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John Szabó

EU-IRAN NATURAL GAS COOPERATION POTENTIAL

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Author:

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John Szabó[1]

The Islamic Republic of Iran has taken the spotlight in terms of global affairs, as the P5+1 powers aim to finalize a deal regarding its nuclear program by the end of June 2015. Subsequently to the scaling back and enabling international monitors to observe its nuclear activities, sanctions imposed by the international community will be lifted. Agreeing on the terms of a deal would put an end to Iran's isolation from the global economy, providing it the opportunity to export an increased volume of its hydrocarbons. This could potentially lead to an EU-Iran cooperation regarding natural gas trade. (Katzman, 2015)

Implications of lifting sanctions for the Iranian oil and gas industry

Until a final deal has been concluded, details regarding the lifting of sanctions will most likely remain to be unclear. This point, embedded in the framework, causes issues between the negotiating parties, because Iran has voiced that when a deal was reached, all imposed sanctions on behalf of the international community be lifted imminently. The implementation of this seems unlikely, as P5+1 powers, would like to gain assurance through monitoring activities that Iran has kept its part of the deal; this would suggest a minimum of a 2-6 month lag in lifting nuclear-related sanctions, from the signing of an agreement. According to the framework reached in Lausanne in early 2015, sanctions imposed on the energy sector would be lifted, furthermore IOCs would also be able to once again enter the Iranian market. (EEAS, 2015) (Northam, 2015)

[1] student, Corvinus University of Budapest

Iranian natural gas potential

A jump in Iran's natural gas exports is not solely dependent on market access. Domestic consumption is high, even wasteful and ramping up production is also of essence. According to (OPEC, 2014) gas reserves amount to approximately 34 tcm, with production rates in 2013 reaching 228 bcm, of which a large portion is reinjected into oil wells to boost production. (BP, 2014) states that natural gas production, excluded volumes recycled or flared, amounted to 166.6 bcm in 2013 and consumption levels reached 162.2 bcm. This balance points towards small exports, which added up to a mere 9.4 bcm in 2013 (BP, 2014), a result of three decisive factors (1) high domestic consumption rates, (2) the lack of adequate production up until 2013 and (3) underdeveloped infrastructure to neighbouring countries[2].

TPES[3] in Iran consists of oil and gas, of which the latter has been under pressure; supplies have not been sufficient in the northern parts of the country during the winter[4], additionally the volumes of gas reinjected into oil fields to boost oil production are also expected to increase, from already high levels. The solution to meeting domestic demand would be the further implementation of energy efficiency measures and conservation policies, alongside the framework set in the Iranian targeted subsidy plan being met.

With the 2nd largest reserves in the world at Iran's disposal, in a scenario where demand is met through energy efficiency measures and the new phases of the South Pars field are inaugurated, a growing surplus can be achieved. This process can be sped up with the involvement of IOCs, which amongst other positive impacts, can help in bridging mismanagement issues present in the sector. If a surplus is achieved, a potential export strategy can even be discussed, although political obstacles must be overcome, e.g. the Iranian Revolutionary Guard Corps (IRGC), a paramilitary organization, has a decisive role in controlling hydrocarbon resources. The IRGC has acclaimed a large influence in the Iranian oil and gas sector with its personnel heavily intertwined with that of the Ministry of Petroleum, which controls state-owned oil and gas firms, such as the National Iranian Gas Company (NIGC), responsible, through its

[2] Turkey being an exception.
[3] Total Primary Energy Supply
[4] This looks to change with the development of phases 12 and 15-18 of the South Pars gas field in the upcoming years, resulting in additional volumes of approximately 70 bcm/a by 2018. The current gas deficit has been met via imports from Turkmenistan, amounting to 4.7 bcm in 2013. (BMI, 2014)

subsidiaries, for a dominant portion of Iranian gas production. IRGC will most likely be hesitant in allowing IOCs to become involved in the development of Iran's gas fields, as they pose a direct threat to its existing market share. (Unver, 2015) (Mohamedi, n.d.)

