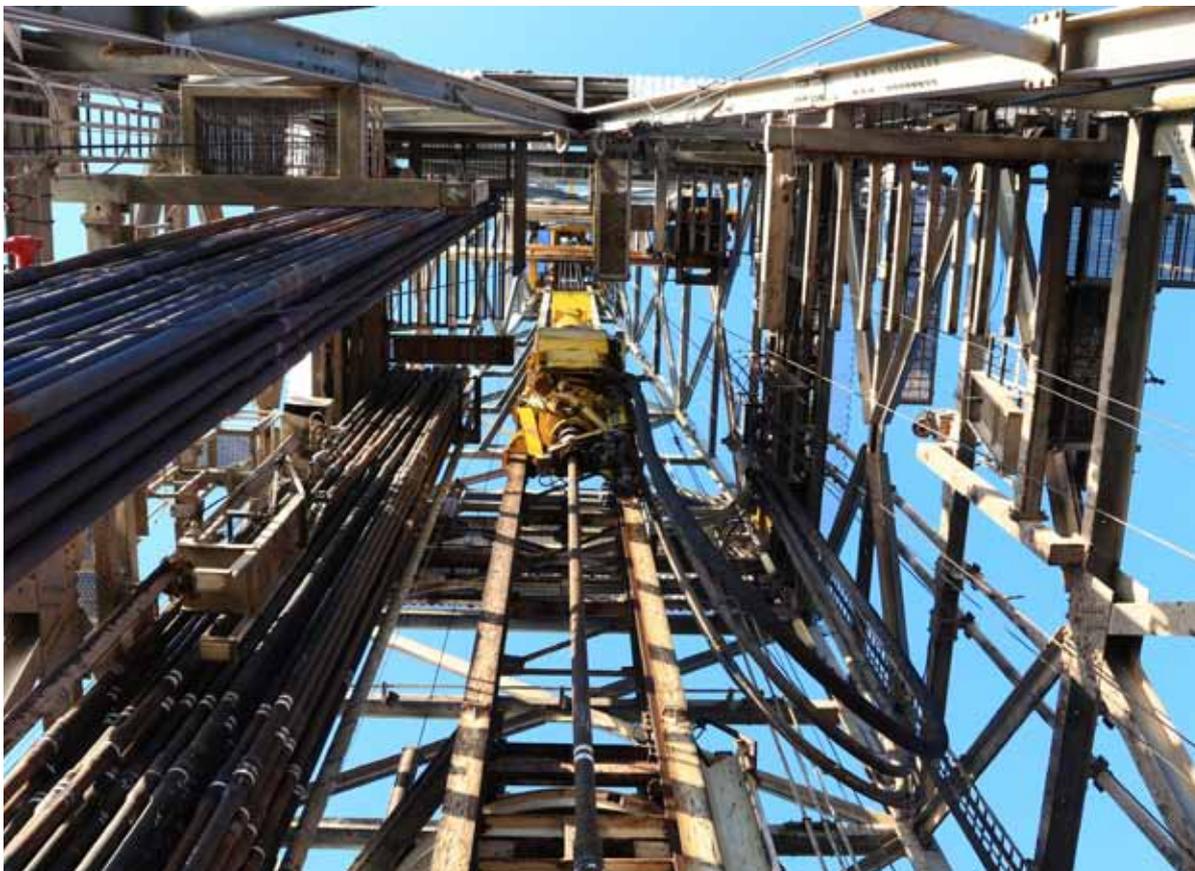


Erratic progress for East Mediterranean gas developments

The East Mediterranean region is home to some of the world's most promising gas reserves. But, as energy consultant Gina Cohen explains, developing them is proving highly challenging for the main players in the sector



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IN MARCH 2010, the US Geological Survey estimated that the Levant basin – an area of around 83,000 square km consisting largely of offshore Israel, Palestine, Lebanon and Cyprus – contained 1.7 billion barrels of recoverable oil and 122 trillion cubic feet (cf) of recoverable gas reserves. Expectations were – and still are – very high that these volumes will be discovered, developed and marketed, both locally and for export.

The early stages of development were very positive. The first major discovery was that of the Tamar field offshore Israel in 2009, with reserves of 10 trillion cf of gas, building on the earlier smaller finds of Mari-B, offshore Israel, and Gaza Marine, offshore Gaza, with 1 trillion cf of gas each.

Barely one year after the discovery of Tamar, the Leviathan field was discovered offshore Israel, adding 22 trillion cf to reserves, followed a year

later by the first Cypriot discovery, the Aphrodite field.

