

Introduction

As global demand for natural gas continues to increase, around the world and within the Middle East, it is crucial that the Middle East regionally integrate in order to reap the positive externalities associated with a stable, integrated exporting market. Long-term terrestrial access to the markets of Africa, Asia and Europe will allow the Arab Gas Pipeline (AGP) to be a vital diplomatic tool for the Middle East. It is important to keep in mind that it is difficult, if not impossible, to divorce economics from politics when examining energy security. This article will focus on the relationship between infrastructure and developing regionalism in the Middle East, especially Egypt and the Mashreq.

Natural gas constituted 47% of the Middle East's primary energy consumption in 2009. Demand is expected to rise due to the clean burning nature of this fossil fuel coupled with its flexibility in use and transport. Not only do natural gas powered generators produce fewer emissions with less particulate matter than other fossil fueled power generation, they also produce less toxic sludge than its counterparts in coal and oil. Gas can also be injected into coal and oil burners to create a fuel mix that provides a more efficient use of coal and oil fuels, with fewer emissions than in burning either exclusively. Natural gas also lends itself to cogeneration, the production of heat and electricity simultaneously, and combined cycle generation, recycling heat waste energy, to increase efficiency. These features provide the incentives to governments and businesses to invest in natural gas.

The increased use of natural gas will lead Middle Eastern nations to cooperate in order to develop secure energy markets. Constructive diplomatic exchange in the Middle East will continue to increase due to improved regional energy security, achieved in part through trans-regional pipelines. This diplomatic exchange will significantly contribute to regional integration in the Middle East. Such integration will graduate progressively from energy security to economic cooperation. Strong economic cooperation will encourage political rapprochement. This article examines the influential role of one such trans-regional pipeline—the Arab Gas Pipeline (AGP)—as it contributes to regional energy security. The AGP's origins are traced, and the obstacles faced by its creation are identified before highlighting the domestic state of affairs in Egypt, Jordan, Syria, Israel, Turkey and Iraq. These domestic markets will cooperate to secure downstream European markets for the export of Middle Eastern natural gas. The present majority of Middle Eastern natural gas originates in Egypt; Syria contributes a small portion, and Iraq is currently developing its fields in order to supplement gas flow through Turkey via the Arab Gas Pipeline and the Nabucco Pipeline. A brief look at inter-state relations in the Middle East in conjunction with the AGP's 'on-stream' data will provide the reader with a clear positive correlation between energy infrastructure and diplomacy.

Origins of the Arab gas pipeline

Egypt's natural gas ventures began in 1995 when foreign and domestic oil and gas companies

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were given permission to actively drill for gas in order to satisfy domestic demand, which stood at 429 billion cubic feet (Bcf) that year. In 1999, the Egyptian government declared that domestic demand had been met and encouraged the search for export markets.

In conjunction with that search, the Integrated Gas Strategy (1999) in Egypt was penned by Mr. Sameh Fahmi, Petroleum Minister. It featured the creation of a 'Master Plan' which should remain valid through 2017. The Master Plan involves price optimization to attract investors, increased gas exports, and infrastructure development, qualified by six considerations:

1. An export ceiling—25% of total production;
2. No foreign or domestic gas operator may export gas from Egypt prior to investing in Egypt's domestic gas market;
3. Special incentives were established to encourage foreign and Egyptian Exploration & Production (E&P) companies to establish marketing franchises, in order to promote gas-based business within Egypt;
4. Incentives were also established to encourage diversification within the gas industry;
5. Exploration & Production (E&P) incentives were aimed to maintain a higher level of attractiveness, when compared with neighboring countries;
6. All businesses within Egypt—whether state-controlled, private, or mixed—were encouraged to convert to natural gas for energy needs.

