European Parliament

DIRECTORATE-GENERAL FOR EXTERNAL POLICIES

POLICY DEPARTMENT

Energy: a shaping factor for regional stability in the Eastern Mediterranean?

AFET

EN

2017

DIRECTORATE-GENERAL FOR EXTERNAL POLICIES
POLICY DEPARTMENT

European Parliament

STUDY

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ABSTRACT

Since 2010 the Eastern Mediterranean region has become a hotspot of international energy discussions due to a series of gas discoveries in the offshore of Israel, Cyprus and Egypt. To exploit this gas potential, a number of export options have progressively been discussed, alongside new regional cooperation scenarios. Hopes have also been expressed about the potential role of new gas discoveries in strengthening not only the regional energy cooperation, but also the overall regional economic and political stability. However, initial expectations largely cooled down over time, particularly due to delays in investment decision in Israel and the downward revision of gas resources in Cyprus. These developments even raised scepticism about the idea of the Eastern Mediterranean becoming a sizeable gas-exporting region. But initial expectations were revived in 2015, after the discovery of the large Zohr gas field in offshore Egypt. Considering its large size, this discovery has reshaped the regional gas outlook, and has also raised new regional cooperation prospects. However, multiple lines of conflict in the region continue to make future Eastern Mediterranean gas activities a major geopolitical issue. This study seeks to provide a comprehensive analysis of all these developments, with the ultimate aim of assessing the realistic implications of regional gas discoveries for both Eastern Mediterranean countries and the EU.

EP/EXPO/B/AFET/2016/03
June 2017 - PE578.044

EN

This paper was requested by the European Parliament's Committee on Foreign Affairs.

The English-language manuscript was completed on 16 May 2017.

Printed in Belgium.

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This paper will be published on the European Parliament's online database, 'Think tank'.

ISBN 978-92-846-0945-1 (pdf)
ISBN 978-92-846-0946-8 (print)
doi:10.2861/145448 (pdf)
doi:10.2861/44821 (print)
Catalogue number: QA-02-17-402-EN-N (pdf)
Catalogue number: QA-02-17-402-EN-C (print)

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Executive summary

The Eastern Mediterranean region has become a hotspot of international energy discussions following a series of large-scale gas discoveries in the offshore of Israel, Cyprus and Egypt. To exploit this gas potential, a number of export options have progressively been discussed, alongside new regional cooperation scenarios. Hopes have, indeed, been expressed about the potential role of new gas discoveries in strengthening not only the regional energy cooperation, but also the overall regional economic and political stability.

However, initial expectations largely declined over time, particularly due to continuous investment decision delays in Israel, and the downward revision of gas resources in Cyprus. These developments even raised scepticism about the idea of the Eastern Mediterranean becoming a gas-exporting region.

But initial expectations were revived in 2015, after the discovery of the large Zohr gas field in offshore Egypt (the largest gas field ever discovered in the Mediterranean). Considering its size, this discovery has reshaped the regional gas outlook, and has also raised new regional cooperation prospects.

If there is a certainty about Zohr, it is that its development will primarily serve the Egyptian domestic market. Due to a rapid decline in production, the country has increasingly struggled to meet its domestic demand. As a result, Egypt even started to import liquefied natural gas (LNG) in 2015. Accordingly, Egypt's LNG exports dropped to zero in 2014, leaving the country's two LNG plants completely idle. Zohr thus represents a major relief for Egypt's strained gas market.

Furthermore, Zohr could be the first of a new string of gas discoveries in offshore Egypt. International oil and gas companies have already started to increase operations in the area, and if Zohr and other offshore fields reach their full potential in the 2020s, Egypt might again become an LNG exporter.

The impact of Zohr could go well beyond Egypt's boundaries, due to its geographic location and infrastructure. Zohr is located only 90 km away from Aphrodite (Cyprus), which in turn is only 7 km off from Leviathan (Israel). This proximity could allow a coordinated development of the fields and thus the creation of the economies of scale needed to put in place a competitive regional gas export infrastructure.

Egypt already has in place a large LNG export infrastructure in Idku and Damietta, that currently sits idle. This would allow to export any volumes from Zohr and other fields not used in the domestic market. Given the growing domestic demand in Egypt, it is fair to assume that some export capacity would be left for Israeli and Cypriot gas – if it could be brought to the Egyptian terminals. As both LNG plants can be expanded, Israeli and Cypriot developers would have a flexible outlet.

For Israel and Cyprus, cooperating with other players in the region is crucial. Building the export infrastructure and developing the fields is a circular problem: if there are political or commercial risks that no export infrastructure will be in place when the production starts, a lot of money will be lost. If the field underperforms compared to expectations, expensive export infrastructure will sit idle. Consequently, bringing together an underused and scalable export infrastructure with several promising fields could be the key to unlocking untapped regional potential.

So, in the short-term Egypt seems to hold the key to the Eastern Mediterranean's gas future. It could decide to proceed alone by exporting the gas volumes that will progressively become available on top of the domestic demand, or it might decide to proceed together with Israel and Cyprus, by creating a new Eastern Mediterranean gas hub ('hub' to be understood as a crossroads of physical flows, not as a trading hub) based on its existing export infrastructure.

Creating a new Eastern Mediterranean gas hub seems to represent the best option for all players involved, allowing Egypt to enhance its role in the region and secure revenue from a transit scheme, and

Israel and Cyprus to fully exploit their gas reserves. It would also present an opportunity for Europe, where gas import requirements will grow post 2020 due to declining domestic production and the expiration of long term contracts with Norway and Russia.

A joint regional export scheme via Egypt's LNG facilities could also provide a first opportunity to test gas cooperation between Egypt, Israel and Cyprus. A cooperation that could scale-up during the 2020s, should new gas resources be found in the region and should gas demand in export markets justify the construction of additional infrastructure, such as an Israel-Cyprus-Greece pipeline.

Albeit economically sound, the creation of an Eastern Mediterranean gas hub based on Egypt's LNG facilities will ultimately depend on the evolution of regional geopolitics. Regional gas developments are unlikely to function as a catalyst for regional stability, for at least two key reasons: i) Eastern Mediterranean gas reserves are, for the time being, too limited in size to overcome the region's profound geopolitical rifts such as the Cyprus issue, the Palestinian issue, Israel-Turkey relations, Israel-Egypt relations and the Israel-Jordan territorial disputes; ii) Geopolitical stability represents a fundamental prerequisite to allow international companies to invest in costly and long-term energy infrastructure. In short, Eastern Mediterranean gas developments should be considered as a function of regional geopolitical stability, and not vice-versa.

For the EU, the materialisation of an Eastern Mediterranean gas hub would be beneficial for both energy policy and foreign policy considerations. In terms of energy policy, the joint exploitation of Eastern Mediterranean gas resources could, already in the short-term, provide substance to the long-lasting EU gas supply diversification strategy. In terms of foreign policy, even if Eastern Mediterranean gas cooperation could not function itself as a catalyst for regional stability, it certainly represents one of the few areas where sensible regional dialogue could be established. This could also provide substance to the EU Neighbourhood Policy's target of strengthening EU energy dialogue with neighbourhood countries on energy security.

Introduction

In recent years, the Eastern Mediterranean has been a hot topic in international energy markets. Interest in the area arose when three large fields were discovered between 2009 and 2011: the Tamar and Leviathan fields in offshore Israel and the Aphrodite field in offshore Cyprus.

To exploit this potential, a number of export options where progressively discussed, from pipelines (to Turkey or Greece) to LNG plants (in Cyprus, Israel and Egypt).

Analysts have expressed hopes that the new gas discoveries might not only strengthen the energy cooperation in the region, but also pave the way for a new era of economic and political stability. However, the high initial expectations were largely muted over time.

In Israel, a long-lasting internal political debate on the management of the gas resources created a climate of uncertainty that contributed to the delay of key investment decisions.

In Cyprus, where the gas discovery was welcomed as a god-sent gift to relieve the country from its financial troubles, the initial enthusiasm cooled down due to successive downward revisions of the expected resources.

These developments raised scepticism on the general idea that the Eastern Mediterranean might become a gas-exporting region. But expectations were revived by the recent discovery of the large Zohr gas field in offshore Egypt. Considering its size, this discovery – the largest ever made in the Mediterranean Sea – might indeed completely change the regional gas outlook.

However, multiple lines of conflict (e.g. the Cyprus issue, the changing relations between Turkey, Israel and Egypt, Israel's relations with neighbours and the Turkish-Greek disputes over the Aegean) make future potential exploitation of Eastern Mediterranean energy resources a major geopolitical issue.

This study seeks to provide a comprehensive analysis of these developments, taking into consideration all their geological, legal, economic and geopolitical dimensions, with the ultimate aim of assessing the implications of these recent gas findings for countries in the region and for the EU.

Chapter 1 discusses the relevance of Eastern Mediterranean gas issues for EU energy and foreign policy. It focuses on the Energy Union initiative, the Union for the Mediterranean (UfM) Euro-Mediterranean Energy Platforms and the EU Neighbourhood Policy. By reviewing these initiatives, the chapter illustrates how Eastern Mediterranean gas could fit into both the EU's energy and foreign policies.

Chapter 2 provides an overview of Eastern Mediterranean gas issues, covering geological, legal, economic and geopolitical aspects. In particular, the chapter offers insights on the respective offshore gas developments of Israel, Cyprus, Egypt, Lebanon and Gaza.

Chapter 3 provides a detailed analysis of Eastern Mediterranean proposed gas export routes. It explains pipeline projects such as the Israel-Jordan and Israel-Gaza pipelines, the Israel-Cyprus-Greece pipeline, the Israel-Turkey pipeline, the Israel-Cyprus-Greece electricity interconnector, as well as floating LNG (FLNG) projects in Cyprus and Israel. The chapter also discusses the option of using existing LNG plants in Egypt for the export of regional gas resources.

Chapter 4 analyses key destination markets for Eastern Mediterranean potential gas supplies: LNG, regional markets (Jordan and Palestine), Europe and Turkey.

Chapter 5 presents, on the basis of the previous analysis, a reflection on the potential role of energy as a shaping factor for regional stability.

The study was carried out on the basis of rigorous research methodologies. First of all, an in-depth review of existing literature on the issue was carried out, in order to base the study on a solid state-of-the-art platform. Then, the most accurate international data sources (e.g. United States Geological Survey, United States Energy Information Administration, International Energy Agency, Eurostat, Cedigaz, Platts) were utilised to describe the geological and economic situation of regional energy. The mix of these qualitative and quantitative toolkits was then strengthened by semi-structured in-depth interviews with high level stakeholders engaged in the regional energy sector at various levels (e.g. national governments, international organisations, EU institutions, national energy regulatory authorities, international and national energy companies, international consultancies).

1 The relevance of Eastern Mediterranean gas for the EU energy and foreign policy

1.1 Introduction

Why should Eastern Mediterranean gas developments be of any interest for the EU? The answer to this legitimate question is twofold: because these developments are relevant for the EU energy policy, as well as for the EU foreign policy.

Under the energy policy perspective, the EU has been pursuing a gas supply diversification strategy since the early 2000s. For a number of economic and political reasons, this strategy has proved to be difficult to implement. Not by coincidence, the issue of security of the gas supply served in 2014 as a catalyst for the launch of the EU Energy Union, one of the flagship initiatives of the Juncker Commission. Due to its vast, untapped gas resources and to its geographical proximity to Europe, the Eastern Mediterranean could provide an important contribution to EU energy security – and provide substance to the Energy Union gas supply diversification vision.

Under the foreign policy perspective, the Eastern Mediterranean represents a key hotspot for the EU. The migration crisis that started in 2015 is a clear example of how developments in the Eastern Mediterranean region could spill over to Europe. For the EU it is therefore a priority to promote geopolitical stability and economic development in the Eastern Mediterranean and in the overall Southern Neighbourhood. This priority is clearly stated in the EU Neighbourhood Policy, particularly following its 2015 review.

This section provides a comprehensive discussion of these issues, in order to properly set the context for the succeeding analysis of Eastern Mediterranean gas developments.

1.2 The Energy Union initiative

The security of energy supplies has for a long time been an unexplored area at the EU level. Only with the Green Paper 'Towards a European strategy for the security of energy supply' of 2000 did the European Commission really start to reflect on how to deal with the security of energy supplies at the EU level.

With the Green Paper 'A European Strategy for Sustainable, Competitive and Secure Energy' of 2006 the European Commission outlined the need to ensure uninterrupted energy supply also by establishing a mechanism for rapid solidarity between Member States in the case of crisis (for instance composed of emergency oil and gas stocks) under the supervision of a European Energy Supply Observatory.

Following this proposal, the European Commission adopted in 2008 the Communication 'Second Strategic Energy Review – An EU Energy Security and Solidarity Action Plan'[1], with which it proposed an action plan based on the following points: 'i) Infrastructure needs and the diversification of energy supplies; ii) External energy relations; iii) Oil and gas stocks and crisis response mechanisms; iv) Energy efficiency; v) Making the best use of the EU's indigenous energy resources'[2].

This vision was further developed by the Commission in 2011, with the Communication 'The EU Energy Policy: Engaging with Partners beyond Our Borders'[3], which proposed a new strategy based on three axes: 'i) Promote transparency between Member States on energy agreements with non-EU countries;

[1] European Commission (2008).
[2] *Ibidem*, p. 5.
[3] European Commission (2011).

ii) Help coordinate both policy toward specific partner countries and positions to be taken in international organisations; iii) Promote comprehensive energy partnerships with key partner countries'[4].

In 2012, the European Parliament and the Council followed-up this proposal of the Commission, by adopting a Decision establishing an information exchange mechanism on intergovernmental agreements between Member States and third countries in the field of energy[5].

Finally, in 2014 the Commission adopted the Communication 'European Energy Security Strategy'[6], (re)proposing a series of measures (in truth already outlined in 2008 and 2011) to tackle the EU's security of energy supply challenges such as: i) Increase energy efficiency; ii) Increase energy production and diversify suppliers countries and routes; iii) Complete the internal energy market; iv) Speak with one voice in external energy policy; v) Strengthen emergency and solidarity mechanisms and protect critical infrastructure.

This sizeable series of legislative activities on the issue of security of energy supply demonstrated the growing awareness of the need for common action on energy security. A great contribution to the inception and development of this awareness has been provided by the series of energy security crises experienced by the EU since 2006.

In particular, the Russian-Ukrainian-European gas crises of 2006 and 2009 represented a key stimulus to the EU to take action in this field. The latest Communication adopted by the Commission in this field confirms the trend, having been launched as a response to the 2014 Ukraine crisis and the related unprecedented standoff between the EU and the Russian Federation.

However, the effectiveness of this intense legislative activity remains limited. In fact, the theoretic common approach to the security of energy supplies proposed by the EU continues to collide with the actual nationalist approach adopted by Member States in this field. An approach reflected by the Treaties themselves, considering that – according to Article 194 of the Treaty on the Functioning of the European Union – each Member State has the right to autonomously determine its energy mix and its energy security of supply architecture.

This situation clearly elucidates that the absence of the security of energy supply element in the EU energy policy is fundamentally due to a political reason: the reluctance of Member States to cede part of their sovereignty to the EU over an issue considered as highly strategic for their respective national interests.

In this context, it appears that only a new, strong political momentum could significantly change the situation, boosting the development of a truly European security of energy supply strategy. This is unlikely to occur in a situation of general stability, where a business-as-usual approach tends to characterise the EU (energy, but not only) policy making. On the contrary, this might occur in a situation of urgency determined by a sudden change in the external environment, as the perception of external threats might ultimately lead EU Member States to strengthen their union.

In the case of energy, a situation of emergency emerged again at the EU level with the 2014 Ukraine crisis. In fact, the profound political rift that materialised between the EU and the Russian Federation over Ukraine led to an unprecedented reconsideration of the EU-Russia energy partnership at the EU level. In that challenging situation, many European leaders called for the rapid development of a common EU strategy on the security of energy supplies[7].

[4] *Ibidem*, p. 15.
[5] European Council (2012).
[6] European Commission (2014).
[7] European Council (2014).

On the basis of an explicit request by the European Council, the Commission in May 2014 adopted the previously mentioned Communication 'European Energy Security Strategy', outlining the need for implementing many of the measures already proposed by the Commission itself in 2008.

However, this time the reaction of the EU was not limited to this, rather traditional, outcome. In fact, the new President of the Commission, Jean-Claude Juncker, announced in early September 2014 his intention to appoint a Commission Vice President for Energy Union (in addition to the Commissioner for Energy and Climate), a move that represented a considerable upgrade for energy in the EU institutional structure[8].

This move was favoured also by the fact that EU leaders elected Polish Prime Minister Donald Tusk on 30 August 2014 to be the next President of the European Council. President Tusk expressed several times during the Ukraine crisis the need for a truly European energy policy, ultimately calling for the establishment of a European Energy Union[9].

On this basis, the new Juncker Commission formally launched the Energy Union initiative in March 2015 with the Communication 'A Framework Strategy for a Resilient Energy Union with a Forward-Looking Climate Change Policy'[10]. This policy document has five interlinked parts: i) energy security, solidarity and trust; ii) a fully integrated European energy market; iii) energy efficiency contributing to moderation of demand; iv) decarbonisation of the economy; and v) research, innovation and competitiveness. Given the origins of the document it is no surprise that energy security is mentioned first. According to the document, energy security should be safeguarded by reducing energy consumption, strengthening the internal exchange of energy and diversifying energy supply. While reducing consumption and improving energy markets relate to the second and third parts of the Energy Union (internal market and efficiency), diversification measures are seen as the core of energy security.

To diversify the sources of Europe's gas imports, the Commission reiterated the need for further action on the two, usual, gas security policy lines: i) To reinforce partnerships with current and prospective gas producing and transit countries (The Communication clearly mentions traditional suppliers such as Algeria and Norway but also prospective transit countries such as Turkey. This latest is mentioned in relation to the Southern Gas Corridor, the importance of which is outlined in the Communication in a very clear way); ii) To enhance the role of LNG in the European gas market by promoting more interconnections within the EU but also a better synergy between LNG and storage. In early 2016 the Commission made a step forward in the advancement of this policy by defining the missing links within the EU that will need to be achieved to effectively allow LNG to play a greater role in the system.