Although Aphrodite had reserves of only 4.5 trillion cf of gas, it was good news for Cyprus, given that amount of gas would be enough to meet the island's needs for more than a century and potentially herald the discovery of enough gas to start an export industry. Hopes were raised that revenues from exports could help the country escape from the huge debts it had racked up during the global financial crisis and perhaps help Europe to reduce its over-dependence on Russian gas.

Major oil and gas companies jumped at the opportunity to extend exploration when Cyprus opened its second licensing round at the beginning of 2012. By June 2013, the owners of the Tamar, Leviathan and Aphrodite discoveries had signed a non-binding agreement with the Republic of Cyprus to carry out a feasibility study for the construction

of a multi-train liquefied natural gas (LNG) export facility at Vassilikos on the island's southern coast.

Skip two years ahead to the present day and we find a combination of disappointing results from exploration wells in both Israel and Cyprus, over-zealous regulatory fervour in Israel and indecisiveness in Cyprus. Together, these elements have dramatically slowed the pace at which these reserves can be monetised.

Local supplies and exports

The Tamar gas field came on stream in March 2013 and has been producing about 1 billion cf of a day (cf/d) of gas since then. The field is located in deep water – as are all the big recent discoveries – resulting in a complex and relatively expensive development.

However, US firm Noble Energy and Israel's Delek Group, which control Tamar, had the advantage of having a

ready market into which to sell the gas. Israel had already started its conversion into a major gas consumer after the smaller Mari-B field had been discovered and thanks to imports of gas from Egypt. However, by 2013 Mari-B had been depleted and Egypt had cut off its supplies to Israel.

In 2014, half of Israel's electricity generation capacity of 12,700 megawatts (MW) was fed by gas, some 7.5 billion cubic metres (cm) of which was consumed in the process. That figure is forecast to increase to about 13 billion cm/y by 2020.

However, in order to develop Israel's Leviathan and Cyprus's Aphrodite fields – both also operated by Noble – a bigger market is needed to justify the huge costs and risks. The incremental needs of the Israeli market beyond what Tamar can supply is not sufficient for the development of Leviathan and the local Cypriot market requires less than 1 billion cm of gas a year, making it uneconomic to develop the 125 billion cm Aphrodite field.

As a result, the partners in the fields and governments focused on finding export options. Several were identified, including exports to more distant markets, such as Europe and/or the Far East, as well as markets closer to home in the surrounding region.

Sentiment has shifted over what would work best, as the prevailing geopolitical situation and other factors have changed.

Potential partners have signed memoranda of understanding (MoUs) with companies such as Australia's Woodside, which planned to call on its LNG expertise and farm in to Leviathan. However, this deal was subsequently cancelled and nothing has yet been finalised on the export front.

Meanwhile, the global oil and gas market has been in a state of upheaval. The market has shifted over the last several months from peak oil prices of \$115 a barrel in June 2014 to below \$50/b at the outset of 2015, with spot natural gas prices tumbling in tandem and long-term oil-linked gas contracts adjusting accordingly, albeit with a four- to six-month lag.

Competitive market

Looking at the next two years, global LNG supplies are set to increase by 25%, or more than 60 million tonnes, potentially putting further pressure on

LNG prices. Competition is already hotting up. The PNG LNG project in Papua New Guinea, constructed at an estimated cost of \$2,750 per tonne, has been on stream since May 2014, and located just a short distance from the major Asia-Pacific markets. In December 2014, BG began supplying LNG from its \$20 billion Queensland Curtis LNG (QCLNG) project in Australia. Then, there are the planned exports from the US, where the conversion from relatively cheap brownfield facilities is not expected to cost more than around \$1,000 a tonne.

Currently, a range of export options are still on the table for Israel and Cyprus, including:

- Exports to global markets via an onshore LNG or an offshore floating LNG terminal to be constructed in Israel or Cyprus;
- Exports via pipeline to Egypt for the purpose of supplying the local Egyptian market and/or for liquefaction at existing facilities there owned by BG Group and Spain's Union Fenosa Gas;
- Exports by pipeline to Turkey, where there is high gas demand, but little indigenous gas production;
- Exports to Europe via pipeline from Israel, through Cyprus and Greece, to Italy and beyond;
- Exports via onshore pipeline to Jordan, which wants to import 3 billion to 4.5 billion cm/y of gas;
- Exports via pipeline to Palestine, to fuel power stations to be constructed in the West Bank, or the existing 140 MW facility in Gaza.

