

THE MINERAL INDUSTRY OF UNITED ARAB EMIRATES

By Bernadette Michalski

The production of crude petroleum and natural gas was the most important facet of both the United Arab Emirates' ¹ (UAE) mineral industry and the country's economy in 1995. Crude petroleum and natural gas accounted for approximately 80% of Government revenues and 34% of the country's gross domestic product which was reported at \$39,230² million according to the Planning Ministry.

Aluminum metal from Dubai, ammonia from Abu Dhabi, and cement manufactured in six of the seven emirates were significant in terms of production volume and export earnings. Dubai also was one of the world's leading gold bullion importers and jewelry exporting centers.

All mineral resources were owned and controlled by the individual emirates and only loosely administered by the Federal Government. The Ministry of Petroleum and Mineral Resources coordinated Federal UAE activities with the international community. The Government continued to encourage the expansion of the country's mineral production capacity.

To increase non-oil income, customs duties were increased from 1% to 4% during 1994. However, iron and steel for the construction industry and unworked gold were excluded from the higher duties.

The Federal Environment Authority (FEA), organized under Federal Law No. 7 of 1993, was responsible for combating pollution in the UAE. The FEA drafted new environmental legislation to combat pollution from oceangoing tankers. Industrial companies' dumping of noxious waste in the desert also was to be targeted and eliminated.

Crude oil production, averaging approximately 2.2 million barrels per day (Mbb/d), was primarily from Abu Dhabi. Additional petroleum and gas production was from Dubai, Sharjah, and Ras al-Khaimah. Production was restrained by the 1995 Organization of Petroleum Exporting Countries (OPEC) quota.

Although the variety and output of minerals produced was small, demand for domestic industrial minerals continued to grow. (*See table 1.*)

Crude oil and refined petroleum products were the principal mineral products exported. Japan was the primary customer for UAE petroleum and natural gas, buying almost 50% of produced petroleum, and most of Abu Dhabi Gas Liquefaction Co.'s (ADGAS) liquefied natural gas (LNG)

production. The United States imported a total of 3.2 million barrels (Mbb) of crude oil and petrochemical feedstock in 1995.

Aluminum was exported primarily to Japan, the Republic of Korea, and Taiwan. Gold products were exported primarily to Asia and the Middle East.

The Government was heavily involved in the mineral industry, owning majority shares in the aluminum, fertilizer, natural gas, petroleum production and refining, and sulfur industries. It also had a significant presence in the cement industry. Nonetheless, private investor participation in the mineral sector continued to grow with the Government's encouragement. International petroleum companies were heavily involved in crude oil and natural gas development and infrastructure projects in Abu Dhabi. Expatriates accounted for about 75% of the Emirate's labor force.

In the metals sector, chromite mining in Fujairah by Derwent Mining Ltd. of Ireland continued. The Dubai Aluminum Co. Ltd. production reached record levels prompting expansion plans to 372,600 metric tons per year (t/yr) by 1997. Other metal operations included the Ahli Steel Co., which had a 70,000-t/yr steel plant for production of reinforcing bars near Dubai; Solo Industries Ltd., Sharjah, which operated an 800-t/yr lead refinery for scrap recycling; and Lucky Recycling Ltd., Dubai, which melted copper scrap.

Within the industrial minerals sector, Ruwais Fertilizer Industries (Fertil) continued to expand fertilizer exports. Fertil proposed to increase its annual ammonia production capacity by 25% to 500,000 t/yr and urea production capacity by 15% to 600,000 t/yr. Smaller fertilizer plants included a 219,000-t/yr plant at Ajman and the 6,000-t/yr Union Kemira plant at Jebel Ali, Dubai. Abu Dhabi National Oil Co.'s (ADNOC) subsidiary, National Chlorine Industries, produced salt, chlorine, and caustic soda at its plant in Umm Al-Nar.

Expansion was underway at Fujairah Cement Industries in Dibba, Fujairah, and at Ras al-Khaimah Co. for White Cement and Construction Material in Khor Kywair, Ras al-Khaimah. A project to reduce environmental emissions commenced at Gulf Cement Co. at Al-Nakheel, Ras al-Khaimah.

Costain Abu Dhabi was awarded a contract to build a barite and bentonite grinding plant during 1995. Silica sand

demand would be expected to increase with the proposed 1995 construction of a 280-million-bottle-per-year glass factory in Dubai.

ADNOC began construction of an 80-metric tons per day (t/d) Claus unit to augment sulfur recovery at Habshan. Liquid sulfur was trucked to Ruwais where the construction of two additional 1,100-t/d granulation units was proposed.

The Government encouraged the expansion of hydrocarbon production capacity to ensure its participation in future world markets. According to a study by the Union of Arab Chambers of Commerce and Industry, the UAE was projected to increase sustainable crude petroleum production capacity from 2.3 Mbbl/d in 1991 to nearly 2.9 Mbbl/d by 1996. Natural gas production also was projected to expand to 4.8 million cubic meters per day (Mm³/d) from 3.5 Mm³/d.

Domestic and international oil companies' investment to increase production capacity has included drilling infill wells, upgrading wellhead equipment, and adding oil and gas gathering facilities, such as new trunklines, flowlines, and remote manifold stations. But the UAE's production was restrained by the OPEC quota, and onshore fields in Abu Dhabi were required by the Government to cut back on production. Operations in Dubai and high-cost offshore fields were apparently allowed to produce at higher rates than the onshore Abu Dhabi concessions.

Exploration continued in the UAE with Dubai Production Co. contracting for a marine seismic survey adjacent to its offshore Fateh Field and Geco-Prakla starting a 2-year contract to shoot seismic over ADNOC's onshore concessions.