Eastern Mediterranean potential gas supplies seem to perfectly fit into the Energy Union strategy, most importantly into its energy security section, as it represents a potential diversification option for the EU gas security of supply architecture. This point was also recently stressed by the Commission with its 'Second Report on the State of the Energy Union' of February 2017, which states: 'The Eastern Mediterranean is also a promising source of gas supply for the European Union. This increases the diversification opportunities and reduces import dependency on a single supplier, a key objective of the Energy Union'[11].

[8] EurActiv (2014).
[9] Tusk (2014).
[10] European Commission (2015a).
[11] European Commission (2017).

The diversification of gas supplies has proved to be a difficult exercise for the EU over the last decades. The textbook example of this difficulty is represented by the Southern Gas Corridor, a long-standing priority for the EU, which will only materialise by 2020 (after more than two decades of various pipeline projects' discussion), and will only deliver 10 Bcm/year (billion cubic metres per year) to the EU (i.e. about 5 % of its gas import requirements). Eastern Mediterranean gas could contribute to the EU gas diversification targets, particularly if regional gas exports will occur in a synergetic manner – as is suggested in the conclusions of this study.

1.3 The UfM Euro-Mediterranean Energy Platforms

In the framework of the EU Energy Union initiative, three high-level energy platforms were established by the European Commission in 2015 in order to facilitate partnerships based on mutual trust and transparency between Union for the Mediterranean (UfM) member states as well as with the relevant energy stakeholders in the region[12].

These platforms, established by the European Commission within the framework of the UfM, are:

i) The UfM Regional Electricity Market Platform (UfM REM Platform);

ii) The UfM Renewable Energy and Energy Efficiency Platform (UfM REEE Platform);

iii) The UfM Gas Platform (UfM Gas Platform).

The UfM REM Platform aims at the progressive integration of energy systems and energy markets in the UfM region and, in particular, at the enhancement of electricity exchanges and interconnections, in order to achieve a secure, affordable and sustainable electricity supply for the benefit of citizens and economies in the Euro-Mediterranean region.

The UfM REEE Platform aims to promote the progressive deployment of renewable energy and energy efficiency measures, in order to foster socio-economic development, contribute to ensuring that all citizens and businesses of the region have access to secure, affordable and reliable modern energy services, as well as to support mitigation and adaptation to climate change in the Euro-Mediterranean region.

The objective of the UfM Gas Platform is to establish a regional structured dialogue allowing the development of a Euro-Mediterranean gas market to promote security, transparency and predictability of both demand and supply in a manner that correctly and fairly balances the interests of producing and consuming countries and provides the basis of the long-term and secure development of the reserves in the region.

As gas cooperation in the Western Mediterranean (e.g. EU-Algeria and EU-Libya) is well established both from the infrastructure and commercial standpoints[13], the UfM Gas Platform could have a specific focus on Eastern Mediterranean gas cooperation. Given the UfM platforms' aim to facilitate dialogue between the various public and private stakeholders, this could be a positive contribution toward the development of the Eastern Mediterranean gas potential.

[12] http://ufmsecretariat.org/the-ufm-energy-platforms/
[13] See: Tagliapietra (2017).

1.4 The EU Neighbourhood Policy

Launched in 2004, the EU Neighbourhood Policy (ENP) aims to support and foster stability, security and prosperity in the countries located in the EU's Eastern and Southern neighbourhoods[14].

After the events of the so-called 'Arab Spring' in the Southern neighbourhood and the new developments in the Eastern neighbourhood following the 2014 Ukrainian revolution, the EU reviewed its ENP in 2015, highlighting the stabilisation of the neighbourhood as the most urgent challenge. The EU intends to pursue this target in two key ways: supporting the development of regional economies and scaling-up security cooperation with countries in the region.

Within this framework, energy security emerges as an important area for cooperation between the EU and its neighbouring countries, both as a security measure and as a means for sustainable economic development. For this reason, the EU has declared to be 'committed to strengthen its energy dialogue with neighbourhood countries in energy security, energy market reforms and the promotion of sustainable energy'[15]. With regard to the Southern neighbourhood, the EU has declared its intention to 'offer cooperation, on a tailored basis, to promote the production, distribution, trade and efficient consumption of energy. […]. The EU will support sub-regional cooperation as appropriate in the Eastern Mediterranean, the Maghreb and the Southern Caucasus'[16].

On the basis of these policy lines, it is clear that Eastern Mediterranean gas cooperation perfectly fits into the framework of the ENP. A more specific insight on the role of Eastern Mediterranean gas resources in EU foreign policy was provided in 2016 by the Joint Statement of the U.S.-EU Energy Council held in Washington on 4 May: 'The Council recognized the potential of the new gas resources in the Black Sea, the Caspian Basin, North Africa, and the Eastern Mediterranean for the energy security of the EU and the wider region. The Council stressed the need to respect the sovereignty and sovereign rights of EU Member States to explore and exploit their natural resources and stands ready to facilitate the development of these resources and corresponding infrastructure, underlining the need to respect international law'[17].

[14] For an valuable insight on the ENP, please refer to: Aliboni (2005).
[15] European Commission (2015b), p. 11.
[16] *Ibidem*, p. 12.
[17] European External Action Service (2016).

2 Eastern Mediterranean gas: the big picture

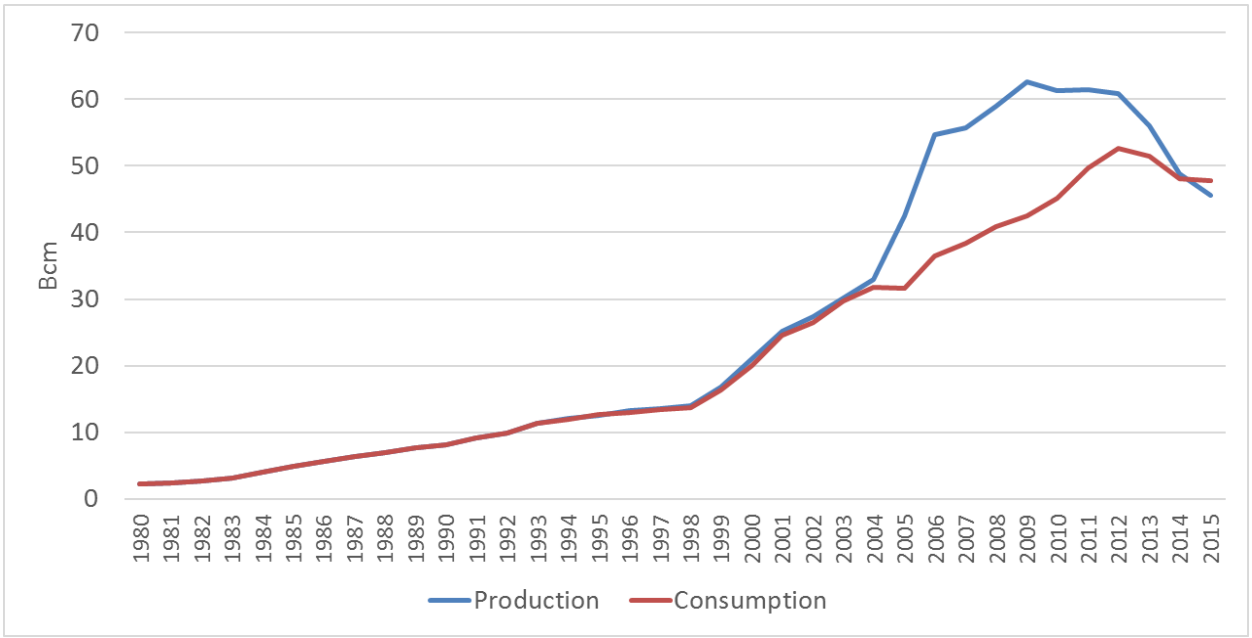
2.1 Introduction

Gas does not represent a new element in the Eastern Mediterranean energy architecture. In fact, it has played an important role in the region's largest energy market – Egypt – for almost four decades. After 2000, Egypt became a major gas exporter, developing not only a large LNG infrastructure, but also two international pipelines that, for years, represented examples of regional economic and political cooperation driven by energy: the Egypt-Israel pipeline and the Arab Gas Pipeline. This section first provides an overview of the historical developments of gas in Egypt and the region, and then focuses on the offshore developments that, since 2010, have made the Eastern Mediterranean a new hotspot of the international energy debate.

2.2 Egypt: the cornerstone of Eastern Mediterranean regional gas markets

Egypt increasingly made use of its large gas reserves – estimated at 1.8 trillion cubic metres (Tcm)[18] – during the 1980s and 1990s, but really scaled-up their exploitation only after 2000. Between 2000 and 2011, the country tripled its gas production, paving the way for considerable gas exports (Figure 1).

Figure 1: Egypt's gas balance, 1980-2015



Source: author's elaboration on data provided by BP (2016).

[18] If not otherwise stated, all gas statistics in this paper refer to: BP (2016).

However, the country's gas production was severely hit by the so-called Arab Spring, as the political turmoil blocked the inflow of essential upstream investments[19]. Since 2011, Egypt's gas production has dramatically decreased, resulting in massive power cuts[20] in 2012 and 2013 that helped catalyse protests that led to the overthrow of President Muhammad Morsi[21].

In this context, Egypt had to start importing gas to sustain its own domestic needs – through a floating storage and regasification unit (FSRU) installed off the Red Sea coast in 2015. Egypt imported 4.3 billion cubic metres (Bcm) of gas through this facility in 2015, and around 8 Bcm in 2016.

The gas import context which emerged in the aftermath of the Arab Spring made obsolete the export infrastructure developed by Egypt over the previous decade. This infrastructure is composed of two LNG plants – located in Damietta and Idku – and two pipelines – the El Arish-Ashkelon Pipeline and the Arab Gas Pipeline (Figure 2).

The Damietta LNG complex is located 60 km west of Port Said and has one train with a total capacity of 7.56 Bcm/year of LNG[22]. The Idku LNG complex is located 50 km east of Alexandria and has two trains with a total capacity of 11.48 Bcm/year[23]. The total LNG export capacity of Egypt thus amounts to 19 Bcm/year.

Figure 2: Egypt's gas export infrastructure

Source: Observatoire Méditerranéen de l'Énergie (2011).

[19] Bahgat (2012).
[20] The bulk of power stations in Egypt remains gas fired (current 32 GW capacity includes 46 % gas-fired and 43 % gas or oil).
[21] Al Monitor (2012).
[22] http://www.gasnaturalfenosa.com/en/activities/global+presence/africa/1285338593618/egypt.html
[23] http://www.egyptianlng.com/elng/about/

The El Arish-Ashkelon Pipeline entered into operation in 2008, channelling Egyptian gas to Israel. In 2010 the pipeline supplied approximately half of the gas consumed in Israel. With the pipeline's total 9 Bcm/year physical capacity, agreements between Egypt and Israel were set for the delivery of up to 7.5 Bcm/year. In 2010, some Egyptian activists appealed for a legal provision against governmental authorities to stop gas flow to Israel on the grounds of the obscure nature of the contract and the alleged low pricing compared to global benchmarks. However, the appeal was rejected by the Mubarak regime. In 2011, after the 25 January revolution, many Egyptians called for the end of gas exports to Israel. Gas supplies to Israel were unilaterally halted by Egypt in 2012, as Israel had allegedly breached its obligations and stopped payments a few months earlier. Since then, the pipeline has sat idle.

The Arab Gas Pipeline (also known as the Trans-Mashreq Gas Pipeline) is an infrastructure of 1 200 km linking Egypt with Jordan, Syria and Lebanon up to Turkey, with a capacity of 10 Bcm/year. Gas flows through the pipeline commenced in 2003 to Jordan, and then reached Syria in 2008 and Lebanon in 2009. In the past, an ambitious project to expand the Arab Gas Pipeline to Iraq was also proposed. However, the Arab Gas Pipeline interrupted its operations in March 2012, after several attacks following the start of the Egyptian revolution, mainly carried out by Bedouin Islamists and Jihadist activists in the Sinai Peninsula. The pipeline has not been re-opened.

In January 2008 Turkey and Syria signed an agreement to construct a 63 km pipeline between Aleppo and Kilis (at the Turkish border) as the first segment of a Syria-Turkey connection with the Arab Gas Pipeline. In 2008 the European Union, Turkey, Iraq, Egypt, Jordan, Lebanon and Syria reached a consensus to extend the Arab Gas Pipeline to Turkey and Europe with a connection to Iraq. Syria and Turkey started talks in 2010 concerning gas imports through Turkey that could be supplied by Iran or Azerbaijan.

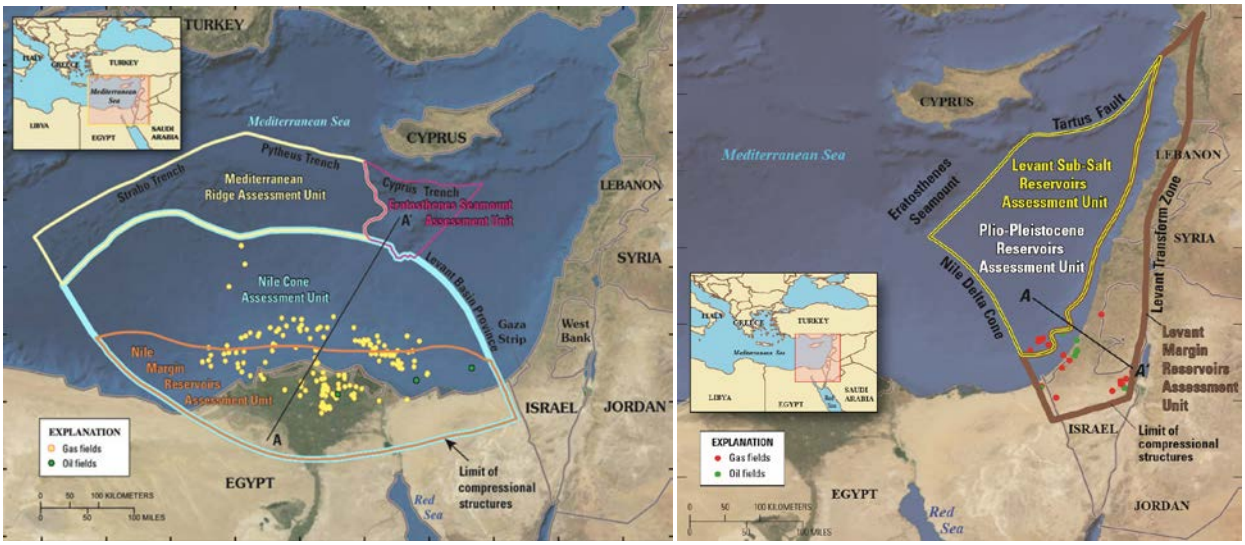
All these discussions and agreements led, in 2005, to the launch of the 'Euro-Arab Mashreq Gas Market Project', an EU initiative aimed at contributing to the integration of the gas markets of Egypt, Jordan, Lebanon and Syria in order to create a regional gas market in the Mashreq, as a first step towards integration with the EU gas market. The project focused on developing a Gas Master Plan and network development for the region, as well as on putting the necessary regulatory frameworks in place. After a first phase (2005-2009) where Iraq and Turkey participated as observers, the project was extended for a second phase (2010-2013), with Iraq as a full partner. However, this cooperation effort was nullified by the Arab Spring.

In short, the halt of Egyptian gas supplies to Israel through the El Arish-Ashkelon Pipeline and the halt of the Arab Gas Pipeline after the various attacks on the infrastructure, ended the expectations of regional gas cooperation embodied by the 'Euro-Arab Mashreq Gas Market Project'. The political turmoil in Egypt, the civil war in Syria and the conflictual relations between Egypt and Israel undermined the established geopolitical equilibrium of the region, making any form of comprehensive regional cooperation on gas extremely difficult. Furthermore, a second factor contributed to the obsolescence of the cooperation scheme embedded in the regional gas cooperation vision: the gas discoveries that were made in offshore Israel and Cyprus between 2009 and 2011.

2.3 The new offshore horizon: geology and legal aspects

As part of a programme aimed at estimating the recoverable oil and gas resources of priority basins around the world, the U.S. Geological Survey (USGS) estimated the undiscovered gas resources of the Nile Delta Basin and of the Levant Basin in 2010 (Figure 3).

Figure 3: The USGS' assessment units of the Nile Delta Basin and of the Levant Basin



Source: USGS (2010a) and (2010b).

Using a geology-based assessment methodology, the USGS estimated the undiscovered technically recoverable gas resources[24] of the Nile Delta Basin at 6.3 Tcm, and of the Levant Basin at 3.5 Tcm[25].

These estimations attracted new interest in the Eastern Mediterranean gas potential, even if they should not have come as a total surprise. In fact, offshore exploration in the Eastern Mediterranean waters started already in the late 1960s, with a series of wells drilled by Belpetco. These wells targeted structural culminations on the shallow shelf of Israel and the northern Sinai, but all were found dry. Although unsuccessful in terms of hydrocarbon production, these early wells provided important information and established the initial geologic model of the Eastern Mediterranean region. A second exploration campaign, between the mid-1970s and the mid-1980s, was more successful. Several wells were drilled offshore Sinai and light oil was found in several areas, although no commercial production was established.

Exploration activity in the offshore Eastern Mediterranean experienced a significant renaissance in 1999-2000, when five modest gas fields were discovered at a shallow depth west of the coastal town of Ashqelon and the Gaza Strip. These discoveries sped up exploration efforts and promoted the acquisition of geophysical data throughout the entire Eastern Mediterranean area, particularly in the Levant Basin.

[24] While the specific locations of estimated undiscovered recoverable resources are not yet known, they are believed to exist in geologically favourable settings. 'Proved reserves' are those volumes of oil and gas that geological and engineering data demonstrate with reasonable certainty to be recoverable in future years from known reservoirs under existing economic and operating conditions.
[25] Mean estimates.

The real turning point in terms of gas discoveries came in 2009, when Noble Energy announced the discovery of the Tamar field in offshore Israel. After this discovery, Noble Energy announced two other major findings in the Levant Basin: the Leviathan field in offshore Israel and the Aphrodite field in offshore Cyprus. In 2015, Eni announced the discovery of the giant Zohr gas field in offshore Egypt (Table 1 and Figure 4).

Table 1: Main recent gas discoveries in offshore Eastern Mediterranean

Gas field	Gross mean resources (Bcm)	Discovery
Tamar - Israel	280	2009
Leviathan - Israel	620	2010
Aphrodite - Cyprus	140	2011
Zohr - Egypt	850	2015

Source: Noble Energy and Eni (official websites, accessed in January 2017).

