



2014 Minerals Yearbook

PAKISTAN [ADVANCE RELEASE]

THE MINERAL INDUSTRY OF PAKISTAN

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Pakistan is rich in such mineral resources as clays (including china clay and fireclay), copper, dolomite, gypsum, iron ore, limestone, marble (onyx), salt, sand and gravel, and silica sand; coal, crude oil and natural gas; and precious and semiprecious stones. Pakistan ranked 3d in world production of iron oxide pigments, 10th in world production of barite, and 16th in world production of cement. The country is among the world's 18 leading producers of white cement (Kuo, 2014; Global Cement, 2014d; McRae, 2016; Tanner, 2016; van Oss, 2016).

Minerals in the National Economy

Pakistan's real gross domestic product (GDP) increased by 4.1% in 2014 compared with an increase of 3.7% (revised) in 2013 owing to an increase in the output of the construction sector and expansion of the manufacturing and services sectors. Pakistan's industrial sector accounted for 20.8% of the GDP in 2014 compared with 20.9% (revised) in 2013. Manufacturing accounted for 65.0% of the overall industrial sector output in 2014 compared with 63.0% in 2013; the sector accounted for 13.5% of the GDP, which was an increase of 5.6% in 2014 compared with an increase of 3.5% in 2013. The mining and quarrying sector accounted for 14.5% of the industrial sector in 2014 compared with 14.7% in 2013, and 3.0% of the GDP in 2014 compared with 3.1% in 2013. The rate of growth of the mining and quarrying sector was 4.4% in 2014 compared with 3.8% (revised) in 2013. In 2014, despite the 3.7% rate of growth for electricity generation and distribution and gas distribution sectors, Pakistan continued to face power shortages. The power shortages had a negative effect on the country's economy and constrained the rate of growth of the GDP. The Government approved the use of grid-connected solar energy, installation of rooftop solar panels, and mortgage financing for installation of home solar panels to ameliorate the energy crisis in Pakistan in 2014. After the World Bank offered to finance the feasibility study for and installation of a transmission line to send electricity to Pakistan from 1,200 megawatts (MW) of generating capacity in India, a memorandum of understanding between the Governments of India and Pakistan was approved by both countries in 2014. The importation of electricity by Pakistan from India was expected to start in January 2015 (Ministry of Finance, 2013b, p. 7–8, 11; Economic Times, The, 2014; Ministry of Finance, 2014c, p. ii; Saeed, 2014).

Foreign direct investment (FDI) increased to \$1.75 billion in 2014 from \$1.33 billion in 2013. Oil and gas exploration was of major interest to foreign investors (Asian Development Bank, 2015, p. 172; United Nations Conference on Trade and Development, 2015).

Government Policies and Programs

The National Mineral Policy (NMP) of 1995 was amended and implemented by the Ministry of Petroleum and Natural

Resources in February 2014. Minerals, not including nuclear minerals, such as uranium, are located in special federating units, including federally administered tribal areas, the Islamabad Capital Territory, and the International Offshore Water Territory. The NMP states that Provincial governments and federating units are responsible for the regulation, detailed exploration, mineral development, and safety of these operations and for making decisions related to these activities. Federal responsibilities include geologic and geophysical surveying and mapping, national and international coordination, and formulation of national policies and plans. The Federal Government provides support and advice to the Provinces. Royalties on the mineral commodities produced are determined periodically by the respective government and paid to the Provincial governments, federating units, and the Federal Government (Ministry of Petroleum and Natural Resources, 2013, p. 8, 18).

In 2012, the Home Department within the government of Sindh Province had imposed a ban on illegal excavation of sand and gravel and precious stones within the Thatta District under section 144 of the Criminal Procedure Code (Cr.P.C.). Police were directed to take strict action against violators and were authorized to register complaints under section 188 of the Pakistan Penal Code for violations of section 144 of the Cr. P.C. As of 2014, no update on the ban was available (Onepakistan News, 2012; Pakistan Newswire, 2012).

In January 2013, the Mines and Minerals Department of Punjab Province awarded 110 fireclay exploration licenses. The licenses awarded used modern equipment to dig and identify new areas of fireclay resources. In 2014, the Ministry for Petroleum and Natural Resources, after achieving an agreement among all Provinces and finalizing the Model Petroleum Concession Agreement and the Model Exploration License for onshore natural gas and oil exploration, awarded 50 petroleum exploration blocks with a total area of 103,348 square kilometers (km²) to eight companies; 38% of the blocks were under exploration by yearend. The petroleum concession agreements and the exploration licenses were signed by the Minister of Petroleum and Natural Resources in February 2014. Oil and Gas Development Co. Ltd. (OGDCL) was awarded 29 exploration blocks; Pakistan Petroleum Ltd. (PPL), 10; Pakistan Oilfields Ltd. (POL), 3; Al-Haj Enterprises and Oil and Gas Investment Ltd., 2; and Tallahassee Petroleum Inc. of Canada, Mari Petroleum Ltd., OMV (Pakistan) Exploration GmbH, and Ocean Pakistan Ltd., 1 each. Of the 50 exploration blocks, 21 were located in Balochistan Province, with a total area of 45,770 km²; 15 were located in Punjab Province, with a total area of 32,272 km²; 8 were located in Khyber Pakhtunkhwa Province, with a total area of 10,550 km²; and 6 were located in Sindh Province, with a total area of 14,756 km² (Associated Press of Pakistan, 2013; Ministry of Petroleum and Natural Resources, 2014a, b).