Within this context, the Arab Gas Pipeline was formed within the framework of bilateral discussions with Jordan in 2001. The original Memorandum of Understanding (MoU) grew to include Syria and Lebanon. A side deal ensured gas supply to Israel, while Turkey and Iraq both subsequently signed deals to cooperate in this regional project. The 1,200-kilometre, 36-inch diameter AGP currently exports mainly Egyptian natural gas. It is divided into four segments. The first, from Arish to Aqaba in Egypt was completed in 2003; the Aqaba-Amman, Jordan-El Rehab, Jordan section in 2006; the El Rehab, Jordan – Damascus, Syria – Hims, Syria section in 2008; and the Hims, Syria – Tripoli, Lebanon leg was completed in 2009. The Arish – Ashkelon, Israel extension of the AGP pipeline was completed in 2008.

The AGP delivered its first 12 billion cubic feet (Bcf) of Egyptian natural gas to Jordan in 2003. Since then Egypt's total exports of natural gas have risen to 598 Bcf in 2008 with the completion of further extensions to the pipeline along with the completion of LNG infrastructure.

Obstacles faced by the AGP

There were several common challenges and barriers to investment faced during the genesis of the AGP project including those that may be classified as market, regulatory, technical, and political in nature. Market risks faced by investors included the lengthy repayment period on investments, the volatility of multiple economies, the lack of an international market price driver for natural gas, and the detrimental effects of global events such as 9/11. Regulatory risks included the over-regulation of energy sectors in the Middle East and the lack of an internationally-binding legal framework. Environmental as well as engineering issues provided

further challenges to the inception of the project, already set in a region known for its political tensions.

Gas demand of original members

EGYPT

Energy subsidies provided by the government defy logic and contribute to the instability of Egypt's domestic supply. An example of such instability was demonstrated by the blackouts (electricity failures) during the month of Ramadan in 2010. As a result of subsidy-induced low prices, natural gas supplies were drained by thermal power plants (generating electricity), and domestic demand could not be met. Until Egypt allows prices to be regulated by the market, its domestic market will continue to face such shortages. Adjusting the volumes set aside for domestic consumption may be necessary, but before such measures are taken the market must be deregulated to allow for the most accurate assessment of domestic energy needs. Currently, thermal power plants in Egypt have switched from oil to natural gas and consume 65% of Egypt's total domestic natural gas supplies. It is also important to adhere to the export ceiling set by the Master Plan (1999) at 25% of total production.

Since 1994, proven Egyptian reserves have increased 400% from 19.2 trillion cubic feet (Tcf) to 77.20 Tcf in 2009; the production of natural gas has risen 350% from 549 billion cubic feet (Bcf) in 1995 to 1,935 Bcf in 2008; the consumption of natural gas has risen 260% from 423 Bcf in 1995 to 1,108 Bcf in 2008; and exports of natural gas have risen from 0 Bcf in 1995 to 598 Bcf in 2008.

JORDAN

Jordan lacks significant fossil fuel resources and therefore relies heavily on imports. While continuing to search for investors to explore for greater reserves, Jordan transformed its electric power plants to run on natural gas rather than diesel in 2003. This swell in consumption can clearly be seen as consumption figures jumped from 11 Bcf in 2002 to 105 Bcf in 2008. Looking to the future, Jordan has signed a US\$3 billion, '20 year national energy development plan' which will deregulate its energy sector along with removing fuel subsidies.

SYRIA

While pursuing potential investors to develop its own gas fields, Syria has imported natural gas from Egypt through the AGP since 2008. Syria's proven reserves have stalled at 9 Tcf since 1999 while its production and consumption steadily increased from 134 Bcf in 1994 to 208 Bcf in 2008 and 134 Bcf in 2002 to 213 Bcf in 2008, respectively. Similar to its neighbors' policies, Syria has been attempting to shift domestic energy consumption from petroleum to natural gas to 'free up' oil for export. While exploration continues, the ability to tap into the permanent

infrastructure of the AGP will provide Syria a platform for stable development.

