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by Nicolò Sartori and Margherita Bianchi

Istituto Affari Internazionali (IAI), Rome

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From Findings to Market: Perspectives and Challenges for the Development of Gas Resources in the East Med

Nicolò Sartori and Margherita Bianchi*

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Abstract

In the past decade, thanks to a second round of gas reserve findings such as the Zohr field in Egyptian waters and Calypso in Cypriot ones, the East Med region has become increasingly more important on a strategic level – with the potential to become a viable energy hub and trading partner for Europe beyond supplying the region's own growing energy needs. Such potential, however, is for the time being hindered by geopolitical and industrial obstacles that include the conflict between Turkey and Cyprus, the relations of the Turkey–Israel–Egypt triangle, the disputes between Israel and Lebanon and the competition arising from the growing LNG market. These issues hinder the conditions needed for the East Med to become the energy hub it can potentially be. For these reasons the paper takes into consideration options for fostering investment and a shared agenda in the area, so as to evaluate the viability and prospects for exploiting the region's gas resources.

* *Nicolò Sartori is Senior Fellow and Head of the Energy, Climate & Resources Programme at the Istituto Affari Internazionali (IAI). Margherita Bianchi is Junior Researcher at IAI.*

Introduction

Oil and gas findings have progressively changed the strategic importance of the Mediterranean region. This seems evident if looking at the past decade, when the Eastern Mediterranean has emerged as one of the most promising energy districts in the European neighbourhood and possibly at the global level, thanks to the discovery of significant reserves – mainly gas – in the territorial waters of Israel, Cyprus and Egypt. The increased geopolitical importance of the area is reflected in the literature and public discourse, not least through its (now common) naming as the "East Med region", infrequent before 2009.

The hydrocarbon resources located in the area, estimated to amount to 1.7 billion barrels of oil and 3.5 trillion cubic meters (tcm) of natural gas, represent an important asset to foster economic development at the regional level but also to offer a strategic alternative for Europe in terms of energy supply diversification. This assessment provides an impression of the region's potential: although it might prove a rather optimistic scenario,[1] gas resources in the area would double those currently held by Norway, a key supplier for European markets.

For these reasons, strong political and industrial interest is growing in the area and the surge of the East Med as an

1 These data are included in a report published in 2010 by the United States Geological Survey: Christopher J. Schenk et al., "Assessment of Undiscovered Oil and Gas Resources of the Levant Basin Province, Eastern Mediterranean", in *U.S. Geological Survey Fact Sheets*, No. 2010-3014 (March 2010), https://pubs.usgs.gov/fs/2010/3014. The authors consider it to be a rather optimistic yet comprehensive analysis, although more up-to-date assessments would certainly prove useful for the sake of the analysis.

energy-exporting region is gaining a renewed impetus. This interest is also the consequence of a major shift in energy and geopolitics, with natural gas becoming more strategic than in the past, partly as a result of the greater attention devoted to security of supply and decarbonisation policies, where gas plays a role, and of advances in the shipping of its liquefied form that have provided stronger power and means to those countries holding resources.

Despite its significant geological potential, however, full exploitation of the energy assets of the East Med has not yet taken hold, due to a combination of geopolitical and commercial concerns still slowing down industrial activities in the region. On the one hand, the political and security situation around the island of Cyprus, divided since 1974, as well as other territorial disputes in the area, represent factors of uncertainty for energy companies involved in drilling in the waters of the Eastern Mediterranean. On the other hand is the fact that East Med producers need to compete with expanding supply and low prices at the global level to secure their export markets.

These factors have generated a two-speed condition, resulting in the epicentre of the 'energy district' moving progressively southward – read, towards Egypt – where discovered resources are larger, energy markets (including infrastructures) are more mature and the political situation is more stable. Conversely, developments in other parts of the East Med – particularly in Cyprus, where discoveries keep pace but skirmishes with Turkey do not seem to settle down – are undergoing a standoff that will be quite difficult to overcome without a pragmatic approach, an inclusive cooperative framework and more favourable market conditions.

