



2009 Minerals Yearbook

SAUDI ARABIA

THE MINERAL INDUSTRY OF SAUDI ARABIA

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The Kingdom of Saudi Arabia, which ranked first in the world in terms of its crude oil reserves, had about 20% of the world's total proved crude oil reserves and was a leading producer of petroleum, including condensate, crude oil, and natural gas liquids. The country ranked 9th in the world in terms of petroleum refining capacity and was the 26th ranked steel producer. A variety of industrial minerals and metals also were produced in Saudi Arabia (table 1; BP p.l.c., 2010, p. 6, 9, 18; World Steel Association, 2010, p. 10).

All mineral deposits are the exclusive property of the state. The Supreme Council for Petroleum and Mineral Affairs defines and approves national hydrocarbon policies and strategies. The Ministry of Petroleum and Mineral Resources implements general policy related to minerals, natural gas, and oil. The Deputy Ministry for Mineral Resources administers activity in the mining sector and promotes the mineral industry. Mining is regulated by Royal Decree No. M/47 (the Mineral Investment Law) of 20 Sha'ban 1425 (October 4, 2004).

Minerals in the National Economy

Saudi Arabia's economy remained strongly linked to hydrocarbon production, which accounted for about 61% of the nominal gross domestic product in 2008 (the latest year for which data were available). In 2009, the volume of crude oil exported by Saudi Arabian Oil Co. (Saudi Aramco), which was the Government oil company, decreased by about 18% to 2.06 billion barrels, and exports of refined petroleum products increased by 13% to 149 million barrels. In 2008 (the latest year for which data were available), mineral products (primarily crude oil) accounted for 90% of total Saudi Arabian exports. In 2009, the value of Saudi Arabia's total exports decreased by about 37% to \$192 billion¹ from \$313 billion in 2008. The decrease was attributed to the notable drop in Saudi Arabian crude oil output and the significant decrease in the average oil price in 2009 compared with the average 2008 oil price (Saudi Arabian Monetary Agency, 2010, table 1, 7; Saudi Arabian Oil Co., 2010, p. 69).

About 56% of Saudi Arabia's crude oil exports was shipped to Asia and about 14% was shipped to the United States. Countries of Asia also bought about 51% of Saudi Arabia's exports of refined petroleum products and about 38% of its exports of natural gas liquids (Saudi Arabian Oil Co., 2010, p. 65).

Production

The estimated increases in copper, gold, lead, silver, and zinc output were attributed primarily to the rampup of Saudi Arabian Mining Co.'s (Ma'aden's) Al Amar Mine. A full year of production from the bauxite and kaolin mining operation

of Ma'aden in the central zone of the Az Zabirah lease was estimated to have resulted in an increase in the production of low-grade bauxite, which was used by the cement industry, and kaolin. Domestic construction demand sustained production. Compared with that of 2008, significant decreases in production volume were reported for condensate, crude oil, and total refined petroleum products in 2009. Data on mineral production are in table 1.

Structure of the Mineral Industry

The Government maintained ownership interest in most of the large companies that operated in the mineral sector, which included Saudi Basic Industries Corp. (SABIC) and Ma'aden. Subsidiaries of SABIC included Al-Jubail Fertilizer Co., National Chemical Fertilizer Co., Saudi Arabian Fertilizer Co., Saudi Iron and Steel Co. (Hadeed), and several petrochemical companies.

Exploration for and production of crude oil in Saudi Arabia were restricted to Saudi Aramco, which formed joint ventures with international firms to explore for natural gas and to refine petroleum. The Ministry of Petroleum and Mineral Resources supervised its affiliate companies in the mineral and petroleum sectors; these included Aramco Gulf Operation Ltd., Ma'aden, and Saudi Aramco. Aramco Gulf Operation and Saudi Arabian Chevron Inc. (which was a subsidiary of Chevron Corp. of the United States) worked in the Partitioned Neutral Zone between Kuwait and Saudi Arabia on behalf of the Ministry. The Ministry also supervised the Saudi Geological Survey.

