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LEBANON: THE NEXT EASTERN MEDITERRANEAN GAS PRODUCER?

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Cover photo: The sun sets behind ancient columns at Al-Mina Archaeological Site in Tyre, Lebanon.

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1 INTRODUCTION

Lebanon's exclusive economic zone (EEZ) forms part of the Levant Basin,¹ which has been estimated to hold up to 122 trillion cubic feet (3.45 trillion cubic meters) of recoverable natural gas, in addition to some 1.7 billion barrels of recoverable oil.² Lebanon's seabed could contain significant hydrocarbon potential, with an initial estimate of up to 30 trillion cubic feet (tcf) of natural gas (around 850 billion cubic meters) and 660 million barrels of oil.³ Jibril Basil, then acting minister of energy, raised these estimates to 95.5 tcf of natural gas and up to 865 million barrels of oil in October 2013, although no exploratory drilling had been conducted.⁴ However Spectrum, a Norwegian company that carried out Lebanon's first 3D seismic survey in August 2012, has estimated the country's recoverable offshore gas reserves at 25.4 tcf.⁵ Clearly these different estimates involve considerable uncertainty.

The development of its hydrocarbon reserves would enable Lebanon to reduce its dependence on imports of oil products, which in 2012 constituted more than 97 percent of its total primary energy supplies.⁶ In 2013, Lebanon's imports of oil and its derivatives amounted to \$5.11 billion, representing 11.4 percent of its GDP.⁷

The government is keen to diversify Lebanon's energy mix away from oil to strengthen its security of supply and to reduce air pollution. But gas production is not likely to begin before the mid-2020s. Until then, Lebanon would need to import all its gas requirements in order to increase the share of natural gas in the energy mix. The government has announced plans to import liquefied natural gas (LNG) to replace fuel oil in power generation, although at present the country has no regasification terminal and no contract to build and operate one has been signed. Lebanon has two combined cycle gas turbine (CCGT) plants in operation, with a combined nominal generation capacity of 870 megawatts, accounting for about 50 percent of the country's total installed capacity. These newly constructed plants, however, have not been operating optimally because of gas shortages.

Figure 1: The Arab Gas Pipeline



Source: U.S. Energy Information Administration, Eastern Mediterranean Region Country Analysis Brief (August 2013)

¹ The Levant Basin is bordered by Turkey, Syria, Lebanon, Israel, the Gaza Strip, Egypt, and Libya.

² "Assessment of Undiscovered Oil and Gas Resources of the Levant Basin Province, Eastern Mediterranean," U.S. Geological Survey (2010), <http://pubs.usgs.gov/fs/2010/3014/pdf/FS10-3014.pdf>.

³ "Lebanon says gas, oil reserves may be higher than thought," Reuters (2013), <http://www.reuters.com/article/2013/10/27/us-meast-investment-lebanon-idUSBRE99Q07L20131027>.

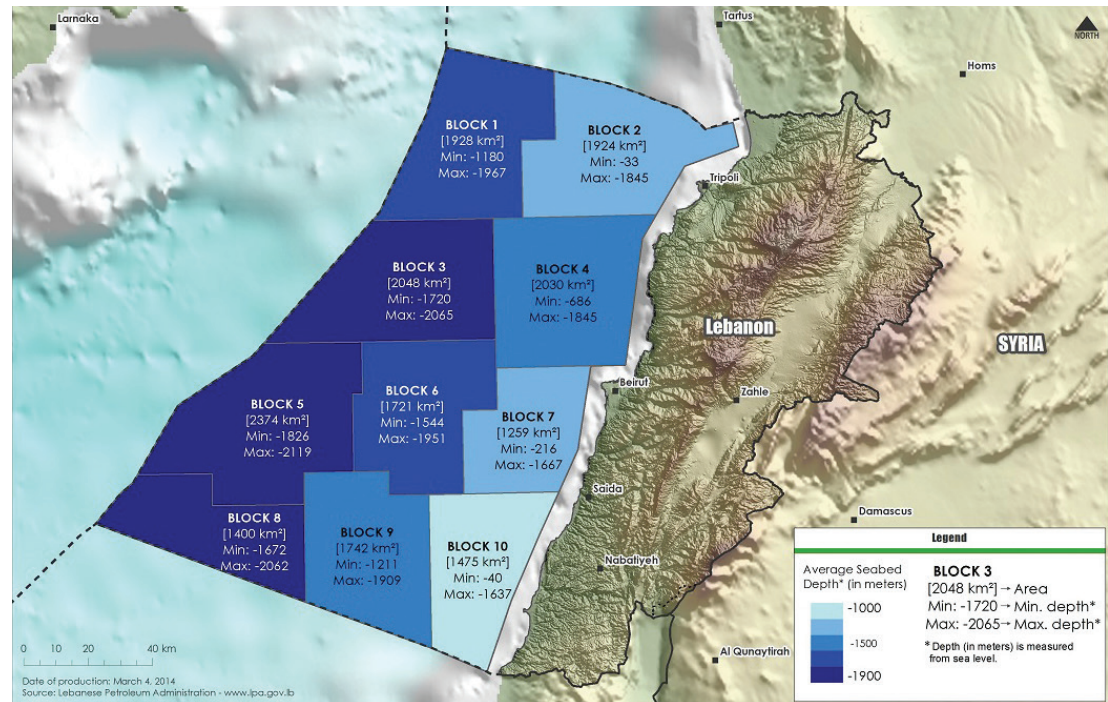
⁴ *ibid.*

⁵ Josh Wood, "Lebanon Pins Economic Hopes on Oil and Gas," *The New York Times* (2013), <http://www.nytimes.com/2013/04/18/world/middleeast/lebanon-pins-economic-hopes-on-oil-and-gas.html?pagewanted=all&r=0>.

