The Development of Middle-East Natural Gas Markets

GAWDAT BAHGAT

The Middle East holds more than one third of the world's proven natural gas reserves. At the beginning of the 2000s these reserves are largely under-developed and under-utilized. In recent years several Middle Eastern states have made substantial efforts to develop these gas resources. This study examines the economic, political and strategic environments under which plans to explore and develop gas fields have been drawn and implemented. Particular attention is paid to Saudi Arabia, Iran and Israel. The paper suggests that in spite of serious challenges, ambitious schemes to develop the Middle East's gas potentials have started and are likely to benefit both people in the region and the global energy market.

Dr. Gawdat Bahgat is the Director, Center for Middle Eastern Studies, Department of Political Science, Indiana University of Pennsylvania, Indiana, PA 15705, USA.

In the beginning of the 2000s, natural gas continues to be the fastest growing primary source of energy. Abundant reserves, competitive prices and environmental advantages over the other hydrocarbon fuels ensure strong market growth for natural gas. According to the United States Department of Energy the world natural gas consumption is projected to grow by 3.1 percent from 2000 to 2020, while oil consumption will grow by 1.9 percent and coal 1.6 percent.[i] Most remarkably, world proven reserves of gas increased by 31 percent, despite the production of nearly 23 trillion cubic meters over the past ten years.[ii] The growth in world gas reserves has come mainly from two areas – the former Soviet Union and the Middle East.

Within the Middle East, however, there remains an emphasis on oil over gas, not least because of oil's favorable position with regard to revenue-generation and profitability. As global gas demand continues on its upward growth curve in a more environmentally aware world, the Middle East's share in the global natural gas market will expand. A strong reserve base will support this projected increase in production from Middle Eastern producers as the following table shows:

Table I

Proven natural gas reserves in the Middle East (in billion cubic feet)

Country	January 2000	January 2001
Abu Dhabi	196,100	196,100
Bahrain	3,875	3,875
Dubai	4,100	4,100
Iran	812,300	812,300
Iraq	109,800	109,800
Israel	10	1,470
Jordan	240	230
Kuwait	52,200	52,200
Neutral Zone	1,000	1,000
Oman	28,416	29,280
Qatar	300,000	393,830
Ras al Khaimah	1,100	1,200
Saudi Arabia	204,000	213,300
Sharjah	10,700	10,700
Syria	8,500	8,500
Yemen	16,900	16,900
Total Middle East	1,749,241	1,854,785
Total World	5,146,207	5,278,484

Source, Oil and Gas Journal, Vol.98, No.51, December 18, 2000, pp.122-123.

The figures show that the largest increases were in Qatar and Israel. Also, the Middle East's share of world proven gas reserves climbed from 33.99% to 35.14%. Thus, the question for the future of Middle East gas production is not whether there will be enough natural gas under the ground, but whether the economic, political and strategic environment in the region will facilitate or hinder the full utilization of these abundant resources. This study examines the recent efforts to explore and develop natural gas fields in three Middle Eastern states – Saudi Arabia, Iran and Israel. The challenges facing these efforts will be analyzed. The experience in these three cases suggests that in spite of these economic and political challenges Saudi Arabia, Iran and Israel have started drawing and implementing plans to fully utilize their natural gas potentials.

Saudi Arabia: the economic challenge

Prior to the 1970s, energy industry in Saudi Arabia was comprised of a single energy source – oil. Although gas associated with crude oil was abundant, it was mostly disposed of by flaring as a useless by-product of oil production. Following the rise in world oil prices, the Saudi government has sought to utilize its natural gas potentials. A significant step in this direction was the creation of Master Gas System (MGS), which began functioning in 1981. The MGS has the capacity to process nearly 130 million cubic meters per day of natural gas.[iii] It provides fuel to power utilities including electrical and seawater desalination plants. Furthermore, the MGS feeds the rapidly expanding petrochemical industry in the kingdom. With the discovery of new non-associated gas reserves, production of non-associated gas started to flow in 1984 to supplement the gas requirements of water desalination and power utilities as well as the petrochemical industry. As a result of enhanced supply availability and competitive prices, demand for gas was stimulated in all its uses and grew at a rate of 11% annually for the period 1984-2000.[iv]