Commodity Review

Metals

Aluminum.—In December, Alcoa Inc. of the United States acquired 40% equity interest in Ma'aden's ongoing aluminum project. The joint venture expected to use imported bauxite to begin production at the alumina refinery at Ras al Zawr in 2013. Initial production from the aluminum smelter at Ras al Zawr also was expected in 2013. Development and initial production from the Az Zabirah metallurgical-grade bauxite mine was scheduled for 2014 as was the startup of a rolling mill at Ras al Zawr (Saudi Arabian Mining Co., 2009a).

Copper, Gold, Silver, and Zinc.—In addition to production operations, Ma'aden and its subsidiaries (Ma'aden Gold and Base Metals Co. and Saudi Company for Precious Metals) explored for precious metals and associated minerals at several sites. Bariq Mining Ltd., which was a joint venture of Citadel Resources Group of Australia and Consolidated Mining Company Investments Ltd. of Saudi Arabia, completed a feasibility study of the Jabal Sayid copper and gold project in 2009. Citadel explored the Bari gold, the Lahuf gold, the Jabal Baydan zinc, the Jabal Matorber gold, the Jabal Shayban copper,

¹Where necessary, values have been converted from Saudi Arabian riyals (SAR) to U.S. dollars (US\$) at the fixed rate of SAR3.75=US\$1.00.

and the Wadi Shugea copper-gold-zinc deposits in 2009. Abdul Rahman Saad Al-Rashide & Sons Company Ltd. of Saudi Arabia and Kefi Minerals Plc of the United Kingdom formed a joint venture called Gemco Ltd., which was exploring for gold.

Al Masane Al Kobra Mining Co. (AMAK), which was a venture of local investors and the Arabian American Development Co. of the United States, continued work on the Al Masane project. Construction of the surface facilities for the underground mine by China National Geological and Mining Corp. was about 71% completed. Commercial shipments of ore were expected to begin in mid-2011 (Arab American Development Co., 2010, p. 5, 39).

Iron Ore.—London Mining Plc of the United Kingdom reported the completion of a bankable feasibility study of a proposed 5-million-metric-ton-per-year (Mt/yr)-capacity iron ore pelletizing plant for the Wadi Sawawin project. Saudi London Iron Ltd., which was a joint venture of London Mining and National Mining Co. of Saudi Arabia, would operate the project, which also included a proposed iron ore mine that was to be developed about 52 kilometers inland from the seaside pelletizing plant. In 2010, London Mining planned to complete an 8,000-meter drilling program, which was expected to expand the economic resources of the iron ore deposit (London Mining Plc, 2009).

Industrial Minerals

Cement.—The Government banned the exportation of construction sand in 2009. The Ministry of Commerce and Industry revoked the ban of cement exports in late 2009 that had been imposed in 2008. Cement exports, however, remained subject to several conditions, including the availability of cement on the local market and a ceiling on the price of bagged cement for sale in Saudi Arabia (Gulf Daily News, 2009; Shaheen, 2009; Saudi Gazette, The, 2010).

Sustained worldwide economic downturns and the subsequent declines in demand for hydrocarbons historically have resulted in reduced Government revenues in Saudi Arabia. Such decreases in income resulted in the cancellation or the postponement of large-scale Government-funded construction projects. In 2009, despite the global economic crisis, a number of construction projects in Saudi Arabia continued, which resulted in a continued (but lower-than-planned) demand for cement. Numerous capacity expansions at existing cement plants and new cement plants, however, were proposed in Saudi Arabia. National cement capacity was expected to increase to about 50 Mt/yr in 2010 and 64 Mt/yr in 2012 from about 45 Mt/yr in 2009. Cement companies planned to export cement production that exceeded domestic demand (McCaffrey, 2010).

