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Contact Information

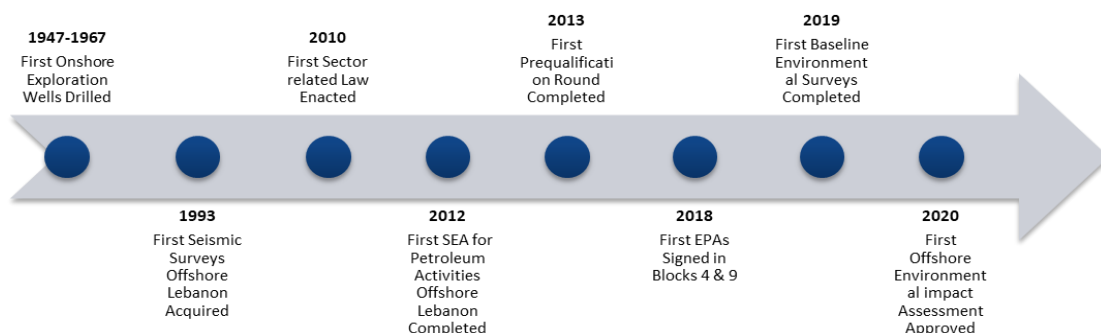
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The global energy markets have been witnessing serious shock waves amid Russia's invasion of Ukraine topped with supply shortages, price volatility and uncertain economic outlook. Major economies are bearing the brunt of the negative consequences of this crisis as global growth is projected to slow in the coming period. However, market changes have been noticeable especially on the traditional energy trade routes in order to meet the energy demand. In fact, the crisis paved the way for potential countries to enter the energy market for alternative suppliers to Europe. As such, Israel and the European Union have been in negotiations to export gas to Europe via Egypt.

As for Lebanon, it has no proven reserves of oil or natural gas, despite that several surveys have been carried out onto land and sea that revealed trace amounts of gas. However, the opportunities for Lebanon of entering the club of oil producers are highly uncertain, for reasons are mostly political and economic. Nevertheless, the most certain subject to shed the light on is the petroleum sector in Lebanon. As such, we will present a brief overview of Lebanon's new industry, history of exploration, opportunities it brings to the country, as well as the challenges it offers.

What does history reveal on the gas and oil sector in Lebanon?



The gas and oil industry in Lebanon has a long history. The start of the petroleum exploration in Lebanon began in the 1930's with the French Mandate and lasted until the 1970's, when the civil war broke out. In the village of Yohmor at the Bekaa valley, year of

1947, experts found rocks and fossilized marine animals similar to the rocky environments that are frequently found next to petroleum fields. This discovery initiated the interest in drilling in several locations. As such, and according to the Lebanese Petroleum Administration, between 1947 and 1967, seven wells were drilled onto the land in Terbol, El Qaa, Aabrine, Tell Znoub, Yohmor, Sohmor, and Aadloun.

Gas was observed but investors had no interest in gas production, especially as the cost of extraction was considered very expensive. Furthermore, the exploration activities came to a halt due the adverse security conditions of the civil war in the seventies.



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

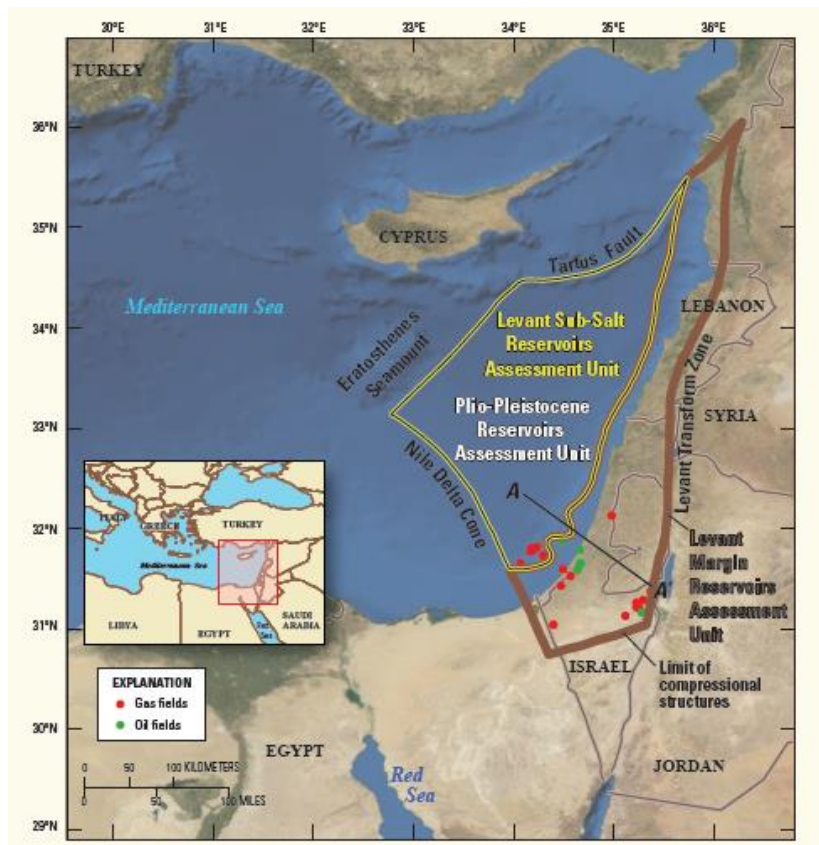
Meanwhile in the nineties, oil and gas scouting was revived on the Lebanese coastal area. Lebanon acquired its first seismic surveys offshore by 1993. The interpretation of the surveys was executed by the Lebanese Petroleum Authority. In fact, the US Geological Survey estimated a mean of 122 trillion cubic feet of recoverable gas in the Levantine basin province that includes Lebanese, Palestinian, and part of Cyprus offshore. However, no precise estimation for Lebanese gas was done since we haven't yet drilled any wells in the Lebanese offshore. To move things forward, the current status of Lebanon's petroleum sector modernized the outdated legal framework through the law 132 of 24/8/2010 dedicated to petroleum activities in the EEZ. Moreover, a number of implementation decrees have been issued to properly enforce legislation. In this context, the Lebanese Petroleum Administration LPA has been established.

