

# THE MINERAL INDUSTRY OF

# KUWAIT

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In recent years, output from metal fabricating and cement plants have lessened the necessity of Kuwait importing these products. The preponderant sector of the mineral industry continues to be the production and refining of crude oil. The oil industry accounted for about 40% of the gross domestic product (GDP), generated nearly 95% of export revenues, and provided 90% of government revenues. The production for export of such value-added commodities as ammonia and urea will include ethylene-based petrochemicals after the nation's first petrochemical plant begins production in 1997.

## Government Policies and Programs

Kuwait's many investments, which included participation in foreign petroleum exploration, acquisition of foreign petroleum refining and distribution networks, and participation in overseas petrochemical facilities, have fostered an economy with globally dispersed assets.

Under its privatization plan, the Kuwaiti Government, which employed most of the work force, proposed selling state enterprises during the next 5 years. The plan included shedding a total of \$2.68 billion in equity distributed among 62 companies and privatizing services that were being subsidized or provided free by the Government. These services included electric power production, transportation, and communications. The Government planned to increase the contribution of the private sector to the GDP from 25% to 31% by 2000. In support of this privatization program, 17 state-owned companies had been wholly or partially privatized by year-end. Kuwait Petroleum Corporation (KPC) realized \$435 million from the sale of American assets owned by its subsidiary, Santa Fe International Corp. and an additional \$1.23 billion from the sale of North Sea assets owned by Santa Fe that were purchased at auction by Norway's Saga Petroleum Corp.

## Environmental Issues

The environmental damages resulting from the Iraqi occupation had not yet been fully realized. Because there was no precedent upon which to draw to make an assessment, it was expected to be some time before the full extent of the damage could be understood.

## Production

The Organization of Petroleum Exporting Countries extended Kuwait's crude oil production quota at the same level of 2

million barrels per day (Mbbbl/d) for 1996. This quota level has been assigned to Kuwait since the fourth quarter of 1993. Kuwait's crude oil production for 1996 averaged 2 Mbbbl/d, including about 200,000 barrels per day (bbl/d) from the Divided Zone shared with Saudi Arabia. (See table 1.) This is the highest production level attained since 1979 when output was 2.5 Mbbbl/d.

## Trade

Total exports, mostly hydrocarbon-related, were valued at \$15.2 billion. Total imports, principally vehicles and other consumer goods, were valued at \$8 billion. Less crude oil was available for export as combined throughput capacity at the nation's three refineries was upgraded to 895,000 bbl/d from 750,000 bbl/d in 1995. The principal market for crude oil was Japan, which imported about 500,000 bbl/d. European imports averaged about 290,000 bbl/d; however, much of the crude oil was delivered to Kuwait-owned European refineries and the resulting products were marketed through the Kuwait-owned distribution system. The United States imported 236,000 bbl/d of mostly crude and unfinished oil from Kuwait, accounting for 2.5% of the U.S. petroleum imports for the year (Energy Information Administration, 1996).

## Structure of the Mineral Industry

The Government of Kuwait imposed few restrictions on trade or financial flows and placed considerable emphasis on the private sector to develop the economy. The petroleum and natural gas extraction and processing industries, however, were under Government control. (See table 2.) Total control of the Kuwait Oil Corporation (KOC) and the Kuwait National Petroleum Company (KNPC) has been in effect since 1975.

The Government established a state umbrella company for hydrocarbon operations KP in 1980. This organization controlled all the state hydrocarbon companies and managed Government share holdings in various oil ventures, including those operations in the Divided Zone and the acquired interests in foreign operations.

Despite the liquidation of several billion dollars in stocks and bonds since the Iraqi invasion, Kuwait retained substantial worldwide investments, including an extensive refining and distribution network in Western Europe, as well as downstream investments in Eastern Europe, India, and Southeast Asia.

## Commodity Review

### Metals

Arabian Light Metals Co. operates a 5,000-metric-tons-per-year (t/yr)-capacity aluminum extrusion plant. The company used billet imported from Bahrain, Dubai, and Egypt.