To increase IOCs interest towards Iran, not only must sanctions be lifted, but a reform in regulations and the introduction of an attractive fiscal regime would also be of key importance, as circumstances were not favourable even in a US$ 100+ oil price scenario. According to the Iranian Ministry of Petroleum, the oil and gas industry would require US$ 200 billion of investment. (Carter, 2014) To overcome the arising issue, a new production contract model will be introduced, the *Iran Petroleum Contract*, offering higher fees for projects with higher risks. Parallel to adapting a new contractual framework, the second phase of the Iranian subsidy reform plan should also be fully implemented. This would decrease wasteful use of hydrocarbons, leading to increasing the availability of additional volumes for exportation, ultimately boosting government revenues. (BMI, 2015)

The South pars gas field plays a central role in production as it holds approximately 40% of Iran's natural gas reserves. The project is to consist of 24 phases, of which phases 1 through 10 are producing at maximum capacity; phase 12 is planned to ramp up to maximum production (30 bcm/a) by 2016/2017, whilst some of the remaining phases are heavily dependent on the outcome of the ongoing negotiations and, thus the potential involvement of IOCs. Other recent, large discoveries include the Khayyam and Madar fields, which add up to nearly 700 bcm[5] of natural gas reserves. Continuous findings and developments, exploited in spite of sanctions being in place, underline the production potential Iran holds. (EIA, 2014) (Carter, 2014) (Stevens, 2015) (BMI, 2015) (Jalilvand, 2013) (Sadeghi-Boroujerdi, 2012)

Natural gas exports

Despite its vast reserves, Iran's natural gas trade only amounts to 2% of global trade, this looks to be increased at least fivefold, as a part of the *Iran Strategic Development Plan*, to 10% by 2025. To facilitate this, the National Iranian Gas Company (NIGC) has been ordered to expand the length of natural gas pipelines from 2012's 30,000 km to

[5] Estimate based on (LNG World News, 2011) (Gas and Oil, 2011) and (BMI, 2015).

70,000 km. (Fallahnejad, 2013) As a part of this initiative the Iranian Gas Trunkline (IGAT) will be developed, which is a pipeline network running throughout Iran, set to consist of IGAT-1 through IGAT-9 when ongoing construction is completed. (POGC, 2015) (EIA, 2014)

Source: (Google Maps, 2015) (BMI, 2015) & (Shah, 2015) Edited by: John Jr. Szabó

Current exports are dominantly aimed at Turkey through the Tabriz-Ankara pipeline, which has a maximum capacity of 12-12.5 bcm/a, set to be increased to 14-14.5 bcm/a and with the completion of IGAT-9 this can rise to 35 bcm/a. Small volumes are also exported to Armenia, Azerbaijan and Turkmenistan, cooperation with the latter is based on the mutual trade of gas, as Iran also imports from them, to northern remote areas of the country. In the case of Azerbaijan, the two states have a gas swap deal in place.

The Iran-Iraq pipeline, a recently constructed piece of infrastructure, enabling Iranian gas exportation, is currently undergoing tests and is planned to come onstream with

volumes of approximately 9.6 bcm/a in the near future, gradually increasing to 14.6 bcm/a. (BMI, 2015)

Pakistan is facing an energy-crisis due to a 6-7 GW electricity supply deficit in 2012, in addition to heavy reliance on the importation of crude oils. Natural gas also plays a central role in Pakistan's TPES, although the lack of infrastructure disables additional purchases from abroad; to overcome this, the long-thwarted Iran-Pakistan pipeline looks to ease growing pressure on Islamabad. The project has been stalled for years, due to the lack of sufficient financing and US opposition, however has recently moved forward with Beijing pledging US$ 2 bn for the construction of the pipeline, with a planned initial capacity of 7.8 bcm/a. (BMI, 2015) (Shah, 2015)

India, a country also struggling with insufficient domestic energy supplies, has also looked to import natural gas from Iran, but has backed out of a decision due to international sanctions. With the outlook of these being lifted, Iran looks to rekindle the IPI (Iran-Pakistan-India pipeline) and has also proposed an offshore Iran-India pipeline. China has shown interest in Iran's resources, albeit its shale gas potential and agreement with Russia on the Power of Siberia will most likely offset cooperation in the short- and mid-term. Oman has looked to import natural gas from Iran, through a planned 10 bcm/a pipeline, regarding which an MOU was signed in 2013. This has not seen progress since, even though an underlying motive to achieve progress would be Iran's potential use of Oman's LNG terminal liquefaction capacities, allowing access to lucrative international LNG markets.

