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Petroleum Pipeline Security in the Middle East

Key Takeaways

- *Oil pipelines in the Middle East have historically focused on the security of supply and export rather than on the economic benefits of having cheaper oil transport. Looking at the historical record of these pipelines, one could easily conclude that the objective of oil supply security sought by Middle Eastern producers has not been met through pipelines.*
- *The petroleum security supply from the Middle East depends on political stability in the region. Nevertheless, the area's turbulent history does not promise future stability.*
- *On the gas side, new gas pipeline developers have also to consider the new realities in the global gas markets, which now favor the gas trade in liquefied form (LNG) rather than pipelines.*
- *Building a regional gas network between countries of the Middle East should always be kept on top of the policymaker's agenda. Such a network would increase the gas resources available to regional economies and create a strong development drive. In addition, it would boost intra-regional trade and become an important step towards long-term political co-operation and economic integration*

Introduction

While many situations of instability and conflict in the Middle East remain restricted to small-scale, internal, or regional crises affecting petroleum security supplies from within, this region is immediately considered as a threat to international peace and global markets, especially if associated with petroleum supply disruptions. This behavior derives from an implicit conviction that Middle Eastern petroleum is to be ‘shared’ among its producers and consumers, being vitally and strategically important to the latter’s economies.

Petroleum has always weighed in heavily in the Middle East with its geopolitical and strategic aspects; the region holds more than 48 percent of the world’s oil reserves and around 40 percent of those of gas¹. It is also the region’s Achilles’ heel: any dispute or conflict could materialize first by striking the petroleum industry, which remains the backbone of many states in the region.

The petroleum industry in the Middle East is indeed highly exposed to both internal instabilities as well as to external attacks and violence, which can have major consequences on the petroleum supply. This is especially true for petroleum pipelines in the region, although the situation differs between oil pipelines and those channeling natural gas.

Oil Pipelines: An Unsuccessful Track Record

Oil pipelines already established in the Middle East focus on the security of supply, exporting it rather than having the economic benefits of cheaper oil for transport. In fact, oil pipelines have been expensive to build and operate. In the years just after the World War II, for example, the Arabian American Oil Company (Aramco) built the Trans-Arabian Pipeline (Tapline) from the Saudi eastern province to Zahrani on the Lebanese coast to avoid the Suez Canal and its transit fees. Yet, Aramco had to innovate in the pipeline’s construction to keep it cost-competitive with shipping, and had to overcome fierce competition and related political hostility from Britain and its allies in Jordan and Syria. Later, Syria imposed transit fees on Tapline’s oil, which undermined the line’s economic value.

Nevertheless, Tapline, as well as Iraqi pipelines through Syria and Lebanon, were priceless immediately after the closure of the Suez Canal in 1967 as it allowed short access of Saudi and Iraqi crude to Mediterranean markets and beyond. However, with the introduction of supertankers, shipping regained some of its economic advantage.

The eight-year Gulf war (1980-88) was a stimulating factor in both Iran and Iraq to plan and implement a number of alternative oil export outlets to replace closed pipelines and damaged terminals. The regional conflict made this diversification attractive to all other Middle Eastern states. Not surprisingly,

¹ BP Statistical Review of World Energy, 2021, London, June 2021.

Iraq, whose meagre Gulf coastline was blocked early on in the war, and its export outlets through the Mediterranean shut down soon after, consistently wanted the diversification of its export channels through Turkey and Saudi Arabia.

Although Iran's export security problem has never been as serious as that facing Iraq, sporadic Iraqi air strikes on Iran's Kharg Island in the 1980s gave Tehran reason to plan a number of pipelines aiming, principally, at by-passing the exposed terminal. However, most of the projects were later put on hold as an indirect result of the 1986 Iraqi strikes on the Iranian remote Larak and Sirri terminals, which raised serious questions in Iran about the usefulness of pipelines and their security.

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For Saudi Arabia, Petroline—its main export pipeline from the eastern province to Yanbu on the Red Sea—was basically built to secure outlets outside of the Gulf, and to lessen the kingdom's dependence on the vulnerable Strait of Hormuz. Yet liftings at the Red Sea must transit the Suez Canal or the Strait of Bab Al-Mandeb, or alternatively be piped through the Sumed pipeline, which links, through Egypt, the Gulf of Suez to the Mediterranean. The Eilat-Ashkelon pipeline in Israel could play a similar role.