⁶ "Lebanon: Balances for 2012," International Energy Agency (2012), <http://www.iea.org/statistics/statisticssearch/report/?year=2012&country=LEBANON&product=Balances>

⁷ Mirna Chami, "Lebanon's Trade Activity in 2013 Highlights a Hectic Year," *Blominvest Bank* (2014), <http://blog.blominvestbank.com/lebanons-trade-activity-in-2013-highlights-a-hectic-year/>.

Figure 2: Blocks and Seabed Depth



Source: Lebanese Petroleum Administration data

Currently, the share of natural gas in the fuel mix of the power sector has fallen to zero.

The commercial development of Lebanon's hydrocarbon reserves faces many internal and external challenges. Lebanon's hydrocarbon sector and its institutional and regulatory framework are still in their infancy. Deadlock in Lebanon's sectarian political system has led to long delays in the country's hydrocarbon development and produced a volatile regulatory environment. The country suffers from weak administration, widespread corruption, and a poor business climate. As yet, Lebanon has no proven gas reserves, and until 2005 it did not have any gas infrastructure at all.

Natural gas entered the energy mix for the first time in 2009 when the Arab Gas Pipeline (AGP, see Figure 1) started supplying Egyptian gas to Israel, Jordan, Lebanon, and Syria. The flow of Egyptian

gas was frequently disrupted because of delayed government payments and attacks on the pipeline in Sinai. The last delivery of Egyptian gas to Lebanon was in November 2010. Lebanon's delimitation dispute with Israel, with which it is formally in a state of war, further complicates the prospects for its offshore gas sector.⁸ Lebanon's faltering economy could benefit from the development of the country's offshore hydrocarbon reserves, provided they are wisely managed, taking into account best international practice.

However various sources of vulnerability remain including:

- a high level of sovereign debt that has required repeated rescheduling;

⁸ Tullio Scovazzi, "Maritime Boundaries in the East Mediterranean Sea," The German Marshall Fund of the United States, Eastern Mediterranean Energy Project (2012), http://www.gmfus.org/wp-content/blogs.dir/1/files_mf/1339504227Scovazzi_MaritimeBoundaries_Jun12.pdf.

- large interest payments, which crowd out priority spending and capital expenditure;
- a banking system whose stability hinges on the government's ability to service its debt;
- a persistent current account deficit whose financing relies on foreign deposits and remittances; and
- a persistent government deficit that will keep the debt-to-GDP ratio at high levels for the foreseeable future.

Lebanon's economy also suffers from an over-valued exchange rate underpinned by the Lebanese pound's peg to the U.S. dollar, which is considered essential for financial stability. Lebanon has sustained repeated internal and external shocks over the past three decades but has managed nonetheless to maintain overall macro-economic stability.

2 RECENT DEVELOPMENTS

The LPA has been unable to perform its tasks without interference and is affected by the country's political deadlock.

The discovery of gas deposits offshore Gaza, Israel, and Cyprus⁹ over the past decade prompted Lebanon to conduct comprehensive 2D and 3D seismic surveys of its own EEZ.¹⁰ Israel's discovery of the 9 tcf Tamar field in 2009, followed by the 19 tcf Leviathan field in 2010, as well as several smaller fields, and Cyprus' discovery of Aphrodite in 2011, probably containing up to 4-5 tcf, prompted Lebanon to accelerate exploration.¹¹

Lebanon adopted the Offshore Petroleum Resources Law in August 2010 (Law 132), which provides the legal and institutional framework for the exploration and exploitation of offshore oil and gas resources in Lebanon.¹² This was followed in April 2012 by Decree 7968/2012, establishing the Lebanese Petroleum Administration (LPA) as the body responsible for the management, monitoring, and supervision of petroleum activities, including the issuing of licenses and the implementation of agreements. The LPA, however, is not an autonomous body and falls under the tutelage of the Ministry of Energy and Water Resources and, indirectly, is reliant on the Council of Ministers for key decisions regarding the hydrocarbon sector.¹³ Thus the LPA has been unable to perform its tasks

without interference and is affected by the country's political deadlock.

After months of political infighting between the various factions, the government eventually appointed the six members of the LPA in December 2012.¹⁴ They were chosen along sectarian lines. In February 2013, the government issued Decree 10289/2013, setting out the Petroleum Activities Regulations for Lebanon, which provide the basic guidelines for Lebanon's hydrocarbon sector. The decree stipulates requirements for license applications and the scope of agreements with energy companies.

The appointment of the members of the LPA and the passing of these decrees paved the way for the launch of a prequalification round at the beginning of 2013.¹⁵ The response to the government's call for expressions of interest demonstrates the commercial attractiveness of Lebanon's potential offshore energy resources for international investors. Some 50 international companies registered interest, including several major oil companies (IOCs), such as Total, ENI, Shell, Statoil, Chevron, and ExxonMobil. Forty-six companies were qualified, including 12 operators. The initial interest in Lebanon's first bidding round was high, especially when compared to earlier bidding rounds in Israel and Cyprus, which faced political constraints.

⁹ Hakim Darbouche, Laura El-Katiri, and Bassam Fattouh, "East Mediterranean Gas: What Kind of Game Changer?" Oxford Institute for Energy Studies, *OIES Paper NG 71*, 2012.

¹⁰ A number of companies have been acquiring data in offshore Lebanon. In 1993, 2D seismic surveys covering 508 linear kilometers off Tripoli were acquired by Geco Prakla. Spectrum (a Norwegian company that provides seismic surveys) dataset includes 3D seismic surveys covering 5,360 km² (2012-13) and 5,172 linear km of 2D (2000-02). Petroleum GeoServices (also a Norwegian company) data sets includes 3D seismic surveys covering 9,700 km² (2008-11) and 9,700 linear km of 2D (2006-2012) seismic data. For more information, see Lebanese Petroleum Administration, <http://www.lpa.gov.lb>.

