

OIL AND GAS 2014 IN LEBANON

Market and Economic Research Division





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EXECUTIVE SUMMARY

The discovery of hydrocarbons by the Eastern Mediterranean countries represents great economic opportunities for the region. This report focuses on the case of Lebanon and examines the relevant developments of this new promising sector within the geological, geographical, legal and economic contexts.

The first section of the report outlines recent oil and gas discoveries in the Levant region and assesses the potential findings and discoveries offshore Lebanon. Recent two-dimensional (2-D) and three-dimensional (3-D) seismic surveys have indicated a high probability of considerable reserves in Lebanon's Exclusive Economic Zone (EEZ). This section also overviews Israel's and Cyprus' positions on hydrocarbon exploration. In this context, it details the maritime border issues between Lebanon and Israel.

The second section of the report examines the legal and institutional framework for the exploration and exploitation of offshore oil and gas resources in Lebanon that is defined by the Offshore Petroleum Resources Law (OPRL). It discusses the fiscal terms, negotiation parameters and the revenues streams in the Exploration and Production Agreement (EPA) that is concluded between the Lebanese State and each consortium of oil companies. In particular, this section explains how the revenues of hydrocarbon extraction will be shared between parties. It is the Petroleum Administration (PA) authority, a dedicated establishment under the Ministry of Energy and Water that is responsible to negotiate and conclude agreements as well as handle all functions stipulated by the OPRL.

The third section gives an account of the steps taken so far by the government and the timeline in Lebanon's offshore oil and gas sector, including the ongoing licensing and bidding phases as well as the coming exploration, development and production phases. A total of 46 companies were pre-qualified by the PA to bid for offshore oil and gas exploration.

In light of the country's background and current status of the oil and gas sector, the report concludes with an assessment of the potential challenges to Lebanon. It argues that the natural resource wealth is a great opportunity for the country, but it could turn into a double-edged sword. In that case, the newfound resource would be considered a curse rather than a blessing; a phenomenon referred to as the paradox of plenty. Therefore, strong governance frameworks and practices are recommended to ensure a sustainable development of the country's oil and gas sector.

ACRONYMS

2-D	Two-Dimensional
3-D	Three-Dimensional
EEZ	Exclusive Economic Zone
EITI	Extractive Industries Transparency Initiative
EPA	Exploration and Production Agreement
GDP	Gross Domestic Product
MMcf/d	Million cubic feet per day
OPRL	Offshore Petroleum Resources Law
PA	Petroleum Administration
PGS	Petroleum Geo-Services Company
QHSE	Quality, Health, Safety, Environment
QHSE MS	Quality, Health, Safety, Environment- Management System
SWF	Sovereign Wealth Fund
tcf	trillion cubic feet (of natural gas)
UNCAC	United Nations Convention Against Corruption
UNCLOS	United Nations Convention on the Law Of the Sea
USGS	U.S Geological Survey



INTRODUCTION

There is a lot of interest in Lebanon about the country's oil and gas potential, particularly after the deepwater gas discoveries in neighboring countries that share the same geological offshore basin. Accordingly, the Lebanese government has engaged international oil and survey companies since the 2000s to carry out 2-D and 3-D seismic surveys indicating the likely presence of offshore hydrocarbon accumulations. Lebanon's offshore hydrocarbon potentials have led to a new petroleum policy, and a law has been passed by the Lebanese government in August 2010. The appointment of the Board of the Petroleum Administration in November 2012 and the launching of the first ever offshore licensing round in February 2013 opened a new chapter for the Lebanese economy. As investors have responded positively, Lebanon now seems to be on the right track to become a real player in the Middle Eastern oil and gas industry, but the oil and gas exploration and production journey is paved with risks and challenges.



GEOLOGICAL DATA & HYDROCARBON PROSPECTS

1. The Levant Basin Potential

The Levantine basin within the Eastern Mediterranean region is considered today as a new frontier hydrocarbon province, being constantly re-assessed through advances in seismic technology. It covers approximately 83,000 square kilometers (km²) of the eastern Mediterranean area. It is bounded to the east by the Levant Transform Zone, to the north by the Tartus Fault, to the northwest by the Eratosthenes Seamount, to the west and southwest by the Nile Delta Cone Province boundary, and to the south by the limit of compressional structures in the Sinai. It includes the territorial waters of Lebanon, Israel, Syria and Cyprus.

In 2010, the U.S. Geological Survey (USGS) estimated the undiscovered oil and gas resources of the Levant Basin Province to be around 1.7 billion barrels¹ of recoverable oil and 122 trillion cubic feet (tcf)² of recoverable gas. The resources are considered to be the world's largest gas discoveries of the decade.

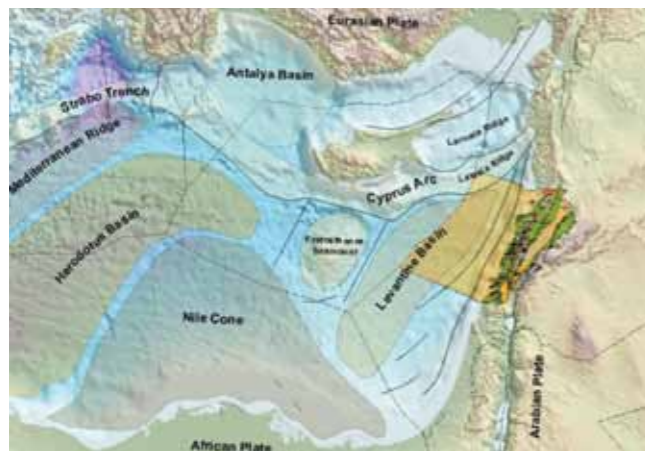


Figure 1 Eastern Mediterranean Basin

Source Lebanese Petroleum Administration www.lpa.gov.lb



¹ A barrel is a US unit of volume for crude oil and petroleum products. One barrel equals approximately 159 liters or 5 cubic feet.

² A cubic foot is a volume measurement of natural gas defined as a cube with sides of one foot (0.3048 m) in length. 1 cubic foot equals 28.3 liters.