The Eilat-Ashkelon oil pipeline got much publicity lately with the United Arab Emirates (UAE) reportedly agreeing with Israel to channel part of its crude from the Red Sea to the Mediterranean through this line. This pipeline was built in 1968 as a joint-venture between Israel and Iran to transport Iranian crude oil to Europe. However, Iran ceased using the pipeline following the 1979 Islamic Revolution, following Israel's subsequent seizure of the pipeline. Recently, in May 2021, rocket fire from Gaza damaged the pipeline.

With this in mind, one could easily conclude the Middle Eastern producers seeking an oil supply security objective has not been met through these pipelines. This is confirmed in an historical record assessment of international oil pipelines (crossing at least one state boundary) in the region up until 2020 (Table 1), which reveals 431 cumulative pipeline years, with some 164 actual pumping years (38 percent). Thus, over their whole lifetime, the international oil pipelines in the Middle East had 267 years (62 percent) of cumulative interrupted pumping.

It is also interesting to note that every international oil pipeline in the region was shut down at least once, and that most of them remain closed until the present time. From a Middle Eastern experience, the vulnerability of an international pipeline is proportionate to the number of borders that it crosses, which clearly results in internal pipelines having fewer problems and difficulties (Abi-Aad & Grenon, 1997).

Table 1.*Security of International Oil Pipelines in the Middle East (End-2020 Status)*

Pipeline	Date of previous and current shut down	Reason	Actual pumping/age (year)
Kirkuk, Iraq-Haifa, Palestine	Since 1948	Arab–Israeli conflict.	16/89
Kirkuk, Iraq-Tripoli, Lebanon	Three days in 1956. June 1972-March 1973. April 1976-December 1981. January and March 1982. Since April 1982.	Conflict over Suez Canal. Nationalization of the line by Iraq and Syria. Disputes over transit fees. Sabotage attacks. Iraqi-Syrian antagonism.	41/87
Kirkuk, Iraq-Banias, Syria	Three days in 1956. June 1972-March 1973. April 1976-February 1979. Closed since April 1982.	Conflict over Suez Canal. Nationalization of the line by Iraq and Syria. Disputes over transit fees. Iraqi-Syrian antagonism.	26/70
Kirkuk, Iraq-Ceyhan, Turkey (IT I)	September-November 1980. 1990-2003.	Iranian air attacks. Conflict over Kuwait and UN embargo against Iraq.	31/44
Kirkuk, Iraq-Ceyhan, Turkey (IT II)	1990-2003	Conflict over Kuwait and UN embargo against Iraq.	21/34
Iraqi pipeline across Saudi Arabia (IPSA)	Closed since August 1990.	Conflict over Kuwait and UN embargo against Iraq.	5/36
Abqaiq, Saudi Arabia-Zahrani, Lebanon (Tapline)	Three days in 1956. Several days in 1969, 1970, 1971, and 1972. May 1970-January 1971. February 1975-September 1990. Closed since September 1990.	Conflict over Suez Canal. Sabotage attacks. Disputes over transit fees Economic reasons, only some pumping to Lebanon and Jordan for local use. Meanwhile the line was attacked by Israel in 1981 and 1982 Conflict over Kuwait and deterioration in Saudi–Jordanian relations	24/71
Total			164/431

Note. Author's calculations.

Supply Security or Political Stability?

Many western analysts (Fattouh, 2007; Luciani, 2011; Mills, 2016) believe that the security of petroleum supplies from the Middle East have tended to have a circumscribed meaning unrelated to its political context. The two wars involving Iraq in the 1980s and early 1990s showed that oil production and export installations were less vulnerable than was often assumed. The experience of these conflicts suggests that overland oil pipeline transportation is more resilient to attack than maritime outlets and sea transportation. Then, because of the diversification of the oil transportation system, and with a few additional pipelines, these analysts believe a stage may be reached where Middle Eastern oil exports would be considered as ‘very safe.’

In fact, only a few oil pipelines appear to have been shut down as a result of military hostilities. Terrorist attacks or air strikes intermittently hit above-ground pipelines as well as pumping stations in the region, which temporarily cut both Saudi and Iraqi lines to the Mediterranean, while only some sections and pumping stations of the Iraqi export system were damaged as a result of military conflict with Kuwait.

“Most of the pipelines crossing state boundaries have fallen victim to the region’s political rivalries and conflicts.”

However, this analysis seems to neglect the main reasons behind the shutdown of many export pipelines in the Middle East: political conflicts persist within producing countries or transit states, and their interstate disputes. In fact, most of the pipelines crossing state boundaries have fallen victim to the region’s political rivalries and conflicts.