Figure 4: Geographical location of the main recent gas discoveries in offshore Eastern Mediterranean

Source: author's elaboration on Middle East Economic Survey (2016).

This wave of gas discoveries revived the issue of maritime boundaries in the Eastern Mediterranean. In fact, various delimitation disputes are still open in the region, notably in Cyprus and between Israel and Lebanon (Figure 5).

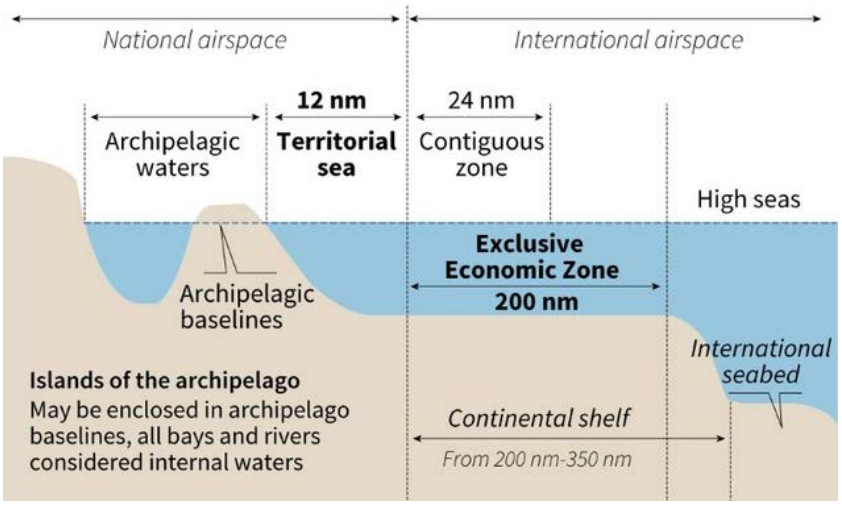
Figure 5: Eastern Mediterranean key prospective gas fields and disputed maritime boundaries

Source: The Economist (2013).

Issues related to maritime boundaries are internationally regulated by the United Nations Convention on the Law of the Sea (UNCLOS)[26], also known as the Montego Bay Convention[27]. UNCLOS defines the rights and responsibilities of nations with respect to their use of the world's oceans and seas, establishing guidelines for businesses, the environment, and the management of marine natural resources.

UNCLOS defines maritime zones and also provides clear guidance on navigation, transit regimes, deep seabed mining, the exploitation regime and settlement of disputes. Maritime zones are defined by the convention as reported in Figure 6.

Figure 6: Maritime zones under UNCLOS



Source: AFP on AMTI/CSIS/Batongbacal and Baviera (2013). Values expressed in nautical miles.

[26] United Nations (1982).
[27] This international agreement resulted from the third United Nations Conference on the Law of the Sea (UNCLOS III), which took place between 1973 and 1982. UNCLOS came into force in 1994, a year after Guyana became the 60th nation to ratify the treaty. As of end-2016, 167 countries and the European Union have joined in the Convention. It should be noted that Turkey, Syria and Israel are not parties to the UNCLOS.

As Scovazzi (2012) outlines, four treaties have, so far, been concluded to establish maritime boundaries in the Eastern Mediterranean[28] on the basis of UNCLOS (Figure 7):

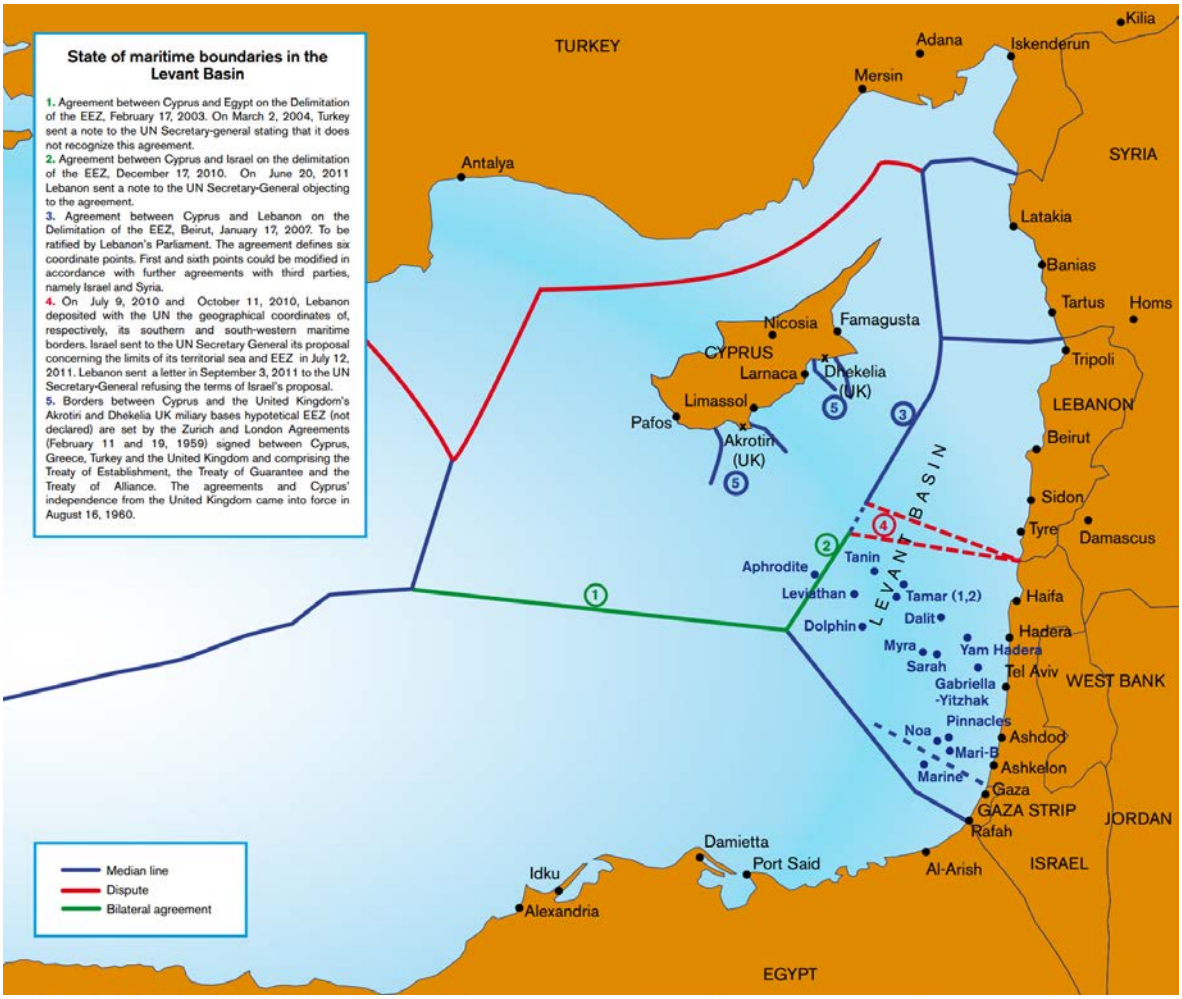
i) Republic of Cyprus-United Kingdom: signed in 1960 by the Republic of Cyprus, Greece, Turkey and the United Kingdom, this particular treaty was aimed at maintaining the two Sovereign Base Areas located in Akrotiri and Dhekelia under the sovereignty of the United Kingdom[29];

ii) Republic of Cyprus-Egypt: signed in 2003, the treaty delimited the Exclusive Economic Zones (EEZs) of the two countries[30];

iii) Republic of Cyprus-Lebanon: signed in 2007, the treaty delimited the EEZs of the two countries. This treaty was ratified by the Republic of Cyprus, but not by Lebanon[31];

iv) Republic of Cyprus-Israel: signed in 2010, the treaty delimited the EEZs of the two countries[32].

Figure 7: Maritime borders and main gas fields in the Levant Basin



Source: IEMed (2012).

[28] For an in-depth discussion of the issues summarised here, please refer to the seminal study of Scovazzi (2012), pp. 6-10.
[29] United Kingdom of Great Britain and Northern Ireland (1960).
[30] United Nations Delimitation Treaties Infobase (2003).
[31] See: United Nations Development Programme (2014).
[32] United Nations Delimitation Treaties Infobase (2010).

These EEZ delimitation treaties hit regional 'open wounds' and paved the way for the emergence of new disputes in the region. In particular, two key disputes have emerged: the first concerns the waters offshore Cyprus, while the second concerns the EEZ delimitation between Israel and Lebanon:

i) Cyprus: in 2004, Turkey notified to the United Nations that it does not recognise the previously mentioned 2003 treaty between the Republic of Cyprus and Egypt for the delimitation of theirs EEZs, claiming that delimitations in the offshore of Cyprus should be agreed by all states in the region (i.e. including Turkey), based on the principle of equity[33]. This issue is, of course, related to the Cyprus issue, following by the proclamation of the 'Turkish Republic of Northern Cyprus' ('TRNC') in 1983, that the United Nations declared legally invalid[34] and that only Turkey recognised[35]. After the gas discoveries in offshore Israel and Cyprus, Turkey signed an agreement with the 'TRNC' in 2011 for the delimitation of the continental shelf;

ii) Israel-Lebanon: this dispute emerged in 2010[36], after the previously mentioned treaty between the Republic of Cyprus and Egypt was signed. Lebanon claimed the treaty violated its own rights over the seabed and waters (clearly, where hydrocarbons are supposed to be present).

Both the UNCLOS and customary rules of international law provide a number of means for the peaceful settlement of maritime boundary issues[37], so there is no reason why these two Eastern Mediterranean disputes could not be solved. However, as also outlined by the UNCLOS, states should behave in good faith in order to reach such delimitation agreements. For this reason, only a stabilised geopolitical environment in the Eastern Mediterranean would allow the resolution of these disputes.

After this overview on the geological and legal aspects related to the new Eastern Mediterranean offshore gas horizon, the following sections will provide insights on the developments in the countries of the region.

2.4 Offshore developments in Israel

In the gas business, availability of resources does not automatically signify deliverability – as several issues can delay or even prevent the exploitation of the resources. The case of Israel clearly illustrates this trend, as the major barrier to the development of the country's gas resources has so far been regulatory issues.

After the discovery of the Tamar and Leviathan fields in 2009 and 2010, the Government of Israel appointed an inter-ministerial committee in October 2011 to examine the various policy options to exploit the newly discovered gas resources. The committee, chaired by the then-Director General of the Ministry of Energy and Water Resources, Shaul Zemach, conducted a comparative study of the accepted policy in the gas sector around the world. The goal was to learn from accrued international experience, identify best practices and accordingly recommend to the Government of Israel the optimal policy for the country's future gas industry. Because of the importance of the gas resources for the future of the Israeli economy and society, the committee attributed great importance to ensuring that these resources would be utilised in such a way as to maximise their value for the Israeli public and contribute to the country's foreign relations. After a year of work, the committee presented its policy recommendations to the Government in September 2012[38]. These suggested that Israel should give preference to supplying gas

[33] United Nations (2004).
[34] United Nations (1983).
[35] On Turkey and the problem of the recognition of Cyprus, also see: Comfort (2005).
[36] Financial Times (2011).
[37] For a detailed analysis of this point, please refer to: Patibandla (2011).
[38] State of Israel (2012).

for the needs of the local economy, and export no more than 500 Bcm of its existing and prospective gas resources by 2037.

These policy recommendations stimulated a wide discussion in the country about the management of gas resources. Considering the different size of the two key discoveries (280 Bcm at Tamar and 620 Bcm at Leviathan), this policy discussion particularly concerned Leviathan, being the field considered as the bulk of the country's potential gas export strategy.

In the meantime, the Tamar field was quickly developed and became operational in early 2013, supplying Israel with 7.5 Bcm/year of gas already in 2014. This gas was very important for Israel, as it allowed the country to provide a structural solution to the gas shortage created by the post-2011 halt of Egyptian gas deliveries previously mentioned. In 2014, the Tamar consortium (at the time composed of Noble Energy and Delek Drilling) also signed Israel's first gas export deal with Jordan's Arab Potash Corporation and Jordan's Bromine Company[39]. The deal called for the supply of 1.8 Bcm of gas over a 15-year period, and received the Israeli Government's approval in 2015. In September 2016, Israel's Prime Minister Benjamin Netanyahu announced his commitment to supply energy and water to the Gaza strip, starting with the laying of a gas pipeline to deliver Tamar's gas[40]. Considering the short distance between the field's gas entrance point to the Israeli shore and the Israel-Gaza border, the cost of the pipeline is likely to be very limited.

After several revisions of the Zemach Committee's recommendations of 2012, the Israeli Government decided in 2013 that 60 % of the country's discovered gas would be devoted to domestic consumption, in order to secure the country's domestic market for around 30 years[41].

Also on the basis of this decision, Leviathan's shareholders[42] entered into talks with Australia's Woodside Petroleum, a global LNG player, to evaluate its entrance into the consortium. This deal, estimated at USD 2.7 billion, would have allowed a quicker entrance of Leviathan into the global LNG market. However, the Australian company pulled out from the talks in May 2014 citing unspecified commercial reasons[43], a move that analysts have attributed to Israel's regulatory and tax uncertainty.

In the meantime, Leviathan's shareholders entered into gas export talks with both Egypt and Jordan.

With regard to Egypt, Leviathan's shareholders moved in two directions. They entered into talks with BG Group for the export of a large amount of gas over a period of 15 years to the Egyptian Idku LNG plant via an undersea pipeline, with the aim of supplying Egypt, but also of re-exporting part of the gas as LNG. In parallel, they entered into talks with the Egyptian group Dolphinus for the export of 4 Bcm/year of gas to Egypt over a period of up to 15 years.

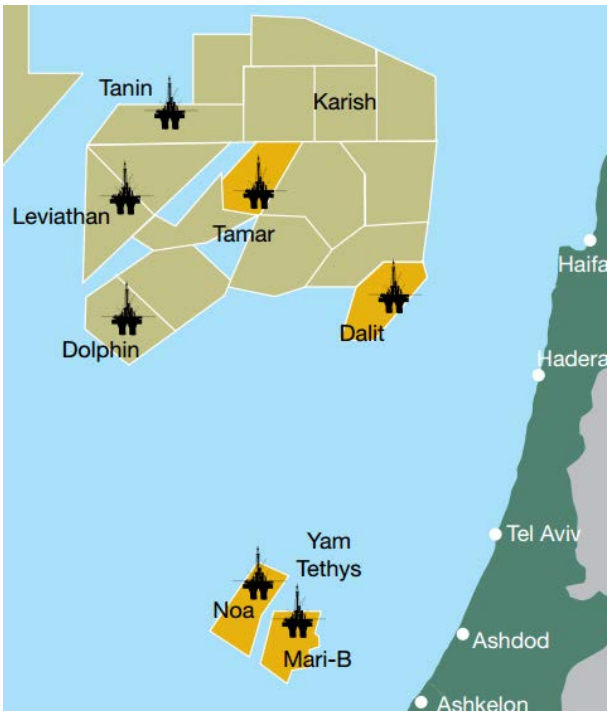
With regard to Jordan, Leviathan's partners entered into talks with the Jordanian National Electric Power Company in 2014. The two parties signed a letter of intent for the supply of 45 Bcm of gas from Leviathan to Jordan over a period of 15 years. However, the Jordanian Parliament voted against the deal and, for two years, gas talks between the parties were halted. This situation changed in September 2016 with the signature of a gas supply agreement between the Jordanian company and Noble Energy.

All these resource monetisation plans of Leviathan's shareholders were delayed between 2012 and 2016 not only due to geopolitical issues, but also due to Israel's deep regulatory uncertainty.

[39] The two Jordanian companies own factories on the Eastern shores of the Dead Sea.
[40] Reuters (2016).
[41] Reuters (2013).
[42] Houston-based Noble Energy, and Israel's Delek, Avner and Ratio.
[43] Woodside (2014).

In 2012, the Israeli Antitrust Authority led by Prof. David Gilo declared the Noble Energy-Delek partnership, that discovered the gas fields in offshore Israel, a monopoly. As a consequence, they could not develop all the fields together. As Rettig (2016) points out, 'though the antitrust previously allowed the companies to develop the fields, it was now concerned that with the demise of the Egyptian gas pipeline Israel has become wholly dependent on a single supplier that controls all of its gas and its price'[44]. As a result, Noble Energy and Delek divested their ownership in the Karish and Tanin fields (Figure 8), in order to avoid being branded a cartel by the Israeli authorities.

Figure 8: Gas fields in offshore Israel



Source: Offshore Energy Today. Note: most important fields outlined in yellow.

The antitrust issues relating to gas activities in the country scaled-up in December 2014, when the Antitrust chief stated that he was reconsidering his previous agreement to let the Noble Energy-Delek partnership retain its stakes in the Leviathan and Tamar reserves if they would sell smaller fields. He argued that the arrangement may constrain competition and that he was considering declaring the partnership a monopoly, a move that might require it to sell holdings in one of the two big fields[45].

At that point, an inter-ministerial panel was tasked with negotiating a solution'. Under the compromise reached in May 2015 between the Government and the gas companies, Delek should sell all its shares in Tamar within six years of signing the agreement, while Noble Energy should reduce its stake from 36 % to 25 %. The two companies also agreed to sell the smaller Karish and Tanin fields to other companies.

In strong disagreement with the Government over this compromise, the Antitrust chief resigned from his position in August 2015, claiming that the new policy framework would not lead to proper competition in the Israeli gas market[46].

[44] Retting (2016), p. 61.
[45] New York Times (2014).
[46] Bloomberg (2015).

Prime Minister Benjamin Netanyahu reacted to this situation by making use of an option of last resort: invoking a special clause – Article 52 – of Israel's key antitrust law[47] that allows the Government to circumvent the Antitrust authority for reasons of national security.

Netanyahu based his decision on documents submitted by the National Security Council and the Ministry of Foreign Affairs, arguing that without gas supplies, electricity and water shortages could take place in Egypt and Jordan, leading to renewed regional instability. They also argued that, should Israel fail to do this, Iran might have eventually filled the gas gap of these two countries, creating a direct security issue for Israel in its neighbourhood.

Prime Minister Netanyahu invoked Article 52 in December 2015. He did so in his capacity as Economy Minister, as his previous Minister resigned after having refused to sign the article. The Prime Minister did so also against the opinion of the Knesset Economic Affair Committee, which advised against signing Article 52[48].