The Abu Dhabi Co. for Onshore Oil Operations (ADCO) procured four additional wellhead platforms and associated facilities for the offshore Umm Al-Anbar Field. Bechtel Corp. of the United States was part of a joint venture that was contracted to upgrade the gas-processing facilities at Habshan. This \$1.3 billion onshore gas development project for ADNOC will further development of the Thamama B, C, and F sour gas reservoirs. A projected natural gas flow of 42 Mm³/d was to be treated to recover condensate and sulfur.

ADGAS doubled its Das Island gas-processing capacity to approximately 58 million barrels per year (Mbbl/yr) with the construction of a third LNG production train on Das Island. The liquefaction train was completed in May 1994 and began full production in September. Tokyo Electric Power Co. had contracted to receive 50 Mbbl/yr until 2019.

Early in 1995, Abu Dhabi's Supreme Petroleum Council approved expansion of the Ruwais refinery. The project includes increasing distillation capacity by 335,000 barrels per day (bbl/d) to 455,000 bbl/d through the installation of a second 135,000 bbl/d crude distillation unit and a 200,000 bbl/d condensate distillation unit. Hydrocracking capacity

was scheduled to be expanded from 27,000 bbl/d to 73,000 bbl/d.

According to the Kuwait-based Organization of Arab Petroleum Exporting Countries (OAPEC), the UAE had estimated proven petroleum reserves of 98 billion barrels as of January 1, 1995. Proven natural gas reserves for the UAE were estimated in OAPEC's annual report to be 5.79 trillion cubic meters. Most of the UAE's hydrocarbon reserves were in Abu Dhabi, the locale for 94% of petroleum reserves and 92% of natural gas reserves.

The Nation's four government-run electric utilities had a total installed electricity generating capacity of 5,500 megawatt (MW). A number of gas-fired power and desalinization plants were also under construction.

The United Arab Emirates had an extensive crude oil and natural gas pipeline network. A 125-km, 106-centimeter-diameter gas pipeline from Bab to the Taweelah B power station was under construction. Coastal petroleum terminals were at Ruwais, Jebel Dhanna, Port Zayed, and Umm Al-Nar in Abu Dhabi; Jebel Ali and Port Rashid in Dubai; and in Sharjah. Island or mooring buoy loading facilities were at Abu Al-Bukhoosh, Das Island, Delma Island, Mubarrak, and Zirku Island in Abu Dhabi; Fateh, Dubai; and Mubarak, Sharjah.

The country's port facilities and merchandising capabilities were expected to attract additional precious metal and stone companies and continue to expand on its transshipment commerce.

Privatization, expanding economic interests, and Government interest should ensure growth for the mineral industry. Revenues from mineral fuels were expected to continue to be reinvested in diversification projects and downstream processing.

¹Includes the following seven Emirates: Abu Dhabi, Ajman, Dubai, Fujairah, Ras al-Khaimah, Sharjah, and Umm al-Qaywayn.

²Where necessary, values have been converted from Emirian dirhams (Dh) to U.S. dollars at the rate of Dh3.67=US\$1.00.

Major Sources of Information

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TABLE 1
UNITED ARAB EMIRATES: PRODUCTION OF MINERAL COMMODITIES 1/

(Metric tons unless otherwise specified)

Commodity 2/	1991	1992	1993	1994	1995 e/
Aluminum, metal, primary ingot	239,030	244,605	242,264	246,890	239,900 3/
Cement, hydraulic 4/ thousand tons	3,470	3,800	4,000 e/	5,000 r/ e/	6,000
Chromite e/	--	1,000	20,000	25,000	25,000
Fertilizer materials:					
Ammonia:					
Gross weight	348,000	332,000	372,000 r/	347,500 r/	441,000 3/
N content	286,000	275,000	305,600 r/	286,500 r/	362,700 3/
Urea:					
Gross weight e/	517,000 3/	506,000	520,000	540,000	540,000
N content	241,000	236,000	243,000	250,000 e/	250,000
Gas, natural:					
Gross million cubic meters	32,860	30,130 r/	31,630 r/	32,000 r/	40,000
Dry do.	25,810 r/	22,170 r/	22,930 r/	23,000 r/	30,000
Gypsum e/ thousand tons	95	95	95	95 r/	90
Lime e/ do.	45	45	45	45	50
Natural gas plant liquids e/ thousand 42-gallon barrels	60,000	52,500	58,000	80,000 r/	100,000
Petroleum:					
Crude do.	890,000	836,000	800,000	792,000 r/	800,500 3/
Refinery products:					
Gasoline do.	10,695	10,770	10,700 e/	10,800 e/	10,800
Kerosene do.	9,270	9,200	9,200 e/	9,250 e/	9,250
Distillate fuels do.	19,565	19,565	19,500 e/	19,600 e/	19,600
Residual fuels do.	18,830	18,940	18,900 e/	18,925 e/	18,925
Other do.	10,650	10,800	10,700 e/	10,750 e/	10,750
Total do.	69,010 r/	69,275 r/	69,000 r/ e/	69,325 r/ e/	69,325
Sulfur, byproduct: e/					
From petroleum refining	10,000	20,000	24,000	24,500 r/	24,500
From natural gas processing	64,000	200,000 r/	225,000 r/	225,500 r/	230,500
Total	74,000 3/	220,000 r/ 3/	249,000 r/ 3/	250,000 r/	255,000

e/ Estimated. r/ Revised.

1/ Table includes data available through May 15, 1996.

2/ In addition to the commodities listed, crude industrial minerals such as common clays, diabase, limestone, marble, shale, other construction stone, and sand and gravel presumably are produced, but output is not reported, and general information is inadequate to make reliable estimates of output levels.

3/ Reported figure.

4/ Includes white cement.