The pipelines built to carry oil from Iraq to the Mediterranean coasts help prove this point. The line built before World War II to Haifa (now in Occupied Palestine) was closed permanently in 1948 as a result of the first Arab-Israeli conflict, while lines to Lebanon’s Tripoli and Syria’s Baniyas repeatedly fell (and are still) victim to Iraqi-Syrian antagonism. Recently, the Iraqi pipelines through Turkey were shut down between 1990 and 2003 in the political aftermath of the conflict over Kuwait, while the Iraqi lines through Saudi Arabia have since remained permanently closed.

As a result, although decades of pipeline construction have diversified oil export routes in the Middle East, significantly reducing their vulnerability, the threats of political disruption in producing and/or transit countries remain strongly present. This could be fueled further by many elements of instability in the region, and could well lead to the closure of many pipelines there.

Nevertheless, considering that producing countries in the Middle East sell their wealthy hydrocarbon resources, and that transit fees constitute an important share of the transit countries’ revenues, the risk of permanent or sustained petroleum supply interruption as a result could well be considered as slight, known as ‘the mutual dependency stabilizing factor.’

However, the possibility of short-term (weeks, months, or even years) petroleum supply dislocation or interruption due to governments in the region losing control over one or more of the endogenous pressures along the area is considered to be high. Arab oil embargoes applied in the aftermath of the 1967 and 1973 conflicts with Israel, the international sanctions against Iraq between 1990 and 2003, and the sanctions on Iran's oil exports since the beginning of the new century have further demonstrated the point.

All this leads to confirm that there is no security of petroleum supply from the Middle East without real political stability in the region. Nevertheless, the turbulent history of the area does not promise future stability: if it is not one country it is another, and if it is not one problematic issue it is another. The end-result for Middle Eastern petroleum pipelines is that most of the closed oil pipelines have remained idle, and there is no serious plan, with the single exception of the Iraqi-Jordanian oil pipeline, to build new ones.

In addition to securing stability in the exporting, importing, and transit countries, many issues have to be addressed for petroleum pipelines to operate properly. There is first the issue of transit fees, especially when a link between two countries passes through third territories (transit countries). Those fees, in money or nature terms, could well affect the whole economic feasibility of a pipeline network project.

Another important issue related to the transit of natural gas, crude oil, or petroleum products through pipelines is connected to the agreements and terms of the World Trade Organization (WTO). In fact, each member of the WTO has to give the owner or operator of any pipeline passing through its territories full and free access to its own domestic market, however, for various reasons, not all Middle Eastern countries admit the right to market access.

Gas Pipelines: A Missed Golden Opportunity

Several issues have to be addressed when it comes to gas pipelines in the Middle East². In addition to the critical element of gas price, which needs to be competitive on one hand and well determined on the other, ways to handle the swing nature of gas demand in the area should be decided. Indeed, in this part of the world, demand for electric power (and consequently for natural gas) peaks in summer, when all households maximize their air-conditioning use. There is therefore a huge swing between summer and winter power and gas demand. Options to manage this swing, either by creating storage facilities at the upstream producing end, or at the downstream consuming one, should be evaluated together with their impacts on both the capital and operating costs.

² Naji Abi-Aad, Natural Gas in the Arab World, OAPEC Arab Energy Conference, Amman, May 2006.

There is also the question of “energy independency,” which needs to be addressed. Usually, states do not want to depend on neighboring countries for their fuel supplies. Another related element needs to be taken into consideration: Middle Eastern countries are oil producers and there is a psychological desire among them for self-sufficiency, which promotes a greater willingness to burn more liquid fuels, despite their higher relative and opportunity costs and damaging environmental impacts. In fact, many Middle Eastern countries, proud of their large hydrocarbon reserves (including huge associated gas resources, found, and eventually produced in association with crude oil), find it difficult to “import” gas (or any other energy sources) from anywhere.

Due to difficulties in dealing with these issues, only a few interstate gas-pipelines have been built in the Middle East, most of which have had problems and a troubled life. That also led to the failure in building an ambitious regional grid aimed at pumping gas from gas-rich to gas-poor countries or areas, a project which has been “under discussion” for more than 50 years³.

In fact, only a few scattered gas pipelines have been built in the Middle East. The first interstate gas line in the region was built in 1986, linking the Iraqi fields to Kuwait. This short-lived pipeline has been closed since the Iraqi invasion of its southern Arab neighbor, when it was used to supply water to Iraqi troops. Then, following the construction of a small gas link between Oman and the UAE emirate of Ras Al-Khaimah in the late 1980s, the much larger Dolphin pipeline came on stream in 2007, supplying Qatari gas to the UAE and Oman. Those pipelines were the ultimate result of political compromises and concessions, resulting in generally low prices for the piped gas.