Right after this approval, a number of petitions were submitted to Israel's High Court of Justice, demanding the overturn of Article 52 and the return to negotiations. In March 2016, the High Court of Justice ruled against the so-called 'Stability clause' contained in the policy framework, arguing that the terms of the framework itself went further than governments can go in a democracy. The Court gave the Government a year to come up with a legal solution to the 'Stability clause' or the whole framework would expire.

After this decision, Prime Minister Netanyahu declared: 'The High Court of Justice's decision is a grave threat to the development of Israel's gas reservoirs. Israel is perceived as a state with legal intervention that makes it harder to make business. Certainly no one has a reason to celebrate that the gas might stay deep under the sea and billions of shekels lost to Israel citizens. We will look for other ways to overcome the heavy damage that was caused to the Israeli economy by this bizarre decision'[49].

Israel's gas developments have experienced a speed-up in 2017 as a final investment decision for the development of the first phase (Phase 1A) in the development plan of the Leviathan gas field was reached by Noble Energy, Delek Drilling, Avner Oil Exploration and Ratio Oil Exploration on 23 February. Leviathan's Phase 1A will produce 12 Bcm/year of gas, starting in 2019[50].

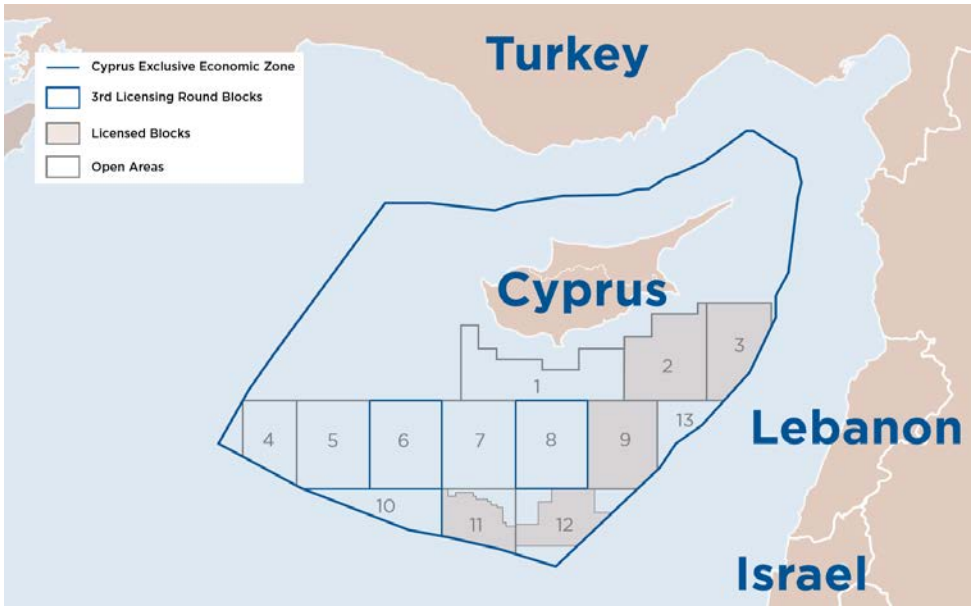
2.5 Offshore developments in Cyprus

If the development of gas resources in Israel has been mainly delayed by regulatory uncertainty, in Cyprus developments have mainly been delayed by the limited amount of gas resources found in the island's offshore.

In 2011 Noble Energy and Delek discovered a natural gas reservoir in offshore Cyprus (Block 12) with a resource estimate, at the time, of up to 220 Bcm: the Aphrodite field (Figure 9).

[47] State of Israel (1988).
[48] Jerusalem Post (2015).
[49] Jerusalem Post (2016).
[50] Delek Group (2017).

Figure 9: Cyprus' EEZ and offshore exploration blocks



Source: Ministry of Energy, Commerce, Industry and Tourism of the Republic of Cyprus.

The Government of the Republic of Cyprus immediately engaged with Noble Energy and Delek to design a development plan for the Aphrodite field, with the double aim of meeting the island's domestic gas demand for power generation and exporting part of the gas resources. However, the initial enthusiasm was cooled down after initial estimations of Aphrodite's resources were revised to 140 Bcm in 2013. This amount could certainly be sufficient to satisfy Cyprus' domestic gas needs for several decades, but, due to the small size of the island's market, these gas resources could only be developed if partly devoted to exports. In November 2015, Noble Energy and Delek announced a farm-out agreement for a portion of its interest in Block 12 with BG International. With this deal, BG – then acquired by Shell in February 2016 – acquired a 35 % interest in Block 12[51].

In January 2013, Italy's Eni signed exploration and production sharing contracts with the Republic of Cyprus for Blocks 2, 3 and 9. The company was awarded the three blocks whilst leading a consortium formed by Eni itself (80 %, as operator) and the Korean company Kogas (20 %) in an international competitive tender[52]. Eni drilled two wells in Block 9 between 2014 and 2015, and both of them failed to reveal exploitable gas resources. After this disappointing result, the Republic of Cyprus granted a two-year extension to Eni's lease of Blocks 2, 3 and 9 – until 2018[53].

The award of exploration licenses has been made by the Republic of Cyprus despite the objections of both the Turkish Cypriot community and of Turkey. As previously described, both claim that the Republic of Cyprus does not have the sole authority holding exclusive rights concerning the island's natural resources until a settlement of the decades-old Cyprus issue is found.

In response to the offshore drilling programme being carried out by the Republic of Cyprus on its offshore exclusive economic zone (EEZ), the Turkish Cypriot community commissioned to Turkish Petroleum (TPAO) in late 2014 the exploration of offshore areas. TPAO sent the seismic vessel Barbaros Hayreddin Pasa in Cypriot waters, which soon became another stumbling-block in the already complicated Cyprus settlement talks, which began in early 2014[54]. Furthermore, Turkey threatened to

[51] Oil and Gas Journal (2015).
[52] Cyprus 2nd Offshore Licensing Round, which was completed in May 2012.
[53] Reuters (2015a).
[54] Reuters (2015b).

blacklist international gas companies taking part on the Republic of Cyprus' exploration programme. However, several international gas companies showed their interest in being part of the offshore exploration promoted by the Republic of Cyprus, even at the cost of compromising their positions in Turkey.

This interest was vivid also in 2016, when the Republic of Cyprus launched a new licensing round, which ultimately awarded blocks 6, 8, and 10 to four international firms: i) Block 6 was awarded to a partnership of Eni and Total, with Eni playing the role of operator with a 50 % stake; ii) Block 8 was awarded exclusively to Eni; iii) Block 10 was awarded to a partnership of ExxonMobil and Qatar Petroleum. The recent discovery of the Zohr field in nearby waters of offshore Egypt certainly contributed to keep interest high about Cyprus' blocks, notwithstanding the unpromising results so far obtained by exploratory wells[55].

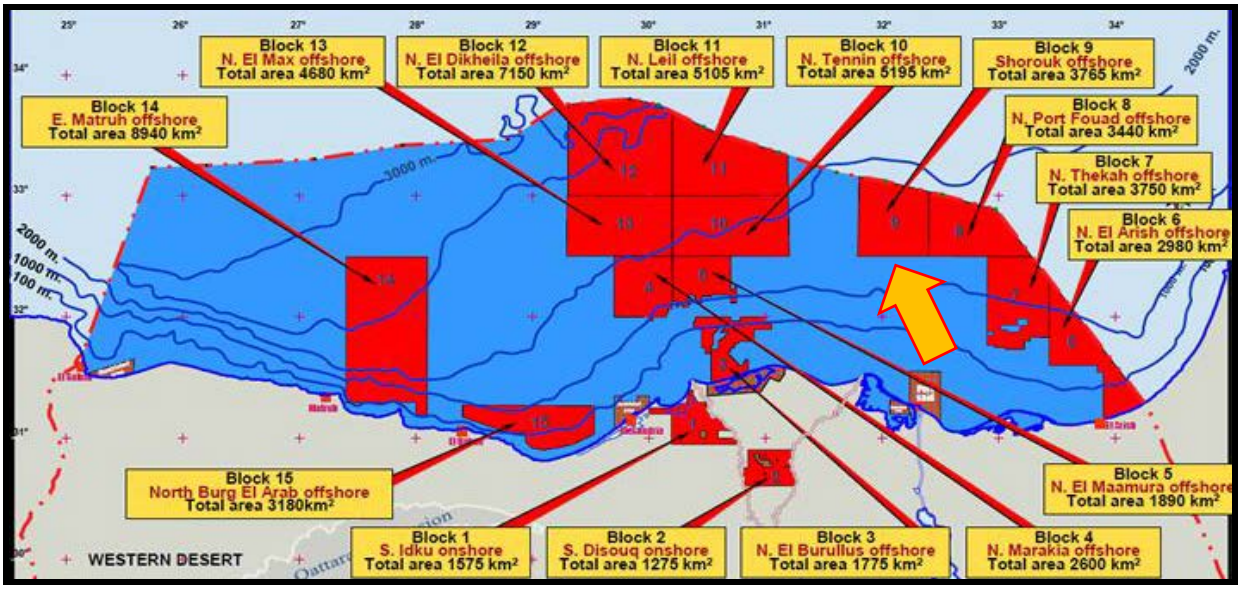
Only the results of the new exploration activities will shed light on the future gas prospects of Cyprus. In fact, as the troubled geological developments in Cyprus illustrate, it is not possible to estimate future developments, as the reality projected by seismic surveys might be different from the one concretely revealed by exploratory drilling activities.

2.6 Offshore developments in Egypt

Egypt has a long history of offshore gas exploration and production activities[56]. Gas exploration in the Egyptian offshore started as early as the 1960s, and the first offshore discovery – the Abu Qir field – was made in 1969. This and other onshore discoveries encouraged further explorations, which led to new important discoveries and ultimately allowed the country to increase its gas production to 60 Bcm/year in 2010 (see Section 2.2).

Since 2015, Egypt's offshore has been in the limelight following Eni's discovery of the major Zohr gas field in the Shorouk block (Figure 10).

Figure 10: Block 9 Shorouk offshore in Egypt's 2012 licensing round



Source: EGAS (2012).

[55] Offshore Energy Today (2016).
[56] For an in-depth discussion of Egypt's energy scenario, please refer to: Tagliapietra (2017).

With its 850 Bcm of total gas resources in place, Zohr represents the largest gas discovery ever made in the Mediterranean Sea and, due to its size, it might redefine the overall Eastern Mediterranean gas outlook.

If there is a certainty about Zohr, it is that its development will primarily serve the Egyptian domestic market. As already illustrated in Section 2.2, due to a rapid decline in production, the country has increasingly struggled to meet its domestic demand. As a result, Egypt even started to import gas in 2015. Accordingly, Egypt's LNG exports dropped from a starting level of about 15 Bcm/year in 2005 to almost zero in 2014, leaving the country's two LNG plants completely idle. With a potential 20 year-plateau production level of 20-30 Bcm/year, Zohr would be a major relief for Egypt's strained gas market.

Eni has embarked on a fast-track development programme at Zohr, and gas production is expected to start in 2017. Eni will not be alone in the development of Zohr, as it sold a 10 % stake in the Shorouk concession to BP in November 2016, and it sold another 30 % stake to Rosneft in December 2017[57].

Zohr is the first discovery in a geological formation previously not exploited, and for this reason could be the first of a new string of gas discoveries offshore Egypt. International gas companies have already started to increase operations in the area. For instance, in June 2016 Eni itself made another significant gas discovery – the Baltim South West discovery – in the Egyptian offshore, in an area – Great Nooros – that is estimated to hold 70-80 Bcm of gas. BP is proceeding with the development of its West Nile Delta project, which is expected to produce around 12 Bcm/year (e.g. about 25 % of Egypt's gas demand) starting in 2017[58]. Other companies are also active in the Egyptian offshore – such as Italy's Edison, which operates the North Thekah and North Port Fouad concessions adjacent to Shorouk, and Shell, which is expected to progress shale gas exploration in Egypt in partnership with Apache. If Zohr and other new potential offshore fields reach their full potential in the 2020s, Egypt might become an LNG exporter again by the mid-2020s.

However, the impact of Zohr could well go beyond Egypt's boundaries, due to its geographic location and infrastructure. Zohr is located only 90 km away from Aphrodite (Cyprus), which in turn is only 7 km off from Leviathan (Israel). This proximity could allow a coordinated development of the fields and thus the creation of the economies of scale needed to put in place a competitive regional gas export infrastructure. As previously mentioned, Egypt already has in place a 19 Bcm/year LNG export infrastructure in Idku and Damietta that currently sits idle. This would allow it to export any volumes from Zohr and other fields not used in the domestic market. Given the growing domestic demand in Egypt, it is fair to assume that some export capacity would be left for Israeli and Cypriot gas – if it can be brought to the Egyptian terminals. As both LNG plants can be expanded, Israeli and Cypriot developers would have a flexible outlet.

This potential development will be better analysed, together with other Eastern Mediterranean gas export options, in Chapter 3.

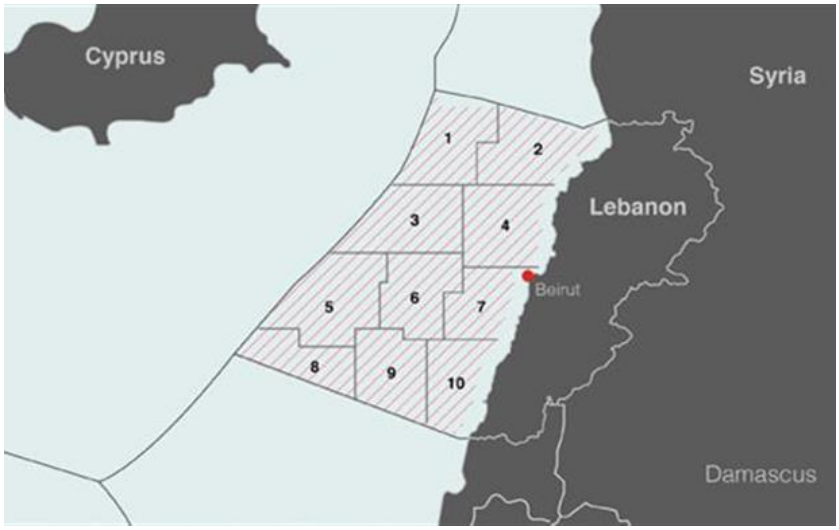
[57] These agreements are aligned to Eni's 'dual exploration model' which, in parallel with an accelerated development of the hydrocarbons reserves, aims at early monetisation via the dilution of high participating interest owned in exploration discoveries.
[58] All the produced gas will be fed into the country's national gas grid.

2.7 Offshore developments in Lebanon

Hydrocarbon exploration activity on Lebanese territory has never taken place. However, considering that the country's offshore geology is a continuation of offshore Israel, following the gas findings in this area a detailed 3D seismic survey of Lebanon's offshore has been undertaken[59]. The survey, carried out by the UK-based Spectrum ASA in the 'Phase 1' area offshore Lebanon, was completed in September 2012 and estimated Lebanon's gas reserves at 700 Bcm[60]. However, this kind of estimations should be handled very careful.

After years of political discussions, the Lebanese government launched its first oil and gas licensing round in January 2017, opening five offshore blocks (blocks 1, 4, 8, 9 and 10) (Figure 11). Three of the five blocks included in the licensing round are located near Israeli maritime borders.

Figure 11: Lebanon's offshore blocks



Source: Lebanon Petroleum Administration.

When considering that this licensing round was supposed to take place back in 2013, it is possible to understand the major governance challenge faced by Lebanon. At the time, the launch of the licensing round was said to mainly depend on the finalisation of the country's Petroleum Administration, the government body that is to administer Lebanon's hydrocarbon sector under the supervision of the Ministry of Energy and Water.

The establishment of this institution took time, as the new government body had to be made up of members representing each of Lebanon's religious communities. In fact, Lebanon is a parliamentary democratic republic within the overall framework of confessionalism, a form of consociationalism in which the highest offices are proportionately reserved for representatives of the country's numerous religious communities[61]. Lebanon finally appointed the long-awaited Petroleum Administration in November 2012 but vis-à-vis several other political constrains, this was evidently not sufficient to allow the licensing round to take place. This shows, again, how governance represents a major barrier for the advancement of Lebanon's gas exploration activities.

[59] The multi-client survey – contracted by Lebanon's Ministry of Energy and Water – focused on the southwest sector of Lebanon's EEZ.
[60] The Daily Star (2012).
[61] As Obeid (2010, p. 106) points out: 'In Lebanon, you are never simply Lebanese. You are Sunni from Beirut, Maronite Catholic from Jounieh, or Shia from the South. Whether seeking to marry or applying for a job, the first question is always what "confession", or religious sect, you belong to. That is the reality of Lebanese society.'

2.8 Offshore developments in Gaza

In 1999, British Gas secured a license from the Palestinian Authority to explore the wedge of the Palestinian offshore territory between Israeli and Egyptian waters[62]. The following year, the British company drilled two successful wells 36 km off the Gaza Strip (Figure 12), making the first gas discoveries in the offshore Eastern Mediterranean after Egypt[63]: Gaza Marine-1 and Gaza Marine-2, with total gas reserves estimated at 28 Bcm.

A technical review made in 2001 recommended subsea development of the field and the construction of a pipeline to the shore[64]. The Palestinian Authority approved an outline of a development plan in 2002. However, Israel has always been reluctant to allow the development of the Gaza Marine gas field. In 2003, Ariel Sharon vetoed a deal that would enable British Gas to supply Israel with gas from Gaza's wells[65]. In following years, talks between Israel and British Gas for the development of the field made no progress. Hamas' victory at the elections of January 2006 further complicated the situation and in 2008, British Gas decided to close its office in Tel Aviv.

In 2012, Israel declared its intention to engage in a meaningful discussion with the Palestinian Authority with the aim of developing the Gaza Marine gas field. This decision came after talks between Israeli Prime Minister Benjamin Netanyahu and the Quartet[66] Representative to the Middle East Tony Blair and an approach made by the Palestinian Authority to Tel Aviv[67]. However, the conflict between Israel and Gaza that started in November 2012 ended any hopes of cooperation.

Figure 12: The Gaza Marine field

Source: BG Group.

[62] MEES (2012a).
[63] Gaza Marine 1 and Gaza Marine 2. BG holds a 60 % stake in the license, Athens-based Consolidated Contractors Company (CCC) holds 30 % and the Palestinian Investment Fund 10 %.
[64] BG official website: http://www.bg-group.com.
[65] The Daily Star (2010).
[66] The Quartet is made up of the United States, the European Union, the United Nations and the Russian Federation.
[67] Oil Daily (2012).