GEOLOGICAL DATA & HYDROCARBON PROSPECTS

2. Seismic Database of Lebanon

In the last two decades, the Lebanese government has appointed 2-D and 3-D seismic surveys within the Lebanese offshore EEZ area which covers a total of 22,730 km². While the 2-D interpretation provides a regional understanding of geological framework and a preliminary petroleum assessment, the 3-D interpretation improves the assessment by reducing the uncertainty and the risks.

Seismic data offshore Lebanon were acquired by:

- Geco-Prakla (European Geophysical Service Company): Some 460 km of 2-D seismic lines were acquired by Geco-Prakla in 1993 over a limited area offshore northern Lebanon, which is indicated by the pink color in figure 2.
- Spectrum: A Norwegian company that provides seismic surveys and high-quality seismic imaging services to the global oil and gas industry. Spectrum data includes 2-D seismic surveys (1975 to 2002), which have been reprocessed (amounting to 5,526 km) and more recently 3-D seismic (2012/2013) over 3,000 km². The location of Spectrum's 2-D and 3-D data is shown in green color in figure 2 and figure 3.
- Geo-Services (PGS): A Norwegian survey company that offers a broad range of products including: seismic and electromagnetic services, data acquisition, processing, reservoir analysis/interpretation and multi-client library data. PGS data includes two 2-D seismic surveys (2008 to 2011; covering some 8,800 km²) complemented by six 3-D surveys (2006 to 2013; covering around 9,700 km²). The location of the PGS 2-D lines and 3-D data is shown in blue color in figure 2 and figure 3.

Onshore Geophysical Survey

In October 2013, Spectrum started Lebanon's first onshore seismic survey of potential hydrocarbon reserves. During the previous year, the company was awarded the contract to perform 2-D seismic surveys along several seismic lines, with a total length of around 500 kilometers after having completed 2-D and 3-D seismic surveys of Lebanon's offshore reserves. This first phase of the onshore survey started in the region of Batroun.

More recently, the Ministry of Energy and Water has signed in January 2014 a geophysical multi-client contract with U.S Company NEOS, covering 6,000 km² onshore Lebanon. This survey will be an airborne survey with acquisition taking place in the second quarter of 2014. The PA expects data to be available for international oil companies in the fourth quarter of this year.



Figure 2 Offshore 2D Seismic Survey

Source: Lebanese Petroleum Administration www.lpa.gov.lb



GEOLOGICAL DATA & HYDROCARBON PROSPECTS



Figure 3 Offshore 3D Seismic Survey

Source: Lebanese Petroleum Administration www.lpa.gov.lb

The analysis of the seismic data has provided a new understanding of the nature of the hydrocarbon systems and a clearer understanding of the hydrocarbon potential of various areas in the Levantine basin offshore Lebanon. Although the interpretation reports remain undisclosed and confidential, the seismic data and recent discoveries reveal that there is a considerable hydrocarbon resource base and that the offshore Lebanon area is petroliferous (rich in petroleum) and highly prospective. In fact, 2-D and 3-D studies clearly identified and delineated several potentially giant sub-salt prospects. It is worth mentioning that sub-salt is an exploration beneath a salt layer that overlies rocks, knowing that salt presents significant barriers to seismic penetration.

As stated by the Ministry of Energy and Water, the Levantine Basin -of which 30% offshore Lebanon- is a large deep basin which is estimated to contain more than 10,000 meters of Mesozoic and Cenozoic sediments. The basin contains all the key elements for successful hydrocarbon exploration with deep water hydrocarbon plays within the Tertiary (Miocene/Oligocene sands) anticlinal structures enhanced by large potential stratigraphic traps. Nearer to the shore, in relatively shallower water, hydrocarbon leads have also been recognized in the basin margin invoking new petroleum systems.

Estimated Gas Reserves

Estimates of the quantity of natural gas in Lebanon's offshore area vary considerably. All approximations at this stage are still limited, and hence results are prone to differ as estimations expand. In fact, it is impossible to figure out the exact amount until exploration and drilling phases start.

Yet, experts at Spectrum said in 2012 that in terms of the area they surveyed in 3-D, the estimation is at 25 tcf of gas in Lebanon's southern waters. Meanwhile, in October 2013 the Ministry of Energy and Water declared that the estimated reserves could rise to around 96 tcf of natural gas. Considering gas prices at around USD 5 per thousand cubic feet, these resources' worth would vary between USD 125 billion and USD 480 billion.

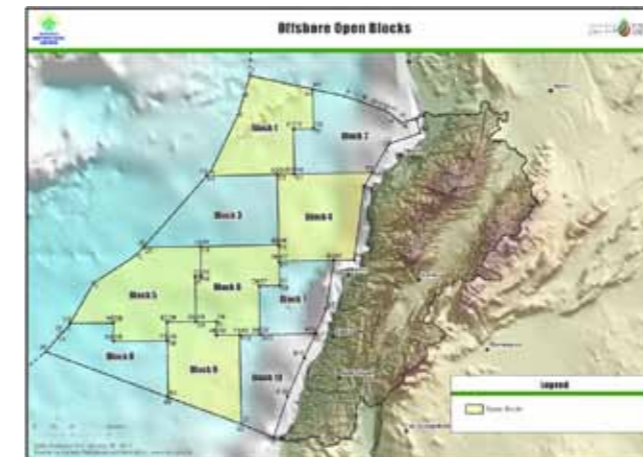


Figure 4 Offshore Open Blocks

Source: Lebanese Petroleum Administration www.lpa.gov.lb

Newly Discovered Oil Reservoir

While launching the pre-qualification round in February 2013, an oil reservoir was discovered in the northern maritime borders demarcating Lebanon, Cyprus and Syria. According to French consulting company Beicip-Franlab, this area is estimated to contain between 440 and 675 million barrels of oil. More recently, the Ministry of Energy and Water declared that oil reserves could reach up to 865 million barrels of oil. Considering oil price at USD 108 per barrel; the Lebanese share of the resources would be worth between USD 60 billion and USD 93 billion. Also, the area where the reservoir has been found already holds an estimated 15 tcf of natural gas.

