

THE MINERAL INDUSTRY OF SAUDI ARABIA

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The Kingdom of Saudi Arabia maintained its position as the main oil producer in the world; it accounted for 12.8% of the world's crude oil production compared with Russia (about 11.4%) and the United States (about 9.2%) (BP p.l.c., 2004§¹). Saudi Arabia's large annual production volume, excess production capacity, and low local consumption allowed the country, which was a member of the Organization of the Petroleum Exporting Countries (OPEC), to increase supply in 2003. The increased supply helped offset the international petroleum market shocks; these included declines in crude oil outputs from Nigeria and Venezuela that were the result of domestic disturbances and supply disruptions associated with the military action in Iraq (Cable News Network LP, LLP, 2003§; Organisation for Economic Co-operation and Development, 2004§, p. 252).

The International Monetary Fund (2004§) estimated that the gross domestic product (GDP) based on purchasing power parity was about \$271 billion² in 2003 and per capita GDP based on purchasing power parity was \$11,849. The real GDP growth rate was estimated to have jumped to 7.2% compared with a revised increase of 0.1% in 2002. The Saudi Arabian Central Department of Statistics estimated that the Kingdom's population was about 22.6 million in 2003, of which 5.7 million were non-Saudi (Saudi Arabian Monetary Agency, 2004§, table 29).

In 2003, exports of crude oil and petroleum products from Saudi Arabia to the United States were reported to be about 1.774 million barrels per day (Mbb/d). Of this total, about 1.726 Mbb/d was crude oil, which accounted for about 18% of the United States' crude oil imports and made Saudi Arabia America's leading source of imported crude oil in 2003. The United States had imported an average of 1.552 Mbb/d of crude oil and petroleum products from Saudi Arabia in 2002 (U.S. Energy Information Administration, 2004).

Production

In addition to crude oil, natural gas, and mineral products from the processing of petroleum and natural gas, such as carbon black, methanol, petrochemicals, refined petroleum products, and sulfur, mineral and mineral-based commodity production in Saudi Arabia included barite, cement, construction and industrial materials, copper, nitrogenous and phosphatic fertilizers, ferroalloys, gold, granite, lead, salt, silica sand, silver, and zinc. Steel was produced from scrap and imported iron ore pellets. Titanium dioxide pigment was produced from imported rutile.

¹References that include a section mark (§) are found in the Internet References Cited section.

²Where necessary, values have been converted from Saudi riyals (SRIs) to U.S. dollars (US\$) at the rate of SRIs3.75=US\$1.00.

In 2003, total Saudi Arabian petroleum production, which included domestic crude oil and one-half of the production from the Saudi-Kuwaiti-partitioned Neutral Zone, natural gas liquids, and "other liquids" oil, rebounded to about 9.82 Mbb/d compared with 8.66 Mbb/d in 2002. Domestic crude oil production averaged about 8.1 Mbb/d in 2003. The official OPEC production allocation assigned to Saudi Arabia rose to 7.476 Mbb/d in January 2003 from 7.05 Mbb/d in 2002. The production ceiling subsequently increased to 7.963 Mbb/d in February 2003 and to 8.256 Mbb/d in June before returning to 7.963 Mbb/d in November. Actual sustainable production capacity ranged from about 10.0 to 10.5 Mbb/d (Organization of the Petroleum Exporting Countries, 2004, p. xiii; Mably, 2003§; U.S. Energy Information Administration, 2004§).

Structure of the Mineral Industry

All minerals and mineral fuels were owned by the Government and most mineral commodity operations were run by subsidiaries of state-owned companies. The state-owned Saudi Arabian Mining Co. (Ma'aden) participated in and promoted mineral exploration and mining activities throughout the Kingdom. The Foreign Investment Act of 2000 authorized international investors to own 100% of most mineral industry operations with the notable exception of oil exploration, drilling, and production. Saudi Arabian Oil Co. (Saudi Aramco) and its subsidiaries were the only companies authorized to engage in oil and gas exploration and field development within Saudi Arabia; contracts for gas exploration programs under negotiation in late 2003, however, were expected to allow consortia of multinational oil companies to participate in the natural gas exploration and production arena. Many industrial projects in the petrochemical and petroleum-refining sectors were joint ventures between Saudi firms and international companies. Affiliated companies of state-controlled Saudi Basic Industries Corp. (SABIC) included Arabian Petrochemical Co. (100% equity interest), Jubail United Petrochemical Co. (100%), Saudi Iron and Steel Co. (Hadeed) (100%), National Industrial Gases Co. (70%), Saudi-European Petrochemical Co. (70%), Al-Jubail Fertilizer Co. (50%), Al-Jubail Petrochemical Co. (50%), Eastern Petrochemical Co. (50%), National Chemical Fertilizer Co. (Ibn Al-Baytar) (50%), National Methanol Co. (50%), National Plastic Co. (50%), Saudi Methanol Co. (50%), Saudi Petrochemical Co. (50%), Saudi-Yanbu Petrochemical Co. (50%), and Saudi Arabian Fertilizer Co. (42.99%).