In 2016, Israel approved in principle the construction of the first Palestinian power station in the West Bank, expected to be built in the Jenin Industrial Zone, near the Gilboa-Jalame checkpoint. The construction time of this power plant is estimated at four years, after which it could provide the Palestinian market with 450 megawatt at full capacity. Should this project go ahead, Palestinian gas demand could increase from the current level of 0.3 Bcm/year to almost 1 Bcm/year over the course of the next decade. While Israel would initially supply the gas needed by this power plant, in the longer-term Palestine could make use of Gaza Marine fields to produce its own gas resources.

The development of the Gaza Marine gas fields could thus represent a win-win solution for Israel and the Palestinian Authority. The Gaza Marine gas field could supply, in the longer term, the Palestinian electricity market and, at the same time, provide revenues to ease the financial problems faced by the Palestinian Authority[68]. In addition, the development of the Gaza Marine fields could also be economically beneficial for Israel, considering that the Gaza Strip and West Bank receive almost all of their electricity from Israel, at a very poor payment regime. In September 2016 Israel concluded a deal with the Palestinian Authority to pay off its USD 500 million debt to the Israel Electric Corporation. About quarter of the debt is to be erased by Israel, while the rest is to be spread over a long-term repayment plan.

Albeit technically and economically sound, the outlook of Palestine's gas potential will largely depend on the evolution of the relations with Israel. In fact, as the volumes of the Gaza Marine fields are very limited (28 Bcm), it is not possible to expect these gas resources to incentivise political dialogue between Palestine and Israel.

Due to its limited size, the Gaza Marine fields should not be given excessive geopolitically importance, but rather should be considered as a purely technical potential option. After all, it would be unrealistic to consider gas issues in general – and the Gaza Marine issues in particular – as a game changer in the deep-rooted and long-lasting Israeli-Palestinian conflict.

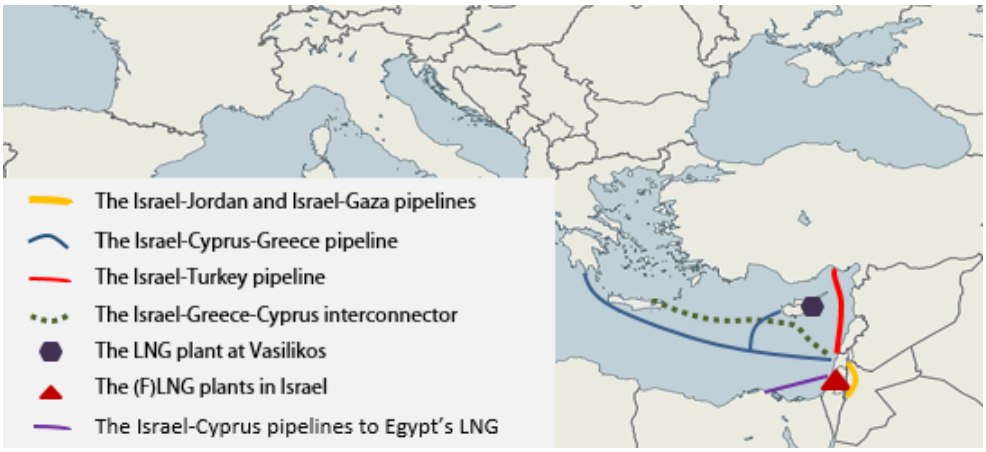
[68] The revenues from the natural gas would go directly to the Palestinian Authority, bypassing Hamas' government.

3 Assessment of proposed gas export routes

3.1 Introduction

Having illustrated the offshore gas resources in the Eastern Mediterranean, it is now useful to analyse how this gas could be exported. Since 2009-10, a number of export projects have been proposed, both as pipelines and LNG. This chapter provides an in-depth analysis of these projects: i) Israel-Jordan and Israel-Gaza pipelines; ii) Israel-Cyprus-Greece pipeline; iii) Israel-Turkey pipeline; iv) Israel-Cyprus-Greece electricity interconnector; v) LNG plant at Vasilikos; vi) (F)LNG plants in Israel; vii) Israel-Cyprus pipelines to existing Egypt's LNG plants (Figure 13).

Figure 13: Eastern Mediterranean main gas export projects



Source: author's elaboration.

3.2 Israel-Jordan and Israel-Gaza pipelines

As illustrated in Section 2.4 the Tamar consortium signed Israel's first gas export deal in 2014, with Jordan's Arab Potash Corporation and Jordan's Bromine Company. The deal called for the supply of 1.8 Bcm of gas over a 15-year period[69], and received the Israeli Government's approval in 2015. To allow the materialisation of this deal, a pipeline is being constructed in the Sdom area by the Dead Sea, and is expected to become operational by end-2017.

A second Israel-Jordan pipeline is projected to be built in the Beit Shean area, on the basis of the gas supply agreement signed in September 2016 between the Leviathan consortium and the Jordanian National Electric Power Company. Under this deal, 45 Bcm of gas from Leviathan are expected to flow to Jordan over a period of 15 years starting in 2019[70]. The deal came after a letter of intent signed by the Jordanian company and Noble Energy in 2014. At the time, the Jordanian Parliament voted against the deal and multiple protests were staged in Amman. These protests revived in September 2016, after the signature of the supply agreement. However, the Jordanian government responded to the protests arguing that the deal represents a strategic decision to diversify Jordan's energy sources[71].

In September 2016, Israel's Prime Minister Netanyahu declared his willingness to allow Israel's energy and water supply to the Gaza strip, starting from the laying of a gas pipeline. The cost of the pipeline would be very limited, but its realisation will depend on the evolution of the political situation in Gaza.

[69] Noble Energy (2014).
[70] Delek Group (2016).
[71] See: Milton-Edwards (2016).

3.3 Israel-Cyprus-Greece pipeline

The Israel-Cyprus-Greece pipeline project, also known as East-Med pipeline, represents an offshore/onshore gas pipeline aimed at directly connecting Eastern Mediterranean gas resources in offshore Israel and Cyprus to Greece via Crete, with a total capacity of 16 Bcm/year. The project is being designed by IGI Poseidon, a 50-50 % joint venture between DEPA and Edison. The pipeline is projected to be built in conjunction with the Interconnector Turkey-Greece-Italy (ITGI) and the Interconnector Greece-Bulgaria (IGB) pipelines, to supply gas to Italy and other South East European countries (Figure 14)[72].

The East-Med pipeline project envisages a 1 300 km offshore pipeline with various diameters (60-80 cm) and a 600 km onshore pipeline (100 cm diameter). The pipeline is designed with the following sections: i) 200 km offshore pipeline stretching from Eastern Mediterranean gas fields to Cyprus; ii) 700 km offshore pipeline connecting Cyprus to Crete Island; iii) 400 km offshore pipeline from Crete to mainland Greece (Peloponnese); and iv) 600 km onshore pipeline crossing Peloponnese and West Greece.

In 2015, with the support of the Cypriot, Greek and Italian governments, the East-Med pipeline was confirmed as Project of Common Interest (PCI) and was included by the EU Commission in the second PCI list among the Southern Gas Corridor projects.

The East-Med pipeline project has also been included in the last Ten-Year Network Development Plan (TYNDP), in line with the objective of the European Network Transportation System Operators of Gas (ENTSOG) to create a single European market for gas and a reliable and safe transmission network capable of meeting Europe's current and future needs.

The project has been awarded with European grants of EUR 2 million in 2015 through the Connecting Europe Facility (CEF) necessary for the co-finance of the Pre-FEED studies.

These Pre-FEED studies concluded that the project is technically feasible and represents an economically viable export option. According to these studies, a pipeline running from the Levantine Basin to Greece with a capacity of 10 Bcm/year would cost EUR 5.2 billion. This cost would rise to EUR 6.2 billion when including the segment to connect Greece and Italy[73].

However, several energy experts question the economic viability of such an infrastructure project, particularly considering the still-limited volumes of gas resources discovered in offshore Cyprus on the supply-side, and the uncertain outlook for European gas demand on the demand-side.

Figure 14: The projected Israel-Cyprus-Greece pipeline route

Source: IGI Poseidon.

[72] http://www.igi-poseidon.com/
[73] IGI Poseidon (2017).

3.4 Israel-Turkey pipeline

In 2013, Turkey's Turcas Holding submitted a USD 2.5 billion offer to Israel for the construction of a 470-km gas pipeline connecting Israel and Turkey, with a capacity of 16 Bcm/year.

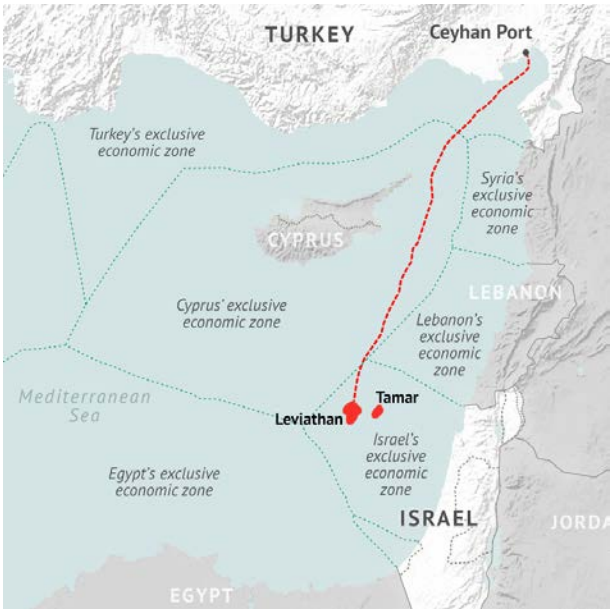
Right after this proposal, Turkey's Zorlu Group also expressed its interest in building a pipeline between the two countries, taking into account its existing activities in Israel (i.e. the company was constructing a power plant in the Ashkelon province). In 2014, eight other companies presented offers in a tender for the export of gas from Israel's Leviathan to Turkey via pipeline[74].

However, these expressions of interest from energy companies were completely halted by the political and diplomatic rift between Turkey and Israel which emerged after the 'Gaza flotilla raid' of 31 May 2010[75]. Then-Turkish Energy Minister Taner Yildiz stated on several occasions that 'for energy projects to proceed, the human tragedy in Gaza will have to be stopped and Israel will have to instate a permanent peace there with all elements'.

The Israel-Turkey pipeline project was revived in June 2016, after the two countries signed a reconciliation agreement after their six-year diplomatic freeze. Following this development, Turcas announced that at least 15 Turkish energy companies would be interested in creating a consortium to transport Israeli gas to Europe via Turkey. However, the company also stated that, in order to export Israeli gas to Turkey via pipeline, new bilateral agreements are required between Israel and Cyprus and between Cyprus and Turkey.

It is, indeed, at this very point that lies the most important barrier to the development of an Israel-Turkey gas pipeline project. In fact, after the Israel-Turkey reconciliation agreement of June 2016, the Republic of Cyprus immediately announced that it would allow an Israel-Turkey gas pipeline to cross its waters (Figure 15) only when its relations with Turkey improve.

Figure 15: The projected Israel-Turkey pipeline



Source: Stratfor (2015).

[74] For an in-depth analysis of the Israel-Turkey pipeline project, please refer to: Winrow (2016).
[75] The Gaza flotilla raid was a military operation by Israel against six civilian ships of the 'Gaza Freedom Flotilla' on 31 May 2010 in international waters in the Mediterranean Sea. Nine activists were killed in the raid. The flotilla, organised by the Free Gaza Movement and the Turkish Foundation for Human Rights and Freedoms and Humanitarian Relief (İHH), was carrying humanitarian aid and construction materials, with the intention of breaking the Israeli blockade of the Gaza Strip.

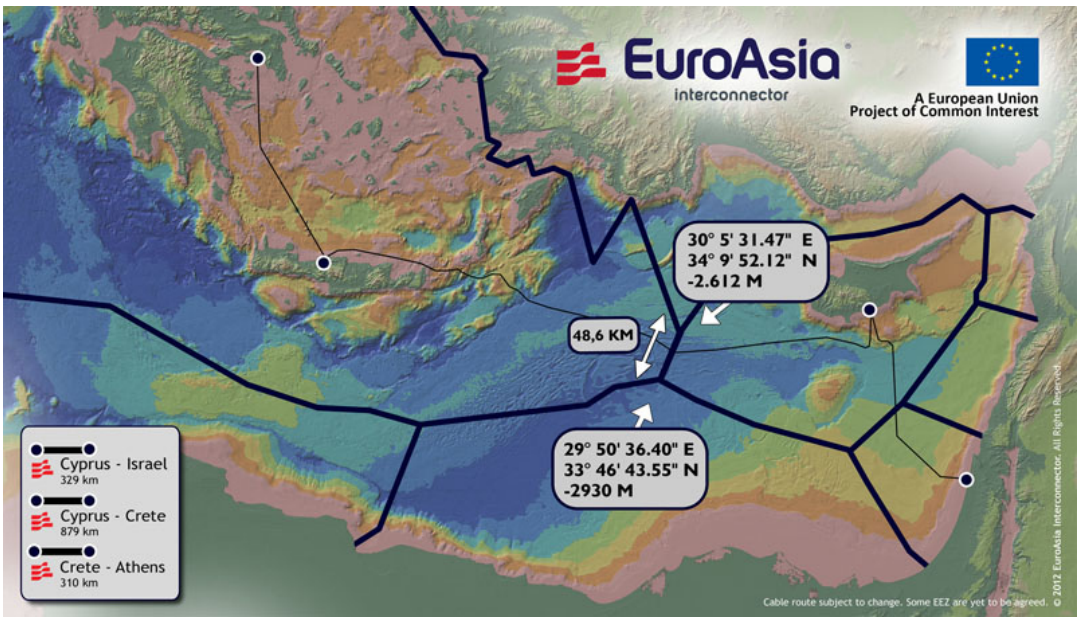
The solution of the long-lasting Cyprus issue thus represents the fundamental prerequisite for the advancement of the Israel-Turkey gas pipeline project.

3.5 Israel-Cyprus-Greece electricity interconnector

The Israel-Cyprus-Greece electricity interconnector, also known as EuroAsia Interconnector, is a proposed interconnector to link Greek, Cypriot and Israeli power grids via a submarine power cable. The idea behind this project is to generate electricity with gas-fired power plants in Israel and Cyprus, and then export this electricity to Europe via the interconnector.

A 287 km cable would link Israel with Cyprus. Cyprus would be connected with the Greek island of Crete. From Crete, an existing cable would be used for connection to mainland Greece providing a connection to the pan-European electricity grid (Figure 16).

Figure 16: The projected Israel-Cyprus-Greece electricity interconnector



Source: EuroAsia Interconnector (2012).

If built, the total length of the interconnector would be about 1 000 km and it would be laid at depths of up to 2 000 metres under sea level. It would have a capacity to transmit 2 000 MW of electricity in either direction. Such infrastructure is estimated to cost about EUR 1.5 billion[76].

A memorandum of understanding for conducting a feasibility study was signed in Jerusalem on 4 March 2012 between the project company, DEH Quantum Energy, and the Israeli Electric Corporation. However, no further developments have occurred so far.

[76] http://www.euroasia-interconnector.com/

3.6 LNG plant at Vasilikos

In 2003 and 2008, the Government of Cyprus expropriated land at Vasilikos for the construction of the Vasilikos Energy Centre (VEC), which was to comprise an onshore LNG import terminal by the coast east of the Vasilikos power station and storage for white and black oil products in the north of the VEC site[77].

The year after the discovery of the Aphrodite field, Noble Energy and Delek Group signed a Memorandum of Understanding with the government of the Republic of Cyprus to develop an LNG plant within the VEC site. The idea underlying this project was to use the prospective Vasilikos LNG plant to export both Cypriot and Israeli gas – given Leviathan's proximity to Aphrodite.

Given that the Vasilikos area is limited to only 2 km^2, various industry sources questioned the feasibility of the project, considering the area as not sufficient to accommodate an LNG plant of at least three trains of 5 million tons/year of LNG each.

Cost certainly represented a major point of weakness for the Vasilikos LNG project. In fact, the project's cost was estimated at about USD 10 billion[78]: more than double that of the proposed Israel-Turkey pipeline.

Other weaknesses of the project related to Israeli concerns about the control of prospective revenues, and about potential security risks should Cyprus become embroiled in a situation of higher political tensions with Turkey[79]. From a military point of view, Israel's generals appeared to have no doubts abput the necessity of putting the export facility firmly within Israeli sovereignty[80].

The October 2013 downward revision of Aphrodite's estimated resources, represented another blow to the Vasilikos LNG project, which was then progressively marginalised in the discussions concerning Eastern Mediterranean gas export options.

3.7 (F)LNG plants in Israel

Potential sites for an LNG export terminal in Israel included the Red Sea port of Eilat, and the Mediterranean ports of Ashkelon, Ashdod and Haifa. However, residents of Ashdod, Ashkelon and Eilat and environmentalist groups strongly opposed the idea of constructing an LNG plant in Israeli territory, leading to wide public opposition against such prospect.

Moreover, technical problems also emerged with regard to these options. For instance, the first location to be proposed for an LNG facility was the Red Sea port of Eilat, which could have been connected to the Leviathan field via a new gas pipeline built parallel to an existing oil pipeline running along the Israeli coast from the port of Ashkelon. Considering that the Gulf of Aqaba measures only 24 km at its widest point, LNG tankers would have difficulty manoeuvring in such a tight space. Any Eilat LNG plant would also have had to share space with Israel's and neighbouring Jordan's biggest tourist hubs, and with major container terminals located in the territories of both countries.

The convergence of public opposition and technical constrains made the prospects for LNG plants in Israel difficult. The adoption of a floating LNG (FLNG) facility was also evaluated for the offshore of Israel, but due to the limited amount of gas that could be shipped with this technology, this option was also dismissed.

[77] http://www.mcit.gov.cy/mcit/mcit.nsf/All/02B6E904DE1DC822C2257B2100257B20
[78] Tsakiris (2014).
[79] World Gas Intelligence (2012).
[80] MEES (2012b).

3.8 Israel-Cyprus pipelines to existing Egypt's LNG plants

After the discovery of Zohr, the prospects of utilising Egypt's two idle LNG plants to export Egyptian, Israeli and Cypriot gas all together gained momentum. This option indeed sounds like the most convenient from both the technical and economic perspectives.

