ENERGY IN THE EASTERN MEDITERRANEAN: PROMISE OR PERIL?

EGMONT PAPER 65

ENERGY IN THE EASTERN MEDITERRANEAN: PROMISE OR PERIL?

Joint Report by the Egmont Institute and the Atlantic Council

Sami ANDOURA and David KORANYI (EDS.)

Belgian Federal Public Service (FPS) Foreign Affairs,
Foreign Trade and Development Cooperation

May 2014

ACADEMIA PRESS

The Egmont Papers are published by Academia Press for Egmont – The Royal Institute for International Relations. Founded in 1947 by eminent Belgian political leaders, Egmont is an independent think-tank based in Brussels. Its interdisciplinary research is conducted in a spirit of total academic freedom. A platform of quality information, a forum for debate and analysis, a melting pot of ideas in the field of international politics, Egmont's ambition – through its publications, seminars and recommendations – is to make a useful contribution to the decision-making process.

✧ ✧ ✧

✧ ✧ ✧

Egmont – The Royal Institute for International Relations
Address Naamsestraat / Rue de Namur 69, 1000 Brussels, Belgium
Phone 00-32-(0)2.223.41.14
Fax 00-32-(0)2.223.41.16
E-mail info@egmontinstitute.be
Website www.egmontinstitute.be

Lay-out: proxessmaes.be

ISBN 978 90 382 2376 6
D/2014/4804/162
U 2237
NUR1 754

Table of Contents

INTRODUCTION: ENERGY IN THE EASTERN MEDITERRANEAN – PROMISE OR PERIL?

SAMI ANDOURA AND DAVID KORANYI[1]

A candid dialogue on developing the hydrocarbon resources in the Eastern Mediterranean

In order to address the different challenges and opportunities on energy cooperation in the Eastern Mediterranean Region and Levant Basin, EGMONT – The Royal Institute for International Relations of Belgium – together with the Atlantic Council, and supported by H. E. Belgian Minister for Foreign Affairs Didier Reynders, opened an expert dialogue in 2013 in order to look at how the management of the new energy resources could act as a vector of cooperation instead of conflict between the concerned countries.

The activities have targeted finding new possibilities for cooperation on political and security challenges, energy infrastructure development, the regulatory and legal framework, environmental concerns, and bilateral and regional structures, in a manner that enhances stability and security in the region, increases European energy security, contributes to rather than hinders a comprehensive Cyprus settlement, and promotes wider regional cooperation.

The Egmont Institute and the Atlantic Council have brought together an influential constituency of experts, private-sector stakeholders, and government officials from the region, as well as from the European Union and the United States, with the aim to facilitate a candid dialogue on developing the hydrocarbon resources in the Eastern Mediterranean. The discussions were conducted under Chatham House Rule.

Our goal has been to ensure that these energy resources will not become a new source of tensions but will instead be used to open channels of communication and devise mutually beneficial mechanisms to make certain that the hydrocarbon finds are exploited in a way that takes into account political and economic realities as well as global and regional energy market developments, and that it will enrich all affected communities. The project was a sustained effort to contribute to solving the complicated regional puzzle and address problems by devising expert solutions and building trust. Our aim was to build an enduring regional community of experts, policymakers, and businesses with a vision and dedication toward finding solutions

[1] Professor Sami Andoura is a senior research fellow at the Egmont Institute and at the Jacques Delors Institute, and is the Holder of the Chair of European Energy Policy of the College of Europe. David Koranyi is the acting director of the Atlantic Council's Dinu Patriciu Eurasia Center.

to resource development challenges in a politically and commercially sustainable way.

We identified four key areas where fresh ideas and thinking outside of the box are necessary going forward:

1. How to address the conflicts between Cyprus and Turkey and Lebanon and Israel over their exclusive economic zone;
2. How to build confidence over energy issues in the context of the Cyprus settlement;
3. How to frame and develop the necessary cross-border energy infrastructures between Cyprus, Turkey, and Israel; and
4. How to devise mutually beneficial regulatory frameworks for investments and environmental protection in the region.

At three 2013 workshops – two held in Brussels (April and November) and one held in Rome (June) – participants discussed key regional energy challenges that include maritime border delimitation, cooperation on infrastructure development, export routes and technology transfer, as well as concrete proposals developed by the participants themselves. The workshop in Brussels in early November was followed by a high-level meeting organized by Egmont under the patronage and with the participation of the Belgian deputy prime minister, minister of foreign affairs, foreign trade and European affairs, Mr. Didier Reynders.

The aim of this publication is to give an overview of the main issues discussed within the project and the process itself (introduction), as well as to publish some of the contributions from the group's experts that were discussed at this occasion. All authors express their own views.

Identifying the potential for cooperation

These new resources represent a huge potential for the region in terms of its own development, namely: energy independence, which has geostrategic implications; huge savings made by the domestic use of gas in place of oil in the power sector; economic growth; social development; and so on. And this happens in a region with both fast-growing population and energy needs.

Because it is a complex puzzle of connected issues, there is clearly a need for cooperation between the countries involved. The example of the energy infrastructures necessary to develop, transport, and, to a certain extent, export the energy resources – some of them being cross-border – is particularly relevant.

Our discussions mainly focused on both the existing energy infrastructure and corridors in the region (such as the Suez Canal, the Arab Gas Pipeline, etc.) and the various potential corridors for the transportation of resources (such as, among others, an

Israel liquefied natural gas [LNG] or floating liquefied natural gas [FLNG] terminal, an Israel-Turkey pipeline, Egypt-Israel LNG sharing, Israel-Jordan pipeline, a Cyprus LNG terminal, pipelines between Israel and Cyprus), along with their political and commercial advantages and disadvantages.

Each option faces several technical, administrative, commercial, security, legal, and political challenges that have to be overcome. Although all options on the table are technically feasible, the costs involved, the complexity of negotiating the necessary deals, as well as overcoming political barriers, pose serious obstacles to the development of the discovered gas resources.

In this context, we find a complex set of actors involved: national/international, public/private. The role of foreign companies is key. These countries can become gas exporters if and only if oil and gas companies convert discovered reserves into production capacity. Companies will carry on costly exploration and field development activities if they see the ability to commercialize their discoveries with a favorable rate of return. Much will depend on the gas price the companies will receive in selling natural gas to the domestic market; the availability of export options and transport means; and the stability in the countries' regulatory, fiscal, and gas policies, as well as in their political atmosphere, etc.

Beyond cooperation, the responsibility for the development of these resources lies in each single country separately – and none of the countries involved so far have demonstrated a solid framework in all of these issues.

Main preconditions to be addressed

Political and regulatory stability

There is a strong need for all of the countries involved – with many of them not having real experience in the field of energy exploration and exploitation – to build the proper administrative and regulatory framework for these activities to take place, and also to attract investors and international companies. The European Union and the United States to a certain extent could play a potential role in helping to create integrated gas and electricity markets around the Mediterranean.

Environment seems to be another potential area of cooperation. A dialogue process on monitoring and crisis management regarding increasing hydrocarbon developments could be established, with wider regional implications. With its already-existing environmental regulation procedures and mechanisms, the European Union could play a leadership role in convincing the parties to take constructive steps in setting the right regulations and standards for the protection of the environment.

A stable and predictable framework also implies being able to address the bilateral conflicts regarding the ownership of resources and the demarcation of maritime

borders through the exclusive economic zone (EEZ) for Cyprus, Turkey, Lebanon, and Israel – one of the most pressing challenges. They are interlinked, to a certain extent. For instance, the lack of settlement on the Cyprus issue and between Turkey and Cyprus might create problems for the other players, too (an Israeli-Turkish gas pipeline will need to go through the EEZ of the Republic of Cyprus, and thus require its consent).

The group also intensely debated the question of so-called "peace pipelines." Experience of conflicts in the region casts doubt on the idea that cooperation in such complicated issues as natural resources will ever produce peace agreements. In fact, it seems to be the other way around. Peace agreements should ideally precede cooperation on natural resources.

Political stability also implies that governments have a long-term vision on how to make best use of the discovered gas and the money that will flow from its exploitation. In terms of governance of the resources, it will not be easy to strike a balance between competitiveness, which mainly concerns industry; affordability, which is the primary issue with consumers; security of supply, which is a headache for governments; and the environmental issues, that governments, citizens, and the industry must deal with.

Regarding the question of acceptance of these projects by local populations: Citizens will have to be included in the process, and also be able to see direct benefits for them.

Export policies and pricing

Many questions are related to the balance to be found between domestic use and export of the new energy resources. Export of gas rather than its domestic use is the inevitable driver for the development of these gas resources. Export revenues will be needed in order to make the entire projects economically viable, and thus also to secure domestic use.

Then comes the question about the future export markets: Will it be Asia, the region itself, Turkey, the European Union? The margin of profits and energy prices lies at the heart of these decisions. But there are other parameters to take into account, as well, such as the costs and feasibility of infrastructures.

Some countries might prefer multiple gas export possibilities, which is reflected in discussions over LNG or pipeline, or both. The aim of the countries concerned is to mitigate at best the risk of any one country suspending exports for political or other reasons, and to maximize commercial leverage to secure the highest prices for sales of their gas.

Conclusion: Timing is crucial

In general, all of these activities take place in a fast-changing energy landscape, but the political arena also experiences sudden changes; taken together, all of these factors impact these projects in one way or another. There are also considerable resource risks: Only a few of these reserves are proven, so the possibility of future surprises is still there. Moreover, initial conditions and early decisions on production and export infrastructure in some countries might affect later developments in other countries. For instance, the decisions made by Israel and Cyprus today might affect later decisions to be taken on by Lebanon and others.

On all of these fronts, all countries are not moving at the same pace. Some are much more advanced (Israel) than others (Cyprus, etc.), while others even face the risk of regressing (as in the case of Egypt). This makes it ultimately very difficult to have a clear story line and horizon for the development of these energy resources. There is therefore a need to constantly adapt and update our analysis in this fast-changing context.

The year 2014 will be a critical one for hydrocarbon development in the Eastern Mediterranean. The Israeli government will in all likelihood make critical decisions related to exporting natural gas from their country by the end of the year, which will enable private companies to proceed with the preparation of infrastructure investment decisions. This will have important repercussions on Israeli relations with Cyprus, Turkey, Jordan, Lebanon, and the Palestinian Authority. The revived Cyprus settlement negotiations will arrive at a critical phase. Turkey is entering into a prolonged fifteen-month election cycle that could fundamentally affect its choices. The Syrian civil war will continue to act as a destabilizing factor in the region, not least in Lebanon and Iraq, with direct and indirect implications to East Med energy developments.

The Egmont Institute and the Atlantic Council will continue to address these issues and conduct an ongoing dialogue in an effort to mitigate tensions and to facilitate the emergence of collaborative schemes in developing the Eastern Mediterranean's hydrocarbon riches.

THE EAST MEDITERRANEAN: THE MIDDLE EAST'S LAST HYDROCARBON FRONTIER

LAURA EL-KATIRI AND BASSAM FATTOUH[1]

The East Mediterranean is in the midst of a significant energy revolution. Sizable discoveries of over 35 trillion cubic feet (tcf) of natural gas off the shores of Israel and Cyprus have since 2009 turned the region's fate of being a long-term energy importer, reliant on neighboring Arab and Russian suppliers, into prospective net exporters. US Geological Survey estimates suggest a further 85 tcf could yet be discovered within the Levant Basin, the stretch of land and sea that ranges from Syria and Lebanon in the north down to the coast of Israel and the Palestinian territories in the south. The East Mediterranean gas discoveries therefore not only mark the emergence of a new regional gas province, but they also signify the fall of one of the last hydrocarbon frontiers in the Middle East.

The significance of these gas discoveries extends beyond their use for Israel's and Cyprus's domestic energy sectors. Their export value attracts the attention of a range of interested potential stakeholders, including those markets that could benefit from importing East Mediterranean gas, including close-by neighbor Europe. However, the real value of East Mediterranean gas, both in economic and in wider geostrategic terms, lies indeed in its regional use. Neighboring Israel and Cyprus are in a region defined as much by long-standing political conflict as it is by economic difficulty, in which low-cost, regional gas supplies could play a strategic role. East Mediterranean gas offers a rare opportunity for the region to reengage in mutually beneficial trade relations that could underpin greater economic and political stability in one of the most politically volatile regions in the world.

Exploration success with some future prospects

The East Mediterranean gas discoveries since 2009 and after were not the first offshore exploratory successes in the Levant Basin. Gas was discovered in 1999 and 2000 at Israel's offshore Noa and Mari-B fields, as well as in offshore Gaza; granted, these first discoveries were small, and triggered little of the notable attention the region has received more recently. The region's first offshore discoveries were as much the result of economic stubbornness as they were of politically conceived

[1] Dr. Laura El-Katiri is a research fellow at Oxford Institute for Energy Studies, Oxford, UK. Dr. Bassam Fattouh is the director at the Oxford Institute for Energy Studies, Oxford, UK. The authors published a study with Hakim Darbouche under the title "East Mediterranean Gas: What Kind of Game-Changer?," Oxford Institute for Energy Studies, December 2012, available on the Institute's website. A previous version of this article was published in the Oxford Energy Forum, No. 93, October 2013.

economic need. Israel's historical political and economic isolation among its Arab neighbors has motivated the country's on- and offshore exploration efforts for decades, with the strategic aim to reduce its import dependence for energy reaching back as early as the 1970s.

While Mari-B provided Israel with small volumes of domestically produced gas for a limited period of time, subsequent years saw disappointing exploration results, reinforcing both Israel's and the wider region's expectations of remaining reliant on energy imports for the foreseeable future. Eventually, new gas was discovered in 2009, again in Israeli waters, and this time the discoveries were large, amounting to some 10 tcf, mostly located in Tamar, followed by the 2010 landmark discovery of the giant Leviathan field, with up to 20 tcf. Israel's offshore success was subsequently mirrored by Cypriot discoveries of up to 7 tcf of offshore gas resources in its south-eastern-located Block 12 in the Aphrodite play, close to Israel's Leviathan discovery. Further exploration work is under way, with Cyprus having tendered out five more blocks adjacent to the Aphrodite play in hopes of further raising the island state's recoverable resource estimates.

With proven reserves of some 9.4 tcf by the end of 2012, and an estimate of up to 40 tcf of currently known offshore gas resources, Israel now holds resources large enough to supply its domestic market for several decades, and to allow for exports. Cyprus's small domestic market similarly allows for surplus gas to be exported, opening up the opportunity of post-2020 gas export revenues, in addition to savings made by the domestic use of its offshore gas resources in place of oil in the power sector. Israel's offshore reserves place the country into the ironic position of overtaking all of its direct Arab neighbors, including Syria, in the size of its natural gas reserves, offering at present the Levant region's only immediately available potential export volumes of natural gas.

Lebanon and Syria, too, offer promising prospects for offshore hydrocarbon deposits, following initial seismic work, and hold high-end interest in both developing and future offshore discoveries. Both countries' complicated domestic political scene – characterized by quasi-permanent parliamentary stalemate in Lebanon and an escalating civil war in Syria, since 2011 – have preempted the two Arab neighbors' own plans for the exploration of their share of the East Mediterranean sea. And while Lebanon seems by now set to move ahead with a first offshore licensing round this year, the chaos in Syria will likely keep its offshore area off the regional hydrocarbon map for the foreseeable future.

Economically well-timed discoveries …

The East Mediterranean discoveries since 2009 have arguably come at exactly the right time. The Middle East and North Africa as a region has experienced tremendous growth in domestic energy demand for the past decade, a rising share of which is

supplied by diminishing natural gas supplies. Regional gas reserves are highly concentrated in a few large gas producers, principally Iran, Qatar, and, to a lesser extent, Saudi Arabia. Among these, Qatar is currently the only stable gas exporter, albeit primarily in the form of flexible yet expensive LNG.

The Levantine economies – generally less well endowed in hydrocarbon wealth than the oil-rich Gulf states, and parts of North Africa – have for most of their histories been import-dependent for the majority of their energy needs. Excluding Syria, this has been true not only for Israel, Lebanon, and Cyprus, but also for Jordan and, most recently, Egypt. Egypt's case most drastically illustrates some of the things that have gone decisively wrong in the region for most of the past twenty years: surging domestic demand – driven by population growth, rising living standards, energy-intensive industrialization policies, and a domestic energy price environment which endemically undervalues energy down to a fraction of average energy costs anywhere else in the world. This has crippled Egypt's gas export capacity in the last few years.

Having famously canceled its existing gas supply contract with Israel in April 2012, the Egyptian government has since struggled to fulfill its gas supply contract with Jordan, which has been recurrently interrupted by political turmoil and sabotage. Both Jordan, whose power sector is more than 80 percent dependent on Egyptian gas, and Lebanon, which must rely on oil for power generation, are arguably in a gas crisis. So is Egypt, whose current domestic situation is not only shaped by continued political turmoil and dysfunctional governing institutions, but also by insurmountable budgetary pressure, and continued fuel shortages and electricity blackouts.

… But it's the politics, stupid

Syria and Lebanon's domestic predicament with regard to its lagging exploration progress, and Egypt's current gas crisis, gives us a taste of what sort of dynamics are likely to drive the direction of East Mediterranean gas development. East Mediterranean gas could play an economically sound and mutually beneficial role in the Levant's current energy-related economic predicament: Israeli gas – and perhaps gas from Cyprus, as well – could supply gas-short neighbors through existing and expanded gas pipeline infrastructure. Israel's most immediate neighbors, the Palestinians, are already set to benefit from gas, albeit supplied from Israeli offshore fields. Egypt's government, with idle LNG facilities and unfulfilled export contracts on the one hand, opposed deeply to trade with Israel on ideological grounds on the other, faces an economy in disarray and, commercially speaking, could benefit significantly from an Israeli-Egyptian gas-linked entente.

Cyprus, which is divided between Greek and Turkish communities, faces controversy centered around its gas development plans. Territorial water delimitations claimed

by the Turkish Republic of Northern Cyprus (TRNC) overlap with the Republic of Cyprus's offshore blocks. Turkish claims also overlap with Cyprus's EEZ in the south-western part of the island, a factor which has been blamed for the continued negotiations over Cypriot Blocks 5 and 6, for which bids have been received.

In spite of these political barriers, Turkey could yet offer a geographically close and economically logical export market for Cypriot gas. This would diminish Turkey's need for higher-cost Russian gas imports and the political controversy associated with Turkish alternatives to Russian gas, including Iranian and Kurdish gas from northern Iraq, and could potentially contribute to Turkey's intended role as energy hub for Eastern, not Russia-based, gas deliveries toward Europe. The absence of a settlement of the Cyprus problem renders this option highly unlikely in the near future, at the cost also of the northern Cypriot community, which would significantly benefit from a reconciliation with the Greek Cypriots in the south.

Turkish claims to defend northern Cypriot interests in the offshore Mediterranean have since been met by yet more saber rattling on the other side of the coastline between Israel and Lebanon, which also share disputed land and maritime boundaries. Egypt, too, is looking to reassess its offshore claims toward the East – toward what would be Palestinian waters, albeit under de facto Israeli administration. Palestinian interests in the offshore Mediterranean have perhaps been most overlooked in recent years. Offshore Gaza offers two known plays sizable enough for commercial development, yet deadlock between the Israeli government – keen to prevent any direct gas development revenue stream to Hamas – and shareholders kept the discoveries from being developed.

Uncertain outcome

Geostrategic interests in the East Mediterranean are yet to shape the direction that gas development takes. More than impacting the current development and future gas export volumes – which remain a separate, domestic policy issue in both Israel and Cyprus – regional politics will most likely prove critical in determining the extent to which East Mediterranean gas will benefit the region, or only its immediate resource holders, and where East Mediterranean gas will eventually flow. While regional options are attractive for economic and political reasons for Israel and Cyprus, political barriers to greater regional gas trade leave both countries looking at other export options.

Cyprus, with limited pipeline options, has already decided to prioritize LNG exports. The expected size of initial Cypriot exports with some estimated 5 million tons per annum makes the country an unlikely second Mozambique or Tanzania, but will eventually generate badly needed funds for the country, whose public finances are struggling under the terms of a multilateral bailout. By contrast, Israel – an island

politically if not geographically – offers feasible regional options. In June 2013, Israel removed the last remaining hurdle for gas exports by approving the export of 20 bcm of Israeli gas. Still, all of Israel's domestic battles have yet to be fought, and it may eventually agree to a joint LNG project in Cyprus, a pragmatic option in a region so deeply divided by politics.

Regardless of the many other challenges involved in bringing the region's gas to market – including the not yet fully resolved question of the size and nature of export; fiscal and regulatory regimes that are a work in progress; and the eventual confirmation of technically recoverable reserves – the offshore gas discoveries made since 2009 have tremendously changed the regional energy power balance in the East Mediterranean. Being the latest, and possibly last, gas frontier in the Middle East, the area is of no less consequence for world gas markets than East Africa and the Caspian. Unprecedentedly, natural gas has the potential to change the East Mediterranean's energy landscape forever.

THE EASTERN MEDITERRANEAN ENERGY CONUNDRUM: OPTIONS AND CHALLENGES

JOHN ROBERTS[1]

The Eastern Mediterranean holds great promise for hydrocarbon riches, but there are considerable problems concerning just how that promise might be delivered. It is primarily a gas-rich area, and gas is usually much more complicated to develop than oil, not least because the costs of getting a unit of energy to market in the form of gas are roughly twice those for oil.

Moreover, the Eastern Mediterranean poses a host of trans-boundary problems in terms of getting its output to market, exacerbated by the different stages of development in the region. So, while Israel has already discovered major commercial quantities of gas, Cyprus is only just at the beginning of what it hopes will be a new gas era; it has found some gas, but not enough, as yet, to secure financing for its plans to build a national, and perhaps regional, facility to produce liquefied natural gas (LNG).

The issues concerning practical development of Eastern Mediterranean hydrocarbons essentially comprises three elements: the resource base, the prospective timing for development of these resources, and the various destinations to which these resources might be sent. This last issue, of course, embraces the complex matter of which markets should be served, as well as the transportation systems required to reach those markets.

In general, the resource base can be considered as reasonably well-established already, with considerable prospects for the discovery of further hydrocarbons, with Cyprus and, perhaps, Lebanon joining Israel as owners of commercially viable offshore reservoirs. But while Israel already has one major field, Tamar, in production, and an even bigger field, Leviathan, in preparation for full field development, Cyprus has a major issue to resolve: Its sole discovery to date, Aphrodite, is currently insufficient to justify a major export-oriented project. And Lebanon has yet to even implement its current offshore block award program.

As for the final element, the immediate issue is commonly viewed in terms of whether Israeli gas might be piped to Turkey via a subsea pipeline across or around Cyprus, or whether it might opt for an LNG facility. If it were to choose LNG, then this raises a host of further questions concerning just where such a facility might be

[1] John Roberts is a non-resident senior fellow at the Atlantic Council's Dinu Patriciu Eurasia Center.

located: onshore in Israel, onshore in Cyprus, or perhaps a floating facility in the Mediterranean itself.