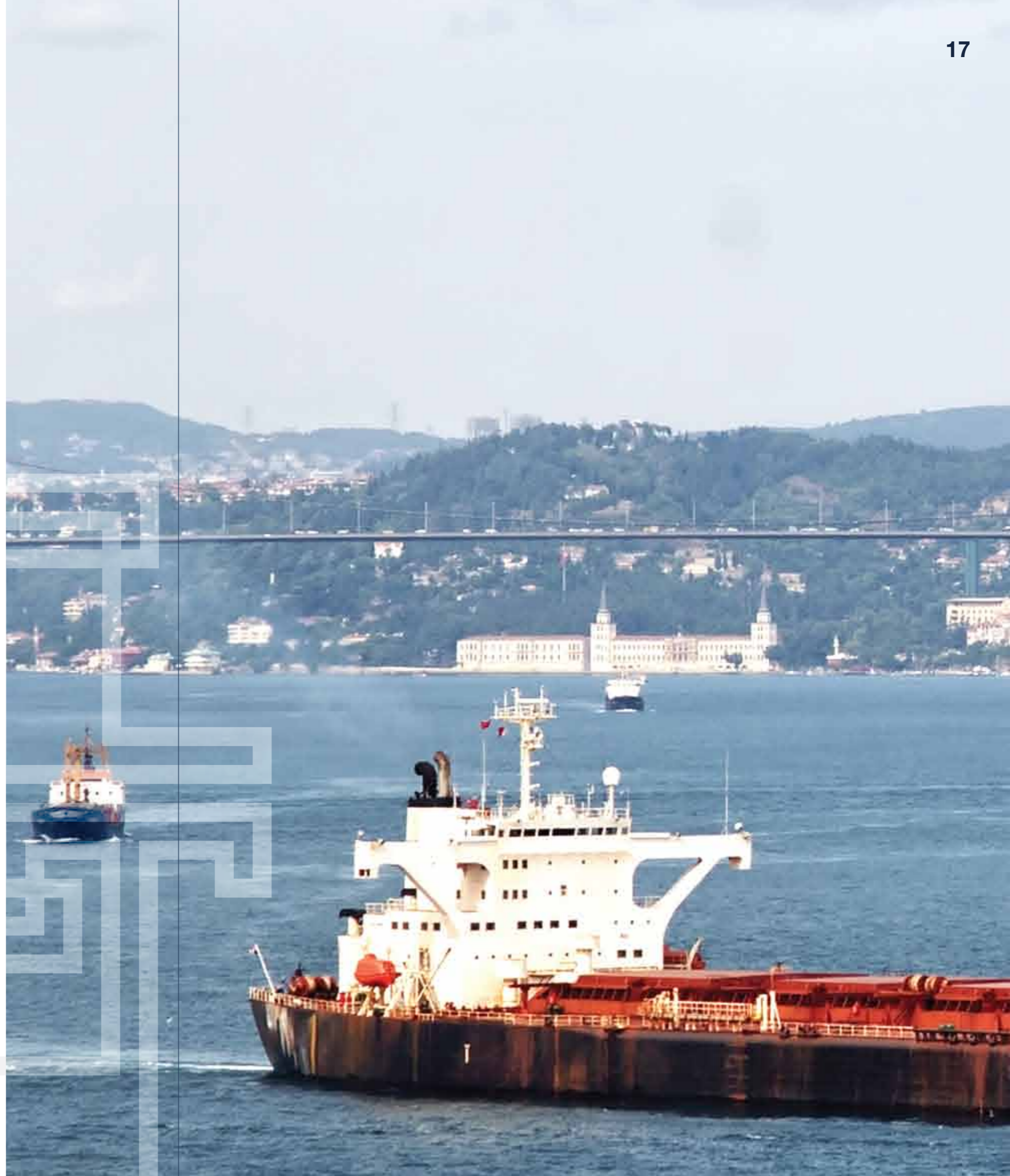
GEOLOGICAL DATA & HYDROCARBON PROSPECTS

Block Delineation

A total of ten offshore drilling and exploration blocks have been defined within Lebanon's EEZ and were sent to the Council of Ministers for approval. They vary in size from 1,259 km² to 2,374 km². Out of the ten blocks of the Lebanese offshore, the following five blocks - Blocks 1, 4, 5, 6 and 9 - are open for bidding within the first licensing round as shown in figure 4, with the possibility of opening additional blocks for bidding after the Cabinet ratifies the decrees related to the delineation of the offshore blocks and the EPAs.

Block	Size km ²
1	1,928
2	1,924
3	2,048
4	2,030
5	2,374
6	1,721
7	1,259
8	1,400
9	1,742
10	1,475

Table 1 Offshore Blocks' Outline
Source Lebanese Petroleum Administration www.lpa.gov.lb



GEOLOGICAL DATA & HYDROCARBON PROSPECTS

3. Hydrocarbon Discoveries in Israel and Cyprus

Israel

Following significant discoveries made at the northern and southern ends of the Palestinian Coast during the decade from 1999 to 2010, Israel went from being an energy-poor country to a potential exporter of gas to world markets.

Israel has already announced findings at Dalit, Tamar and Leviathan fields totaling 30 tcf of natural gas and still unproven quantities of oil. The initial discoveries were made in March 1999 and included the Noa and Mari B gas fields. In January 2009, explorations west of Haifa revealed the Tamar gas field, followed by nearby Leviathan in June 2010. Leviathan alone provides Israel with 17 tcf of gas reserves.

Table 2 outlines some of the major Israeli discoveries of natural gas as well as the proven reserves in each of the gas fields.