In February 2014, the Government of Pakistan signed eight additional petroleum concession agreements and eight additional exploration licenses with Al-Haj Enterprises (Pvt.) Ltd. for Block No. 3169–4 in Baska North and Block No. 3271–6 in Potwar South; OGDCL for Orkzai Block No. 3369–1, Hetu Block No. 3170–7, and Zargarh Block No. 2868–7; OMV (Pakistan) Exploration GmbH and PPL for Margand Block No. 2866–4 and Kuhan Block No. 2867–5; and PPL for Block No. 2569–5 in Khipro East (Ministry of Petroleum and Natural Resources, 2014b).

In 2014, Pakistan's Government awarded China Harbor Works of China a \$130 million contract to construct the first Pakistan International Bulk Terminal (PIBT) at Port Qasim. The total cost for the construction of the PIBT, including equipment, was estimated to be \$250 million. In the first phase, the terminal was expected to handle 12 million metric tons per year (Mt/yr) of imported coal, 5 Mt/yr of cement, and 2 Mt/yr of clinker. In the second phase, the terminal was expected to handle 20 Mt/yr of coal. The construction of the terminal was expected to start in 2014 and to be completed in 2016 (Global Cement, 2014c).

Production

Production of dolomite increased by 174%; feldspar, by 114%; fuller's earth, by 100%; bentonite, by 95%; antimony and sulfur, native, by 43% each; bauxite (gross weight), by 23%; gypsum, by 17%; petroleum, crude, by 16%; soda ash, by 15%; fluorspar, by 12%; fireclay and uranium (processed, U content), by 10% each; and cement, by 3%. Production of phosphate rock (P_2O_5 content) decreased by 66%; coal, coke, iron ore, and magnesite, by 44% each; chalk, by 38%; kaolin, by 35%; chromium ore (gross weight and Cr_2O_3 content), by 28% each; silica sand, by 26%; talc, by 25%; phosphate rock (gross weight), by 15%; ocher and pig iron, by 14% each; marble, by 13%; and crude steel, by 7%. Data on mineral production are in table 1.

Structure of the Mineral Industry

Table 2 is a list of major mineral industry facilities.

Mineral Trade

In 2014, Pakistan's total exports increased by 2.4% to \$25.1 billion from \$24.5 billion in 2013. Pakistan's exports of chemicals and chemical products increased by 5.91%; cement, by 2.50%; and petroleum products, by 4.69%. Pakistan exported cement to Afghanistan, Djibouti, India, Iraq, Kenya, Mozambique, South Africa, Sri Lanka, Sudan, and Tanzania. Pakistan's major export partners were, in order of value, the countries of the European Union (21.2%), the United States (15%), China (10%), the United Arab Emirates and Afghanistan (7% each), and the United Kingdom (6%). Exports of gemstones and jewelry increased to \$1.3 billion in 2013 from that of 2012 (Ministry of Finance, 2013c; 2014d, p. 121; Ministry of Commerce, 2014; Pakistan Bureau of Statistics, 2014).

Pakistan's total imports increased by 0.3% to \$45.1 billion in 2014 compared with \$44.95 billion (revised) in 2013. The main import categories were, in order of value, manufactured iron and steel (\$1.1 billion), iron and steel scrap (\$589 million),

fertilizer (\$584 million), gold (\$28 million), petroleum products (\$7.5 million), and crude petroleum (\$4.7 million) (Ministry of Commerce, 2014; Ministry of Finance, 2014d, p. 122; Pakistan Bureau of Statistics, 2014; Trade Development Authority of Pakistan, 2014, p. 23, 28, 31–33, 39).

Commodity Review

Metals

Copper and Gold.—In 2014, gold was produced at the Saindak copper and gold mine, which remained the only producing copper and gold mine in Pakistan. The Saindak copper and gold mine, which is located in the Chagai Hills in Balochistan Province, also produced copper. In 2014, despite a reduction in minable ore and increased hardness of ore, the Metallurgical Corp. of China Ltd. (MCC) reported production of 13,122 metric tons (t) of copper content. The agreement on mining licenses between MCC and the Government for the Saindak copper and gold mine was extended until October 2017 (Metallurgical Corporation of China Ltd., 2013, p. 18; 2014, p. 21; Bullion Street, 2014).

FDI in the Reko Diq copper and gold mining project was estimated to be \$3.3 billion; the project was expected to receive the largest influx of FDI of any project in Pakistan. The Reko Diq deposit is located in northwestern Balochistan Province. Tethyan Copper Corp. (Pvt.) Ltd. (Tethyan), which was a joint venture of Antofagasta plc of the United Kingdom and Barrick Gold Corp. of Canada, owned 75% of the Reko Diq project, and the remaining 25% was owned by the government of Balochistan Province. Tethyan conducted a feasibility study in August 2010; the total mineral resource was estimated to be 5.81 million metric tons (Mt) at a grade of 0.41% copper and 0.22 gram per metric ton (g/t) gold. The economic reserve was estimated to be 2.17 Mt at an average grade of 0.53% copper and 0.30 g/t gold. Reko Diq's production capacity was expected to be 196,800 metric tons per year (t/yr) of copper and 8,040 kilograms per year of gold from 560,500 t/yr of concentrate. In February 2011, Tethyan submitted a mining lease application, which included an environmental and social impact assessment. The application was rejected by the government of Balochistan Province in November 2011 for unknown reasons. In 2013, Tethyan decided to seek monetary damages from the Government of Pakistan under the auspices of the International Center for the Settlement of Investment Disputes (ICSID) and the government of Balochistan Province under the auspices of the International Chamber of Commerce (ICC). The hearing for the ICC was scheduled for June 23, 2014, and the hearing for the ICSID was scheduled for October 6, 2014. In 2014, the ICSID encouraged the Government of Pakistan and Tethyan to try to negotiate an out-of-court settlement. If the two sides could reach a mutual agreement, the award request would be delayed, and arbitration would be suspended (Tethyan Copper Co., 2010a, b; Mining Weekly, 2011; Antofagasta plc, 2013, p. 159; MacDonald, 2013; Balochistan Development Authority, 2014; Kiani, 2014).