Magnesium Compounds.—Olayan Descon Industrial Company Ltd. of Saudi Arabia was contracted by Ma'aden to develop a 140,000-metric-ton-per-year (t/yr)-capacity magnesite mine at Zarghat (which also was known as the Al-Gazalah deposit) and to build a processing plant at Medina. The plant would produce caustic calcined magnesia and dead-burned magnesia (Saudi Arabian Mining Co., 2009b).

Phosphate Rock.—Ma'aden, which held 70% equity interest in the Al-Jalamid phosphate project, and SABIC, which held

30% interest, continued the development of the Al-Jalamid phosphate mine and the Ras Az Zawr fertilizer complex. Ma'aden Phosphate Co., which was the operating company, expected that the initial production of diammonium phosphate fertilizer would begin in late 2010 (Dow Jones Newswires, 2010).

Silicon.—First Energy Bank B.S.C. of Bahrain and Project Management and Development Co. of Saudi Arabia formed the Saudi Polysilicon joint venture, which was to develop a polysilicon plant at Al Jubail Industrial City 2. The proposed 7,500-t/yr-capacity plant was expected to begin production in 2013 (First Energy Bank B.S.C., 2010, p. 26.)

Mineral Fuels

Natural Gas and Petroleum.—In 2009, 32 fields accounted for Saudi Aramco's oil and gas production. New fields discovered in 2009 included the Sanaman gasfield and the Sirayyan oilfield. New hydrocarbon reservoirs were discovered in the Arabiyah, the Hasbah, the Jana, the Juraybi'at, the Karan, the Midrikah, and the Shedgum fields (Saudi Arabian Oil Co., 2010, p. 15).

In 2009, the company added more than 2 million barrels per day (Mbbbl/d) to its crude oil production capacity, which exceeded 12 Mbbbl/d. Also in 2009, production began from the 1.2-Mbbbl/d-capacity Khurais expansion project, which included the development of the Abu Jifan and the Mazalij fields; the 500,000-barrel-per-day (bbl/d) Khursaniyah project, which included the development of the Abu Hadriyah, the Fadhili, and the Khursaniyah fields; and the 250,000-bbl/d-capacity expansion of the Shaybah field. An additional 500,000 bbl/d of production capacity was added in the company's other fields in 2009 with the completion of 134 wells, which would be used as crude oil production wells or as water-injection wells (which would maintain reservoir pressure) (Saudi Arabian Oil Co., 2010, p. 7, 15, 19, 20, 21).

Outlook

With its crude oil resources and increased production capacity, Saudi Arabia is well placed to meet international demand for petroleum. Significant infrastructure development, which includes the expansion of the national highway and railroad network, will likely maintain the short-term demand for construction minerals and products, such as cement, glass, sand, steel, and stone. The Kingdom's continued encouragement of private investment in mineral projects is expected to be attractive to international investors.

References Cited

- Arab American Development Co., 2010, Form 10-K—2009: U.S. Securities and Exchange Commission, 68 p.
- BP p.l.c., 2010, BP statistical review of world energy—June 2010: London, United Kingdom, BP p.l.c., 45 p.
- Dow Jones Newswires, 2010, Maaden—Sabic to operate phosphate fertilizer jv in 4q—Report: Zawya.com Ltd., February 13. (Accessed February 16, 2010, at <http://www.zawya.com/story.cfm/sidZW20100213000014/lok070921100213?weeklynewsletter&zawyaemailmarketing>.)
- First Energy Bank B.S.C., 2010, Annual report 2009: Manama, Bahrain, First Energy Bank B.S.C., 95 p.

Gulf Daily News, 2009, Contractors seek ways of tackling sand crisis: Gulf Daily News, v. 32, no. 269, December 14. (Accessed December 14, 2009, at <http://www.gulf-daily-news.com/NewsDetails.aspx?storyid=263241>.)

London Mining Plc, 2009, Results of bankable feasibility study—Wadi Sawawin—Saudi Arabia: London, United Kingdom, London Mining Plc, December 23, 6 p.