Lebanon's gas finding potential has led to a new law that passed by the Lebanese Cabinet in August 2010, following in 2012 the appointment of the Board of the Petroleum Administration and later in 2013 the launching of the first ever offshore licensing round.

How much oil and gas does Lebanon have?

The US geological survey (USGS), which was done in 2010 on the Levantine basin, projected the undiscovered oil and gas resources of the area to be around 1.7 billion barrels of recoverable oil (8.5 billion cubic feet or 270.3 billion liters) and 122 trillion cubic feet (tcf) of recoverable gas.

The Levant basin is considered to be the world's largest gas discoveries of the decade. It includes roughly 83,000 square kilometers (km²) of the eastern Mediterranean area. The Levantine area goes from the east, the Levant Transform Zone to the north bounded by Tartus Fault, the northwest surrounded by the Eratosthenes Seamount and from the west and southwest it touches Nile Delta Cone Province Boundary, and from the south it limits the Sinai. Overall, the Levantine area comprises the territorial waters of Lebanon, Palestine (Israel), Syria, and Cyprus.



Source: US Department of the Interior – US Geological Survey

As for Lebanon, interest rose particularly after the deep-water gas discoveries in the bordering countries; accordingly, the Lebanese authorities has employed several international oil companies to carry out 2-D and 3-D seismic surveys showing the possible presence of offshore gas accumulations.

The seismic data on the offshore of Lebanon was picked up by the following three companies:

- Geco-Prakla (European Geophysical Service Company)
- Spectrum (Norwegian company)
- Geo-Services (PGS) (Norwegian Survey company)

The European company acquired 460 km of 2-D seismic lines in 1993, while Spectrum delivered high-quality 2-D seismic surveys for the period 1975-2002 and more recently it presented 3-D seismic surveys over 3000 km² in 2012 and 2013. Geo-Services offered a broad range of products related to gas exploration surveys and covered 8,800 km² for the period 2008 to 2011 and 9,700 km² for the years 2006 to 2013.

The interpretation reports of the companies remained undisclosed and confidential but it revealed that there is a considerable hydrocarbon resource base and that the Lebanese offshore is rich in petroleum resources and highly prospective. The analysis of the data provided a new explanation of the nature of the hydrocarbon potential of the Lebanese offshore area. The studies noticeably outlined potential sub-salt prospects which are beneath a salt layer that overlies rocks. According to the Ministry of Energy and Water, the Levantine Basin of which 30% offshore Lebanon is a large deep basin which is predicted to contain more than 10,000 meters of Mesozoic and Cenozoic sediments as well as the basin comprised all the necessary elements for effective hydrocarbon exploration.

