RAPID DEVELOPMENTS IN EAST MED GAS

The Eastern Mediterranean has been blessed with a number of major gas discoveries over the last few years, and it is attracting considerable interest from international oil and gas companies. These gas discoveries have raised expectations significantly and will have a major impact on the region, albeit often overstated. Globally, however, low gas prices are hindering their development. Regional markets may be more conducive, but these present challenges as well. In the Eastern Mediterranean, Egypt is a hotbed of activity in terms of hydrocarbons. Rapid developments in Egypt's natural gas projects, and its progress towards self-sufficiency, are impacting prospects for Cyprus and Israel to export their gas to Egypt and Europe. Not only is this commercially challenging, but the markets for it may no longer be available. However, rapid developments in the region are also opening up other opportunities for Israel and Cyprus, which are addressed in this article.

Charles Ellinas*

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* Dr. Charles Ellinas is a nonresident senior fellow with the Atlantic Council's Eurasian Energy Futures Initiative.

The key gas producers in the Eastern Mediterranean are Egypt, Israel, and Cyprus.[1] Lebanon has potential but political instabilities have thus far prevented it from exploring its hydrocarbon prospects. Egypt is by far the biggest producer and user of gas in the region, with close to three trillion cubic meters (tcm) of proven reserves.

Israel and Cyprus have made sizeable gas discoveries, but need to be able to export gas if they are to justify the considerable investment required to develop the Leviathan (620 billion cubic meters - bcm) and Aphrodite (128 bcm) gas fields and monetize their assets. This requires access to export markets.

None of these projects will be realized unless they are commercially viable and low risk, which means the focus must be on local and regional markets in view of current low gas prices in both the Asian and European gas markets and the increasing possibility that such low prices will prevail for the foreseeable future. Turkey offers a market where gas prices are relatively high and is thus highly attractive for nearby Eastern Mediterranean producers.

However, the region is also characterized by uncertain economic and political conditions that can make exploration and exploitation of gas fields challenging.[2]

Egypt Gas in Context

In Egypt, by far the largest current and prospective producer in the region, the focus is currently on servicing high levels of domestic demand.[3] Recent discoveries and moves toward liberalization of gas prices are changing this, enabling Egypt to become self-sufficient and potentially resume LNG exports.

Current demand in 2016 for natural gas in Egypt is 52 billion cubic meters per year (bcm/y) and may reach 65-70 bcm/y over the coming 10 years. A combination of a switch to renewables, reduction of subsidies, higher gas prices, and an awareness campaign by the Egyptian government on ways to rationalize energy consumption should help stem the rampant increase in demand. But even with these efforts, the gas deficit of seven bcm/y in 2015 will continue to grow unless new gas is brought online.

The problem is that gas production had already declined at the start of this year to 42 bcm/y due to the misguided policies of the previous government, forcing Egypt

[1] Charles Ellinas et al., "Hydrocarbon Developments in the Eastern Mediterranean: The Case for Pragmatism," *Atlantic Council*, 2016.

[2] Charles Ellinas, "Eastern Mediterranean gas export risk," *in-cyprus*, January 10, 2016, http://in-cyprus.com/east-med-gas-export-risk/

[3] Charles Ellinas, "Egypt gas impact: Cyprus and Israel," May 1, 2016, http://in-cyprus.com/egypt-gas-impact-cyprus-israel/

to utilize expensive LNG imports. If this decline continues unchecked, gas production may go down to 15 bcm/y in 10 years, as most of Egypt's existing gas wells are either at maturity or beginning to decline in yield. The oil minister said recently that Egypt is expected to spend an estimated eight billion dollars on LNG imports this fiscal year – a drain on the country's finances. Without new gas production, the situation will only get worse.

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Egypt has revamped its energy sector strategy and is striving to increase gas production. It is signing new exploration contracts, and has renegotiated new and higher gas prices, between four and 5.88 dollars per mmBTU, which has prompted gas companies to speed up project development.

Spurred by the new gas prices, Zohr and a number of new gas field developments are coming to the rescue, with BP and ENI leading the way. By mid-2016, it already looks as if the decline in gas production is now being reversed.

BP, ENI, and other oil and gas companies operating in Egypt stand to gain from this new pricing regime, which is a major incentive to develop new projects, and with a gas-hungry domestic market, they do not have to look far or hard to find consumers.

Through its unused LNG plants, Egypt also has the capability to export excess production. Provided security and the fiscal situation improve, there is the potential for significant growth for oil and gas companies operating in Egypt.