Commodity Review

Metals

In 2003, Saudi Arabia's metal ore production was from the open pit Al-Hajar gold mine; the underground Mahd Adh Dhahab polymetallic mine where Ma'aden produced gold and

silver bullion and a bulk concentrate that contained copper, gold, lead, silver, and zinc; the open pit Bulghah gold mine; and the open pit Sukhaybarat gold mine. Ma'aden, which the Government proposed to privatize, also managed development operations at the underground Al-Amar polymetallic mine.

Columbium (Niobium) and Tantalum.—Tertiary Minerals plc of the United Kingdom (UK) continued its evaluation of the Ghurayyah tantalum deposit, which was estimated to contain resources of 385 million metric tons (Mt) of ore with an average grade of 8,915 grams per metric ton (g/t) zirconium oxide, 2,840 g/t niobium pentoxide, and 245 g/t tantalum pentoxide. A scoping study of the deposit was completed in 2003. The study envisioned a mine with a capacity of 1.52 million metric tons per year (Mt/yr) of ore and processing facilities with the capacity to recover 10,000 metric tons per year (t/yr) of zircon concentrates, 2,860 t/yr of columbium pentoxide, and more than 272 t/yr of tantalum pentoxide. Tertiary sought a joint-venture partner that could fund additional studies to allow the development of the mine beginning in 2006 (Tertiary Minerals plc, 2004, p. 7-9).

Gold.—Gold production increased significantly in 2003 primarily owing to increased output at the Bulghah Mine, which produced more than 4,200 kilograms (kg) of gold and exceeded the previous year's total output of the Kingdom's other gold mines. The three other gold mines also posted increased output in 2003—the Al-Hajar by 18% to 1,502 kg, the Sukhaybarat by 7% to 1,345 kg, and the Mahd Adh Dhahab by 2% to 1,678 kg (Reuters, 2004§).

Iron and Steel.—Hadeed postponed the awarding of contracts for the planned expansion of its Al-Jubayl plant's flat products production capacity to 2 Mt/yr from 850,000 t/yr until 2004. The company proposed to increase its rolling-mill capacity to produce an additional 500,000 t/yr of steel concrete-reinforcing bar (Middle East Economic Digest, 2003; 2004b)

Titanium.—In 2002, the National Titanium Dioxide Co. Ltd. increased its titanium dioxide pigment production capacity to 100,000 t/yr from 70,000 t/yr. The chloride-process Yanbu plant treated imported rutile (National Titanium Dioxide Co. Ltd., undated§).

Zinc.—In November 2003, the Saudi Arabian Council of Ministers issued a resolution advising the Ministry of Petroleum and Mineral Resources to discuss with Arabian American Development Co. of the United States the opening of a mine at the Al Masane zinc prospect and Arabian American's payment of about 4 years of late surface rents (the past due amount of which had reached about \$543,000 as of December 2003). Arabian American was attempting to resolve the situation satisfactorily (Arabian American Development Co., 2004, p. 10).

Industrial Minerals

Cement.—In July, Eastern Province Cement Co. awarded contracts for the installation of a new cement line. In October, the installation of a 4,500-metric-ton-per-day-capacity cement and clinker line for Qassim Cement Co. was initiated at Buraidah (Middle East Economic Digest, 2004a).

Nitrogen.—Saudi Arabian Fertilizers Co. (SAFCO) awarded the contract to Uhde GmbH of Germany to build SAFCO-4, which was a proposed 3,300-metric-ton-per-day (t/d)-capacity ammonia plant and a 3,250-t/d-capacity urea plant at Al-Jubayl. SAFCO-4 was scheduled to become operational in 2006 (Asian Chemical News, 2002b; Saudi Basic Industries Corp., 2003§; 2004b§).

