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## THE CROSS-BORDER GAS PIPELINES AND ENERGY SECURITY: THE CASE OF IRAN

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*Today, one of the dimensions of national security is energy security. Due to its huge gas resources and its superior strategic location, Iran has a high capacity to ensure its energy security through cross-border gas pipelines. Iran, as an exporter, importer and transit country for gas through cross-border pipelines, faces challenges. The main purpose of this research is to identify these challenges and provide solutions to them. Findings of this study show Iran's main challenges in the field of gas export, import and transit are security of demand, security of supply and security of supply-demand, respectively. To address the demand security challenge of, Iran needs to attract investment and transfer of technical knowledge, enhance readiness to supply in urgent conditions and reduce international disputes over gas supply. Increasing of energy efficiency, enhancing self-sufficiency in energy supply, improvement of energy storage and concluding suspended contracts are solutions of the challenge of supply security. To manage the transit security challenge, Iran should use cross-border pipelines for meeting both energy supply and energy demand.*

**Keywords:** *energy security, natural gas, cross- border pipelines, supply and demand.*

### Introduction

Nowadays the national security of energy producing and supplying states depends on the process of energy supply and demand. In fact, the continuous supply and demand of energy in global markets, known as energy security, is a requirement for national security (Pereira and Pyhäranta 2013: 6). Energy security generally refers to the lack of any barrier in the process of production and consumption of energy. In recent decades, natural gas supply and demand has grown significantly by pipelines and according to international forecasts, this growth will continue. The two main reasons for this increasing growth are the location of gas resources and the changes in demand patterns. Gas resources located near consumer markets are depleting and it is necessary to pass long distances to access gas. On the other hand, due to less pollution than oil, the pattern of energy consumption has changed and the global consumption of gas has increased.

The most common methods of gas transmission are cross-border pipelines and LNG, each with its own technology and requirements. Russia use the first method and Qatar use the second one. Generally, in the Middle East, gas transit through pipelines is relatively less important than LNG (Mills 2016: 6). However in spite of favourable de-

velopments in the field of LNG transmission method, this technology is complex and costly, and except for distances of longer than 3000 km, it has no special advantages over cross-border pipelines (ESMAP 2003: 13). In the light of this fact and the increasing importance of gas in global markets in the future, there will be a need for more cross border gas pipelines. Cross-border gas pipeline is a strategic infrastructure for any country (Vinois and Bros 2019: 8) and it transfer energy resources from supplying states to demanding states. In the simplest case, there are only two sides: producing and consuming states, but in some cases, when supplying states are remoted from demanding states, the pipelines also pass through the territory of a third state called the transit state. Iran holds 17 per cent of the world's proved natural gas reserves and after the United States and Russia is the world's third-largest dry natural gas producer.\* Although the rates of natural-gas production and consumption in Iran have been almost equal and most of the natural gas produced is consumed domestically (Singh 2019: 14), Iran trades gas via cross-border pipeline with its four neighbours. It exports gas to Turkey, Armenia, Azerbaijan and Iraq, and imports from Turkmenistan and Azerbaijan. In 2017, about 73 per cent of total natural gas exports via pipeline were destined for Turkey (EIA 2019: 6). Over the past decades, Iran has repeatedly referred to its plans to become a major exporter of natural gas and to allocate 10 per cent of share of international gas trade to itself (Jalilvand 2013: 6). In addition to importing and exporting gas, Iran has a high potential for gas transit through pipelines. Iran is located in the energy ellipse of the world and can become a transit route for gas pipelines to East Asian and European markets by land and to other states by sea. Despite this importance and high potential, cross-border gas pipelines have not passed from Iran so far, but it is possible that in the future Iran will be the transit state of Turkmenistan gas pipelines to international markets.

Since cross-border pipelines are important to expand energy security (Abolhosseini *et al.* 2017: 232) Iran can use them to strengthen its energy security. As the approaches of supply demand and transit, states are different; Iran's approach to energy security depends on its position in the energy chain. The main concern of exporting states is the security of energy demand. Energy demand security means stable trade relationship with customers, which their purchase often provides a significant portion of the exporting states income. The most important issue in this regard is a steady flow of energy exports at a reasonable price that cannot only ensure new energy investment but also the general economic development of the state (Energy Charter Secretariat 2015: 13). On the other hand, energy-importing states are primarily concerned with supply security. Energy security from the point of view of the importing state is permanent and uninterrupted access to the required energy resources at a reasonable price. The most important challenge in this regard is the ability to rely on foreign suppliers, which provide energy to the importing state without short-term and long-term disruption. However, there is still no clear definition of energy transit security. It generally means the acceptable level of threat of supply and price disruption arising from risks associated with the transit of gas supplies. Thus, energy security is a multidimensional concept and only an integrated approach that considers all its dimensions can be successful.