Major Israeli Gas Fields Discovered and Explored					
Gas Field	Noa & Mari B	Tamar	Dalit	Leviathan	Tanin
Estimated Size of Field	1.2 trillion cubic feet	9 trillion cubic feet	518 billion cubic feet	17 trillion cubic feet	1.2 trillion cubic feet
Year of Exploration	1999	January-09	April-09	June-10	February-12
Year of Production	2004	April-13	N/A	July-05	N/A
Operating Companies	Delek Drilling; Noble Energy	Delek Drilling; Noble Energy; Isramco	Delek Drilling; Isramco; Dor Gas	Delek Drilling; Noble Energy	Noble Energy; Delek Drilling; Avner Oil Exploration

Table 2 Major Israeli Gas Fields Discovered and Explored

Source Global Deepwater Competition Service (GDC), Arab Center for Research and Policy Studies

Tamar started supplying gas to Israel in April 2013 -only four years after its discovery. It is worth noting that the Tamar field is estimated at 10 tcf and oil company Noble Energy has started production with all five wells producing at a rate of about 300 million cubic feet per day (MMcf/d).

The total current sales, when added to the existing Mari-B volumes, is estimated to have averaged 700 MMcf/d by the end of 2013.

According to the Israeli Ministry of Energy and Water Resources, 14 exploratory gas wells were drilled over 2011-2012. Another 13 exploratory gas and oil wells were planned to be drilled by the end of 2013.

Cyprus

The recent discovery of hydrocarbons within Cyprus' EEZ has attracted a lot of attention internationally. Exploration offshore Cyprus is progressing at a steady pace. Today, Cyprus has delineated 13 blocks in its offshore EEZ consisting of 51,000 km².

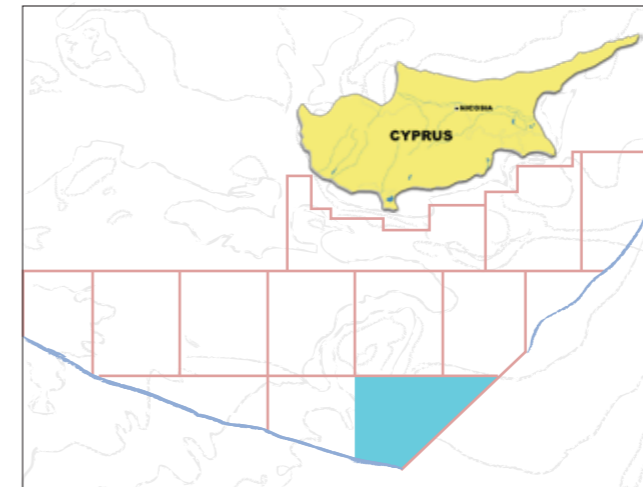


Figure 5 Hydrocarbon Exploration Blocks in part of the Exclusive Economic Zone of Cyprus
Source BankMed Research

Cyprus has completed a first licensing round for exploration rights in August 2007 with one license awarded for Block 12 (as shown in green color in figure 5) to Noble Energy. In late December 2011, Noble announced a natural gas discovery at this block (Cyprus A, Aphrodite) with an estimated resource of 7 tcf. In February 2013, 30% of Noble Energy's exploration rights in block 12 were transferred to the Israeli companies Delek Drilling and Avner Oil Exploration.

Gas Field	Cyprus-A (Aphrodite)
Estimated Size of Field	7 trillion cubic feet
Year of Exploration	December-11
Year of Production	N/A
Operating Companies	Noble Energy; Delek; Avner Oil Exploration

Table 3 Aphrodite Gas Field Block 12

Source Global Deepwater Competition Service (GDC)

The Cypriot Government closed a second bid round in May 2012 for licenses of the additional 12 offshore blocks. 15 consortia made up of 29 international companies and joint ventures from 15 different countries submitted their bids for most of the remaining 12 blocks.

In January 2013, a consortium was issued between Italy's oil company ENI and Korea Gas Corporation (KOGAS) with licenses for Blocks 2, 3 and 9. In February 2013, the contracts for the granting of licenses for the exploration of Blocks 10 and 11 were signed with France's oil company Total. Following the awarding of licenses to Blocks 2, 3, 9, 10 and 11, an extension of 180 days was granted for the completion of the second licensing round for the remaining unallocated blocks in Cyprus' EEZ.

GEOLOGICAL DATA & HYDROCARBON PROSPECTS

4. Lebanon Boundaries Issues

Lebanon and Israel both claim ownership over a possibly resource-rich 860 km² area of water near Lebanon's southern border. They have reached varying ownership claims due to the differing calculations of the limits of the EEZs. Concerning Lebanon's calculations, they are based on the internationally recognized equidistance method, which remains the most frequently adopted method for delimiting maritime boundaries between states and using objective and clear mathematical principles in the equitable distribution of maritime space.

As such, Lebanon considers Point 23 (shown in figure 6) as the southwestern limit of its EEZ, while Israel considers Point 1, which falls around 17 km north of Point 23, as the endpoint of its northern maritime border with Lebanon.

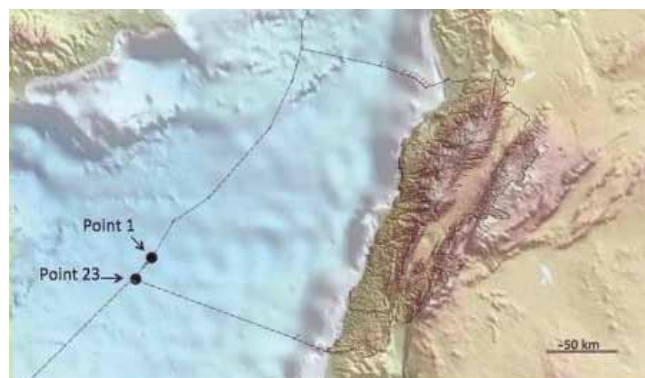


Figure 6 Points 1 and 23 of Lebanon's southern border
Source Lebanese Ministry of Energy & Water's Data Room

As with Cyprus, Lebanon signed an agreement on the delimitation of the EEZ in January 2007. The edges of their respective EEZs were marked by 6 coordinates judged to be equidistant between the two countries. Point 1 marked the southernmost coordinate, although a clause in the agreement allowed Lebanon to amend this point depending on upcoming EEZ agreements with Israel. In July and October 2010, Lebanon officially submitted to the UN the charts and geographical coordinates of points marking the southern and southwestern boundaries of its EEZ, selecting Point 23 as the limit of the boundary. However, Israel entered into its agreement with Cyprus in December 2010, in which the starting point was the original Point 1, several months after Lebanon's claim had been submitted.