Iran has also long-lobbied to partake in the European market, to do so, the Persian Pipeline, transiting natural gas from the Pars field through Turkey, Greece and Italy to Central Europe, was proposed. The project, aimed at delivering 37-40 bcm/a was seen as a rival to Nabucco, which has since been cancelled. The Persian pipeline has not seen progress for years, primarily due to the sanctions imposed by the EU.

Alongside aforementioned cooperation, Iran has formerly signed numerous other MOUs, with Switzerland, Syria, Kuwait, Bahrain and UAE. (BMI, 2015)

Through questionnaires and the analysis of received data (Fallahnejad, 2013) has pointed out the primary causes of delays natural gas pipeline infrastructure construction, the ten most frequent reasons being: "*imported materials, unrealistic*

project duration, client-related materials, land expropriation, change orders, contractor selection methods, payment to contractor, obtaining permits, suppliers, and contractor's cash flow." (Fallahnejad, 2013, p. 143) *Findings show that regardless of the NIGC being backed by the Oil Ministry, financing remains to be insufficient, alongside the procurement of materials hindering progress. These issues can be overcome with the lifting of bans, which would enable potential financing and through the involvement of IOCs, the availability of necessary materials.*

LNG

Iran has envisioned LNG exports to gradually increase with the development of liquefaction terminals. This has been hampered, as western firms pulled out of the country ridding Iran of the necessary technology. As a direct result, the development of the only LNG terminal in the country located at Tombak Port has been stalled. Consequently Iran has opted to expand its natural gas exports via pipelines. (BMI, 2015) (Jalilvand, 2013) This may be set to change, with Iranian Petroleum Minister Bijan Namdar Zanganeh stating: "I don't rule out a pipeline but there are so many transport problems, legal issues and fees...That wouldn't be our choice in the first instance." (IRNA, 2015) This suggests that with the lifting of sanctions and with the involvement of IOCs, Iran would look to establish and grow its LNG capacities, allowing it more flexibility regarding the choice of destinations, whilst reducing transport related risks.

European energy-security

By involving additional suppliers of natural gas, the Juncker Commission would be able to achieve progress towards the voiced goal of ensuring energy-security in the EU. The ambitious initiative of forming an Energy Union, amongst other measures requires cross-border and domestic infrastructure developments, alongside the diversification of import sources. Determining and potentially constructing Projects of Common Interest (PCI) looks to ensure the former, whilst EC delegations have set out to initiate negotiations with potential natural gas suppliers, amongst which is Iran.

The relevance of such actions, in a context of European OECD gas consumption only estimated to increase at an annual rate of 0.6% until 2030 (IEA, 2014), is the EU's overreliance on Russian energy resources, i.e. a 30.7% of natural gas imports originate from the Russia Federation in 2013, with some European countries solely reliant on Russian gas. (Eurostat, 2015) This poses a large risk, as EU-Russia relations have deterred following the annexation of Crimea and Russia's involvement in the destabilization of eastern Ukraine, a result of which is that the EC looks to decrease Russian natural gas imports by 25% until 2020. (EC, 2015) (IEA, 2014) (Gloystein, 2014) (Dickel, Hassanzadeh, Henderson, Honoré, El-Katiri, Pirani, Rogers, Stern and Yafimava, 2014) (Gaub, 2014)

Competition looking to fill the void left by Russian gas is fierce; those connected to the European gas network, i.e. Algeria and Libya are at a seemingly advantageous point, albeit ongoing conflicts in Libya have offset production growth, whilst high levels of domestic gas consumption, postponement of new field developments and the increasing amounts of gas reinjected into wells to enhance oil recovery have all hindered Algerian export potential; these factors have and will most likely remain to disable additional North African gas exports to Europe. Meanwhile, Norway's Foreign Minister Borge Brande stated that, albeit already supplying one fifth of European gas, Norwegian exports could be increased in the future. (RFE/RL, 2015)