In a response to this growing domestic demand, the Saudi government has laid down a

comprehensive strategy to explore and develop the country's gas resources. The ultimate objective of this strategy is to develop a self-sufficient, fully integrated gas industry, capable of providing gas to the Saudi economy at competitive prices that will help support a thriving industry. This so-called Natural Gas Initiative is also part of a wider effort to boost investment in the kingdom with the aim of creating employment for the fast growing population of young people. It is estimated that each one billion dollars of investment would create approximately 16,000 new jobs.[v] International oil companies (IOCs) are expected to provide most of these necessary investments. Thus, the opening up of the Saudi energy sector to foreign investment got under way in September 1998 when Crown Prince Abdullah Ibn Abd Al-Aziz met the chief executives of several major U.S. oil companies and asked them to submit proposals for investment in the kingdom. Since then, Prince Saud Al-Faisal, the foreign minister, and Ali Al-Naimi, the oil minister, have held negotiations with representatives of major IOCs[vi] and set out parameters for investment proposals. In late 2000, the Saudi government identified three core areas for investment: South Ghawar, the Red Sea coast and Shaybah.[vii] It also asked the IOCs to propose ways of participating in all areas of the investment chain and made it clear that those involved in upstream gas would also be expected to participate in downstream areas, including petrochemicals and refining.

To sum up, economic incentives (i.e., the need to diversify national revenues, generate jobs and provide feedstock for growing petrochemical industry and fuel for water desalination schemes) have played a significant role in shaping the new and increasing Saudi interest in utilizing the kingdom's natural gas resources. It is important to point out that the Saudi officials do not face international constraints in their decisions to choose which IOC to work with. Another Middle Eastern gas producer – Iran confronts a completely different international environment.

Iran: the political challenge

Iran has the second largest natural gas reserves in the world after Russia. Like Saudi Arabia, however, the gas sector had been neglected in favor of oil production for a long time. Put differently, gas received low priority because oil offered better and higher foreign exchange returns. The first national gas trunk line, IGAT-1, was built in 1970 mainly to supply the Soviet Union in payment for the Soviet-built Isfahan steel mill.[viii] It was only after the 1979 revolution that significant efforts were made to exploit gas reserves. Gas production has since risen about five-fold and is due to double again by the middle of this decade.[ix] These ambitious plans to increase gas production have been constrained by a significant impediment – the United States sanctions.

The United States has maintained various sanctions against Iran since the 1979 revolution and the seizure of the U.S. embassy in Tehran. In early 1995 President Clinton signed Executive Order 12957, which prohibited U.S. companies and their foreign subsidiaries from conducting business with Iran. A year later, 1996, the Iran-Libya Sanctions Act (ILSA) was passed unanimously by the U.S. Congress and signed into law by, then, President Clinton. ILSA imposes mandatory and discretionary sanctions on non-U.S. companies, which invest more than $20 million annually in the Iranian oil and gas sectors. For U.S. companies, the White House's executive order and the Department of Treasury's Iranian Transactions Regulations are more restrictive than the Congress's Iran-Libya Sanctions Act, which is most relevant to non-US companies. These American efforts to isolate Iran have made some major international oil and gas companies hesitant to invest in Iran.

On the other side, the Iranian authority has used its substantial hydrocarbon resources and reserves to attract foreign investors from outside the United States. The main focus is to develop the country's largest non-associated natural gas field – South Pars. Geologically, the field is an extension of Qatar's giant North Field. South Pars was first identified in 1988 and originally appraised at 128 trillion cubic feet (Tcf) in the early 1990s.[x] However, the National Iranian Oil Company (NIOC)-sponsored studies conducted in mid-1996 indicate that South Pars contains

an estimated 240 Tcf of gas, of which a large fraction will be recoverable.[xi] The plan to develop South Pars is divided into 25 phases. At the end of 2000, eight phases had already been contracted out to foreign and local firms.[xii] In addition to South Pars, Iran aims to develop the non-associated Khuff reservoir of the Salman oil field, which straddles Iran's maritime border with Abu Dhabi. Finally, in 2000 the Oil Ministry announced the discovery of two sweet gas fields – Tabnak[xiii] with an estimated reserves of 443,000 million cubic meters and Homa with approximately 133,100 million cubic meters.[xiv]