It is impossible to say exactly how rich this area is in resources as there has been no drilling to date. While it is not believed to represent the majority of either Israel or Lebanon's resources, it has the potential to be highly lucrative. One of the major factors that complicate the issue is the absence of diplomatic ties and the lack of mutually agreed-upon land and maritime borders. On the other hand, Israel, contrary to Lebanon, does not follow the principles set out by the UNCLOS since it is not a signatory, meaning that Lebanon cannot force Israel to court. This leaves Lebanon with the option of a third party mediation, through the United Nations for example, or even start an international campaign to get Israel to sign the UNCLOS.



OFFSHORE PETROLEUM RESOURCES LAW (OPRL)

The offshore oil and gas regime in Lebanon is governed by Law 132/2010 (the Offshore Petroleum Resources Law) and supplemented by decrees, rules, regulations and policies set by the Council of Ministers. This law provides the legal framework for the exploration and exploitation of offshore oil and gas resources in Lebanon. The Lebanese State has the exclusive right to own and manage petroleum resources in Lebanon. The Minister of Energy and Water is assigned to prepare for the licensing rounds and to conclude exploration and production agreements on behalf of the Cabinet.

In November 2012, the cabinet officially appointed the six members of the Petroleum Administration (PA) authority, a dedicated establishment under the Ministry of Energy and Water, organized to handle functions stipulated by the OPRL. This nomination enabled Lebanon to proceed with its first round of offshore oil and gas licensing. The PA will also be responsible for managing and supervising exploration and production activities in Lebanon.

Fiscal Terms

Lebanon's Offshore Petroleum Resources Law declares that any contract with energy companies will be based on an Exploration and Production Agreement (EPA). The EPA is concluded between the state and each consortium of no less than three right holders, to regulate the performance of exploration and production petroleum activities within a defined area.

The PA negotiates agreements on how the profits of any extraction will be shared between the companies and the Lebanese state.

Negotiation Parameters

The approach of profit splits that will be used between the contractor and the Lebanese government is based on the R-factor and the cost recovery that are considered very progressive and transparent parameters. The PA will award contracts to the companies offering the best return to the government.

a. R-Factor

$$\text{R-Factor} = \frac{\text{Cumulative net revenues}}{\text{Exploration and Development expenses}}$$



OFFSHORE PETROLEUM RESOURCES LAW (OPRL)

An R-Factor is the ratio of cumulative receipts from the sale of petroleum to cumulative expenditures. This ratio is initially zero during exploration since there is no sale of petroleum -while there may be considerable expenses- and then gradually grows in time. An R-Factor less than 1 would mean that costs have not been fully recovered yet: total expenditures exceed total receipts. The larger the R-Factor is, the more it is a profitable operation for the Lebanese State.

The PA's bid evaluation would go to the oil companies proposing the highest R-Factor.

b. Cost Recovery Ceiling

Cost recovery refers to the oil revenues retained by the contractor to recover the costs of exploration, development, and production. The contractor recovers costs to the limit agreed upon. What is left of this cost oil portion is the cost recovery ceiling that would be attributed to the government. In the bidding evaluation and negotiation, the PA will attempt to achieve the highest ceiling rate.

Revenue Streams

As determined by the OPRL, revenue streams in an EPA are shown in the diagram 1. Oil (or gas) produced is split into cost oil, profit oil, and the royalty.

