Israeli Natural Gas: The Economic and Strategic Significance

Shmuel Even

In 1999, after some 50 years of exploration, commercial quantities of natural gas were discovered in Israel. A discovery of this magnitude is a potential windfall, in both economic and security terms. However, to reap the benefits of it, a number of steps remain to be taken. Exploiting natural gas reserves requires more than just the discovery of the gas itself: an infrastructure of pipelines for delivering it to consumers must be set up, and a market for it must exist.

Natural Gas as an Energy Source: Pros and Cons

Natural gas is not like cooking gas, with which most readers are familiar. Rather, it is an alternative to oil or coal – energy sources upon which modern economies are largely dependent. Almost pure methane, it is formed naturally as a by-product from the bacterial decomposition of organic materials. These materials are contained in ancient deposits of sediments carried from the Nile River into the Mediterranean. They account for the large deposits of gas that have been found off the coasts of Israel, Egypt and the Gaza Strip.

When properly used, natural gas can serve as an energy source for generating electric power, and for industry. Compared to other fuels, it burns relatively cleanly, emitting fewer pollutants and greenhouse gases than crude oil, diesel fuel or coal. Moreover, there are a number of additional advantages to using natural gas for the generation of electricity, to wit:

- *Space.* Gas-fired power stations take up relatively little area.
- *Location.* Unlike coal-fired power stations, which must be established on valuable and densely built shorelines, gas-fired power stations can be built anywhere.
- *Cost.* The construction of gas-fired power stations is roughly half as much as that of coal-fired stations.

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The first large reservoir of Israeli natural gas was discovered at the Noa-I drilling site, off the coast of Ashkelon, in 1999. Further exploratory drillings followed, resulting in the discovery of additional quantities of gas. Underwater drilling was conducted at depths of 120-800m, and gas was struck some 1,750m below the seabed. Despite the high costs — as much as US$25 million — new technologies were used in order to undertake drilling at these depths.

To date, more than 52 billion cubic meters (m^3) of gas reserves have been found off the coast of Israel, worth billions of dollars. The quantities discovered are estimated to suffice for all domestic needs over the coming decade. Dr. Yehezkel Druckman, who oversees gas and petroleum exploration in the Ministry of National Infrastructures, has estimated that domestic sources of gas should be sufficient to supply local needs for the next 20 years. Moreover, to date only a small segment of the Mediterranean has been surveyed, and the chances of finding additional reserves are estimated to be high.

The main consumers of Israeli natural gas would be local producers of electricity (whether by the Israel Electric Co. (IEC) or by private producers), and industries such as Israel Chemicals, the Dead Sea Works, and Nesher Cement. In addition, it could be used to fuel specially adapted cars, as a substitute for cooking gas, and as a source of inexpensive energy for water desalination.

The main disadvantage in using natural gas, as opposed to oil and coal, is that it is difficult to store, and to

transport in tankers. The most efficient way of distributing it is via networks of pipelines.

The Economic Advantages of Producing Gas in Israel

For a number of reasons, natural gas would prove cheaper than any other source of energy on the Israeli market. This is due to two factors: first, the proximity of the gas wells to the local market. Second, competition between Israeli and Egyptian suppliers for a tender offer made by the IEC has driven the price for natural gas to tens of percentage points below the cost on the world market. This would likely reduce the price of electricity for consumers. In addition, there are a number of advantages to using locally produced gas, compared to imported gas or oil:

- *Direct income for the state treasury.* Sales of Israeli gas would net tens of millions of dollars in royalties (12.5% of total sales) for state coffers. In addition, locally taxed corporate profits would yield further revenues (36% of net corporate income).
- *Reducing demands on Israel's balance of payments.* Using Israeli gas would save millions of dollars annually on the import of fuels. As such, it would save foreign currency, and thus should be given preferential treatment, just as is already done with export-driven industries.
- *Creating a market for further exploration.* The consumption of Israeli gas would spur further exploration in Israel. According to geological surveys conducted by private companies (among them British Gas), there is a high probability of finding additional quantities of gas – and perhaps even oil – in Israel. Oil discoveries are closely connected to discoveries of natural gas, because the sale of gas serves to underwrite further exploration. The more investors in oil exploration are able to count on gas sales to nearby markets, the greater their motivation to continue exploring.

Some contend that Egypt's dependability has been demonstrated by its commitment to the existing oil-supply agreement with Israel. However, it is difficult to accept this comparison.

It is precisely this thinking, among other factors, which guides Egypt in its efforts to find markets for the gas discovered in its territory.