Nor are these the only possibilities. There are those who favor a pipeline to Greece, and there are also proposals for a radical new form of export transportation using compressed natural gas.

In sum, both the pace and methods of development of this new hydrocarbons province remain uncertain; what is certain is that commercial imperatives will ensure that the energy riches of the Eastern Mediterranean will be developed. At present there is a window of opportunity which grants both the companies involved in actual field development and the governments seeking to develop national energy strategies the chance to decide just how far they wish to go in working cooperatively to develop the region's resources. In commercial terms, they are helped by the fact that some of the leading companies involved in developing Israel's offshore resources are also involved in the sole Cyprus discovery to date; in political terms, there is also the intriguing prospect that an approach to cooperative development of export routes might also contribute to movement to resolve the decades-old Cyprus dispute.

The resource base

As of late 2013, the Eastern Mediterranean's proven resource base consisted of the following main fields:

Israel

- Tamar, operated by Noble Energy with Delek and Avner. Reserves: 275 billion cubic meters (bcm). Field production started in March 2013, with a major offshore platform in place. By July 2013 Tamar was producing at a rate of 636 million cubic feet per day (mcf/d), the equivalent of 18 million cubic meters per day (bcm/d), and accounting for 94 percent of Israeli gas production.
- Leviathan, operated by Noble Energy with Delek and Avner. Reserves: 481-566 bcm. Planning is in progress to assess how best to develop the field. The type – and cost – of the development will depend on the export strategy adopted. The decision on whether Australia's Woodside will proceed with its option to take a 30 percent stake in the venture is specifically linked to agreement on export strategy.
- Tanin, Mari-B, Noa, Dalit, Dolphin, Shimshon. Total reserves: 114-127 bcm. Minor fields which may be developed as adjuncts to Tamar and Leviathan. In July 2013, the official best estimate for recoverable reserves at Tanin was 592 bcf (16.8 bcm), a fraction of the resource base of either Leviathan or Tamar, but enough to make it Israel's third biggest gas field (unless eclipsed by Karish).

- Karish, operated by Noble Energy. Discovered in May 2013. Estimated resource base (with further assessments required to translate these into reserves) c. 50 bcm. Its significance is that it lies close to, but does not appear to extend into, either Lebanon's undisputed exclusive economic zone (EEZ), or the sliver of water in which Israel and Lebanon have overlapping EEZ claims.

Cyprus

- Aphrodite, operated by Noble Energy. Reserve base: 102-170 bcm. Planning for development is under way, but is adversely impacted by the downward revision of reserves announced on October 3, 2013.

Palestine

- Gaza Marine, operated by BG Group. Reserves: c. 28 bcm. Discovered in 2000, but no development so far due to such issues as the Intifada and poor Israeli-Palestinian relations. BG officials visited Israel in September 2013 to assess whether field development might now become possible.

Eastern Mediterranean

- Total proven reserve base, as of November 2013: 1,000-1,206 bcm.

  However, additional resources are also likely to be found. In March 2010 the US Geological Survey estimated recoverable gas reserves in the Levant Basin (most of which lies within Israeli and Cypriot national or EEZ waters) at some 3.4 trillion cubic meters of gas. Major efforts are under way to discover further resources. Specific efforts include:

  Cyprus: The Cypriot authorities have so far defined thirteen exploration blocks located broadly alongside or near the southern coasts of the island, and thus under clear Republic of Cyprus control, and on the Cypriot side of maritime boundary lines agreed upon by Egypt, Israel, and Lebanon. Major companies involved include Total, Eni, and South Korea's Kogas. Charles Ellinas, the executive president of the Cyprus National Hydrocarbons Company (KRETYK), said in March 2013 that natural gas resources in the six offshore blocks already awarded could amount to 40 tcf (1.13 tcm), enough to allow for production of up to 30 million tonnes per year of LNG in the future.

  Israel: Ongoing exploration. The key issue is the development of Leviathan.

  Lebanon: In May 2013, Lebanon launched its first licensing round with fifty-two companies, including such giants as Shell, Total, ExxonMobil, and Chevron, reported to have expressed interest in Lebanese prospects. But lack of a properly

constituted government in Beirut, which was under caretaker administration for much of 2013 in the absence of a government able to secure a parliamentary majority, has delayed license awards. There are ten blocks for which licenses are available, and awards, delayed twice already, are currently supposed to be made in January 2014. In May 2013, Lebanese mineral resources minister Gebran Bassil declared that preliminary surveys show reserves of 30 tcf of natural gas in Lebanese waters. But this was based entirely on seismic studies conducted by Norway's Spectrum, and, in the absence of actual drilling, does not constitute a reliable basis for reserve projections.[2]

Palestine: In 2001 BG found the Gaza Marine field, 30 kilometers off the coast of the Palestinian Territories, with an estimated reserve base of 1 tcf (about 28 bcm). Initial development plans broke down over the price that Israel would pay for any gas not required by the Palestinian Authority. Renewed talks are currently under way, now that Israel, at least de facto, no longer requires surplus gas from non-Israeli sources.

Turkey (and TRNC): In April 2012, the state-owned Turkish Petroleum began exploratory drilling off the northern coast of Cyprus. This followed a September 2011 agreement between Ankara and the self-proclaimed TRNC concerning continental shelf delimitation, under which the TRNC granted Turkey permission to drill off all the island's coasts, including southern coastal areas controlled by the Republic of Cyprus. So far, however, Turkish companies have made no attempt to drill in such waters, although Ankara has dispatched its *Piri Reis* survey vessel into waters off coastal areas controlled by the Republic of Cyprus on various occasions.

Greece: The first data sets for seismic studies covering an arc of offshore Greek EEZ extending from south of Crete to the Ionian Sea were made available in July 2013. No figures for putative reserves have yet been made available, and it may be some months before evaluations can yield even tentative estimates. There does not appear to have been any seismic activity in the areas east of Crete extending toward the Cypriot EEZ.

Syria: Damascus has officially undertaken two bidding rounds for offshore licenses. The first, in 2007, did not result in the award of any blocks. The second, in March 2011, covered 9,038 square kilometers; bids were due by September 2011, but, because of the civil war, the process was not followed up.

[2] Gebran Bassil, address to Arab Economic Forum, Beirut, May 10, 2013.

Prospective timelines for development …

When Noble discovered the Aphrodite field in late 2011, it appeared quite reasonable to contemplate the possible development of the field in conjunction with the Israeli offshore fields, Tamar and Leviathan, being developed by Noble. There was a difference in scale, but there was – and still is – a reasonable prospect that there might well be further discoveries in Block 12, Noble's Cypriot concession. This encouraged both Cypriot leaders and Noble itself to consider the possible development of an LNG liquefaction complex at Vasilikos on the southern coast of Cyprus to serve Israeli as well as Cypriot fields. To this end, on June 26, 2013, Noble and Delek signed a memorandum of understanding with the Cypriot government to build an LNG facility at Vasilikos.

But the time frames for developing Cypriot and Israeli resources now seem out of sync. Tamar is already under development, and the Israelis, naturally enough, want to see Leviathan developed as quickly as possible, However, on October 3, 2013, the Cypriot government received some very bad news indeed: Noble had revised its previous estimate for the reserve base at Aphrodite, down from a mean of 198 bcm (its original December 2011 assessment) to just 141.5 bcm.[3]

… and their impact on LNG

This has profound implications for the timing of any liquefaction project at Vasilikos. Senior Cypriot officials have told the author they think that in practice, it is likely to lead to a two-year delay in developing the plant. Before the reserve revision, the Cypriot government was hoping that it would be able to negotiate a framework agreement for the Vasilikos LNG plant by the end of 2013; to complete heads of agreement with the various parties by the end of 2014; to secure a final investment decision in the third quarter of 2015; to start actual construction in 2016; to have gas delivered to Cyprus in the third quarter of 2018; and to have the first LNG export train operational in the third quarter of 2019.

But an LNG project is a complex business. The upfront costs in terms of site purchase, preparation, and infrastructure development, including loading facilities, ensure that the cost of building an initial LNG train is roughly double that of any subsequent train. Since it takes some 7 bcm of gas input to produce 5 mt (million tonnes) of gas output, the Cypriot authorities considered that their initial understanding that Aphrodite possessed 198 bcm was, broadly speaking, sufficient to feed the first train, which they hoped would come on-stream in late 2019, for the standard thirty-year cycle

[3] When it initially assessed Aphrodite's resources in December 2011, Noble Energy believed that the field probably possessed between 5 trillion cubic feet (tcf) and 8 tcf, "with a gross mean of 7 tcf." But in October 2013, it anticipated probable reserves of between 3.6 tcf to 6.0 tcf, "with a mean of approximately 5 tcf." Seven tcf is the equivalent of 198 bcm; 5 tcf equates to 141.5 bcm.

required to secure project financing. (In practice, of course, LNG trains may operate for much longer than this.) They would then rely on further discoveries in Cypriot waters and/or the provision of gas from Israeli fields to provide input for the all-important second train.

So in reducing the initial available Cypriot resource base to around 140 bcm (and it may be better to use an approximation, as prospective investors will now be looking much harder to see how Noble Energy further refines its Aphrodite figures), Aphrodite's operator has highlighted just how great is the disparity between what the Cyprus government would like to do and the indigenous resources available for transforming its dreams into reality.

Moreover, it is by no means clear that the Israelis – either in the form of the actual developers of the offshore fields, or as the government – are prepared to commit sufficient gas at this stage to justify the development of Vasilikos on anything like the timetable envisaged by Nicosia. And while it remains important to restate the key point that it is the same group of companies that is developing the major fields on both sides of the Israel-Cyprus EEZ boundary, it is also true that so far, no LNG plant has yet been developed that relies on feedstock from an external supplier; or, more to the point, no provider of gas has yet been willing to see its gas processed into LNG in a foreign country.

At present, it looks as if both the Israeli government and the field developers favor a twin-track approach that would envisage exporting some 8 to 13 bcm/y of gas by pipeline to Turkey, and a further 5 bcm/y processed as LNG at Vasilikos. This concept was discussed privately at a conference on Eastern Mediterranean energy at Paphos in early September, but at this stage, such figures should be considered as indicative of volumes that might be made available, rather than as specific proposals for actual project implementation.

Israeli volume available for export

The availability of Israeli gas for general export is, in the short run, constrained by the Israeli government's decision in July 2013 to retain some 540 bcm of proven reserves to cover anticipated domestic consumption over the next twenty-five years. This decision owed much to the fact that in 2012, Israel had expected gas to fuel as much as 40 percent of its power supply, only to discover that, as a result of persistent cutoffs in gas supplies from Egypt, there was only enough gas to account for 14 percent of its power generation. With Israeli electricity already close to 70 percent reliance on gas (largely as a result of Tamar coming online), a strong domestic focus is quite understandable.

In addition, there is also the strongly held view in some Israeli governmental circles that, in order to bolster relations with its immediate neighbors (in effect, to ensure a

degree of economic dependence on Israel), a portion of Israel's reserves should be used to provide around 2.5 to 3 bcm/y to regional markets in the Palestinian Territories and Jordan.

However, it should be noted that although Israeli accounts have reported that this meant Israel was seeking to retain more than 60 percent of the gas discovered in its Eastern Mediterranean fields for domestic use, such calculations were based on an assumption that the putative figure of 900 bcm for Israeli reserves used by the government's Tzemach Committee as the basis for its deliberations was no more than an assumption, albeit a reasonable one as of early to mid-2013. But, unlike Cyprus, and as the Karish discovery further demonstrated, Israeli reserves *do* show good prospects for continued expansion, while the commercial imperatives for getting an export project up and running will make it hard for Israeli lawmakers to secure legislation that limits the amount of gas that can be exported in any given year.

In general, it is far better to assume that while Israel will retain around 600 bcm for domestic use or supply to its immediate neighbors over a twenty-five-year time frame, this does not carry any automatic connotation that some 24 bcm have to be used at home in any given year, not least because actual current Israeli demand is running at about 7 bcm/y. By the time Israeli demand has risen to the average 21.6 bcm, envisaged by the government in setting its 540 bcm retention figure, actual reserves are likely to have grown sufficiently that there will be then, as now, far more gas potentially available for export than is required to meet domestic requirements, whether in terms of actual consumption or envisaged long-term energy security.

Export markets and the way they might be reached

Pipelines and the development of LNG facilities constitute the main contemporary systems for large-scale gas exports. The first is generally reckoned to be far more cost-efficient up to distances of around 2,000 nautical miles; the latter generally works better for longer distances.[4] But further elements also need to be considered. There is no single global gas market. And Europe – surrounded by gas producers in Russia, the Caspian, the Middle East, North Africa, and now North America – not only has some output in the North Sea, in increasingly interesting frontier areas off Norway, but also constitutes a massive import market that is becoming increasingly competitive.

In contrast, the Asia/Pacific region constitutes an even bigger import market – and one which is likely to grow both rapidly and steadily, as gas consumption increases in

[4] This generalization should not be regarded as absolute. Some LNG has worked profitably on shorter hauls, notably for Egyptian gas deliveries to Europe, while some pipelines carry gas for thousands of miles, albeit from fields commonly located far inland.

contrast to the somewhat hesitant growth prospects for European gas imports, which depend far more on Europe's declining indigenous gas production than on any anticipated growth in actual gas consumption.

Moreover, if Europe is to be regarded as the destination for Eastern Mediterranean gas, then the obvious initial market is Turkey, since Turkey is the one European country with a steadily increasing demand for gas that can – until or unless the Turks themselves make a major gas discovery in the Black Sea – only be fulfilled by imports. And while there are other prospective suppliers in the region, notably in Azerbaijan and northern Iraq, the proximity of the Eastern Mediterranean fields to Turkey provides an obvious commercial basis for developers to explore, to see just how their gas might be delivered to the most rapidly growing market in the region.

As for the Asia/Pacific markets, precisely because they are so far away from the bulk of their suppliers, by and large they have to be supplied by LNG. And the nature of the LNG trade is such that LNG facilities tend to be developed with firm arrangements already in place for the long-term supply of dedicated volumes of gas to designated customers, according to specific price formulas intended to secure both a return on the high cost of developing the initial LNG liquefaction, shipping, and regasification facilities, and to provide some kind of link to ensure that developers can profit from any subsequent, more-general increase in energy prices.

Theoretical pipeline options

In trying to reach Turkey by pipeline, prospective East Mediterranean developers will have to resolve a combination of political and boundary problems. The political issues relate to the ongoing Cyprus dispute; the boundary problems, to the fact that there is no direct pipeline route to Turkey from Israel's offshore EEZ that currently involves passage through waters that are either uncontested, or considered by Israel to be friendly to Israeli interests.

In theory, there are four prospective routes for delivery of gas from Leviathan to Turkey. These are:

1. Onshore through Lebanon and Syria. Even in the absence of a civil war in Syria, this is not a realistic prospect for Israeli-sourced gas.
2. Offshore through Lebanese and Syrian waters. This entails the same political/security constraints as above, and can thus be ruled out for the foreseeable future.
3. Through waters that constitute the EEZ of Cyprus. This is doable, so long as there is a Cyprus settlement. A variant on this would be through the Cypriot EEZ, then through Cyprus territorial waters and onshore, across the island itself, before heading offshore again for a connection from northern Cyprus to Turkey. Again, this requires the resolution of the Cyprus problem.

4. A maritime route to the west of Cyprus. This raises the vexing question: Who possesses the EEZs through which such a line would pass? Turkish opinion asserts that its EEZ shares a common boundary with Egypt's EEZ; Greek opinion states that its EEZ shares a common boundary with the Cypriot EEZ. These contradictory claims raise problems which almost certainly rule out the immediate consideration of a pipeline to connect Leviathan to Turkey by such a route. In addition, they raise issues concerning the somewhat long-term possibility of a pipeline to connect Aphrodite and any other Cypriot discoveries by pipeline to Greece.

The pipeline issue and the Cyprus dispute

In considering the transit of pipelines through the EEZs of Eastern Mediterranean states, the main point is simply that although the owners of an EEZ cannot legally refuse permission for third parties to build such lines, they have the right to require full environmental impact assessments, and to play a role in determining the exact route that such a line should take. This, in practice if not in theory, ensures that their cooperation must be secured for the development of such pipelines. This is why any line from Leviathan requires the cooperation of the Cypriot government, and, given the poor state of relations (to be polite) between the Republic of Cyprus and the government of Turkey (which no longer recognizes the Republic of Cyprus), such cooperation cannot reasonably be expected in the absence of a more-general Cyprus settlement.

In this context, however, it is important to note that both Turkish and Israeli government officials appear to believe that they can, somehow, finesse the Cyprus issues and develop a pipeline in the absence of a Cyprus settlement. Almost certainly, this simply reflects a misunderstanding of attitudes in both the Greek and Turkish Cypriot communities that underpin the Cyprus problem.

Nonetheless, it is possible to envisage that a pipeline connecting the Eastern Mediterranean gas fields to Turkey might be secured within the context of a resolution of the Cyprus problem. Efforts are currently under way to revive the peace process, not least by instituting twin dialogues: one between Ankara and the internationally recognized government of Cyprus, which in practice administers the large, Greek-populated, and southern 62 percent of the island; and the other between Athens and the self-declared Turkish Republic of Northern Cyprus, which in practice – and with Turkish military protection – administers the largely Turkish-populated and northern 38 percent of the island.

In addition, with the European Commission moving to reopen talks on Turkish entry into the European Union, prospects for improving relations throughout the region, including the Cyprus problem itself, are better than they have been at any time since the failure of the last Cyprus peace effort in 2004.

In this context, two elements are worth considering. The first is whether there should be an energy track added to the bicommunal discussion process between the Greek- and Turkish-Cypriot communities; the second is whether, in order to save time in the event that a Cyprus settlement were to make such a pipeline possible, the United States and/or the European Union might fund a preliminary survey of potential pipeline routes.

Although no one has yet carried out a full pipeline feasibility study (or, indeed, a full LNG feasibility study), at least one Turkish group, Turcas, has attempted to cost a pipeline project to Turkey. In September 2013, Turcas formally unveiled a proposed 16 bcm twin-pipe, 470-km pipeline from Leviathan to either Çekisan or Mersin, in southern Turkey, estimating the project's cost at $2.55 billion. In addition, during the course of 2013, Israel's Delek Group stated that it is also assessing the possibility of a pipeline to Turkey.

Israeli LNG prospects

There is, of course, the possibility that Israel might seek to develop its own LNG facilities, particularly in light of a prospective delay to the development of Vasilikos. Israel has various options, and all are under study. However, they all have drawbacks.

The options are:

Onshore on the Mediterranean Coast: It appears that this is the most logical site for an Israeli LNG facility, but in practice there are few sites that could really work. There would be considerable opposition from environmentalists, who quite naturally want to preserve as much of the country's limited stretches of relatively undeveloped coastline as they can for recreational purposes.

Onshore in the Gulf of Aqaba: A plant on the Red Sea is a logical choice, since the markets Israel would hope to reach are those in the Asia/Pacific region. A terminal on the Red Sea would ensure that tankers would not have to pass through the Suez Canal en route to their prospective destinations – or have to go all the way around Africa were the canal to be closed for any reason. But Israel only has a few kilometers of coast on the Red Sea, and it is all taken up with existing docks or beaches serving the port and people of Eilat. One suggested alternative is construction of a facility at the industrial area of Jordan's adjoining port of Aqaba. But whether the Israeli government would be willing to risk such an investment beyond its borders, even though it has a peace treaty with Jordan, remains highly uncertain.

There is, however, one intriguing variant on the Red Sea concept, and that is the development of a liquefaction facility some 15 or 20 kilometers inland from Eilat, in the Negev Desert, with the liquefied output then conveyed to LNG tankers via both onshore and subsea cryogenic pipelines.

Offshore in the Mediterranean: There are three current international projects to develop floating liquefied natural gas (FLNG) facilities. In effect, these are giant, purpose-built supertankers carrying full liquefaction trains on board. This option poses considerable security problems, as such a vessel would be an obvious potential target for anti-Israeli forces, notably Lebanon's Hezbollah.

CNG – the long shot: Although pipelines and LNG constitute the backbone of current international gas-delivery systems, there is the intriguing possibility that both could lose out to a third option: maritime transport in the form of compressed natural gas (CNG). This is an untried technology, although at least one company, Calgary-based Sea NG, has secured certification from the American Bureau of Shipping for tankers capable of carrying anything from 66 to 600 million cubic feet of gas (1.87 to 17 million cubic meters [mcm]). Presentations by Sea NG officials characterize the option as one that would be competitive with pipelines, even over short distances, and with LNG, over distances of up to 2,000 kilometers.

Australia's Woodside, which is assessing an option to take a 30 percent stake in Leviathan, is also assessing the introduction of a compression unit as part of the design process for a production platform at Leviathan. If CNG is as competitive as its promoters suggest, then it constitutes a way to deliver Israeli gas to regional markets such as Turkey without any of the trans-boundary problems associated with construction of a direct pipeline. Against this are the uncertainties associated with being the first developer of a new system. There are logical arguments as to why it should prove commercially attractive, but, as yet, there is no experience of it actually working in practice.

Who determines the choice of options?

All cross-boundary energy projects require both a commercial and a political green light (as do many projects within individual states). Commercially, an attractive case can be made both for delivering gas to Turkey in the near term and then, in the medium to long term, taking advantage of Turkey's increasing role as a physical hub to deliver gas to European markets beyond Turkey. In the longer term, the lure of a major market in the Asia/Pacific region is extremely strong; as and when the resource base justifies the initial costs involved in the development of LNG facilities, commercial developers would naturally wish to take advantage of such a market.

But timing is crucial. The Turkish market is on the Eastern Mediterranean doorstep, and Turkey is a market that could take gas as soon as it was actually available in the Eastern Mediterranean – in other words, within two or three years. As for the Asia/Pacific market, sometime around 2020, a host of new, export-oriented LNG projects will come on-stream in Australia and the waters between Australia, Indonesia, and East Timor. These will almost certainly have a profound impact on prospects for

other suppliers seeking to secure contracts to deliver gas to customers in China, Japan, and South Korea.

This is one quite genuine reason why Cyprus has been so keen to press ahead with an LNG plant at Vasilikos as fast as possible: It wants to not only sign up customers in the Far East, but also to be able to supply them before the next wave of Australian LNG comes on-stream. This is why the downward revision of initial reserves at Aphrodite is such bad news for the Cypriot authorities, since it makes it highly improbable that they will be able to secure financing for an LNG plant until new resources are discovered, and then transformed into proven reserves. This, in practice, means waiting for such companies as Eni and Total to succeed in their exploration efforts. So while it is reasonable to assume that, in time, further discoveries will be made, in practice such discoveries have to be made and confirmed by actual drilling. Eni and Total are not due to start their drilling activities until 2014, almost certainly ensuring at least a two-year wait for any significant upward revision of Cypriot reserves.