McCaffrey, Robert, 2010, Current situation and outlook for the Saudi Arabian cement industry: Global Cement Magazine, February, p. 50-54.

Saudi Arabian Mining Co., 2009a, Ma'aden and Alcoa forge partnership to develop lowest-cost aluminum complex in the world: Riyadh, Saudi Arabia, Saudi Arabian Mining Co. press release, December 20, 4 p.

Saudi Arabian Mining Co., 2009b, Ma'aden sign construction deal with Al Olayan Descon for Kingdom's first magnesite plant: Riyadh, Saudi Arabia, Saudi Arabian Mining Co. press release, August 17, 1 p.

Saudi Arabian Monetary Agency, 2010, Appendix of statistical tables of the forty sixth annual report: Riyadh, Saudi Arabia, Saudi Arabian Monetary Agency. (Accessed August 23, 2010, at http://sama.gov.sa/sites/SAMAEN/ReportsStatistics/ReportsStatisticsLib/5600_R_Annual_En_46_Apx.xls.)

Saudi Arabian Oil Co., 2010, Annual review 2009: Dhahran, Saudi Arabia, Saudi Arabian Oil Co., 71 p.

Saudi Gazette, The, 2010, Saudi cement sales to rise 19% in 2010: The Saudi Gazette, April 1. (Accessed August 27, 2010, at <http://www.saudigazette.com.sa/index.cfm?method=home.regcon&contentID=2010040168040>.)

Shaheen, A.R., 2009, Saudi Arabia lifts two-year-old ban on cement product exports: Gulf News, October 8. (Accessed October 13, 2009, at http://www.zawya.com/story.cfm/sidGN_08102009_10355685/lok000000991008?weeklynewsletter&zawyaemailmarketing.)

World Steel Association, 2010, World steel in figures 2010: Brussels, Belgium, World Steel Association, 26 p.

TABLE 1
SAUDI ARABIA: PRODUCTION OF MINERAL COMMODITIES¹

(Thousand metric tons unless otherwise specified)

Commodity ²	2005	2006	2007	2008	2009 ^c	
METALS						
Bauxite, low grade, for cement	--	--	--	150 ^e	200	
Copper content of concentrate and bullion	metric tons	668	730	737	1,465	2,000
Ferroalloys ^c	do.	--	85,000	85,000	90,000	90,000
Gold content of concentrate and bullion	kilograms	7,456	5,180	4,440	4,527	5,500
Iron and steel:						
Low-grade iron ore, for cement	metric tons	582,000	584,000	642,000	581,000	600,000
Direct-reduced iron		3,630	3,580	4,340	4,970	5,000
Steel, crude		4,185	4,000	4,600	4,670	4,700
Lead content of concentrate ^c	metric tons	--	-- ³	123 ³	600	700
Silver content of concentrate and bullion	kilograms	13,501	9,100	9,028	8,232	9,500
Zinc content of concentrate	metric tons	--	983	716	3,663	5,000
INDUSTRIAL MINERALS						
Barite ^c	metric tons	15,000	23,308 ³	30,000 ³	30,000 ³	30,000
Cement, hydraulic		26,064	27,056	30,369	31,823	40,000
Clays:						
Kaolin	metric tons	1,490	3,957	4,415	15,000 ^{r,e}	20,000
Other, for brick and tile		4,300	3,800	3,900	5,000	5,000
Feldspar	metric tons	42,300	42,300	73,000	550,000	550,000
Fertilizer, phosphatic, P ₂ O ₅ content ^c		300	300	300	300	300
Gypsum, crude		713	2,101	2,100	2,300	2,100
Lime ^c		360	360	400	400	400
Nitrogen:						
N content of ammonia		1,780	2,000	2,600	2,600 ^e	2,600
N content of urea		1,250	1,400	1,850	1,850 ^e	1,850
Salt		1,738	1,752	1,507	1,600	1,600
Sand and stone:						
Aggregate		190,000	217,000	234,000	248,000	250,000
Basalt		43	53	--	--	--
Dolomite		498	550	465	465	450
Granite		843	962	954	1,100	1,100
Limestone:						
Blocks		462	308	308	242	240
For cement		30,600	30,500	33,447	36,100	45,000
Marble	metric tons	84,700	84,700	85,000	85,000	85,000
Pozzolana and scoria		372	400	784	810	800
Sand and gravel		28,000	35,000	26,000	22,000	23,000
Silica sand (glass sand)		518	781	820	799	800
Sulfur, byproduct, hydrocarbon processing	metric tons	2,716,823	2,906,911	3,089,223	3,163,346	3,213,678 ³