Iran is concerned to security of demand due to gas exports to Turkey and Armenia, to security of supply due to gas imports from Turkmenistan and Azerbaijan, and to transit security due to the possibility of transit of Turkmenistan gas pipelines through its territory.

Therefore, Iran can use the potential of cross-border pipelines to achieve its energy security from three perspectives of supplier, importer, and transit state. In the present article, the relationship between cross-border gas pipelines and energy security of Iran will be studied from these three perspectives.

### **1. Cross-Border Gas Pipelines and Energy Security of Iran as a Supplier**

Energy security is a dynamic concept that has evolved in the context of international evolutions (van Vactor 2007: 10). Previously, most of the energy security literature focused on the issue of supply security for importing states. The idea of security of energy demand came after the sharp drop in oil prices in 1986 due to the efforts of importing states to reduce their dependence on oil, whereby energy exporting states faced a sharp decline in oil export revenues. Since then, one of the main concerns of energy exporting states, both individually and organizationally, such as OPEC and the Assembly of Gas Exporting States, has always been the issue of demand security. In its 2007 Riyadh Declaration, OPEC emphasized the interrelationship between supply security and demand security (Riyadh Declaration 2007: 2). The Gas Exporting Countries Forum also stressed the importance of fair risk sharing of all gas market players to ensure the security of gas supply and demand (Moscow declaration 2013: 2).

Since Iran as one of natural gas producers is expected to retain its spot in 2040 (Al-verà *et al.* 2000: 36), it tends to raise security of its energy demand. However, one of the main obstacles to supply security of Iran's energy is the issue of the US sanctions. The United States has reduced Iran's oil exports and oil revenues by directly and explicitly banning the purchase of Iranian oil in world markets. While the US sanctions do not explicitly target Iranian natural gas exported by pipeline, those has implicitly affected the export of Iranian gas through cross-border gas pipelines in three ways:

1. The US political pressure on states in the region has made it impossible to build new cross border gas pipeline. An example is the Pakistan-Iran pipeline, which, according to the Pakistani Foreign Ministry, Pakistan did not commit to complete the line under the US political pressure (Katzman 2022: 46). In general, the construction of gas pipelines involving Iran is subject to the US sanctions.

2. The US political lobbies have been ruled out the possibility of cross-border gas pipelines passing through the territory of Iran. An example is the Baku-Tbilisi-Erzurum pipeline, which Iran was excluded from the project.

3. The US sanctions are applicable to financial transactions that facilitate such sales, and payments for Iranian natural gas must be held in escrow accounts in the importing country and not made to Iran. The American sanctions on financial transactions with Iran might impede gas transactions with Iran. A clear example is the export of gas to Iraq, where Iran does not have access to financial resources from own gas exports. However, From Iran's point of view, as supplier state, energy security is access to reliable market with reasonable growth at a predictable price. Therefore, Iran desires to supply gas without interruption, at a favourable price and with a reasonable growth in exports.

#### ***1.1. The Ways of Ensuring of Demand Security of Iran***

Demand for produced gas of Iran is the cornerstone of demand security of Iran. In order to achieve this goal, Iran needs to pursue the following dual goals.

### *1.1.1. Maintaining of Existing Demand*

Most of Iran's gas is exported through pipelines to Turkey, Armenia, and Azerbaijan. In spite of the US sanctions on Iran's energy sector, export of Iran's natural gas is likely to continue (Jalilvand 2019: 14). Iran is the second state after Russia in exporting natural gas through pipelines to Turkey. Despite the fact that Turkey's gas needs are expected to increase, its demand for gas from Iran is likely to decrease in the future because Turkey has other gas trading partners such as Russia, Turkmenistan, Azerbaijan, Libya, Egypt and Algeria. Alternatives to Iran gas pipelines to Turkey are Blue Stream (Russia), Baku-Tbilisi, Erzurum (Azerbaijan), and Bulgaria-Turkey (Russia) pipelines. However, the seasonal peak of Turkish consumption, along with the increase in Turkish demand, indicates that it will not be easy for Turkey to replace gas imports from Iran. In addition, according to the provisions of the agreement between Iran and Turkey, if Turkey does not import gas from Iran by 2027, it must pay the contract price. Furthermore, the loss of a major supplier such as Iran could also limit Turkey's bargaining power with other suppliers, especially Russia.