So this throws the spotlight back on Israeli plans for LNG, or on Israeli willingness to supply gas from Leviathan as feedstock for Vasilikos.

The involvement of Noble and Delek on both sides of the boundary line between the Israeli and Cypriot EEZs, and the difficulties posed by the development of an LNG facility in Israel itself, do make it quite possible to envisage the eventual development of Vasilikos as a plant designed to serve both Israeli and Cypriot gas fields. But in the short term – in effect, until the next round of the Cyprus exploration campaign produces its results (or lack thereof) in late 2014, or sometime in 2015 – Israel would have to commit around twice as much gas as Cyprus to make the plant viable. And Israel, while wanting to keep the Vasilikos option alive, quite clearly considers that it should only constitute one element in a multipronged export. In particular, it is highly unlikely that Israel will wish to support the development of an LNG facility at Vasilikos if it were to be designed, as a result of limited supply from Cypriot fields, primarily to serve Israeli gas exports, since a plant that essentially existed to serve Israeli interests would almost certainly come to be seen by radical anti-Israeli forces in the region as an Israeli enclave in Cyprus, and thus, a prospective target for sabotage or direct attack.

However, the idea that Israeli gas might supply *both* an LNG terminal at Vasilikos *and* be piped to Turkey was discussed privately at a conference on Eastern Mediterranean energy at Paphos in early September 2013, with Michael Lotem, Israel's special envoy for regional gas issues. Lotem told the conference attendees: "I truly believe that an energy facility in Cyprus and a pipeline to Turkey are not competing options for Israeli gas; they are complementary options. The model is that one strengthens the other."[5]

[5] Michael Lotem, Conference on Eastern Mediterranean Energy, Paphos, September 11, 2013.

Conclusion

The difference in the time frames for developing Israeli and Cypriot gas make it hard to envisage any early start to a Cypriot LNG plant along the timeline favored by the Cypriot government. This raises the issue of how far the Israeli government – and, more importantly, the companies developing Leviathan – will go in pursuing the concept of a joint LNG project rather than focusing on alternative export options, notably a pipeline to Turkey, but perhaps also including development of CNG.

Both a pipeline to Turkey and development of a maritime CNG option would appear to provide export options for Israel that would enable both companies and the government to monetize the resources of Leviathan much more quickly than by waiting for the development of a viable multi-train LNG facility at Vasilikos. But while a pipeline to Turkey would almost certainly constitute the fastest way for Israeli gas to reach a major export market, such a line can only be laid with the explicit support of the government of Cyprus. And, in practical terms, such support cannot be expected unless there is also a settlement of the decades-old Cyprus question.

The next six to twelve months should be sufficient to demonstrate whether current efforts by the United Nations and the United States to revive the Cyprus peace process are getting anywhere, and whether the European Commission's promised revival of EU membership talks with Turkey are helping to serve détente, if not rapprochement, between the governments of Cyprus and Turkey, and, more importantly, between the two Cypriot communities themselves.

There is a considerable degree of flux in Eastern Mediterranean geopolitics at present, and it is reasonable to argue that the development of export routes for Eastern Mediterranean gas – and, thus, the development of the biggest discovery to date, Leviathan – will very largely depend on just how much the region's geopolitics change in the next year or so.

How to Frame and Develop the Necessary Cross-Border Energy Infrastructures between Cyprus, Turkey, and Israel?

Sohbet Karbuz[1]

What are the main issues at stake?

The Eastern Mediterranean waters hold, without question, large hydrocarbon resources. As of January 2014, natural gas resources discovered in Israel and Republic of Cyprus amount to 1,100 billion cubic meters (bcm). And yet, the region remains one of the world's most underexplored or unexplored areas, despite having good prospects for additional gas – and, perhaps oil – reserves. The US Geological Survey assessment in March 2010 confirms this.

Substantial gas discoveries made to date, as well as the prospect of substantial hydrocarbon resources waiting to be tapped beneath the Eastern Mediterranean waters, offer big opportunities in terms of energy security and economic prosperity. Existing discoveries are already sufficient to rapidly transform both countries from a heavy reliance on imports for their energy needs to a status of energy independence. Moreover, they have the potential of exporting more than 10 bcm of surplus gas by early next decade, if they wish to do so. By becoming a gas exporter they will have the potential to open new and competitive gas supply options to European and Asian markets, and the possibility to contribute to the much-discussed European security of gas supply by diversifying both supply sources and routes.

Israel and the Republic of Cyprus can become gas exporters if and only if oil and gas companies convert discovered reserves into production capacity. Companies will carry on costly exploration and field development endeavors if they believe they will have the ability to commercialize their discoveries with a favorable rate of return. Much will depend on the gas price the companies will receive in selling natural gas to the domestic market; the availability of export options and transport means; and stability in the countries' regulatory, fiscal, and gas policies, as well as in the overall political atmosphere, etc. Above all, such a large-scale project requires a certain and stable policy environment. Unfortunately, neither Israel nor Cyprus so far has demonstrated a solid framework in all of these areas, and this lack of stability will have negative commercial implications, slowing the pace of the extraction and transport of gas resources.

[1] Dr. Sohbet Karbuz is the director of the hydrocarbons division at the Mediterranean Observatory for Energy, France. Views and opinions expressed in this article are those of the author.

Currently, one of the most debated issues is when and how to bring the gas to the customers beyond the domestic market. Since the aim of this article is to discuss how to frame and develop a cross-border gas infrastructure between Israel, Cyprus, and Turkey, we will look at the issues from three angles in an objective and pragmatic way. We will argue that although all export options present a myriad of obstacles, any option from Israel to Turkey is trapped by diplomacy.

What are the main obstacles to potential progress/achievements in this area?

Neither Israel nor Cyprus has any gas export infrastructure. They have three realistic options: by pipeline, via LNG, and a combination of both. However, each option faces several technical, administrative, commercial, security, legal, and political challenges, with geopolitical implications.

The technical challenges are centered on infrastructure. Although all options on the table are technically feasible, the costs involved, along with the complexity of negotiating the necessary deals and overcoming political barriers, pose serious obstacles not only to the export options but also to the development of discovered gas resources. Administrative challenges include whether the governments involved will have the ability and long-term vision to make best use of the discovered gas. Security challenges come along with perturbed political relations between the countries in the region, particularly the unresolved Cyprus problem. Legal and political challenges are being manifested in the debate and dispute over conflicting claims regarding the ownership of resources and the demarcation of maritime borders. Heightened political tensions and conflicts over the unresolved demarcation of maritime borders between Cyprus and Turkey are arguably the most visible sensitive subject, even though the core issue is the Cyprus problem. This is arguably the most pressing challenge for a possible gas pipeline connection between Israel and Turkey, provided that such a pipeline could source gas from one or more suppliers.

This brings us to the source of gas. The crucial issue of whether or not to export its gas, and how much of it will be left at home, has delayed any tangible progress for a long time in Israel. Even Israel's High Court of Justice was involved in the process. For months, the Court deliberated on whether the Cabinet has the prerogative of making a final decision on the matter, or whether the Cabinet's decision needed to be approved by the Knesset. In October 2013, the Court dismissed the petitions and finally gave its approval for the export of gas. Israel will export about 40 percent of a presumed resource base of 950 bcm.

The decision to export approximately 40 percent of its gas means that Israel has a lot of gas to sell to immediate neighbors and other markets. Israeli officials have underscored on many occasions that they prefer multiple gas export possibilities. In fact,

Israel's multiple export policy has already started to take shape. Although small in terms of commercial value, recent agreements with Jordan and Palestine[2] show that Israel would like to take advantage of regional gas shortfalls first. With these deals Israel has started to pave the way toward an important economic link with its neighbors. A similar but much more significant attempt could be made with Egypt. This may not be as difficult as it sounds. First, Israel could sell Egypt 4.6 bcm of natural gas (the amount of gas Israel imported from Egypt between 2005 and 2012) at the same cost at which it was purchased from Egypt. Such a move could immensely alleviate the gas shortage in Egypt. Second, Egypt could allow its two underutilized LNG export plants to be used by the Leviathan partners for some time.[3]

After potentially having supplied the immediate neighbors with natural gas from the Leviathan (and Tamar) fields, Israel's multiple gas export strategy would aim to reach distant but lucrative markets, in Europe or Asia. Security reasons may also push Israel to diversify its gas export routes. Within this concept, Israel welcomes gas export pipelines to both Turkey and Cyprus.

Arrival of Israeli gas to southern Cyprus is crucial for the latter because the downward revisions to the Aphrodite field's gas resources alone does not justify the construction of the planned LNG plant at Vasilikos.[4] On the other hand, waiting for other possible discoveries would delay, if not halt, the planned LNG plant for at least three to four years.[5] The first gas from the Aphrodite field can be produced in 2019, assuming that a final investment decision is made in late 2015 or 2016. All in all, LNG exports from Cyprus cannot start before 2022. Israeli participation would certainly speed up the progress of the Cyprus LNG project. In this case, the plant could be used to liquefy and export the gas from the Leviathan field as well. This is another reason why the Leviathan gas field in Israeli waters holds the key for any significant gas exports from the region.

This will not be easy simply because the Leviathan field itself is surrounded by plenty of obstacles. Leviathan partners (Noble Energy Inc., Delek Group Ltd., and Ratio Oil

[2] Israel is planning to build a 15-kilometer-long pipeline to Jordan and supply Palestinians in the West Bank. The pipeline is expected to be fully constructed by 2016. In February 2014, a fifteen-year gas sales agreement was signed with two companies in Jordan (Arab Potash Company and Jordan Bromine Company) to supply a total of 1.8 bcm gas (starting from 2016) from the Tamar field. The two nations also signed a substantive water-sharing deal in 2013. In January 2014, the Leviathan partners and Palestine Power Generating Company signed a twenty-year deal to sell up to 4.75 bcm of natural gas once Leviathan starts production to feed a 200 MW power plant that the purchaser intends to build near Jenin, in the northern West Bank. It is yet to be seen whether this commercial deal will require political commitments to be realized.

[3] In this case, Leviathan gas would make use of the Arish-Ashkelon offshore pipeline connecting both countries, but gas would flow in the reverse direction.

[4] The estimated contingent and prospective gas resources in the Aphrodite field have fallen under the best scenario to 4.1 tcf (116 bcm), mostly due to a decrease in the estimated thickness of the target layer.

[5] Total and Eni have expressed interest in joining the LNG project if their exploratory drillings in 2014–15 turn out to be successful.

Exploration) had to receive a production lease[6] from the Israeli government. For this, the partners had to present a development plan for the field. This could not be done for a long time because the National Planning and Building Commission could not decide where the onshore reception terminal should be built.[7] Any approval on this issue is not expected before late 2014. Also, it is still not clear whether the Israeli government will levy a special tax on the gas exports. Meanwhile, the Antitrust Authority could not decide whether Leviathan partners fail to meet the conditions required for effective competition, and hence would be labeled a cartel. More importantly, it has been not clear whether the government will make any adjustment for enabling the transfer of export allocations from one field to another, so as to allow for more than half of Leviathan's reserves to be exported.

Many of these issues, in addition to the final taxation arrangements (tax regime and treatment of capital gains tax for sellers),[8] have been particularly important for finalization of Australian company Woodside Energy's decision to acquire a 25 percent interest in the Rachel and Amit licenses on which the Leviathan field is located, and to operate a planned floating LNG (FLNG) plant. Woodside was supposed to sign the deal on March 27, 2014, conditional on the taxation question being settled to its satisfaction. This has not happened, and Woodside's Leviathan entry has been delayed once again. The good news is that around the same day, the Antitrust Authority ordered Delek and Noble Energy to sell the Karish and Tanin gas fields to another party,[9] and the Leviathan partners received the government's production lease terms.[10] In sum, the field's future is still uncertain, at least time-wise.

A subsea pipeline from Israel's Leviathan field (with or without crossing the island of Cyprus) to Turkey and possibly from there onward to Europe seems to be a cost-effective and attractive option. Although a direct route from Leviathan to Turkey has attracted much attention, the indirect route via Cyprus has not been publicized, perhaps (political reasons aside) due to the insistence of Cyprus on LNG exports.

---

6 The production lease replaces an exploration license. The lease agreement, which is crucial to raise the financing, regulates the relations between the developers and the state regarding the field's development and production, and also the sale of the produced gas for a strict timetable.

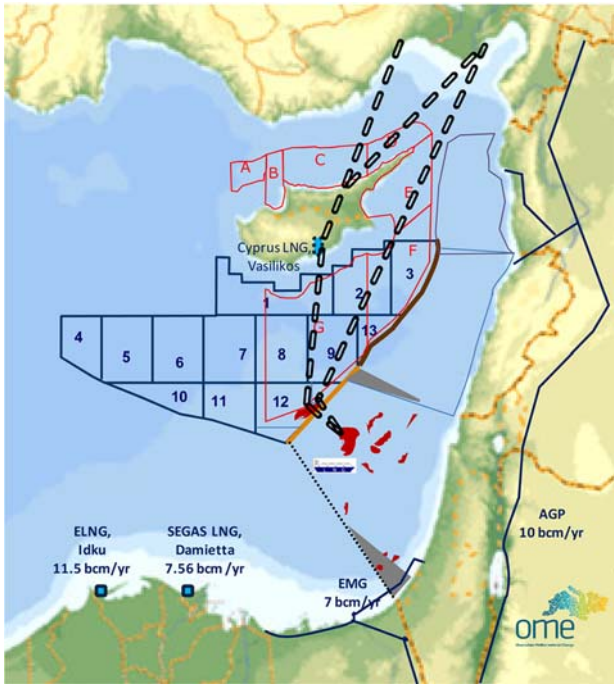
7 Adjacent to the Meretz Sewage Treatment Plant in the Hefer Valley and adjacent to the Hagit Power Station near Yokne'am. Another considered option is to build an artificial island 7.5 kilometers off the coast of Hadera.

8 In March 2014 an Israeli government panel announced that the preferred model for taxing gas exports should be based on netback. This decision still needs Cabinet and parliamentary approval (Reuters, March 25, 2014).

9 In this way they will avoid being branded a cartel by the Antitrust Authority. Production from these two fields will only be sold in the domestic market by the buyer. This issue is still subject to the approval of the Antitrust Authority.

10 Some of the lease terms will not be that easy for the Leviathan partners to swallow. For instance, the partners in Leviathan will be required to keep a guaranteed capacity of 9.2 bcm/yr of gas for the Israeli economy; the leaseholders will need to grant priority to the needs of the domestic market in case of a natural gas shortage in Israel; exports will only begin once a link to Israel's coast is complete. (For more, see Globes, *Jerusalem Post*, March 27, 2014). **[AU: Is "Globes" author name or article title? Pls clarify/expand as needed here for proper source info.]**

Figure: Natural Gas Pipeline Project Options between Israel, Cyprus, and Turkey



Note: For illustration purposes, pipeline options are the author's own interpretation.
Source: OME

Several Turkish companies are interested in buying gas from the Leviathan field.[11] Some of them are seriously considering building a pipeline from the Leviathan field to the southeastern Mediterranean coast of Turkey (possibly with a link to the Tamar field). Although the companies are reportedly in "advanced talks," no memorandum of understanding yet exists. A capacity of around 8 bcm/yr would be plausible for such a pipeline.

Apart from that, the issue of what would happen to the gas after it arrived in Turkey is not clear. Any mix of Israeli and Cypriot gas could target the Turkish market or feed into the Trans Anatolia Natural Gas Pipeline (TANAP), which would bring Azeri gas to the Turkey-Greece border, or into the Trans Adriatic Pipeline (TAP) via LNG. If the intent is to feed gas into the TANAP, then the currently announced capacities of TANAP and TAP have to be expanded. But, so far, there are no plans for either TANAP or TAP to accommodate the Israeli or Cypriot gas. More importantly, it appears that neither the Turkish nor the European gas market, as a whole, need additional gas supplies based on oil-linked, long-term, take-or-pay pipeline gas contracts before

[11] Recently, some of them have been contacted by Leviathan partners to find out their interest in quantitative terms (volume and price).

early next decade. Otherwise, the market would be over-contracted and over-supplied in volume terms, even though a gas pipeline between Israel and Turkey would probably not create any significant asymmetric dependence.

In any case, the unresolved Cyprus problem will remain as the most important obstacle to potential progress for any offshore pipeline project from Israel to Turkey, whether it crosses Cyprus or not. Unless that problem is resolved, the political battle over the maritime borders between the Republic of Cyprus, Turkey, and the Turkish Republic of Northern Cyprus (TRNC) will continue.[12] To settle the issue through the International Court of Justice, the International Tribunal for the Law of the Sea, or arbitration would likely take at least a decade. This makes it imperative that all countries in the region work closely together, both bilaterally and regionally.

If a pipeline route via Cyprus is dropped and only a direct route from Israel to Turkey is considered, then the pipeline should go through the proclaimed EEZ of Greek Cyprus, or through Lebanon. It would be nearly impossible for southern Cyprus to let such a pipeline go ahead easily. Although building such a pipeline would not require formal permission, the southern Cypriot government must agree on the route of the line, according to the UN Law of the Sea. Last but not least, if the Cyprus problem is not resolved, it would be extremely difficult to attract financing for a pipeline project from Israel to Turkey.

What are the potential solutions and needed actions in a realistic timeline for possible implementation?

So far we know that southern Cyprus does not have a sufficient quantity of gas in the Aphrodite field to justify its planned LNG plant. We also know that currently, "it is not possible to formulate an approximate schedule or execute the development plan for the Leviathan field,"[13] apart from the announced speculative dates (late 2017 or 2018).

No tangible progress has been recorded after numerous rounds of UN-mediated negotiations between the Greek Cypriot and Turkish Cypriot leadership on a unified political settlement over the last four decades; indeed, these repeated efforts have proven fruitless. The existence of hydrocarbons resources off the waters of the island

[12] Turkey's disagreement with the Republic of Cyprus concerns the overlapping claims in offshore areas located in the western and southeastern parts of the island. Turkey claims that maritime demarcation agreements signed by the Greek Cypriots with countries in the region are null and void for several reasons. First, Turkey does not recognize the Republic of Cyprus, and hence, its proclaimed EEZ. Second, Turkey argues that the Greek Cypriot government does not represent the Turkish Cypriot population. Third, Turkey argues that Greek Cypriot unilateral drilling is hurting the reunification negotiations. This is why Turkey and the TRNC oppose the drilling program in southern Cyprus. They propose suspension of all activities or establishing a joint committee related to hydrocarbon reserves off the island until the reunification process of both communities of the island is concluded. On the other hand, the TRNC is only recognized by Turkey.

[13] Delek Group press release, "Update on Natural Gas Reservoir Leviathan," December 9, 2013.

has opened a new window of opportunity. Today all parties agree that both communities on the island should benefit from the exploitation of hydrocarbons in terms of a revenue-sharing mechanism, with a varying degree of modality and conditions. Greek Cypriot officials warn against any effort to link the hydrocarbons issue to efforts in finding a comprehensive solution to the problem of the division of the island. Most probably a pipeline project would not qualify for an exception.

A genuine mechanism that would lead to joint exploitation of hydrocarbons resources in the island of Cyprus may offer an interim solution for creating interdependencies and paving the way for cooperation in the region. However, such an option does not presently exist, and reaching substantive compromises will be unlikely unless relevant parties talk to each other.

UN Secretary-General Ban Ki-moon has been pressing for a revival in the talks, but with little to no success. Cyprus president Nicos Anastasiades stated in August 2013 that finding a just and viable solution for the Cyprus problem constitutes the top priority for the new government. Although a new dialogue for a solution was finally started on February 11, 2014, under the auspices of the UN, the struggle, as underlined by Anastasiades, "begins now, and it will be difficult," adding that "nothing will be agreed upon unless everything is agreed upon."[14]

The resumption of long-stalled talks to end the Cyprus problem was expected to open the way for energy-related projects, particularly a possible natural gas pipeline from Cyprus to Turkey. Currently, such a pipeline is not considered an option without a solution to the Cyprus problem. Cyprus's minister for energy, commerce, industry, and tourism, Yiorgos Lakkotrypis, has stressed on several occasions that there was no way Cyprus would agree to supply its gas through pipelines going through Turkey, "at least not before there was a fair and permanent solution to the Cyprus problem." This means that both discovered and undiscovered natural resources in the waters off the island – as well as any pipeline project from the Leviathan field to Turkey, with or without crossing the island – could either help to resolve or inflame the Cyprus problem. This is why there is no alternative to a negotiated settlement.

Greece assumed the rotating six-month EU presidency in January 2014. This, along with the ongoing dialogue, is an opportunity not to be missed in order to settle the Cyprus problem. The European Union could make this a priority political issue to be tackled,[15] preferably together with northern Cyprus's accession issue, which was once expected to function as a catalyst for reunification. The prospect of extracting and transporting hydrocarbons has created a new opportunity for cooperation and

[14] "Remarks by the President of the Republic on the Cyprus Problem," Press and Information Office, Ministry of Interior, March 16, 2014.

[15] It seems that reopening the port of Famagusta in the TRNC will be made a precondition by the Greek Cypriots and the European Union. This will probably be rejected by Turkey and the TRNC.

resolution of the fifty-year-old Cyprus conflict.[16] All relevant parties must engage in direct talks so as not to miss this potential last call. If the Cyprus problem is not resolved this time, the accession negotiations between Turkey and the European Union might also enter into a dark zone.

If Turkey-Israel diplomatic ties could improve quickly, Israel could work in support of reconciliation talks between Turkey and Greek Cyprus. In the end, Israel's policy will determine the future of any tripartite or two-partite pipeline route, as well as the future of gas exports from Cyprus. A dual export strategy – including a pipeline to Turkey via Cyprus, and an LNG plant at Vasilikos, fed partially by Israeli gas – would be an excellent compromise.

As for normalizing relations between Turkey and Israel, the Turkish foreign minister reminds us frequently that while Turkey's demand for an Israeli apology has been fulfilled, the remaining two conditions (compensation for the families of the passengers killed on the *Mavi Marmara*, and the lifting of the blockade on Gaza) have not been met. Some progress has been made in regard to the second condition, but it seems that the environment for the third condition has changed following the ouster of former Egyptian president Mohamed Morsi, in July 2013. The current political crisis in Turkey emphasizes the slow progress on the part of Turkey.

Finally, the recent political crisis between Russia and Ukraine has further revealed that East Mediterranean gas may play an important role in diversifying Europe's gas supply sources and routes, and also help to reduce Europe's heavy reliance on Russian gas. A Cyprus settlement, combined with normalized ties between Turkey and Israel, may turn the East Mediterranean into a new and reliable source of energy for Europe and other markets.

Conclusion

Instead of forming a common denominator and an axis for stability, natural gas has become a main component of geopolitical obstacles. Despite political animosity, oil and gas companies are showing considerable commercial interest in constructing a gas pipeline from Israel to Turkey. How to manage and contain the disputes remains a challenge, but what is clear is that energy resources and transport infrastructure offer a vehicle for regional dialogue between the countries involved. A tripartite pipeline carrying Israeli gas (preferably with part Cypriot gas) to Turkey via Cyprus could be an important part of such a vehicle.

