GULF STATES

By Peter W Harben & J M Harris
Peter W Harben Inc, New Mexico 88011, USA (www.peterharben.com)

The several small monarchies and city-states that make up the Persian Gulf States hold about a third of the Earth's future fossil-fuel supplies and by 2020 could be supplying over half the world's oil needs. These contemporary states – Bahrain, Kuwait, Qatar, Dubai, and the United Arab Emirates – are undergoing dramatic changes in order to diversify and at the same time combine their older traditions with an often dynamic modernism typified by Dubai's gleaming hotels and international financial centre. At the same time, the Gulf States have assumed greater strategic importance recently having taken on the Saudi mantle of staging posts for supplying Iraq after the war.

The United Arab Emirates (UAE) consists of a federation of seven independent states -- Abu Dhabi (Abu Zaby), 'Ajman, Dubai, Al Fujayrah, Ra's al Khaymah, Ash Shariqah, and Umm al Qaywayn -- located in the south-eastern corner of the Arabian Peninsula and bordered by the Persian Gulf to the north, Saudi Arabia to the south and west, and Oman and the Gulf of Oman to the east. The roughly crescent-shaped UAE has a total land area of some 83,600 km^2 including its islands and mainly consists of desert with a flat coastal plain, mostly tidal salt flats. The largest emirate, Abu Dhabi, accounts for 87% of the UAE's total area and the smallest, Ajman, for just 259 km^2.

Following the discovery of oil in Bahrain by Standard Oil Co of California (Socal) in 1932, exploration focussed on the Persian Gulf states where geological conditions were similar to those in Iran and because treaties signed between 1820 and 1920 gave the British substantial influence. However, World War II delayed the development of the discoveries and it was not until the 1950s that the oilfields were developed first in Kuwait (1953) and then in Qatar, and Abu Dhabi (1962). Abu Dhabi became a member of the Organisation of the Petroleum Exporting Countries (OPEC) in 1966 and when the emirates federated in 1971, membership was transferred to the UAE. Oil brought rapid growth and modernisation to the area, and today about 30% of the federation's GDP is based on oil export revenues, although diversification has occurred through aluminium production, tourism, aviation, re-export commerce, and telecommunications.

The UAE contains proven crude oil reserves of 97.8 billion barrels, just less than a tenth of the world total: Abu Dhabi accounts for 94%, with some 92.2 billion barrels, followed by Dubai (4 billion barrels), Sharjah (1.5 billion barrels) and Ras al-Khaimah (100 million barrels). Abu Dhabi joined OPEC in 1967, but Dubai did not. The UAE's total capacity is 2.65 Mbbl/d and its OPEC production quota effective September 1, 2001, is 2.03 Mbbl/d; production quotas were cut three times in 2001. The Abu Dhabi National Oil Co. (ADNOC), is planning a limited opening of UAE upstream oil production to

foreign business and the first asset sale will involve 28% of the offshore Upper Zakhum field, currently producing some 500,000 bbl/d. ADNOC also operates two refineries; the Ruwais one underwent a US$100 million upgrade in 1995 to a capacity of 145,000 bbl/d and a US$1.2 billion second phase expansion. With planned completion last year, total capacity will be about 415,000 bbl/d. There are four smaller refineries and a 40,000 bbl/d gasoline unit owned by ISO Octane opened near Jebal Ali in May 2000.

Natural gas reserves in the UAE are 212,000 billion ft^3, the world's fifth largest, and 196,100 billion ft^3 are located in Abu Dhabi where the non-associated Khuff natural gas reservoirs and Abu al-Bukhush oil fields are among the world's largest. Increased consumption and demand have prompted increasing use of natural gas, and the development of natural gas fields results in increased production and exports of condensates which are not subject to OPEC quotas. There has been a multi-billion dollar programme of investment in the natural gas sector; the second phase of the onshore natural gas development programme at the Habshan complex was finished in early 2001; a third phase of expansion is planned and engineering and design bids were sought in September 2001.

The Asab natural gas development project was completed in 1999 and processes some 830 Mft^3/d of associated wet natural gas and up to 100,000 bbl/d of condensate for processing at the Ruwais refinery. Natural gas consumption in Dubai alone is anticipated to increase by 7% annually through 2005. The US$8-10 billion Dolphin Project, which will allow the export of non-associated natural gas from the huge offshore North Dome field, will develop links between the natural gas infrastructures of Qatar, the UAE, and Oman and possibly the Indian subcontinent, with natural gas supplies starting in late 2005.

