



# 2007 Minerals Yearbook

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## YEMEN

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# THE MINERAL INDUSTRY OF YEMEN

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The production of hydrocarbons formed a significant segment of the economy of Yemen. The oil sector accounted for 92% of total merchandise exports, 75% of Government revenue, and about 11% of the country's gross domestic product in 2006 (the latest year for which data were available) (van Rooden and others, 2007, p. 3, 11, 23).

Mineral and energy resources were owned by the state, according to Article 8 of the Constitution. Metal and industrial mineral exploration and production operations were governed by the Mines and Quarries law No. 24 of 2002. Mineral projects also were subject to the provisions of the Investment law No. 22 of 2002. In 2007, the International Finance Corp., which was an affiliate of the World Bank, and the Ministry of Oil and Minerals of Yemen jointly continued work on the development of a national mining policy. Oil projects were governed by production-sharing agreements, which, when approved by the Government, were promulgated as individual laws.

## Production

Other than oil and natural gas, mineral production was limited to industrial minerals, primarily limestone for domestic cement plants, and gypsum and salt for domestic use or the export market. Mineral exploration companies continued to evaluate the economic viability of the development of known deposits of cobalt, copper, gold, iron ore, nickel, and zinc.

In 2007, cement production increased by about 18% and crude oil production declined by 11% compared with that of 2006. The increase in cement output was attributable to the startup of a new production line at the Amran plant. Since 2000, crude oil output has declined by 29% because of depletion of oil reserves (table 1).

## Structure of the Mineral Industry

The Ministry of Oil and Minerals was responsible for the mineral sector in Yemen. The Geological Survey and Minerals Resources Board supervised solid mineral activity. Most of the country's 2,000 mining entities were small-scale domestic industrial mineral operations. Output from private-sector cement plants that were under construction was expected to supplement state-owned Yemen Cement Manufacturing and Marketing Co. output.

Natural gas and petroleum exploration and production activities were supervised by the Petroleum Exploration and Production Authority. Some of the produced crude oil was refined by the Government's Aden Refinery Co. and the private sector's Yemen Refining and Marketing Co.

## Commodity Review

### Metals

**Cobalt, Copper, and Nickel.**—Cantex Mine Development Corp. of Canada completed an 11-hole drilling program at the Wadi Qutabah prospect and started a 17-hole drill program at the Suwar project in 2007. Cantex planned to complete a prefeasibility study of the Suwar project by mid-2010.

**Zinc.**—Jabal Salab Co. Ltd., which was owned by ZincOx Resources plc of the United Kingdom (52% interest) and Ansan Wikfs Investments Ltd. (48%), continued the development of the Jabaili zinc deposit, which was located about 110 kilometers (km) northeast of Sana'a. Construction of the Jabaili Mine and plant facilities was scheduled to begin in 2008, and initial zinc oxide production was expected in late 2009.

### Industrial Minerals

**Cement.**—The Government proposed to increase domestic cement production to 7 million metric tons per year (Mt/yr) by 2009. Five new private sector cement plants were expected to be built. Sinoma International Engineering Co., Ltd. and the Yemeni-Saudi Cement Co. started work on a 1-Mt/yr-capacity cement plant in the Batis area, and Yemen Cement Manufacturing and Marketing Co. started work on an 850,000-metric-ton-per-year (t/yr)-capacity expansion of its 262,000-t/yr-capacity Bajil Cement Factory (Saba News Agency, 2007; Yemen Observer, 2007).

The International Finance Corp. agreed to fund partially the construction of a 1.54-Mt/yr-capacity cement plant for Arabian Yemen Cement Co., which was owned by Saudi Arabian and Yemeni investors (40%), Eastern Province Cement Co. of Saudi Arabia (30%), and Saudi Arabian and Yemeni companies (30%). Initial production from the plant, which was to be built near Mukalla, was expected to begin in 2009 (International Finance Corp., 2007).