The second importing gas state from Iran is Armenia. Export of Iranian gas through pipelines to Armenia, based on contract for electricity and gas barter, will not increase the security of Iran's energy demand. In this regards the main reasons are small population and poor economic situation of Armenia, and its willingness to import gas at a lower price from Georgia and Russia. However, Armenia like Turkey faces a problem in ensuring of demand if winter consumption peaks. Regarding gas SWAP between Iran and Azerbaijan (Nakhchivan), it should be noted that the energy situation of Nakhchivan is unfavourable and there is no alternative to supply energy except Iran. However, the supply market in Nakhchivan is very limited and Iran cannot rely on its long-term economic benefits. To sum up, in order to ensure the security of its current demand, Iran initially should maintain its current demand for gas by Turkey, Azerbaijan, and Armenia.

### *1.1.2. Diversifying of Demand*

The cross-border pipeline creates a correlation in the gas trade whereby suppliers and consumers are interconnected in the medium or long term. The positive effects of this correlation strengthen the security of supply and demand between the mentioned states, but on the other hand, the possibility of dependence on supply and demand sources is created. Diversification is one of the most important ways to ensure security and it occurs in three ways: diversification of energy resources, diversification of exporters and importers, and diversification of transit routes of supply and demand. Exporters are looking for diverse applicants for energy demand and diversification policies to reduce the instability of their export income. For example, Russia tries to build new gas pipelines in Siberia to China to reduce its dependence on European demand markets. In the light of this fact, Iran has signed agreements with some states to export gas through cross-border pipelines.

Iran has signed Iran-Iraq pipeline agreement to supply the natural gas needed by the Baghdad and Diyala power plants. Although export is expected to begin soon, security issues can make it so difficult to increase demand. The other pipeline is the Iran-Oman pipeline, the agreement of which was signed in 2014, but the construction of this pipeline has been delayed due to disputes in the price. The Pakistan-Iran pipeline, known as the Peace Pipeline, is another project in which the construction of pipeline on the Irani-

an side is complete, while there has been no significant progress on the Pakistani side. Despite the fact that parties are decided to complete this project and a lot of negotiations have taken place, the implementation of this project has been delayed for various reasons (mainly political), especially from the Pakistani side. In recent years, Iran and the UAE have finally started agreement on the transfer of natural gas from the Salman field to Sharjah in the United Arab Emirates, but negotiations to conclude the agreement have not been resulted (EIA 2015: 13). Overall, to secure its demand security, Iran makes increasing efforts to maintain existing demand and create new ones through cross-border pipelines, but has not yet achieved its goals.

### ***1.2. Challenges of Demand Security***

In order to achieve the goal of securing gas demand, there are several challenges that Iran needs to consider. These challenges are both international and national in nature.

#### ***1.2.1. Attracting Investment and Transfer of Technical Knowledge***

Today, the most important challenge for oil and gas producing states for a constant presence in energy markets is sufficient investment in facilities and infrastructure for production and transmission of gas and access to modern technologies. Producing states, despite having and exporting oil and gas resources, are in intense need of transfer of technology. Therefore, exporting states need to cooperate with transnational companies or investing states to attract investment and transfer knowledge and technology.

Due to economic sanctions, Iran is facing a major challenge on attracting foreign investment and technical development of gas industry. The US investment restrictions over more than 20 million in Iran for American companies ratified in 1995 are the main factor limiting investment on Iran's gas industry. Because of the Russian and Chinese opposition, Iran's energy sector was not subject to the UN sanctions, but the US sanctions include the Iran's energy sector (Katzman 2020: 11). The main target of American sanctions is to reduce oil and gas exports and income sources to zero (Hazrati and Malakoutikhah 2019: 16). In addition to the investment ban, the EU sanctions banned technical support for Iran's oil and gas industry, and the United States increased its sanctions on Iran's energy sector to include transfer of technical knowledge. Despite the fact that investment and technology transfer is a win-win game that benefits all parties, the post-2010 sanctions by the European Union and the United States directly targeted Iran's energy industry and produced a significant negative impact on natural gas development (Jalilvand 2013: 13).