In 2014, Lake Resources N.L. (Lake) of Australia entered into an exclusive agreement with Colt Resources Middle East (CRME)

of the United Arab Emirates for the Chagai Hills project, which is located in Balochistan Province. The Chagai Hills project, for which Lake Resources was granted an exploration license in 2009, contains three exploration licenses—the Amalaf, the Dasht-i-Gauran, and the Koh-i-Sultan. The Amalaf project covers an area of 46.9 km² and is located on the northern boundary of the Saindak copper-gold mine; the Dasht-i-Gauran covers an area of 29.12 km² and is located west of the Reko Diq project; and the Koh-i-Sultan copper-gold deposit covers an area of 85.1 km² associated with intensively altered breccia and volcanics. Lake conducted drilling at Koh-i-Sultan in 2012. Drilling results included 14 meters (m) containing 2.20 g/t gold and 0.32% copper, and 10 m containing 2.96 g/t gold and 0.44% copper (Lake Resources N.L., 2014a, p. 1, 4, 6; 2014b, p. 2, 35).

Iron Ore and Iron and Steel.—According to the Ministry of Industries and Production, Pakistan Steel Mill Corp. (Pvt.) Ltd. (PSM) was the country's leading state-owned industrial complex in Pakistan in terms of steel output. PSM's capacity utilization decreased by 25% in May 2012 and by 19% in May 2013; by July 2013, PSM's capacity utilization decreased further by 12% owing to a shortage of coke feedstock, raw materials, and capital. PSM had a loss of \$8.2 million (PKR86.27 billion)¹ in June 2013, and the loss increased to \$9.4 million (PKR98.83 billion). The Government decided to privatize PSM and to sell 26% of its stake in the company. The Government also planned to introduce a voluntary separation plan at PSM to reduce the number of employees. PSM had about 4,800 employees in 2013; after layoffs, the total number would be 4,000 employees. In 2013, the Government approved a plan for the reconstruction of PSM. The Government of Russia expressed interest in investing \$1 billion to modernize the complex and to increase PSM's production capacity. After modernization, the production capacity was expected to increase to 1.5 Mt/yr or possibly to 3 Mt/yr from the current 1.1 Mt/yr. PSM had two furnaces with a total crude steel production capacity of 1.1 Mt/yr; however, the second furnace had not been operational for more than 1 year. In 2014, PSM received \$178.6 million in bailout packages (could be cash, bonds, loans, or stocks) from the Government. As of October 2014, the PSM stopped crude steel production, and production was not expected to resume in the near future (Kiani, 2013; Ministry of Finance, 2013b, p. 35; Salman, 2013; Siddiqui, 2013; Metal Bulletin, 2014, p. 11).

Bolan Mining Enterprise (BME), which was one of the leading barite-producing enterprises in Pakistan, was a joint venture of the government of Balochistan and Pakistan Petroleum Ltd. (PPL) (50% each). BME had two iron ore mining licenses. The iron ore mines are located northwest of the Nokkundi region of Balochistan Province. POSCO of the Republic of Korea and Al-Ittifaq Steel Production Co. (ISPC) of Saudi Arabia signed a memorandum of agreement with the Government of Pakistan for the development of the Nokkundi iron ore deposit. BME planned to set up a beneficiation plant with a production capacity of 1 Mt/yr of iron ore concentrates. The beneficiation plant was expected to begin

production by 2015 or 2016 (Bolan Mining Enterprise, 2013; Pakistan Petroleum Ltd., 2013, p. 60; 2014b).

Lead and Zinc.—Since 2012, production at the Duddar zinc-lead mine, which is located in the Lasbella District in Balochistan Province, was suspended owing to maintenance of the site and underground system. The Duddar zinc-lead mine was a joint venture project between MCC (75%) and the Pakistan Mineral Development Corp. (PMDC) and the government of Balochistan Province (25%). In July 2014, China Huaye Group Co. Ltd. of China (a subsidiary of Metallurgical Corp. of China) won a bid for the Duddar zinc-lead mine project and began repair and maintenance of onsite equipment (table 2; Metallurgical Corporation of China Ltd., 2012, p. 23; 2013, p. 19; 2014, p. 22).

Industrial Minerals

Cement.—Cement played an important role in Pakistan's manufacturing sector. In 2014, D.G. Khan Cement Co. Ltd., Fauji Cement Co. Ltd., and Lucky Cement Ltd., started using biofuels for operations as an energy source, and Bestway Cement Ltd. of the United Kingdom, Cherat Cement Co. Ltd., D.G. Khan Cement, Fecto Cement Ltd., and Lucky Cement also installed heat recovery plants to generate their own electricity (table 2; Ministry of Finance, 2014b, p. 52). Demand for cement increased by 3% in 2014 and was expected to increase by 1 Mt/yr for the next 5 years owing to the World Bank Group's Board of Executive Directors's approval of financing from the International Development Association for the development of the Dasu Hydropower stage-1 construction project (DHP-1). The total cost of constructing the dam was estimated to be \$4.8 billion. Cement for the project was expected to be provided by the following cement companies: Bestway Cement, Cherat Cement, D.G. Khan Cement, Fauji Cement, Fecto Cement, and Maple Leaf Cement Factory (Global Cement, 2014d; World Bank Group, 2014).