“*The Arab Gas Pipeline (AGP), built 20 years ago, has been linking Egypt to its Arab neighbors, including Jordan, Syria, and Lebanon (through a branch line from Syria), with plans to connect to the European network in Turkey.*”

In the East Mediterranean, a gas pipeline linking Egypt and Israel was first used to channel Egyptian gas to Israel, before reversing its flow to supply Israeli gas to Egypt. On a more regional scale, the Arab Gas Pipeline (AGP), built 20 years ago, has been linking Egypt to its Arab neighbors, including Jordan, Syria, and Lebanon (through a branch line from Syria), with plans to connect to the European network in Turkey.

However, the AGP has had serious difficulties since its inauguration. The pipeline’s problems are mainly due to shortage of gas feedstock from Egypt, at a time when its highly-subsidized local gas demand has left very little resources for export, pushing the country to import gas from its Jewish neighbor. These supply difficulties in Egypt have led Jordan to increasingly (although intermittently)

³ This project was originally conceived and promoted by the Organisation of Arab Petroleum Exporting Countries (OAPEC).

rely on imports of liquefied natural gas. In addition, since the 2011 Syrian civil war, AGP has transformed from a regional network to a gas pipeline linking Egypt to Jordan.

More recently, in September 2021, Cairo announced it would deliver its gas to Lebanon through AGP as a regional response to Lebanon's ongoing fuel and electricity crisis. However, many challenges have to be faced before getting the first drop of Egyptian gas again in Lebanon, including the availability of sufficient gas volumes to be exported from Egypt, the prices to be paid for this gas, Jordan and Syria transit request fees, and the security situation in Syria, through which a long section of the pipeline passes.

Another blow to prospects of considering much more gas pipeline schemes in the Middle East came with the regional development of terminals for importing liquefied natural gas (LNG). In fact, Bahrain, Dubai, Jordan, and Kuwait are already operating LNG import terminals, while Lebanon, Oman, and Saudi Arabia have been seriously considering putting similar facilities in place.

In addition to the problems encountering gas pipelines (transit fees, WTO regulations, political risks, security issues, etc.), the LNG option has been favored over gas pipelines as a result of many factors, including the competitive costs and prices for building the different parts of its chain (liquefaction plants, transport vessels, and regasification units), the perception that LNG prices shall further decrease in the coming few years, and the increasing use of LNG as a way to diversify energy and gas supply sources, and to enhance gas supply security (Al-Attiyah Foundation Research Series, 2017).

To sum up, gas pipeline developers in the Middle East have to take into consideration the new realities of the global gas markets, which now favor LNG over piped gas and the difficulties in dealing with problematic issues gas pipelines encounter in the region. However, policymakers in the Middle East have to always keep in mind the idea of building a regional gas network at the top of their agenda. In fact, such a network increases gas resources available to the regional economy and creates a strong development drive. It also boosts intra-regional trade and acts as an important step towards long-term political co-operation and economic integration.

Appendix

Figure 1.