### Mineral Fuels and Related Materials

**Natural Gas.**—Construction of a two-train 6.7-Mt/yr-capacity natural gas liquefaction plant and associated dock facilities at Balhaf for Yemen Liquefied Natural Gas Co. was underway in 2007. Balhaf is located about 120 km southwest of Mukalla. Work on a 320-km natural gas pipeline that would connect the plant to natural-gas-gathering facilities on Block 18 (Marib al Jawf) had begun in 2006. Yemen Liquefied Natural Gas's initial shipment of liquefied natural gas was scheduled for late 2008 (Yemen Liquefied Natural Gas Co., undated, p. 2, 4).

**Petroleum.**—In 2007, Yemen Exploration and Production Co.'s (YEPC), which was a joint venture of Yemen Hunt Oil Co. (51% interest) and Exxon Yemen, Inc. (49%), continued

its arbitration case against the Government. In 2005, the Government had terminated YEPC's operations on Block 18 (Marib al Jawf) during the initial year of a 5-year extension of the production-sharing agreement (U.S. Securities and Exchange Commission, 2008, p. 11).

**Uranium.**—Cantex acquired a prospecting permit for uranium in the Naqub West region. A historical airborne radiometric survey of the prospect, which was located 195 km southeast of Sana'a, had been completed in 1985.

## Outlook

Political unrest, especially the Houthis' ongoing conflict with the Government, which was underway north of Sana'a, could adversely affect mineral development in northwest Yemen. The Government is expected to continue to promote the diversification of the country's limited suite of produced minerals, especially the development of known mineral deposits, which include clays, feldspar, gold, iron ore, lead, perlite, salt, silica sand, silver, and zeolite.

Yemen's crude oil resources were depleting rapidly. The World Bank estimates that, without the discovery of new crude oil resources, Yemen could effectively cease production of crude oil by 2018, based on current (2007) production rates. Known

natural gas resources, however, are expected to be tapped to supply the Yemen LNG plant for more than 25 years (Dunkley, 2006; World Bank Group, 2007, p. 24).

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TABLE 1  
YEMEN: ESTIMATED PRODUCTION OF MINERAL COMMODITIES<sup>1,2</sup>

(Thousand metric tons unless otherwise specified)

Commodity <sup>3</sup>	2003	2004	2005	2006	2007
Cement	1,541	1,546 <sup>4</sup>	1,550 <sup>4</sup>	1,470 <sup>r,4</sup>	1,728 <sup>4</sup>
Gypsum	42	37	38	44	44
Natural gas:					
Gross <sup>5</sup> million cubic meters	30,000	28,500	29,500	28,100	25,000
Flared and used do.	1,000	1,000	1,000	1,220	1,200
Liquids <sup>6</sup> thousand 42-gallon barrels	7,360 <sup>4</sup>	7,830 <sup>4</sup>	7,960 <sup>4</sup>	8,220 <sup>4</sup>	7,500
Petroleum:					
Crude do.	157,270 <sup>4</sup>	147,500 <sup>4</sup>	146,090 <sup>4</sup>	133,330 <sup>4</sup>	118,000
Refinery products: <sup>6</sup>					
Naphtha do.	1,200	1,100	1,200	1,200	1,400
Gasoline <sup>7</sup> do.	9,000	9,700	10,200	10,000	10,100
Kerosene do.	3,800	3,100	1,700	1,700	1,600
Distillate fuel oil do.	16,000	16,900	18,200	18,000	19,000
Residual fuel oil do.	10,000	9,000	6,800	6,800	7,000
Other do.	640	640	690	700	760
Total do.	40,600	40,400	38,800	38,400	39,900
Salt	116 <sup>4</sup>	88 <sup>4</sup>	90	100 <sup>r</sup>	100
Sand and gravel	624 <sup>4</sup>	668 <sup>4</sup>	1,030 <sup>4</sup>	1,162 <sup>r,4</sup>	1,200
Stone:					
Marble thousand square meters	98 <sup>4</sup>	97 <sup>4</sup>	100 <sup>4</sup>	127	130
Other quarried stone	2,333 <sup>4</sup>	2,269 <sup>4</sup>	3,533 <sup>r,4</sup>	3,986 <sup>r,4</sup>	4,000

<sup>r</sup>Revised. do. Ditto.