LEBANON

Lebanon was operationally linked to the AGP in late 2009 and was promised approximately 32 million cubic feet (Mcf) per day. However, Egyptian and Syrian shortages of domestic supplies may hamper the fulfillment of that promise. Lebanon has no significant fossil fuel reserves to power its economy. Although natural gas demand during the mid-2000s was very low, Lebanon is currently in the process of converting its power plants from petroleum-based liquids to run on natural gas. Regionally, Lebanon holds a very critical geopolitical position, in large part due to the border it shares with Israel as well as due to the presence of Hezbollah.

Gas supply

EGYPT

Egyptian proven reserves in 1995 stood at 25.20 Tcf. In August 2001, Egypt Natural Gas Holding Company (EGAS) was incorporated as a state-owned entity. While many sectors of Egypt's economy have been deregulated since the 1990s, the energy sector remains under tight control with price ceilings and floors in place. Despite controls, foreign companies do have a presence in both the upstream and downstream sectors of natural gas in Egypt.

Recent discoveries of additional reserves [5 Tcf] by BP and RWE Dea were announced in July 2010 and valued at US\$9 billion. It is projected that the five offshore gas fields will supply 1 billion cubic feet per day (bcf/d) with a target on-stream date of 2014. These discoveries have revealed a willingness to de-regulate (ever so slightly) by the Egyptian government. Rather than taking a %age of total production as Egypt has done in past agreements with foreign companies, BP and RWE Dea will sell the gas to EGAS.

SYRIA

With political tensions stemming from Syria's leadership, attracting investors has proven difficult though not impossible. In 2006, US-based Marathon Oil Corporation signed a gas (and oil) exploration deal with Syria. However, political tensions with the US and the speculation of sanctions caused Marathon Oil to sell its shares to Petro-Canada only months later. The estimates for the fields of Al Shae'r and Al Sharyfa stand at 80 million cubic feet per day (Mcf/d) with reserves of about 500 Bcf. Petro-Canada has stated 2010 as 'target on-stream date' for bringing this gas on-line. Currently, Syria exports small amounts of gas to Lebanon.

Further connections

ISRAEL

Rising Israeli demand for natural gas may be what the region needs to provide a strong incentive towards regional integration for both Israelis and its Arab neighbors. With steadily

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increasing production and consumption, Israel may literally be sitting upon a very powerful tool in terms of regional reconciliation. Israel currently supplies about half of its domestic natural gas consumption while fueling the other half through the Arish-Ashkelon pipeline. With a capacity of 335 million cubic feet per year (Mcf/y), this pipeline stretches 100 kilometers under the Mediterranean Sea to connect Israel to the AGP. The pipeline was constructed and is operated by the East Mediterranean Gas Company (EMG). EMG is a multinational gas company and a joint effort of the Egyptian General Petroleum Corporation (EGPC) with 68.4% of shares, Merhav, an Israeli company with 25% of total shares, and the Ampal-American Israel Corporation with the remaining 6.6% of shares. The MoU signed between Egypt and Israel promised 63.45 Mcf/y, however this has since been increased to 78.65 Mcf/y through 2028. The original agreement sold the natural gas to the Israel Electric Corporation (IEC). In late 2009, EMG signed deals promising an additional 74.65 Mcf/y to private companies in Israel. IEC, on its corporate website, has predicted annual consumption will rise gradually until it plateaus at 223 Mcf annually.

TURKEY

Turkey plays the role of infrastructure-hub between Africa (Egypt), the Middle East, Europe and the Caspian Sea region. With the recently-signed MoU between Egypt and Turkey, the AGP will supply 100-400 million metric cubic feet per day (Mmcf/d) to Turkey along with 203-608 Mmcf/d to Eastern Europe, most likely by connecting to existing or developing pipelines such as the Nabucco Pipeline. The actual data is predicted to run at the low end of these promised volumes until recently discovered offshore fields come on-stream. Supplies may also be supplemented from other fields such as those in the Arabian Gulf and Iraq. This monumental agreement will no doubt be heralded by both the Egyptians and the Turks. The Middle East's regional energy security will be strengthened significantly if Middle Eastern gas gains access to the European market. Such is the vital importance of developing permanent infrastructure to encourage long-term multi-regional energy security.