1. Overview of the energy resources in the region

The East Med is one the most interesting areas in the world if observed through the lens of exploration. The area has indeed become one of the hottest drilling zones in the last decade, displaying its resource-rich waters. All main energy companies are active in the area – including Eni, Total, Noble Energy, Exxon Mobil, BP, Royal Dutch Shell, Qatar Petroleum and Novatek – and much attention is devoted to the region by powers such as Turkey, the US, Russia, France, Italy, Lebanon, Jordan, Qatar and the UAE.

Two main phases can be identified when observing this dynamic area. The first phase started a decade ago, when first Israel and then Cyprus found sizeable gas reservoirs in their waters. It began with the discovery of Tamar in early 2009 by US Noble Energy and Israeli Isramco, Delek Drilling, Avner and Dor. Noble Energy and Delek then found the Leviathan field in late 2010 also offshore Israel, followed shortly after by the Aphrodite gas field found in the Cypriot Exclusive Economic Zone (EEZ) at the end of 2011. Estimated sizes of these gas fields vary: the Israeli Tamar field has projected reserves of 318 billion cubic meters (bcm), which is almost doubled by the Leviathan (around 605 bcm), the latter considered to be large enough to satisfy Israel's entire domestic electricity need for more than 40 years and still allocate surplus for export. Cypriot Aphrodite reserves are estimated at around 129 bcm. In this timeframe other minor discoveries were also made, such as the Tanin gas field 120 km off the coast of Israel.

These discoveries were fervently welcomed by Israel and Cyprus, which saw them as a blessing to foster political, social and economic development and to reduce financial burdens. A number of solutions were initially discussed in both countries in order to allow these resources to access the market, starting from liquefied natural gas (LNG) schemes for distant markets, compressed natural gas (CNG) for closer ones, along with more traditional potential solutions such as pipeline routes to Turkey, Egypt, Greece, Jordan and the Palestinian Authority.[2]

However, despite the potential of this first round of discoveries, several obstacles emerged for their immediate managing, and reality soon replaced initial enthusiasm. If on the one side a never-ending debate in Israel over the management of resources and the regulation of gas exports resulted in more uncertainty and delays, in Cyprus the size of discoveries soon revealed the country couldn't become an energy hub.[3] In general however, these resources altogether were considered too modest to have a strong impact at the global level. Furthermore, as these gas fields sprawled across maritime borders and in a turbulent and problematic region, several security and political issues soon emerged, most of them still unsettled today.

This timeframe also coincides with turbulent times in Egypt, whose energy sector has undergone important changes and ceased to be a key destination for foreign direct investment. If by the early 2000s the country's gas production was exceeding the internal demand, exporting gas to Jordan and Israel via the Arab Gas Pipeline (AGP) and supplying the global gas markets through the LNG terminals of Idku and Damietta, the situation worsened

2 For a detailed overview of solutions initially considered by Israel and Cyprus please see: Ayla Gürel, "Eastern Mediterranean Gas: Source of Prosperity for the Region?", in Silvia Colombo, Mohamed El Harrak and Nicolò Sartori (eds), *The Future of Natural Gas. Markets and Geopolitics*, Hof van Twente, Lenthe/European Energy Review, May 2016, p. 131-135, https://www.iai.it/en/node/6340.

3 Simone Tagliapietra, "An Opportunity for Natural Gas in the Eastern Mediterranean", in *Financial Times*, 8 March 2019, http://bruegel.org/2019/03/an-opportunity-for-natural-gas-in-the-eastern-mediterranean.

at the end of the decade. From 2010 Egypt's natural gas production started declining in parallel with investments in its energy sector, resulting in exports progressively falling to meet the rising national demand. The situation has worsened with the Arab Spring uprising; the Egyptian energy sector has suffered from lower foreign direct investment, ultimately impacting its powerful role in the region, its energy-intensive economy and its citizens.