- *Employment and R&D.* The production of the Israeli gas would create local employment opportunities in the energy field, and would foster the establishment of an R&D infrastructure in this field.

Reducing Dependence on Imported Energy Sources

The State of Israel has a particular security interest in reducing its dependence on strategically vital resources, such as water, foodstuffs, essential raw materials, and – in particular – energy. Because Israel remains isolated in the Middle East, it must depend on distant suppliers for its energy, which must be delivered along supply lines that are narrow and vulnerable. In this context, we need only recall the experience of the Yom Kippur War, when the term 'oil weapon' first gained wide currency.

Given the political and economic conditions of the world market, the likelihood of an oil boycott is low, but longer-term risks remain. World energy forecasts indicate that, over the coming decade, Western dependence on Arab and Iranian oil, which accounts for two-thirds of the world's proven reserves, will again increase. Similarly, it is worth bearing in mind that the Arab oil boycott of 1974 came as a great surprise to both Western states and Israel – at the time it was believed that Saudi Arabia would not act contrary to American interests. While independent energy sources would not reduce the political pressure engendered by an oil boycott, it would certainly lighten the burden of meeting Israel's energy needs.

Israel's oil supply is also vulnerable in other ways. Potential political instability among large oil producers, such as Saudi Arabia, could result in new supply difficulties. It should be recalled that Israel, like other countries around the world, suffered from an oil shortage after the Islamic revolution in Iran, which lead to higher prices and supply difficulties.

The conclusion to be drawn is that Israel's energy policy needs to be based on as many domestic sources as possible. In that vein, the domestic gas sector should be developed for maximum exploitation.

Natural Gas as a Strategic Energy Reserve

As noted, the existence of natural-gas deposits off the coast of Israel is a significant asset in the event of emergency. Should the supply of energy from outside sources come under threat, Israeli gas could still be delivered via secure lines of supply.

The question then arises as to whether it might not be better to keep existing quantities of gas in reserve for emergencies. In my opinion, this move would be counterproductive, as it is based on faulty logic. To ensure a ready supply of gas, it would be better to gear up for maximum exploitation of existing reserves. While this may seem contradictory, the reason for this is that only by consuming existing deposits of gas would it be possible to underwrite further efforts to find additional ones in the future. Unless gas is extracted in large quantities, the existing gas fields will not be developed, and further exploration will not be undertaken.

Moreover, as has been noted above, natural gas can only be exploited if an infrastructure and a market are created for it. Yet the infrastructure that would serve emergency needs is the same infrastructure that would be used to serve day-to-day needs. If day-to-day demand is small, then the infrastructure set up to serve that demand will be correspondingly modest – the firms that discovered the existing gas fields will not invest in more infrastructure than is necessary to serve their own commercial purposes. Accordingly, setting up a limited infrastructure would not provide increased production capacity during periods of peak demand. Waiting for an emergency to expand production and distribution capacity could take many weeks, during which time there would be a shortage of energy. Only by creating large scale demand can the construction of a high-capacity infrastructure for delivery be spurred.

The development of a gas market depends on three elements: discovery, distribution, and consumption.

Importing Natural Gas from Egypt

The IEC would likely be the major consumer of locally-produced natural gas for at least the coming decade. In February 2001, the company decided to purchase an average of some 1.7 billion m^3 of gas per year from Egypt – roughly half of its projected needs – over the next 10 to 15 years. To that end, the IEC has been conducting negotiations with an Egyptian company, EMG, for supplying gas via pipeline from fields in the Nile Delta. In March 2001, the company decided to purchase a similar amount of gas from Israeli suppliers. The total quantity that the IEC plans to purchase from the two sources together thus stands at about 3.5 billion m^3/year.

The main considerations behind the IEC's decision to purchase gas from Egypt were the large size of proven Egyptian reserves (some 3,400 billion m^3). In addition, the company wanted to diversify its sources of supply, and create competition. In response, would-be Israeli suppliers have cut their asking price by tens of percentage points below the international average.

The IEC's negotiations with both sides proceeded in parallel, and as of mid-October 2001, no deals had been concluded. Nonetheless, in view of the deterioration in relations between Israel and Egypt since October 2000, some doubts have been raised as to the wisdom of becoming dependent on Egyptian sources of a vital energy resource.