#### ***1.2.2. Readiness to Supply in Urgent Conditions***

Providing energy services without interruption and at a reasonable price is one of the important features of today's supply markets. Even short interruptions disrupt the trade balance in the energy market. Therefore, it is necessary to eliminate the interruption in energy supply in the shortest possible time. Otherwise, the supplying state will gradually lose its position in the supply markets. This interruption in supply can occur even in accidents such as explosions in pipelines or reduction of gas pressure in the pipeline. Iran has repeatedly cut off its gas exports to Turkey due to a lack of supply from Turkmenistan during the cold seasons. Similarly, Turkey has sometimes officially suspended its agreed imports from Iran for technical reasons. Therefore, predicting alternative capacity is an immediate response to supply disruption.

### 1.2.3. Reducing International Disputes over Gas Supply

Increasing disputes with importing states over quantitative and qualitative conditions or the price of delivered gas can not only lead to temporary disruptions in supply but can also lead to gradual decrease of long-term reliance of importing states on exporting states. For example, in late 2014, Turkey sued Iran in The International Court of Arbitration (ICC) over the uncertainty of the National Iranian Gas Company (NIGC), and Iran was eventually condemned to pay \$ 2 billion to the Turkish company, Botas. Although such a trend is inevitable, if it increases, it can reduce the security of Iran's gas demand in the international market. Generally, Iran needs to improve the atmosphere of international trust, which is serious about natural gas exports.

## 2. Cross-Border Gas Pipelines and Energy Security of Iran as Demander

Security of energy supply is a precondition for economic growth. This dimension of energy security is the main concern of energy importing states and organizations such as the International Energy Agency, the G8, and the Energy Charter Conference. Security of energy supply in the simplest definition is a reliable supply at a reasonable price (Mills 2016: 30). However, today, the common definition of security of supply is the continuous supply of energy in different forms, in different quantities and at reasonable prices. The International Energy Agency, for example, defines security of energy supply as uninterrupted access to energy resources at an affordable price. Although Iran is the third consumer of natural gas in the world (Khodamoradi and Sojdei 2017: 23), it has enough gas resources and only 3 per cent of consumption is supplied by other states. Thus, the issue of security of supply for Iran is not as challenging as the security of demand and in the long term, it can ensure its energy security, even if supply security is disrupted, by reducing domestic consumption or increasing domestic supply.

### 2.1. The Ways of Ensuring of Supply Security of Iran

To ensure energy security through gas pipelines, initially Iran should maintain existing suppliers at the current level and should gradually diversify number of suppliers in cases of permanent or temporary disruption or interruption in supply.

#### 2.1.2. Maintaining of Existing Supply

In recent years, Iran has always imported gas from Turkmenistan to supply north eastern parts of the country that had no pipeline connection to its own ample gas resources (Pirani 2019: 13). The inability to rely on Turkmenistan has led to disputes over the Iran-Turkmenistan gas pipeline, which is a clear example of international pipeline disputes that indicate a lack of supply security for Iran (Chichilnisky-Heal 2012: 2). In 2008 and 2016, Turkmenistan severely cut off gas exports to Iran at peak consumption. Since Turkmenistan only participates in supplying the northern Iranian market through its gas pipelines, a short-term dependence can arise. However, as Iran's imports from Turkmenistan are only 3 per cent of its total gas consumption, it will not create a strategic dependence in the long term. In addition, Iran's long-term dependence on Turkmenistan gas is unlikely due to the presence of alternative exporters, increased domestic production capacity, limited import amount from Turkmenistan, and limited Turkmenistan political power in the region. In general, long-term dependence on supply depends on adequate scheduling and investment in production and transmission facilities (Checchi *et al.* 2009: 24). Nevertheless, Iran's security of energy in the long term is

partly related to Turkmenistan's cross-border gas pipelines. Because if Iran wants to be a regional hub in the Middle East, supplying gas to neighbouring states through pipelines and SWAP and providing technical services in exchange for gas can be effective in ensuring Iran's energy security. Since the Energy strategy is one of Iran's main priorities (Ebrahimi *et al.* 2017: 79), it should consider gas imports from Turkmenistan as one of its strategic goals for the long term.