All of these alternatives are possible, some more so than others, and each has its own particular technical, geopolitical and economic hurdles that need to be surmounted.

The partners have been focusing mainly on exports to Palestine, Jordan and Egypt. Over the last year, non-binding gas sales and purchasing agreement (GSPA) MoUs have been signed with private and public entities in all three of these countries.

If sufficient deals could be finalised for Leviathan, Noble and its partners were set to move ahead with a development including a floating production storage and offloading (FPSO) vessel capable of producing and supplying 1.6 billion cf/day. Although it is unusual for a mostly gas-prone reservoir to be developed via an FPSO, the facility would be ideally located

to supply both local and regional markets.

However, in the midst of negotiations about gas sales, all hell broke loose, or as one international expert said at the time, Israel was "shooting itself in both knees".

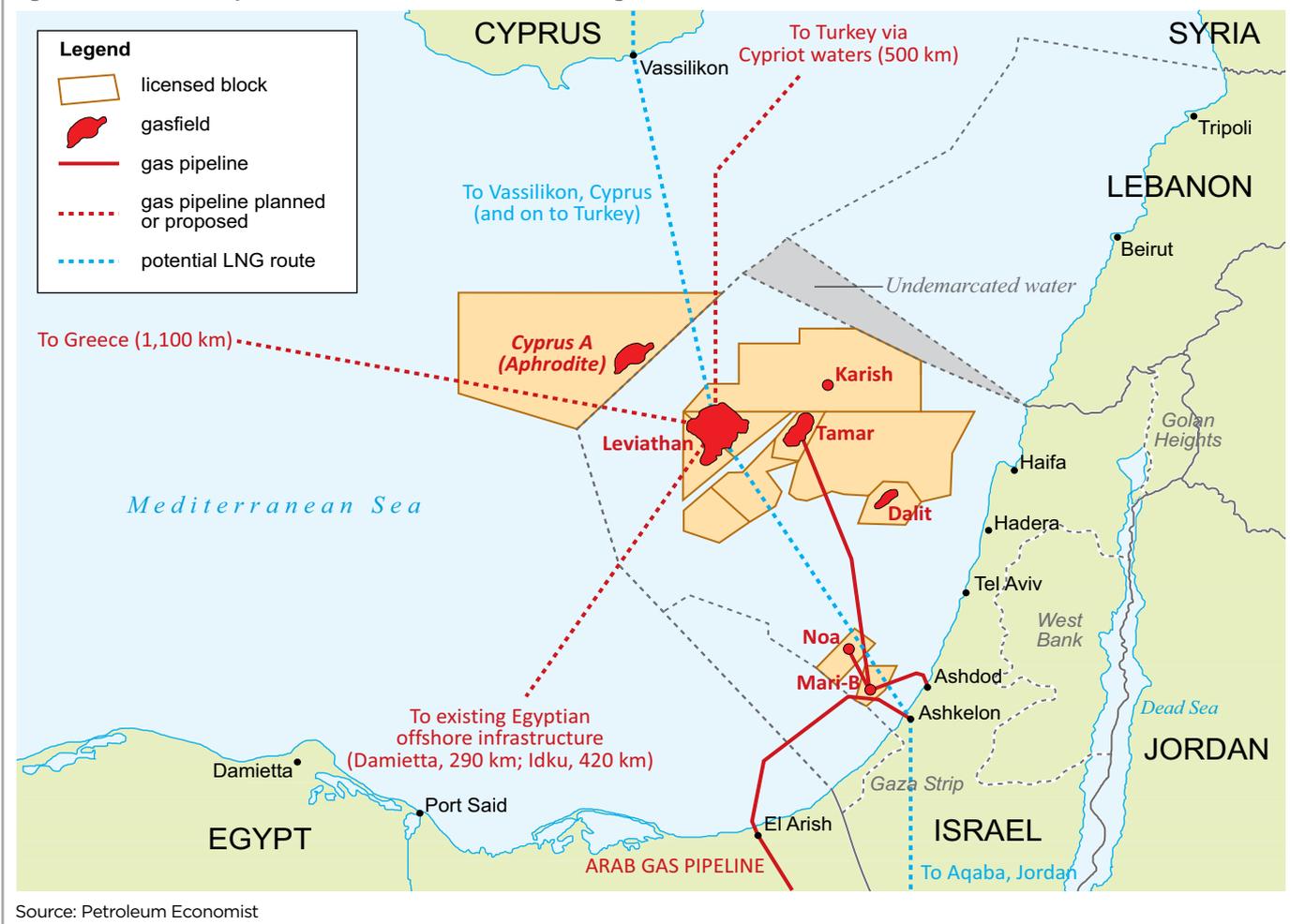
On 23 December 2014, the Israel Antitrust Authority retracted from previous agreements reached with the developers of the gasfields and decided that they were not only a monopoly, but that they had entered into a restrictive trade practice. The authority called on the firms to sell a substantial amount of rights in some of their discoveries, effectively penalising them for success.