¹¹ Brenda Schaffer, "Israel — New natural gas producer in the Mediterranean," *Energy Policy* 39 (2011), pp. 5379–87; Walid Khadduri, "East Mediterranean energy plans taking shape," *MEES* 55, 2012; Authors' interviews, March to July 2014.

¹² For this and other relevant laws, see Lebanese Petroleum Administration, <http://www.lpa.gov.lb>.

¹³ The LPA acts as an advisory body, with the Minister of Energy and Water Resources playing the overriding role. The minister in turn has to obtain the endorsement of the Council of Ministers for key decisions.

¹⁴ The board of directors was appointed by virtue of Decree No. 9438, issued in December 2012.

¹⁵ The prequalification phase calling on companies to participate in offshore licensing rounds was set out in Decree No. 9882, issued on February 16, 2013. Decree No. 9882/2013 specifies the conditions for prequalification that both operators and non-operators must meet, as well as the requirements of the prequalification phase.

3 CHALLENGES FACING THE GAS SECTOR

The outlook for Lebanon, however, is highly uncertain. Delayed decision-making and inadequate administrative capacity cast doubt on the goal of starting production by the end of this decade. The prolonged failure of the Lebanese parliament to elect a new president and the formation in February 2014 of an unstable government made up of rival political groups has paralyzed the decision-making process. As of February 2015, the Lebanese government has failed to pass two decrees that are essential for tendering Lebanon's offshore acreage.

One of the missing decrees would delimit Lebanon's territorial sea and exclusive economic zone,¹⁶ an awkward matter as some blocks straddle a disputed area between Lebanon and Israel. The other decree would stipulate the provisions of future Exploration and Production Agreements (EPA).¹⁷ The EPA determines the way in which future revenues are to be shared between the state and the investors that provide capital, technology, and expertise.¹⁸

The draft decree has been criticized, especially regarding two key fiscal parameters — the cost recovery and profit-sharing provisions — as well as the minimum profit-sharing parameter, on which investing consortiums may bid. These provisions would add a further administrative burden to Lebanon's already overstretched bureaucratic system, complicate revenue forecasting, and create scope for future renegotiation of fiscal terms if discoveries prove smaller than expected or uneconomic

to develop.¹⁹ Other causes for concern include provisions that require “not less than 80 percent of the aggregate number of employees of the Right Holders to be Lebanese” (EPA draft as of April 2014, Art. 20)²⁰ — a requirement unlikely to be met given the shortage of qualified workers in the country.

The failure to pass these two decrees illustrates 1) Lebanon's complex domestic political landscape, which affects the decision-making process, the quality of institutions, the efficiency of public administration, and the business environment, and 2) the difficulty of delimiting Lebanon's EEZ, in light of the dispute with Israel, which could escalate if either country decided to award blocks in the disputed area.²¹

Domestic Political Factors

Lebanon's political scene is dominated by continuous conflict over the distribution of political power and economic resources among sectarian groups. This often paralyzes parts of the political system, including the legislative body, resulting in long delays in decision-making. The Lebanese Parliament may delay voting on key issues for years until consensus is reached. Similar delays occur within the Council of Ministers, the executive body responsible, *inter alia*, for adopting and implementing decrees related to the energy sector. Lebanon's first bidding round was delayed as no stable political coalition could be formed in 2012-13. A new government took office early in 2014, but has so far failed to approve the decrees indispensable to launching the first bidding round.

Delayed decision-making and inadequate administrative capacity cast doubt on the goal of starting production by the end of this decade.

¹⁶ For updates on Lebanon's ongoing bidding round, see Lebanese Petroleum Administration, <http://www.lpa.gov.lb>.

¹⁷ A draft proposal, reportedly combining production-sharing contracts with royalties paid to central government, was presented for consultation with bidding companies in 2013. This will be followed by the painstaking task of responding to and negotiating fiscal amendments, and obtaining approval by the relevant ministries.

¹⁸ For a general background, see IMF, “Fiscal Regimes for Extractive Industries: Design and Implementation,” 2012, <http://www.imf.org/external/np/pp/eng/2012/081512.pdf>; Daniel Johnston, “International petroleum fiscal systems,” United Nations Development Program, *UNDP Discussion Paper No. 6*, http://www.un.org/kh/undp/images/stories/special-pages/extractive-industries/docs/fiscal_systems_eng.pdf.

¹⁹ Carole Nakhle, *Licensing and Upstream Petroleum Fiscal Regime: Assessing Lebanon Choices*. Beirut: The Lebanese Center for Policy Studies, 2015 (forthcoming).

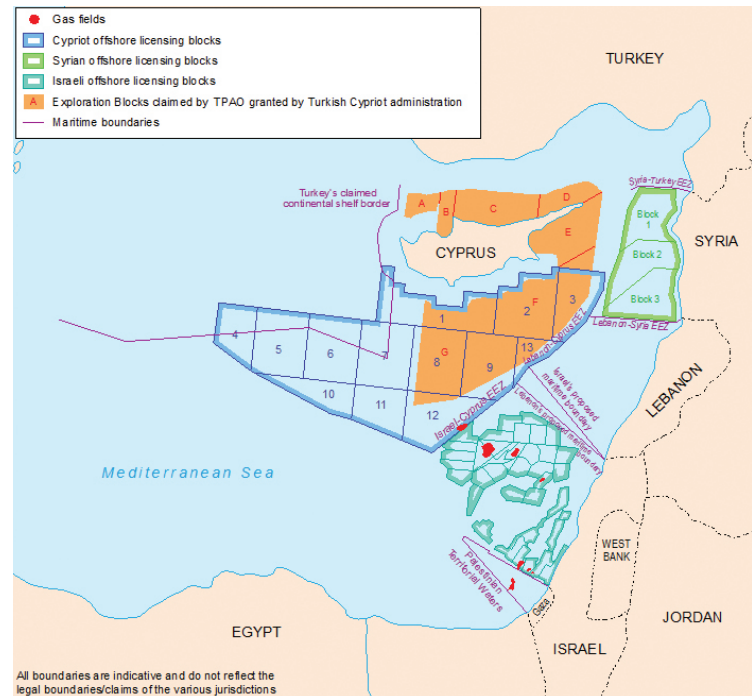
²⁰ Quoted in Nakhle, 2015 (forthcoming).