Iran also imports gas from Azerbaijan. However, the same amount of imported gas exports to Nakhchivan through SWAP and has practically no effect on ensuring the security of Iran's supply. Therefore, Iran acts as interface and this situation cannot be considered an appropriate basis for calculation in the supply and demand market. However, gas imports from Turkmenistan and Azerbaijan can be economically viable in meeting market demand in the northern regions of Iran especially in peak consumption, and partially ensure the supply security in north part of Iran.

### 2.1.2. Diversifying of Demand

Increasing of supply can be achieved through both national and international capacity. At the same time, increasing domestic supply is one of the first plans that a producer can consider to meet domestic demand and ultimately achieve energy security. However, if domestic supply capacity is not enough to meet energy demand, the energy consumer may turn to foreign producers to secure supply. In this case, diversity in both geographical sources of gas supply and transportation routes is essential to enhance energy security (Bjornmose *et al.* 2009: 25). For example, the EU member states, as consuming states, are strongly committed to diversifying energy resources and routes. They need to strengthen four areas. One of these areas is the development of the Southern Gas Corridor to supply Caspian and future Middle East gas resources to Europe, which will increase security of gas supply by reducing its dependence on Russia (*Ibid.*: 9).

The tension between Russia and Western countries after the Ukraine-Russia war in 2022 has raised Iran as one of the alternative options for Russian gas. So that Iran's energy minister officially announced that Iran has the necessary preparation in this field and is currently evaluating the current situation. However, there are several major obstacles to the realization of this hypothesis. The first obstacle is sanctions related to Iran's oil and gas industry due to Iran's nuclear program. As long as European sanctions remain, it will be impossible to export Iranian gas to Europe. The second obstacle is the low technical ability of Iran. Comparing the production and export of Iran and Russia shows a huge difference between them. This huge difference naturally shows itself in exports as well. Iran is still not technically able to supply the high-consuming and large European market, and at least for the next ten years, Iran cannot be considered a reliable substitute for Russian gas. The third problem is the high level of Iran's domestic consumption and the lack of necessary investment in recent decades, which has prevented Iran from becoming a major exporter. If there is no required investment in gas production and efficient use of resources, Iran will be dependent on gas imports despite all its reserves. The fourth obstacle is Iran's reluctance to compete with its strategic partner, Russia. The Russians will use all their means to prevent the loss of Europe's gas dependence on Russia, and Iran does not want to enter the traditional energy market of Russia. Finally, it should not be forgotten that Europe tends to gradually focus on renewable energies to replace Russian gas; not to depend on Iranian gas instead of Russian gas. Therefore,

although it is theoretically possible to replace Russian gas with Iranian gas, there is still a long way to realize this option.

Therefore, Iran needs to have several supplying partners instead of one partner in order to prevent disruption of energy supply. Turkmenistan is the only real exporter of gas to Iran. Despite the fact that the share of imported gas from Turkmenistan is very small compared to the total gas consumption of Iran, but the monopoly of supplying state indicate lack of supply security of Iran. Azerbaijan potentially can participate in the process of gas exports to Iran and contribute to the supply security of Iran by eliminating the existing monopoly. In this regard, it is necessary for Iran to agree with Azerbaijan on the supply of gas in excess of the current amount.

## **2.2. Challenges of Demand Security**

To achieve the mentioned goals, Iran faces several major challenges. These challenges are mainly internal and managing them is effective in achieving security of supply in Iran.

### *2.2.1. Increasing of Energy Efficiency*

In comparison to other states, the intensity of energy consumption in Iran is very high and the pattern of gas consumption needs to be seriously modified. In this regard, the idea of energy conservation can be effective. Energy conservation, also known as a secondary and alternative source of energy, does not directly generate energy, but it is equally able to meet primary energy needs. Conserved energy is just as important as the energy produced in meeting the needs of society, and in this sense, energy conservation is equivalent to the use of primary energy sources (Lyster and Bradbrook 2006: 30–31). According to the International Energy Agency in 2006, every dollar spent on improving energy efficiency equals two dollars spent on energy production (IEA 2006: 10). Energy efficiency is a traditional countermeasure to prevent energy insecurity for importers. A good example here is the Japan Energy Protection Act of 1979. This is also the case with the European Union, since the EU considers energy efficiency as an immediate tool for energy security policy and aims to increase energy efficiency by up to 20 per cent until 2020. Iran should also ensure energy security in a domestic way by reducing energy consumption and improving energy efficiency.