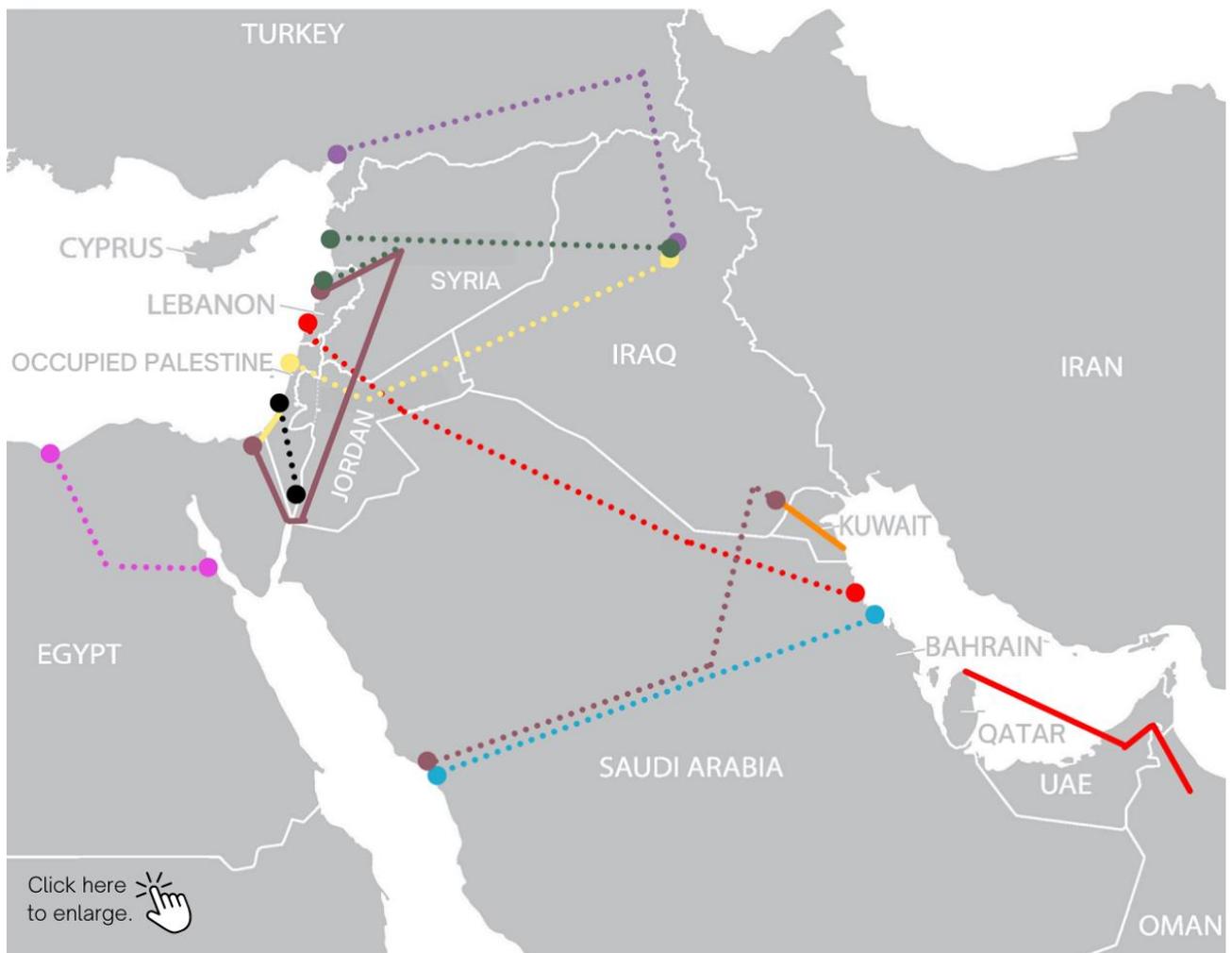
Selected Oil & Gas Pipelines in the Middle East

Oil Pipelines

- Abqaiq (Saudi Arabia)- Zahrani (Lebanon) Tapline
- Kirkuk (Iraq)-Banias (Syria)- Tripoli (Lebanon)
- Kirkuk (Iraq)-Ceyhan (Turkey)
- Kirkuk (Iraq)-Haifa (Palestine)
- Rumaila (Iraq) - Yanbu (Saudi Arabia)
- Eastern Province (Saudi Arabia)- Yanbu (Saudi Arabia) Petroline
- Eilat (Israel)- Ashkelon (Israel)
- Ain Sokhna (Egypt) - Sidi Krir (Egypt) Sumed Pipeline

Gas Pipelines

- North Field (Qatar) - Taweelah (Abu Dhabi)- Sohar (Oman) Dolphin Pipeline
- Arish (Egypt)- Aqaba (Jordan)- Amman (Jordan)- Homs (Syria)- Deir Ammar (Lebanon)- Banias (Syria) Arab Gas Pipeline
- Ashkelon (Israel) - Arish (Egypt)
- Rumeila (Iraq)- Shuaiba (Kuwait)



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About the author

During the past 35 years, Dr. Najj Abi-Aad has built a long career as energy economist and strategist, with a special focus on the Middle East. In 2012, he started acting as COO to Petroleb, an oil company based in Beirut and active in petroleum exploration offshore the East Mediterranean and the Gulf. In addition, Dr. Najj was appointed in 2016 as the Senior Advisor to Tellurian Inc for the Middle East.

Prior to his move to Lebanon, Dr. Abi-Aad was serving for seven years in Qatar, first as Research Advisor for Qatar Petroleum (QP) and its Board of Directors Department, and as Media and Research Strategist in the Office of HE Qatar's Deputy Premier, Minister of Energy & Industry, before being appointed as Senior Advisor to the CEO of Qatar Petroleum International (QPI).

Dr. Abi-Aad studied at the American University of Beirut before been awarded a Ph.D. degree in Energy Economics from Grenoble University in France. During his long years of experience, he has been involved in extensive consultations, conferences and studies, particularly on oil and gas in the Middle East, their resources and supply prospects. He has authored over 100 reports and studies on Middle East energy issues, as well as a book on security of petroleum supply from the region.

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