These doubts have been fed following a number of news items, which call into question the Egyptian government's willingness to guarantee gas supplies to Israel. For example, in February 2001, the Egyptian magazine *Al-Ahram Weekly*, considered an 'establishment' publication, published an article

headlined "No Egyptian Gas for Israel." The Egyptian Minister of Oil, Samakh Fahmi, was quoted in the article as saying, "I've been following with great amazement newspaper reports that would indicate that Egypt is going to supply natural gas to Israel." Afterwards, the Egyptians made it clear that the gas agreement between EMG and the IEC was not to be an agreement between *governments*, but one between *private companies*. In effect, Fahmi seemed to be implying that the government of Egypt was not prepared to provide long-term guarantees for the deal.

In early June, 2001, the *Washington Post* quoted an unnamed senior official in the Egyptian Ministry of Oil as saying that Egypt intended to cancel its agreement to provide natural gas to Israel. At the same time, Egyptian newspapers called on businessman Hussein Salam, chairman of the board of EMG, to suspend the project to supply natural gas to Israel. The Egyptians have also presented alternative projects that would bypass Israel entirely, such as a pipeline running through Jordan to Syria, Lebanon and Turkey. Another proposal has been to lay a pipeline along the floor of the Mediterranean.

In addition to all of this, there has been a recent downturn in relations between the two states. Cairo has recalled its ambassador, and there is a boycott of Israeli goods in force that enjoys President Mubarak's encouragement. Moreover, various measures have been taken to discourage Israelis from doing business in Egypt, including the decision to prevent an Israeli company from laying an underwater cable infrastructure within Egyptian territorial waters. Cooperation in tourism has also been suspended. Finally, in mid-July 2001, Osama El-Baz, a senior adviser to President Mubarak, warned that "Syria would not be alone in the event of Israeli aggression." Egypt has also made similar threats during periods of tension with Syria, and during the confrontation between Israel and the Palestinians in 1996.

Although Israel's proven gas reserves are presently limited in volume, they are believed to suffice for at least a decade.

In view of all this, it is fair to question the degree to which it would be possible to rely on the stability of Egyptian gas supplies in the event of a rise in regional tensions. In the event of a military confrontation between Israel and an Arab state, both domestic and regional Arab pressures to boycott Israel would likely increase. In such a case, Egypt might very well decide not to honor its trade commitments with Israel, including the supply of natural gas.

There are those who contend that Egypt's dependability has been amply demonstrated by its commitment to carry out the existing oil-supply agreement with Israel. However, it is difficult to accept this comparison. The oil-supply agreement is anchored in the peace treaty between the two countries, appearing as an appendix to it. While it remains conceivable that Egypt could abrogate the agreement anyway, doing so would entail a serious political cost.

However, Egypt is working hard to prevent the present gas agreement from attaining the same kind of status. As Egypt is presently depicting it, the gas agreement is intended to be an ordinary commercial agreement between companies, whose abrogation therefore would not entail a high political cost. Moreover, Israel would be more vulnerable to a suspension of gas supplies than to a suspension of oil supplies. Unlike oil, supplies of which can be stored for emergencies or for which alternative suppliers can be found on the open market, gas easily cannot be stored, and is uneconomical to transport by ship. Therefore, a threat to cut supplies of gas would have to be taken extremely seriously.

Similarly, hopes ought not to be pinned on the likelihood that Egyptian economic interests would deter it from violating its contractual obligations, since the total contribution of such a contract to the Egyptian economy would be small. The monetary value of the deal presently being negotiated is some US$150 million/year. A large

portion of this would go to the foreign companies that spearheaded the Egyptian exploration effort. Overall, the total value of the agreement to Egypt's balance of payments is negligible, when we consider that its imports total some US$16 billion/year.

When we compare the risks, then, the balance clearly favors using Israeli gas. The risk attached to using limited supplies of Israeli gas is the gradual depletion of domestic reserves over the course of many years. However, the risk attacked to dependence on Egyptian gas is the possibility of a sudden suspension of supply, due to a diplomatic or political crisis between Jerusalem and Cairo. Clearly, the former scenario is less severe, since such an eventuality can be planned for well in advance.

Beyond these two scenarios, there is also another kind of risk: that of either a serious industrial mishap or sabotage. In anticipation of this possibility, the IEC is planning to construct power stations that can operate, as needed, on either natural gas or petroleum products. It should be noted, however, that this solution is suitable only for short periods, such as would be required in the event of a temporary system failure that needed to be repaired, and is less efficient over the long term. Hence, the construction of dual-use power stations is not an effective hedge against the possibility of a prolonged suspension of gas supplies, as would be the case in the event that Egypt were to suspend a supply agreement with Israel.

