Texas Petroleum Co. of the United States would invest \$175 million from 1994-96 for exploration and production of oil and gas in the Badin area, Sind Province. Its joint venture with Occidental Petroleum Corp. of the United States and the Government would continue to explore and develop in the concession area. The Government planned to divest OGDC and 49% of its stock shares would be offered to foreign investors and the general public. A catalytic reformer unit would be added to the Attock Refinery in order to produce premium-grade gasoline with reduced lead content.

OGDC announced its exploration and production goals for the eighth 5-year plan that it would drill 142 exploration wells and produce 123,317 bbl/d of crude oil, compared with current output of 60,000 bbl/d. Natural gas production was slated to rise to 71 million m³/d. OGDC and Lasmo PLC of the United Kingdom signed a new natural gas exploration license agreement to cover an area of 3,300 km² in western Sind Province. Lasmo and Shell Oil each controlled a 47.5%-interest and the Government owned a 5%-share in the project.

An 8-month drought wiped out water reserves at several hydroelectric power stations, reducing the country's energy production by one-third. Meanwhile, the second Russian-made unit of the Muzaffargarh thermal power station in southern Punjab caught fire and burned to the ground. A bill was passed for the privatization of WAPDA, which had controlled 80% of the country's generating capacity. The Government moved to expedite private-sector proposals for 19 new powerplants.

The World Bank promised to secure external financing for

the \$2.3-billion Ghazi Borotha hydropower project on the Indus River. A dam at Ghazi was to be connected by a 64-km underground channel to a power station at Borotha with a head of 76 meters. Construction of the first 290-MW unit was expected to take 4 years.

The \$1.8-billion Hub River project, owned by Hub Power Co., for an oil-fired powerplant along the coastline of Baluchistan was slated to open in early 1997 and expected to increase generating capacity by 15% to produce 1,300 MW of electricity. The World Bank approved a \$250-million loan along with a political-risk guarantee for a \$240-million commercial bank loan. The local government intended to raise \$2.39 billion for the powerplant and various related projects, including a pipeline to transport fuel oil to powerplant sites. Hub Power Co. is a consortium led by Mitsui & Co. of Japan, Xenal Industries of Saudi Arabia, and National Power Ltd. of the United Kingdom, with National Power as operator of the plant.

The Government signed agreements for 19 power projects worth \$5 billion that together would generate 5,000 MW of electricity. In addition, new oil pipelines, a \$2.5-billion railroad to transport oil from Karachi's port to inland plants, and the laying of seven 500-kilowatt transmission lines, costing about \$2.5 billion, were planned.

Midlands Electricity Ltd. of the United Kingdom and Tenaska International and Hawkins Oil and Gas, both of the United States, planned to build a gas-fired powerplant at the Uch Gasfield. The 584-MW, \$600-million powerplant was likely to be completed before 1998.

AES Corp. of the United States was to build two 360-MW thermal powerplants for \$700 million. The plants would be located at Lal Pir and Sidhnai in Punjab Province.

Consolidated Electric Power Asia (CEPA) of Hong Kong was to build a \$5.5-billion coal-fired powerplant and a \$2-billion transmission network, and develop and Thar coalfields, as well as roads and rail links in Sind Province. CEPA would build a 5,280-MW powerplant comprised of eight 660-MW units. The first unit was due to come on-stream by December 1997 and the last by mid-2000. Initially, imports of 30 Mmt/a of coal were needed until the Thar coalfields were ready for production. With electricity consumption rising by 12% a year, the country would need \$1 billion a year of new investment to keep up with the demand.

¹Text prepared June 1995.

²Where necessary, values have been converted from Pakistani rupees (R) to U.S. dollars at the rate of R30.21=US\$1.00 for 1994.

³Platt's Metals Week, Apr. 11, 1994, p. 7.

⁴Mining Journal, June 3, 1994, p. 403.

⁵Official figures of the Sind Ministry of Industries, Commerce, and Mineral Development in State Dept. telegram, Apr. 1994.