### *2.2.2. Self-Sufficiency in Energy Supply*

Energy self-sufficiency and avoiding dependence on external resources is the first priority in ensuring security of supply. Since the amount of Iranian gas imports is relatively small and accounts for 3 per cent of the total amount of gas consumed, meeting this domestic demand does not face any particular difficulty. In this regard, creating new internal pipelines to transport gas from the south to the north and northeast of Iran seems to be a good solution. Energy self-sufficiency through transmission of South Pars gas to northern Iran, while meeting domestic gas demand, can play an important role in gas SWAP and connecting the pipeline to East Asian and European markets.

### *2.2.3. Energy Storage*

Complementary infrastructures have attracted the most attention as a way to solve supply disruption. Such strategies are useful in temporary disruption but are not useful in the case of complete disruption. The strategy of storing energy resources is a clear example of complementary infrastructure that has been implemented for many decades in many member states of the Organization for Economic Cooperation and Development.



In fact, one of the main reasons for the establishment of the International Energy Agency is the coordination of oil storage within the member states for at least 90 days to achieve security of supply. In the absence of efficient gas storage facilities close to the demand center, any disruption will create greater security concerns (IEA 2016: 11).

In the case of Iran, such a solution could be useful in case of a temporary disruption in supply. With the launch of the gas storage project, Iran's need to import gas from Turkmenistan will be reduced at peak consumption and domestic demand will be met until required gas is resupplied. In this regard, Shurijeh and Sarajeh gas storage project has been started, which can secure supply for the northern provinces of Iran in the peak of winter consumption.

#### *2.2.4. Concluding Suspended Contracts*

A suspended contract is a type of contract that allows the exporting state to cut off energy supply to agreed customers at specific times. According to this solution, in case of emergency, in order to maintain supply to non-suspended customers, supply to suspended customers will be cut off. The International Energy Agency considers suspended contracts noteworthy because they are more flexible than storage. These types of contracts are widely used in North America and Western Europe for gas and electricity. Therefore, in order to meet the emergency needs of domestic energy during peak consumption, such a condition can be included in contracts.

### **3. Cross-Border Gas Pipelines and Energy Security of Iran as a Transit State**

There is still no clear definition of gas transit security. However, it can be argued that the concept is part of the security of energy supply (Energy Charter Secretariat 2015: 17). For example, transit security is also an essential part of the security of the EU gas supply as a major consumer.

Principally, the interests of the transit state are different from the interests of exporting and importing states. Transit states have less interest in pipelines passing through their territory while bearing all the environmental and security risks of transit (Mills 2016: 33). The most important advantage of cross-border pipeline for transit state is its strategic effects for them. In addition, the passage of a gas pipeline through a transit state also ensures its security of energy supply or demand; because transit states can also use transit pipelines to meet domestic demand or supply for gas.

There are different types of transmission systems for cross-border pipelines. In some cases, pipelines pass through the territory of the transit state without any effect on its energy supply and demand Like the Algerian pipeline that passes through Morocco. However, in some other cases, the pipeline is connected to the internal network of supply and demand of the transit state. In this situation, the transit state can decrease or increase the amount of transit gas. Therefore, in these cases the cross-border pipeline can be effective on the security of energy supply or demand of the host or transit state.

Iran has a special geopolitical position in the energy markets and its participation in cross-border pipeline projects as a transit state is effective in achieving security of energy supply and demand. Azerbaijan and Turkmenistan, Iran's two gas neighbours can transit their export gas through Iran the idea that was finally achieved in 2021. During the 15<sup>th</sup> summit of the Economic Co-operation Organisation in Turkmenistan capital, Iran, Turkmenistan and Azerbaijan signed a gas swap deal for up to 2 billion cubic me-

tres (bcm) per year whereby Iran will receive 5 to 6 million cubic meters of gas per day from Turkmenistan and deliver an equivalent amount to Azerbaijan at the Astara border. In general, by neglecting its position in the Caspian Sea, Iran has lost the economic opportunities of energy transit in the northern basin (Koolaei 2011: 22). But now it can play a considerable role in international transit of gas.