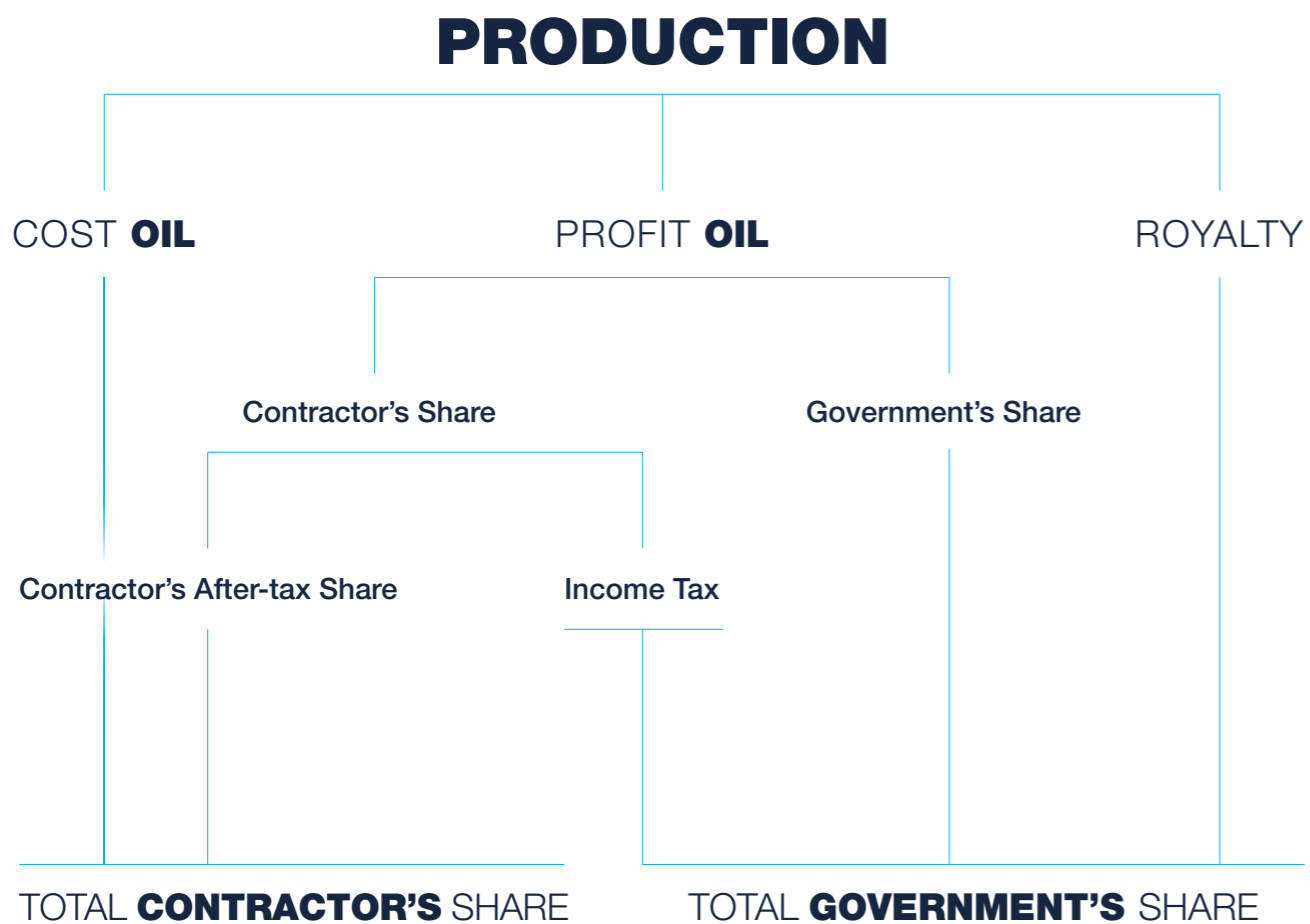


Diagram 1 Lebanon Hydrocarbons Revenue Streams
Source World Bank, BankMed Research

Royalty

As owner of petroleum resources, the state entails a percentage of petroleum extracted from reservoirs, as determined by OPRL. Royalties are based on the volume or value of petroleum extracted and are paid as soon as commercial production commences, thereby providing early revenues to the government.

Cost Oil

The portion of petroleum extracted from a reservoir and available to each right holder to cover the cost and expenses incurred in carrying out petroleum activities and specified in each individual EPA.

Profit Oil

The share of production remaining after the royalty is paid and cost oil has been retained by the contractor. Profit oil is shared between the government and the contractor.

Corporate Income Tax

The contractor is subject to income tax based on taxable income. Income tax is paid after production is shared as in the diagram. The Income tax goes to the Government's Treasury account.

The government's share (Royalty and Profit oil) is to be placed in a **Sovereign Wealth Fund (SWF)** as per the OPRL. Lebanon has to set up a SWF in which to include the profits from the hydrocarbons. However, the Lebanese parliament has yet to pass a law on the management structure of the SWF and its investment principles. Until such a law is passed, it will remain unclear how the money will be exactly allocated.

TIMELINE & MAJOR MILESTONES

The Ministry of Energy and Water had outlined the timeline and next steps in Lebanon's offshore oil and gas sector. The ongoing licensing and bidding phases that were expected to be completed by now are postponed to April 10, 2014. The Ministry had previously extended the deadline of the licensing round from November 4 to December 10, 2013 and then to January 10, 2014. The reason behind these three successive extensions is local political paralysis. In fact, the cabinet of Lebanon missed the deadline to pass two important decrees concerning the delineation of the maritime blocks and the approval of the EPAs.

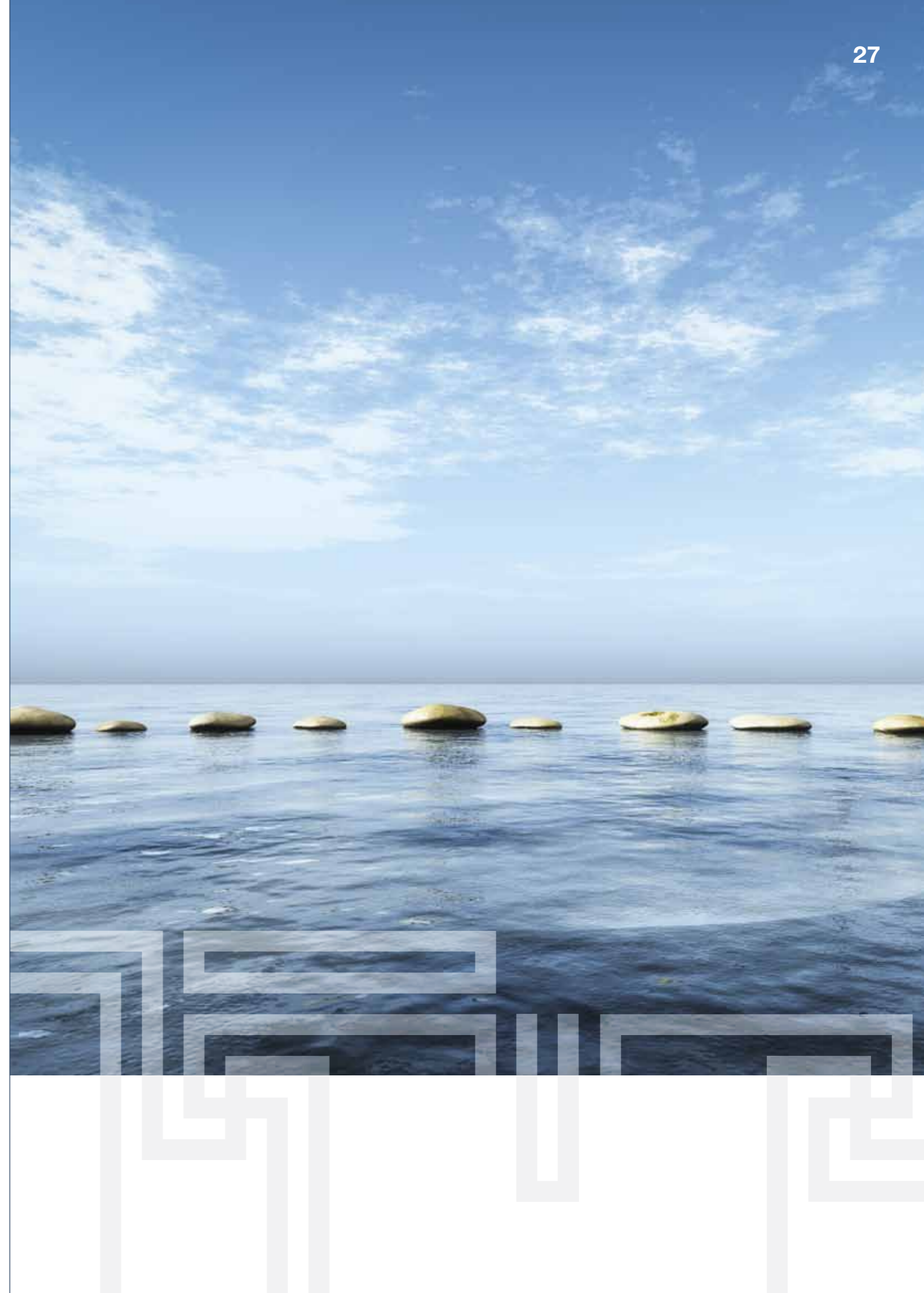
In the recent estimated timeline, contracts are scheduled to be signed with the winning oil companies in June 2014. If the bidding deadline schedule goes as planned, the exploration for oil and gas will then start immediately and be completed within 18 to 24 months. Diagram 2 shows the estimated timeframe as announced by the Ministry of Energy and Water in which the development and production phases are expected to take their course starting in 2016. The first commercial extraction of oil and gas is planned to take place in 2018.