Given the massive investments needed to develop these natural gas fields and Iran's shortage of financial resources, officials in Tehran have concluded that international companies' participation is crucial. The process of opening up the country's upstream gas sector to foreign investment began in mid 1990s. This policy gained in scope and momentum in August1998 when the Oil Ministry invited IOCs to bid on 43 new oil and gas development projects.[xv] These bids are based on the so-called "buy back methodology". Buy back contracts are essentially risk-service contracts under which the contractor funds all investments. The contractor recovers its investment from a commercial field and receives remuneration from NIOC. The remuneration is based on an agreed contractor rate of return and is paid in the form of NIOC's allocation of a share of production equal in value to the amount due.

Over the last few years the Iranian authorities have signed several significant contracts worth billions of dollars with IOCs. In June 2000 a consortium comprising nine foreign energy firms – the UK's BG International, France's TotalFinaElf and Gaz de France, UK-based BP Amoco, Agip of Italy, the Royal Dutch/Shell Group, Australia's BHP Petroleum, Lasmo of the UK and Petronas of Malaysia – was formed and asked to carry out a study for a 25-year gas utilization plan.[xvi] A month later, in July 2000, the Italian firm ENI signed a $3.8 billion deal with Iran to develop the South Pars field.[xvii] Following President Khatemi's visit to Japan in late 2000, the two sides agreed to exchange information on the natural gas industry including both liquefied natural gas (LNG) and gas-to-liquids (GTL).[xviii] Finally, in February 2001 India's Reliance, the UK's BP and the NIOC formed a partnership to carry out a feasibility study for a LNG plant to export gas from South Pars to India.[xix]

To sum up, the American efforts to deprive Iran of badly-needed foreign investment in its energy sector and Tehran's successful attempts to break international economic isolation suggest that political issues have played a significant role in conjunction with geological factors in determining the pace of resource development in Iran over the last several years. Strategic considerations have also played an important role in forming an economic and political integration in another part of the Middle East – Israel.

Israel: the strategic challenge

For a long time many analysts have seen regional economic cooperation in the Middle East as the sine qua non of a durable peace. Given the continuing violence between the Israelis and Palestinians since late 2000, the prospects for such cooperation have faded. Mutual interests in large-scale infrastructure projects in the natural gas sector, however, seem to be the exception. Gas occupies a particularly important position in the Middle East energy equation. It is the fuel that may provide the Palestinian National Authority (PNA) with some useful export earnings and it may lead to significant cooperation between Israel, Egypt and the PNA.

Until recently, Israel has had essentially no commercial fossil fuel resources of its own and has been forced to depend almost exclusively on imports to meet its energy needs. Furthermore, Israel has attempted to diversify its supply sources and to utilize alternatives like solar and wind energy. Given the hostile Arab-Israeli relations, Israel has always relied on fuel from far outside the Arab world – coal from Australia, Colombia and South Africa and oil from Norway, Britain and Mexico.[xx] Since the late 1990s, Israel has sought to increase the share of natural gas in its fuel mix (especially for electricity generation, currently dominated by coal-fired plants) for energy security,

economic and environmental reasons and has been looking at various options. Currently three players dominate Israel's gas supply: 1) the Israeli company Yam Thetis, 2) the Israeli-Egyptian pipeline company which plans to sell Egyptian gas to Israel and 3) British Gas (BG) which offers gas from Palestinian waters.

In June 1999 the Israeli government announced that over 4,000 square miles of offshore oil and gas exploration permits had been awarded, mostly to BG.[xxi] The government also announced the first gas discovery off the Mediterranean coast.[xxii] Since then, several energy companies have discovered significant amounts of natural gas. These recent discoveries have complicated negotiations to import gas from Egypt.