See footnotes at end of table.

TABLE 1—Continued
SAUDI ARABIA: PRODUCTION OF MINERAL COMMODITIES¹

(Thousand metric tons unless otherwise specified)

Commodity ²	2005	2006	2007	2008	2009 ^c
MINERAL FUELS AND RELATED MATERIALS					
Gas, natural:					
Gross million cubic meters	81,350	85,001	82,665	86,158	88,432 ³
Dry (methane) do.	57,400	60,300	61,900	68,000 ^{r,e}	65,000 ³
Petroleum:					
Crude oil million 42-gallon barrels	3,309	3,253	3,114	3,266	2,888 ³
Condensate do.	89	94	94	93	84 ³
Natural gas liquids:					
Ethane million cubic meters	11,200	10,600	10,700	10,600	11,500
Propane thousand 42-gallon barrels	150,588	149,320	143,681	146,048	152,262 ³
Butane do.	94,148	94,338	92,684	94,483	100,679 ³
Natural gasoline and other do.	66,299	61,456	63,926	68,195	74,468 ³
Refinery products:					
Liquefied petroleum gases do.	12,740	14,730	11,521	11,300	13,677 ³
Gasoline and naphtha do.	198,870	186,420	188,644	200,610	180,076 ³
Jet fuel and kerosene do.	80,910	77,330	67,282	69,680	56,674 ³
Distillate fuel oil do.	236,370	241,790	238,496	247,440	210,778 ³
Residual fuel oil do.	177,970	181,000	174,385	174,380	158,944 ³
Unspecified ⁴ do.	13,780	14,160	15,041	17,960	17,034 ³
Total do.	720,640	715,430	695,369	721,370	637,183 ³

^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 August 25, 2010.

²In addition to commodities listed, low-grade bauxite, carbon black, and methanol were produced, but available information is inadequate to make reliable estimates of output.

³Reported figure.

⁴Includes asphalt.

TABLE 2
SAUDI ARABIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2009

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Bauxite, low-grade for cement	Saudi Arabian Mining Co. (Ma'aden) (Government, 50%)	Central zone, Az Zabirah area	250,000
Cement:			
Grey portland	Yamama Cement Co. Ltd.	Riyadh	4,600
Do.	Yanbu Cement Co.	Yanbu	4,600
Do.	Saudi Cement Co.	Al Hofuf, about 120 kilometers southwest of Dammam	4,000
Do.	do.	Ayn Dar, about 120 kilometers southwest of Dammam	1,450
Do.	Najran Cement Co.	About 160 kilometers northwest of Najran	4,000
Do.	Eastern Province Cement Co.	Al Khursaniyah	3,500
Do.	Qassim Cement Co.	Jal al Watah, 18 kilometers north of Buraydah	3,500
Do.	Arabian Cement Co. Ltd.	Rabigh	3,100
Do.	Southern Province Cement Co. (Government, 52%)	Suq Al Ahad, 10 kilometers northeast of Jizan	2,600
Do.	do.	Bishah, 550 kilometers southeast of Jiddah	2,000
Do.	do.	Tihama	1,800
Do.	Northern Region Cement Co.	About 190 kilometers west-northwest of Arar	2,000
Do.	Riyadh Cement Co.	About 30 kilometers southwest of Riyadh	1,700
Do.	Tabuk Cement Co.	Tabuk	1,800
Do.	Al Safwa Cement Co. (Khayyat Group, 50%, and Lafarge Cement S.A., 50%)	Jabal Farasan	1,400 ¹
Do.	Al Jouf Cement Co.	South of Turaif	1,500 ¹
White	Al-Gharbiah Cement Factory	Jeddah	250
Do.	Saudi White Cement Co.	About 30 kilometers southwest of Riyadh	200

See footnotes at end of table.