What is needed to help turn controversies into possible cooperation is for all the players and stakeholders to get into a balanced but pragmatic cooperative approach through a constructive and candid dialogue on the most burning issue – namely, the

[16] March 2014 marks the fiftieth anniversary of the UN's peacekeeping mission in Cyprus.

unresolved maritime delimitations. In the case of Cyprus and Turkey, this is part of the Cyprus problem. The absence of diplomatic relations between the Republic of Cyprus and Turkey will not make this easy. A mutually agreed upon, formal two-state settlement between the Turkish Cypriot and Greek Cypriot sides on the island seems like the only way to resolve this conflict. At the same time, frosty Turkey-Israel political relations must be normalized.

Political issues aside, it is difficult to imagine a final investment decision on a gas pipeline from Israel to Turkey in the immediate future, or any significant gas deliveries through such a pipeline before the early 2020s. Until then, many obstacles need to be surmounted, innovative solutions need to be found, and policies need to be reformulated in order to reflect the new realities. Myopic policies pursued by all the countries in the East Mediterranean region further complicate the existing challenges and shrink the room for optimism. Until and unless the pressing challenges are managed carefully, and with wisdom, converting them into opportunities will be more and more difficult.

A pragmatic cooperation is essential to open the door for East Mediterranean gas to be piped to Turkey. There is an old African proverb that says “If you want to go fast, go alone. If you want to go far, go together.” It is up to the politicians to choose which path they would like to take. For the benefit of their people, they have to go both far, and fast.

EASTERN MEDITERRANEAN NATURAL GAS: POTENTIAL FOR HISTORIC BREAKTHROUGHS AMONG ISRAEL, TURKEY, AND CYPRUS

MATTHEW BRYZA[1]

Discoveries of natural gas since 2010 in Israel and Cyprus could help to reshape the geopolitical trajectory of the Eastern Mediterranean at the strategic confluence of the Middle East, North Africa, and Eurasia. If managed with collaborative vision and skill, these new gas fields could provide Cyprus and Israel with energy independence; they could catalyze new industries, generate significant export revenues, and foster diplomatic breakthroughs on the Cyprus problem and Turkey-Israel relations; and they could help Turkey to emerge as a major energy hub. Absent collaborative vision, however, this hydrocarbon bounty could only serve to reinforce political divisions and weaken regional stability.

Intertwined economic and political issues for Israel, Cyprus, and Turkey

Economic and political issues are intertwined for Israel, Cyprus, and Turkey as each country's government and commercial partners deliberate how best to develop the Leviathan and Aphrodite natural gas fields in Israel and Cyprus, respectively.

In Israel, recent natural gas discoveries are viewed above all as providing domestic benefits – namely, reducing Israel's dependence on imported energy, developing energy-intensive industries, and boosting economic growth. The Israeli government has therefore allocated 60 percent of all of its future natural gas production to domestic consumption, including the entire Tamar field, which began producing in March 2013. At the same time, the Israeli government realizes significant natural gas exports are required in order to enable commercial development of the Leviathan field, the world's largest discovery in a decade when it was made in 2010. Consequently, 40 percent of Israel's natural gas will be eligible for export.

The Israeli government also appears to value natural gas exports as a means to strengthen Israel's relations with neighboring countries. Israel is reportedly planning to build a 15-kilometer gas pipeline to Jordan, which could help to stabilize the Jewish state's lone Arab partner. Additionally, the Leviathan field's developers said

[1] Former US Ambassador and Deputy Assistant Secretary of State Matthew Bryza is a non-resident senior fellow at the Dinu Patriciu Eurasia Center of the Atlantic Council and Director of the International Centre for Defence Studies, Tallinn.

on January 5, 2014, that they had signed a deal to sell gas to the Palestine Power Generation Co. over twenty years.

Though politically significant, these modest export deals, totaling only 2 to 3 bcm, are too small to justify full development of the Leviathan field. Securing financing for Leviathan's full-field development will require exports of at least 8 to 10 bcm.

For political and commercial reasons, Israel seeks multiple options to export its larger gas volumes: Politically, multiple options will mitigate the risk of any one country suspending exports for political reasons; commercially, a multiplicity of options will maximize Israel's commercial leverage in gas sales negotiations. Jerusalem's preferred mix of export options will likely comprise: (1) a pipeline to Turkey, the cheapest and most commercially attractive option; and (2) an LNG terminal, which would avoid tying Israel to a single importing country and offer access to global markets (including East Asia, with the world's highest prices).

Locating an LNG terminal within Israel, however, may be politically impossible, given intense public concerns about potential environmental and human consequences of a terrorist or military attack on such an attractive target. A floating gas LNG terminal in Israel's territorial waters could mitigate these concerns, but the technology is only now being deployed for the first time (in Australia), and currently costs up to twice as much as a land-based LNG terminal, and more than three times as much as a pipeline to Turkey. That said, FLNG technology is developing quickly, with construction costs decreasing. FLNG could eventually offer a commercially attractive gas export options for Israel, although it would deny Israel the diplomatic benefits of the options described below.

Among those other options is an LNG terminal located in a neighboring country. Egypt's unused gas liquefaction facilities could provide a cheap alternative. Israeli gas could be pumped south via either an existing onshore pipeline across the Sinai Desert, or a line that could be constructed offshore (to avoid potential terrorist attacks in the Sinai) to Egyptian LNG terminals, from where the gas would be shipped to East Asian markets through the Suez Canal. Still another alternative could be to build a new pipeline across Israel's Negev Desert to help develop that region, with an extension to Jordan's port of Aqaba on the Red Sea. In practice, however, political obstacles in all three countries to the Jordanian and Egyptian projects seem insurmountable.

That leaves Cyprus as the most promising location for an LNG terminal for Leviathan gas. The government of the Republic of Cyprus has defined development of an LNG terminal on its southern coast at Vasilikos as an urgent national priority for both economic and political reasons. Economically, a gas liquefaction terminal would cost only one-third to one-half as much as Cyprus's other favored export option for Aphrodite gas, a pipeline to Crete and mainland Greece. Lower capital expenditures (CAPEX) would earn Cyprus higher profits from gas exports, thereby helping it meet

the conditions of its financial bailout from the European Commission, European Central Bank, and International Monetary Fund. An LNG terminal would also provide attractive jobs at Vasilikos, which is also crucial for Cyprus's economic recovery.

In conjunction with the LNG terminal, a new gas-fired power plant would also be developed at Vasilikos, which would overcome a severe electricity shortage (caused when a massive explosion at a neighboring ammunition dump destroyed a diesel-fired power plant in June 2011) and provide cheaper power by burning cheaper natural gas rather than expensive diesel. Politically, an LNG terminal could allow Cyprus to emerge as a natural gas transit hub for the Eastern Mediterranean, thereby elevating Cyprus's strategic significance and boosting its relations with Israel (and perhaps Lebanon, once its gas prospects are developed).

The companies leading the development of Cyprus's Aphrodite field, the United States' Noble Energy and Israel's Delek Group, appear to favor the Vasilikos LNG terminal as the most commercially attractive export option for Cypriot gas. These companies are also developing Israel's Leviathan field, along with the Israeli company, Ratio. One of the world's largest LNG developers, Australia's Woodside, is weighing whether or not to join the Leviathan consortium, with an eye on an LNG solution.

Notwithstanding these economic and political advantages, the Vasilikos LNG terminal faces serious financing obstacles due to a lack of Cypriot natural gas. Aphrodite's estimated reserves are currently only 257 bcm, sufficient to justify only a single train of LNG production, which is unlikely to attract commercial financing. Additional discoveries should eventually justify two or more production trains, which will require two or more years to drill appraisal wells. Charles Ellinas, executive president of the Cyprus National Hydrocarbons Company, has suggested this could take until at least 2016, at which point a final decision could be made by private investors on whether or not to proceed with the Vasilikos LNG project.

Vasilikos's timetable could be accelerated if Israel were to export early Leviathan gas via the Cypriot LNG terminal. No country, however, has ever permitted all of its primary gas exports to occur from an LNG terminal located in another country. Israel will thus almost certainly refuse to permit exports of Leviathan gas from Vasilikos until another export option is available, over which Jerusalem would enjoy more operational control.

The most probable (and promising) such option is a subsea pipeline to a lucrative market – say, from Israel to Turkey**,** which would offer the cheapest export route for Leviathan gas, other than the more politically difficult Egyptian route. According to Turcas Enerji, the Turkish energy company on whose board I sit, connecting the Leviathan field with the Turkish coast would cost approximately $1.737 billion for an 8- to 10-bcm pipeline, or less than one-third the most optimistic estimate of the cost a single LNG train at Vasilikos. The pipeline would consist of one strand of 24-inch pipe

stretching from Israel to Turkey's Mediterranean coast, at either Mersin or Ceyhan, from where it could be connected via a 40-kilometer pipeline to Turkey's national gas grid for approximately $122 million, for a total cost of $1.859 billion (according to Turcas's engineering studies).

More ambitiously, Leviathan gas could enter the European Union via the Southern Corridor, the network of pipelines the European Union supports to diversify its natural gas supplies, and which is under development from Azerbaijan to Italy. When completed, the Southern Corridor will comprise the South Caucasus Pipeline Expansion (SCP-X) across Azerbaijan and Georgia, the Trans Anatolia Natural Gas Pipeline (TANAP) across Turkey, and the Trans Adriatic Pipeline (TAP) across Greece and Albania, then under the Adriatic Sea to Italy. According to our engineering studies at Turcas, connecting the Israel-Turkey pipeline to TANAP would cost an additional $726 million; joining TAP at the Turkey-Greece border from Ceyhan or Mersin would require $1.790 billion. The CAPEX of even this grandest pipeline variant all the way to Greece would be $3.528 billion, still 22 percent lower than even one train of LNG at Vasilikos; and, the pipeline's operational expenses (OPEX) would also be lower than that of the LNG terminal.

Incorporating Eastern Mediterranean gas into TANAP and/or TAP would provide a major boost to the Southern Corridor's economic attractiveness, while bolstering the ties of Israel and Turkey to the European Union. These developments could reinvigorate Turkey's EU accession bid, and lead to the opening of Turkey's negotiations on the EU Acquis's energy chapter, which Ankara has long sought. For now, however, commercial deliberations foresee consumption of the initial 8 to 10 bcm of Leviathan gas in Turkey at prices pegged to European trading hubs' spot-markets.

Even this most modest export option, however, without a connection to the European Union, is highly attractive to Turkey for economic and political reasons. Economically, Israeli gas imports would help Turkey to diversify away from its heavy dependence on more-expensive Russian and Iranian gas. Consequently, Turkey would enjoy: a lower national gas price for Turkish consumers; leverage to negotiate still-lower prices from Gazprom; and a boost to Turkey's halting effort to liberalize its natural gas market and establish hub-based pricing.

Politically, an Israel-Turkey pipeline would advance Turkey's quest to become a strategic gateway for natural gas into Europe. Additionally, an Israel-Turkey gas pipeline would bolster Turkey's political standing in the Eastern Mediterranean as a key and constructive regional actor. During the late 1990s, Turkey established a strategic partnership with Israel that included military and intelligence cooperation, opening new opportunities for Ankara to combat terrorism, manage Iran, and contribute to the Middle East peace in both the Palestinian territories (through economic assistance) and Lebanon (through troop contributions to the UN mission launched in mid-2006).

The need for energy-and-diplomacy breakthroughs

Turkey's strategic partnership with Israel began to collapse in late 2008, when Prime Minister Erdogan interpreted Israel's military assault on Gaza as an attempt to sabotage Turkey's effort to broker a breakthrough agreement between Israel and Syria. Turkey-Israel relations continued to deteriorate throughout the next eighteen months, beginning with Erdogan's verbal attack on Israeli president Peres at the World Economic Forum in Davos in January 2009. Relations entered free fall in June 2010, when the Turkish government expressed support for activists aboard the Turkish ferry, *Mavi Marmara*, who were challenging Israel's "blockade" of Gaza; Israel responded with a commando raid resulting in a violent clash and the deaths of eight Turkish citizens aboard the vessel.

Since early 2013, Turkey and Israel have been working to mend their relations. On March 22, 2013, Israeli prime minister Netanyahu apologized by telephone to Turkish prime minister Erdogan (with US president Obama's intercession) for the *Mavi Marmara* deaths. Despite Israel's dramatic gesture, the reconciliation process slowed in the summer of 2013, with the two sides unable to agree on the level of monetary compensation for the families of those killed in the Israeli commando raid. Yet, behind the scenes, both governments quietly support efforts by private companies to explore a possible Israel-Turkey pipeline, which could allow for a package solution in which framework agreements on both the pipeline and diplomatic normalization could be reached in tandem.

A similar energy-and-diplomacy breakthrough is also possible between Turkey and Cyprus, although the current state of relations between the two countries is nonexistent. Turkey and Cyprus have lacked diplomatic relations since 1974, when Turkey's military intervened to protect long-harassed Turkish Cypriots (according to Turkey), or invaded (according to the Republic of Cyprus), in response to a military coup that aimed to reunify Cyprus with Greece. Today, the political breach between Ankara and Nicosia remains deep. Turkey is the only country to recognize the Turkish Cypriots' breakaway state on the northern third of the island, the Turkish Republic of Northern Cyprus, where up to 35,000 Turkish troops have been based since 1974.

Moreover, Turkey is now warning that it will begin to explore prospective blocs where its continental shelf claims overlap with those of Cyprus. Ankara has also vowed to prevent prospecting in any Cypriot bloc without the permission of Turkish Cypriot authorities. So far, Ankara's preferred tool for enforcing this threat has been to curtail the rights to operate in Turkey of international energy companies prospecting in Cypriot blocs without Turkish Cypriot permission (such as Italy's ENI). But Ankara has suggested it may turn to more-forceful methods to prevent exploration and development in Cypriot blocs without Turkish Cypriot permission.

There is nevertheless some hope for new momentum in UN-brokered talks. A new round was supposed to begin in autumn 2013, following a three-year hiatus in nearly

four decades of negotiations that have yet to yield a breakthrough. Cyprus now enjoys its most adamantly pro-settlement president since the country entered the European Union in 2004. Meanwhile, top Turkish officials, including President Gul, indicated throughout late 2013 their desire for a breakthrough in this next round of talks (which, unfortunately, had yet to commence at the time of writing in late January 2014).

Absent such a breakthrough in Cyprus-Turkey relations, it is difficult to imagine how an Israel-Turkey pipeline could proceed, since the project must cross the continental shelf of Cyprus, (given that the alternative of crossing the continental shelves of Lebanon and Syria is politically inconceivable). Theoretically, investors could try to force a pipeline across Cyprus's continental shelf without permission of the Cypriot government, citing the ambiguity of the UN Convention on the Law of the Sea (UNCLOS). Pursuant to Articles 58 and 79 of UNCLOS, all states are entitled to lay subsea pipelines across the EEZ and continental shelf of another state. Indeed, Subparagraph (2) of Article 79 states, "Subject to its right to take reasonable measures for the exploration of the continental shelf, the exploitation of its natural resources and the prevention, reduction and control of pollution from pipelines, the coastal State may not impede the laying or maintenance of such cables or pipelines." But, Subparagraph (3) seems to suggest the opposite, stipulating, "The delineation of the course for the laying of such pipelines on the continental shelf is subject to the consent of the coastal State." Hence, UNCLOS seems to grant Cyprus a right to withhold its consent for a pipeline across its continental shelf at the same time that it obligates Cyprus to permit such a pipeline. Given this legal ambiguity, it is unlikely that either the Israeli government or any (non-Turkish) private investor would accept the political risk of challenging the apparent right of Cyprus, an EU member state, to withhold permission for an Israel-Turkey pipeline.

A grand bargain

Overcoming this legalistic impasse will require a *sui generis* agreement among the three countries that offers Cyprus one of its key energy-related objectives in exchange for permission for the Israel-Turkey pipeline to cross its continental shelf. That coveted energy-related objective could be the LNG terminal at Vasilikos. Fortuitously, the serious financial obstacles confronting the Vasilikos project could be significantly eased by an Israel-Turkey pipeline if some of the pipeline's early revenues could be channeled into the LNG terminal. The outlines of a grand bargain to enable both energy projects to proceed would thus entail: (1) Cyprus offering permission to an Israel-Turkey pipeline to cross the Cypriot continental shelf; and (2) Israel and Turkey (together with Noble and Delek) channeling some of the pipeline revenues into the Vasilikos LNG terminal.

Choreographing this grand bargain will require considerable diplomatic and financial skill. Noble and Delek appear to support such an effort. Commercial support, however, will not be sufficient to reach this complicated agreement. An experienced and major international actor will be required to help the three countries reach necessary compromises. The UN lacks experience in negotiating this sort of a commercial-diplomatic deal. The European Commission enjoys some of the requisite negotiating experience (thanks to its effort with Turkmenistan on the Southern Corridor), but lacks trust among Turkish parties, given that Cyprus is an EU member. The United States, however, enjoys strong relations with all three countries, as well as considerable experience negotiating the international legal and commercial framework agreements governing the Baku-Tbilisi-Ceyhan oil and South Caucasus gas pipelines during the late 1990s.

The United States is unlikely to become involved, however, until Turkey improves its relations with both Israel and Cyprus. As of January 2014, current trends were not positive, with Turkish prime minister Recep Tayyip Erdogan blaming an international conspiracy led by an "interest lobby" (e.g., the US government and Jewish financiers) for Turkey's landmark corruption scandal. These tensions are unlikely to subside before Turkey's municipal elections in March 2014, at the earliest.

Eventually, however, Turkey's political crisis will subside. Already, senior Turkish government officials appear willing to try to rejuvenate Cyprus settlement talks and repair relations with Israel, once they receive the signal from their political leaders. Moreover, these Turkish officials seem to have willing counterparts in Israel and Cyprus. In the coming months, therefore, as Turkey's political dust settles, Washington must be ready to seize a potential opportunity to forge a historic breakthrough among Turkey, Israel, and Cyprus. Given the commercial and legal logic of the *sui generis* agreement outlined above, the chances for success will be considerable, provided political leaders in all three countries lead the way with modest openings in Turkey-Israel relations and in UN talks on a Cyprus political settlement.

Conclusion

Finally, one more emerging commercial development could help smooth the way to such a trilateral agreement. A new application of an old technology, compressed natural gas (CNG), could allow initial production from Leviathan and Aphrodite to be exported by ship, thereby avoiding the political-legal challenge of crossing Cyprus's continental shelf and the high costs of LNG. Thanks to recent advances in steel manufacturing, sufficiently large pipes can now be placed aboard ships so that CNG can provide the lowest-cost way to transport modest to medium volumes of natural gas for distances up to 1,300 kilometers. Though never yet deployed, CNG is now ready for the market, and is attracting attention from the companies exploring export options for Leviathan and Aphrodite gas. CNG could thus enable production at Levi-

athan to begin without augmenting diplomatic tension between Turkey and Cyprus, thereby improving the prospects for reaching the trilateral agreement that could allow an Israel-Turkey gas pipeline and a Cypriot LNG terminal to be built in tandem.

Regardless of whether CNG plays a role, a gas export agreement among Turkey, Cyprus, and Israel could materialize, provided Ankara decides to improve relations with Jerusalem, and Nicosia and Washington engages. Such an accord could do much more than enable major energy investments; it could also allow Turkey and Israel to restore their strategic partnership, while catalyzing a breakthrough in UN efforts to reach a comprehensive settlement of the Cyprus problem. These could be historic achievements, which would help to stabilize the Levant and heal political wounds between Turkey and Cyprus that have hampered cooperation not only between those two countries, but also within the broader Euro-Atlantic community.

THE LEVIATHAN-CEYHAN PIPELINE: POLITICAL AND COMMERCIAL ARGUMENTS AGAINST THE CONSTRUCTION OF A TURKISH-ISRAELI PIPELINE

THEODOROS TSAKIRIS[1]

Geopolitical considerations

An Israeli export pipeline to Turkey, regardless of its size and route, will need to overcome a series of major geopolitical impediments that relate not only to the region's increasing volatility, but also to the political preconditions necessary to construct a multibillion-dollar investment which will need to operate for decades. What are the different route options available for a Leviathan-Ceyhan Pipeline?

Onshore via Syria/Lebanon: The first theoretical route of such a pipeline would essentially bypass both Cyprus and Lebanon by crossing to Turkey via Syria, probably along the route of the Arab Gas Pipeline. Turkey and Syria were months away from completing the construction of a smaller capacity (3-5 bcm/y) gas interconnector before the civil war of 2011 erupted.

Apart from the evident problems of stabilizing and reconstructing Syria, any post-Assad regime is likely to have higher priorities than to facilitate the transit of Israeli gas, especially as long as the Golan issue remains unresolved. It will be close to impossible to convince Noble, Delek, and, more importantly, Woodside to invest billions of US dollars in the construction of a 10 to 15 bcm/y pipeline through so volatile a place as post-Assad Syria. In case Assad reasserts control, it would not be an exaggeration to suggest that for several years, Syria would be closer to Tel Aviv than Ankara.

Offshore, bypassing Lebanon via the Cypriot EEZ: The second theoretical route of such a pipeline would essentially bypass Lebanon by crossing through Cyprus's EEZ and, in particular, Blocks 12, 9, 13, and 3, before it enters Turkish and the so-called "Turkish-Cypriot" territorial waters either via Syria's undetermined EEZ, or via the arbitrarily defined EEZ of the occupied northern parts of Cyprus, which are solely recognized by Turkey as the Turkish Republic of Northern Cyprus (TRNC). This is the

[1] Dr. Theodoros Tsakiris is Director, Energy and Geopolitics Programme at ELIAMEP (Hellenic Foundation for European & Foreign Policy), and Assistant Professor, Geopolitics of Hydrocarbons, at the University of Nicosia.

Figure 1

Source: US Energy Information Administration.

plan suggested by former US ambassador Matthew Bryza, who currently sits on the board of directors of Turcas Enerji.[2]

Such a solution would be impossible in the absence of a comprehensive resolution of the Cyprus problem, and Nicosia has said that it would not link its gas export options with the potential restart of the proximity talks. Even if there are a few Greek-Cypriot politicians who would be ready to discuss a "Turkish" pipeline as a parallel option to the Vasilikos LNG terminal, no one would be ready to drop Vasilikos in favor of a pipeline option, especially if it would end up to Turkey.

Aphrodite's size is too small to give Ankara the necessary incentives to move the Turkish Cypriots closer to a comprehensive solution of the Cyprus problem in order to import 5 to 6 bcm/y from Aphrodite through a theoretically reunited Cyprus. The only quick method to change these dynamics and give Ankara a more "tangible" energy incentive would be to add another 10 to 12 bcm/y from Leviathan through a pipeline that would bring Israeli gas to Vasilikos.