New Gas Projects

Last year, ENI announced the discovery of a giant 100 square kilometers gas field named Zohr, about 190 kilometers offshore and close to Egypt's EEZ border with Cyprus.[4] It is estimated to hold about 850 bcm of gas. This was confirmed in early 2016 by the first appraisal well, which showed there may even be an upside. Zohr was discovered in a carbonate formation with excellent reservoir characteristics.

ENI is drilling another three appraisal wells this year and a dedicated well to test the prospects of a deeper gas reservoir. Based on the evaluation of seismic data, ENI indicated that this may hold another 280 bcm of gas.

[4] Charles Ellinas, "ENI's giant discovery," *in-cyprus*, 5 September 2015, http://in-cyprus.com/enis-giant-discovery/

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Motivated by the attractive gas price of 5.88 dollars per mmBTU, ENI and the Egyptian government agreed to a fast-track development plan that will bring Zohr online by the end of 2017 with initial production of 10 bcm/y, to reach a plateau of 27 bcm/y when full production is achieved by 2019. ENI's CEO Claudio Descalzi said Zohr gas will be "mainly sold on the Egyptian market." But he noted that Egypt's two LNG export terminals have enough spare capacity to enable some Zohr gas to be liquefied for export.

The 12 billion dollar West Nile Delta (WND) Project involves the development of gas fields located offshore from Alexandria.[5] BP has started work on phase-I to produce over 140 bcm of gas. First production is expected to start in 2017, with peak production expected to reach 12.5 bcm/y of gas, which is approximately 30 percent of Egypt's current gas production.

WND also includes other discoveries that will be explored and developed in later phases. These are expected to produce another 140 bcm-200 bcm of gas, potentially adding another 12 bcm/y-16 bcm/y to the Egyptian gas grid.

With a market for its gas assured at attractive prices, BP plans to also step up investment in its existing operations, and to move forward with its exploration program in the Nile Delta. Together with its partners, BP currently produces 30 percent of Egypt's gas and expects to more than double this over the next four years.

Encouraged by the attractive gas prices, BP, ENI, Apache, Shell, and Dana are also developing a number of other smaller gas fields that will start producing much needed gas from 2017 onwards.

Potential for New Discoveries

The discovery of Zohr is encouraging oil and gas companies to look more carefully at carbonate formations in the Eastern Mediterranean. The region has produced some significant discoveries in recent years, and it is believed that there are still massive hydrocarbon deposits to be discovered in the Mediterranean. Initial indications from 3D seismic surveys completed by Edison in the North Thekah block, adjacent to Zohr, are reportedly good.

[5] "BP to develop Egypt's West Nile Delta gas fields," *Oil Review Middle East*, 9 March 2015, http://www.oilreview.me/gas/bp-to-develop-egypt-s-west-nile-delta-gas-fields

BG, now part of Shell, has three offshore concessions, where two discoveries with an estimated 170 bcm of gas were made. It remains to be seen how Shell will develop these.

Having awarded four offshore licenses last year, and a total of 56 concessions between 2014-2015, Egypt plans to announce a new international tender in 2016 for 11 new exploration blocks in the Mediterranean and Nile Delta.

For Egypt, an issue of pressing concern is its ability to pay its debts to oil and gas companies, including its LNG suppliers. If this problem goes unchecked, it will affect Egypt's financial credibility. Combined with persistent terrorist threats, this could affect future investments.

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Egypt's Gas Production Set to Surge

In terms of energy and gas, Egypt is going through a rapid transformation that will see it go from being an importer of LNG to a net exporter by 2021-22. This is driven by three key factors:

- President Al-Sisi has made energy self-sufficiency a cornerstone of his presidency and has pulled out all the stops to promote exploitation of gas field prospects.
- The Egyptian energy market is hungry for gas, and it is ready to absorb anything that its gas fields can produce; as a result, sellers do not have to go far to sell.
- Gas prices recently negotiated between the government and the gas companies are high; assured high profits encourage investment and field development.[6]

Based on the new discoveries and developments already in progress, Egypt can expect to more than double its current gas production by 2019-2020 by bringing another 50-60 bcm of gas online.[7] Not only is this enough to achieve self-sufficiency – and do away with the need for expensive LNG imports – but there should also be excess gas available for exports.

Egypt is also in a good position to continue the expansion of its gas production well into the next decade.