²¹ The influential speaker of the parliament, Nabih Berri has repeatedly called for offering for tender all ten of the blocks off Lebanon's coast and letting the companies choose five, in order to generate the best offers. However, this position is not widely supported.

Another source of delay is the Lebanese “allotment state” (*dawlat al-muhasasa*) in which “fierce struggles over the building of state institutions coexist with an utter disregard for the universal application of institutional rules” and “the country’s political class divides highly prized resources, opportunities, and privileges accruing from the state and its prerogatives among themselves and their allies and, to some extent, they pass it on to their (sectarian) constituencies to ensure their continued political support.”²²

The sectarian political system permeates all institutional structures and administrative bodies, which are populated by politically appointed bureaucrats, eroding public trust in the state’s institutions and limiting their effectiveness. As a result, Lebanon suffers from a poor institutional framework, a weak business environment, administrative inefficiencies, lack of accountability, and political deadlock, even where vital interests, such as exploration for oil and gas resources, are at stake. This political structure also encourages corruption and rent-seeking behavior. Transparency International’s Corruption Perceptions Index²³ indicates the widespread nature of corruption among Lebanese government institutions, public and private sector enterprises, and

Figure 3: The Eastern Mediterranean Region



Source: Oxford Institute for Energy Studies

society at large, with a continuous deterioration in recent years.²⁴

The weak institutional and administrative framework also results in a wide gap between declared government plans and actual delivery. The parliament and government have been slow to adopt and implement legislation to kick-start the sector but Lebanese politicians have created exaggerated expectations over the future of oil and gas in Lebanon. Billboards sponsored by the Ministry of Energy and Water have been erected along highways promising better transportation networks, a better healthcare system, more jobs, and even a better-equipped army, all to be funded by hydrocarbon wealth. Jibrán Basil, the energy minister,

²² Reinoud Leenders. *Spoils of Oil? Assessing and Mitigating the Risks of Corruption in Lebanon's Emerging Offshore Petroleum Sector*. Beirut: The Lebanese Center for Policy Studies, 2014/2015 (forthcoming).

²³ Transparency International's Corruption Perceptions Index can be accessed at <http://www.transparency.org/>. In 2014, Lebanon was ranked 136 out of 175 on the Corruption Perception Index.

²⁴ Reinoud Leenders. *Spoils of Oil? Assessing and Mitigating the Risks of Corruption in Lebanon's Emerging Offshore Petroleum Sector*. Beirut: The Lebanese Center for Policy Studies, 2014/2015 (forthcoming).

claimed in February 2013 that Lebanon would be able to start exporting natural gas “within four years,” that is by 2017 — a timeline that is unattainable even under the most favorable scenario. The gap between promise and delivery is likely to affect perceptions by IOCs of Lebanon’s reliability as a partner in implementing high-risk investment projects.

Politically determined delays are also preventing Lebanon from developing an overall system of governance for its energy sector, which would encourage balanced economic development, without excessive dependence on the hydrocarbons sector and a loss of economic diversity. This is one of the main challenges facing a new energy producer. However, it is unlikely that best practice, as developed, for example, in Norway, can be implemented in the Lebanese context.

Maritime Delimitation with Israel

The overlapping Lebanese and Israeli maritime claims over some 854 square kilometers are another potential constraint on exploration and production,

and carry the risk of escalation. If exploration were to go ahead in this disputed area, and especially if significant resources were discovered, incidents at sea and further escalation could occur.

There are precedents for trans-boundary natural resource sharing initiatives concerning oil and natural gas. However, such options do not apply to states that do not recognize each other’s borders and are technically at war. Lebanon still does not recognize the state of Israel.

There have been informal efforts by the United States to prevent the delimitation dispute from becoming an additional source of tension between the two countries. U.S. diplomatic efforts have centered on discouraging Israel and Lebanon from exploring the disputed area until a solution is reached.²⁵ So far, both countries have avoided exploring or awarding contracts in the disputed area, reflecting their desire to avoid escalation. However political developments could reignite the dispute at any time.

²⁵ “Beirut to Delay Bids,” *MEES* 57, 2012.

4 MANAGING HYDROCARBON REVENUES

The Lebanese government needs to put a framework in place for managing future hydrocarbon revenues, well before these revenues materialize.

The Lebanese government needs to put a framework in place for managing future hydrocarbon revenues, well before these revenues materialize.²⁶ The Offshore Petroleum Law requires part of these revenues to be placed in a fund for the benefit of future generations. Article 3 of the law stipulates that the “statute regulating the Fund, the rules for its specific management, the principles of investment and use of proceeds shall be regulated by a specific law, based on clear and transparent principles for investment, and use of proceeds that shall keep the capital and part of the proceeds in an investment fund for future generations, leaving the other part to be spent according to standards that will guarantee the rights of the state and avoid serious, short- or long-term negative economic consequences.”²⁷

The initial policy priority for Lebanon, when revenues from energy production begin to flow, will be to reduce the state’s debt, estimated at 146 percent of GDP in 2014, beginning with the most risky liabilities: external debt denominated in foreign currency. Such liabilities, especially when they are short term, expose the domestic economy to external market shocks. The World Bank emphasizes the benefits of a sharp drop in the country’s debt levels, which would lower the sovereign risk premium and hence reduce the cost of the remaining public debt.²⁸ An improved sovereign debt rating would also lower interest rates for the private sector, raising the competitiveness of the economy and potentially boosting growth.