Abu Dhabi is the most politically powerful part of the UAE, providing over 80% of the federation's income. Dubai itself, with its Internet City, resembles a boomtown and has tried hard to diversify. Dubai Aluminium Co. (Dubal) was founded in 1975 and accounts for 2% of the world's aluminium production or some 536,000 t/y. It incorporates a power generating capability of over 1,400 MW and a seawater desalination plant capable of providing over 25 Mgal/d of potable water. It has expanded three times and Dubal considers itself the largest single-site smelter in the Western world and the largest non-oil foreign exchange earner in the UAE. With a workforce of 2,700, it is the world's largest supplier of foundry alloy to the automotive wheel industry in Asia and a significant supplier of billet for extrusion products. The UAE has one of the best developed desalination systems in the world, which has helped transform its shoreline and foster construction.

Other metal and mineral activities include: chromite mining in Fujairah; Ahli Steel Co. which has a 70,000 t/y steel plant for reinforcing bars in Dubai; Solo Industries Ltd, with a 800 t/y lead refinery for scrap recycling in Sharjah; and Lucky Recyling Ltd, a copper scrap facility in Dubai.

ADNOC subsidiary, National Chlorine Industries, produces caustic soda, chlorine, and salt at its Umm Al-Nar plant. Silica sand demand is increasing, with a glass bottle factory in Dubai where there are also ten cement factories. Expansions have occurred at Fujairah Cement Industries and at Ras al-Khaimah Co for white cement and construction material; cement is also manufactured in six of the seven emirates. High- quality rockfill and aggregate are quarried near Fujairah's port and Ras al Khaimah where rockwool factories using dolerite feedstock have been operating.

Abu Dhabi Fertilizer Industries (Adfert) has helped make the UAE self-sufficient in that area. Established in 1997, it is one of the fastest-growing business conglomerates in the UAE. ITT Emirates established Adfert, one of the largest agricultural firms engaged in the marketing of fertiliser in the Gulf region, and has an association with SQM Corp, the Chilean nitrate and potash producer. The two companies co-operated to set up an NPK chemical fertiliser plant with two production lines (water soluble, granular NPK compound fertilisers) and the first trial production run was done in July 1997, with commercial production starting the next month. Expansions have continued, with eight new production lines by the end of 2000.

Qatar occupies 11,427 km^2 of the Qatar Peninsula which juts into the Persian Gulf from the eastern coast of the Arabian Peninsula and is bordered on the south by Saudi Arabia. The land comprises coastal salt pans, elevated limestone formations (the Dukhan anticline) along the west coast under which lies the Dukhan oil field, and massive sand dunes surrounding Khawr al Udayd, an inlet of the gulf in the southeast known to local English speakers as the Inland Sea. Doha, the capital located on the central east coast, is an important port and together with Umm Said is capable of handling commercial shipping. The island of Halul, about 90 km east of Doha, serves as a storage area and loading terminal for oil from the surrounding offshore fields.

Oil was discovered in Dukhan, on the west coast of Qatar, in 1939 and a year later about 4,000 bbl/d were being produced. Development was interrupted by World War II and its aftermath so that exports did not begin until 1949. The Dukhan field extends south from Dukhan along the west coast and has three oil reservoirs layered progressively deeper between limestone formations and a natural gas field underlying them all. A pipeline carries crude from the Dukhan fields to storage, refining, and terminal facilities on the east side of the peninsula at Umm Said.

Today, Qatar holds the third largest natural gas reserves and the largest non-associated gas field in the world. An OPEC member, Qatar currently exports over 745,000 bbl/d of oil. Proven and recoverable oil reserves are 13.2 billion barrels with the onshore Dukhan field remaining the largest producing one. There are also six offshore fields. In 2000, Qatar produced 863,000 bbl/d of liquids (including crude oil, natural gas liquids, and condensate) and, as of June 2001, monthly crude oil production was averaging 700,000 bbl/d. Lease condensate and other natural gas liquids are also produced and not included in OPEC quotes.

Qatar has been trying to encourage foreign oil companies such as Chevron to improve oil recovery and exploration with improved contract terms and production-sharing agreements. BP Amoco operates al-Rayyan, one of the newer oil fields, which has been producing some 25,000 bbl/d recently, and BP Amoco and its consortium partners agreed in April 2001 to develop it further, which will almost double its capacity.