D.G. Khan Cement produced 3.6 Mt of clinker and 3.99 Mt of cement in 2014 compared with 3.9 Mt of clinker and 4.03 Mt of cement in 2013. D.G. Khan Cement was planning to start construction of a new cement plant at Hub in Balochistan Province with a production capacity of 2 to 2.5 Mt/yr. The cost of the construction was estimated to be \$250 million. The plant was expected to start operations in 2018 (D.G. Khan Cement Co. Ltd., 2014, p. 26; Global Cement, 2014e).

The merger of the Farooqia plant of Pakistan (formerly Mustehkam Cement Ltd.) and Bestway Cement was approved in May 2013 under the name Bestway Cement Ltd. (a subsidiary of Bestway Group). The purpose of the merger was to reduce administrative, marketing, and procurement costs. Before the merger, Bestway Cement owned two cement plants with production capacities of 1.23 Mt/yr and 3.6 Mt/yr, respectively, which were located near the village of Tatal in Chakwal District, Punjab Province. The Farooqia plant's production capacity was 1.09 Mt/yr. After the merger, the combined production capacity of Bestway Cement increased to 6 Mt/yr. In 2014, Bestway Cement acquired an 87.93% share of Lafarge Pakistan Cement Ltd.'s cement plant in Chakwal District, which had a production capacity of 2.5 Mt/yr. The total production

¹Where necessary, values have been converted from Pakistani rupees (PKR) to U.S. dollars (US\$) at an average rate of PKR105.15=US\$1.00 for 2013

capacity of Bestway Cement after acquiring the Lafarge cement plant was 8 Mt/yr (Bestway Cement Ltd., 2013, p. 1, 2; Cemnet, 2013; Global Cement, 2014a).

In 2014, Cherat Cement planned to invest \$197 million to construct a new production plant at Nowshera in Khyber Pakhtunkhwa Province with a production capacity of 1.3 Mt/yr. The plant was expected to start operations in 2016 (Global Cement, 2014b).

Mineral Fuels

Coal.—According to the Lahore Chamber of Commerce and Industry, coal resources in Pakistan were estimated to be 186 billion metric tons (Gt), including 175 Gt of resources at the Thar coalfields. In 2014, coal production in Pakistan decreased by 3%. In 2013, the major consumers of coal in the country were the cement sector, which accounted for 58% of total coal consumption, and brick kilns, which accounted for 41% of total coal consumption. The increase in coal consumption by cement plants was attributed to their transition to coal from natural gas. In 2014, development of the Thar (a lignite coalfield) was an important project for the Government because it would improve the country's energy security (Ministry of Finance, 2013a, p. 193; 2014a, p. 244; Daily Times, 2014).

Oracle Coalfields plc of the United Kingdom acquired a 30-year mining license for Block IV of the Thar lignite coalfield; it covers an area of 66.1 km² and is located in Sindh Province in southeastern Pakistan. The drilling results of Block IV indicated 1.4 Mt of in situ coal. According to the Joint Ore Reserve Committee (JORC)-compliant assessment, the resources (including measured, indicated, and inferred) were estimated to be 529 Mt and the proven reserves were estimated to be 113 Mt. In September, Oracle Coalfields signed a joint-development agreement with China Engineering Co. for the development of the proposed mine in Block IV. In November, Oracle Coalfields signed a memorandum of understanding with Solar Electric Power Co. (SEPCO) of China for the development of a 600-MW-capacity powerplant and with Lucky Cement and Thatta Cement Co. Ltd. for coal supply. Oracle Coalfields conducted a technical feasibility study, which indicated the possibility of open pit mining with a capacity of 5 Mt/yr of coal. The company signed an Engineering Procurement and Construction (EPC) framework agreement with SEPCO for the construction of a 600-MW-capacity powerplant and development of a 4-Mt/yr-capacity open pit mine. In 2014, Sindh Carbon Energy Ltd. was notified that the mining licenses for Block IV had been canceled; no explanation for the cancellation was provided (Oracle Coalfields plc, 2013, p. 2–3, 6; 2014a, p. 2; 2014b, p. 3).

In May 2012, United Coal Holdings Ltd. of Canada (formerly Copper Minerals Inc. of Canada), through its subsidiary AJK Mining Company (Pvt.) Ltd., acquired a coal property in the Kotli coal district in the States of Azad Jammu and Kashmir (AJK). United Coal Holdings held a 60% interest in the coal property, which is located within the Navel and Planna areas and the village of Karjai in the Tehsil and Kotli Districts of AJK. By October 2012, the company had extracted 492 t of coal for the trial, and sold it to local cement companies. In November 2013,

the company slowed down the exploration drilling owing to limited funding. Reserves had not been estimated for the property. The mining licenses held by AJK Coal Mining Co. (Pvt.) Ltd., which had been established for exploration and development of the area, expired. The application to renew the exploration license was filed, and final approval was pending (InfoMine, 2013, p. 1–3; United Coal Holdings Ltd., 2014a; 2014b, p. 2–3).

Natural Gas and Crude Oil.—Pakistan's energy sectors and industries were heavily dependent on natural gas and crude oil. In 2013, power shortages took place owing to a minimal increase in the supply of natural gas, which continued in 2014. Natural gas and petroleum were produced by PPL, OGDCL, POL, and OPL (Ministry of Finance, 2013a).