The political significance of this incentive should not be overestimated, however, especially if it is linked to the restart of the proximity talks between the island's two principal ethnic communities. Such a restart is problematic for several reasons, not the least due to the persistence of the Turkish government to not recognize the existence of the Republic of Cyprus. One variation of this scenario – namely, the linking of

[2] Mathew Bryza, "An Israel-Turkey Natural Gas Pipeline: Inter-Connection of Commercial & Geopolitical Logic," *Oxford Energy Forum,* Issue 93 (August 2013), pp. 10–13. The US Energy Information Administration map is retrieved from the EIA's Country Analysis Brief on the Eastern Mediterranean Region, published on August 15, 2013 (http://www.eia.gov/countries/regions-topics.cfm?fips=EM).

the gas pipeline with a comprehensive settlement – would have the gas shipped to Turkey via Cyprus and/or its EEZ, something Nicosia would consider *only after* the comprehensive resolution of the Cyprus problem *and* the construction of the Vasilikos LNG terminal.

A second variation of this scenario calls for the construction of a Turkish-Israeli pipeline through the Cypriot EEZ without the prior resolution of the Cyprus problem. According to this scenario, a so-called interim solution would be agreed upon in order to secure the "right-of-way" of the pipeline through Cypriot waters. It is not clear exactly what Cyprus would gain from this interim solution, but one of the most imaginative ideas recently presented by Mr. Bryza at an international gas conference in Pafos in early September 2013 is that Delek and Noble would utilize the profits from the sale of the gas to Turkey in order to finance the construction of the Vasilikos LNG plant at a later stage. Yet even if one were to accept this idea, there is no guarantee that the profits would actually go toward building an LNG terminal in Vasilikos. Cyprus would have indirectly recognized the TRNC in exchange for exactly what?

Would a more politically tangible quid pro quo be more acceptable to Nicosia? Would Ankara be ready to offer such an incentive – for example, the return of the Varosia area to its proper inhabitants under UN/EU control, in exchange for a Cypriot permit to Zorlu, Akfel, Turcas, or anyone else who wants to build the Leviathan-Ceyhan pipeline? This is quintessentially a political question, and it appears extremely unlikely that any stakeholder would be willing or even able to provide the appropriate answer, especially since Turkey's prime minister refuses to even recognize the right of the Republic of Cyprus to exist and implement the Ankara Protocol.

For its part, Israel is unlikely to proceed with the de facto recognition of the TRNC, a possibility it refused to consider even at the apex of its strategic alliance with Turkey during the second half of the 1990s, when it planned to construct oil, gas, and water pipelines in order to connect it to Turkey. The return of Mr. Lieberman to power[3] has made it close to impossible for such a pipeline to exist even if it was built in such a way that would simultaneously bypass Cyprus *and* Lebanon. Noble and Delek are currently committed to the development of Aphrodite and the Vasilikos LNG terminal, and are highly unlikely to jeopardize their investments in Cyprus for any Turkish pipeline option that would essentially violate Cypriot sovereignty and constitute an indirect recognition of the TRNC.

[3] Shortly before his reappointment as foreign minister, Mr. Lieberman urged all interested parties to "stop deluding themselves about Turkish-Israeli relations." On October 13, 2013, Lieberman posted on his Facebook account the following statement, which should end – at least for the foreseeable future – the debate on the dynamics of the Turkish-Israeli "rapprochement": "I have no intention of improving relations with Israel … My opposition to apologizing to Turkey is not new, and I expressed it clearly before and after it happened. I reasoned and explained that it will not improve relations between the countries but will only harm Israel's standing in the region and play into the hands of extremists in the Middle East, with Turkey under Islamist extremist [President Recep Tayyip] Erdogan among them," Lahav Harkov, "Let's Stop Deluding Ourselves about Israel-Turkey Relations," *Jerusalem Post* (October 19, 2013).

Offshore, bypassing Cyprus via the Lebanese EEZ: The third alternative would essentially bypass Cyprus but would have to go through Lebanese territorial waters, or Lebanon's EEZ, depending on the distance of the pipeline from the shore. The difference would be very significant in terms of expense, since it could increase the cost by a factor of two if it goes via deeper waters. Given the existing state of war between Israel and Lebanon and their more-recent friction over an area of 854 km^2 that has frozen the development of the Alon F & Alon D blocks, it is impossible for the Israelis to bypass both Cyprus and Lebanon when considering an underwater pipeline connection to Turkey.

For reasons of geography, the pipeline would pass either through Cyprus's EEZ or through the area of the Lebanese EEZ, which is adjacent to the area of Israel's EEZ that is contested by Beirut. Moreover, a serious consideration of a Turkish-Israeli pipeline would make the ratification of the 2007 Cyprus-Lebanon EEZ agreement more, not less, likely, and would torpedo Israeli efforts to find an accommodation with the anti-Hezbollah factions inside Lebanon. Even in the highly unlikely case that Turkey and Israel could reach an accommodation with Lebanon, they would have to cross either Syrian territorial waters or Syria's EEZ, which are undefined with both Lebanon *and* Turkey.

The Leviathan-Ceyhan Pipeline (LCP): Economic and commercial considerations

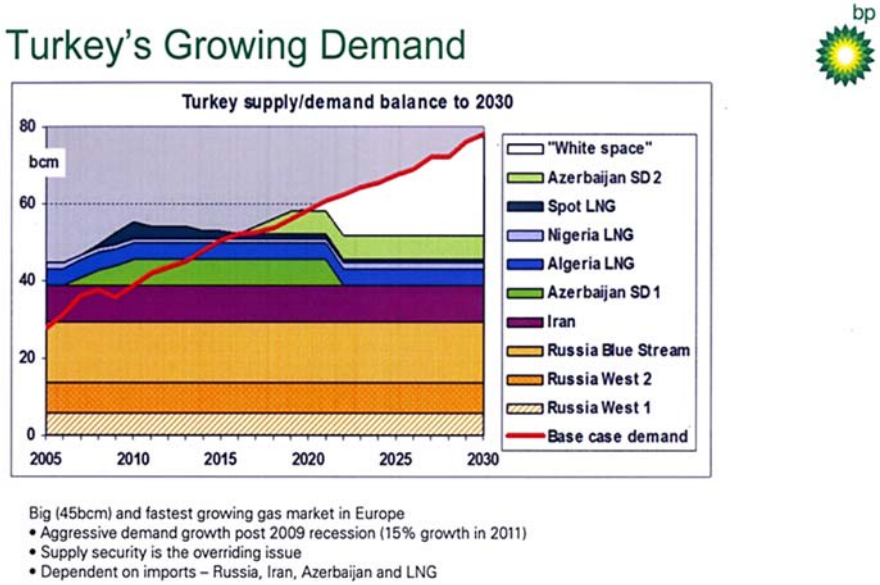
Apart from the multitude of geopolitical obstacles that undermine LCP's materialization, there are *three major commercial* arguments in favor of the LNG option, regarding the export of Israeli and Cypriot gas:

(1) Imbalanced trade relationship

Any pipeline option for the export of Israeli gas to Turkey that does not provide Tel Aviv with a secure transit option for Europe would essentially trap any Israeli or Cypriot exporter in an imbalanced "semi-monopsony" trade relationship with Turkey. Since LCP would only be making commercial sense as an 8 bcm/y capacity pipeline, even if Israel commits at least 8 bcm/y over a twenty-year period, it would still be exporting to Turkey over the life of the contract around 160 bcm, equal to 43 percent of Israel's entire export potential that is currently set at 370 bcm (40 percent of 920 billion cubic meters). This would make Turkey Israel's principal consumer. On the other hand, even if Turkey consumes by 2020 up to 8 bcm/y of Israeli gas, it would be dependent on Tel Aviv for *merely 13.79 percent* of its projected demand, estimated by BP at 58 bcm/y.

Turkey could easily replace Israeli imports if it would decide to do so by increasing supplies from its LNG sources: Iran, Russia, Azerbaijan, and (most probably by 2020)

Figure 2



Source: BP Azerbaijan.

Kurdish Iraq. Israeli/Cypriot exporters would not be able to find alternative export markets as easily as Turkey could find alternative importers from within its existing supply contracts and import infrastructures. Israel does not have other possible clients able to consume 8 to 10 bcm/y, even if it had the pipeline infrastructure with which to export this gas.

Moreover, any LNG liquefaction terminal would be utilized at full capacity as a matter of revenue maximization. Woodside and Noble are not likely to construct a liquefaction terminal with an idle or "standby" liquefaction capacity around 8 bcm/y so as to provide Israel with alternative export options in case Turkey decides to stop its Israeli imports. Idle liquefaction capacity is far more costly than an underutilized pipeline. In short, Israel's export vulnerability vis-à-vis a sudden disruption of Turkish imports is more than double Turkey's respective import vulnerability.

(2) No transit option via Turkey to Europe

An Israeli export option involving Turkey would make commercial sense only if all exported volumes were to be consumed in Turkey. The perception that a transit option for significant Israeli gas exports (more than 5 bcm/y) exists via Turkey to Europe is erroneous for the following five reasons:

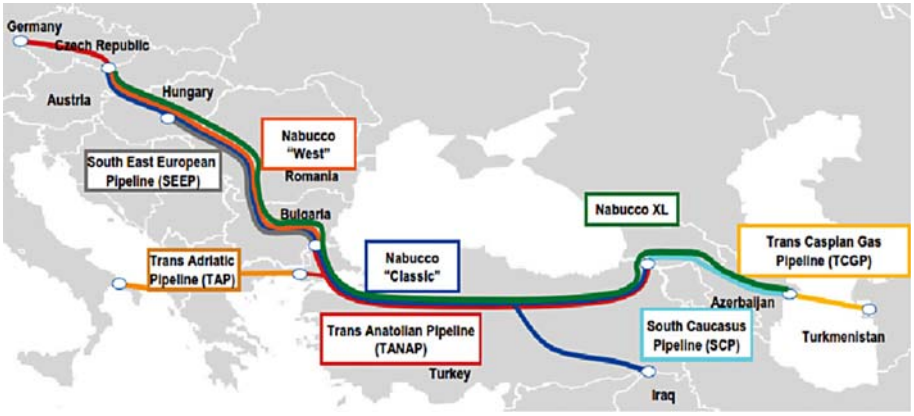
i. There is no spare transportation capacity within the National Gas Transmission System (NGTS) of Turkey capable of servicing the needs of even a 5 to 10 bcm/y

export volume toward Europe. If there was any spare transit capacity of that magnitude, Turkey would not be asking the Trans Anatolia Natural Gas Pipeline (TANAP) partners to transport the 6 bcm of Shah Deniz 2 production, which will be dedicated to cover its domestic needs.

ii. The construction of TANAP, which will become operational circa 2017-18, with a maximum transportation capacity of 31 bcm/y, will be dedicated to the service of Turkey's needs (6 bcm/y) and the transportation of Azeri exports – first from Shah Deniz (10 bcm), and thereafter from additional production from yet undeveloped fields, such as Safag-Asiman, Umid/Babek, and Absheron. These fields could cumulatively increase export volumes by around 10 bcm by the early 2020s, and this would take priority over any other available exports.

The Shah Deniz consortium and BP demanded that the four final contesting projects (Nabucco, ITGI, TAP, and SEEP) propose a pipeline project with a final scalable capacity of 20 (not 10) bcm/y, exactly because they want to factor into their long-term projections the availability of major gas exports *post* Shah Deniz 2. This means that if there would be spare transportation capacity in the TANAP system available to Israeli exporters, it would be limited to less than 5 bcm/y, and could become available after all Azeri export needs are covered. This is more likely to happen between 2023 and 2025, or later. Recently, even Turkey's own energy minister, Taner Yildiz, acknowledged that "We don't feel the need to add gas from other countries," pointing out that other gas fields such as Absheron, in the Azeri sector of the Caspian, are also expected to produce gas, which can be fed into TANAP.[4]

Figure 3



Source: RWE.

[4] "Turkey Doesn't See Iraqi, Israeli Gas in Planned TANAP pipeline: Minister," *Platts,* November 25, 2013 (http://www.platts.com/latest-news/natural-gas/istanbul/turkey-doesnt-see-iraqi-israeli-gas-in-planned-26489764).

iii. Consequently, in order to get the gas from Ceyhan to the Turkish-Bulgarian border, the champions of the LCP (Leviathan-Ceyhan Pipeline) would need to construct a dedicated pipeline independent of the existing Turkish NGTS. Such a pipeline would need to carry at least 10 bcm/y for a period of fifteen to twenty years in order to become bankable, and would cover a distance of approximately 970 kilometers on a straight line. Given the fact that Tractebel's cost estimates (used in the research conducted from the PRIO Center in 2013)[5] for onshore pipelines is calculated at $670 million per 100 kilometers, the minimum cost for such a pipeline would be around $6.7 billion, provided that the pipeline is built as if on a desert, with no detours and no altitude/terrain specificities factored into the cost estimate. In reality, the cost would be higher than $6.7 billion, although no preliminary engineering study actually exists, because Turkey claims that it can transport the Israeli gas through its existing capacity in the national transmission system. In order to put matters into perspective, compared to actual versus imaginative costs, TANAP, which will have a maximum throughput capacity of 31 bcm/y and cover a distance of 2,000 kilometers instead of 970 kilometers, is estimated to cost anywhere from $10 to $17 billion.[6]

iv. Even if Israeli gas could somehow transit via the Turkish NGTS and reach Turkey's border with Europe, there is no pipeline available to carry the Israeli gas to its final European destination. Both the Nabucco West and TAP projects were tailored to service up to 20 bcm of future Azeri gas exports. Since TAP prevailed over Nabucco West, Nabucco may present a theoretical alternative for Israeli exporters if they can resolve the lack of transit capacity in Turkey and get enough gas from Iraq, Iran, or Turkmenistan in order to construct a 20 to 30 bcm/y capacity pipeline. Nabucco developers cannot make the same mistake twice and promote a pipeline with only Israeli gas, even if 8 to 10 bcm/y would be available to them for a period of fifteen to twenty years.

They would need at least another 10 bcm/y from Iraq or Turkmenistan before attempting to resurrect the currently defunct pipeline project. In any case, the cost of all three pipelines (Leviathan-Ceyhan + Ceyhan-Edirne + Nabucco West) necessary to connect Leviathan exporters with a major European hub like Baumgarten will be significantly more expensive than the construction of two trains of LNG in Vasilikos, which are estimated to cost around $10.5 billion. Moreover, any pipeline transit via Turkey would "offer" the Leviathan developers considerable transit cost, significant transit risk, and, more importantly, minimal market flexibility compared to any LNG option.

5 Ayla Gürel, Fiona Mullen, and Harry Tzimitras, "The Cyprus Hydrocarbons Issue: Context, Positions and Future Scenarios," PCC Report, January 2013 (Nicosia: PRIO Cyprus Centre, 2013), p. 85.

6 This is the estimate of Kenan-Yavuz, the head of Socar's Turkish subsidiary. "TANAP Project Cost to Increase Up to $10 Billion," US-Azerbaijan Chamber of Commerce (http://www.usacc.org/ news-a-publications/ investment-news/637-tanap-project-cost-to-increase-up-to-10-billion.html).

v. If Nabucco's developers entertain the idea of Israeli gas exports, the final cost would still be significantly higher than any transit of Azeri gas due to the distance between Leviathan and Baumgarten, and the comprehensive interconnectivity of all Balkan markets by 2017. In order for a resurrected Nabucco to make better economic sense and regain the transit approvals of the interested states, it needs to feed the markets – especially high-profit markets, as is the case in the Balkans – through which it transits. Smaller-scale pipelines capable of transporting up to 5 bcm/y will integrate the markets of Greece, Bulgaria, Romania, Hungary, and Serbia by 2017, at the latest. This would therefore eliminate the need for a Nabucco-size pipeline for the export of Israeli gas to Central Europe that originates in Turkey.

After the collapse of Nabucco, Turkey will most likely speed up the process of constructing its own interconnector pipeline with Bulgaria in order to balance the strategic advantage Greece will acquire through the completion of the Interconnector Greece-Bulgaria (IGB). It should be noted, however, that this chain of interconnecting pipeline begins in Greece, since there is still no viable plan for the construction of a Turkish-Bulgarian gas interconnector, given the fact that Bulgaria would need to pay for over 90 percent of its construction.

If Israeli exporters do not wish to reach Baumgarten and target the higher-value southeast European markets (Bulgaria, Romania, Serbia, Hungary, Greece), they are more likely to export their gas to Greece's main LNG import terminal in Revythousa and secure swap arrangements with all Balkan states. Revithousa, after the expansion of its storage and regasification capacity, will be able to process up to 5 bcm/y of LNG imports equivalent to the cumulative requirements of the four principal regional consumers (Serbia, Romania, Bulgaria, and Hungary) in southeastern Europe.

(3) Net profits

Although an LCP that will export Israeli gas only to the Turkish market is the *second* less costly export option for Israeli gas,[7] it is not necessarily the most profitable option for Leviathan's developers compared to any LNG alternative. So let's ask a reverse question: Why would Nicosia and Tel Aviv not choose an LNG option over a pipeline to Turkey, even if it is less costly to construct? There are several reasons for this:

(a) Higher LNG profit margins

The best price Turkish off-takers would be willing to pay for Cypriot/Israeli gas is estimated at approximately $8.5/mbtu (million British thermal units). LNG prices in Europe were estimated in 2012 at $11 to $12/mbtu, and Japanese benchmark prices

[7] Only Israeli exports to Egypt and an export pipeline to Jordan would be cheaper exports options for Israel.

are anywhere between $15 to $17/mbtu. If Delek and Noble decide to liquefy 10 bcm/y of their gas in Vasilikos, the net profit margins of the LNG option *for the second LNG train* could be several times higher than the $1 to $1.75/mbtu Cypriot and Israeli exporters would hope to get from selling their gas to Turkey.[8]

Turcas has claimed that it would be willing to cover the entire cost of constructing and operating a 480-km underwater pipeline of 8 bcm/y capacity that would cost anywhere between $2 to $3 billion. In this scenario, if Noble/Delek are not burdened at all with the cost of transporting the gas to Turkey, Turkey becomes nearly equally attractive (at $2.5 to $3/mbtu), in terms of net profits, for Leviathan's developers as any LNG destination in Southern Europe, provided Israeli gas is consumed in Turkey and does not transit to Europe**.** If the overall cost for the development of Aphrodite/ Leviathan gas through an LNG terminal in Vasilikos is around $8 to $9/mbtu, then gas exports to Europe's less-interconnected (Balkans) and higher-value Mediterranean destinations, in Italy, Greece, Spain, and France, can generate a net profit of approximately $2.5 to $3/mbtu.

If export contracts to Asian markets are closed by Delek/Noble within 2015-16, especially *before* East African LNG development projects (especially from Mozambique) are launched, then the potential profit margins could be as high as $7 to $8/mbtu. This is why it is very likely that at least 50 percent of the projected exports from Aphrodite and Leviathan would find their way to Asian markets and not the European Union. The ongoing debate about whether Cypriot gas would be sold to Asia due to the expected increase of Australian exports and Chinese shale gas by the late 2010s *is irrelevant.*

The participation of KOGAS*,* South Korea's state-controlled natural gas company, in the ENI-led consortium, which is exploring for hydrocarbons in Cyprus's offshore Blocks 2, 3, and 9, guarantees that a significant share of potential Cypriot exports would reach Asian markets, even if they are exclusively consumed by South Koreans. KOGAS is not in Cyprus in order to sell Cypriot gas to Europe. KOGAS is in Cyprus to sell Cypriot gas to Seoul, and Seoul is, at the end of the day, the world's second-largest consumer of LNG, after Japan. Such an export strategy – equally dividing Cypriot LNG exports between Europe and Asia – would generate an average net profit for LNG exports at $5.125/mbtu, compared to a best estimate of $3/mbtu for the Turkish pipeline option.

(b) Higher-demand security due to multiple and "substitutable" export destinations

Another important advantage of LNG is that it ensures a higher level of demand security from the exporter's point of view. Pipelines commit an exporter to one particular market for a very long time and at a relatively steady price, especially if this market

[8] For the 2012 prices, *BP Statistical Review of World Energy,* 2013, p. 27.

is not well interconnected with other markets so as to provide alternative client options to the exporter.

Committing more than half (in the case of Israel) or the totality (in the case of Cyprus) of your exports to one market through one export venue is not a very good idea for a new exporting country, especially if the political climate between the exporter and the importer is unstable. There are no "peace pipelines" as yet, which are typically constructed and operated in a hostile political environment, and there will not be any in the foreseeable future, unless the economic cost of breaking this relationship is perceived as equally high for both sides, as was the case with the Soviet Gas pipelines to NATO-Europe in the 1980s.

This is not the case for a potential Israeli/Cypriot pipeline to Turkey. As has been already noted, an Israeli/Cypriot export pipeline to Turkey, regardless of its size and route, will also need to overcome a series of major geopolitical impediments that relate not only to the region's increasing volatility, but also to the political preconditions necessary to construct a multibillion-dollar investment which will need to operate for decades to come.

If Turkish-Israeli relations would return to a hostile status within the life expectancy of the Leviathan-Ceyhan pipeline, could Israel find readily available alternative export destinations in case Turkey cancels its own imports, or stops the transit of Israeli gas through its territory, even if such a transit were economically viable? The answer is negative. Gas pipelines do not get built in a matter of months. Similarly, LNG liquefaction capacities are not constructed quickly, and it is quite costly if they remain idle, as Egypt's experience clearly illustrates. Building excess LNG export capacity as a backup to a potential disruption of pipeline-based exports is highly expensive and counterintuitive. Furthermore, the structure of the international gas market – even the LNG market – is dominated by long-term contracts that are too inflexible to allow an exporter to find alternative clients in case its principal market destination is lost, especially if this market was serviced through pipelines and represented such a large portion of its entire export capacity.

(c) Minimal transit risk

Another major advantage of the LNG option is that it has no transit risk. In this context, the Russian-Ukrainian gas transit crises of 2006 and 2009 are irrelevant. The possibility of a new war between Russia and Georgia, as well as PKK attacks on the pipeline routes in North-Eastern Asia Minor, also become irrelevant. The main political risk factors which could sever the flow of gas from Azerbaijan to Europe do not constitute a political risk factor when you are dealing with an LNG option. The experience of the last decade illustrates the need to maximize the diversification of EU import routes and limit EU dependence on one or more transit states. No one wants to see Turkey – especially a Turkey that does not comply with the EU *acquis* – to

emerge as a second Ukraine in terms of the volume of gas that would be crossing Turkish territory on its way to European destinations.

