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COUNTRY ANALYSIS BRIEFS

Bahrain

Last Updated: March 2008

Background

Bahrain's oil sector accounts for about two-thirds of total government revenues.

Bahrain is comprised of a group of small islands in the energy-rich Persian Gulf. The country's economy is highly dependent on the oil sector, with oil revenues amounting to about two-thirds of total government revenues. While Bahrain is a net exporter of oil, it is the smallest Middle East oil producer by volume, and unlike other Gulf states, Bahrain exports refined petroleum products rather than crude oil. Domestically, the vast majority of Bahrain's total energy consumption comes from natural gas, with the remainder supplied by oil. Hydrocarbons also provide the foundation for Bahrain's two major industries: refining and aluminum smelting. With demand for energy rising and domestic production falling, Bahrain will become increasingly dependent on oil and gas imports unless it can increase domestic production.

Oil

Bahrain exports much of its oil in the form of refined petroleum products rather than crude oil.

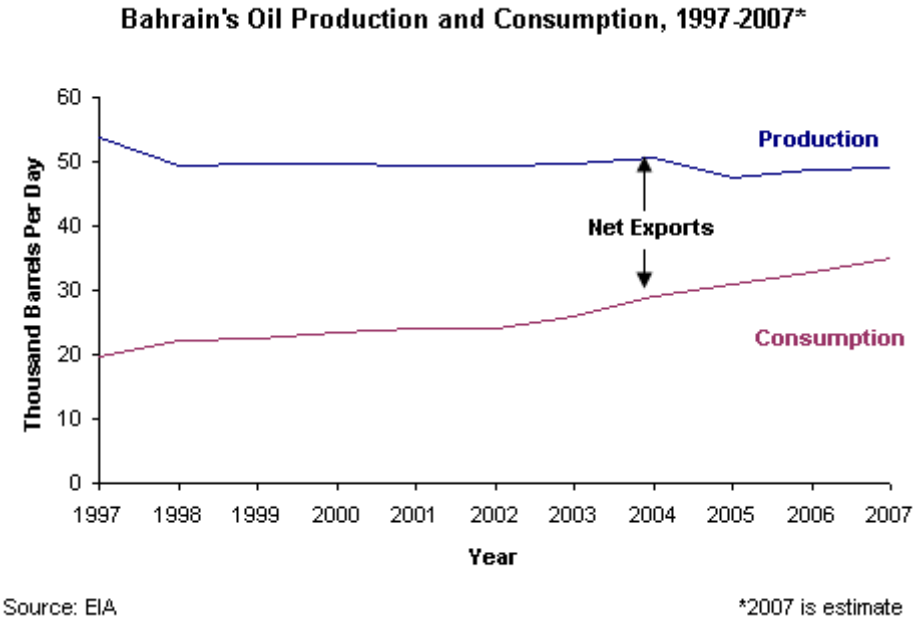
Bahrain's proven oil reserves stood at 125 million barrels as of January 2008, all of which are located in the Awali field. In addition to what is produced in its territory, Bahrain and Saudi Arabia share the 300,000 barrels per day (bbl/d) of oil production from the offshore Abu Saafa field. This figure is counted in Saudi oil production figures, but half of the output is given to Bahrain. Separately, Bahrain also purchases Arab Light crude oil from Saudi Arabia via a subsea pipeline, which it refines for export at its Sitra refinery (see the Saudi Arabia Country Analysis Brief for more information).

In 2007, Bahrain produced an estimated 49,000 bbl/d of total oil liquids, of which 35,000 bbl/d was crude oil, 11,000 bbl/d was natural gas liquids, and 3,000 bbl/d was refinery gain. This amount excludes joint production from the Abu Saafa field, of which Bahrain's share is about 150,000 bbl/d. During 2007, Bahrain consumed an estimated 35,000 bbl/d of oil.

Oil Imports and Exports

Unlike other Gulf states, Bahrain exports refined petroleum products rather than crude oil. Bahrain's domestic oil pipeline network is rather limited, focused primarily on delivering crude oil from the Awali field to the refinery at Sitra. Because domestic production is much lower than the

country's refining capacity, Bahrain imports about 225,000 bbl/d of Arab Light crude oil from Saudi Arabia via a subsea pipeline linking the two countries. Bahrain Petroleum Company (Bapco) refines this crude oil and exports much of it via tanker. Most of Bahrain's exports go to India and other Asian markets. Joint Bahrain-Saudi Arabian crude oil production from the offshore Abu Saafa field is sold from the Ras Tanura terminal in Saudi Arabia, the world's largest export terminal.