In 2014, PPL's shareholding was divided between the Government (68%), private investors (25%), and PPL Employees Empowerment Trust (7%). In 2014, PPL operated six producing natural gas fields, including Adhi, Chachar, Hala, Kandhkot, Mazarani, and Sui, and had a working interest in 11 other partner-operated producing fields. Total production from PPL's wholly owned fields and joint-venture-operated fields was 8.8 million cubic meters of natural gas and 3.8 million barrels (Mbbbl) of crude oil. The recoverable reserves of the Sui natural gas field were depleted; it was estimated to be 3.9 million cubic meters in 2014 compared with 4.5 million cubic meters in 2013. The mining license for the Sui natural gas field was expected to expire in 2015. Natural gas from the Kandhkot natural gas field was used at the Gudu thermal powerplant. The recoverable reserves at the Kandhkot natural gas field were estimated to be 152.9 million cubic meters of natural gas and 18 billion barrels of condensate. The Mazarani natural gas field, which was a joint venture between PPL (87.5%) and Government Holdings (Pvt.) Ltd. (GHPL) (12.5%), had recoverable reserves estimated to be 1.2 billion cubic meters of natural gas and 0.22 million barrels of condensate. In 2014, four wells were drilled in the Mazarani natural gas field, and only three wells were in operation. The Adhi natural gas field was a joint venture of PPL (operator) (39%), OGDCL (50%), and POL (11%). The recoverable reserves of the Adhi natural gas field were estimated to be 1.3 billion cubic meters of natural gas and 6 Mbbbl of natural gas liquids (NGLs). As of 2014, 12 wells were operating at the Adhi natural gas field. The engineering, procurement, construction, and commissioning contract was signed in 2014 for the construction of a 310-million-cubic-meter-per-year liquefied petroleum gas (LPG) and NGL plant (Plant-III). The plant was expected to be operational in 2015. The Chachar natural gas field, which was a joint venture between PPL (75%) and the GHPL (25%), had recoverable reserves estimated to be 9.3 billion cubic meters of natural gas. As of 2014, the Chachar 1 and Chachar 2 wells were in production, and the Chachar 3 and Chachar 4 wells were abandoned owing to water load-up. Production from the Chachar natural gas field declined to 9.3 million cubic meters per day in 2014. In 2014, the Hala natural gas field, which was a joint venture between PPL (65%) and Mari Petroleum Co. Ltd. (MPCL) (35%), produced natural gas, condensate, and LPG from the Adam-X1 well under extended well testing. The Hala plant was recommissioned in 2014; the second well was spud and drilling was in progress, and

exploratory drilling for the third well was planned to start in 2015. PPL announced a natural gas and condensate discovery at the Shraft X-1 well in Sanaghar District. Two additional zones were identified and were expected to be tested; the cumulative production was expected to be 2.7 million barrels per year (Pakistan Petroleum Ltd., 2014a, p. 41–43; 2014c, d).

In 2014, OGDCL produced 15.1 Mbbbl of crude oil and 12.1 million cubic meters of natural gas. In 2013, OGDCL discovered natural gas and gas condensate during exploration of the Saand Well 01 in the Tando Allah Yar District and the Maru East-1 well in Ghotki District in Sindh Province. The test for hydrocarbon potential of the Low Gory Formation at Saand Well 01 yielded 60.4 million cubic meters per year of natural gas and 23,725 barrels per year of condensate. In 2014, OGDCL continued exploration at both areas (Oil and Gas Development Co. Ltd., 2013a, p. x; 2013b; 2014, p. ii, 2, 31).

Outlook

The power and industrial sectors of Pakistan are heavily dependent on natural gas and coal. The Government is actively trying to increase the energy supply in the country by awarding petroleum exploration licenses, developing coalfields, and approving the use of grid-connected solar energy, installation of rooftop solar panels, and mortgage financing for the installation of solar panels on homes. Construction of the Dasu dam and improvements in infrastructure are likely to increase cement production during the next 5 years. Steel and metal production, however, are likely to continue to decrease owing to aging technology and a lack of funding and new investments at production facilities. Pakistan's GDP is expected to increase by 4.2% in 2015 (Asian Development Bank, 2015, p. 170).

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TABLE 1
PAKISTAN: PRODUCTION OF MINERAL COMMODITIES^{1,2}

(Metric tons unless otherwise specified)