[6] "Egypt: EGPC Agrees With Eni On Gas Prices Between U.S.$4 and U.S.$5.88," *allAfrica*, 24 November 2015, http://allafrica.com/stories/201511251037.html

[7] Charles Ellinas, "Gas dynamics and prospects in Eastern Mediterranean," *in-cyprus*, 21 February 2016, http://in-cyprus.com/dynamics-and-prospects/

The outcome of all these developments is a dramatic reversal of fortunes for Egypt from gas shortages to self-sufficiency and exports. This impacts the hopes of its neighbors Israel and Cyprus, and their plans to export gas to Egypt. Not only is this commercially challenging, but the markets for it may no longer be available.

"The loss of the Egyptian market leaves Israel with increasingly limited options to export its gas."

Commercial Challenges for Exports to Europe

The world has entered an era of plenty at a time when global primary energy demand may be peaking. Technology developed for shale oil and gas is unlocking the development of more resources at lower costs. In addition to potentially vast shale oil and gas resources, the development of renewables is increasing exponentially and becoming cost competitive. Energy efficiency is also on the rise, while energy intensity is going down. As a result, the world now has abundant energy supplies. In addition, with the link between world economic growth and energy use broken, global primary energy consumption is expected to peak by 2025 to 2030. The outcome of plentiful supplies and peaking demand is that oil and gas prices are low and are expected to stay low for the foreseeable future.

European and global spot gas prices range from four to five dollars per mmBTU (mid-2016) and are expected to stay low well beyond the end of this decade. The main reasons for this are:

- An LNG glut, expected to persist well into the next decade, with more and more already committed LNG plants coming online.
- Massive increases in shale gas production in the US are keeping gas prices in the US low, around 2.50 dollars per mmBTU in 2016, and fueling LNG exports, adding to the global glut.
- In Europe and Asia, the price of coal is at an all-time low, about half the price of gas.

In 2016, Russian gas piped to Europe is down to four dollars per mmBTU.

Plans for export of gas from Israel and Cyprus to be liquefied at Egypt's two idle LNG plants at Idku and Damietta, for export to Europe, cannot compete with these prices.

Noble is selling gas in Israel at over five dollars per mmBTU and would expect

a similar price for gas at Leviathan or Aphrodite for export to Egypt. By the time the cost of pipelines to take the gas to Egypt, and the costs of liquefaction and then transport and regasification in Europe are added, the price of gas delivered to Europe will be well in excess of European (and global) gas prices.

European gas demand is well-supplied by gas piped from Russia and Norway at prices other gas suppliers find difficult to compete with. US LNG is also making inroads in Europe providing additional flexibility and complementing Russian and Norwegian gas rather than competing with them. Gas from Israel or Cyprus cannot compete under these conditions.

Statoil's CFO confirmed recently that the European natural gas market is well supplied by pipeline gas from Norway and Russia and expects only limited impact from US LNG. If US LNG with a gas cost of about 2.50 dollars per mmBTU cannot compete with Russian or Norwegian gas, how can Israel and Cyprus with a gas cost of five dollars per mmBTU expect to do so? Commercial challenges remain formidable for the foreseeable future.

Impact on Israel

Gas is changing Israel's national security and foreign policy perceptions. Eastern Mediterranean policy, in particular, is being driven by energy considerations, both in terms of field development and export markets.[8]

Not only do the aforementioned commercial challenges make Israeli gas exports to Egypt challenging, but this is exacerbated by the uncertainties introduced by the recent regulatory problems and the rift between Egypt and Israel caused by the ICC arbitration decision.

The regulatory problem has now been resolved, but the ICC arbitration decision is still an issue. In December last year, ICC awarded 1.76 billion dollars to Israel's Electric Corporation against Egypt's EGAS as compensation for halting gas supplies in 2012. Egypt promptly launched an appeal and stopped all gas import negotiations with Israel.[9] There are informal contacts, but the process is in a state of deadlock. In April, the US State Department made attempts to broker a solution by apparently pushing Israel to drop the case, but there was no clear outcome. In any case, the prospect of Egypt achieving self-sufficiency and resuming LNG exports

[8] Charles Ellinas, "Gas dynamics and prospects in Eastern Mediterranean," *op. cit*., http://in-cyprus.com/dynamics-and-prospects/

[9] "Egypt to appeal $1.76 billion award to Israel in gas dispute, freeze gas import talks," *Reuters*, 6 December 2015, http://www.reuters.com/article/us-iec-egypt-natgas-appeal-idUSKBN0TP0HL20151206

has removed the incentive and urgency from such negotiations, even if politically the two countries are now closer together.