Source: EIA *2007 is estimate

Sector Organization

Bahrain's oil sector is dominated by state-owned Bahrain Petroleum Company (Bapco), which is charged with the exploration, production, refining, marketing, and distribution of Bahraini oil for domestic use and the international market. In 2005, Bahrain's government issued a royal decree establishing the National Oil and Gas Authority (NOGA), which replaced the Ministry of Oil. NOGA is the primary body with regulatory and oversight authority as well as policymaking functions for the oil sector. Dr. Abd al-Husayn Mirza was appointed as the Chairman of NOGA. Dr. Mirza also holds the title of Minister of Oil & Gas Affairs, and holds the rank of a cabinet minister since December 2006. In August 2007, a NOGA holding company was established to administer the government's 100% stake in Bapco; its 75% of Banagas; its 60% stake in Bafco, the aviation fuel company and its one-third share of Gulf Petrochemical Industries Company. The holding company will invest in the domestic oil and gas industry, establish new companies and also invest in energy companies abroad. It is under the supervision of NOGA and its head, Abd al- Husayn Mirza.

Exploration and Production

Bahrain is one of the oldest oil-producing countries in the Persian Gulf. Current crude oil production of about 35,000 bbl/d from the Awali field is well below peak production of 75,000 bbl/d in the 1970s. To help offset continuing declines in oil output, Bapco announced that it expects to drill 700 new wells at the Awali field between 2007 and 2015. Company officials have said that they expect the drilling program to increase the field's production capacity by 12,000 bbl/d, which is only likely to offset anticipated declines. In November, 2007, Bapco received 8 bids from international oil companies for a project to upgrade operations in the Awali field. Bahrain has since compiled a short list of 3 international oil companies as potential partners for this onshore oil field project. ExxonMobil, Occidental Petroleum and Denmark's Maersk Oil are on the shortlist, and a final decision over the winning bidder is expected by June 2008. Bahrain's oil minister said the country would add another 700 oil wells over the next 15 years to maintain and increase oil production.

Offshore Licensing Round

To encourage greater foreign investment in Bahrain's upstream oil sector, in March 2007 NOGA announced that it had opened a new licensing round for four offshore exploration and production (E&P) projects. Until 2001, much of the offshore territory in the Gulf of Bahrain was unavailable for E&P work as a result of a maritime boundary dispute with Qatar, which was resolved by the International Court of Justice (see the Qatar Country Analysis Brief for more information). The result of subsequent prospecting in Bahrain's eastern and south-eastern territorial waters after the dispute with Qatar had been resolved was disappointing. In February, 2008, Thailand's PTTEP

and U.S. Occidental were awarded exploration and production licenses offshore Bahrain. PTTEP signed the exploration and production-sharing agreement (EPSA) for Block 2, where it committed to drilling at least 2 wells in the Khuff formation. Occidental signed an EPSA for Blocks 3 and 4, where it committed to drilling 3 wells in the Arab formation. Both companies also committed to perform seismic surveying of their areas during their 6-year exploration periods. In case of a commercial discovery, the exploration period will be converted to a 24-year production period.

Refining

Bahrain has 250,000 bbl/d of refining capacity at the Bapco-owned Sitra facility. However, NOGA figures show that in 2006 the Sitra plant ran at an average rate of 263,000 bbl/d, slightly higher than its nameplate capacity. Plans for the expansion of the 250,000 bbl/d Bahrain refineryinclude laying new pipelines to import crude from SaudiArabia. About one-sixth of the crude used by the refinery originates from the Bahrain oilfield and the rest ispumped from Saudi Arabia via a 33-mile pipeline. Earlier in 2007, Bahrain Petroleum Company (Bapco) and Saudi Aramco conducted a joint study into the long proposed project to build a new pipeline to transport Saudi crude oil to the refinery. Reportedly, this aging pipeline will be decommissioned after the construction of the “New Arabia” pipeline, a 71-mile, 350,000-450,000-bbl/d capacity feed running between Saudi Arabia’s Abqaiq oil processing center and Bahrain’s refinery at Sitra. The pipeline will be built by local contractors, and is expected to come online in 2008. In 2006, Bahrain imported 224,000 bbl/d of Saudi crude via the existing pipeline