Since the early 1990s, Egypt was seen as the most likely source of natural gas to Israel. Negotiations between the two sides reached an advanced stage by mid-1996 when the Egyptians and Israelis were debating the "appropriate" prices to be paid for gas. Benjamin Netanyahu's election as Israel's prime minister in May 1996 and the subsequent stalling of the Arab-Israeli peace process brought the Egyptian-Israeli negotiation over natural gas supplies to a halt. Consequently, Israel began investigating alternative options, notably gas imports from Russia by means of a gas-line across Turkey and, thereby, a subsea connection from Turkey to Israel. When Ehud Barak came to power in mid-1999, the Egyptian option came back on line. There was strong U.S. backing for the scheme. Accordingly, the Egyptian government announced in June 2000 that it would guarantee the supply of 140 billion cubic meters of natural gas to Israel under a 20-year contract.[xxiii]

Several months later, January 2001, the Israel Electric Corporation (IEC) decided to purchase more than half of its natural gas needs over the next decade from the East Mediterranean Gas Pipeline (EMG), which is jointly owned by Israeli and Egyptian companies. The value of the gas contract totals over $3 billion a year.[xxiv] It was also decided that the supply will conform to a "take or pay" contract, meaning that the IEC will pay the supplier the agreed amount for the gas, whether or not it needs it. Opponents of the deal described the decision to purchase Egyptian gas despite the availability of an Israeli source as "unpatriotic". They also noted that Israel will be dependent on a country with which it has a "cold peace" for the supply of a strategic product, and pointed out that many Egyptian organizations consistently boycott Israel.[xxv] On the positive side, at least three factors played a role in the decision to buy the Egyptian gas. First, for more than 20 years Israel has purchased significant quantities of oil from Egypt with no problems. Second, the dependency will be mutual: the Egyptians will also be interested in maintaining a permanent source of income through this deal with the IEC. Indeed, the Israeli decision gives a boost to Egypt's natural gas industry, which has huge reserves and is seeking buyers. Third, dependency on Egyptian natural gas will not be absolute. Half of the quantities needed, will be purchased from other sources – mostly from local supplies. The purchase of half the gas needs from local sources will enable the development of regular pumping of gas from wells under Israeli control and at the same time retain reserves of the fuel in the seabed. The Egyptian supplies might be in competition with supplies from another source – the Palestinian National Authority.

In November 1999 BG signed an agreement with Yasser Arafat, the Chairman of the PNA, under which BG and its local partner, the Palestinian-owned but Greek-based Consolidated Contractors Company (CCC) secured Palestine's first exploration licence.[xxvi] The deal granted BG an exclusive 25-year concession to explore for oil and gas off Gaza. One important impediment BG has to overcome is the uncertainty regarding the legal status of the seabed included in the concession. It was not clear if there was such a thing as Palestinian territorial waters, given the PNA's non-sovereign status. The Oslo accords assigned the Palestinians a 20-by-20 mile swath of sea for limited fishing, recreation and economic activity, but said nothing about resources beneath the Mediterranean.[xxvii] With the quiet assent of, then, Prime Minister Barak, BG conducted a seismic survey off the coast of the Gaza Strip, a survey that yielded positive indications of oil and gas formation in two fields.

To efficiently develop these reserves, Israel and the Palestinians would have to work together. Neither can afford entirely separate plants and pipelines for pumping the gas to their respective markets. Thus, the crux of this partnership should be a new Palestinian role as an energy supplier to Israel. Eventually, these gas discoveries could provide not just energy to Israelis and Palestinians, but fresh water too. Natural gas would make desalination plants an affordable adjunct to power plants serving the densely populated Gaza and Israeli seacoast, helping to resolve an acute potable water scarcity that is one of the region's most difficult diplomatic and environmental problems.

Conclusion: the future of natural gas in the Middle East

For the last several decades the world has become more conscious of the environment and pollution. This global concern has contributed to the rapid rise of natural gas as a major source of energy. In addition to oil, the Middle East is blessed with substantial gas reserves. Almost all over the region, very little efforts had been made to develop these gas resources. This attitude has drastically changed in the last several years. Besides meeting growing domestic demand, the development of gas resources can provide a significant source of foreign revenues.