Commodity	2010	2011	2012	2013	2014
METALS					
Antimony	25	--	12	89	127
Bauxite, gross weight	9,031	9,033	30,223	25,288	31,156
Chromium ore:					
Gross weight	232,000 ^r	134,000 ^r	207,000 ^r	96,000 ^e	69,000
Cr ₂ O ₃ content	104,000 ^r	60,000 ^r	93,000 ^r	43,000 ^r	31,000
Copper, mine output, Cu content	18,805 ^r	18,016 ^r	19,211 ^r	13,500	13,122
Iron and steel:					
Iron ore, gross weight	418	430	384	412	255
Fe content, 32%	134	138	123	132	82
Pig iron	415 ^r	358 ^r	198 ^r	165 ^r	142
Steel, crude	800 ^r	850 ^r	850 ^r	972 ^r	900 ^e
Lead, refined, secondary ³	2,522 ^r	2,268 ^r	-- ^r	-- ^r	--
Zinc, Zn content ³	21,812 ^r	19,457 ^r	-- ^r	-- ^r	--
INDUSTRIAL MINERALS					
Barite	57,000	32,000	49,000	118,000	131,000
Cement, hydraulic	31,358	28,716	29,557	31,098	31,960
Silica sand	369,000 ^r	262,000 ^r	348,000 ^r	301,000 ^r	222,000
Chalk	1,322	1,422	1,500	1,600	1,000
Clays:					
Bentonite	34,596 ^r	30,840 ^r	16,520	22,000 ^r	43,000
Fireclay	329,055	274,042	408,000 ^r	410,000 ^r	450,000
Fuller's earth	11,210 ^r	4,200 ^r	6,906	4,000 ^r	8,000
Kaolin, china clay	22,000 ^r	14,000 ^r	23,000 ^r	20,000 ^r	13,000
Feldspar	54,198 ^r	23,254 ^r	53,235	38,218	81,858
Fluorspar	290	3,156 ^r	6,859 ^r	8,000 ^{e,r}	8,938
Gypsum, crude	742,000 ^r	1,164,000 ^r	1,276,000 ^r	1,229,000 ^r	1,436,000
Magnesite, crude	5,159	4,908	5,444	6,705	3,730
Nitrogen, N content of ammonia	2,800	2,700	2,300	2,700	2,600
Phosphate rock:					
Gross weight	87,807	30,950	69,400	104,961 ^r	89,000
P ₂ O ₅ content	15,800	5,567	12,484	47,272 ^r	16,000
Pigments, mineral, natural, ocher	55,352	36,078 ^r	42,107 ^r	37,769 ^r	32,634
Salt:					
Marine	190	315	292	297	300
Rock	1,941 ^r	2,173 ^r	2,091 ^r	2,263 ^r	2,241
Total	2,131 ^r	2,488 ^r	2,383 ^r	2,560 ^r	2,541
Sand and gravel	37,604	38,215	--	381,863 ^r	387,971
Sodium compounds, n.e.s.: ⁴					
Caustic soda	173 ^r	144 ^r	192 ^r	172 ^r	166
Soda ash, manufactured	393 ^r	372 ^{r,3}	367 ^r	379 ^r	437
Stone:					
Dolomite	130,000	240	198	219	600
Limestone	34,049 ^r	33,900 ^r	38,803 ^r	36,133	36,133
Marble	1,065 ^r	1,133 ^r	1,751 ^r	2,360 ^r	2,057
Strontium minerals, celestite	160	--	--	--	--
Sulfur, native	27,100	28,000	26,000	21,000	30,000
Talc, and related materials, soapstone	121,800	114,100	110,000	93,214	70,000
MINERAL FUELS AND RELATED MATERIALS					
Coal, lignite, bituminous	3,367 ^r	3,207 ^r	3,378 ^r	2,985 ^r	3,085
Coke	343	302	193	203	113

See footnotes at end of table.

TABLE 1—Continued
 PAKISTAN: PRODUCTION OF MINERAL COMMODITIES^{1,2}

(Metric tons unless otherwise specified)

Commodity	2010	2011	2012	2013	2014	
MINERAL FUELS AND RELATED MATERIALS—Continued						
Gas, natural:						
Gross production	million cubic meters	42,362 ^r	42,362 ^r	43,806 ^r	42,617 ^r	41,937
Marketed production, sales ^e	do.	40,400 ^r	40,400 ^r	47,800 ^r	40,600 ^r	40,000
Petroleum:						
Crude	thousand 42-gallon barrels	23,874 ^r	23,724 ^r	26,135 ^r	29,489 ^r	34,232
Refinery products:						
Gasoline	do.	11,532 ^r	10,667 ^r	10,612 ^r	12,936 ^r	12,547
Jet fuel	do.	7,570 ^r	6,631 ^r	5,600 ^r	6,000	6,394
Kerosene	do.	1,082 ^r	903 ^r	987 ^r	1,131 ^r	1,141
Distillate fuel oil	do.	32,000	24,550 ^r	24,271 ^r	29,084 ^r	31,986
Residual fuel oil	do.	20,000	16,146 ^r	14,360 ^r	17,472 ^r	17,347
Lubricants	do.	1,393	1,393 ^r	1,473 ^r	1,414 ^r	1,348
Liquefied petroleum gas	do.	2,306	2,159 ^r	2,149 ^r	2,645 ^r	2,311
Other	do.	17,000	6,643 ^r	5,832 ^r	5,674 ^r	6,280
Total	do.	19,306 ^r	8,802 ^r	7,981 ^r	8,319 ^r	8,591
Uranium, processed:						
U ₃ O ₈ content		38	38	38	38	38
U content		45	45	45	41 ^r	45

^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 September 4, 2015.

²In addition to the commodities listed, abrasives, secondary aluminum, emery, and natural gas liquids were produced but information was not adequate to make reliable estimate of output. The Saindak copper mine produced gold and silver.

³The Duddar lead-zinc mine project was suspended in 2012 and continued to be on care-and-maintenance status owing to site maintenance and maintenance of the underground system.

⁴Not elsewhere specified.