The other probable opportunity was the Baku-Tbilisi-Erzurum pipeline, which did not pass through Iran. The next option is the transit of Turkmenistan gas through Iran to Turkey, Europe, East Asia, the Persian Gulf and even neighbouring states such as Armenia. In this case, Iran could use the potential of cross-border pipelines to ensure energy security. However, the ability to attract investment to create infrastructure of transit cross-border gas pipelines is one of the challenges facing Iran. Iran as a transit state can use of potentials of cross-border gas pipelines for reaching two different targets.

### ***3.1. Use of Transit Pipelines for Securing the Energy Demand***

Based on the agreement with owner of the transit pipeline, the transit state can export a part of its produced gas to the demand markets through the transit pipeline because one of the features of cross-border pipelines is the possibility of connection with downstream importing states. If the pipelines of Turkmenistan or Azerbaijan pass through Iran, Iran can export part of its surplus produced gas to Pakistan and India through the transit pipeline. At present, despite the existence of an international pipeline from Turkmenistan to Azerbaijan, through swap of Turkmenia gas to Azerbaijan, Iran can also export some of its surplus production to Azerbaijan.

It should be mentioned that there are some risks for exporting state about transit pipelines. If the transit state is an exporter of gas (such as Iran), there is a risk for the exporting state that the transit state will gradually take over its entire market share. In other words, the transit state can stop transit and develop its own markets. Likewise, the state will not hesitate to cut off transit exports in order to increase its oil prices. The experience of Iraq pipelines through Saudi Arabia is an example of such a transit state behaviour (ESMAP 2003: 22). Saudi Arabia gradually took over Iraq's market share.

### ***3.2. Use of Transit Pipelines for Securing of Energy Supply***

Principally, the transit state participates in the transit pipeline project for strategic benefits and economic revenue, but in some cases, it looks for an opportunity to meet the needs of the domestic demand instead of receiving transit costs and tolls. This is especially true when the transit state's domestic market is too small to justify the construction of a national gas pipeline. For example, the transit toll of Georgia, which transits Russian gas to Armenia, is 5 per cent of transit gas through this state. In addition, Morocco and Tunisia, as transit states of Algerian gas to Europe, take between 4 and 5 per cent of transit gas as transit toll. Iran also can use the potential of transit pipelines to meet its domestic demand, especially during peak consumption in northern cities. Based on the recent gas trade deal between Iran, Azerbaijan and Turkmenistan, Iran takes 20 per cent of transit gas instead of transit costs and tolls which allocates it to supply gas to the northern and north-eastern in the cold seasons of the year, which is far removed from most of its own gas fields and reservoirs in the south. In general, if Caspian oil and gas pipelines pass through Iranian territory, Iran could economize at least \$ 1 billion per year.

## Conclusion

Iran has great potential in the field of gas, and this energy source can ensure its energy security. However, despite the increase in gas production in the last decade in Iran, the country does not play a significant role in international gas markets yet. In the geopolitical and technical situation of Iran, cross-border pipelines are the best way to export and import of gas. This method can ensure energy security for Iran from the perspective of an importer, exporter, and transit state.

As a gas exporting state, Iran's main concern is the issue of demand security. In this regard, Iran should increase the number of future demander while maintaining of existing applicants by diversifying the demand paths. However, challenges such as limitations of attraction of foreign investment and transfer of technical knowledge resulting from the sanctions, limited preparedness in cases of supply disruption and increasing trade disputes can prevent the increase in demand for Iranian gas at the international level. As a gas importing state, Iran's priority is the issue of security of supply. In this regard, Iran should use various supply routes to import its required gas (especially in the peak of winter consumption and for the northern regions), while maintaining the existing supply. In this regard, security of supply will depend on issues such as energy efficiency, domestic demand trends, and reform of gas consumption patterns, gas storage, and the conclusion of suspended contracts that can provide the grounds for a gradual decline in domestic demand for gas. As a gas transit state, cross-border pipelines can ensure both security of supply and security of demand. In other words in some cases Iran can export its surplus production through these pipelines to consumer markets (security of demand) and in some cases instead of transit tolls and taxes, Iran can take a percentage of the transit gas to meet its domestic required (security of supply).

Due to its comparative advantage over other fossil fuels, gas will definitely be traded more in the future. If Iran wants to improve its energy security, it should reconsider its approach to the cross-border gas pipelines and adopt a coherent strategy for gas exports and imports in the short and long term. In the meantime, Iran can use the capacity of the Gas Exporting Countries Forum, which coordinates the export policies of member states.

## NOTE

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