As illustrated in Section 2.6 the Zohr gas field is located only 90 km away from Aphrodite, which in turn is only 7 km off from Leviathan. This proximity could allow a coordinated development of the fields and thus the creation of the economies of scale needed to put in place a competitive regional gas export infrastructure.

Egypt's 19 Bcm/year LNG capacity could allow the export of any volumes from Zohr and other fields not used in the domestic market. Given the growing domestic demand in Egypt, it is fair to assume that some export capacity would be left for Israeli and Cypriot gas – if it could be brought to the Egyptian terminals. As both LNG plants can even be expanded, Israeli and Cypriot developers could well find in Egypt a flexible outlet.

For Israel and Cyprus, cooperating with other players in the region is crucial. Building the export infrastructure and developing the fields is a circular problem: if there are political or commercial risks that no export infrastructure will be in place when the production starts, a lot of money will be lost. If the field underperforms compared to expectations, expensive export infrastructure will sit idle. Consequently, bringing together an underused and scalable export infrastructure with several promising fields could be the key to unlocking untapped regional potential.

The flexibility provided by Egypt's idle LNG plants could also provide an answer to the need for flexible solutions in a region characterised by high geopolitical risk.

For international investors, committing to multi-billion infrastructure projects such as a new LNG plant or a new offshore pipeline is already a challenging task, considering the high technical and financial efforts required. Committing to such capital-intensive projects, that only repay initial costs over a long period of time, requires a stable geopolitical and regulatory environment. Without this certainty, investors are unlikely to commit.

With several geopolitical rifts still open, and with the persistency of unstable regulatory environments (as the case of Israel illustrates), the Eastern Mediterranean does not appear to be the most comfortable region to make the large, long-term and geopolitically-sensitive investments necessary for these gas infrastructure projects.

Making the best use of existing infrastructure, such as Egypt's LNG plants, could reasonably represent the best way to advance energy projects in a risk-mitigated manner.

4 Assessment of key destination markets

4.1 Introduction

If there is a certainty about Eastern Mediterranean gas developments, it is that regional gas resources will be initially exploited to serve the respective domestic markets. As illustrated in Chapter 2, Egypt emerged from the so-called Arab Spring as a net gas importer, while Israel developed a gas exploitation strategy that prioritises the domestic market. Likewise, Cyprus would also prioritise the domestic market – as it is currently utilising crude oil for generating its electricity.

Gas demand projections for both Egypt and Israel clearly illustrate the need of these countries to primarily focus their gas resources domestically. The IEA forecasts Egypt's gas demand to increase by more than 5 % per year between 2015 and 2021, stressing that the demand potential is huge, and that the increase in gas consumption could prove substantially higher where supplies are available[81]. Israel's Ministry of National Infrastructure, Energy and Water expects the country's gas demand to strongly increase in the future, from 5.2 Bcm in 2010, to 12.5 Bcm in 2020, and to 18 Bcm by 2030, of which 85 % should go to electricity generation and to industry[82].

However, after a first phase of development devoted to the respective domestic markets, a scale-up of gas exploitation activities in the offshore Eastern Mediterranean could well be devoted to substantial exports. In terms of timing, this scale-up might occur around 2020, once Egypt's Zohr gas field will reaches its production plateau and once Israel's Leviathan gas field finally starts production.

This section provides an assessment of key destination markets for the potential second phase (post-2020) of Eastern Mediterranean gas development: LNG, Jordan and Palestine, Europe and Turkey.

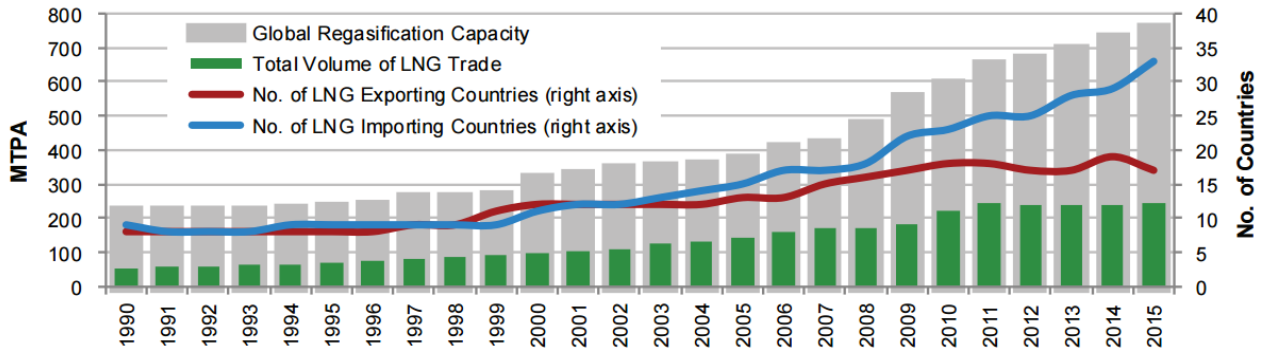
4.2 LNG

LNG has represented the key driver underpinning the progressive globalisation of international gas markets over the last decade. In fact, two of the world's three key natural gas markets (Europe and Asia) have become more and more interconnected due to inter-regional LNG trade[83]. This situation might expand in the future to the third key natural gas market, North America, due to the entrance of LNG from the United States into the global market. LNG trade, which is projected to continue to grow strongly over the next decades, is also increasing the price links between the three regional markets through the potential for arbitrage. This section sheds light on the key developments of this important market, in order to understand what role a future Eastern Mediterranean LNG could play in the wider international market context.

[81] IEA (2016).
[82] http://energy.gov.il/English/Subjects/Natural%20Gas/Pages/GxmsMniNGEconomy.aspx
[83] For a wider discussion of the globalisation of gas markets, please refer to: Tagliapietra and Hafner (2015).

Global LNG trade has constantly grown over the last decades. As illustrated in Figure 17, the volume of LNG trade expanded from less than 50 million tons/year in 1990 to 244.8 million tons/year in 2015[84].

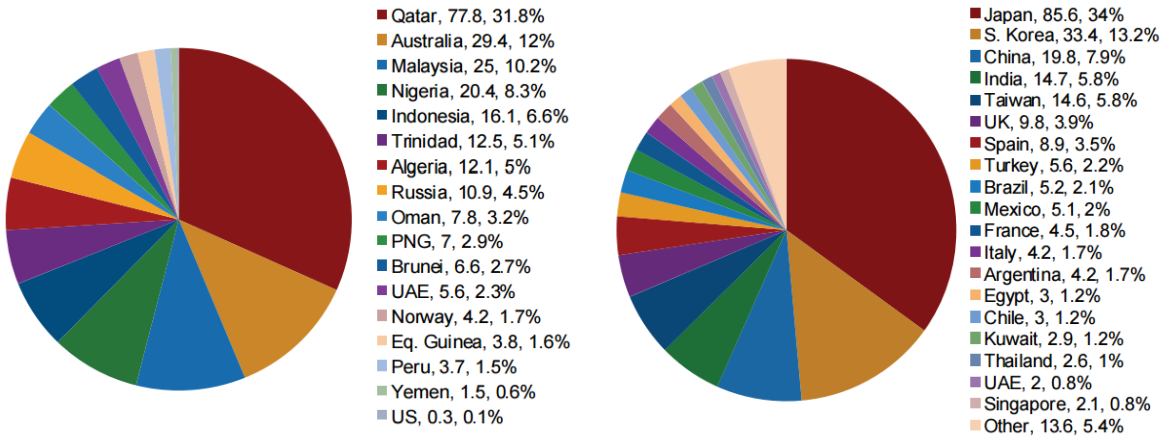
Figure 17: LNG trade volumes (1990-2015)



Source: International Gas Union (2016).

Both the number of LNG exporting and importing countries have grown significantly, from about seven in 1990 to about 17 and 33 respectively in 2015. In 2015, Qatar was the key LNG exporter of the world (covering one third of global LNG supply), followed by Australia, Malaysia, Nigeria, Indonesia, Trinidad, Algeria, Russia and other minor suppliers. The Middle East thus represents the leading LNG exporting region in the world. In the same year, Japan and South Korea imported more than half of global LNG (Japan alone imported more than 30 %), followed by China, India, Taiwan and several other minor importers (Figure 18). Asia and Asia Pacific markets thus represent the most important LNG importing region at global level, with a combined demand of 57 % in 2015. However, this figure is rapidly evolving, with the Chinese and the Indian markets expected to grow strongly over the next years.

Figure 18: 2015 LNG exports by country (MTPA) and 2015 LNG imports by country (MTPA)

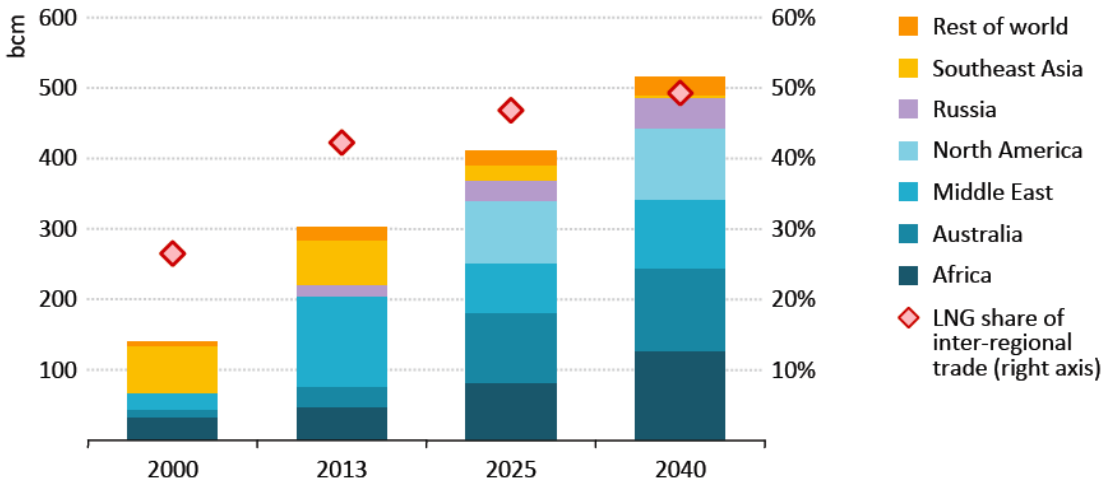


Source: International Gas Union (2016).

[84] Unless otherwise stated, all LNG statistics in this section refer to: International Gas Union (2016).

In this perspective, the LNG share of inter-regional trade is expected to further rise over the next decades. The IEA estimates that this share will grow from the current level of about 40 % to 50 % in 2040[85]. As Figure 19 illustrates, LNG exports are set to rise mainly in Australia, Africa, North America and Russia.

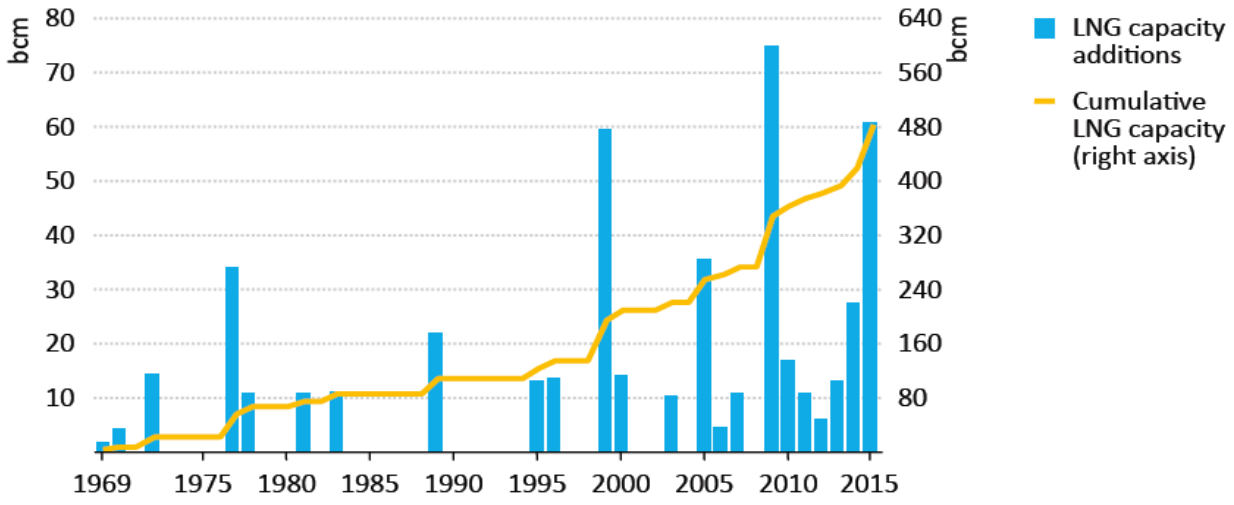
Figure 19: LNG exports by region in the IEA New Policy Scenario



Source: International Energy Agency (2015).

The previous figure also indicates a major expansion of LNG exports in the period up to 2025. This reflects the major capacity addition that characterises the period 2015-2020. In fact, as illustrated in Figure 20, capacity additions tend to come in waves that come in intervals of about five years or more.

Figure 20: Global LNG liquefaction capacity additions



Source: International Energy Agency (2015).

[85] International Energy Agency (2015).

These cycles are driven by gas discoveries, cycles in gas markets and expectations of future demand growth. The year 2015 signalled the beginning of the new cycle with a capacity addition of 60 Bcm. This cycle will gather further pace with major projects coming online by 2020 in Australia and the United States. Australia has seven new LNG projects coming online or under construction, that will expand its exports from 26 Bcm in 2013 to 90 Bcm per year in 2020.

At the same time, the United States – with Sabine Pass and four other projects under construction – is also set to expand their exports to 90 Bcm per year in 2020.

This expanding cycle will have a strong impact on the LNG market over the coming years, also in terms of pricing. In fact, gas importers are expected to benefit from this situation as growing supply will put a downward pressure on prices all over the world. This trend will be further emphasised by the fact that even if LNG continues to be mainly based on long-term trade, in relative terms spot and short-term trade has substantially increased over the last decades, rising from zero % in 1995 to about 27 % in 2014.

China and India will certainly absorb much of the new supply but considering that Japan will progressively reopen its nuclear reactors, it is difficult to expect Asia to take all the new available additional volumes. For this reason, Europe certainly has an opportunity to access low-priced LNG in the period up to 2020.

However, this favourable situation for LNG importers might well reverse in the 2020s, with a new cycle of tighter markets resulting from delayed investment in new LNG projects due to low prices in the period 2015-2020. In fact, many new LNG projects (expected to come online after 2020) are already being reconsidered all over the world from Africa to Australia, to North America. For instance, the prospects of a new wave of post-2020 Australian projects is being reconsidered after announcements of final investment decision postponements or even project cancellations from different international companies. The same phenomenon is also already appearing in Canada and Russia.

So, where does the potential Eastern Mediterranean LNG stand in this wider international context? Considering the previously illustrated Egyptian gas balance and Israel's offshore gas fields prospective development, it is possible to estimate that any potential Eastern Mediterranean LNG exports wouldn't materialise until the mid-2020s. As just mentioned, in that timeframe global LNG demand and supply might have returned more into alignment. In case the sharp cutback in upstream investment triggers worsening gas supply problems in some LNG producing countries, the post-2020 global LNG markets might even contract faster than expected today. Consequently, Eastern Mediterranean LNG might well find its way into global – and particularly European – LNG markets.

4.3 Regional markets: Jordan and Palestine

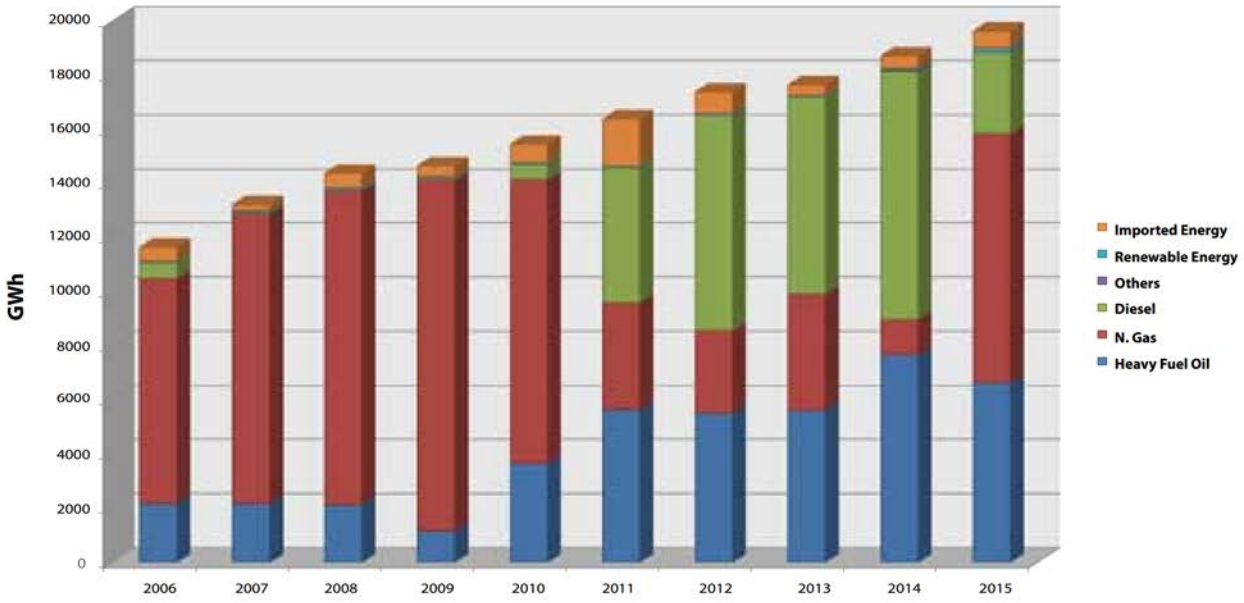
Jordan, unlike its neighbours, does not possess significant energy resources and thus almost entirely relies on imports of crude oil, petroleum products, and natural gas to meet domestic energy demand. Government sources indicate that energy imports meet more than 90 % of Jordan's energy demand, and those imports account for more than 40 % of the country's budget[86].

Up to 2010, gas played a key role in the country's energy system, contributing to about 90 % of electricity generation. The main part of this gas was imported from Egypt, via the Arab Gas Network. After the interruption of this pipeline in 2011, the role of gas in Jordan's energy system rapidly collapsed, as the country had to turn to oil to meet its electricity generation needs. Crude oil and oil products accounted for approximately 90 % of Jordan's total primary energy demand in 2014. Gas made a comeback in 2015, as Jordan completed the construction of an LNG terminal at Aqaba city. On the basis of a five-year LNG

[86] https://www.eia.gov/beta/international/analysis.cfm?iso=JOR

supply agreement signed with Shell, Jordan thus recommenced to producing a predominant share of its electricity with gas in 2015 (Figure 21).