The second chapter of the energy saga in the Eastern Mediterranean starts with a turnabout for Egypt, whose waters were found to be incredibly rich in resources, and significant findings in Cyprus also emerged. In summer 2015 Eni discovered the Nooros gas field offshore the Nile Delta, Egypt, followed shortly after by the detection of Zohr, a supergiant gas field found in the Shorouk block, about 190 km north of Port Said, Egypt. A few years later, in 2018, Eni and Total discovered Calypso offshore Cyprus, doubling the country's estimated offshore resources, while in February 2019 Exxon declared together with partner Qatar Petroleum the finding of "Glaucus" in block 10, adjacent to Zohr. In March, Eni announced a new gas discovery under evaluation in the Nour exploration prospect, Egypt. Along with the discovery of Zohr, Eni and BP have found other relevant gas resources in the Baltim offshore field.

Zohr is the biggest field in the Mediterranean with estimated reserves of 850 bcm of gas. Calypso, in Cypriot waters, contains an estimated 200 bcm of gas, while Glaucus has estimated in-place gas resources in the reservoir at between 142 and 227 bcm. The game-changer Zohr and this second phase of discoveries in general, represented the consolidation of the region's potential, to the point that the United States Geological Survey estimated that enough gas could potentially be found in the Eastern Mediterranean to meet both regional and European power demand for decades.[4]

This potential also encouraged Europe's attempts to diversify its energy imports portfolio and find alternative gas suppliers, as the continent heavily depends on Russia. The rationale for a stronger Euro-Med cooperation over gas is evident, considering both sides' interests and strategies. Security of supply and decarbonisation policies are the two main pillars of Brussels' energy and climate strategy, and the East Med countries' interest and disposition to export their resources tie into the European vision by pushing these two priorities further, obviously in combination with renewables (RES) and with the longer-term objective of phasing out hydrocarbons completely. As domestic gas production in the EU is slowly declining but capacity to receive LNG is in place, the East Med definitely seems a good option in the medium term.

However, this European ambition is not necessarily as easily attainable as it would seem, as dynamics in the MENA area portray an energy-intensive future for most countries. The growing population trends and energy needs in the East Med will indeed oblige the region – and Egypt in particular – to devote a large share of these recently found resources to their own consumption.

This renewed interest in the region translated into a number of concrete initiatives and into several pieces of the puzzle being slowly sorted out through political agreements and investment needs, not least a stronger confidence in the economies. In December 2018, Italy, Greece, Cyprus and Israel signed a memorandum of understanding for the construction of the EastMed gas pipeline, a project that – without further big gas discoveries in the area – many analysts consider probably too complex and expensive. At present the Italian government seems to be reconsidering its support for the project, putting under question the feasibility of the initiative.[5] This, even though the plan received the blessing of the EU, which has approved significant Connecting Europe Facility grants and conceded Projects of Common Interest status to both the East Med Pipeline and another project in Cyprus, the CyprusGas2EU LNG terminal.

Among institutional initiatives, the Eastern Mediterranean Gas Forum (EMGF) held in Cairo in early 2019 is the most relevant, as it clearly aimed at setting up a regional gas market to allow its members to tap their resources and the region to become an exporting hub towards Europe, by cutting infrastructure costs and offering competitive prices. Other than Egypt, participants included Cyprus, Greece, Italy, Israel, Jordan, as well as the economic advisor of the President of the Palestinian National Authority. The EMGF is generally considered good news for companies operating in the area; however several regional powers were left outside discussions – both Lebanon and Syria but first and foremost Turkey.

2. Main geopolitical and industrial obstacles

Despite the significant hydrocarbon resources located in its waters, the presence of energy majors investing in the area, and the political commitment of global players such as the US, the EU and Russia, the transformation of the East Med into a world-class export region still lags behind.

Geopolitics is still the main obstacle to secure a fast energy development in the region, as demonstrated by the recent events that occurred around the island of Cyprus. The uncertainty over the boundaries of the territorial waters of the two entities – formally in conflict

4 Clifford Krauss and Declan Walsh, "Egypt Looks to Offshore Gas Field for Growth and Influence", in *The New York Times*, 11 March 2019, https://www.nytimes.com/2019/03/11/business/energy-environment/egypt-gas.html.