(d) More cost-effective scalability

The second LNG liquefaction train is on average 25 percent less expensive than the first, and the third, 25 percent less expensive than the second. LNG trains do not require the same space and land acquisition costs as a second parallel pipeline with the same capacity as the first one. That is why Vasilikos can accommodate a maximum of three LNG trains, but could grow to eight trains if Cyprus relocates a small naval base that is adjacent to the Vasilikos area. The cost of building a second Leviathan-Ceyhan underwater pipeline will be exactly the same as the cost of building the first underwater link. This scalability essentially increases project profitability by significantly reducing construction costs.

How to Build Confidence over Energy Issues in the Context of a Cyprus Settlement?

Ayla Gürel, Hayriye Kahveci, and Harry Tzimitras[1]

Introduction and the regional framework

The discovery of hydrocarbons off the shores of Cyprus came at a time of both economic and political crisis for Cyprus and its European family framework, and coincided with regional uncertainty following the Arab Spring and the rupture of Israeli-Turkish relations. The hydrocarbons exploration potential, apart from the expected commotion, has become a national issue in Cyprus – or, at any rate, constitutes the new phase of the traditional one. At least for the Republic of Cyprus (RoC), hydrocarbons development has become the vehicle of promotion of the national cause against Turkey; the way out of the economic crisis; the affirmation of the RoC's importance; the cementing of bilateral relations with a number of states; and the securing of an economically, politically, and strategically viable future.

The regional framework includes Turkey-EU relations; Greek-Turkish relations; Turkish-Israeli relations; relations between Turkey and the other states in the region (Egypt, Lebanon, and Syria); as well as between Turkey and the states that became stakeholders through their national companies operating in Cyprus's waters. Thus, for instance, Greek actions might have a spillover effect, as Turkey might react spasmodically to actions it perceives as strangling or suffocating it, like a prior initiative regarding a common Greece-Republic of Cyprus EEZ. At the same time, the EU framework-Turkey relations come into play in various ways. The RoC EEZ is part of the proposed EU EEZ. Drawbacks in Turkey's EU vocation would also be expected to influence its behavior and willingness to cooperate. In such an eventuality, for instance, the RoC and Greece would stand to lose much of their perceived or actual leverage vis-à-vis Turkey.

At the same time, political instability in the wider Middle East introduces considerable challenges for the foreign policies of all countries in the region. In the case of Turkey, these challenges might render it more difficult for the government to regard the Cyprus issue as a priority. This means Turkey would not be able to contribute much to a Cyprus settlement. Similarly, domestic turbulence in Turkey and initiatives on other fronts (the Kurdish issue, the Alevite issue, other minority issue openings, etc.) are not conducive to a prioritization of the Cyprus issue.

[1] Dr. Ayla Gürel is a senior research consultant at PRIO Cyprus Centre. Dr. Hayriye Kahveci is teaching at the Middle East Technical University's Northern Cyprus Campus. Dr. Harry Tzimitras is the director of PRIO Cyprus Centre.

Finally, there is great speculation regarding Turkish-Israeli relations. The recent rapprochement process between the two countries, and the role that potential cooperation in energy matters has played to this end, introduce an important parameter to be taken into consideration. Private companies from both sides have been actively pushing for the construction of a direct pipeline between Israel and Turkey. This would definitely have a bearing on the expected gas cooperation between the RoC and Israel.

On the other hand, developments in the RoC – in particular, the economic crisis – dramatically affect the hydrocarbons issue in its substance and its perception. Thus, the dire financial situation the RoC finds itself in at the moment means that pragmatism regarding the different options for hydrocarbons extraction and export needs to prevail. This means prioritization of financially and temporally expedient solutions that might involve cooperation with neighboring states.

The finding of hydrocarbons in the area, then, has both exacerbated existing tensions and holds the key to cooperation, ensuring non-escalation of conflicts and their resolution. At the same time, hydrocarbons have already contributed to new regional cooperation and have indirectly facilitated a diffusion of other crises. In August 2013 a memorandum of understanding was signed between Israel, Greece, and the RoC regarding cooperation in the field of energy. Historical rivals Greece and Turkey have found in energy an avenue for cooperation, with the Turkey-Greece Interconnector joining their gas pipeline networks. The prospect of cooperation in oil and gas exploration and exploitation in the Eastern Mediterranean also played a key role in the recent rapprochement between Turkey and Israel.

Furthermore, oil and gas "concessions" by Israel, meant to serve as the locomotive industry of the economy in a possible independent Palestinian state in the future, could serve as the basis for cooperation toward a solution of the Israeli-Palestinian problem. Similarly, in the case of Cyprus, collaboration on hydrocarbon issues could be a unique opportunity for cooperation between the two communities on the island and beyond, including Turkey and Israel. It could serve as a platform for mutually beneficial dialogue and confidence building, paving the way toward a solution to the Cyprus issue.

Strategic challenges in the Eastern Mediterranean and economic realities in the individual countries of the region highlight the pressing need for cooperation, and hydrocarbons offer probably the best platform for doing so. At the same time, they can easily trigger conflict if the countries involved pursue policies that are insensitive to regional realities.

Background: A very brief description of the political situation

Following the breakdown in 1963 of the original bicommunal power-sharing government of the RoC, the Greek Cypriot community assumed sole governance of the state. Over time, and without any formal revision to the relevant international treaties and the constitution, this de facto Greek Cypriot government came to be internationally accepted as the legitimate RoC government. Meanwhile, the Turkish Cypriots set up a parallel administration to govern themselves in the numerous enclaves scattered throughout the island. In 1974, a Greek-Greek Cypriot coup aimed at uniting the island with Greece triggered Turkey's military intervention and the de facto division of the island into a northern and a southern part.[2]

The RoC has since been in control of the southern part. In the north, the Turkish Cypriots established their separate de facto state, the Turkish Republic of Northern Cyprus (TRNC), recognized only by Turkey. The Turkish Cypriots and Turkey, in contrast with the international community, do not recognize the government in the south as the legitimate RoC government on the grounds that since the 1963 rupture, no single authority constitutionally competent to represent Cyprus as a whole (i.e., Greek Cypriots and Turkish Cypriots together) has existed on the island. The Greek Cypriots for their part regard the north as occupied RoC territory, and the TRNC as Turkey's "puppet state."

UN-sponsored intercommunal negotiations aimed at resolving the anomalous political situation on the island through the establishment of a bizonal, bicommunal federation have been going on intermittently for over four decades. The latest round of talks began in 2008, but petered out after March 2012. In February 2014, the two communities agreed on a joint declaration, which enabled the resumption of the talks. The agreement was reached after difficult and protracted negotiations. Before the breakthrough, the discussions had been stuck for several weeks, the impasse mainly stemming from the parties' differences on how sovereignty will be exercised in a post-settlement united Cyprus.[3] In the talks held so far, a point of agreement, which is likely to stay in the new phase of negotiations, has been that the island's natural resources would be a federal competence.

Exploration by the RoC

The RoC began prospecting for hydrocarbons in 2006 in a thirteen-block exploration area off the island's south coast. Having held two international tenders for exploration licences, it has so far licensed Block 12 to US-based Noble Energy (2007), Blocks

[2] Turkey and Turkish Cypriots officially describe this action as a "peace operation," while Greek Cypriots and most of the international community view it as an "invasion."

[3] Security Council Report, "January 2014 Monthly Forecast: Cyprus," December 20, 2013 (http://www.securitycouncilreport.org/monthly-forecast/2014-01/cyprus_3.php).

2, 3, and 9 to the Italian-South Korean consortium ENI-KOGAS (2013), and Blocks 10 and 11 to French firm TOTAL (2013). Noble launched its first drilling operation in Block 12 in September 2011 at a location called the Aphrodite field, and announced in December 2011 that it had discovered an estimated mean of 7 tcf (198 bcm) of natural gas. However, following an appraisal drilling in summer 2013, the company revised its estimate for Aphrodite downward to 5 tcf (140 bcm). Noble plans to carry out additional appraisal drilling in Aphrodite and more exploratory drilling in another prospect in Block 12 within 2014. ENI-KOGAS and TOTAL are also expected to start drilling sometime in late 2014 or early 2015.[4]

Given the small size of the country and hence, its small domestic market potential, the RoC can safely export most of the discovered gas. While a pipeline to Greece (giving access to other European networks) is still considered a possible export route, the government's preference remains an LNG plant on the island's southern coast at Vasilikos, aimed at European and Asian markets. The hope is that this plant would process not only Cyprus gas, but also potentially gas from Israel and Lebanon, thus "making it possible to create a world-class LNG hub at Vasilikos."[5]

However, the estimated 5 tcf of gas so far discovered is not enough to make an onshore LNG commercially viable.[6] Thus, securing the use of gas from Israel's Leviathan field now has become urgent and necessary for the construction of an LNG plant in Cyprus.[7] The RoC has asked Israel to allocate about a fourth of its Leviathan gas for LNG export via Cyprus,[8] a proposition which Israel has yet to accept. On the other hand, the RoC has not excluded altogether the possibility of a Cyprus-Turkey gas pipeline – a project of great interest to Turkey and the Turkish Cypriots, albeit after a solution in Cyprus. RoC Commerce, Industry, and Tourism Minister George Lakkotrypis has ruled out a pipeline in advance of a solution, but said that it could be an option after a settlement of the Cyprus issue.[9]

4 Poly Pantelides, "Noble: Cyprus's Gas World Class," *Cyprus Mail*, October 4, 2013 (http://cyprus-mail.com/2013/10/04/noble-cyprus-gas-world-class/).

5 Charles Ellinas, "Cyprus Energy Reserves," presentation at The Economist's 9th Cyprus Summit, Nicosia, November 25, 2013.

6 Elias Hazou, "Gas Plans Have Precedence over Oil for Noble," *Cyprus Mail*, December 19, 2013 (http://cyprus-mail.com/2013/12/19/gas-plans-have-precedence-over-oil-for-noble/).

7 Timing is critical because of the uncertainties about the future direction of gas prices. Experts warn that by the time additional gas is found in the RoC's Block 12 and other licensed blocks, it will be too late for entering the lucrative Asian markets. See Stefanos Evripidou, "Gas Chief in LNG Warning," *Cyprus Mail*, November 24, 2013 (http://cyprus-mail.com/2013/11/24/gas-chief-in-lng-warning/).

8 Elias Hazou, "Minister Pushes Plan for Joint Gas Exports with Israel," *Cyprus Mail*, October 22, 2013 (http://cyprus-mail.com/2013/10/22/minister-pushes-plan-for-joint-gas-exports-with-israel/).

9 Interview in *Kathimerini* (in Greek), December 23 2013 (http://www.kathimerini.com.cy/index.php?page-action=kat&modid=1&artid=157824).

Hydrocarbons and the sovereignty issue

RoC's offshore exploration activities and gas discovery initiated a dispute between Turkish Cypriots and Turkey, on the one side, and Greek Cypriots, on the other, over sovereign rights in the island's EEZ. This has in turn accentuated the parties' fundamental differences at the negotiations on the crucial and persistent question of sovereignty. Indeed, the abovementioned impasse on the joint communiqué is a clear indication of this. This is evident from the parties' positions with regard to rights in Cyprus's EEZ, which are summarized below.[10]

The Greek Cypriot position is that, as an internationally recognized state, the RoC is entitled to an EEZ, can sign maritime delimitation agreements with other states, and enjoys exclusive sovereign rights to explore for and exploit the natural resources in its EEZ. Accordingly, pending a political settlement, the RoC's sovereign right to explore and extract hydrocarbons lying in its EEZ is "inalienable and nonnegotiable," and is not conditional on a Cyprus solution. More specifically, the exercise of this right is not a bicommunal issue for negotiation with the Turkish Cypriots at present (i.e., before a settlement). The Greek Cypriots accept – as does the international community – that the island's offshore natural resources belong to Turkish Cypriots as well as Greek Cypriots, but they say that the former will enjoy the benefits of any natural resource wealth within the framework of a united Cyprus. The international community generally supports the Greek Cypriot position, although some international actors have emphasized more firmly than others the point that revenues must be shared with the Turkish Cypriots.[11]

The Turkish Cypriots and Turkey, for their part, object to all RoC actions relating to EEZs and offshore hydrocarbons development on the basis that the Greek Cypriots alone cannot legitimately represent Cyprus as a whole. They regard such actions as involving the exercise of sovereign rights at the international level, which, they maintain, Turkish Cypriots and Greek Cypriots possess jointly, by virtue of their being the equal constituent communities of the RoC as it was established in 1960. Since the Greek Cypriots and Turkish Cypriots are co-owners of the island's offshore natural resources, exploration for and development of such resources can only be jointly carried out by the two communities. From this perspective, any RoC action in this

[10] For a comprehensive discussion of the positions of all interested parties and references, see chapter 4 in Ayla Gürel, Fiona Mullen, and Harry Tzimitras, "The Cyprus Hydrocarbons Issue: Context, Positions and Future Scenarios," Report, January 2013, PRIO Cyprus Centre.

[11] For example, in his last four reports on the United Nations operation in Cyprus, the UN Secretary-General noted that it is important to ensure that any newfound natural resource wealth will benefit both communities. Also, the United States holds the position that the island's natural resources "should be equitably shared between both communities in the context of an overall settlement," but, at the same time, it believes that this issue "underscores even more the need for a comprehensive settlement that would entail sharing of [hydrocarbon] revenues." See "New US Ambassador to Cyprus Vows to Work for Reunification," *Famagusta Gazette*, July 20, 2012 (http://famagusta-gazette.com/new-us-ambassador-to-cyprus-vows-to-work-for-reunification-p16102-69.htm); and US Department of State, Press Conference by Philip H. Gordon, Assistant Secretary, Bureau of European and Eurasian Affairs, Nicosia, Cyprus, July 13, 2012 (http://www.state.gov/p/eur/rls/rm/2012/195058.htm).

field now – at a point where the Cyprus problem is still unresolved – amounts to ignoring the legitimate rights and interests of the Turkish Cypriots.

In addition to the intercommunal dimension of the natural resources issue, Turkey itself has another reason for opposing the RoC's pursuit for hydrocarbons: Its continental shelf claims in the Eastern Mediterranean clash with the EEZ proclaimed by the RoC. More specifically, Turkey disputes the RoC-Egypt EEZ boundary agreement, insisting that this agreement ignores Turkey's continental shelf rights in the area to the west of longitude 32° 12' 18". The continental shelf that Turkey claims in this area covers almost all of the EEZ, which the RoC claims in the west and partially overlaps RoC exploration Blocks 1, 4, 5, 6, and 7 in the southwest. Of course, this issue of overlapping claims is also related to the Cyprus issue; this is because, pending a solution, and as long as Turkey does not recognize the solely Greek Cypriot-led government as legitimately representing the RoC, it is difficult to see how the claimants can come together to discuss a negotiated solution or resort to an international adjudicative mechanism or tribunal for a resolution of their claims.

In response to the Greek Cypriot exploration initiatives, the Turkish Cypriots and Turkey moved to restore the political balance – as they see it – in the context of the Cyprus issue, by taking "reciprocal steps of equal significance." The TRNC signed a continental shelf delimitation agreement with Turkey in September 2011, about the time when Noble Energy started drilling in the RoC's offshore Block 12. In the same month, it issued licenses to TPAO for seven offshore blocks and one onshore block. Two of these blocks overlap approximately 40 percent of the RoC exploration area in the island's southeast. Meanwhile, Turkey also claims that parts of RoC Blocks 1, 4, 5, 6, and 7 in the southwest of Cyprus overlap its own continental shelf, and has declared that it would not allow any exploration in these areas.

At the same time, the Turkish Cypriots proposed that the two sides work together in developing Cyprus's offshore hydrocarbon resources. Their proposals notably entailed obtaining the two sides' mutual consent on international agreements signed and exploration licenses granted unilaterally by either side, and a joint decision about each side's share of the resources. The Greek Cypriots ignored the proposals, which contradict their stance that the current RoC's sovereign right to explore in Cyprus's EEZ is not a bicommunal matter. They see them as part of Turkish attempts to put on an equal par the unrecognized TRNC with the internationally recognized legitimate state, the RoC.[12]

It is clear that the controversy here is closely linked to the dispute in the context of the negotiations over sovereignty and the related question of transition from the present status quo to the new one in a reunited Cyprus. In this dispute, the Greek

[12] RoC PIO, "Statements by the Government Spokesman," October 6, 2011 (http://www.cyprus.gov.cy/moi/pio/pio.nsf/0/1a80c6a9b4d04bd3c2257921002af4d0?OpenDocument&print).

Cypriots insist that "the [new] state of affairs that will result must be a continuation and an evolution of the [existing] Republic of Cyprus into a federal state with … a single sovereignty …," while the Turkish Cypriots talk about a new partnership state which the two existing sovereign entities/peoples will create by ceding some of their sovereignty to it.[13]

Thus, contrary to expectations that they would act as a catalyst for reconciliation, offshore hydrocarbon resources have so far simply exacerbated the parties' more fundamental and long-standing disagreements at the negotiating table, and hence complicated the solution of the Cyprus problem.

Possible measures and obstacles

A possible improvement of conditions regarding the four areas listed below could lead to a conducive environment that would contribute to confidence-building between the parties to the Cyprus issue.

1) Capoeira Dance: Assertion of maritime jurisdiction claims

So far the parties have done little toward building confidence over energy issues. On the contrary, the RoC's initial declaration of an EEZ and signing of EEZ delimitation agreements with Egypt triggered a maritime dispute between Turkey and the RoC, creating serious security concerns in the region. While NATO member Turkey is not happy with the international community's clear approval of the RoC's exploration activities, the RoC appears to exercise some caution in furthering these activities, and has so far refrained from licensing areas that overlap with Turkish claims. Turkey has signaled that it would go as far as taking military action against any activity in these disputed areas.

The main obstacle in this domain is political. Mere lack of diplomatic relations between Turkey and the RoC complicates any effort to improve the situation. For the time being, an official third-party (e.g., UN) involvement seems to be impossible due to the political positions of the parties, Turkey's in particular – a situation which eliminates the possibility of obtaining parties' consent for such an official involvement.

The only option left seems to be an unofficial dialogue between the parties. The recent dialogue between Turkish foreign minister Ahmet Davutoğlu and Greek foreign minister Evangelos Venizelos might open a window in this regard. For this dialogue process to evolve into something that can contribute to confidence-

[13] See, for example, PIO RoC, "The President of the Republic Mr. N. Anastasiades Addresses an Event at the Cypriot Community Centre, in London," September 21, 2013 (http://www.cyprus.gov.cy/MOI/pio/pio.nsf/9c0256267bb09565c2257076004d0270/825b75e8d46190c0c2257bed003ac419?OpenDocument); and "Cumhurbaşkanı Eroğlu Basın Mensuplarına Resepsiyon Verdi," *Haber KKTC*, December 27, 2013 (http://www.haberkktc.com/haber/cumhurbaskani-eroglu-basin-mensuplarina-resepsiyon-verdi-84664.html).

building, both parties should agree somehow not to push each other into escalating tensions in the region. While on the one hand the RoC might agree not to antagonize Turkey over the disputed areas, on the other hand Turkey might be persuaded to refrain from issuing military threats against the RoC.

2) Exploration / exploitation / revenue sharing / usage

So far both Cypriot sides have chosen to follow separate paths in their exploration activities, a situation which currently serves as a mutual provocation element. While the Turkish Cypriots say their proposals for cooperation remain on the table, the Greek Cypriots object to any kind of dialogue on this matter before a political settlement is reached. Exploitation has not started yet. On revenue sharing, the Greek Cypriots take the position that this also has to wait until after a settlement. The issue of usage (the possibility of using natural gas on both sides of the island) has not even been brought up yet. The reason for deadlock in this area is twofold. On the one hand, lack of dialogue prevents any progress toward confidence-building initiatives. On the other hand, the fact that all four items (exploration, exploitation, revenue sharing, and usage) are being considered as inseparable adds to the challenges of starting any discussion on these issues.

Matters of exploration and exploitation could be de-linked from matters of revenue sharing and usage, and two unofficial dialogue schemes could be established in order to increase the chances of progress. Matters of exploration and exploitation have essentially been related with the sovereignty claims of the two parties. Progress could conceivably be achieved here if Turkey could be induced to tone down its aggressive position. This could open a possibility for persuading the Greek Cypriot side to come closer to dialogue. Revenue-sharing and usage issues should be considered under a separate dialogue process. There is potential for improvement here, especially because of opportunities involved regarding the financing of a possible Cyprus settlement, and conversion on both sides of the island to more-sustainable energy production infrastructures in line with the EU 2020 targets, etc.

3) Transportation to external markets

So far there have been various transportation scenarios, ranging from pipelines providing access to European markets through Greece or Turkey to construction of LNG facilities off the shores of Israel or on Cyprus. It seems that Israel's moves will have a determining impact on developments in this area, which may or may not contribute to confidence-building among the parties. For the time being it seems that a dual transportation regime is being mooted. On the one hand, the RoC is determined to build an LNG terminal even though this seems to be a hard task to realize without Israel's natural gas. On the other hand, several Turkish and Israeli

companies are in talks regarding the construction of a pipeline from Israel to Turkey, which would need to pass through the EEZ claimed by the RoC, thus raising an issue that would have to be discussed with the RoC.

Israel might play a key role in starting a dialogue between the RoC and Turkey. Of course, this requires a full normalization of Turkish-Israeli relations (downgraded as a result of the *Mavi Marmara* incident of May 2010). The two sides have been in dialogue for this purpose since March 2013, when, at the personal request of President Obama, Prime Minister Netanyahu apologized to Turkey for the killing of nine Turkish citizens during the incident.

As regards gas export options, signals regarding Israel's concern for not putting all her eggs in one basket are becoming clearer every day. It seems that Israel will favor at least a dual transportation regime for its natural gas. In addition to recent discussions regarding possible gas exports to close neighbors, such as Egypt, Palestinian Authority, and Jordan, Israel will still have to consider developing further export routes for the 40 percent of its natural gas resources.[14] An Israel-Turkey pipeline, which is considered as a commercially attractive option, could be realized if the RoC is persuaded to allow it to go through its EEZ. The catch in return for the RoC will be twofold: Such a pipeline could have a branch that would transport Israeli gas to the RoC, providing the increased volume of gas needed to make the latter's planned LNG terminal commercially viable.[15] Then the pipeline infrastructure could become the basis of a quick monetization option for the Aphrodite field (through export to Turkey), since for the time being the RoC is already behind schedule for its LNG terminal project.

4) Environmental protection

Although not discussed very much, environment seems to be the most possible area of cooperation between the two parties. A technical dialogue process on monitoring and crisis management could be established with the potential to have wider regional implications, and contribute to the development of an East Med Environmental Regulation regime regarding increasing hydrocarbon potential of the region.

With its already-existing environmental regulation mechanism, the European Union could play a leadership role in convincing the parties to take constructive steps on the subject.

---

14 Natural Gas Europe, "Israel: An Overview of Export Options," January 30, 2013 (http://www.naturalgas-europe.com/israel-overview-of-export-options).