Figure 21: Jordan's electricity production by fuel



Source: Jordan's National Electric Power Company (2016).

Looking to the future, Jordan is expected to maintain its current trend of rising electricity demand (of around 5 % per year). As a consequence, Jordan's gas-fired electricity generation capacity is expected to double from 3 GW in 2011 to around 6 GW in 2025.[87] Jordan therefore represents a potential destination market for Eastern Mediterranean gas exports, due to a perfect combination of growing demand and geographic proximity.

Palestine's energy demand is small but on the rise, due to high population growth, increasing living standards and industrial growth. The energy situation in Palestine is highly different compared to other countries in the region due to limited availability of natural resources, financial constraints and unstable political conditions. Palestine is heavily dependent on Israel for meeting its energy requirements. More than 97 % of the West Bank's electricity needs (peak load: 800MW) are imported from Israel, while 50 % of the available electricity for Gaza (peak load: 470 MW) is supplied by the Israeli network[88].

As illustrated in Section 2.8, in 2016 Israel has approved the construction of the first Palestinian power station in the West Bank. Also on the basis of this project, Palestinian gas demand could increase from the current level of 0.3 Bcm/year to around 1 Bcm/year over the course of the next decade. Palestine's gas market is, therefore, not going to be a significant export market for Eastern Mediterranean exports. Israel could easily supply the gas needed to fuel the planned power station, while the small Gaza Marine field could in the longer term be exploited to replace Israeli gas and allow a more autonomous development for Palestine's gas sector. Due to their limited size, these developments should not be given excessive geopolitical importance, but rather be considered as purely technical.

[87] Jordan's National Electric Power Company (2016).
[88] Mission of Palestine to the EU (2016).

4.4 Europe

Gas represents a pivotal element of the EU energy architecture. Covering about a quarter of the total primary energy supply, it represents the second most important fuel source in the EU energy mix after oil[89].

Since the 1950s, a large gas import infrastructure has been developed in and around Europe. The capacity of the import pipelines from Russia, Norway, Algeria and Libya alone (422 Bcm/year) would be sufficient to more than satisfy current EU gas import requirements (255 Bcm/year). In addition, several Member States have installed a total of 183 Bcm/year of LNG import infrastructure. The excessive size of these infrastructures relative to actual EU gas demand explains their low rates of utilisation: 58 % for import pipelines and 32 % percent for LNG terminals (Table 2).

Table 2: EU gas import infrastructure

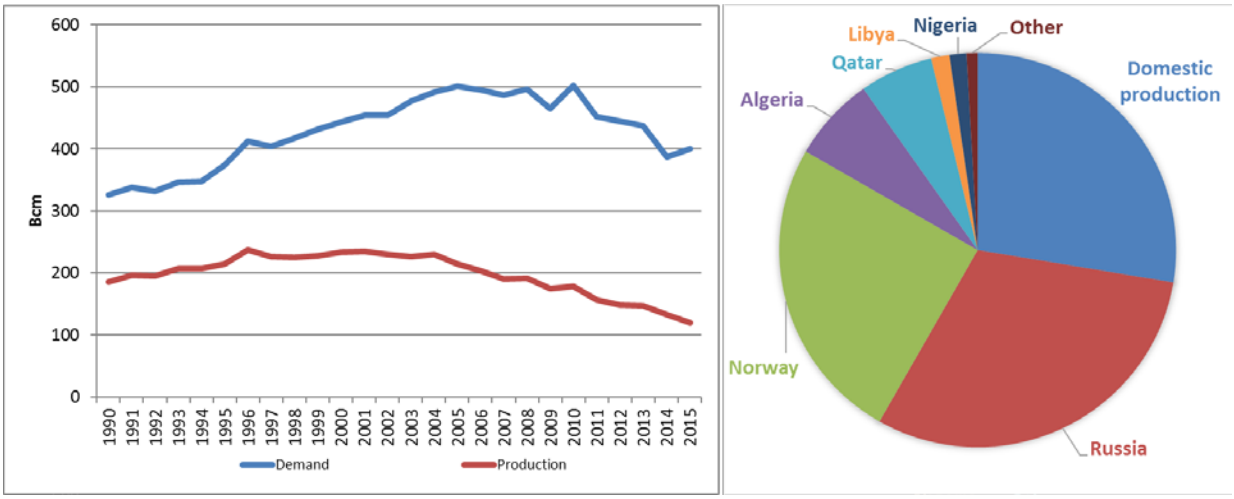
Pipelines (Bcm/y)			
From	***Capacity***	***Imports in 2014***	***Utilization rate***
Russia	230*	119	51.7%
Norway	127	101.1	79.6%
Algeria	54	19.5	36.1%
Libya	11	6	54.5%
TOTAL	**422**	**245.6**	**58.2%**
LNG (Bcm/y)			
Country	***Capacity***	***Imports in 2014 (Net of re-exports)***	***Utilization rate***
Spain	60.2	17.6	29.2%
United Kingdom	50.7	18.5	36.5%
France	25.3	10.1	39.9%
Italy	15.3	7.2	47.1%
Netherlands	12	0.9	7.5%
Belgium	9	2.1	23.3%
Portugal	5.5	2.1	38.2%
Greece	5.2	0.8	15.4%
Lithuania	4	n.a.	n.a.
Sweden	0.3	n.a.	n.a.
TOTAL	**183.5**	**59.3**	**32.3%**

Source: author's elaboration based on data from BP (2015), GIE (2015), GIIGNL (2015), IEA (2015).

The EU domestic gas production has dramatically fallen since the early 2000s, sliding from 235 Bcm in 2001 to 120 Bcm in 2015 (Figure 22). This trend has been predominantly driven by the United Kingdom, where production collapsed from 108 Bcm in 2000 to 37 Bcm in 2015. However, more recently the Netherlands has also contributed to the fall, by reducing its production from 70 Bcm in 2010 to 43 Bcm in 2015.

[89] For an in-depth discussion of Europe's gas market outlook, please refer to: Tagliapietra and Hafner (2016).

Figure 22: EU gas balance (1990-2015) and supply portfolio (2015)



Source: author's elaboration on BP (2016).

This decline, mainly driven by rapidly depleting resources throughout the EU, will most likely continue in the future.

In the Netherlands, currently the EU's largest gas producer, the government decided to cap production at the large Groningen gas field following earthquakes in the production region in early 2014. Limits on Groningen production were initially set at 42.5 Bcm for 2015 and at 40 Bcm for 2016[90]. However, in December 2015 the government ultimately decided to further limit the extraction at Groningen, to a level of 27 Bcm for the 2015/2016 gas year[91]. While taking this decision, the government also outlined its intention to further reduce long-term production levels at the gas field, possibly to a level between 18 and 24 Bcm in 2020[92]. Within this context, a further gas production decline in the Netherlands will be unavoidable in coming years.

Furthermore, it should be highlighted that Groningen has always played a very important role as a swing producer in continental North-western Europe. The reduced future output of the field could thus put into question this role, therefore reducing the overall flexibility of European gas markets. Considering the expected strong demand for flexibility generated by the high penetration of renewables into the European systems, this might create new challenges which can only be partially addressed by the increased flexibility provided by additional LNG imports.

In the United Kingdom, the declining gas production trend is also set to continue. The government's scenarios illustrate that production will decline further in the 2020s, reaching about 20 Bcm in 2030. It should be noted that a significant share of future gas production is expected to come from new fields. Considering the current environment of low oil and gas prices, investing in the development of these new fields might turn out to be challenging for oil and gas companies. This could add further uncertainty to the future outlook of gas production in the United Kingdom.

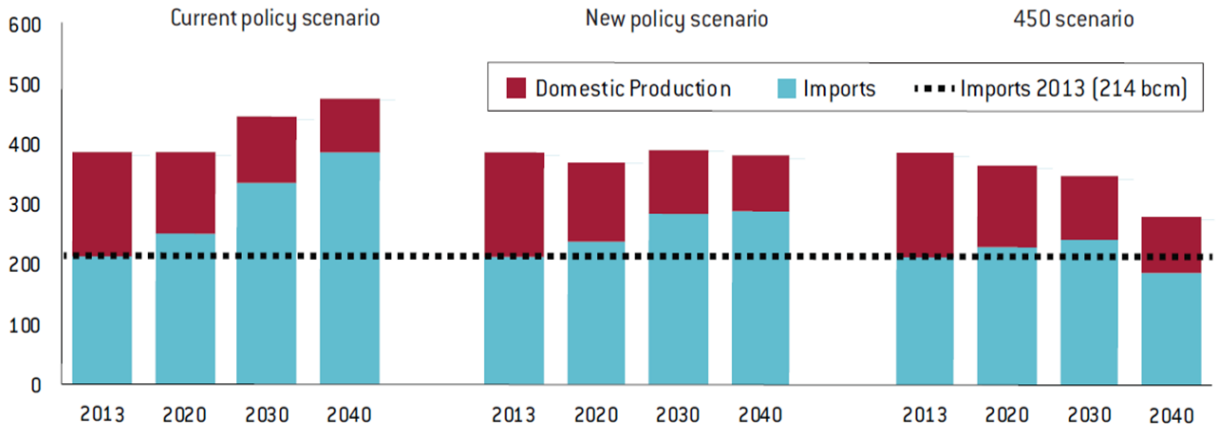
Over the last few years, expectations emerged in the EU of counterbalancing the declined in the conventional gas production with a new unconventional gas exploitation[93]. However, these expectations have proven to be illusory, due to disappointing results from test wells, regulatory constraints, and

[90] Platts (2014).
[91] Reuters (2015c).
[92] Reuters (2015d).
[93] For a multidisciplinary analysis of shale gas in the EU refer to: Musialski, Zittel, Lechtenböhmer, Altmann (eds.) (2013).

continued public hostility towards unconventional gas extraction. Moratoria forbidding unconventional gas extraction were adopted in different countries both de jure (e.g. France, Bulgaria, the Netherlands) and de facto (e.g. Germany). These constrains have added to the deteriorating energy economics, as a result of lower oil and gas prices. Even in the case of the country regarded as the most promising unconventional gas hotspot in the EU, Poland, eight of the eleven international oil and gas companies which had invested in unconventional gas halted their exploration activities by end-2015[94].

In conclusion, over the next decades, the EU domestic gas production will continue its downwards trajectory. As a result, the EU's import needs are expected to grow, even when considering different gas policy scenarios – from business-as-usual to strong decarbonisation (Figure 23)[95].

Figure 23: EU gas outlook in the International Energy Agency' scenarios



Source: author's elaboration on International Energy Agency (2015).

The rising level of gas import requirements illustrated in these scenarios unveil the structural nature of the EU dependency on external gas suppliers. This element, combined with the limited diversity of the gas import portfolio illustrated in Figure 22 outlines the importance of the security of gas supply issue in the EU.

This implies the EU is vulnerable to a few external suppliers that might, at any moment, cut their supplies. On this point a caveat is necessary: while the EU security of gas supply debate is often exclusively concentrated on Russia and on the related fears about its geopolitical use of gas, the issue is in reality much more complex because it potentially encompasses gas supplies from all suppliers, which might be interrupted for either technical or geopolitical reasons. For instance, a traditionally secure supplier such as Norway might need to reduce its gas exports in the future simply because of depleting resources, or Algeria, another traditionally secure supplier, might cut its supplies in the event of an unpredictable regional political turbulence. Security of gas supply is therefore an issue that concerns all EU Member States.

Considering that gas imports and therefore gas supply security will remain crucial issues for the EU for decades to come, Europe could represent a potential market for Eastern Mediterranean gas supplies.

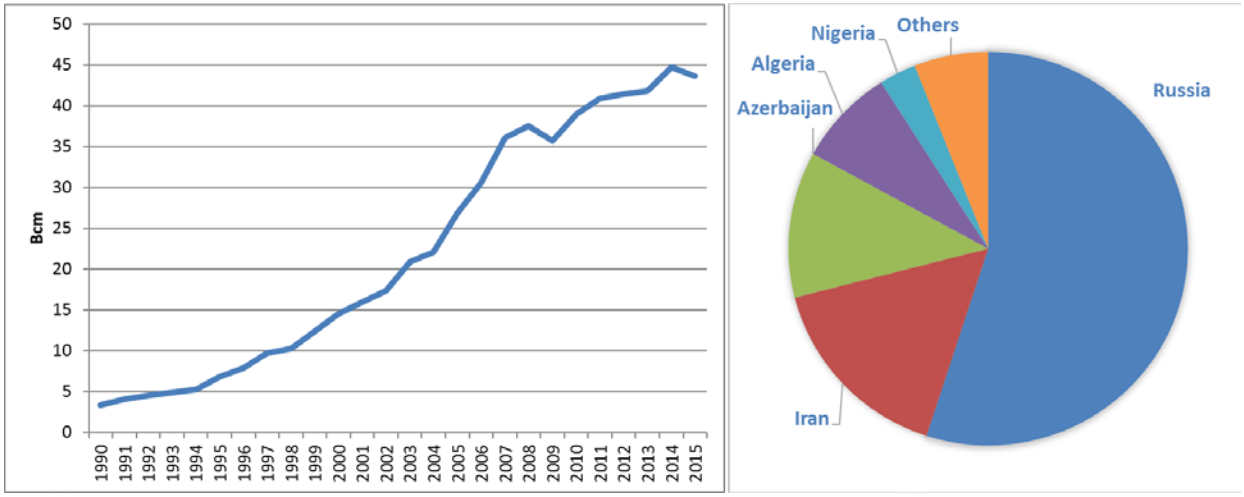
[94] The Guardian (2015).
[95] The IEA has three key scenarios: i) The Current Policies Scenario, where no changes from current policies are assumed;
ii) The New Policies Scenario, where broad policy commitments and plans that have been announced by countries, including national pledges to reduce greenhouse-gas emissions and plans to phase out fossil-energy subsidies, are considered;
iii) The 450 Scenario, which sets out an energy pathway consistent with the goal of limiting the global increase in temperature to 2°C by limiting concentration of greenhouse gases in the atmosphere to around 450 parts per million of CO2.

4.5 Turkey

Gas is the main source of fuel in Turkey, accounting for around 30 % of the energy mix and 39 % of electricity generation in 2015. Gas supply is almost entirely imported, as domestic gas production is negligible (0.4 Bcm/year). Since 2005, Turkey's gas imports have grown by almost 80 %, driven by higher gas consumption in the residential sector, following large-scale gasification, rising private investments in gas-fired power plants and growing consumption in the industry sector.

In 2015, Turkey imported 48 Bcm of gas, originating mostly from Russia (55 %), Iran (16 %), Azerbaijan (12 %), Algeria (8 %), Nigeria (3 %) and others (Figure 24). Pipeline gas is dominant in the import structure as LNG has only played a small role in the country's gas supply architecture so far, notwithstanding the presence of two LNG terminals with a total capacity of 14 Bcm/year.

Figure 24: Turkey's gas consumption (1990-2015) and supply portfolio (2015)



Source: author's elaboration on data from BP (2016).

Gas plays an important role in the Turkish economy and has been a driver of economic development. In 2009 the Turkish government set out objectives, through its Electricity Market and Security of Supply Strategy, to stabilise the share of gas in the country's electricity mix to below 30 % by 2023. In 2015, with the Strategic Plan 2015-19, the government targeted a share below 38 % by 2019. In the same year, gas had a share of 39 % in the electricity mix, down from a peak of 60 % in 2007[96].

The IEA expects a moderate growth in gas demand as gasification of the distribution sector is almost complete[97]. In addition to the steady use of gas in the heating and industry sectors, future growth in the power sector will depend on the pace of renewable energy deployment, coal development and electricity demand growth. Coal to gas competition will be strong in the wholesale market in the absence of a carbon price or new environmental restrictions in Turkey, which gives coal an advantage over gas use in power generation.

[96] For a wider discussion of Turkey's gas strategy, please refer to: Tagliapietra (2016).
[97] International Energy Agency (2016).

Given its gas import contract portfolio (Table 3), Turkey is unlikely to be able to accommodate new, additional, major volumes of gas before the mid-2020s – should gas demand not substantially increase over the next years.

Table 3: Turkey gas import contracts

Current agreement	Volume (bcm/y)	Date of agreement	Status	End date
Algeria (LNG)	4.4	1988	In operation	October 2024
Nigeria (LNG)	1.3	1995	In operation	October 2021
Iran	9.6	1996	In operation	July 2026
Russia (Blue Stream)	16	1997	In operation	End of 2025
Russia (West)	4	1998	In operation	End of 2021
Turkmenistan	15.6	1999	Pending	
Azerbaijan (Phase I)	6.6	2001	In operation	April 2021
Azerbaijan (Phase II)	6	2011	2017/18	2032/33
Azerbaijan (BIL)	0.15	2011	In operation	2046

Source: International Energy Agency (2016) on BOTAŞ.

However, after the mid-2020s Turkey might well be in the position to import gas from new sources, such as the Eastern Mediterranean region, in the framework of the country's gas supply diversification strategy.

5 Energy: a shaping factor for regional stability?

5.1 Introduction

The discoveries of the Tamar, Leviathan, Aphrodite and Zohr gas fields have sparked hopes about their potential role in strengthening not only regional energy cooperation, but also wider regional economic and political cooperation. Several voices emerged, over the last years, to suggest that regional gas cooperation could pave the way for wider cooperation in the Eastern Mediterranean. However, other voices highlighted the improbability of such a spillover effect in the region, mainly due to its profound geopolitical rifts, such as the Cyprus issue, the Palestinian issue, Israel-Turkey relations, Israel-Egypt relations and the Israel-Jordan territorial disputes. This section firstly illustrates this debate, on the basis of concrete examples from the regional experience. The section then provides a theoretical perspective on the issue of regional cooperation, to frame the Eastern Mediterranean into the wider discussion on if and how economic cooperation can function as a catalyst for wider social and political cooperation and regional integration.

5.2 Views from the regional experience

The concept of fostering Eastern Mediterranean regional stability through energy cooperation has been promoted by many sides, and on the basis of various arguments. Just to provide a taste of this discussion, some examples are outlined below.