<sup>1</sup>Estimated data are rounded to no more than three significant digits; may not add to totals shown.

<sup>2</sup>Table includes data available through June 18, 2008.

<sup>3</sup>In addition to the commodities listed, feldspar, silica sand, and zeolite may have been produced; and aggregate, limestone, mica, pumice, rolled steel bars, scoria, and talc were produced, but available information is inadequate to make reliable estimates of output.

<sup>4</sup>Reported figure.

<sup>5</sup>Most natural gas that was produced was stripped of hydrocarbon liquids and reinjected.

<sup>6</sup>Natural gas liquids include liquefied petroleum gas produced at the Aden refinery.

<sup>7</sup>Formerly listed as Benzene.

TABLE 2  
YEMEN: STRUCTURE OF THE MINERAL INDUSTRY IN 2007

(Metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Cement		Amran Cement Factory (Yemen Cement Manufacturing and Marketing Co., 100%)	Kilns and mills at Amran	1,000,000
Do.		Al Barh Cement Factory (Yemen Cement Manufacturing and Marketing Co., 100%)	Kilns and mills Mafraq, near Taiz	580,000
Do.		Bajil Cement Factory (Yemen Cement Manufacturing and Marketing Co., 100%)	Kilns and mills at Bajil	262,000
Do.		Al Mukalla Raysut Trading Co. Ltd. (Raysut Cement Co., 49%)	Maalah Port, Aden	NA <sup>1</sup>
Natural gas	million cubic meters	Safer Exploration and Production Operations Co. (Government, 100%)	Block 18	20,000 <sup>2</sup>
Do.	do.	Yemen Exploration and Production Co. (YEPC) (Yemen Hunt Oil Co., 51%, and Exxon Yemen, Inc., 49%)	Block 14	10,000 <sup>2</sup>
<b>Petroleum:</b>				
Crude	million 42-gallon barrels	Crude oil was produced under production-sharing agreements, with joint ventures that included domestic or international companies, and one Government owned operation.	Oilfield on Blocks 4, 5, 9, 10, 14, 18, 32, 43, 51, 53, S-1, and S-2	160
Refined	42-gallon barrels per day	Aden Refinery Co. (Government, 100%)	Refinery at Aden	120,000
Do.	do.	Yemen Refining and Marketing Co. (Yemen Hunt Oil Co. and Exxon Yemen, Inc., 75.5%, and Yukong Group, 24.5%)	Topping plant at Marib	10,000
<b>Salt:</b>				
<b>Crude:</b>				
Marine		Local private companies	Eleven saltworks near Aden	150,000
Rock		do.	Five salt mines near Salif	140,000
Refined		Salt Refining and Packing Factory (Government)	Salif	NA
Do.		Aden Salt Factory (Government)	Aden	NA
Steel, rolling mills		Arab Iron and Steel Corp.	do.	40,000
Do.		Mukalla Iron and Steel Co.	Rayan	120,000 <sup>3</sup>
Do.		Yemen Steel Manufacturing Company Ltd. (Al-Rhabi Trading Group, 100%)	Al Hodeidah	120,000
Stone, block, crushed, or dimension		About 1,900 local private companies	Dhamar, Mayana, Sana'a, Taiz, and Wadi Marek areas	NA

Do., do. Ditto. NA Not available.

<sup>1</sup>Cement imported through Aden terminal.

<sup>2</sup>Most produced natural gas was stripped of hydrocarbon liquids and reinjected into oil reservoirs.

<sup>3</sup>Under construction.