5 Marco Bresolin, "Rome Hits Pause on East Med Gas Pipeline", in *La Stampa*, 6 March 2019. https://www.lastampa.it/esteri/la-stampa-in-english/2019/03/06/news/rome-hits-pause-on-east-med-gas-pipeline-1.33685654.

– governing the island has a negative impact on the business environment, affecting the willingness of industrial actors to commit themselves and heavily invest in exploration and production activity. The presence of Turkey, key geopolitical player in the region and guarantor of the government of the Turkish Republic of Northern Cyprus (TRNC), further complicates the situation. Ankara not only supports the territorial claims of the TRNC, it has its own national agenda when it comes to delimitation of its EEZ in the East Med and the subsequent right to exploit the energy resources located therein.

Indeed, in the last few years this situation has led to an escalation of aggressive initiatives in the area. Starting with the blocking of Eni's SAIPEM 12000 exploration ship by Turkish navy intervention in February 2018, and the exploration activities commenced by the Turkish drilling vessel Fatih, which in May 2019 launched offshore operations in waters claimed by the Republic of Cyprus (RoC) as under its sovereignty. The aggressiveness of Ankara in the area has reached levels that are unprecedented in recent years, and the reaction of the RoC, closely backed by Greece, hit a historical high as well. Despite the EU's calls to cease its illegal activities in the area, Turkey continued its drilling operations within Cypriot territorial waters. For this reason, the Council recently took a strong position: for the time being it decided to suspend negotiations on the Comprehensive Air Transport Agreement, not to hold the Association Council and further meetings of the EU–Turkey high-level dialogues and to endorse a proposal to reduce the pre-accession assistance to Turkey for 2020. EU foreign ministers also invited the European Investment Bank to review its lending activities in Turkey.[6] Similarly, also the US State Department expressed its deep concern about the Turkish drilling operations.

Although tensions around the island of Cyprus represent the most powerful driver of instability in the region, other geopolitical factors have an impact on the pace and the efficacy of energy developments in the East Med. First, the evolving relations in the triangle formed by Turkey, Israel and Egypt, the three key geopolitical players in the area. While political tensions between Cairo and Tel Aviv have progressively decreased leading to a number of agreements in the energy domain (last, but not least, the 500 million dollar deal to end the gas dispute that has been going on since 2012), the isolation of Turkey vis-à-vis both Egypt and Israel *de facto* limits the export option (and to a certain extent development) for local gas resources. Second is the longstanding territorial disputes between Israel and Lebanon, and more in general the status of the relations between Beirut and Tel Aviv; as a case in point, Hezbollah – which claims ownership of the deposits of the Israeli field Leviathan – repeatedly threatened to attack Israeli platforms in the event of interference with Lebanese exploration activities.[7] Third is Israel's relation with Gaza, affecting both the pace of Israeli offshore production (frozen and recovered several times due to security reasons) and the possibility for the authority governing the Palestinian enclave to develop its own gas resources.

In addition to political uncertainty and growing conflict, evolving trends in the global gas and LNG market contribute to complicating the East Med energy picture. In light of a modest growth in gas demand at the global level, the strong competition from new LNG projects emerging in North America, Qatar, Africa, Australia and Russia represents a potential obstacle to the full development of resources in the East Med, in particular in those countries where markets are not completely mature and export options and infrastructure are still lacking. This situation is further endangered by the level of spot LNG prices, for which the longer term forecasts have confirmed a return to about 8 dollars per million British thermal units (mmBtu) in Japan and 6 dollars/mmBtu in north-western Europe. East Med gas will have to compete with these values to secure export markets. These evolutions in the gas market create additional obstacles to the effective marketability of this gas. What's more, competition is to be considered not only at the global level, but within the East Med region as well, as all main countries involved have their own interests when it comes to gas, starting with Israel, Egypt and Cyprus.

3. Options to transform the resource rich-area into an export region

In this framework, the energy game in the East Med is experiencing a significant shift in terms of balance of power, with Egypt assuming a leading role as catalyser of regional efforts to produce and export hydrocarbon resources. Thanks to (a) the large resources discovered primarily in Zohr and in other gas fields, (b) its longstanding tradition as hydrocarbon producer and exporter, (c) a number of key energy infrastructure available and (d) an expanding domestic market that would be able to absorb a large part of national gas production, Cairo is well placed to act as the industrial cornerstone and possible political federator of cooperative initiatives in the region.