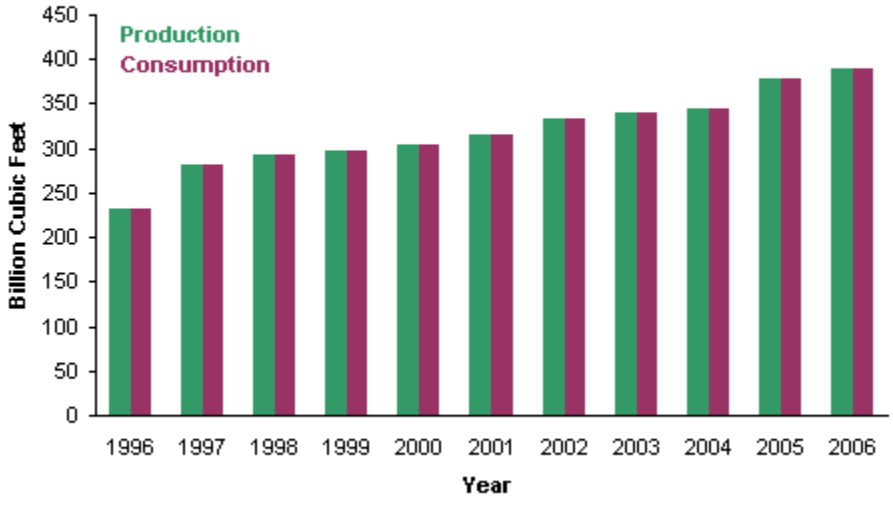
Bapco's refinery modernization includes a $685 million project to reduce the sulphur content of its diesel and kerosene. In 2005, Foster Wheeler Italiana, an Italian subsidiary of the US-based Foster Wheeler Corporation, was awarded the $112 million contract for a refinery gas desulphurization project. On December 4, 2007, the Low Sulphur Diesel Production (LSDP) facility at Bapco’s refinery was inaugurated. This project reduces the current high-sulphur content in Bapco’s diesel pool, ensuring sales in the international diesel market. It will produce 60,000 barrels per day and is in line with the government’s aim of keeping abreast of the latest technological advancements in the sector. The government of Bahrain has studied the possibility of building a petrochemical complex alongside the Sitra refinery, but no final decision has been reached on whether or not to proceed with such a project.

Natural Gas

Bahrain has modest natural gas reserves, and is looking to import natural gas supplies from neighboring countries.

Bahrain’s proven natural gas reserves stood at 3.25 trillion cubic feet (Tcf) as of January 2008, much of it associated gas from the Awali oil field. In 2006, the country produced and consumed 390 billion cubic feet (Bcf) of natural gas.

Bahrain's Natural Gas Production and Consumption, 1996-2006



Source: EIA

Sector Organization

The Bahrain National Gas Company (Banagas) was established in 1979 to capture associated natural gas at the Awali oilfield that had previously been wasted. Banagas was formed by Amiri

Decree with the primary objectives of processing the associated gas into marketable products and supplying residue gas for local industrial use. Banagas is 75-percent owned by the Bahrain government, 12.5-percent by the Arab Petroleum Investment Corporation (APIC) and 12.5-percent by Caltex Bahrain (Chevron).

All of Bahrain's natural gas production is used domestically, either in power plants, enhanced oil recovery (EOR) projects, or in heavy industry, where natural gas is used as a feedstock. The largest domestic consumer of natural gas is Aluminum Bahrain (Alba), which is the largest aluminum smelter in the world. Alba also operates a large natural gas-fired power plant. Banagas operates a gas liquefaction plant, which produces approximately 3,000 bbls/d of propane, 2,700 bbls/d of butane and 4,500 bbls/d of Naphtha. Liquefied propane and butane are transferred to refrigerated storage for ship loading at the SitraWharf, while naphtha is sent to the Bapco for storage and subsequent export.

Exploration and Production

Natural gas demand in Bahrain is expected to grow in the coming years as a result of greater natural gas requirements for power plants and domestic industry. To help meet rising demand, Bapco is leading an effort to increase the company's natural gas supply by 500 million cubic feet per day (MMcf/d), a 53 percent increase from 2004 levels. In 2006, Bapco approved plans to invest a reported $200 in drilling 10 new onshore natural gas wells. Bapco plans to introduce new natural gas production incrementally over the next several years, including improving the natural gas recovery rates at existing fields. On March 5, 2008, Bapco signed an agreement with ExxonMobil to carry out a technical analysis of Bahrain's natural gas sector to be completed in 4 months.