²⁶ “Oil and Gas in Lebanon 2014,” *BankMed* (2014), http://www.bankmed.com.lb/LinkClick.aspx?fileticket=_Sfjx3YcF80%3D&portalid=0. Present estimates of future revenues are highly speculative.

²⁷ World Bank, “Lebanon Economic Monitor: A Sluggish Economy in a Highly Volatile Environment,” Spring 2014.

²⁸ The World Bank (2014) calculates that a reduction in Lebanon’s debt-to-GDP ratio to 100 percent would reduce the interest cost of the remaining debt. If the risk premium on Lebanon’s debt were reduced by 100 basis points, this would save the annual budget 1 percent of GDP (or US\$4.4 billion every year based on 2014 GDP).

While debt reduction would bring economic benefits, there are risks associated with this strategy. If a significant part of natural resource revenues are absorbed into the national accounts, with a lack of transparency, there is a major risk of voracity effects and rent-seeking behavior. In any event, using resource revenues to reduce public debt may not be politically feasible and may face public resistance, as expectations have been raised of the availability of future financial resources for public expenditure. There is also a risk that lower interest rates, resulting from reduced debt levels, would provide an incentive for borrowing, producing a credit bubble.

Consideration has also been given to a cash hand-out scheme, in the absence of a functioning social transfer system. But such a scheme would involve a high level of moral hazard and be subject to abuse. Furthermore, if the cash handouts were sizeable enough to undermine politicians’ patronage, “there are no a priori reasons to believe that public decision-makers would cooperate and this way bankroll themselves out of office.”²⁹

Lebanon should avoid distributing future resource revenues as energy subsidies since these distort pricing signals and result in misallocation of resources. Although energy subsidies constitute an important social safety net for the poor, they are regressive in nature because in many instances richer households capture the bulk of subsidies. Energy subsidies also have a negative environmental impact by encouraging wasteful consumption of fossil fuels. Once energy subsidies are introduced, they are very difficult to reverse, reducing macroeconomic policy flexibility.

There is scope for increasing public investment in infrastructure such as electricity and transport. Infrastructure constraints pose a serious barrier to

²⁹ Reinoud Leenders. *Spoils of Oil? Assessing and Mitigating the Risks of Corruption in Lebanon’s Emerging Offshore Petroleum Sector*. Beirut: The Lebanese Center for Policy Studies, 2014/2015 (forthcoming).

competitiveness. Investment in public infrastructure would yield a relatively high rate of return and benefit the population. But the quality of public spending is critical. If public investment is directed toward poor quality projects or affected by corruption, there would be few benefits for the economy or the public at large.

In the period before offshore resources come on stream, which could be a decade or more, it is

important to work out a balanced strategy for managing the resulting revenues. Under existing legislation, part of the revenues must be set aside in an investment fund for future generations. The residue should be used for debt reduction, public investment, and transfer payments. Meanwhile, public expectations should be gradually lowered to allow policymakers to take realistic decisions in a supportive political climate.

5 LEBANON'S DOMESTIC GAS DEMAND AND INTERIM GAS IMPORT OPTIONS

Meeting domestic demand, especially in the power sector, should be the top priority in government policy.

If exploratory drilling confirms commercially recoverable offshore resources in Lebanon, the balance between the use of gas to meet domestic demand and for export will need to be determined. Meeting domestic demand, especially in the power sector, should be the top priority in government policy. The Ministry of Energy has estimated that at a price of \$90 per barrel, Lebanon could make a saving of \$1.9 billion on its annual fuel bill if it switches its power generation to gas.³⁰ In addition to these savings, such a policy would bring substantial environmental benefits.

The 2010 Ministry of Energy and Water Policy Paper for the Electricity Sector, endorsed by the Council of Ministers, includes a plan to supply around 12 percent of the fuel mix from renewable energy sources, to use natural gas for two-thirds of the fuel mix, and to increase the installed capacity to 4,000 MW by 2014 and 5,000 MW by 2020. It is estimated that the implementation of this plan would reduce greenhouse gas emissions up to 177,912 Gg of CO₂eq between 2011 and 2030.³¹

In order to achieve these gains, however, the government should have a clear policy regarding the pricing of gas for the domestic market. This has the potential to be a contentious issue with energy companies. Since gas demand is strongly linked to electricity demand, it is essential that the government embark on the reform of the power sector and of electricity prices.

Électricité Du Liban (EdL), the country's principal power utility, suffers from very large financial and operating losses, which constitute between 20 and 25 percent of the government's primary expendi-

ture.³² EdL also suffers from chronic underinvestment, which has, until now, prevented it from modernizing its grid and expanding power generation capacity.³³

Increasing the proportion of gas in the power mix would require heavy investment in the gas grid, including the planned project to build a 173 km, 36-inch coastal gas pipeline connecting a planned storage terminal onshore near the future Floating Storage Regasification Unit (FSRU) to Tyre in southern Lebanon, allowing all of Lebanon's major power plants to tap the gas supply. However, this project faces many hurdles including land reclamation and finding the necessary funding for its construction. There is a risk that gas might come on stream without the government having put in place the necessary infrastructure onshore to transport it.

Meanwhile, Lebanon needs to ensure interim supplies of natural gas for its power plants, if the government's plan to switch from heavy fuel oil to gas is to be realized. As mentioned earlier, Lebanon no longer receives pipeline gas from Egypt.