Kuwait consumes about 0.5 million metric ton per year (Mt/yr) of steel reinforcing bars. The construction of an \$80 million mill is under consideration as a joint venture with Iran, which is expected to supply the Kuwait mill with direct reduced iron from the National Iranian Steel Company.

### Industrial Minerals

**Cement.**—The heavy construction demands resulting from damages related to the Gulf War required large imports of cement. Any further construction programs are within the limits of the 2 Mt/yr domestic kiln capacity. The Kuwaiti cement industry imports all of its clinker requirements.

**Fertilizers.**—The Petrochemical Industries Company (PIC) operated the Shuaybah Fertilizer Complex, which had the capacity to produce almost 1 Mt/yr of ammonia and 800,000 t/yr of urea. The bulk of the complex's urea output is exported to China, Japan, and the Philippines. Ammonia exports, by order of volume, are destined for India, The Republic of Korea, Taiwan, Jordan, Tunisia, Turkey, Spain, and Greece.

### Mineral Fuels

**Natural Gas.**—Fully restored since the Gulf War, the gas system has the capacity to process associated gas from as much as 3 Mbbbl/d of oil production (current production is only 2 Mbbbl/d), stripping liquids for export, and using dry gas for Kuwait's domestic needs—fuel for electric power and feedstock in fertilizer and eventually petrochemical production.

Kuwait's associated natural gas gathering network delivers the gas to three gathering stations distributed in different regions within the country. From each of these locations it is piped to Shuaybah for fractionation. Associated natural gas from the Raudhatain and the Sabiriya Fields near the northern border with Iraq was processed in northern Kuwait, and a mixed liquids stream was delivered by pipeline to the fractionator at Shuaybah. Natural gas from the Minagish, the Umm Gudair, and the South Umm Gudair Fields, near the western border with Saudi Arabia, flowed as wet gas to the processing plant at Shuaybah. Natural gas from the Burgan and the Maqwa-Ahmadi Fields was processed at two field recovery plants. The recovered liquids were then delivered by pipeline to Shuaybah for fractionation.

**Petroleum.**—Production.—The bulk of Kuwait's 2 Mbbbl/d output was derived from the Burgan complex, which included the Maqwa and the Ahmadi Fields.

The country's sustainable crude oil production capacity is about 2.5 Mbbbl/d, including more than 200,000 bbl/d in the

Divided Zone. The Government plans to augment sustainable crude oil production capacity to 3 Mbbbl/d by 2000 and a further increase to 3.5 Mbbbl/d by 2005. Much of the expansion in capacity was expected to result from the development of the light crude oil reservoirs in the deep Marat, Naja, and Sarjelu Formations.

**Refining.**—During the Gulf War, overall damage to the Mina al Ahmadi refinery was relatively light compared with that to the Mina Abdullah and the Shuaybah refineries. A vigorous petroleum refinery reconstruction program was implemented. As a result, total domestic refining capacity was 750,000 bbl/d by the start of 1995, and increased to 830,000 bbl/d in 1996. As a guaranteed outlet for its crude oil, KPC continued acquiring equity in overseas refining centers, progressing toward achieving its target of attaining 400,000 bbl/d of refining capacity in Asia alone. Plans include a joint venture with the Indian Oil Corp.(IOC) to construct a refinery in the State of Orissa. The refinery's initial capacity was planned at 120,000 bbl/d eventually to be expanded to 180,000 bbl/d. KPC and IOC will each have 26% ownership with the remainder offered for public subscription in India. Similar joint-venture refineries were planned in China, Pakistan, and Thailand.

Kuwait's refining equity in Europe was about 150,000 bbl/d, mostly from refineries in Rotterdam, the Netherlands, and in Gulfhaven, Denmark. In September 1995, KPC reportedly reached an agreement with Italy's Agip for a 50% stake in the 300,000-bbl/d Milazzo refinery in Sicily.