Turkey is motivated to participate in the AGP and Nabucco projects because it lacks any major proven reserves of natural gas (0.3 Tcf in 2009) and has very high consumption rates (1,238 Bcf in 2009). Turkey's economy will experience many positive externalities associated with pipeline construction and usage because it operates within a deregulated national energy sector.

Technical progress

The major stakeholders in the Arab Gas Pipeline are: EGAS (Egyptian Natural Gas Holding Company) of Egypt, ENPPI (Engineering for the Petroleum and Process Industries) of Egypt, PETROJET (The Petroleum Projects and Technical Consultations Company) of Egypt, GASCO (Egyptian Natural Gas Company) of Egypt and SPC (Syrian Petroleum Company) of Syria. Other subsidiaries and companies with smaller shares come from the United States, Britain, Germany, Canada, and Russia.

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Supply will continue from Egypt, with newly discovered offshore fields supplementing for the added demand. Additional supply may come from Iraq in conjunction with the pending links to the European Nabucco pipeline project. Arabian Gulf states are also developing extensive pipeline networks which may serve to satisfy rising demand as well. The projected maximum capacity of the AGP, including the completed extension to Turkey, will stand at 970 Mcf/d. In tandem with anticipating and urging the expansion of the AGP, connected countries will need to develop and/or streamline domestic infrastructure within a deregulated economic atmosphere in order to reap the greatest benefits from participation in the AGP project.

During 2008, Egypt was producing approximately 1.9 Trillion cubic feet (Tcf) while consuming 1.1 Tcf. Egypt possesses the third highest estimated natural gas reserves in Africa at 58.5 Tcf, after Nigeria (185 Tcf) and Algeria (159 Tcf). In 2009, Egypt exported 646 Billion cubic feet (Bcf) or about 1.77 Bcf/d, 30% of which (about 193.8 Bcf/y or about 530 Mmcf/d) flowed through the AGP. As with LNG infrastructure, the Arab Gas Pipeline allows Egypt to continually secure markets for its natural gas export to its neighbors of the Middle East as it eyes the markets of Europe.

Outlook

Within the domestic markets of the Middle East, heavy investment in infrastructure for distribution networks is needed to ensure not only that supply reaches consumers but that it is regulated for residential consumers as well. Without secure domestic infrastructure and sound domestic resource management they will not experience the full potential of positive externalities.

The AGP has also courted connections with other exporters and importers of natural gas. The exporting pipelines of Iraq [a deal signed in 2004 in tandem with Turkey], the possibility of supplying the 3,300-km European Nabucco pipeline project, and the future prospect of linking to the exports of Dolphin Gas pipelines in Qatar and the United Arab Emirates will allow the Middle East region to target European natural gas markets as a stable and united net exporter. Working towards such levels of integrated regional cooperation signals that energy security may be the beginning of sustainable regional stability in the Middle East.

IRAQ

Despite possessing the 10th largest natural gas reserves in the world, standing at 11.2 Tcf as of January 2010, Iraq's natural gas sector has yet to recover from the 1991 Gulf War. Both Iraq's oil and gas sectors have suffered from a lack of investment in both technology and maintenance of infrastructure. However, there are several companies, including Royal Dutch Shell, Mitsubishi, South Gas Company, and others, which are working to reinvigorate the sector with the cooperation of the central government.

Currently, Iraq is looking to export gas through Turkey to the Nabucco pipeline or through the Arab Gas Pipeline through Syria, Lebanon, Turkey and eventually on to Europe. A 2009 US\$8 billion deal to export gas from the semi-autonomous Kurdistan Regional Government to Central

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Europe was called off after the central government and the state oil marketing organization in Baghdad declared it illegal. The fate of these deals depends upon domestic organization and investment procured for the oil and gas industries in Iraq. Amongst other challenges, the companies operating out of Iraq face gas flares and the high cost of updating internal and external infrastructure. That said, integrating Iraqi gas supply into regional pipelines would provide an incentive for consumers in neighboring countries and companies within Iraq itself to invest in Iraq's energy sector. Cooperation beginning on this level would significantly stabilize Iraq, and therefore the region.