Natural Gas Imports

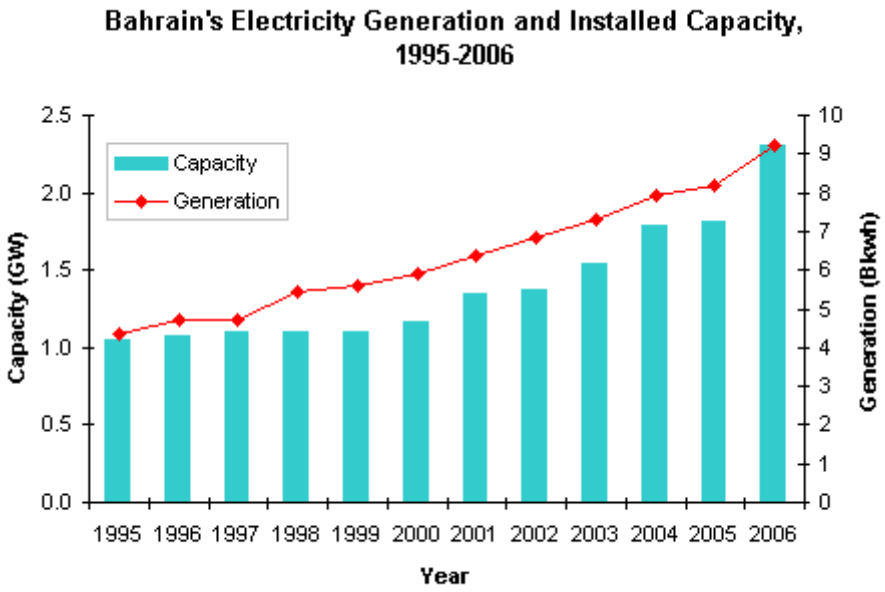
Bahrain has also pursued natural gas supply arrangements with neighboring countries. In 2001, Bahrain signed an initial agreement with Qatar for the supply of 500 million cubic feet per day (MMcf/d) of piped natural gas from Qatar's massive North Field. However, the agreement was not finalized, and Qatari officials extended a moratorium on new natural gas developments in its North Field until at least 2010. Plans for an integrated petrochemicals, power and water project by Kuwait Finance House and Bahrain have also been set back by the lack of agreement on natural gas supplies. The visit of Iran's president Ahmadinejad in November 2007 produced a memorandum of understanding for the supply of 1 MMcf/d of Iranian natural gas. In February, 2008, Dr. Mirza said the latest meeting of the joint committee had focused on which Iranian gas field would provide the supply to Bahrain, and on the means of transporting the gas. Also under discussion, according to Dr. Mirza, was whether Bahrain would invest in the development of the assigned gas field, or buy the gas once it had been extracted by Iran. National Iranian Oil Company (NIOC) is understood to have earmarked the offshore Farsi gas field as the source for future exports to Bahrain (see the Iran Country Analysis Brief for more information).

Electricity

Bahrain's government expects that the country's electricity demand will grow by 7 percent annually through 2020.

In 2006, Bahrain had 2.3 gigawatts (GW) of installed electric generating capacity, all of which came from conventional thermal sources, mostly natural gas with some oil, and generated 9.2 billion kilowatthours (Bkwh) of electricity. Officials from Bahrain's Ministry of Electricity and Water (MEW) expect that electricity demand will grow by 7 percent annually through 2020. To help meet rising demand, Bahrain has encouraged independent power projects (IPPs) and has allowed the privatization of some state-owned power sector assets. Bahrain's first IPP power station, the natural gas-fired Al Ezzel plant, started commercial operations in 2006 with an initial capacity of 470 megawatts (MW). Phase 2 added 480 MW, bringing the total capacity to 950 MW during 2007. Al Ezzel accounts for 30% of the generating capacity available at present. In January 2006, Bahrain's government announced the sale of the state-owned Al Hidd power and desalination plant to a consortium of private companies, which formed the Hidd Power Company (HPC). Al Hidd is the largest power plant in Bahrain, with 965 MW of current generating capacity and plans to expand the facility in the future.

In November, 2007 the Ministry of Electricity and Water announced plans for a $1 billion electric power and desalination project. The new power station will be located at Al Dour and is on track to open in 2010, according to a February 4, 2008 announcement by Minister al Jowder to the Bahrain News Agency. It will produce 1,200 MW of electricity daily and 48 million gallons of desalinated water in its first phase. The project will be the country's third IPP. There are 3 other power stations: at Rifa, with a capacity of 700 MW, at Manama, with 167 MW, and at Sitra, with 125 MW. The ministry also said that peak power demand was nearing total capacity, which is currently about 2,230 MW.