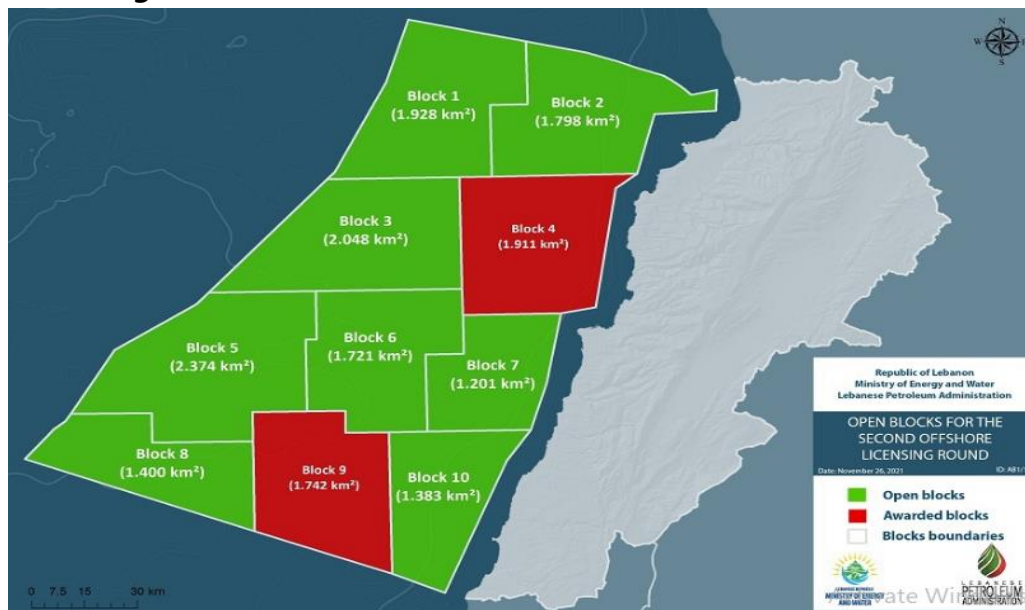
What is the estimate of Lebanon's oil and gas reserves?

The actual size of the country's oil and gas reserves remains uncertain. Lebanon's gas reserves prediction substantially differ as estimates are still limited and hence it is impossible to guess the exact amount until drilling phases start. However, specialists at Spectrum company declared, in 2012, that 25 trillion cubic feet of gas is in Lebanon's southern water is assessed during the survey in 3-D. In the interim, the Ministry of Energy and Water stated in October 2013 that around 96 trillion cubic feet is estimated as natural gas reserves; and based on a price of \$5 per thousand cubic feet, these resources' worth would vary between \$125B and \$480B.

As for oil, the French consulting company Beicip-Franlab discovered area in the northern maritime borders delimiting Lebanon, Cyprus and Syria, assessed to have between 440 and 675 million barrels of oil. However, the Ministry of Energy and Water stated that a total of 865 million barrels of oil could be extracted from this oil reservoir bearing in mind that if oil price is at \$108/barrel, the Lebanese stake of these oil reserves would be estimated between \$60B and \$90B.

In addition to the US geological survey (USGS), a 2012 seismic study by a British firm assessed the value of recoverable gas reserves at 25.4 trillion cubic feet (tcf), but it had never been validated by the Ministry of Energy and Water despite that majority of the political leaders were projecting higher expectations. However, skepticism rose claiming it's too early to consider Lebanon an oil producer country despite that the US funded geological study proved gas discoveries in Israel and Egypt.

Block Segmentation in Lebanon



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

Lebanon have been demarcated a total of 10 offshore drilling blocks. The exploration blocks vary in size as shown in the above map with a range between 1,259 km² and 2,374 km². The only well drilled was Block 4 which found trace amounts of gas and some evidence of a petroleum system but no reservoir of oil or gas. However, these announcements are not assumed to be a sign of failure rather they signal long time procedure for gas or oil finding. Noting that Africa' s under-explored petroleum basins is an example of the long road for oil and gas discoveries as, since 2001, only six out of twelve countries that looked for oil and gas actually found enough for reaching a final investment decision on a project with companies. Out of those, only three have started producing.

When, if ever, will Lebanon become an oil and gas producer country?

With the historical maritime border agreement signed between Lebanon and Israel in late 2022, Lebanon is looking towards petroleum sector development while investors positively responding to the news. However, the realization of this long term vision is coupled with serious risks and challenges. First and foremost, the political leaders have never presented a clear and realizable timeline which fueled inactivity and routine delays. In addition, Lebanon has lost years between ratifying the Offshore Petroleum Resources Law and the establishment of the Lebanese Petroleum Administration as well as it took five years between the launch of the first bidding round in 2013 and the closing of that round in 2018. Noting that the **longer it took to start production, ensuring a defined relationship with the external market and start selling, the higher the chances are for lower prices** especially as markets are heading towards green energy transition and are supporting cleaner energy sources.

The oil and gas sector is promising but unclear. Projects could take years to develop and to maintain an energy strategy. For instance, surveys has showed that the average time between discovery and production is globally around 7.5 years with nearly four-fifths of large upstream oil and gas fall behind schedule. The first oil production is set to take between 6 to 11 years in Lebanon if exploration starts today notwithstanding of the collapse of the financial sector, absence of Government and head of State and lack of political will.

To capture the sector' s full benefits, sound strategies and proper decision-making processes should be put on the table. In addition to the need for regional collaboration to ensure the complementary needs of the countries in the region and to optimize the usage of the existing infrastructure. The oil and gas sector must contribute to the provision of affordable and uninterrupted energy supply for Lebanon and must at all times, produce positive spillover effects on the national economy as well as contribute to enhancing the attractiveness of Lebanon for risk capital and, most importantly, the oil and gas sector must clearly prove an inclusive approach to governance within a strong system of transparency and oversight.

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