Phosphate Rock.—Ma'aden and Saudi Oger Ltd. awarded a \$9.8 million contract to SNC Lavalin Group, Inc. of Canada and Jacobs Engineering Group Inc. of the United States for a feasibility study of the Al-Jalamid phosphate deposit. With a proposed design capacity of 11 Mt/yr of phosphate rock, the project could boost Saudi Arabia to the rank of fifth leading phosphate-rock-producing country in the world in 2008 or 2009 (Jasinski, 2004; Middle East Economic Digest, 2004c).

Mineral Fuels and Related Materials

Carbon Black.—The Zamil Group proposed to build a \$50 million 20,000-t/yr capacity carbon black plant at Al-Jubayl (Middle East Economic Digest, 2004d).

Methanol.—Saudi Methanol Co. (Ar-Razi) (a subsidiary of the Mitsubishi Gas Chemical Co. Inc. of Japan and SABIC) continued its evaluation of the addition of a 1.65-Mt/yr methanol train to its existing 4-line 2.9 Mt/yr facility at Al-Jubayl. Saudi International Petrochemical Co. of Saudi Arabia (65% interest) and the Japanese consortium Japan-Arabia Methanol Co. (35%) formed the International Methanol Co., which, in 2002, initiated the construction of a 1-Mt/yr methanol plant at Al-Jubayl. Methane feedstock for the plant was to be obtained from Saudi Aramco. Initial production from the facility was expected in 2005 (Asian Chemical News, 2002a; Japan's Corporate News Network, 2002§; Saudi Basic Industries Corp., 2004a§; Zamil Group, undated§).

Natural Gas.—In 2003, the original Saudi Gas Initiative Project was cancelled. The former Core Venture II, which was the proposed Rabigh/Midyan (Red Sea Area) project with Exxon Mobil Corp., Marathon Oil Corp., and Occidental Petroleum Corp., was postponed in January. Negotiations for Core Venture I, which was the Haradh (South Ghawar Area) project with BP p.l.c., ExxonMobil, Phillips Petroleum Co., and the Royal Dutch/Shell Group, and for Core Venture III, which was the Kidan/Shaybah project with Conoco Inc., Total S.A., and the Royal Dutch/Shell Group, were terminated in June. Parts of Core Ventures I and III were reoffered to bidders in late 2003 (Asian Chemical News, 2003; O'Sullivan, 2004; U.S. Energy Information Administration, 2004§).

Petroleum.—In 2003, Saudi Aramco announced the discovery of the Yabrin oilfield. Also a 30-barrel-per-day-capacity high-severity fluid-catalytic-cracking demonstration plant was opened at Saudi Aramco's Ras Tannura refinery. The plant, which was designed to process heavy crude oil to produce additional volumes of olefins and higher octane gasoline than standard refineries, was operated by researchers from the Japan Cooperation Center, Petroleum; the King Fahd University of Petroleum and Minerals Research Institute; and Saudi Aramco (Middle East North Africa Financial Network, Inc., 2003§).

Reserves

Despite the production of nearly 3.6 billion barrels of oil in 2003, new crude oil reserves attributed to the Yabrin Field and other reserve additions essentially replaced the volume of reserves that were lost to production. Saudi Aramco reported that the country's crude oil reserves remained at about 259.4 billion barrels, which represented about 23% of the total proven world oil reserves. Most of Saudi Arabian natural gas reserves were associated with the country's oilfields. With the discovery of the Awtad gasfield, gas associated with the Yabrin Field, and other reserve additions, total natural gas reserves were reported to have increased to more than 6.6 trillion cubic meters in 2003, which was about 4% of the world's proven natural gas reserves (Saudi Arabian Oil Co., 2004, p. 34; BP p.l.c., 2004§).

Outlook

Despite diversification efforts, most of the Kingdom's income remained dependent upon the international oil markets and thus vulnerable to changes in the volume and pattern of worldwide trade in crude oil, petrochemicals, and refined petroleum. With the Saudi Gas Initiative (revised), the Government has indicated its interest in opening up the natural gas sector to increased development. Additional natural gas production would open more opportunities in the nation's petrochemical sector.