**Petrochemicals.**—Equate, Kuwait's first petrochemical company, with equity held by PIC, Union Carbide Corp. of the United States, and the Bubiyan Investment Co. of Kuwait, began plant construction at Shuaybah in late 1995; completion is anticipated in 1997. The plant will include a 650,000-t/yr-capacity ethane cracker, and will produce 450,000 t/yr of high-density and linear low-density polyethylene, and 350,000 t/yr of ethylene glycol.

**Petroleum Coke.**—KNPC is considering the construction of a 300,000-t/yr-capacity petroleum coke plant at the Mina Abdullah refinery. The output would be exported within the Gulf region to supply aluminum smelters that are currently receiving petroleum coke imported mostly from the United States.

### Reserves

Kuwait's proven reserves of crude oil as of January 1, 1997, were officially estimated by KOC at 96.5 billion barrels, including 2.5 billion barrels representing Kuwait's share of the Divided Zone reserves. Kuwait enjoys a reserve-to-production ratio of 132 years. The bulk of crude oil reserves were located in the Greater Burgan Field, containing about 65 billion barrels.(Arab Oil & Gas Directory, 1997.

Natural gas reserves were 1,400 billion cubic meters (Arab Oil & Gas Directory, 1997). The reserves were based entirely on associated natural gas because intensive exploration programs during the past decade uncovered no nonassociated gas reservoirs.

## Infrastructure

The pipeline network and storage facilities supporting petroleum production, processing, and transportation were fully restored. The pipeline network totals 390 kilometers of crude, product, and natural gas lines. KOC operates all crude oil and natural gas lines, and KNPC operates all product pipelines. Kuwait has four electric power stations with a combined capacity of 6,550 megawatts. These plants also incorporate seawater desalination facilities and have a combined capacity of 216 million gallons per day. The Ministry of Electricity and Water is expanding and upgrading the national grid through the construction of several new substations and transformer stations to sustain Kuwait's electricity consumption, which the Ministry estimates is rising at a rate of 8% to 10% per year.

## Outlook

The recovery of oil prices in 1995 and even more so in 1996 has served as an impetus to the economy with exports climbing to nearly twice the value of imports. The Government of Kuwait has filed claims amounting to nearly \$95 billion with the United Nations' Compensation Commission in Geneva for damages from Iraq's invasion in 1990. These claims cover only damages to oil reservoirs and loss of crude oil after Iraqi forces set Kuwait's oil fields ablaze. The U.N. Security Council Resolution 687 provided for receipt of a portion of Iraq's oil revenues in compensation for the human and material losses suffered.

After consultations with the International Monetary Fund and the World Bank, Kuwait implemented steps to promote privatization, economic liberalization, and a reduction in the welfare state. To ease the budget deficit, Kuwait plans to reduce public spending by 20% through fees on public services and by privatizing state-owned enterprises.

Domestic refineries were being upgraded. New joint-venture refining projects in Europe and Asia will provide secure outlets for Kuwait in the future—particularly as Kuwait Export crude can be processed only by refiners with adequate desulfurization capacity. If world oil demand remains strong and Government programs for cost cutting and privatization continue to be successful, then the Kuwait budget deficit can be dissolved in this decade.

## References Cited

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Energy Information Administration, 1996, Petroleum Supply Annual, 1996: V. 2 DOE/EIA-0340(96)/2 p. 278-301, June.

## Major Sources of Information

- Kuwait Petroleum Corp. (KPC)  
P.O. Box 26565-Safat  
13126, Kuwait  
Telephone: (965) 245-5455 and (965) 245-2686
- Kuwait Oil Co.  
P.O. Box 9758-Ahmadi  
61008, Kuwait  
Telephone: (965) 398-9111
- Kuwait National Petroleum Co.  
P.O. Box 70-Safat  
13001, Kuwait  
Telephone: (965) 242-0121
- Petrochemical Industries Co.  
P.O. Box 1084  
Safat 13011, Kuwait  
Telephone: (965) 244-8280  
Fax: (965) 244-7159

TABLE 1  
KUWAIT: PRODUCTION OF MINERAL COMMODITIES 1/

(Metric tons unless otherwise specified)