The National Oil Distribution Co. (Nodco), is upgrading its refinery at Umm Said to increase capacity from 57,500 bbl/d to 137,000 bbl/d. A 30,000 bbl/d condensate refining unit came on stream in July 2001, with more upgrades finished at the end of the year. A US$400 million, 80,000 bbl/d condensate refinery at Ras Laffan is scheduled for completion this year as is a US$1.1 billion petrochemical plant, Q-Chem. This will produce 500,000 t/y of ethylene and 467,000 t/y of polyethylene, including high-density and linear low-density polyethylene (Phillips Petroleum Co holds 49% of Q-Chem and QGPC 51%). Natural gas proven reserves stand at 394 trillion ft^3 mostly in the North Field. The Dolphin project will provide an integrated gas pipeline grid for Qatar, UAE, and Oman, and Kuwait may also buy Qatari gas from ExxonMobil's North Field.

However, the country sees the need to diversify and has invested heavily in projects for the export of liquefied natural gas and petrochemicals. The government feels that the country's economic future lies in developing this impressive gas potential. Qatar's real gross domestic product (GDP) is projected to grow at an annual rate of 3.8% in 2002, after growth of 3.4% in 2001. This follows a phenomenal growth rate of 11.5% in 2000, which was largely the result of a sharp increase in natural gas exports. Qatar has begun to pay down its large external debt, which peaked at nearly US$12 billion in 1999, and this is the government's focus rather than increasing public expenditures.

Manufactures include cement, fertiliser, and petroleum products. Revenue from oil concessions is being used for a development programme; a road network, hospitals, and desalination plants have been built, and the country has a welfare plan that includes free medical care and education.

Bahrain, a constitutional monarchy ruled by King Hamad bin Issa Al-Khalifa since March 1999, comprises 33 islands on the western side of the Persian Gulf. The country's area totals 707 km^2, a little less than that of New York City, and the main island of Bahrain accounts for 80% of the territory. After a period of British control, Bahrain became independent in 1971.

Since 1932 when Bahrain became the first Arab state in the Persian Gulf region to develop an oil-based economy, oil production and refining have dominated Bahrain's economy. Natural gas occurs along with the crude oil and comes out of the same wells. For some time, the gas from the wells was wasted, but in 1979 a government company was set up to collect and process the natural gas into propane, butane, and naphtha.

However, Bahrain's oil reserves of only 148 Mbbl are in the Awali field, the first developed in the Gulf and producing about 35,000 bbl/d of crude oil. Bahrain is not a member of the Organisation of Petroleum Exporting Countries (OPEC), but it is a member of the Organisation of Arab Petroleum Exporting Countries (OAPEC), which seeks to co-ordinate Arab oil policy.

Consolidation of Bahrain's state-owned petroleum sector began in January 2000, as the upstream Bahrain National Oil Company (Banoco) began merging into Bapco. The merger was completed on June 1, 2002, forming the Bahrain Petroleum Company (BSC) charged with the exploration, production, refining, marketing and distribution of Bahraini oil for domestic use and the international market. Bahrain does have a significant refinery south of Manama with a capacity of 248,900 bbl/d, and a US$800 million modernisation programme should be finished in 2004. Financing problems have delayed a further 500,000 bbl/d refinery by Petroma. Bahrain has natural gas reserves of about 3.2 trillion ft^3, most of which is associated gas from the Awali oil field.

Bahrain produced 300 billion ft^3 of natural gas in 2000, all of which was consumed locally. Gas production and processing are the responsibility of the majority state-owned Bahrain National Gas Co (Banagas). Because of Bahrain's growing demand for fuel for electric power generation, the country is expected to become a net natural gas importer in coming years.

In January 2002, Qatar and Bahrain signed a Memorandum of Agreement indicating Bahrain's intentions to purchase natural gas from Qatar's North Field Enhanced Gas Utilisation Project. Preliminary estimates indicate that Bahrain could import as much as 500 M ft^3/d from Qatar by 2006. Qatar, which is planning to build a pipeline for exporting natural gas to Kuwait, has considered the possibility of connecting a spur line to Bahrain.

Depletion of Bahrain's limited oil reserves has prompted efforts to develop other industries. For example, in the 1970s the government established Aluminium Bahrain's (ALBA) smelter, one of the largest in the Middle East, with a 460,000 t/y capacity; aluminium has accounted for about a quarter of total exports and has fostered new downstream industries. Imports of crude petroleum from Saudi Arabia for processing at Bahrain's oil refinery account for more than one-third of Bahrain's imports. Other imports include machinery and transportation equipment, food, and chemicals. Exports include petroleum and petroleum products, aluminium, and manufactured goods. Bahrain's major trading partners are Saudi Arabia, India, Japan, the US, and the UK. In a further effort at diversification, the government has also promoted tourism.