An additional disadvantage in importing large quantities of gas from Egypt is the loss in revenue that Israeli gas would provide to the domestic economy, in the form of royalties, taxes and savings in foreign currency. The deals between the IEC and Egypt involve hundreds of millions of dollars. Insofar as is known, the IEC did not consider questions of national interest when deciding to conduct negotiations with the Egyptians – its decision was based only on commercial considerations. In fairness, it should be noted that the

Another Viewpoint

Shmuel Even's article provides an excellent analysis of the strategic significance of natural gas discoveries in Israel. It also highlights many of the issues involved in importing gas from Egypt. Indeed, to some extent Even's article can also be viewed as a strategic warning against creating dependency upon Israel's southern neighbor, with whom relations have been rocky even at the height of the Middle East peace process.

While the risks entailed in importing natural gas from Egypt cannot be easily dismissed, considerations favoring such imports cannot be ignored. Egypt continues to occupy a pivotal role in the Middle East, and no set of relations developed by Israel in the region is as significant as those with Egypt. Moreover, these relations have stood the test of time, enduring considerable tensions created by Israel's invasion of Lebanon in 1982, the first Intifada in 1988-1990, and Palestinian-Israeli violence that has raged since September 2000. While publicly very critical of Israel on these and other occasions, Egypt refrained from violating the peace treaty signed in 1979. Indeed, for over a year now, President Mubarak has played a critical role in preventing Israeli-Palestinian clashes from escalating to a regional confrontation.

Aside from the opportunity to diversify its sources of natural gas and the effect that the availability of an alternative source with large proven reserves has had on the price of natural gas, purchases from Egypt may be of strategic benefit by adding to Cairo's incentives to continue abiding by its peace treaty with Israel. By generating additional foreign currency income for Egypt, natural gas exports to Israel may add an important dimension to the mix of incentives that account for the stability of Egyptian-Israeli relations. While this element cannot be expected to override competing strategic considerations if conditions in the Middle East were to deteriorate, it can play a role in affecting Egypt's choices in less extreme circumstances, in favor of continuing to comply with the important dimensions of its peace treaty with Israel.

Shai Feldman

IEC is under no obligation to make such considerations, which go beyond the company's specific responsibility for the production of electricity. Rather, government ministries are responsible for seeing the larger picture and guiding the electric company accordingly.

The Absence of an Infrastructure for Distribution

As noted, the development of a gas market depends on three elements: discovery, distribution, and consumption. Given the availability of natural gas reserves and the existence of consumer demand, the only thing holding up the gas sector is the absence of a supply infrastructure. Yet despite the fact that more than two years have elapsed since gas was first discovered, no steps have yet been taken in this regard. One of the reasons for this is the government's decision to separate gas producers from the body that will deliver gas to consumers. The latter is to be selected via public tender and will have a monopoly for distribution. This accounts for the slowness in the bureaucratic and legal processes related to this decision. The domestic pipelines that are to be set up are also meant to serve for delivering gas imported from Egypt.

The cost of establishing the required infrastructure is estimated to be about US$350 million. Originally, the system was meant to be ready to go on-line by 2003, but there is now some doubt as to whether this schedule can be met. Clearly, delays in establishing the needed infrastructure would inflict economic losses of hundreds of millions of dollars per year, and would harm the IEC's ability to meet projected demands for electricity in the coming years. The initial demand for gas is estimated to be about 4-5 million m^3/year.

Summary

Israel is standing on the threshold of a new era in energy: the gas era. It has the resources to make this transition on its own, should political or security difficulties arise in arranging supplies of gas from Egypt or elsewhere. Although Israel's proven gas reserves are presently limited in volume, they are believed to suffice for at least a decade, and both the discoveries to date and geological surveys support the belief that additional Israeli gas deposits – and even oil – await discovery. This is also born out by the experience of other countries: initial discoveries of gas (and oil) are usually small, relative to the quantities discovered through further exploration.

Accordingly, it is advisable that Israel develop its existing gas fields, accelerate the establishment of a domestic gas-distribution infrastructure to utilize the gas that has been found, and encourage further exploration. It is also to be hoped that political and economic relations with Egypt would improve in the future, and that this would enable purchasing its gas with confidence. Similarly, it is reasonable to consider that, within a few years, Palestinian gas might also find its way into the Israeli market. In any case, there is unlikely to be a shortage of natural gas in the region.

Dr Even is a former adviser to Delek, a member of the consortium that undertook gas explorations in Israel.

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