15 For more on monetization options of Cyprus Natural Gas, see: MIT Energy Initiative, "Interim Report for the Study of Natural Gas Monetization Pathways for Cyprus, Economics of Project Development Options," MIT Energy Initiative, Massachusetts Institute of Technology, August 2013 (http://www.cyi.ac.cy/Cyprus_NG_interim_report.pdf).

Conclusion

The discovery of hydrocarbons off the shores of Cyprus has triggered tensions and exacerbated the parties' more fundamental and long-standing disagreements at the negotiating table, and hence complicated the solution of the Cyprus problem. Yet, this discovery also holds the key to cooperation, ensuring non-escalation of conflicts and their ultimate resolution. There are numerous alternatives for regional cooperation that will bring greater benefits to the involved parties from the development of Eastern Mediterranean hydrocarbons. Thus, despite the political challenges, it is still possible that incentives from regional cooperation over hydrocarbons development may drive the parties to look for ways to bridge their differences. Arriving there would require bold political vision on the part of the leaders in the region – that is, both sides of Cyprus, Greece, Turkey, and Israel, coupled with backing from influential external actors with an interest in reconciliation and stability in the region.

THE CONFLICT BETWEEN ISRAEL AND LEBANON OVER THEIR EXCLUSIVE ECONOMIC ZONES

NAJI ABI-AAD[1]

The unsolved issues related to defining the maritime boundaries between Israel and Lebanon constitute an important challenge facing the development of hydrocarbon resources in the East Mediterranean region, especially in the areas straddling the borders, with this dispute following the path of a long history of political conflict and military confrontation between the two neighboring countries.

Lebanon's claims over its exclusive economic zone (EEZ)

Lebanon has been accusing its southern neighbor of unrightfully claiming nearly 860 square kilometers of its own EEZ, with Israel concluding in December 2010 its maritime border agreement with Cyprus. Lebanese officials and leaders hinted that the Israeli claim would be considered an act of military occupation of the country's territories. Israel denied the allegations, saying that there are "very strong arguments under international law" that back its claims, based on the "Blue Line" to which its forces withdrew in 2000 from Lebanon following a UN-brokered ceasefire. However, Beirut considers the Blue Line to be a working line, rather than an international boundary.

Lebanon requested the support of the UN to solve this issue, on the basis of maps which the Lebanese government claims were supported by the United States. For that purpose, Beirut in 2010 deposited with the UN Secretary-General the geographical coordinates for the delimitation of the EEZ. Obviously, these coordinates do not coincide with those used in the agreement between Cyprus and Israel.

Meanwhile, Lebanon requested that Cyprus adjust its delimitation agreement with Israel so as to reflect its claims. Although Nicosia refused, it has repeatedly sent diplomats to the region in an attempt to mediate between Beirut and Tel Aviv. Similar, more-aggressive efforts have been undertaken by Washington.

Lebanese-Israeli relations in a new energy context

The problematic borders between Israel and Lebanon have been strongly reflected on the ground, especially the fact that, according to recent seismic studies and explo-

[1] Dr. Naji Abi-Aad is the COO of Petroleb and director of the Institute for Energy Economics at the American University of Beirut, Lebanon.

ration activities, offshore East Mediterranean and its Levantine Basin has considerable reserves of hydrocarbons. Already in 2010, the US Geological Survey (USGS) reported the undiscovered resources in the region to be at an average of 1.7 billion barrels of oil and 3.46 trillion cubic meters of natural gas.

Of those resources, there are the ones discovered by Israel in the Tamar field, which lies some 35 kilometers south of Lebanese waters, and contains between 110 and 270 billion cubic meters of proven reserves. The Lebanese and other media reports have suggested that Tamar straddles at two locations the maritime border claimed by Lebanon.

Whether this is true or not remains to be seen, but what is certain is that more-complicated and serious problems could occur if a field located on both sides of the borders, or closely straddling the boundaries, is discovered by either Israel or Lebanon before resolving the border dispute.

While the area could prove to contain large resources of hydrocarbons that could positively impact the economies of both Israel and Lebanon, these countries are still in a state of armistice (since 1948) if not a state of war (since 2006), with mutual threats between Lebanese and Israeli politicians to resort to force in the case of an encroachment on what they see as their respective maritime territories.

Nevertheless, experts and officials tend to believe that the maritime border conflict between Israel and Lebanon should only partly hinder or delay the two countries' respective plans to develop their hydrocarbon resources, especially around the disputed area. Nevertheless, the situation would dramatically evolve if a field is discovered in this same disputed area by one of the countries.

External attempts to mediate

Recently, in April 2013, Cyprus expressed its renewed interest in reviving mediation efforts to settle the Israeli-Lebanese maritime border dispute in which it actually has been partly involved, and which has prevented as yet the ratification of a Cypriot-Lebanese agreement on border delimitation.

One of the main indirect objectives behind the Cypriot "goodwill" moves is to convince Lebanon to send its natural gas to a Cyprus-based liquefaction plant, which could well become a hub through which East Mediterranean gas (including the resources of Cyprus itself, Lebanon, and Israel) would be exported. Another goal would be to "pacify and neutralize" the Cypriot blocks straddling the borders with Lebanon, especially at the time when those blocks have been offered for licensing.

Following the Cypriot efforts and others undertaken by the UN – and, especially, the United States – to indirectly negotiate a settlement, there are unofficial indications of possible solutions. Recent informal information revealed that there has been a

sort of agreement under which Lebanon will have the rights to 500 square kilometers from the disputed area, leaving the remaining 360 square kilometers for future negotiations. Nevertheless, this information has not been confirmed by any of the concerned countries.

It is clear that the main obstacle for potential progress in finding a settlement to the problematic border issue between Israel and Lebanon remains the mutual distrust and reciprocal suspicion resulting from more than sixty-five years of fierce animosity and terrible hostilities.

Potential options for an ultimate settlement of the border dispute

However, there should be a way out of this impasse. One or more of the following potential options could well be considered to lead to an ultimate settlement of the border dispute:

- Relying on the United States, being a friend to both countries, and ready to mediate on this issue; this is a relatively efficient and quick diplomatic line, but could face reluctance from some anti-American forces in Lebanon;
- Referring to the Law of the Sea and putting the case for the mediation of the International Tribunal for the Law of the Sea in Hamburg, or that of the Permanent Court of Arbitration at The Hague; this approach would normally take years of unnecessary and idle deliberations, and could lead to unrealistic and/or unacceptable solutions;
- Putting the issue under the jurisdiction of the UN Security Council by enlarging the mandate of the UN Interim Force in Lebanon (UNIFIL) to encompass the maritime boundaries between Israel and Lebanon, in addition to their land borders; this could be a realistic and acceptable solution for all parties, but such a move must be strongly backed by the United States; and
- Supporting the efforts of Cyprus to mediate between Israel and Lebanon; however, these countries do not always see the role of Cyprus as neutral.

LEBANON AND ISRAEL: A LINE ON THE WATER

FRED C. HOF[1]

One of the diplomatic missions I undertook for the Department of State involved an attempt to draw a liquid line on the eastern Mediterranean Sea. For about a year, starting in the spring of 2011, I consulted with the governments of Lebanon and Israel on how best to divide their respective exclusive economic zones (EEZs). At issue was approximately 880 square kilometers of Mediterranean seabed claimed by both and likely containing natural gas and oil deposits.

Both Israel and Lebanon considered the United States to be a sympathetic third party genuinely interested in helping them achieve a practical and honorable accommodation, one resulting in a line of maritime separation with which each could live. Given that the two sides lacked diplomatic relations and interacted directly only in security-related meetings at the United Nations Interim Force in Lebanon (UNIFIL) headquarters in southern Lebanon, third party assistance was required. It took the form of multiple meetings over nearly a year with each side separately, in Beirut and Jerusalem.

This effort culminated in the spring of 2012 when I gave each side (separately) an identical set of conclusions and recommendations. I am cannot share now the specifics of what was recommended. The United States remains actively engaged in trying to help Lebanon and Israel come to arrangements enabling them explore and exploit significant natural resources in a non-contentious, mutually respectful, and even cooperative manner: behavior investors (international energy companies) would find attractive and reassuring in a very competitive international oil and gas market. Since American diplomatic efforts are ongoing and my recommendations remain relevant, I will restrict myself to five observations.

First, disputes of this nature are by no means uncommon in the world of unilateral EEZ claims. In this case both sides acted professionally in their calculations and performed in ways fully consistent with customary international practice. I and the small team of American experts who helped me and who interacted with Lebanese and Israeli experts were highly impressed by the professionalism of all concerned.

In fact, there is nothing complex about the Lebanon-Israel case in terms of their coastline or the methodologies they used in asserting conflicting claims. Indeed, if they had had diplomatic relations this relatively minor disagreement would have either been long-since resolved or may not have arisen at all. Each side used accept-

[1] Fred C. Hof is Senior Fellow at the Atlantic Council's Rafik Hariri Center for the Middle East, and former special advisor for transition in Syria at US Department of State, Washington, DC.

able methodologies to arrive at differing answers about where the separation line dividing their respective EEZs in relation to the EEZ claim of the Republic of Cyprus should be: where a line out to sea from near Ra's el-Naqoura/Rosh Hanikra would intersect with a Cypriot line, one that Israel and Lebanon had each accepted.

Second, however, the troubled relationship between these two countries (particularly since 1967) could not be ignored. It was mitigated in this case by our efforts to explain, as best we could, the thinking of each side to the other. In the end the cartographic and legal experts in Beirut and Jerusalem – with each side upholding its respective line as the best – achieved a degree of respect (grudging perhaps) for the work of their opposite numbers. The fact, however, that Israel and Lebanon lack diplomatic ties, have a difficult history, and have no mutually agreed international boundaries on land or sea had an inevitable drag on our ability to broker a solution that each side would regard as fair, honorable, and just. To the extent trust was a factor, it was provided by the third party.

Third, however, at no time did either side manifest a "take it or leave it" attitude with respect to their respective claims. Experts on both sides were acutely aware that the principle of equidistance in projecting maritime claims from land to sea was not an exact science involving a single, canonical formula; that by assigning differing weights to various land base reference points it was possible to bend lines in desired directions. Both sides took pride in the scientific basis of their claims. Each side maximized its claim within the bounds of cartographic and customary practice. Neither, at least at the expert level, ruled out the possibility that a wide range of valid lines could be produced depending on the way the principle of equidistance was applied in practice.

Fourth, however, there was a tendency in some Lebanese political quarters to view Lebanon's claim as sacrosanct; as the assertion and existence of a national boundary not subject to amendment except through the most rigorous of constitutional processes. Although the attitude itself was understandable in the context of a difficult history, it was and is factually incorrect. No line unilaterally asserted by Lebanon or Israel could or would constitute a legally permanent and binding maritime boundary. Such a boundary depends on both parties signing an appropriate bilateral agreement. Lebanon and Israel do not, at present, have permanent and binding boundaries. Indeed, the absence of a land boundary in this case raised the question of where exactly a line projected over the Mediterranean Sea would begin.

Until relations between Israel and Lebanon are normalized, their line-drawing task in the EEZ context (beyond depicting unilateral claims) is to create a mutually agreed maritime separation line that would be legally binding but provisional, pending eventual agreement on permanent and binding international boundaries. Were the two sides to accept the same provisional maritime separation line, each would separately

register that line with the United Nations. Both sides would still be at liberty to make any boundary claim they wish when normalization (peace) talks take place.

Fifth, and finally, if Israel and Lebanon wish to assure investors that the legacy of conflict characterizing the post-June 1967 war era will have no bearing on the peaceful exploitation of petroleum resources, they will move with dispatch to resolve or at least neutralize this dispute.

If filing a coincident maritime separation line proves too hot to handle politically – and it should not – then a unitization arrangement equitably sharing revenues derived from all or part of the disputed area could be arrived at, perhaps with each side contracting independently with the same drilling company. At the very least the parties should avoid fishing in troubled waters, as it were, until a mutually acceptable arrangement can be reached. Both sides, in any event, have plenty of work to do in areas not under dispute: areas whose size dwarfs the relatively small zone under contention. Until arrangements for the contentious area are arrived at, both sides would do well to refrain from exploration and development in that small zone.

Ideally Lebanon and Israel will put this simple, straightforward, and relatively minor disagreement over a liquid line to bed. Minimally they should avoid taking the kinds of actions and making the kinds of statements that could raise bilateral tensions gratuitously, frighten international energy companies, and possibly deny or delay the benefits of impressive, God-given natural resources to their citizens. There are, after all, plenty of major, undisputed gas and oil deposits around the world, and capital is a coward: it flows to places where disputes are nonexistent, resolved amicably, or neutralized in practice. Now is a time for businesslike behavior and statesmanship: the stakes for Israelis and Lebanese are far too high for anything less.

NATURAL GAS DISCOVERIES IN THE EASTERN MEDITERRANEAN: EXPLORING REGULATORY AND LEGAL FRAMEWORKS

ERNESTO BONAFÉ[1]

Introduction

The Eastern Mediterranean region, particularly Cyprus, Israel, Jordan, Lebanon, Syria, Turkey, and Palestine, is facing changes to its energy landscape. The discovery in 2009 by Israel and Cyprus of large gas deposits has the potential to meet growing regional energy demand, spur exports, and even redraw the economic map of the region. However, the realization of gas projects will encounter geopolitical, regulatory, and commercial challenges, which, if unresolved, may put at risk the development of these resources and further affect the stability of the region.[2]

The complex geopolitical challenges, such as the war in Syria, the political and social unrest in Egypt, the border maritime disputes affecting Israel and Lebanon, and the Cyprus problem, will impact regional energy production and consumption, and could undermine trade and the viability of energy infrastructure projects. This suggests that in the current decade, the gas discoveries will be a game-changer, more so locally than for regional and international gas markets. The pace of exploration, development, and export of gas reserves will be driven mainly by local political dynamics and national energy policies decided by each of the East Mediterranean countries.[3]

The gas discoveries present important geopolitical benefits. Israel's export policy will likely drive Jerusalem to select two export options: an LNG terminal, which for environmental, spatial, and security reasons would be located in Cyprus; and, on the other hand, a pipeline to Turkey. This double-export solution would require diplomatic support by the United States and/or the European Union, preceded by a political agreement among the governments of Israel, Turkey, and Cyprus. This could result in a historic breakthrough on the Cyprus problem, and a renewed partnership between Turkey and Israel.[4]

---

1 Ernesto Bonafé is a trade and regulatory expert at the Secretariat of the Energy Charter Treaty. The views expressed by the author may not necessarily reflect those of the Energy Charter and its member states.

2 US Energy Information Administration, *Eastern Mediterranean Region*, August 15, 2013, available on: http://www.eia.gov/countries/analysisbriefs/Eastern_Mediterranean/eastern-mediterranean.pdf.

3 H. Darbouche, L. El-Katiri, and B. Fattouh, "East Mediterranean Gas: What Kind of a Game-Changer?," NG 71, The Oxford Institute for Energy Studies, December 2012, available on: http://www.oxfordenergy.org/wpcms/wp-content/uploads/2012/12/NG-71.pdf.

4 M. J. Bryza, "Eastern Mediterranean Gas: Potential for Breakthroughs?," Daily News, available on: www.hurriyetdailynews.com/gas-and-a-potential-breakthrough-among-israel-turkey-and-cyprus.aspx?pageID=449&nID=60959&NewsCatID=396.

In addition to the geopolitical opportunities presented by the gas discoveries, there are also market and regulatory challenges to overcome in order to ensure a successful energy future for the region. On a purely national basis, each country needs to decide how quickly to develop its natural gas resources, what proportion to dedicate to exports, and how to deliver it. At the same time, the new gas discoveries will have an impact on the market in terms of production and consumption, imports and exports, trade, transit, and investments. Therefore, even if the gas discoveries are not to be a game-changer of the gas sector at regional and international levels, any development of gas markets needs to operate within regulatory and legal frameworks that also cover the regional and international dimensions.

Downstream, gas (like electricity) transmission and distribution networks are natural monopolies. The technical constraints are to be handled by a system operator, in collaboration with system operators of neighboring countries in order to deal with cross-border flows. The objective of market regulation is precisely to design a sound and stable framework to ensure security of supply. Moreover, there is a potential to supply consumers on a competitive basis. Upstream, gas exploration involves high technical and financial risk, while development and production is intense on expertise and capital. In all cases, investments need a transparent and predictable framework in the medium- and long term.

This paper looks into two existing frameworks in order to make some preliminary assessments about their adequacy and suitability to accommodate the market developments related to the gas discoveries in the Eastern Mediterranean region. These frameworks are structured by the Mediterranean Energy Regulators (MEDREG), an organization that seeks progressive market integration in the Euro-Mediterranean region, and the Energy Charter Treaty (ECT), a legal context for international energy cooperation. The objectives, scope, and contents of MEDREG and the Energy Charter are different. However, they are presented together in this paper in order to reflect openly and broadly on the kind of regulatory and legal measures that the gas discoveries in the Eastern Mediterranean require.

Mediterranean Energy Regulators (MEDREG)

MEDREG was founded in 2007, and today it brings together twenty-four energy regulators from the following countries: Albania, Algeria, Bosnia-Herzegovina, Croatia, Cyprus, Egypt, France, Greece, Israel, Italy, Jordan, Libya, Malta, Montenegro, Morocco, Palestinian Authority, Portugal, Slovenia, Spain, Tunisia, and Turkey. MEDREG's objective is to promote a transparent, stable, and harmonized regulatory framework across the Mediterranean, fostering electricity and gas market integration, infrastructure investments, and consumer protection.

The General Assembly, composed of high-level representatives of national regulators, is the decision-making body, and is responsible for defining the strategy, action plans, and budget. Four working groups deal with institutional matters, electricity, gas, and renewable energy sources, and three task forces focus on consumers, the integration of electricity markets of Maghreb countries (IMME), and the cooperation with the international confederation of energy regulators (ICER). A Secretariat based in Milan implements the strategy in coordination with all MEDREG country members.

For the period of 2015 through 2020, the MEDREG gas working group will target the establishment of an integrated market framework and the development of national infrastructure plans detailing existing infrastructures and new investment needs. The main objectives are to establish a regional market and improve security of supply. The work will focus on unbundling of market and regulated activities, market transparency, nondiscriminatory third-party access to gas infrastructure, tariff methodologies and price regulation, and measures to guarantee security of supply.[5]

The expected outcomes in the short term are a study on infrastructures needs and possible projects of common interest, the preparation of a gas infrastructure map of the Mediterranean region, guidelines on third-party access and monitoring of compliance, setting up an online transparency template tool, the exchange of information on access to Mediterranean gas markets, a status review and monitoring on transparency, assessment of competition indicators and market prices, and assessment of the current status of gas markets and its expected evolution.

MEDREG benefits from the support of the Council of European Energy Regulators (CEER). Indeed, CEER's past and present contribution to the harmonization of the EU internal energy market can help to guide the work in the Euro-Mediterranean region. For instance, the new Guidelines for Trans-European Energy Infrastructure have brought the adequacy of national regulatory frameworks for incentivizing investments on cross-border infrastructure to the forefront of the debate. Within the specific institutional system of the European Union, the Agency for the Cooperation of Energy Regulators (ACER) assists national regulators at the EU level. As a result, under the new Guidelines for Trans-European Energy Infrastructure, ACER's role is to facilitate good practices and make recommendations on the basis of national incentive regulatory regimes.[6]

In October 2013 the European Commission unveiled a list of 248 projects of common interest to help to physically integrate the national energy markets and to diversify energy sources. The projects will benefit from accelerated planning, permit-granting procedures and one-stop-shop authority, fewer administrative costs, increased transparency and improved public participation, and the possibility of receiving

5 See www.medreg-regulators.org/Organisation/WorkingGroups/Gas.aspx.

6 Regulation (EU) No 347/2013 of the European Parliament and of the Council of April 17, 2013 on Guidelines for Trans-European Energy Infrastructure, OJEU L 115/39 of 25.4.2013.

financial support. Major gas projects include the Trans Adriatic Pipeline, a Baltic LNG terminal, a gas pipeline from Bulgaria to Austria via Romania and Hungary, and a gas link from offshore Cyprus to Greece.

Moreover, the development of adequate risk-return ratios is a core competence of national regulators as part of their regulatory assessment and review of network investments. Therefore, national regulators – in this case, the CEER – may make clearer the network costs and tariff regulation that impact energy prices unevenly across countries.[7] Mediterranean regulatory authorities could play a similar role, considering that one of MEDREG's objectives is to promote the role and competence of national independent regulatory authorities, and to ensure its presence in the European Union and international context.

In the framework of the G20 Summit held in St. Petersburg in September 2013, energy regulators agreed on some perspectives for sound regulation, and the promotion of investments in energy infrastructure in the power sector and other energy markets, such as natural gas. It was concluded that to achieve effective regulation, independent national regulatory authorities are crucial institutional players. Within the scope of their duties, national regulators play an important role in defining and enforcing rules aiming to ensure open and nondiscriminatory market access and investments, in promoting public interest, and supporting public policies. In emerging economies, national regulators should be fully involved in finding a suitable path leading to national and regional markets within the applicable legal framework.[8]

MEDREG is a key actor for energy cooperation in the Mediterranean region, and a relevant stakeholder in the establishment of the Mediterranean Energy Community by 2020. To that end, MEDREG will closely collaborate with the Association of Mediterranean Transmission System Operators (Med-TSO) for electricity, as well as the Union for the Mediterranean. The gradual energy market integration of Southern Mediterranean within the European Union could, according to the European Commission, be envisaged first for the Maghreb countries, and then for the Mashreq. Nevertheless, this approach could be reviewed following the gas discoveries in the Eastern Mediterranean. In fact, regional integration might be envisaged simultaneously with perhaps a major focus on electricity in the Maghreb and on gas in the Mashreq. This could raise the question of setting up a Med-TSO for gas.

7 CEER, Memo on "Regulatory Aspects of Energy Investment Conditions in European Countries," March 7, 2014, available on http://www.ceer.eu/portal/page/portal/EER_HOME/EER_PUBLICATIONS/CEER_PAPERS/Cross-Sectoral/2014/C13-IRB-17-03_Regulatory%20aspects%20of%20investment%20conditions_Memo_21-Jan-2014.pdf.

8 G20 Outreach Energy Regulators Round Table, "Energy Regulatory Statement on Sound Regulation and Promoting Investments in Energy Infrastructure," June 3, 2013, Kazan, Russia. Available on www.energy-regulators.eu/portal/page/portal/EER_HOME/EER_INTERNATIONAL/G20_Roundtable_2013/Kazan_Statement_Final.pdf.

MEDREG members share information, expertise, and good practices, which helps them to reinforce their institutional capacities and encourage reforms. This also promotes the exchange of know-how, data collection, and dissemination of expertise through studies, recommendations, reports, and capacity building. While these procedures and practices are necessary to build consensus among regulators dealing with heterogeneous national energy markets, they are likely to be insufficient to ensure regulatory reforms. To be effective, MEDREG must rely on some legally binding rules and enforcement powers. This would require that Mediterranean countries agree to share at least a minimum set of market principles and rules, such as those of the Energy Charter Treaty.