Construction projects in Saudi Arabia tend to be advanced in times of high oil prices and deferred in times of lower oil prices. The higher oil prices of 2002 and 2003 drove an estimated 17% increase in the number of construction projects in 2003, which increased the demand for cement and construction materials. Continued high oil prices will likely delay the curtailment of projects traditionally seen during an oil-price down cycle (Knowledge Books and Software, 2004§).

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Major Sources of Information

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Major Publications

Arab Petroleum Research Center. Arab Oil & Gas Directory, annual.

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TABLE 1
SAUDI ARABIA: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons unless otherwise specified)

Commodity ²	1999	2000	2001	2002 ^c	2003 ^c	
METALS						
Ferroalloys ^c	83,000	83,000	78,000	75,000	75,000	
Iron and steel:						
Direct-reduced iron	thousand tons	2,343	3,090	2,880	3,290	3,290
Steel, crude	do.	2,610	2,973	3,413	3,570 ^r	3,944 ³
Ore, mine output:						
Gross weight ^e		1,680,000	1,700,000	2,000,000	2,000,000	2,000,000
Copper content of concentrate and bullion ^c		821 ³	900	800	800	800
Gold content of concentrate and bullion	kilograms	4,570	3,800 ^e	5,000 ^e	4,192 ^{r,3}	8,769 ³
Lead content of concentrate ^e		50	50	60	60	60
Silver content of concentrate and bullion ^c	kilograms	10,470 ³	9,300	15,000	14,000	13,000
Zinc content of concentrate ^e		3,161 ³	3,000	3,300	3,000	3,000
INDUSTRIAL MINERALS						
Barite ^c		7,000	8,000	9,000	9,000	9,000
Cement, hydraulic	thousand tons	16,313	18,107	20,608	22,000	23,000
Fertilizer, phosphatic, P ₂ O ₅ content ^c	do.	145 ³	147	150	150	150
Gypsum, crude ^c		380,000 ³	400,000	450,000	450,000	450,000
Lime ^e		340,000 ³	350,000	350,000	350,000	350,000
Nitrogen:						
N content of ammonia	thousand tons	1,402	1,743	1,774	1,737 ³	1,743 ³
N content of urea	do.	1,002	1,214	1,260	1,200	1,200
Pozzolan ^c		140,000	150,000	150,000	150,000	160,000
Salt ^c		200,000 ³	200,000	200,000	200,000	200,000
Sand and gravel ^c	thousand tons	120,000	120,000	120,000	120,000	120,000
Scoria ^c	do.	2,000 ³	2,000	2,000	2,000	2,000
Sulfur, byproduct, hydrocarbon processing		1,939,758	2,101,391	2,350,000 ^e	2,360,000 ^r	2,400,000
MINERAL FUELS AND RELATED MATERIALS						
Gas, natural:						
Gross ^e	million cubic meters	89,000	96,000	91,500	97,000	100,000
Dry	do.	49,555	54,623	58,163	62,014 ³	65,000
Natural gas liquids: ^c						
Propane	thousand 42-gallon barrels	153,000	163,000	166,000	179,000	180,000
Butane	do.	66,200	69,000	72,000	78,000	80,000
Natural gasoline and other	do.	50,000	53,000	54,000	60,000 ^r	60,000
Total	do.	269,134 ³	285,008 ³	292,385 ³	316,938 ³	320,000
Petroleum:						
Crude oil	million 42-gallon barrels	2,761	2,962	2,879	2,589 ³	3,583 ³
Refinery products:						
Liquefied petroleum gases	thousand 42-gallon barrels	12,533	9,634	13,230	10,300 ^r	13,000
Gasoline and naptha	do.	148,853	155,556	152,230	153,000 ^r	155,000
Jet fuel and kerosene	do.	60,638	66,920	60,050	59,700 ^r	60,000
Distillate fuel oil	do.	188,848	198,176	193,770	193,000 ^r	200,000
Residual fuel oil	do.	164,032	163,941	169,530	158,000 ^r	170,000
Unspecified ⁴	do.	6,625	8,083	8,650	9,180 ^r	9,000
Total	do.	581,529	602,310	597,460	583,000 ^r	607,000

^cEstimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. ^rRevised.

¹Table includes data available through July 2004.

²In addition to commodities listed, the following were produced: basalt, carbon black, clays, granite, limestone, marble, methanol, and silica sand; available information is inadequate to estimate output.

³Reported figure.

⁴Includes asphalt.