Nabucco pipeline

The Nabucco pipeline is the key to linking the Arab Gas Pipeline project and Middle Eastern gas to the European markets. One positive externality gained from access to European markets is the injection of foreign currency into the domestic economies of the Middle East. Foreign currency availability will spur job creation, which will further inject spending power into the economy, creating greater self-perpetuating stability for both local and regional economies. Currently, pipeline construction is set to begin in 2011. According to the official Nabucco website, 'It will directly connect the world's richest gas regions—the Caspian region and the Middle East—to the European consumer markets. The pipeline will link the Eastern border of Turkey to Baumgarten in Austria—one of the most important gas turntables in Central Europe—via Bulgaria, Romania and Hungary.'

A diplomatic tool

The best example of the Arab Gas Pipeline as a diplomatic tool to date is the formation of the Close Neighbors Economic and Trade Partnership Council (CNETAC), a multi-lateral (regional) free trade agreement. Although also in its infancy, CNETAC provides definitive evidence of developing regional cooperation.

On June 10th, 2010 four of the five nations attached to the AGP (Turkey, Jordan, Syria and Lebanon) signed the CNETAC free trade agreement with the aims to 'strengthen existing cooperation, develop long-term strategic partnership and solidarity, and further improve economic integration'. The first committee meeting was held in September 2010 in Amman, Jordan to sketch-out a roadmap of aims prior to the first ministerial meeting planned for Damascus, Syria in December 2010.

This step towards regional integration supports the hypothesis that energy infrastructure is an

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integrative diplomatic tool whose potential should be fully realized by all nations involved. Turkish Foreign Trade Minister Zafer Çağlayan wrote in an official statement. "With this close cooperation, our goal is to increase and diversify trade and investments among the four countries by creating a liberal trade and investment environment with *a modern infrastructure at the international level*

free from all tariff and non-tariff barriers, encompassing a geography feeding a population of 105 million and, as of 2009, having a combined gross domestic product [GDP] of \$723 billion with imports amounting to \$176 billion and exports to \$131 billion." (Italics inserted by author)

Rapprochement

There has been significant bilateral rapprochement between nations participating in the Arab Gas Pipeline project, namely between Syria and Lebanon, Syria and Turkey and Israel and its neighbors. In the case of Israeli regional integration, its increasing dependence on natural gas as a power generator has given added incentive to Israel to cooperate with its neighbors, mainly Egypt. The natural gas flowing from Arish, Egypt to Ashkelon, Israel has helped ease tensions between Egypt and Israel. One example stems from Egyptian parliamentary resistance to exporting energy to Israel. Service was interrupted in 2008, but because the investments were already made and the physical infrastructure was ready to be utilized, Egypt's highest administration court overturned this ban, citing good business practices, and the export of natural gas to Israel was resumed in the same year amidst sharp opposition from the parliament.

Conclusion

There is a nascent correlation between the Arab Gas Pipeline as a diplomatic tool and rapprochement of regional countries in the Middle East. This correlation can be explained by the fact that more secure energy infrastructure, such as the AGP, causes demand for natural gas to increase, which in turn creates jobs and stronger economies. These stronger economies will be in a position to produce strong political bureaucracies which will serve to spur further investment into the region. Some risks discussed include a lack of binding regulatory bodies and institutional regulatory cooperation across state lines. Such frameworks, which have begun and continue to develop, will increase investor confidence in the region.

Through greater regional stability and integration, the Middle East will position itself to capitalize on access to foreign markets, especially in Europe through the proposed Nabucco pipeline. As Europeans fret a lack of diversification in gas supply routes, the AGP now has perfect timing for Middle Eastern gas to walk through an open door. However, while the diplomatic weight of regional energy security is certainly heavy, cooperation on this level is not enough on its own to fully ease tensions in the region. That said, the Arab Gas Pipeline is a promising example of a diplomatic platform for regional cooperation on which agreements such as CNETAC have already been advanced.

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