The EC also looks to develop a comprehensive LNG strategy in Europe, which is a great tool to ensure supply-security and add leverage when negotiating long-term prices. However, the high demand and the high prices present in the Asian markets would point towards LNG utilization rates not increasing substantially at this point. (EC, 2015) (BP, 2014)

Infrastructure to Europe

Taking the aforementioned into account it becomes clear, how a successful conclusion of ongoing nuclear talks with Iran can carry the opportunity to enhance the EU's security of energy supplies, by establishing an EU-Iran cooperation in terms of natural gas. For this to happen, following the implementation of necessary changes in the Iranian market, i.e. modifying the fiscal regime, involving IOCs and cutting hydrocarbon

subsidies, the necessary political will is needed to negotiate supply-contracts and making the long-term commitment of joint cooperation. Parallel to such actions, the development of infrastructure is of essence; three pipelines towards the EU must be considered at this point.

Expanding Iran's current pipeline capacity towards Turkey and extending its reach to Greece may be one option. Constructing IGAT-9 will be a central role in creating this channel.

Secondly, the formerly proposed Persian Pipeline, which has not been officially cancelled nor seen progress, may be revisited. Delivering gas from Iran to the EU via Turkey was in-line with Iran's intentions communicated, following its exit from the Nabucco project, when it shifted focus towards the Persian Pipeline. A planned pipeline having the benefit of solely carrying Iranian gas. An alternative proposed route for this project has been through Iraq and Syria, with an offshore section being constructed under the Mediterranean to southern Italy. Avoiding overreliance on exports through Turkey, would result in additional risks of running supplies through areas that are directly exposed to threats posed by ISIS; considering the current geopolitical landscape this route option seems highly unlikely. (BMI, 2015)

Thirdly, Iran may look to gain access to the European market through the successor of Nabucco, TANAP-TAP. Due to political circumstances, i.e. the EU imposing sanctions and the USA threatening to withdraw backing of the project if Iran was involved, Iran was initially excluded from Nabucco, a pipeline aimed at delivering natural gas from Azerbaijan to Europe, prior to its cancellation in mid-2013. The project was scrapped, as the Shah-Deniz Consortium, its primary supplier of gas, voted in favour of another route through Turkey, Greece and Albania to Italy. An FID[6] has been made for this alternative, which is to consist of the Trans-Anatolian Natural Gas Pipeline (TANAP) and Trans-Adriatic Pipeline (TAP); required investment is estimated to reach US$ 45 billion, when the development of the Shah-Deniz 2 gas fields, the Sangachal natural gas processing plant and the pipelines are included (TAP, 2015), when looking at the TAP pipeline alone, initial costs were estimated to amount to US$ 5 billion, although exact figures have not surfaced despite the project's progress. (Del Sole, 2013) The pipeline was

[6] Final Investment Decision

granted Third Party Access (TPA) exemption status in 2013 by the EC, enabling the initial capacities of 10 bcm/a to be contracted for up to 25 years, by Shah Deniz gas field productions in Azerbaijan. (TAP-AG, 2013)

Construction began in the March of 2015, with completion planned by 2018[7], with an initial capacity of 10 bcm/a, gradually increasing to 20 bcm/a by the mid-2020s. This piece of infrastructure is ground-breaking as it would enable gas-rich countries, such as Azerbaijan or Turkmenistan to gain direct access to the European market. (TAP, 2015) Consequently a recent announcement by Turkey's Energy Minister, Taner Yildiz, suggested that, if sanctions were lifted, Iran would be considered to become a shareholder of the TANAP-TAP pipeline, allowing it access to a huge market seeking alternative sources of natural gas imports, opening up new horizons for EU-Iran cooperation. (Gurbanov, 2015) (Sputnik, 2015)

Of the three projects, only TANAP-TAP has received FID and is likely to be built, alongside which IGAT-9 will see progress. The participation of Iran in TANAP-TAP would grant it the best option to see progress in increasing exports towards Europe; however if it were to implement a similar approach following its exit Nabucco, when Iran opted to develop a project non-reliant on other suppliers, difficulties may occur in negotiations of details and would likely push its market access by many years.