TABLE 2—Continued
SAUDI ARABIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2009

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners		Location of main facilities	Annual capacity
Copper, Cu content of ore		Saudi Arabian Mining Co. (Ma'aden) (Government, 50%)		Al Amar Mine, Ar Riyadh Province and Mahd Adh-Dahab Mine, Al Madinah Province	1,000
Gold	kilograms	do.		Al Amar Mine, Ar Riyadh Province; Al-Hajar Mine, Asir Province; Bulgah Mine, ² Al Madinah Province; Mahd Adh-Dahab Mine, Al Madinah Province; and Sukhaybarat plant, ² Al Madinah Province	8,000
Kaolin		do.		Central zone, Az Zabirah	50,000
Petroleum:					
Crude	million barrels	Saudi Arabian Oil Co. (Saudi Aramco) (Government, 100%)		Eastern Province, Najd Region, and offshore; includes the Ghawar, the Hawtah, the Khurais, the Safaniya, and the Shaybah fields	4,500
Refined products	do.	do.		Ras Tanura	193
Do.	do.	Rabigh Refining & Petrochemical Co. (PetroRabigh) [Saudi Arabian Oil Co. (Saudi Aramco), 50%, and Sumitomo Chemical Co., 50%]		Rabigh	140 ³
Do.	do.	Saudi Aramco Mobil Refinery Co. Ltd. [Saudi Arabian Oil Co. (Saudi Aramco), 50%, and Mobil Yanbu Refining Company Inc., 50%]		Yanbu	140
Do.	do.	Saudi Aramco Shell Refining Co. [Saudi Arabian Oil Co., (Saudi Aramco), 50%, and Shell Saudi Arabia Refining Ltd., 50%]		Al Jubayl	110
Do.	do.	Saudi Arabian Oil Co. (Saudi Aramco) (Government, 100%)		Yanbu	82
Do.	do.	Riyadh Oil Refinery Co. [Saudi Arabian Oil Co. (Saudi Aramco), 100%]		Riyadh	50
Do.	do.	Jeddah Oil Refinery Co. [Saudi Arabian Oil Co. (Saudi Aramco), 100%]		Jeddah	38
Steel, crude		Saudi Iron and Steel Co. (Hadeed) [Saudi Basic Industries Corp. (SABIC), 100%]		Al Jubayl	2,700
Do.		National Steel Co. Ltd. (Al Tuwairqi Group, 100%)		Dammam	800
Titanium dioxide		The National Titanium Dioxide Co. Ltd. (Cristal) (Gulf Investment Corp. of Kuwait; National Industrialization Co. of Saudi Arabia; Shairco Trading Industry and Contracting of Saudi Arabia)		Yanbu	100
Zinc, Zn content of ore		Saudi Arabian Mining Co. (Ma'aden) (Government, 50%)		Al Amar Mine, Ar Riyadh Province and Mahd Adh-Dahab Mine, Al Madinah Province	2,000

Do., do. Ditto.

¹Under construction.

²The Bulgah Mine and the Sukhaybarat plant are operated by the Saudi Company for Precious Metals, which is a subsidiary of Saudi Arabian Mining Co. (Ma'aden).

³Rabigh Refining & Petrochemical Co. (PetroRabigh) was formed in late 2008 as a joint venture of Saudi Aramco and Sumitomo Chemical Co. PetroRabigh will operate the Rabigh refinery formerly managed by Saudi Aramco subsidiary Rabigh Petroleum Refining Co.