In 2003, the government of Lebanon signed a 25-year contract with Syria to import around 1.5 bcm of natural gas per year.³⁴ The Gasyale pipeline, a 32-km pipeline with capacity of 3 million cubic metres per day connecting the Syrian border to the Beddawi power plant, was completed in 2005. However, Syria has not been able to supply Lebanon with gas, as its gas production has been insufficient to meet domestic demand, and persistent

³² A press report suggests that out of the \$2 billion annual losses incurred by EDL, nearly 15 percent is due to theft and technical losses and the remainder is due to the high cost of fuel. For further details, see "EDL tests smart meters to prevent electricity theft," *The Daily Star* (2013), <http://dailystar.com.lb/SearchArticles.aspx?search=EDL%20tests%20smart%20meters%20to%20prevent%20electricity%20theft>

³³ See World Bank, "Republic of Lebanon Electricity Sector Public Expenditure Review," *Report No. 41421-LB* (2008), <https://openknowledge.worldbank.org/bitstream/handle/10986/7990/414210REPLACEMENT04April01502008.pdf?sequence=1>.

³⁴ World Bank, "Republic of Lebanon Hydrocarbon Strategy Study," *Report No. 29579-LE* (2004), <https://openknowledge.worldbank.org/bitstream/handle/10986/15684/295790LE.pdf?sequence=1>

³⁰ "Lebanon Faces Obstacles to LNG Imports," *MEES* 56, 2013.

³¹ Ministry of Environment, "Lebanon's Second National Communication to the UNFCCC," 2011, <http://unfccc.int/resource/docs/natc/lbnc2.pdf>

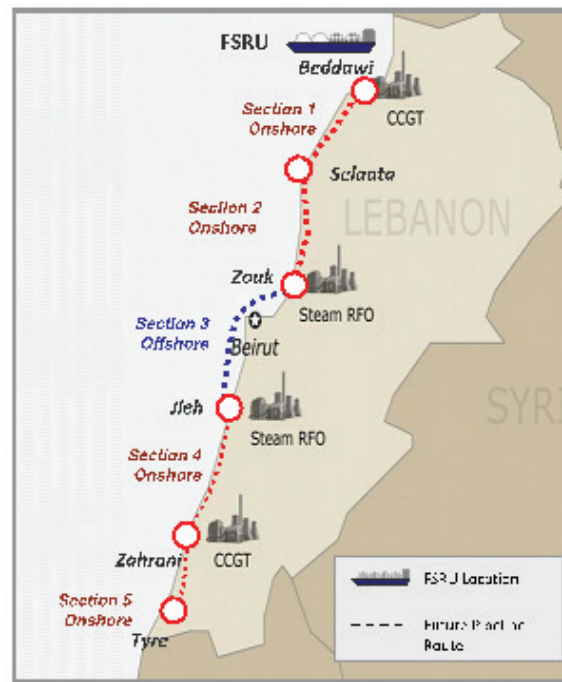
civil conflict has cast doubt on Syria's ability to increase its natural gas output.

Lebanon's lowest-cost option in commercial terms would be to secure pipeline gas from Israel. Despite adjacent gas reserves potentially available for export from Israel, this option is not politically feasible as there are no direct trade ties or diplomatic relations between the two countries.³⁵

Iran is a potential gas supplier to Lebanon.³⁶ A pipeline project carrying up to 25 bcm of Iranian gas to neighboring Iraq and Syria (the "Islamic pipeline") could have become a lifeline for Lebanon's power sector. But the international sanctions regime against Iran, coupled with insufficient gas production within Iran to export additional quantities, has cast doubt over this option.³⁷ Since its announced construction launch in November 2012,³⁸ the project has suffered from funding and practical above-ground problems related to the security situation in Iraq and Syria.

Given Lebanon's limited opportunities for securing pipeline gas imports from neighboring countries, LNG remains the country's only option. LNG has been considered as an option since the 1990s, but the high initial construction costs of an onshore regasification terminal switched policy efforts toward securing lower-cost regional pipeline gas imports.³⁹

Figure 4: Lebanon Power Stations and Proposed Gas Infrastructure



Source: Poten & Partners

Lebanon revived the LNG import option in 2013.⁴⁰ In December 2013, the Ministry of Water and Energy issued a tender to import LNG to replace fuel oil in power generation. The tender is part of a project involving the construction of a Floating Storage Regasification Unit (FSRU). Thirteen companies responded to the Ministry of Energy and Water's tender. The winner will be awarded a 12-year supply contract. Lebanon intends to start importing around 1.2 million metric tons per annum (mtpa) of LNG by 2016, a figure that is expected to reach 3.5 mtpa by 2022, cutting the country's energy bill and generating a savings of an

³⁵ The Israeli Cabinet's decree from June 2013 (together with other issues), reserves some 20 bcm of natural gas from Israel's offshore fields for immediate, regional exports; this includes gas from the Tamar field, which is already onstream.

³⁶ "Lebanon approves plans for North-South gas pipeline," *MEES* 55 (2012), pp. 18-19.

³⁷ Sara Vakhshouri, "Sanctions Raise Questions about Iran's Export Capacity," *MEES* 55, 2012.

³⁸ "Iran starts construction of Iran-Iraq-Syria gas pipeline," *Zawya* (2012), https://www.zawya.com/story/IranIraq_pipeline_ready_for_gas_exports-ZAWYA20140823065709/.

³⁹ "Lebanon Revisits LNG Import Plan," *LNG Intelligence*, 2013.

⁴⁰ "Lebanon's Economy Hit by Power Crisis and Syrian Turmoil," *MEES* 55 (2012); "Lebanon Revisits LNG Import Plan," *LNG Intelligence* (2013); "Lebanon LNG imports a distant prospect amid bidding confusion," *MEES* 56, 2013.

estimated \$1 billion per year.⁴¹ However, the plan for importing LNG by 2016 is unrealistic, as little progress has been made in terms of awarding the contract.

⁴¹ “Lebanon: LNG import tender & FSRU tender confirm business as usual at the MOEW,” *Lebanon: The Oil & Gas Report* (2014), <http://www.mesp.me/2014/02/09/lebanon-the-oil-gas-report-february-10-2014/>.