The Energy Charter Treaty (ECT)

The ECT is an international agreement specific to the energy sector[9] that seeks to create an international level playing field. The Treaty was adopted in 1994, following the Energy Charter political declaration of 1991, and entered into force in 1998, together with a Protocol on Energy Efficiency and Related Environmental Aspects. Being a unique model of long-term international cooperation and legally binding rules, the ECT needs to be seen as a valid and beneficial framework for the Eastern Mediterranean countries.

Today the ECT has fifty-four signatories, including the European Union and its member states, and twenty-five countries and organizations with an observer status. Accession to the ECT is open to any country: developed, developing, and transition; producer, consumer, and transit countries. Although the Energy Charter was born as a tool for West-East energy cooperation in the aftermath of the fall of the Berlin Wall, investor confidence and regulatory stability is no longer a concern of a specific geographical area, but rather global issues that all countries and regions need to address.

The ECT is the first intergovernmental agreement applicable to all energy forms (oil, gas, electricity, nuclear, renewables) and to all stages of the supply chain (resources, production, transport, trade, consumption, energy efficiency). Any substantial (additional norms) and geographical developments (new members) require unanimity. Although this confidence-building provision may impede the process, it also guarantees its internal coherence and the global vocation of the ECT. Arguably, regional markets can develop under the umbrella of the ECT, which has the potential to act as the legal bridge for sharing market principles and rules across the world.

The ECT pursues the promotion of long-term cooperation in the energy field, based on complementarities and mutual benefits. The Treaty also requires the promotion

[9] Text available on http://www.encharter.org/fileadmin/user_upload/document/EN.pdf.

of access to international markets as well as an open and competitive energy market. The ECT provides for rights and obligations, enforceable in legally binding dispute settlement mechanisms, in the areas of investment, trade, and transit. Moreover, the ECT contains soft law provisions on energy efficiency and environmental aspects, competition, technology transfer, and access to capital. At the same time, the explicit recognition of national sovereign rights over energy resources by the ECT means that, at all times, the balance between the protection of investors and the sovereignty of host states needs to be maintained.

The investment chapter is a cornerstone of the ECT. Its provisions aim to promote and protect foreign investment in member countries. To this end, the Treaty grants a number of rights to foreign investors with regard to their investment in the host country. Foreign investors are protected against the most important political risks, such as discrimination, expropriation, and nationalization, breach of individual investment contracts, damages due to war and similar events, and unjustified restrictions on the transfer of funds. These investor rights are reinforced by dispute settlement provisions of the Treaty, covering both inter-state arbitration and investor-state dispute settlement.

ECT rules cover the entire energy chain, including the terms under which energy can be traded and transported across various national jurisdictions. The trade and transit provisions are based on those of the World Trade Organization (WTO) and are extended to ECT Contracting Parties that are not yet members of the WTO. Energy transit, however, is addressed in more detail under the ECT. In accordance with the principle of freedom of transit, ECT Contracting Parties undertake to facilitate the transit of energy through their territory. This includes equal treatment and the prohibition of discrimination in terms of origin, destination, and ownership of energy. There is also a general obligation to secure energy flows, with no interruptions in case of disputes, and the obligation to facilitate the establishment of new transit capacity where necessary.

ECT market-based rules do not mean that a particular model of energy market structure is imposed on national governments at an international level. The ECT fully respects the sovereign right of each of its signatory states to determine the system of property ownership of its national energy resources. Regulation of unbundling and third-party access is carried out at a national level. Moreover, each state continues to hold the right to decide the geographical areas to be made available for exploration and development of its energy resources, and to determine the rate at which such energy resources may be depleted or exploited. The ECT does not prescribe the tax regime or royalties systems for the exploration and exploitation of national energy resources.

The Energy Charter Treaty established an Energy Charter Conference and also a Secretariat to serve it. The Charter Conference is an international organization

whose function is to keep under review and facilitate the implementation of the principles of the Energy Charter Declaration and the provisions of the Energy Charter Treaty. The Energy Charter Conference has adopted a policy on consolidation, expansion, and outreach aiming to facilitate the accession of countries from the Middle East and North Africa (and the Far East) to the Energy Charter Treaty. This is also an objective of the EU external energy policy.[10] Indeed, the more countries who accede to the ECT, the more they would set the standard for international energy relations on a global basis. In line with those objectives, the Energy Charter Conference has commenced the modernization of the Energy Charter Declaration of 1991 to update the language to the new global energy challenges.

With regard to membership, Turkey and Cyprus are Contracting Parties to the ECT. In the Mediterranean context, Jordan in 2007, Syria in 2010, and Morocco in 2012 have signed the Energy Charter Declaration. Other countries across the region, particularly Algeria, Egypt, Oman, Palestine, Qatar, Saudi Arabia, Tunisia, United Arab Emirates, and Yemen, are observers by invitation of the Energy Charter Conference. Accession to the ECT is a clear signal indicating a particular country's willingness to join an international energy community that enhances wider cooperation in the energy sector and agrees on a minimum set of common rules which are necessary to create a regional and international level playing field. It is in this context that all Mediterranean countries, including Israel and Lebanon, should consider the Energy Charter Treaty as an active process for dialogue on market values, and, ultimately, as a framework to share the same minimum rules of the game.

Conclusion

This paper has explored two existing regulatory and legal frameworks, MEDREG and the Energy Charter Treaty, which are certainly of relevance to the development of the recent gas discoveries in the Eastern Mediterranean under transparent and stable market conditions. Attention to these regional and international frameworks have so far been limited, as priority is of course given to the complex geopolitical challenges facing the region. Moreover, each country is to define its own national energy policy with the prospect of turning from a net energy importer into a self-sufficient producer, and even exporter.

The market regulation to be promoted by MEDREG and the rules of the Energy Charter Treaty shall not affect the countries' right to determine the conditions for exploiting its energy natural resources, its choices over the national energy mix, and the general structure of its export and import options. But the respect of national

[10] See Commission Communication "On Security of Energy Supply and International Cooperation – The EU Energy Policy: Engaging with Partners beyond Our Borders" COM (2011) 0539 final; and Conclusions of the Council of the European Union (Transport, Telecommunications, and Energy) on strengthening the external dimension of the EU energy policy, November 24, 2011.

sovereignty over energy resources is compatible with the development of regional energy markets that are secure, sustainable, and competitive. In a global context, national energy markets are also interdependent and interconnected.

Downstream and upstream market activities in the energy sector in general, and the gas sector in particular, can only develop in the medium- and long term under transparent, stable, and predictable frameworks. Either after the settlement of complex geopolitical interests, or rather, as instruments that contribute to settle them, national governments of Eastern Mediterranean countries should seriously consider the potential of MEDREG and the Energy Charter Treaty as frameworks for open dialogues, technical agreements, and multilateral regulatory and legal commitments.

PROTECTING THE MEDITERRANEAN SEA'S ENVIRONMENT, THANKS TO GAS

SAMUELE FURFARI[1]

The splendid Mediterranean Sea

The Mediterranean Sea, where East and West split – or merge, according to one's point of view – was, over the centuries, and still is, one of the most interesting environmental areas in the world. It was the crossing point of civilizations, cultures, religions, and trade, but also of warriors, who tried to end the structure of the surrounding countries. Despite that, it has kept its unique beauty. This sea – Mare Nostrum ("our sea"), as the Romans called it – touches three continents, and if you limit the passage of the Dardanelles, it bathes twenty-one coastal states with suggestive landscapes, colors, and flavors. Between the Caspian Sea and the Atlantic Ocean lies a string of producers or transit countries for oil and gas. The Mediterranean Sea, therefore, critically interests the "Complicated Orient," as the former president of the Fifth Republic of France, Charles de Gaulle, used to call the Middle East. This maritime space itself is also a source of complications for the environment. With the ongoing and lasting discoveries of hydrocarbon deposits, this situation is not about to be simplified.

Some view this new difficulty as something that exacerbates two long-term disputes in the region: the Arab-Israeli conflict and the Greek-Turkish rivalry. On the contrary, environmental protection, if properly managed, can become a tool to appease tensions in this special geopolitical area.

The Barcelona Convention

A proper regulatory framework for environmental protection in the Eastern Mediterranean region should be based on the Barcelona Convention, a convention within the framework of the Regional Seas Programme of the United Nations Environment Programme (UNEP). Its objectives are to assess and control marine pollution to ensure sustainable management of natural marine and coastal resources; to integrate the environment in social and economic development; to protect the marine environment and coastal zones through prevention and reduction of pollution; and, as far as possible, eliminate pollution, whether land- or sea-based, to protect the natural and cultural heritage, to strengthen solidarity among Mediterranean coastal

[1] Samuele Furfari is a professor at the Free University of Brussels and an adviser for the European Commission. The author's views are his own, and do not reflect those of the European Commission.

states, to contribute to the improvement of the quality of life. This convention applies to all the maritime waters of the Mediterranean Sea.

Originally adopted in 1976, the convention was later amended in 1995, the amendments entering into force on July 9, 2004. This framework convention sets out a number of general obligations as well as specific norms relating to dumping, pollution from ships, etc.

Like other framework conventions, the Barcelona convention foresees a set of protocols adopted at diplomatic conferences of the Contracting Parties. The protocols require the State Parties to implement their provisions in national legislation. In our case, we are interested in the protocol for the protection of the Mediterranean Sea against pollution, resulting from exploration and exploitation of the continental shelf and the seabed and its subsoil, agreed in Madrid on October 14, 1994, and entering into force on March 24, 2011.

Therefore, while Article 77(1) of the UNCLOS Convention provides that a coastal state exercises sovereign rights for the purpose of exploring and exploiting its natural resources, and gives the exclusive right to authorize and regulate drilling on the continental shelf to the coastal state (Article 81), the protocol for the protection of the Mediterranean Sea obliges coastal states to take measures to avoid pollution.

This attention to the environment is also an obligation of the UNCLOS convention. Coastal states have a general duty to protect and preserve the marine environment and to exploit natural resources in accordance with this duty. All State Parties have the general obligation “to protect and preserve the marine environment” (Article 192). Article 193 specifies that coastal states have the sovereign right to exploit their natural resources pursuant to their environmental policies and in accordance with their duty to protect and preserve the marine environment.

The conventions also make clear that dumping of wastes at sea requires the express permission of the coastal state.

The EU Directive on safety of offshore oil and gas operations

Pursuant to the Macondo accident in the Gulf of Mexico in April 2010, the European Commission proposed to develop legislation to further protect the environment in offshore operations. Directive 2013/30/EU of the European Parliament and of the Council of June 12, 2013, on safety of offshore oil and gas operations, is reinforcing this international legislation for Member States. The Directive defines general measures to prevent the occurrence of major accidents during offshore oil and gas operations, and to limit the consequences of such accidents. To achieve this, it defines risk-based planning and operations, as well as the obligation to implement best practices by operators and regulators to prevent major accidents. The EU legislation

establishes minimum conditions for safe offshore exploration and exploitation, and improves the response mechanisms in the event of such an accident. Once transposed by Member States, this Directive will increase the protection of the marine environment and coastal economies against pollution.

A fundamental provision is to impose to all parties transparency and the obligation to share knowledge, information, and experience. Member States are required to play an active role in planning and information-sharing with each other. The coordination and cooperation among regulators will help to reach these objectives. Of course, the Directive imposes an environmental liability (the licensee is financially liable for the prevention and remediation of environmental damage), and requests that Member States define penalties applicable to infringement. Member States should also be prepared to act in case of emergency and deliver appropriate responses.

Regarding the obligation of information-sharing, among Member States there should be total access to all relevant information and the ability to assess the effectiveness of measures. Member States are required to prepare external emergency response plans covering all offshore oil and gas installations and potentially affected areas within their maritime area. The information should also be made available to third countries, and the Commission shall promote cooperation between Member States that undertake offshore oil and gas operations in the same marine regions as others, in facilitating the exchange of information. The Directive requires that companies registered in EU's territory and conducting offshore oil and gas operations, either themselves, or through subsidiaries, outside the European Union, as licensees or operators shall report any major accident in which they have been involved to the competent authority in that Member State.

This legislation will set conditions that are particularly relevant for further offshore oil and gas operation. Conditions are set to avoid a major accident as much as possible.

A supplementary step?

The International Maritime Organization (IMO) has adopted the International Convention for the Prevention of Pollution from Ships (MARPOL Convention) that addresses, among other things, oil pollution from ships. The Regulations for the Prevention of Air Pollution from Ships seek to minimize airborne emissions from ships (SOx, NOx, ODS, VOC) and their contribution to local and global air pollution and environmental problems. MARPOL also creates designated sea areas named Emission Control Areas (ECAs) to further reduce emissions of those air pollutants; these areas are selected for technical reasons relating to their oceanographical and ecological condition and to their sea traffic. MARPOL agreed on July 1, 2010, to signif-

icantly strengthen the emissions limits in light of technological improvements and implementation experience. The global sulphur cap has been reduced initially from 4.50 percent to 3.50 percent, then progressively to 0.50 percent, effective from January 1, 2020, subject to a feasibility review to be completed no later than 2018. The limits applicable in ECAs for SOx and particulate matter are presently 1.00 percent, and should be reduced to 0.10 percent, effective January 1, 2015. Progressive reductions in NOx emissions from marine diesel engines installed on ships are also included.

Since October 2, 1983, the Mediterranean Sea, the Black Sea, and the Baltic Sea have been designated ECAs for oil spillage, and since May 1, 2009, for garbage disposal. But for the prevention of SOx pollution by ships, only the Baltic Sea and the North Sea have been defined as ECAs in the European area, respectively, on May 19, 2005, and November 22, 2007. The ECAs subject to sulphur control are named Sulphur Emission Control Areas (SECAs).

The reduction of SOx and particulate matter emissions are going to be achieved by limiting the maximum sulphur content of the fuel oils used on board. Accordingly, MARPOL Annex IV foresees limits in fuel content in general, but also for SECAs that are subject to much more stringent requirements. As of July 1, 2010, the maximum sulphur limit for SECAs has been reduced to 1.00 percent (from 1.50 percent), while from January 1, 2015, the sulphur content in ships' fuel must be below 0.1 percent.

Table 1. Sulphur Limit in Fuel (in %)

Date	SECA areas	Global area
2000	1.5	4.5
July 2010	1.0	
2012		3.5
2015	0.1	
2020*		0.5

** Alternative date is 2025, to be decided by a review in 2018.*
Source: MARPOL 73/78, Annex VI Regulations for the Prevention of Air Pollution from Ships.

These new stringent requirements mean that ships operating in the SECA would have to switch from low sulphur fuel oil (LSFO), with a sulphur content of 1.0 percent, to fuel with a sulphur content of 0.1 percent by 2015. Presently, most fuel is heavy fuel oil (HFO), the untreated component of crude oil remaining after vacuum distillation. It is cheaper because it does not undergo further steps in oil refineries, contrary to intermediate fuel oil (IFO) that undergoes several refining steps. Running marine engines with IFO does not pose a major technical challenge, except that the sulphur-rich HFO has better lubrication properties; accordingly, IFO use will also increase the costs for lubricants. Furthermore, as the demand for IFO increases, it will also presumably go up in price. It is therefore just a question of cost.

SECA Areas and Possible New Zones according to Lars Petter Blikom, Segment Director for LNG at DNV GL

Source: http://blogs.dnvgl.com/lng/2011/02/lng-for-greener-shipping-in-north-america/

Transforming the Levantine Mediterranean Sea in a SECA area would be a major environmental step, but also a tangible form of collaboration among countries that should join together to protect this unique sea.

The solution is readily available

There is a way to achieve the goal of protecting these waters, and that is by using natural gas from the Mediterranean Sea itself, the object of this report. IFO is certainly one answer, but natural gas is a better and simpler solution.

The use of natural gas as a fuel used in industry, the domestic sector, and power plants is well known. Its utilization in transport is less common. Due to their lower energy density, oil products have been widely and globally preferred to gas. The discovery of available, abundant, and affordable reserves of conventional gas has triggered the interest for this cleaner fuel. When the International Energy Agency[2] declares that the gas reserves are the equivalent of 235 years' worth of current worldwide consumption, it is evident that this very abundant fuel has to be widely developed. While the development of compressed natural gas (CNG) has started to emerge in Europe, the development of shale gas in the United States has generated a strong interest in using liquefied natural gas (LNG) in transport.

[2] International Energy Agency World Energy Outlook 2013, page 107.

Shale gas producers realized that their truck fleets can operate with the fuel that they are producing. This has prompted a strong development of LNG use in other fleet sectors (parcel deliveries, school buses, etc.). This is now a reality also for locomotives and shipping. Presently, there are more than twenty LNG-fueled ships (other than LNG carriers) operating in Norwegian waters, and LNG-engine ships (mainly smaller ships) have already been operating for 7 million hours. There are also 210 LNG installations in ports worldwide. It is a very good means to reduce polluting emissions; burning LNG produces 85 to 90 percent less NOx than the conventional fuel. Especially significant: It will cut SO_2 by 100 percent, and 100 percent of particulates, compared with traditional diesel-engine ships.[3] Of course, this is also good for the competitiveness of shipping fleets, and indeed, it is the reason why ship owners prefer to use natural gas rather than IFO.

Many gas engine manufacturers (e.g., Wärtsilä, MAN, Rolls-Royce, Caterpillar, Mitsubishi) are offering LNG-fueled engines already, and competition is well under way to take a share of the developing market. Maritime engine manufacturers are also working to develop more-efficient small- and large-scale LNG engines for ships. Port authorities are paying more attention to this clean transport fuel because the European Union has proposed that all Trans European Network core ports will have to provide LNG as a fuel (by 2020 for maritime ports, and by 2025 for inland ports). Indeed, there are a lot of synergies that exist between ports and shipping in the field of LNG transport.

Therefore, an initiative to raise the awareness of the authorities involved in the Mediterranean Sea, to urge them to declare the Levantine Sea a SECA, or even a SECA with exclusive natural gas use, could lead to a revolution in maritime transport in this area.

Who has not seen the dirty, black smoke ejected by a ship's chimney? This is also sadly the case for the numerous ferryboats crossing this striking blue space. It is time to use the gas produced in the Mediterranean Sea as a fuel to stop polluting it, as is now happening in the Baltic Sea. For example, the *Viking Grace*[4] that shuttles daily between Stockholm and Turku is the greenest ferryboat on the Baltic Sea. The world's first LNG-powered passenger vessel, launched on January 13, 2013, will be able to use three alternative fuels: HFO, IFO, and LNG, which results in fewer emissions. When running on LNG, the vessel meets all the new emission rules now being devised by the European Union.

[3] The reason is very simple: Natural gas is mainly composed of methane (CH4) that burns in a very clean way. This is why it is widely used in kitchens worldwide without any soot, odors, or contaminants. LNG contains virtually no sulphur.

[4] http://www.vikingline.com/Documents/pressreleases/20140113-grace-one-year-en.pdf.

The technical solution is readily available: This fuel is plentiful, and cheaper. New ships should be allowed only if they will be operated with this clean, cheap, and abundant fuel.

Conclusion

We can conclude that a set of international laws and a European Directive are in place for proper management of the environment in the Mediterranean Sea. Accordingly, the exploitation of gas in the Levantine Sea should not be limited by any type of fears; if respected by operators, the existing legislation will be sufficient to properly safeguard the area.

ANNEX: LIST OF PARTICIPANTS TO THE SEMINARS

ABI-AAD Naji, COO of Petroleb and Director of the Institute for Energy Economics, American University of Beirut, Lebanon

ANDOURA Sami, Senior Research Fellow, EGMONT – Royal Institute for International Relations and Notre Europe – Jacques Delors Institute, Holder of the Chair of European Energy Policy of the College of Europe

BECHEV Dimitar, Senior Policy Fellow and Head of ECFR Sofia Office

BOGAERT Mathias, European Correspondent, Ministry for Foreign Affairs, Belgium

BONAFÉ Ernesto, Trade and Regulatory Expert, Energy Charter Treaty Secretariat

BRYZA Matthew, Ambassador, Non-Resident Senior Fellow, Atlantic Council, United States; Director of the International Centre for Defence Studies, Tallinn; Board Member, Turcas Petrol,

CARSTEI Mihaela, Associate Director, Energy and Environment Program, Atlantic Council, United States

CRUYSMANS Marina, Executive Director, EGMONT – Royal Institute for International Relations

De CARTIER Sibille, Observateur, MFA

EL-KATIRI Laura, Research Fellow, Oil and the Middle East Programme, The Oxford Institute for Energy Studies, UK

ELLINAS Charles, Executive President of Cyprus National Hydrocarbons Company

FATTOUH Bassam, Director of the Oil and Middle East Programme, Oxford Energy Institute

FRANCESCON Silvia, Director, European Council on Foreign Relations, Rome Office

FURFARI Samuele, Professor, Free University of Brussels and European Commission Adviser

GÜREL Ayla, Senior Research Consultant, PRIO Cyprus Centre

HOF Fred C., Senior Fellow at the Atlantic Council's Rafik Hariri Center for the Middle East

KAHVECI Hayriye, PhD, Instructor, Political Science and International Relations Programme Coordinator, Mediterranean Research Study Group, Middle East Technical University Northern Cyprus Campus, Kalkanlı, Güzelyurt, Cyprus

KARBUZ Sohbet, Director of Hydrocarbons, Observatoire Méditerranéen de l'Energie

KASSINIS Solon, Executive Vice President, KRETYK (Cypriot National Hydrocarbon Company)

KORANYI David, Deputy Director, Dinu Patriciu Eurasia Center, Atlantic Council, United States

LEIGH Michael, Adviser to the German Marshal Fund, Brussels

LOTEM Michael, Ambassador-at-Large for Energy Security, Israeli Ministry of Foreign Affairs

MANOLIS Dimitrios, Director, International Activities, International Projects Monitoring, DEPA

MARGHERI Marco, SVP – Public and EU Affairs, Edison spa

MOUTON François-Régis, Chairman, GasNaturally and Delegate for European Affairs, Total

OLINGER Pierre, UP Middle East, Total

OLLJUM Alar, European External Action Service

OTTE Marc, Director General, EGMONT – Royal Institute for International Relations

RENDE Mithat, Ambassador, Director General, Multilateral Economic Affairs and Energy, Ministry for Foreign Affairs, Turkey

SACHINIS Harry, Chairman and CEO of DEPA

SALZANO Pasquale, Vice President of International Public Affairs, ENI

TOCCI Nathalie, Deputy Director, IAI

TSAKIRIS Theodoros, Director, Energy and Geopolitics Programme, ELIAMEP, and Assistant Professor, Geopolitics of Hydrocarbons, University of Nicosia

TZIMITRAS Harry, Director, PRIO Cyprus Centre

VAN DE VOORDE Willem, Deputy Head of Cabinet, Ministry for Foreign Affairs, Belgium

YANNIS Alexandros, Strategy Adviser, European External Action Service