Thus, in Saudi Arabia, Iran, Qatar, Oman, the United Arab Emirates, Egypt, Israel and Algeria massive efforts have been made to fully utilize these largely under-developed gas resources. Geological data leaves no doubt regarding Middle Eastern states' potential as major gas producers and exporters. The question is, however, whether the current economic and political environment will facilitate the process of developing natural gas fields in the region. This study suggests that the need for foreign revenues, the desire to expand national industries and generate employment as well as environmental concerns have provoked Saudi Arabia, Iran and Israel to embark on ambitious plans to explore and develop natural gas. Recently, the Saudi leaders have decided that cooperation with IOCs would benefit the two sides. In the case of Iran, the political impediments imposed by the U.S. sanctions have slowed down the official efforts to develop the country's hydrocarbon resources. In recent years, however, Tehran has been able to increasingly attract badly-needed foreign investment to develop its gas fields. Finally, Israel's growing demand for gas in conjunction with impressive discoveries off of the Gaza Strip and in Egypt prove that cooperation in energy schemes can be used to cement peace in the Middle East.

ENDNOTES

[i] Energy Information Administration (EIA), International Energy Outlook, Washington, D.C, United States Government Printing Office, 2000, p 20.

[ii] Martin Quinlan, "World gas: exploring the limits to growth", Petroleum Economist, Vol.67, No.5, May 2000, p 3.

[iii] This information is available on the Aramco's web site at www.saudiaramco.com/ operations/ mastergas.html.

[iv] Prince Faisal Ibn Turki Ibn Abd Al-Aziz, "Perspectives on the Saudi Arabian Energy Industry", Middle East Economic Survey, March 5, 2001, on line at www.mees.com.

[v] Monica-Lucie Lowe, "Oil price brings budget surplus", Middle East Economic Survey, Vol.44, No.37, September 15, 2000, p.30.

[vi] These include the UK's BP Amoco, France's TotalFinaElf, the Royal Dutch Shell Group, Italy's Eni, and the US-based Chevron Corporation, Conoco, Exxon Mobil, Marathon Oil Company, Enron/Occidental, Philips Petroleum Company and Texaco.

[vii] Middle East Economic Digest, "Special Report Oil and Gas: Managing the downside", Vol.45, No.2, January 12, 2001, p 27.

[viii] Vahe Petrossian, "Special report Iran: year of decision", Middle East Economic Digest, Vol.45, No.5, February 2, 2001, p.26

[ix] Ibid.

[x] Energy Information Administration, Country Profile: Iran, September 2000, on line at www.eia.doe.gov.

[xi] Ibid.

[xii] Middle East Economic Digest, "Tehran seeks more gas buy-backs", Vol.44, No.35, September 1, 2000, p. 11.

[xiii] Middle East Economic Digest, "Large sweet gas discovery announced", Vol.44, No.15, April 14, 2000, p. 22

[xiv] Middle East Economic Digest, "Iran reveals second big gas discovery", Vol.44, No.34, August 25, 2000, p. 12

[xv] Ian Seymour, "Opportunities for upstream investment in the Middle East by International Oil Companies", Middle East Economic Survey, Vol.43, No.24, June 12, 2000, on line at www.mees.com.

[xvi] Middle East Economic Digest, "Consortium takes up Iran gas study plan", Vol.44, No.25, June 23, 2000, p. 12

[xvii] This deal is the largest between Iran and a foreign company since the 1979 revolution.

[xviii] Energy Economist, "Editorial: Khatemi in Tokyo: Know-how and Gnosticism", No.229, November 2000, p. 2

[xix] Middle East Economic Digest, "Reliance and BP study LNG plant", Vol.45, No.9, March 2, 2001, p.9.

[xx] Israel's brief experience as an energy producer was after the 1973 war in the occupied oil fields of the Sinai Desert, which were handed back to Egypt six years later.

[xxi] Energy Information Administration, Country Profile: Israel, October 2000, on line at www.eia.doe.gov.

[xxii] Ibid.

[xxiii] Amiram Cohen, "Egypt guarantees Israel 20 years of natural gas", Ha'aretz, June 1, 2000.

[xxiv] Amiram Cohen, "Israel Electric goes for Egyptian gas deal", Ha'aretz, January 26, 2001.

[xxv] Ha'aretz, "Editorial: A correct national decision", January 28, 2001.

[xxvi] Energy Economist, "Gas and the prospects for Middle East peace", No.226, August 2000, p. 4.

[xxvii] William A. Orme, "Gas deposits off Israel and Gaza opening vision of joint ventures", New York Times, September 12, 2000, p.A14.