6 LEBANON, THE EASTERN MEDITERRANEAN, AND GLOBAL GAS MARKETS

Lebanon's location in the Eastern Mediterranean, with good coastal and land access, gives it a natural advantage for gas exports.⁴² The border with Israel is closed but Lebanon has a number of other regional trading options.⁴³ The potential for exports will be critical for securing initial interest by foreign investors.⁴⁴

Lebanon's eventual export strategies will depend on the size of its reserves, domestic and foreign demand, export targets, the cost of Lebanese gas production, price, and competition, as well as the availability of finance for pipelines or LNG facilities to bring the gas to market. Assessments of political and economic risk will affect the willingness of investors to finance the necessary offshore and onshore infrastructure.

The timing of the first Lebanese gas exports is important in view of gas market dynamics. Continued delays could close various market opportunities for the country. The commercial potential of regional exports to Egypt and Jordan is attractive but Israel may have a first-mover advantage if it overcomes present regulatory and political obstacles.⁴⁵

Lebanon LNG and the Regional Gas Hub Option

Because of its flexibility, LNG is probably the most attractive export option, both for the government and for international investors, provided sufficient quantities of gas are available.⁴⁶ Lebanon's initial LNG potential could amount to 5 to 10 mtpa

(6.8-15.5 bcm), a relatively small volume but large enough to make one to two LNG trains commercially viable.⁴⁷ But to make such a project viable, the government would need to make sufficient quantities available for export to permit the conclusion of long-term contracts.

By the time Lebanese LNG might be available — not before the mid-2020s — Lebanon will be competing with new entrants with considerably more market weight, including Australia (expected to bring some 56 mtpa on stream by the early to mid-2020s),⁴⁸ East Africa (20 mtpa by the early 2020s, 30-40 mtpa by 2028)⁴⁹ and, potentially, North America (up to 125 mtpa).⁵⁰ Existing contracting for Australian and East African LNG suggests that by the early 2020s, before Lebanese gas comes on stream, a significant share of the market will be locked up in long-term supply contracts. Given likely production costs, Lebanon may also find it difficult to compete on price.⁵¹

Sharing LNG export facilities with Egypt, or potentially Cyprus, would offer significant cost savings if technical, commercial and political obstacles could be overcome. Joint monetization between Lebanon and Cyprus, with a view to LNG production, might become viable at a much later stage, depending

The timing of the first Lebanese gas exports is important in view of gas market dynamics. Continued delays could close various market opportunities for the country.

⁴² Bassam Fattouh and Laura El-Katiri, *Lebanon's Gas Trading Options*, Beirut: The Lebanese Center for Policy Studies, 2015 (forthcoming).

⁴³ Laura El-Katiri, Bassam Fattouh, and Hakim Darbouche, *East Mediterranean Gas: What Kind of Game Changer?* Oxford: Oxford Institute for Energy Studies, 2012.

⁴⁴ See discussion above.

⁴⁵ "Noble Energy prefers selling Leviathan gas regionally," *Globes* (2013), <http://www.globes.co.il/en/article-1000896169>.

⁴⁶ Laura El-Katiri, Bassam Fattouh, and Hakim Darbouche, *East Mediterranean Gas: What Kind of Game Changer?* Oxford: Oxford Institute for Energy Studies, 2012, p. 5; "Noble Energy lowers Block 12 gas estimate," *Globes* (2013), <http://www.globes.co.il/en/article-1000883055>.

⁴⁷ This is comparable to Cyprus' hypothetical LNG output by the mid-2020s, if additional volumes of gas are discovered.

⁴⁸ Authors' estimates, based on David Ledesma, James Henderson and Nyrie Palmer, "The Future of LNG from Australia," *Oxford Institute for Energy Studies*, OIES Paper NG 90 (2014), <http://www.oxfordenergy.org/wpcms/wp-content/uploads/2014/09/NG-90.pdf>.

⁴⁹ Authors' estimates, based on David Ledesma, "East Africa Gas — The Potential for Export," Oxford Institute for Energy Studies, *OIES Paper NG 74* (2013), <http://www.oxfordenergy.org/wpcms/wp-content/uploads/2013/03/NG-74.pdf>.

⁵⁰ Authors' estimates, based on James Henderson, "The Impact of North American LNG Exports," Oxford Institute for Energy Studies, *OIES Paper NG 68* (2012), <http://www.oxfordenergy.org/wpcms/wp-content/uploads/2012/10/NG-68.pdf>.

⁵¹ Jonathan Stern (ed.), "Reducing European Dependence on Russian Gas: Distinguishing Natural Gas Security from Geopolitics," Oxford Institute for Energy Studies, *OIES Paper NG 92* (2014), <http://www.oxfordenergy.org/wpcms/wp-content/uploads/2014/10/NG-92.pdf>.

on the size and location of any new discoveries offshore Lebanon and Cyprus.⁵²

Pipeline-Export Options to Turkey, Jordan, Egypt, Syria, and Iraq

Pipeline options might be feasible if Lebanon's reserves prove sufficient to permit exports but insufficient to attract investment in the necessary infrastructure for LNG. Pipeline exports to Jordan and Egypt could be made through the existing Arab Gas Pipeline (AGP). The AGP, which previously transported Egyptian gas to Jordan and Lebanon, could be used for reverse flows to both markets. This would require a relatively inexpensive link to be built between Lebanon and the pipeline.

But many uncertainties affect the viability of this option. The route is long and subject to disruptions. In the period before Lebanese gas becomes available, Jordan and Egypt may have contracted to buy

gas, from Israel or other suppliers. If political and economic stability is maintained in Egypt, its own gas production and energy efficiency may increase.