Historical experience

The influence of Russia should not be overlooked when assessing gas exports to the EU, Russia's largest gas export market by revenue. Iran and Russia have adapted a seemingly pragmatic approach to one-another regarding bilateral economic and political relations, regardless of historic ties being cold. Russia has looked to move the nuclear negotiations forward, but the Kremlin will most likely exercise pressure on Tehran, when Iranian gas exports pose a direct threat to Russian market share. (Tashjian, 2012) (Gurbanov, 2015a)

The reliability and consistency of supplies from Iran to Europe is also a point of concern. Based on experience from deliveries to Turkey, where numerous hiccups have

[7] Considering the scale of the project, delays would not be of surprise.

occurred since the completion of the Tabriz-Ankara pipeline in 2001. Albeit a strong initiative on both sides to ensure a good bilateral relation, disputes regarding natural gas have been ongoing. Turkey's lack of demand, Iran's shortcomings in supplies during the winter, pricing, as well as terrorist attacks have all hindered supplies. (Kinnander, 2010)

Conclusion

A positive outcome of the P5+1-Iran negotiations, paired with creating a more attractive fiscal regime will gradually lead to IOCs showing a strong interest in Iran's enormous hydrocarbon reserves. Moreover, the continued implementation of the Iranian subsidy reform, ramping up production and construction of both domestic and cross-border infrastructure can not only solve domestic shortages at a quicker pace, but will also allow Iran to export an increased volume of natural gas. Seeing how projects have progressed in the past, it is unlikely that major developments regarding exportation are to occur prior to 2020, even if negotiations are concluded in mid-2015 and IOCs enter the market in 2016.

Export routes from Iran are beginning to come in place, as domestic infrastructure, i.e. IGAT, is being expanded and will enable a growing quantity of gas to flow through the country. Ramping up phases of 12 and 15-18 of the South Pars gas field should result in a surplus of Iranian gas. This can enhance exports, through e.g. the increasing the utilization of the Iran-Iraq pipeline or developing infrastructure to other countries, with which MOUs have been signed. Seeing how Minister Zangeneh envisions supplies to Europe being through the form of LNG, developing domestic LNG terminals and possibly ensuring access to Oman's facilities can be of essence. The construction of pipelines, which has moved forward at a slow pace, as sufficient financing and necessary materials are not available, can be sped up with the involvement of IOCs in the future. Of the projects proposed, numerous options can be investigated and can potentially come onstream in the upcoming decades. Increasing supplies to Turkey via the IGAT-9, or the Iran-Pakistan pipeline hold potential, albeit the latter's value has somewhat decreased as India is not involved, when compared to the original Peace Pipeline initiative.

The completion of TAP-TANAP set for 2018 will be the first major step in insuring that the region has direct access to European markets. It seems unlikely that Iran will be able to participate in its first phase, primarily, because it seems unlikely that it can develop a substantial gas surplus prior to 2020, moreover without becoming a shareholder in TAP, a project which has been granted TPA exemption status, capacities will remain to be allocated to Azerbaijani gas; however with potential expansion of the pipeline by the mid-2020s to nearly twice its initial capacity, it is quite possible, that either by becoming a shareholder of the project or by purchasing transit capacities, it may have a channel to deliver gas to Europe. Although, seeing that even in a context when political cooperation between Iran and Turkey was heavily accentuated, natural gas deliveries still faced numerous setbacks, it is debatable if Iran will be able to prevail as a reliable supplier. The stakes are high, with infrastructure developments amounting to tens of billions of dollars, pointing towards the necessity of strong trust being built between the parties engaged.

Preliminary measures to facilitate a potential EU-Iran gas related cooperation are being developed, with Iran looking to resolve its domestic supply issues and ramping up exports. Infrastructure has also received the necessary attention and will remain to do so, although numerous hurdles still must be bridged if nuclear discussions are concluded with a deal. The planning of potential channels through which gas can be transited has begun and numerous options are available, from which an involvement in the second phase of TANAP-TAP, increasing supplies through Turkey and additional LNG exports to Europe seem to be the most likely and viable options. The timeframe for these is dependent on numerous factors, albeit at this point it seems unlikely for the EU to hope for Iranian gas prior to 2025-2030.

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