TABLE 1
PAKISTAN: PRODUCTION OF MINERAL COMMODITIES 1/ 2/

(Metric tons unless otherwise specified)

Commodity	1990	1991	1992	1993	1994 e/
METALS					
Aluminum: Bauxite, gross weight	2,580	4,320	3,460	4,850	5,000
Antimony ore:					
Gross weight	59	75	83	--	--
Sb content e/	9	11	12	--	--
Chromium: Chromite:					
Gross weight	18,200	31,500	22,900	22,200	23,000
Cr content e/	6,000	10,400	7,500	7,400	7,500
Iron and steel: e/					
Pig iron	1,000	1,100	1,100	1,200	1,200
Steel, crude	1,000	1,000	1,000	1,100	1,100
Lead, refined, secondary e/	2,500	2,500	3,000	3,000	3,000
INDUSTRIAL MINERALS					
Abrasives, natural: Emery	55,000	10,800	298	666	700
Barite	23,300	28,800	32,400	26,300	25,000
Cement, hydraulic	7,490	7,760	7,790	8,320	8,300
Chalk	3,180	5,430	4,280	4,770	4,800
Clays:					
Bentonite	3,240	5,110	6,060	7,990	8,000
Fire clay	81,900	136,000	123,000	132,000	130,000
Fuller's earth	16,500	22,100	22,000	20,900	21,000
Kaolin (china clay)	61,600	44,700	37,400	37,200	38,000
Other	1,010,000	1,860,000	1,270,000	1,730,000	1,500,000
Feldspar	10,200	10,200	19,200	17,000	17,000
Fluorspar e/	5,310 /3	5,300	5,000	5,100	5,000
Gypsum, crude	478,000	522,000	462,000	535,000	540,000
Magnesite, crude	4,270	5,190	6,480	4,160	4,000
Nitrogen: N content of ammonia	1,210,000	1,150,000	1,140,000	1,450,000	1,450,000
Phosphate rock:					
Gross weight	42,000 /e	19,000	19,800	13,800	15,000
P2O5 content e/	13,000	5,930 /3	6,000	4,300	5,000
Pigments, mineral, natural: Ocher	1,380	1,890	5,130	6,200	6,000
Salt:					
Rock	763	769	853	895	900
Marine	14	12	10	14	13
Total	777	781	863	909	913

See footnotes at end of table.

TABLE 1-- Continued
 PAKISTAN: PRODUCTION OF MINERAL COMMODITIES 1/ 2/

(Metric tons unless otherwise specified)

Commodity	1990	1991	1992	1993	1994 e/
INDUSTRIAL MINERALS--Continued					
Sand:					
Bajri and common e/	220,000	220,000	238,000	378,000	380,000
Glass	131,000	151,000	135,000	168,000	170,000
Sodium compounds, n.e.s.:					
Caustic soda	61,000 /e	78,500	60,000	81,400	80,000
Soda ash, manufactured	135,000 /e	147,000	146,000	186,000	180,000
Stone:					
Aragonite and marble	254,000	332,000	331,000	385,000	390,000
Dolomite	82,600	213,000	153,000	193,000	190,000
Limestone thousand tons	7,810	8,430	8,760	9,070	9,000
Other (reported as "ordinary stone") do.	600 /e	46	50 /e	50	50
Strontium minerals: Celestite	1,800	1,470	1,450	1,680	1,500
Sulfur:					
Native	175	255	140	410	400
Byproduct, all sources e/	25,000	26,000	26,000	27,000	27,000
Total e/	25,200	26,300	26,100	27,400	27,400
Talc and related materials: Soapstone	30,200	33,600	23,700	46,800	45,000
MINERAL FUELS AND RELATED MATERIALS					
Coal, all grades thousand tons	2,730	3,040	2,750	3,310	3,000
Coke e/ do.	620	650	650	670	670
Gas, natural:					
Gross production million cubic feet	500,000	518,000	551,000	584,000	590,000
Marketed production (sales) e/ do.	425,000	450,000	450,000	500,000	500,000
Natural gas liquids e/ thousand 42-gallon barrels	80	80	85	85	85
Petroleum:					
Crude do.	19,000	23,000	22,700	21,500	22,000
Refinery products: /e					
Gasoline thousand 42-gallon barrels	7,200	7,200	7,300	7,300	7,400
Jet fuel do.	4,000	4,200	4,200	4,500	4,500
Kerosene do.	3,200	3,200	3,200	3,300	3,300
Distillate fuel oil do.	13,200	13,500	13,600	13,600	13,800
Residual fuel oil do.	12,100	12,200	12,300	12,300	12,400
Lubricants do.	1,000	1,200	1,200	1,300	1,300
Other do.	4,100	4,100	4,200	4,200	4,300
Total do.	44,800	45,600	46,000	46,500	47,000

e/ Estimated.

1/ Previously published and 1994 data are rounded by the U.S. Bureau of Mines to three significant digits; may not add to totals shown.

2/ Table includes data available through June 8, 1995.

3/ Reported figure.