ESTIMATED TIMEFRAME

Accomplished Steps	Licensing	Exploration	Development	Production
Past 3 Years	May 2013	June 2014	2016	> 2016
Passed Petroleum Law	May 2013-April 2014 Bidding Process	> 18 Months Expected for Exploration	2016 First Drilling Expected to be Completed	2016 Production Phase Expected to Start After Completion of Development
Opened Data Room*				
Completed Seismic Surveys	May-June 2014 Bld Evaluation		Development Phase Expected to Start	2017/18 First Oil Commercially Extracted if No Delays
Formed Petroleum Administration	June 2014 Contracts Signed With Winning Company Consortiums			
Prequalification Process				

Diagram 2 Timeline of Lebanon's Oil and Gas Sector
Source Lebanese Ministry of Energy and Water, BankMed Research

* *The Data Room: available geoscience data has been loaded to technical workstation projects and is available for visitors to view at the PA data room in Beirut. It was established to increase knowledge of offshore Lebanon, evaluate offshore Lebanon hydrocarbon as a potential, invite key clients to data reviews and develop marketing strategy and publications.*



TIMELINE & MAJOR MILESTONES

Lebanon First License Round Calendar

On February 15, 2013, the Lebanese government initiated the first offshore licensing round. Companies interested in bidding for oil and gas exploration and production licenses had until the end of March to submit their pre-qualification package.

Pre-Qualification Process: Eligibility Criteria

Four typical criteria were listed for pre-qualification –specifically legal, financial, technical and QHSE (Quality, Health, Safety, Environment). Prequalified Companies that meet all the below criteria are to be selected.

Companies may have pre-qualified as:

a. Right-Holder Operator

Legal	Financial	Technical	QHSE
Joint stock company conducting Petroleum Activities	Total assets of USD 10 billion	Operatorship of at least one petroleum development in water depths in excess of 500 m	*QHSE policy statements *Established & implemented QHSEMS

The operator manages the day-to-day field operations on behalf of other right-holders:

- Designs and executes the exploration, drilling, completion and production programs;
- Handles the engineering, infrastructure and facilities construction and maintenance;
- Represents the consortium.

b. Right-Holder Non-Operator

Legal	Financial	Technical	QHSE
Joint stock company conducting Petroleum Activities	Total assets of USD 500 million	Having an established petroleum production	*QHSE policy statements *Established & implemented QHSEMS

The non-operator participates in the managing committee of the consortium along with the operator and other right-holders providing:

- Co-financing;
- Commercial and marketing activities;
- Technical and regulatory role.

Companies pre-qualified individually but consortiums of at least 3 companies each-including one operator- are required per EPA and per Block. It is worth mentioning that the whole 22,730 km² EEZ area will be divided into blocks; there will be a block and an EPA for each of the winning consortiums.

A difference exists between the number of companies that purchase the data, those that pre-qualify, those that bid, and the number of contracts awarded. The numbers shrink as licensing process moves towards the latter category. In fact, a total of 52 companies applied to prequalify to the first licensing round for hydrocarbon exploration within the Lebanese offshore EEZ but only 12 right-holders operators and 34 right-holders non-operators have been successful in pre-qualifying to participate in oil and gas drilling bids and their names were announced on April 18, 2013.

Pre-qualified Right-Holders Operators

Company	Country
Anadarko	USA
Chevron	USA
ExxonMobil	USA
Petrobras	Brazil
Maersk	Denmark
Total	France
ENI International	Italy
INPEX	Japan
Petronas	Malaysia
Shell	Netherlands
Statoil	Norway
Repsol	Spain

Table 4 List of right-holders operators
Source Lebanese Ministry of Energy and Water

Pre-qualified Right-Holders Non-Operators

Company	Country
Santos	Australia
OMV	Austria
Suncor	Canada
INA	Croatia
GDF Suez	France
MOL Group	Hungary
Cairn	India
ONGC	India
PetroCeltic	Ireland
Edison International	Italy
JAPEX	Japan
JX Nippon	Japan
Mitsui	Japan
CC Energy	Lebanon
Lukoil	Russia
Novatek/ GBP Global Resources	Russia
Rosneft	Russia
KNOC	South Korea
KOGAS	South Korea
PTT	Thailand
TPAO - Turkish Petroleum	Turkey
Dragon Oil	UAE
KUFPEC	UAE
Crescent	UAE
Crescent / Apex	UAE/Lebanon
Dana Gas	UAE
Mubadala MDC	UAE
Heritage Oil	UK
Cairn (UK)	UK
Dana Petroleum	UK
Genel Energy	UK
SOCO	UK
Marathon	USA
Geopark/ Petroleb	Bermuda/ Lebanon

Table 5 List of right-holders non-operators
Source Lebanese Ministry of Energy and Water

POTENTIAL CHALLENGES TO LEBANON

For an economy with a large public debt like Lebanon, the potential of the oil and gas sector is a great opportunity. Passing the Petroleum Law in 2010 was a first step on the road to petroleum extraction, by approving offshore exploration and specifying the legal system to be used. The appointment of the Petroleum Administration's Board and the launch of the prequalification process for Lebanon's first oil and gas licensing round were all significant steps towards the development of hydrocarbon resources in the country.