It didn't take long for Noble to react. On 20 February 2015, the firm said it would reduce its planned investments in Israel for the year to precisely zero. Noble said it was suspending its plans to expand the Tamar project and the initial development phase of Leviathan until all unresolved regulatory issues were sorted out, even demanding stabilisation of the issues to ensure no further changes down the line.

The regulatory issues that need resolving at the time of writing include:

- **Taxes on export transactions:** on 26 March 2014, the Ministry of Finance announced its intention to amend the Petroleum Profits Law 2011 to regulate the method of taxing petroleum exports, but no ruling has been forthcoming. This issue was the primary reason for the termination of Woodside's MoU;
- **Gas Export policy:** in June 2013, the government approved its gas export policy, albeit limiting gas exports further than prior recommendations. However, partners still require approval on an ad hoc basis for every export contract;
- **Antitrust issues:** in addition to the reversal of the decree of ownership of the licenses, the Israel Antitrust Authority and other regulators are intervening in agreements over the conditions of long-term gas contracts. They have been pondering imposing a regulatory gas price of just above \$5 per million British thermal units (Btu). Owners of a joint field could also potentially be forced to carry out separate gas sales;
- **Development plans:** the Israeli government has been tardy in approving plans, such as that for the Tamar SW field, as well as permits for onshore siting of facilities to bring the gas to shore;
- **Draft Marines Zone Law:** in 2013,

Figure 1: Potential export routes for East Mediterranean gas reserves



the government drafted a new law, which could have implications for gas exploration operations offshore.

Looking to the future

After the recent Israeli elections, it will be incumbent upon the new government to reach agreements with the gas companies on all the regulatory issues mentioned above, if progress is to be made.

What is certain is that the gas companies will not move ahead now before achieving a high degree of certainty, especially as, in the new global environment, the lure of booking reserves is now less attractive.

Phase 1 of Leviathan is forecast to cost around \$7 billion to develop, while the figure for Aphrodite is \$3.5 billion-4.5 billion. The companies understand that the substantial upfront outlays needed cannot be cashed in later if the project is terminated or the terms changed via regulation.

Noble and its partners know that the balance of negotiating power in the pre-development stage of its projects will shift dramatically in favour of the host government as the project develops, so

they will therefore probably not invest any substantial sums until they can be sure of regulatory transparency and certainty from the Israeli and Cypriot governments.

If and when the uncertainties now reining in the market have been resolved, the partners will re-assess their specific development plans to ensure they remain appropriate for the gas sales volumes and markets ultimately contracted. And, of course, the need to pin down those markets and gain a high enough price looms over all this.

The main anchor market at this juncture for both Israeli and Cypriot gas is Egypt, where indigenous gas supplies are insufficient to meet local demand and where LNG export facilities have a shortfall of more than 12 million t/y of LNG to be filled.

However, Egypt is undergoing proactive hydrocarbon policy changes of its own. The government is slowly paying off its debts to international energy companies and has increased the domestic price of gas from the legacy \$2.65/million Btu to \$3.95-\$5.88/million Btu. These measures

have been accompanied by pledges by foreign firms to invest billions of dollars in exploration in Egypt over the next five years.

The window has yet to close on the possibility of bringing Leviathan gas to Egypt, potentially as a joint development with Aphrodite. In its 2014 financial report, Noble's partner Delek says the partners are examining options to develop the Aphrodite field, in combination with Leviathan and Tamar. On the other hand, there is the risk of destructive competition between Israel, Cyprus and Egypt. Whatever option is eventually undertaken it will involve complex trade-offs.

One thing is certain, and that is that even though resources are themselves immobile, Israel and Cyprus need to understand the restricted availability of companies, technical expertise, specialist equipment and financial resources available. The number of areas in which companies are willing and able to work is limited, so it is only those offering the most favourable conditions that will be developed. ■