Source: EIA

Sector Organization

In February 2008, Bahrain's Works Minister, Fahmi Bin Ali Al Jowder, was appointed Minister in charge of the Electricity and Water Authority, giving the sector increased administrative and financial independence. The Authority has prepared a strategic plan until 2020, which includes a study of all facilities. According to the plan, Bahrain needs a new power station with a daily capacity of 3500 MW of electricity and 90 million gallons of desalinated sea water. Planned projects include rehabilitation of the second and third phases of the Sitra electricity and water station. Work on the project is to start in October 2008 and be complete by mid-2009. In 2010, Ras Qareen station is expected to start production at a daily capacity of 1200 MW of electricity and 48 million gallons of desalinated water. The plan also aims to develop Bahrain's electricity distribution network between 2007 and 2011 by creating 39 new stations.

Gulf Cooperation Council (GCC) Electricity Grid

The GCC power-grid project will link the six-member GCC (Saudi Arabia, Qatar, Bahrain, Kuwait, Oman and the United Arab Emirates) with an integrated electricity network. The aim of the project is to reduce the cost of power generation in the six GCC states. Work on the project started in September 2005 and is expected to be completed by 2010. The project is being carried out in three phases. In the first phase, an 800-km 400-kV overhead line will link Kuwait's Al-Zour power station with Doha, and a 400-kV submarine line will link Saudi Arabia with Bahrain. The second phase will link the UAE with Oman. The resulting two megagrids will be joined in the final phase. Once the grid is ready, Kuwait and Saudi Arabia will each receive an extra 1200 MW of power capacity, the UAE will receive 900 MW, Qatar 750 MW, Bahrain 600 MW and Oman 400 MW. The total cost of this project is estimated at $1.95 billion. Around 45% of the first phase of the Gulf Cooperation Council's electricity interconnection grid was completed in October 2007.

Profile

Energy Overview

Proven Oil Reserves (January 1, 2008E)	125 million barrels
Oil Production (2007E)	49,000 barrels per day, of which 70% was crude oil.
Oil Consumption (2007E)	35,000 barrels per day
Crude Oil Distillation Capacity (2007E)	250,000 barrels per day
Proven Natural Gas Reserves (January 1, 2008E)	3.25 trillion cubic feet
Natural Gas Production/Consumption (2006E)	390 billion cubic feet
Recoverable Coal Reserves (2004E)	None
Coal Production (2004E)	None

Coal Consumption (2004E)	None
Electricity Installed Capacity (2006E)	2.3 gigawatts
Electricity Production (2006E)	9.2 billion kilowatt hours
Electricity Consumption (2006E)	9.2 billion kilowatt hours
Total Energy Consumption (2005E)	0.46 quadrillion Btus*, of which Natural Gas (87%), Oil (13%)
Total Per Capita Energy Consumption (2005E)	665.8 million Btus
Energy Intensity (2005E)	32,337 Btu per $2000-PPP**

Environmental Overview

Energy-Related Carbon Dioxide Emissions (2005E)	25.2 million metric tons, of which Natural Gas (82%), Oil (17%)
Per-Capita, Energy-Related Carbon Dioxide Emissions (2005E)	36.6 metric tons
Carbon Dioxide Intensity (2005E)	1.8 Metric tons per thousand $2000-PPP**

Oil and Gas Industry

Organization	Bahrain Petroleum Company (Bapco); Bahrain Natural Gas Company (Banagas)
Major Oil Fields	Awali (35,000 bbl/d)
Major Refineries	Sitra (248,900 bbl/d)

* The total energy consumption statistic includes petroleum, dry natural gas, coal, net hydro, nuclear, geothermal, solar, wind, wood and waste electric power. The renewable energy consumption statistic is based on International Energy Agency (IEA) data and includes hydropower, solar, wind, tide, geothermal, solid biomass and animal products, biomass gas and liquids, industrial and municipal wastes. Sectoral shares of energy consumption and carbon emissions are also based on IEA data.
**GDP figures from OECD estimates based on purchasing power parity (PPP) exchange rates.

Links

U.S. Government

CIA World Factbook - Bahrain
US State Department Consular Information Sheet - Bahrain
US State Department
Bahrain e-Government Portal
Embassy of Bahrain in Washington, DC
National Oil & Gas Authority (NOGA)

Oil and Natural Gas

Bahrain National Gas Company (Banagas)
Bahrain Petroleum Company (Bapco)

Sources

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Business Middle East
CIA World Factbook
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