Preliminary Economic Assessment of Hydrocarbon Reserves

If the schedule for the bidding process deadline materializes as planned and the right mechanisms surrounding the oil and gas sector are put in place, Lebanon can significantly grow its economy. The industry would be a key provider of long-term jobs and have positive impacts on the fiscal and external positions of the country. In fact, the oil and gas reserves are estimated to average more than USD 300 billion; equivalent to around seven times Lebanon's GDP. With these discoveries, Lebanon could move its economy to a higher growth path over the medium to long term and bring its public debt down to more sustainable levels. Although it is still premature to measure any dividends or changes in the country's growth and outlook, it is expected that oil and gas production would create important positive effects and opportunities by enabling Lebanon to gain energy independence and self-sufficiency in oil by satisfying domestic demand. Today, Lebanon is one of the world's most energy-import-dependent countries and spends 15% of its GDP on fuel imports.



POTENTIAL CHALLENGES TO LEBANON

Some experts have argued that in the first year of production, hydrocarbon output is expected to increase by double-digit levels. Therefore, Lebanon is to benefit from substantial increases in government revenues, attributable at a first stage to the share of the Lebanese government in oil revenues from partnerships with foreign oil producing companies. Then, the government oil imports' savings would generate surplus revenues that could be used to fund other needs, and at a later stage, the government's revenues could come from potential exports of oil and gas. As such, these new resources could contribute to shifting the fiscal deficit to a surplus, considerably narrow the current account deficit and bring down the debt-to-GDP ratio to well below 100% of GDP by 2020; as projected by the Institute of International Finance. This would lead to a significant positive effect on GDP, given the impact of oil on macro-economic and fiscal indicators and on the structure of the Lebanese economy.

Still, there is a long way to go. The natural resource wealth could turn into a double-edged sword for Lebanon.

The Paradox of Plenty

It is often considered that extracting hydrocarbon out of the sea is easier than managing the revenues from oil and gas production. Natural resources are often referred to be a "curse" rather than a "blessing": the so-called paradox of plenty. The paradox of plenty refers to the paradox that many oil and gas rich countries have shown slower economic growth than resource poor countries. It also assumes mineral wealth to have a link not just with less economic growth, but also with less democracy, more corruption and violent conflicts. It is often said that the weaker a country is before the oil findings, the more likely it is to be harmed by it.

This is assumed to happen for many different reasons, mainly including:

- **The Dutch Disease Theory:** An economic paradox in which a booming sector adversely affects the performance of other sectors of an economy. When a country begins selling its hydrocarbons abroad, an inflow of dollar-denominated revenues drives up the local currency or local prices leading to a real exchange rate appreciation. That, in turn, make non-oil exports more expensive and so less competitive on the world's markets. The economy would then be dominated by oil which would in turn lead to a decline in economic growth.
- **Corruption:** Countries with abundant natural resources frequently experience high levels of corruption. It could start at the extraction phases and continue when revenues start flowing in. In the case of Lebanon, sectarian rivalry and the patronage politics would make the good governance and regulatory environment problematic. In fact, Lebanon ranked as one of the 50 most corrupt nations worldwide on the 2013 Corruption Perception Index (CPI) produced by Transparency International. In Lebanon, many informal players may have a role in the decision-making process. This is related to the core problem of weak institutions. In fact, the focus today is on the country's offshore licensing, exploration and production phases while no announcements have been made on the effective establishment of the SWF and the management of oil and gas revenues. If this issue is not managed soon, it could bring doubts to the public opinion and international investors of possible future illicit leaks.

- **Inequitable Distribution of Oil Revenues:** the oil and gas industries typically create limited jobs relative to their importance on national revenues, which means that wealth creation can be unequal, accompanied with social tensions and allocating the benefits for the few, instead of the whole economy.
- **Volatility of Oil Prices:** the volatile nature of commodity prices means that growth is hostage to international markets' developments.
- **Environmental Risks:** Gas and oil extraction activities are often blamed for causing water and soil contamination and air pollution. Defective well construction -in particular poorly cemented steel coverings needed to isolate the gas- as well as above-ground spills of waste water and chemicals used during drilling, pose significant risks to the environment.





CONCLUSION

Lebanese policymakers should understand the main causes of the resources' curse in order to prevent it and observe the successes and failures of other resource-rich countries. Internationally, initiatives are being implemented to support financial transparency in the oil and gas sector, such as the EITI and UNCAC. If Lebanon complies to the EITI standards, the government would be requested to publish revenues from oil and gas sales. By making information public, it would be easier to enhance integrity and transparency.

Lebanon first needs to adopt a non-discriminatory and transparent bidding process to preserve a balance between safeguarding profits for the state and preserving the companies' motivation to continue investing in offshore Lebanon. On the other hand, Lebanon needs a whole new established infrastructure, knowing that gas extraction needs even more groundwork than oil extraction. It will need everything from liquefied natural gas plants to pipelines in order to get these resources to market. Also, the government should be aware of the innovative technology and practices that can reduce the environmental risks associated with gas development. Stronger government regulations are therefore needed to provide adequate protection to the environment.

On the revenue management side, the creation of a SWF is needed to manage revenues in a sustainable way and avoid the volatility in the government expenditures that can accompany volatile energy prices. Therefore, greater attention should be given to the development of the administrative capacity to manage the revenue flows in a non-politicized way within a long-term horizon in perspective.

Equally important is the demarcation of Lebanon's maritime borders with Israel. The discoveries in the contested area could limit Lebanon from parts of its resources and risk to pose security threats. Therefore, experts in diplomatic, legal and military affairs should be involved to help Lebanon successfully defend its rights and avoid conflict.

The Lebanese government seems rightly aiming at developing the country's petroleum resources. Yet, strong governance through the implementation of a clear legislative and fiscal framework is paramount to ensure a sustainable development of Lebanon's oil and gas sector.