In November 2016, the U.S. Ambassador to Israel, Daniel B. Shapiro, declared: 'In addition to the economic benefits, I believe that Israel and other Eastern Mediterranean countries could play seller and buyer roles that will promote understanding. I'm sure many of you have a relationship with a corner grocer, a mechanic or a baker that you regularly buy from. After a while your interactions take on more than just the exchange of money for a good but you get to know that other person. They ask about your family and you do the same. In some cases, these persons become your friends and you become a loyal client because you know that a seller/client relationship based on trust is valuable. With natural gas sales, likewise, there is the potential to build greater understanding and trust. I would go further and say: Natural gas has the potential to change the geopolitical landscape in the Eastern Mediterranean for the better. When I mention Greece, Cyprus, Turkey, Lebanon, Jordan and Egypt you might think about borders, some of which are closed. Natural gas could help you and the citizens of those countries think instead about neighbors, neighbors who can also be partners. Discoveries offshore Cyprus, Israel, Egypt, and potentially Lebanon have already redefined regional relationships and will continue to be a catalyst for increased economic and political cooperation through interconnection and integration'[98].

In February 2016, the President of the Republic of Cyprus – Nicos Anastasiades – declared that 'energy cooperation in the region can transform the Eastern Mediterranean into a pillar of stability, security and peace and be a decisive factor in achieving energy security for the EU'[99].

In January 2014, former U.S. Ambassador to Azerbaijan, Matthew Bryza, stressed the potential role of new regional gas discoveries in contributing to reestablishment of Israel-Turkey relations: 'Building an Israel-Turkey pipeline connected to a Cyprus LNG terminal offers strategic opportunities that transcend economics, including a chance for Israel and Turkey to restore their strategic partnership. It would also push Turkey to reach an agreement on the Cyprus question, removing a 40-year irritant in relations with

[98] US Embassy in Israel (2016).
[99] Daily Sabah (2016).

Europe and re-energising Turkey's flagging efforts to join the EU. The U.S., working with the EU, should help to shape this future'[100].

In November 2013, then-Assistant Secretary of State for European and Eurasian Affairs at the U.S. Department of State, Victoria Nuland, also pointed out the potential of the new gas discoveries in contributing to the solution of the long-lasting Cyprus issue: 'With the discovery of significant gas resources off Cyprus […] gas could play as important a role in healing the island's divisions as the coal and steel industry played in 1949 between France and Germany'[101].

Such hopes were founded on the assumption that, in general terms, energy dynamics are strictly interlinked with the economic and geopolitical contexts in which they occur.

However, the probability of seeing new Eastern Mediterranean gas discoveries functioning as a leverage for regional economic and political stability appears to be limited. This is mainly due to a basic reason: discovered gas reserves are too limited in size to overcome the region's profound geopolitical rifts, such as the Cyprus issue, the Palestinian issue, Israel-Turkey relations, Israel-Egypt relations and the Israel-Jordan territorial disputes.

In some cases, new gas discoveries have even further ignited some of the established geopolitical tensions in the region. For instance – as previously described – the launch of the first offshore licensing round by the Republic of Cyprus triggered a negative reaction of Turkey, creating another stumbling block in the Cyprus settlement process.

Furthermore, Shaffer (2014) correctly outlines another reason why Eastern Mediterranean gas discoveries are unlikely to function as a leverage for regional economic and political stability: 'Energy trade reflects existing peaceful relations; it does not create them. […] Close political cooperation generally precedes the establishment of pipeline infrastructure between countries. Most international energy companies shy away from setting up operations in conflict zones. Companies may stay in a region if conflict emerges after they have made investments, but few companies will initiate exploration in hot conflict zones. Intergovernmental agreements are necessary to support commercial agreements on international gas pipelines, and banks will rarely fund new investments in active conflict zones. In the case of the Eastern Mediterranean region, reliance on energy trade for conflict resolution might create unrealistic expectations and divert attention from tackling serious regional security problems head-on'[102].

Along the same lines, Tsafos (2016) also argues that: 'The public conversation [in Israel] should stop advertising the "geopolitical benefits" that Israel is supposed to reap by developing its gas. Close energy relations rarely translate into closer political relations, as Israel's own experience with Egypt shows. As with Egypt, energy relations follow political relations: they can reinforce ties when relations are cordial and get in the way when relations deteriorate. Energy provides less political leverage than is often claimed. If energy dependence led to political dependence, Russia would have far fewer problems in Ukraine. If the Israeli public is sold a set of presumed geopolitical benefits, disappointment and recriminations are likely to follow'[103].

In short, Eastern Mediterranean gas developments should be considered as function of regional geopolitical stability, and not vice-versa. This regional paradigm seems to be confirmed by the theory of International Relations, as the following section illustrates.

[100] Bryza (2014).
[101] As reported by Shaffer (2014).
[102] *Ibidem*, p. 3.
[103] Tsafos (2016), p. 4.

5.3 Views from the theory of International Relations

Can energy be a shaping factor for regional stability? In other words, can economic cooperation function as a catalyst for wider social and political cooperation and regional integration? Such questions have been at the centre of several theories in the academic field of International Relations.

In particular, regional integration processes have been at the core of the neofunctionalist approach to international affairs, developed by Ernst Haas on the basis of previous work by David Mitrany. The neofunctionalist approach[104] elaborated by Haas sought to explain 'how and why states voluntarily mingle, merge and mix with their neighbours so as to lose the factual attributes of sovereignty while acquiring new techniques for resolving conflict between themselves'[105].

Neofunctionalism describes and explains the process of regional integration with reference to how three causal factors interact with one another: i) Growing economic interdependence between nations; ii) Organisational capacity to resolve disputes and build international legal regimes; iii) Supranational market rules that replace national regulatory regimes (Haas, 1961).

Neofunctionalism was first applied to the case of the European Coal and Steel Community (ECSC) in the book The Uniting of Europe (Haas, 1958), and successively to the wider international landscape in the book Beyond the Nation State (Haas, 1964). In fact, as Rosamond (2005) outlines, 'the explicit purpose of the neofunctionalists was to utilize the pioneering European experience of integration to generate hypotheses for testing in other contexts. In short, the plan was to develop not a theory of European integration, but to arrive at a more generic portfolio of propositions about the dynamics of integration in any context'[106].

In contrast to the more traditional realist theories of International Relations, Haas did not assume that states were the only actors on the international stage, but he rather placed major emphasis on the role of non-state actors (and particularly the secretariat of the regional organisation involved and those interest associations and social movements that form at the level of the region) in providing the dynamic for further integration. In this process, member states remain important actors as they set the terms of the initial agreement, but they do not exclusively determine the direction and extent of subsequent change. Rather, regional bureaucrats in league with a shifting set of self-organised interests and passions seek to exploit the inevitable spillover and unintended consequences that occur when states agree to assign some degree of supra-national responsibility for accomplishing a limited task and then discover that satisfying that function has external effects upon other of their interdependent activities. Haas captured these potential dynamics with his concept of spillover.

He hypothesised that, with the help of an active resourceful secretariat and support from the organised interests affected by such externalities, national governments might learn and agree to change their original positions. As Schmitter (2005) outlines: 'According to this approach, regional integration is not an intrinsically sporadic and conflictual process, but one in which, under conditions of democracy and pluralistic representation, national governments will find themselves increasingly entangled in regional pressures and end up resolving their conflicts by conceding a wider scope and devolving more authority to the regional organizations they have created. Eventually, their citizens will begin shifting more and

[104] We use the term 'approach' instead of 'theory' as Haas himself always insisted that neofunctionalism was not a theory but an approach.
[105] Haas (1970), p. 610.
[106] Rosamond (2005), p. 243.

more of their expectations to the region and satisfying them will increase the likelihood that economic-social integration will spill over into political integration'[107].

The concept of spillover is thus used to explain how, once national governments took the initial steps towards integration, the process took on a life of its own and swept governments along further than they anticipated going. The more formalised definition of the concept of spillover is probably the one formulated in 1963 by another early neofunctionalist scholar, Leon Lindberg: 'In its most general formulation, 'spillover' refers to a situation in which a given action, related to a specific goal, creates a situation in which the original goal can be assured only by taking further actions, which in turn create a further condition and a need for more action, and so forth'. In particular, two types of spillover were important to early neofunctionalist scholars: functional and political.

Functional spillover argued that modern industrial economies were made up of interconnected parts. As such, it was not possible to isolate one sector from others. Following this understanding, neofunctionalists argued that if member states integrated one functional sector of their economies, the interconnectedness between this sector and others would lead to a spillover into other sectors. Technical pressures would prompt integration in those related sectors, and the integration of one sector would only work if other functionally related sectors were also integrated (Haas, E.B. 1958). For example, if a joint attempt were made to increase coal production across member states, it would prove necessary to bring other forms of energy into the scheme. Otherwise, a switch by one member state away from coal towards a reliance on oil or nuclear fuels would throw out all of the calculations for coal production. In addition, any effective planning of the total energy supply would involve gathering data about future total demand, implying the development of overall plans for industrial output across member states. To this technical logic of functional spillover, the neofunctionalists added the idea of political spillover, and set perhaps more store by this than by functional spillover in explaining the process of integration.

Political spillover involved the build-up of political pressures in favour of further integration within the states involved. Once one sector of the economy was integrated, the interest groups operating in that sector would have to exert pressure at the supranational level, on the organisation charged with running their sector.

A textbook case of this process is of course represented by the European integration process, where the creation of the European Coal and Steel Community was expected to lead the representatives of the coal and steel industries in all member states to switch at least a part of their political lobbying from national governments to the new supranational agency, the High Authority. Relevant trade unions and consumer groups would have followed suit. It was argued that once these interest groups had switched the focus of their activity to the European level, they would rapidly come to appreciate the benefits available to them as a result of the integration of their sector. Further, they would also come to understand the barriers that prevented these benefits from being fully realised. As the main barrier would be that integration in one sector could not be effective without the integration of other sectors, these interest groups would become advocates of further integration and would lobby their governments to this end. At the same time, they would form a barrier themselves against governments retreating from the level of integration that had already been achieved. This was important because such a retreat would be the one alternative way in which pressures caused by functional spillover could be resolved. In addition, governments would come under pressure from other interest groups who would see the advantages accruing to their counterparts in the integrated sector and realise that they could profit similarly if their sectors of the economy were also integrated. In this context, Haas clearly outlined that the driving force of political integration was the calculated self-interest of political elites: 'The "good Europeans" are not the main creators of the regional community that is growing up; the process of community formation is

[107] Schmitter(2005), p. 257.

dominated by nationally constituted groups with specific interests and aims, willing and able to adjust their aspirations by turning to supranational means when this course appears profitable'[108].

This case highlights a crucial feature of the neofunctionalist approach: its background assumptions. In fact, the political spillover dynamics seems to occur only under certain conditions. In the preface of The Uniting of Europe, 1968 edition, Haas himself explained that 'the explanatory power of neofunctionalism in leading to new political communities was confined to settings characterised by industrialised economies, full political mobilisation via strong political interest groups and political parties, leadership by political elites competing for political dominance under rules of constitutional democracy accepted by leaders and followers. These background conditions appear as crucial precursors for the formation of regional integration schemes'[109].

When transposing this theoretical framework onto the case of the Eastern Mediterranean region it is clear that a key country in the region such as Egypt currently does not meet the aforementioned background conditions. It is thus not possible to expect political spillover out of a potential Eastern Mediterranean gas cooperation scheme.

Within this theoretical framework, political spillover dynamics could take place in the Eastern Mediterranean only if Egypt embarks on a process of transition towards a liberal democracy with full economic, political and social freedoms. As such a transition looks unlikely today, it is impossible to consider energy to be a real shaping factor for regional stability.

On the contrary, it is regional stability that seems to represent the shaping factor for energy developments – as geopolitical stability is a fundamental prerequisite for international investors' commitment to the development of large-scale gas projects in the region.

[108] Haas (1966), p. 34.
[109] Haas (1966/1968), p. 10.

Conclusions and policy recommendations

Since 2010, the Eastern Mediterranean region has emerged as a potential gas exporting region due to a series of gas discoveries in the offshore of Israel (Tamar and Leviathan fields) and Cyprus (Aphrodite field). To exploit this gas potential, a number of export options have progressively been discussed, alongside new regional cooperation scenarios. Hopes have also been expressed about the potential role of new gas discoveries in strengthening not only Israeli-Cypriot gas cooperation, but also overall regional economic and political stability.

However, initial expectations largely cooled down over time, particularly due to investment decision delays in Israel and the downward revision of gas resources in Cyprus. These developments even raised scepticism about the idea of the Eastern Mediterranean becoming a sizeable gas-exporting region.

But initial expectations were revived in 2015, after the discovery of the Zohr gas field in offshore Egypt: the largest gas field ever discovered in the Mediterranean. Considering its large size, this discovery has reshaped the regional gas outlook, and has also raised new regional cooperation prospects.

The impact of Zohr could, indeed, go well beyond Egypt's boundaries. The proximity of Zohr to Leviathan and Aphrodite could allow a coordinated development of the fields, and thus allow the creation of the economies of scale needed to put in place a competitive regional gas export infrastructure.

Egypt already has in place a sizeable LNG export infrastructure that currently sits idle. This would allow to export any volumes from Zohr and other fields not used in the domestic market. Given the growing domestic demand in Egypt, it is fair to assume that some export capacity would be left for Israeli and Cypriot gas – if it could be brought to the Egyptian terminals. As Egypt's LNG plants can also be expanded, Israeli and Cypriot developers would have a flexible outlet.

Utilising the existing Egyptian LNG infrastructure for the export of Eastern Mediterranean gas would have a major added value: flexibility. In a geopolitically-volatile region such as the Eastern Mediterranean, committing to new costly and long-term energy infrastructure might prove to be difficult for international energy companies. However, connecting offshore gas fields to the existing LNG infrastructure in Egypt could represent a 'cheap and quick solution' for the monetisation of regional resources.

A joint regional export scheme via Egypt's LNG facilities could also provide a first opportunity to test gas cooperation between Egypt, Israel and Cyprus. A cooperation that could eventually scale-up during the 2020s, should new gas resources be found in the region and should gas demand in export markets justify the construction of additional infrastructure, such as an Israel-Cyprus-Greece pipeline.

For the EU, the materialisation of an Eastern Mediterranean gas hub (to be understood as a crossroads of physical flows, not as a trading platform) based on Egypt's LNG infrastructure would be beneficial for both energy policy and foreign policy considerations. In terms of energy policy, the joint exploitation of Eastern Mediterranean gas resources could provide, already in the short-term, much-needed substance to the long-lasting EU gas supply diversification strategy. Such developments could also create the basis for a potentially larger gas cooperation in the longer-term, notably via an Israel-Cyprus-Greece pipeline. In terms of foreign policy, even if Eastern Mediterranean gas cooperation could not function itself as a catalyst for regional stability, it certainly represents one of the few areas where sensible regional dialogue could be established. This could also provide substance to the EU Neighbourhood Policy's target of strengthening EU energy dialogue with neighbourhood countries on energy security.

On this basis, the EU might take into consideration the following policy recommendations:

- Establish, with a joint action of the European Commission and the European External Action Service, an 'Eastern Mediterranean Energy Diplomacy Task Force' aimed at facilitating regional dialogue towards the establishment of an Eastern Mediterranean gas hub based on Egypt's existing LNG infrastructure. The dialogue might also pave the way for a longer-term scale-up of the regional cooperation, based on the advancement of an Israel-Cyprus-Greece gas pipeline;
- Push for a resolution of the long-lasting Cyprus issue, this being a key prerequisite for the emergence of a solid regional gas cooperation scheme;
- Push for the implementation of energy reforms in Egypt and other regional countries. Platforms of regional dialogue and sharing of best-practices such as MedReg, MedTSO and the UfM Euro-Mediterranean Energy Platforms might be further developed and reinforced to be more meaningful and effective;
- Enhance bilateral cooperation with Egypt on renewable energy and energy efficiency. These sustainable energy solutions do not only represent a crucial tool to address the country's rapidly growing energy demand, but also represent a way to limit domestic gas demand in Egypt, thereby increasing its prospective gas export potential;
- Enhance the EU financing schemes for sustainable energy investments in Egypt and in the overall Southern Neighbourhood. Push for greater coordination of EU Member States' public development banks in the Southern Neighbourhood to enable economies of scale and stronger leverage. To facilitate this coordination, establish a new public-private partnership mechanism involving the national public banks, the European Investment Bank, governments of Egypt and other interested countries, and international energy companies that operate in the region;
- Act to create the necessary conditions inside the European market to fully seize the opportunities presented by a potential Eastern Mediterranean gas hub. In particular, act to stimulate the advancement of missing intra-EU gas interconnections, in line with the priorities outlined in 2016 by the European Commission with the 'EU Strategy for LNG and Gas Storage'.

The European Parliament might take into consideration the following policy recommendations:

- Support the development of an Eastern Mediterranean gas hub, cooperating with the European Commission and the European External Action Service in the creation of an 'Eastern Mediterranean Energy Diplomacy Task Force'. The European Parliament has always supported the development of an EU energy policy based on coherence, cooperation and solidarity between Member States. It has also supported the EU diversification of energy sources and routes of supply strategy. Likewise, the European Parliament has always supported the development of a truly effective EU Neighbourhood Policy. A new action aimed at unlocking Eastern Mediterranean gas exports would be fully in line with these traditional policy lines;
- Support in a more assertive way the negotiation process for the settlement of the Cyprus issue, this being a major stumbling block for regional cooperation in the Eastern Mediterranean;
- Support the process of reform of the energy systems in Egypt and other regional countries, by engaging with the respective national parliaments and governments on this topic. Energy subsidies are a key component of the social contract of Egypt as well as of other regional countries such as Jordan. Engaging the parliaments in the reform process could, therefore, substantially reinforce the reform process itself;

- Push EU Member States to coordinate their public development banks' activities – notably on sustainable energy projects – in the Southern Neighbourhood. This coordination might occur under the umbrella of a new join public-private partnership mechanisms to be settled with the European Commission and the European Investment Bank;
- Push EU Member States to advance the missing intra-EU gas interconnections, along the lines defined in 2016 by the European Commission, to fully profit from prospective Eastern Mediterranean gas exports.

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QA-02-17-402-EN-C (print)
QA-02-17-402-EN-N (pdf)

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PHOTO CREDIT: iStock International Inc.

ISBN 978-92-846-0946-8 (print)
ISBN 978-92-846-0945-1 (pdf)
doi:10.2861/44821 (print)
doi:10.2861/145448 (pdf)

Publications Office