TABLE 2
PAKISTAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2014

(Metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity ^e	
Aluminum smelters, secondary	Canon Metal Works	Gujranwala	NA	
Do.	H. Gulam Qadir & Sons	do.	NA	
Do.	M. Siraj Din Mohammed Shafi	do.	NA	
Do.	Punjab Metal Works	do.	NA	
Do.	Noor Aluminium Co.	Karachi	NA	
Do.	Standard Aluminium	do.	NA	
Do.	Aluminum Co. of Pakistan Industries (Pvt) Ltd.	do.	1,500	
Do.	Japan Metal Industries	do.	1,500	
Do.	Khan Aluminum Industries	do.	2,700	
Do.	Krudson Pvt Ltd.	do.	1,200	
Do.	Lucky Industries	do.	1,200	
Do.	Pakistan Cabled Ltd.	do.	2,500	
Do.	Pakistan Metal Industries	do.	4,000	
Do.	Chawala Chemical & Metal Industries	Lahore	NA	
Do.	Aluminum Co. of Pakistan Industries (Pvt) Ltd.	do.	1,200	
Do.	Alpha Aluminium Co.	do.	1,100	
Do.	Chauhan Industries	do.	120	
Do.	China Industries	do.	150	
Do.	Craft Aluminium	do.	300	
Do.	Khuram Industry	do.	300	
Do.	Pakistan Alco Products	do.	NA	
Do.	Shaheen Industries	do.	NA	
Do.	Sana Aluminium Industries	Peshawar	NA	
Do.	Hyder Industries	Sahiwal	NA	
Do.	Jilani Industries	do.	NA	
Antimony	MTEQ Pakistan (Pvt.) Ltd.	Vashouk and Dalbadin, Balochistan	12,000	
Barite	Bolan Mining Enterprises, Government of Balochistan, 50%, and Pakistan Petroleum Ltd. (PPL), 50%	Khuzdar, Balochistan Province	437,000	
Do.	Razvi Mining (Pvt.) Ltd.	Gandori, Kalan, and Retri	30,000	
Bauxite	MTEQ Pakistan (Pvt.) Ltd.	Warehouses in Karachi	NA	
Cement	thousand metric tons	Power Cement Ltd. (Arif Habib Group)	Arif Habib Centre, Karachi	600
Do.	do.	Askari Cement Co. Ltd.	Nizampur and Wah	9
Do.	do.	Falcon Cement/Attock Cement Pakistan Ltd.	Hub Chowki, Karachi	1,710
Do.	do.	Bestway Cement Co. Ltd.	Chakwal and 2 plants in Hattar; Lafarge plant in Chakwal District	8,000
Do.	do.	Cherat Cement Co. Ltd.	Nowshera	900
Do.	do.	Dandot Cement Co. Ltd.	Dandot	40
Do.	do.	Dewan Cement Ltd. (A Yousuf Dewan Co.)	Hattar and Dhabeji	800
Do.	do.	Fauji Cement Co. Ltd.	Jhang Bahtar, Attock District	3,000
Do.	do.	Fecto Cement Ltd.	Sangjani	900
Do.	do.	Gharibwal Cement Ltd.	Jhelum	2,500
Do.	do.	Javedan Cement Ltd.	Karachi	600
Do.	do.	D.G. Khan Cement Co. Ltd.	Dera Ghazi Khan and Khairpur Districts	4,000
Do.	do.	Kohat Cement Co. Ltd.	Kohat District	3,000
Do.	do.	Lucky Cement Ltd.	Indus Highway, Karachi	8,000
Do.	do.	do.	Pezu	4,000
Do.	do.	Maple Leaf Cement Factory Ltd.	Daudkhel	3,400
Do.	do.	Pioneer Cement Ltd.	Chenki	1,300
Do.	do.	Thatta Cement Co. Ltd. (Arif Habib Group)	Thatta	500
Do.	do.	Zeal Pak Cement Factory Ltd.	Hyderabad	1,100
Do.	do.	Flying Cement	Lilla, Mangowal, Khushab District, Punjab Province	1,300
Do.	do.	A.C. Rohi Cement Ltd.	Den Nando Kohistan, Sindh Province	NA
Do.	do.	Dadabhoj Cement Industries Ltd. (M.H. Dadabhoj Group)	Dadu, Karachi, Sindh Province	2,800
Do.	do.	Flying Cement	Lilla, Mangowal, Khushab District, Punjab Province	1,300

See footnotes at end of table.

TABLE 2—Continued
PAKISTAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2014

(Metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity ^e
Cement—Continued		A.C. Rohi Cement Ltd.	Den Nando Kohistan, Sindh Province	NA
Do.	thousand metric tons	Dadabhoy Cement Industries Ltd. (M.H. Dadabhoy Group)	Dadu, Karachi, Sindh Province	2,800
Chromite		Pakistan Chrome Mines Ltd.	Gwal, Khanozai, Muslim Bagh, and Nisai, Balochistan Province	20,000
Do.		Ghani Corp. [Ghani Mines (Pvt.) Ltd.]	NA	NA
Do.		Svah Resources Inc.	Muslim Bagh and Khanozai	180,000
Do.		MTEQ Pakistan (Pvt.) Ltd.	Dargai and Malakand	120,000
Coal	thousand metric tons	Sindh Coal Authority	Dadu, Sindh Province	4,000,000
Do.		do.	Tharparkar, Sindh Province	NA
Do.	thousand metric tons	Lakhra coal fields, Pakistan Mineral Development Corp., 50%; government of Sindh Province, 25%; Water and Power Development Authority, 25%	Latifabad, Hyderabad	201,000
Do.		Lakhra Coal Development Co.	Khanot near Lakhra	NA
Do.	thousand metric tons	Degari-Sor-Range (Pakistan Mineral Development Corp.) (Government, 100%)	35 kilometers southeast of Quetta	3,000
Do.	do.	Degari-Sor-Range (Pakistan Mineral Development Corp.) (Government, 100%)	16 kilometers east of Quetta	29,000
Do.	do.	Shahrig-Khost-Harnai Coal field (Pakistan Mineral Development Corp.) (Government, 100%)	160 kilometers northeast of Quetta	159,000
Do.		Progressive Mining Enterprise (Ghani Mines Ltd.)	Takwan, Chakwal District	NA
Do.		Ghani Corp. (Ghani Mines Ltd.)	NA	NA
Do.		Al-Muhandus Corp. (Ghani Mines Ltd.)	Balman and Chukki, Quaidabad, Khushab District	NA
Do.		Nara Minerals [Chani Mines (Pvt.) Ltd.]	Patala Formation, Jhelum District	NA
Copper, mine		Saindak Metals Ltd. (Metallurgical Corp. of China Ltd.)	Chagai Hills, Balochistan Province	NA
Copper, manufacturing		MTEQ Pakistan (Pvt.) Ltd.	Gilgit and Balistan	NA
Fertilizer		Engro Fertilizer Ltd.	Daharki	2,000
Do.		Fatima Fertilizer Company Ltd.	Sadiqabadm Rahim Yar Khan	500,000
Do.		Pakarab Fertilizer Ltd.	Khanewal Road, Multan	NA
Do.		Fauji Fertilizer Bin Qasim Ltd.	Bin Qasim, Karachi	1,000
Gas, natural	million cubic meters	Pakistan Petroleum Ltd. (PPL) (Government, 68%; PPL Employees Empowerment Trust, 7%; private investors, 25%)	Adhi, Punjab Province; Kandhkot and Mazarani, Sindh Province; and Sui, Balochistan Province	8,400
Do.	do.	Oil and Gas Development Co. Ltd. (OGDCL) (Government, 74.97%)	37 oilfields and gasfields, including Mari, Sindh Province	11,315
Do.	do.	Pakistan Oilfields Ltd. (POL)	15 oilfields and gasfields	730
Do.	do.	Mari Petroleum Co. Ltd.	Mari gasfield, Daharki and 14 oilfields and gasfields	850
Do.		Ocean Pakistan Ltd.	Punjab, Balochistan, Khyber Pakhtunkhawa, and Islamabad Provinces	NA
Gold, Ag content		Saindak Metals Ltd. (Metallurgical Corp. of China Ltd.)	Chagain Hills, Balochistan Province	NA
Iron ore		Mines and Minerals Enterprises Pakistan	Punjab Province	NA
Lead and zinc, ore		Metallurgical Corp. of China Ltd., 75%, and Pakistan Mineral Development Corp. and Government of Pakistan, 25%	Duddar lead-zinc mine project, ¹ Duddar, Balochistan Province	131,000
Marble (onyx)		Azeem Marble & Onyx Industries	Karachi	NA
Phosphate rock		Pakistan Mining Co. Ltd.	NA	90,000
Salt		Khewra Salt Mines (Pakistan Mineral Development Corp.) (Government, 100%)	Salt Range, south of Islamabad	435,000
Do.		Warcha Salt Mines (Pakistan Mineral Development Corp.) (Government, 100%)	276 kilometers from Islamabad	613,000
Do.		Kalabagh Salt Mines (Pakistan Mineral Development Corp.) (Government, 100%)	296 kilometers from Islamabad and 50 kilometers from Mainwali	80,000

See footnotes at end of table.

TABLE 2—Continued
PAKISTAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2014

(Metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity ^e
Salt—Continued		Jatta Salt Mines (Pakistan Mineral Development Corp.) (Government, 100%)	217 kilometers from Islamabad and Kohat	73,000
Do.		Bahadur Khel Salt Mines (Pakistan Mineral Development Corp.) (Government, 100%)	265 kilometers from Islamabad and 112 kilometers from Kohat	NA
Do.		Ghani Corp. (Ghani Mines Ltd.)	Banda Daud Shah, Karak District	NA
Do.		Nara Minerals [Chani Mines (Pvt.) Ltd.]	Central Part of Salt Range	NA
Do.		Ghani Mines	Korrian	NA
Do.		AI-Muhandus Corp. [Chani Mines (Pvt.) Ltd.]	Salt Range, near village Choa, Warcha, Quaidabad, Khushab District	NA
Silica sand		Ghani Corp. [Ghani Mines (Pvt.) Ltd.]	NA	NA
Do.		MTEQ Pakistan (Pvt.) Ltd.	NA	120,000
Soda ash		ICI Pakistan Ltd.	Khewra, Punjab Province	350,000
Steel, crude	thousand metric tons	Pakistan Steel Mills Corp. (Pvt) Ltd. (PSM)	Karachi	1,100
Sulfur		Pakistan Oilfields Ltd. (POL)	15 oilfields and gasfields	NA
Talc		CapriCorn Minerals	Bandi Sadique	20,000
Petroleum:				
Crude	thousand 42-gallon barrels	Mari Petroleum Co. Ltd.	Sindh Province	6,000
Do.	do.	Pakistan Petroleum Ltd. (PPL) (Government, 68%; PPL Employees Empowerment Trust, 7%; private investors, 25%)	Adhi, Punjab Province (additional 10 blocks)	1,600
Do.	do.	Oil and Gas Development Co. Ltd. (OGDCL), (Government, 74.97%)	Balochistan, Punjab, and Sindh Provinces	11,500
Do.	do.	Pakistan Oilfields Ltd. (POL)	Balochistan Province	8,000
Do.		Ocean Pakistan Ltd.	Punjab, Balochistan, Khyber Pakhtunkhawa, and Islamabad Provinces	NA
Refined	thousand 42-gallon barrels	Bosicor Pakistan Ltd.	Karachi	10,700
Do.	do.	Pak-Arab Refinery Co. Ltd. (joint venture of the governments of Pakistan and the Emirate of Abu Dhabi)	Mahmood Kot, Punjab Province	360,000
Do.	do.	Attock Refinery Ltd.	Rawalpindi	16,000
Do.	do.	Pakistan Refinery Ltd.	Karachi	17,000
Do.	do.	Pakistan Mining Co. Ltd.	NA	90,000
Do.	do.	National Refinery Ltd.	NA	NA

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

¹The Duddar lead-zinc mine project was suspended in 2012, and the underground system continued to be on care-and-maintenance status.