Kuwait is located at the far northwestern corner of the Persian (or Arabian) Gulf, triangular in outline and covers an area of about 17,818 km^2. The country borders the Gulf to the east, Saudi Arabia to the south and west, and Iraq to the north and west. Since 1977 Kuwait has been ruled by Shaykh Jabir al Ahmad al Jabir Al Sabah and his designated successor, Shaykh Saad al Abd Allah as Salim Al Sabah, the prime minister and crown prince. However,

the Iraqi Government has asserted a claim to rule Kuwait since 1938 and in August 1991 invaded Kuwait and formally incorporated the entire country into Iraq. Under United Nations (UN) Security Council Resolution 687, after the restoration of Kuwaiti sovereignty in 1991, a UN commission undertook formal demarcation of the borders on the basis of those agreed to in 1963.

Kuwait boasts 96.5 billion barrels of proven oil reserves, about 8% of the world's total, and is one of the world's leading oil-producing states. It shares the Neutral Zone with Saudi Arabia and half its five billion barrels of reserves. The bulk of Kuwait's oil production capacity is in the southern onshore Greater Burgan field, whose Burgan, Magwa, and Ahmadi structures normally produce around 1.35 Mbbl/d. Kuwait's other main producing fields include the northern fields of Rawdhatain and Sabiryah (600,000 bbl/d of production capacity); the southern fields of Minagish and Umm Qudayr (150,000 bbl/d); and Kuwait's share of the Saudi-Kuwaiti Neutral Zone (150,000 bbl/d).

Kuwaiti oil output is divided about equally between shallow wells and high-pressure wells producing up to 10,000 bbl/d each from the deep, Marrat structure, which runs north-south through the country and contains an estimated 20 billion barrels of oil in place. The bulk of Kuwait's oil production capacity is located in the southeastern onshore Greater Burgan field, whose Burgan, Magwa, and Ahmadi structures have production capacity of around 1.6 million bbl/d. Kuwait's other main producing fields include the northern fields of Raudhatain (220,000 bbl/d of production capacity, with higher surge capacity) and Sabriya (95,000 bbl/d of production capacity, with plans to raise this to 200,000 bbl/d); the southwestern fields of Minagish and Umm Qudayr (200,000 bbl/d); Abdali, Bahra and Ratqa (50,000 bbl/d) in the north; and Kuwait's share of the Saudi-Kuwaiti Neutral Zone (270,000 bbl/d).

Overall, around two-thirds of Kuwaiti oil production comes from the southeast of the country, with about one-fifth from northern Kuwait and about one-tenth from the west. Kuwait exports the majority of its oil (over 60%) to Asian countries such as Japan, India, Singapore, South Korea, Taiwan, and Thailand. Other oil exports go to Europe and to the US, and have averaged 217,000 bbl/d during 2003.

Kuwait hopes to increase its oil production capacity from 2.5-2.6 Mbbl/d to 3 Mbbl/d by 2005 and 3.5 Mbbl/d by 2010 under Project Kuwait, a US$7 billion 25-year plan entailing controversial help from foreign companies. Kuwait's three domestic refineries have a combined capacity of approximately 772,800 bbl/d.

Kuwait plans to upgrade its three other refineries and wishes to hasten development of its modest petrochemical sector; Petrochemical Industries Co manufactures urea, ammonia, and fertiliser for export and is beginning to produce higher-value products. It may increase production at its polypropylene plant by 20% to 120,000 t/y if prices warrant. The Equate joint venture with PIC and Union Carbide (with 10% held by Boubyan Petrochemical Co) is a US$2 billion industrial complex at Shuaiba which includes a 650,000 t/y ethylene cracker, two polyethylene units and a 350,000

t/y ethylene glycol plant. In April 2001, a US$2 billion plan was approved to construct Equate II to produce olefins.

Kuwait also plans to increase its use of natural gas. At present, it produces only a modest quantity, mostly associated gas from oil production. Exploratory drilling is going on at the Rawdhatain oilfield. In July 2000, Saudi Arabia and Kuwait concluded an agreement on the offshore Dorra gas field that calls for equal sharing of the gas resources; Iran also has a claim on it and negotiations continue.