Lebanon could also consider gas exports to other countries in the Middle East, particularly Syria and Iraq. While these countries may eventually become self-sufficient producers of gas, both face medium-term supply gaps. This might create opportunities for Lebanese gas in the late 2020s.⁵³ But both countries face a high level of violence and instability, making any assessment of their potential as export markets for Lebanon hypothetical.

⁵² Anastasios Giamouridis, "Natural Gas in Cyprus: Choosing the Right Option," The German Marshall Fund of the United States, Mediterranean Paper Series (2013), http://www.gmfus.org/wp-content/blogs.dir/1/files_mf/1379968428Giamouridis_CyprusGas_Sep13_web.pdf.

⁵³ Political turmoil and economic collapse in Syria have reduced its gas demand. But demand is likely to recover quickly if stability is restored. Iraq, while not a net importer, is thought to have been importing Iranian gas; this is unlikely to be sufficient to meet future demand.

7 CONCLUSIONS

The successful development of Lebanon's gas resources could bring substantial economic benefits to an ailing economy and strengthen the country's energy security. Furthermore, a switch to natural gas from fuel oil in the power sector would lower pollution and carbon emissions, improve public health, and ensure a more reliable power supply.

But the road to Lebanon becoming a gas producer is long. Over the next few years, the government will be confronted with many complex and difficult decisions. The formulation, adoption, and implementation of the necessary laws, the establishment of effective institutional and regulatory structures, and the efficient and transparent management of gas revenues are major challenges. In the context of sectarian political polarization, the regulatory environment is likely to remain volatile. Exploration and production may continue to be held back by delays in decision-making and poor implementation.

The Energy Ministry has promised "full transparency" in the evaluation of bids for licenses, but it is doubtful whether such transparency can be achieved in practice. Competition among the various sectarian groups for rents is fierce. If Lebanon is to become a gas producing country over the next decade, it must overhaul its regulatory practices, such as the procedures for obtaining permits as well as customs and security clearance. This is essential to shelter the oil and gas industry from the corruption and red tape that currently characterize Lebanon's business environment.

The government needs, without further delay, to formulate a plan to manage the country's potential oil and gas wealth, even though it may be many years before exploration, production, and monetization reach a decisive stage. Lebanon should be wary of importing revenue management strategies from abroad, as optimal choices depend on each

country's political, economic, and institutional context.

Establishing a sovereign wealth fund, for example, may suit a country like Norway with a high level of per capita income and strong institutional framework, but this may not work in Lebanon, where there is strong rivalry among sectarian groups and where the governance structure remains weak. Furthermore, establishing a sovereign wealth fund might involve forgone opportunities to reduce the size of the public debt and improve the capital stock and infrastructure, which are needed to put Lebanon on a higher growth trajectory. Major oil exporters such as Saudi Arabia, the UAE, and Kuwait have set up sizeable liquidity funds to cope with oil price volatility, but this may not be appropriate for Lebanon, whose hydrocarbon revenues will be relatively modest. Any future strategy should take into account Lebanon's specific economic, political, and institutional features.⁵⁴

Lebanon's natural gas should be used initially to meet domestic demand, replacing fuel oil in power generation. If sufficient quantities are discovered to permit exports, these should, in the first instance, be through pipeline sales to countries in the region, such as Syria, Egypt, and Jordan, rather than through LNG. A joint LNG export facility with Cyprus might become feasible in the medium to long term if both countries discover considerable additional quantities of gas. The viability of such a project, or of an LNG facility in Lebanon itself, will depend on the amount of gas available for export, price, demand, developments on international gas markets, and Lebanon's investment climate. If the recent fall in oil and gas prices is sustained, Lebanon's competitive position, as a high cost producer

⁵⁴ Rozlyn C. Engel, "Managing Newfound Hydrocarbon Wealth: Macroeconomic Policy Challenges in the Eastern Mediterranean," The German Marshall Fund of the United States, Mediterranean Paper Series (2013), http://www.gmfus.org/wp-content/blogs.dir/1/files_mf/1378230392Engel_NewHydrocarbonWealth_Aug13_web.pdf.

The formulation, adoption, and implementation of the necessary laws, the establishment of effective institutional and regulatory structures, and the efficient and transparent management of gas revenues are major challenges.

that has come late to market, will be adversely affected.

The investment climate is affected by both internal and external factors, including Lebanon's relations with its neighbors and developments in the region. Further efforts should be made through third-party mediation to resolve the delimitation dispute with Israel. Meanwhile, both parties should avoid issuing licenses for exploration within the disputed area. The violent conflicts in Syria and Iraq, the refugee flow into Lebanon, and the lack of progress in the Middle East Peace Process continue to weigh on Lebanon's fragile political and economic situation.

Nonetheless Lebanon has demonstrated considerable resilience in pursuing commercial opportunities over the years, notwithstanding an unfavorable political environment. The country's leaders should raise awareness in political circles and among the population both of the potential benefits of developing the country's hydrocarbon resources and of the conditions that need to be met to do this

successfully. This requires considerable restraint in avoiding exaggerated claims regarding increased state expenditure and in explaining the reforms needed to attract the necessary investment.

Lebanon can draw on expertise from existing energy producers and from regulators in Europe, the United States, and other countries in designing a regulatory regime adapted to conditions within the country itself. Regional cooperation, sponsored for example by the European Union, in areas such as the safety of offshore energy installations and rapid intervention in the event of accidents can enhance Lebanon's capacity to manage its new offshore sector effectively. Training programs for regulators, drawing on experience in the North Sea, the Gulf of Mexico, and elsewhere can be of particular value. The international community has a strong interest in ensuring that Lebanon's potential hydrocarbon wealth brings benefits to the country and the region and does not become an additional source of tension.

The image features a solid green background with several horizontal white lines. Small white dots are placed at various intervals along these lines, creating a minimalist, grid-like pattern. The lines and dots are arranged in a way that frames the central text.

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