Commodity	1992	1993	1994	1995	1996 e/
Chlorine	--	25,000	35,000	50,000 r/	50,000
Cement e/ thousand tons	533 r/	500	500 r/	500 r/	500
Clay products, nonrefractory: Sand lime bricks e/ cubic meters	100,000	100,000	100,000	100,000	100,000
Lime: Hydrated and quicklime e/	5,000	35,000	35,000 r/	35,000 r/	35,000
Natural gas: 2/					
Gross million cubic meters	3,600	5,170	7,560 r/	10,870 r/	11,000
Dry do.	2,040	4,470	5,970 r/	9,280 r/	9,400
Natural gas liquids thousand 42-gallon barrels	-- r/	40,000	42,000	45,000 r/ e/	45,000
Nitrogen: N content of ammonia	140,000	317,000 r/	320,000 r/	325,000 r/ e/	325,000
Petroleum:					
Crude 2/ thousand 42-gallon barrels	380,000	683,300	742,000	752,265	752,630
Refinery products:					
Gasoline, motor do.	9,380	10,183 r/	21,316 r/	16,170 r/	18,500
Kerosene do.	11,970	16,315	45,100 r/	49,494 r/	17,000
Distillate fuel oil do.	20,440	43,360 r/	90,702 r/	88,914 r/	36,000
Residual fuel oil do.	61,685	72,817 r/	88,290 r/	66,940 r/	68,500
Other do.	29,930 r/	21,316	40,150 r/	78,402 r/	35,000
Total do.	133,405 r/	163,991 r/	285,558 r/	299,920 r/	175,000
Salt	800	40,860 r/	45,000 r/	100,000 r/	100,000
Sodium and potassium compounds: Caustic soda	16,000	25,000	30,000	60,000 r/	40,000
Sulfur:					
Elemental, petroleum byproduct	50,000 r/	175,000 r/	200,000 r/	559,000 r/	576,000
Sulfuric acid	NA	5,000	5,000 e/	10,000 r/ e/	10,000
Urea	140,000	300,000 r/	400,000 r/	400,000 r/ e/	400,000

e/ Estimated. r/ Revised. NA Not available.

1/ Table includes data available through Oct. 1, 1997.

2/ Includes Kuwait's share of production in the Kuwait-Saudi Arabia Divided Zone.

TABLE 2  
KUWAIT: STRUCTURE OF THE MINERAL INDUSTRY FOR 1996

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of facilities	Annual capacity
Caustic soda	Petrochemical Industries Co. (Government, 100%)	Shuaybah	30
Chlorine	Petrochemical Industries Co. (Government, 100%)	Shuwaikh	25
Do.	do.	Shuaybah	33
Nitrogen:			
Ammonia	Petrochemical Industries Co. (Government, 100%)	do.	1,100
Urea	do.	do.	900
Petroleum, crude million barrels	Kuwait Oil Co. (Government, 100%)	Burgan	550
Do.	do.	Raudhatain	95
Do.	do.	Sabiriya	58
Do.	do.	Ahmadi	20
Do.	do.	Minagish	25
Do.	do.	Umm Gudair	25
Do.	do.	Maqwa	25
Do.	do.	Bahra	15
Do.	do.	Ratqa	5
Do.	Wafra Oil Co. (Saudi Arabian Texaco, 50 %; Kuwait Oil Co., 50%)	Wafra	35
Do.	do.	South Fuwaris	2
Do.	do.	South Umm Gudair	10
Do.	Arabian Oil Co. (Japanese Petroleum Trading Co., 80%; Saudi Arabia, 10%; Kuwait, 10%)	Khafji	100
Do.	do.	Hout	10
Petroleum, products	do.	Mina Al-Ahmadi	400
Do.	do.	Shuaybah	150
Do.	do.	Mina Abdulah	245
Petrochemicals:			
Ethylene	Equate Petrochemical Complex (Petrochemical Industries Co., 45%; Union Carbide Corp, 45%, Bubiyan, 10%)	Shuaybah	650 1/
Polyethylene	do.	do.	450 1/
Ethylene glycol	do.	do.	350 1/

1/ In operation by 1997.