The loss of the Egyptian market leaves Israel with increasingly limited options to export its gas. Exports to Turkey would be a good option, and the restoration of diplomatic relations between Israel and Turkey is opening the way. This can be assisted by solving the Cyprus problem, which is making progress.

The development of the Leviathan gas field is strategically important for Israel. At present, 60 percent of its electricity is generated by one gas field, Tamar (280 bcm), one platform, and one pipeline. This poses a threat to Israel's energy security, requiring the development of Leviathan as a matter of urgency. But for this to happen, Noble and its partners need to secure exports to make such a project commercially viable. This is where Turkey comes in as an option, but this decision does not need to be made until next year.

FCNG or FLNG would offer export flexibility as these would be under the full control of the exporting country, i.e. Israel, but FLNG is capital-intensive and Noble is cash-strapped.

Leviathan could be developed in two phases:

- Phase 1: Domestic market + FCNG exports to regional markets – could be achieved by 2019
- Phase 2: Exports to Turkey, or as FLNG, with no time constraints

Of course there is also the option of accepting a Russian request to bring Gazprom into the development and export of Leviathan gas, but that poses its own geopolitical challenges.[10]

Impact on Cyprus

The commercial challenges described in this article also affect gas exports from Cyprus to Egypt. Even though negotiations at both country and company level have been ongoing since 2014, it is unlikely that they will be completed successfully. Price issues are just too challenging.

Cyprus' export options are also limited without Egypt. Turkey would be an option, but only after resolution of the Cyprus problem. Exports to regional markets using

[10] Charles Ellinas, "Russian interest in Eastern Mediterranean and Cyprus gas," *op. cit*., http://in-cyprus.com/russian-interest-east-med-cyprus-gas/

FCNG or FLNG would be another option, but so far it has not received serious attention.

It is hoped that Total will be successful with its planned exploratory drilling in block 11 early next year. But even if it is successful, this will not change the current situation. Gas exports from Cyprus will have to wait for global gas prices to recover and for a resolution of the Cyprus problem. However, additional gas finds will re-open the option of an LNG plant at Vasilikos as a longer term option, possibly in over 10 years, if and when LNG prices pick up and make it commercially viable.

But Cyprus' successful third offshore licensing round may be opening up new opportunities.[11] Participation is good, with major companies such as ExxonMobil, Total, ENI, Statoil, and QP submitting offers. Prospects are also good for discovering major new gas fields, but only drilling can tell. Certainly this has created a lot of optimism on the island, which will hopefully spur negotiations for a settlement between Greek and Turkish Cypriots.

Concluding Remarks

There is a need for pragmatism and realism throughout the Eastern Mediterranean. If it is to secure export markets, then the development of Eastern Mediterranean gas, whether in Egypt, Israel, or Cyprus, will have to be competitive in a global and European low gas price environment. An era of plenty is upon us and coupled with peaking global energy demand – low prices are here to stay.

The hotbed of activity in the Eastern Mediterranean is Egypt. It is currently suffering from self-inflicted energy shortages, but it has revamped its energy sector strategy and is on a successful drive to increase oil and gas production. The outcome of all these developments is a dramatic reversal of fortunes for Egypt from gas shortages to self-sufficiency and exports. Israel and Cyprus have missed opportunities, but may have new options, following recent developments in both countries and regionally, and will hopefully take them when they come.

The Eastern Mediterranean is volatile, and it is a region fraught with complex geopolitics. There is benefit to building upon ongoing regional discussions and accords between current and prospective producers, notably Egypt, Israel, and Cyprus, and prospective transit or consumer states such as Greece and southeast Europe, to develop regional cooperation mechanisms that Turkey can subsequently join.[12]

[11] Charles Ellinas, "Third offshore licensing round," *in-cyprus*

[12] Charles Ellinas, "Energy Goals May Unify Eastern Med: Interview with Eran Lerman," *Natural Gas Europe*, 17 February 2016, http://www.naturalgaseurope.com/energy-goals-may-unify-eastern-med-academic-28199/

Restoration of diplomatic relations between Israel and Turkey, and talks between the two Cypriot communities, demonstrate that this journey may have already begun.

US and European diplomacy should continue to push toward a cooperative regional development framework that takes into account commercial realities and regional sensitivities, based on realistic longer-term plans and policies to support exploration and commercial field development, while managing expectations.

The Eastern Mediterranean region is fraught with risk, and energy solutions that might seem justifiable and appropriate today may not be tomorrow. The key problem is instability. But ultimately the economics and geopolitics of gas and energy are transforming the wider region. There are opportunities, mostly regional, but these need to be implemented and managed timely through wider regional cooperation.