Not by chance, the abovementioned EMGF is based in the Egyptian capital, providing a platform for the enhancement of multilateral gas dialogue in the East Med. Egypt has increased its production up to 30 percent since 2016, in particular a consequence of the output

6 Council of the European Union, *Turkish Drilling Activities in the Eastern Mediterranean: Council Adopts Conclusions*, 15 July 2019, https://europa.eu/!bK63GV.

7 Israel and Lebanon still claim more than 800 square km of disputed waters, but recently agreed to talk under the watch of UNIFIL.

from Zohr, which has exceptionally come into production in less than two years since its discovery thanks to an impressive industrial schedule. The new resources not only contribute to satisfying the expanding Egyptian gas demand, they also help the country to regain its gas exporter status. By the end of 2018, indeed, Egypt became self-sufficient in natural gas and recommenced exporting LNG volumes – 20 tonnes per day – on the global markets through the Idku terminal.

Despite the initial scepticism of both Cyprus and Israel after the discovery of Zohr,[8] the reinforced position of Egypt in the region therefore represents a positive factor for the transformation of the East Med into a gas-exporting region. On the one hand, it has demonstrated its capacity to establish political cooperation by signing maritime demarcation agreements with regional partners, in order to speed up oil and gas exploration and production activities in the area. On the other hand, it holds the only two significant export terminals in the area, which might be easily interconnected and used by other regional producers (i.e., Israel and Cyprus) to evacuate gas molecules produced in their territorial waters.

The consolidation of the southern flank of the East Med is accompanied by a situation of persisting fluidity in other parts of the region. Despite some signs of reconciliation – i.e., the renegotiation of contracts for exploration of Aphrodite in Cyprus, with the involvement of the Israeli Delek, and the increasing optimism of international companies around gas developments in Lebanon – the misalignment of Turkey still represents a major constraint to gas exploration and production expansion in the area.

Possible options to take into consideration:

• Fostering further exploration and production activities and investments in the East Med area, including in Lebanon, in order to verify the real potential for development and domestic demand/surplus supply for export. The creation of ad hoc financial guarantees and facilities (i.e., in the framework of the EMGF) should be considered as an option to support and encourage international private investment in the East Med gas sector.

• Progressively engaging Turkey by promoting its participation within the institutional framework of the EMGF and by fostering a more effective cooperation through the inclusion of Ankara in the dialogue. Promoting convergence, rather than isolation, on a common agenda for the region to make the forum impactful.

• Working for the creation of a regional gas market to respond with gas (and RES) to local-driven demand in all countries where gas does not yet play a major role in the mix, by creating a positive narrative at the local level. The current debate appears too much export-focused, while these resources also appear crucial for the local benefit. A gas transition would be functional for phasing out the more polluting coal and oil capacities (generating around 90 GW of electricity around the region) and speeding up a more sustainable gas plus RES mix in the medium term.

• In particular, (a) sustaining the gasification of the island of Cyprus into a single gas market in order to respond to demand with cheap, local and less polluting sources, also a tool for the country's decarbonisation objectives; and (b) Promoting a wider access to gas resources to the large Turkish market, where the economy, population and energy demand trends are growing and will continue to do so in the upcoming years. Turkey remains the largest gas market in the area besides being an important (and cheap) route to export resources. What's more, the country produced 37 percent of its electricity with coal in 2018 and has increasingly put a large emphasis on expanding its capacity by exploiting domestic coal and lignite reserves. To counteract these plans and replace 15 GW of coal with more sustainable resources, attention should be placed on a stronger gas and RES collaboration (the country has one of the largest RES potentials at the regional level), and in this sense access to East Med resources should be evaluated (and possibly encouraged).

8 Both Tel Aviv and Nicosia considered Egypt, given its booming domestic demand, as a potential importer of their gas.