Turkey's role in EU's energy security

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Abstract

Energy always has been on top of the world agenda as its continuous and reliable supply seen as a security concern. While economic development and growth means better life conditions for citizens; it also means increasing energy demand and use together with key challenges such as sustainable, reliable, secure energy supply and clean energy development or environmental protection for countries. Energy has become an increasingly important part of the Turkey and European Union (EU) relations, with a special emphasis on natural gas. The recent discoveries of natural gas reserves in offshore Caspian Region, also in Eastern Mediterranean and the 2014 Ukraine crisis as well as Russia's decision to cancel in famous South corridor can eventually reshape the EU-Turkey energy relations, in particular, considering strategic geographical location of Turkey at the crossroads of major natural gas-rich regions like the Caspian Sea region and the Middle East on one hand, and a major natural gas-consuming market, Europe. This study summarizes developments in natural gas flows and routes from major producers like Azerbaijan, Turkmenistan, Iraq and Iran in the Caspian Region and the Middle East to Europe following energy disputes between Russia and Ukraine. It is expected that Turkey would eventually play a key role as a transit country in the future with or without the Russian involvement.

Keywords:

Natural Gas Pipelines, Energy Corridors, Energy Security

Introduction

Energy always has been on top of the world agenda as its continuous and reliable supply seen as a security concern. International Energy Agency (IEA) defines energy security, as “the uninterrupted availability of energy sources at an affordable price”. The energy security concept has a multidimensional characteristic that includes economic, political and geographical risks which can be analyzed in two parts: long-term and short-term energy security aspects. Short-term energy security focuses on the ability of the energy system to meet the demand in the events of sudden supply disruptions and reacting promptly to the changes in the supply-demand balance. On the other hand, long-term energy security focuses on timely investments in order to provide energy supply in line with economic developments and environmental needs (Giamouridis and Poleoyannis, 2011:3; IEA, 2014).

Energy security requires a well-functioning energy system. It has mainly two aspects; security of supply and security of demand in economic sense. This paper focuses on supply security of energy which has a relatively high importance depending on the role of the actor or the country within the energy markets(Johansson,2013:200).

The concept of energy security has become more critical in terms of sustainable economic development just after tripling the price of crude oil in a relatively short period of time, beginning from October 1973. Empirical studies find that affordable energy prices generally lead to a significant growth of national economy. The most important economic risk factor threatening supply security has always been world energy prices. The increasing energy demand and the competition over energy reserves lead to increase in energy prices and effect energy supply security negatively. Energy prices that soared after oil shocks, caused a series of chain results including the effects on the prices of other energy sources, declines in energy consumption and reduction in energy investments in the long run, inflationary pressure, problems in balance of payments and business losses for companies which are followed by high unemployment and mistrust by consumers (Costantini et al., 2007;Gnansounou, 2008; Shafiee and Topal, 2008; Gnansounou, 2010).

The energy supply and its long run security is highly correlated

with by economic, political, social structures as well as local, regional and global conditions such as wars, embargoes, natural disasters etc. Conflicts around the globe arising from the competition for scarce natural resources can be attributed to the economic dimension of energy security (Johansson,2013:202).

The strategies of secure energy policies have focused on both diversification of energy sources and integration of energy markets amongst producer, consumer and transit countries in order to control both import risks and cost to provide and maintain sufficient energy at an affordable price for economic development and social well being.

The diversification strategy helps the energy system respond to external shocks and reduce the vulnerability of a single energy source against supply shocks or the manipulations created by market powers. Cohen et al. (2011:4863) suggest that “The basic idea of a diversification index is borrowed from portfolio theory in finance: holding other things constant, the overall risk to energy supplies is smaller if there is a diversified portfolio of suppliers”. The diversification of energy supply, even in the absence of supply disruptions, can reduce vulnerability against a particular supplier country or region and also the market power of any one supplier, hence lowering the “risks of higher prices and/or inferior production”.

On the other hand, it suggests that the integration of energy markets among the producers, consumers and transit countries helps to improve energy supply security. Hence an integrated policy strategies assuring energy security should be based on a vision that recognizes the ever changing energy needs, perceptions and choices in a global energy arena where energy related industries become interconnected through pipelines, grids and networks. Though any physical disruption in supply of crude oil or natural gas leads to energy crisis in an integrated energy market; a universal access and sustainable energy supply to modern energy services, on the other hand, would be immensely increase energy efficiency(Cohen et al.(2011:4863)).

Although in last two decades the CO₂ emissions and environmental protection attributed to fossil based energy consumption have been recognized as key areas related to energy issues; environmental concerns are considered as the major factors that bring countries together to concentrate on reducing emission from the energy in-

dustry. It is widely accepted that a process of integration should be established by a coordination amongst energy supplying and consuming countries. An informed energy strategy should focus on the need for change, somehow enabling a mix of more efficient fossil fuels, nuclear and renewable energy resources in order to reduce pressure on the environment while such a mix also is viable economically.

Energy supply security is at the top of agenda for both industrialized countries such as USA, Japan, European Union as well as Newly Industrialized Countries (NIC) like China, India, Brazil and Turkey. Recently the concept of energy supply security is more important for EU and East European countries which rely on Russia, a major energy supplier to Europe with its abundant gas and oil supplies for a foreseeable future. EU needs to reduce its energy dependence by accelerating further diversification of its energy supply in order to increase its bargaining power, and coordinate the development of the infrastructure in order to support so called diversification, continue to develop renewable and other indigenous energy sources while increasing its energy efficiency (BP 2013; Buchan, 2014:3).

New investments in energy infrastructure, especially in electricity, oil and natural gas, are aimed to assure sustainable economic growth and to avoid supply disruption. Strategies for secure energy should consider options and transition pathways to move from present to a future energy systems that would provide diverse, affordable and clean energy solutions. Such sustainable energy systems are needed to reduce uncertainty along with better energy governance and energy innovations providing safe and affordable energy supply.

Energy Security in Europe

It is expected that energy demand, in Europe, especially for electricity, will increase by 50 percent in the next 25 years. The oil and gas consumption will continue to grow because of increasing demand of transportation and clean energy concerns. On the other hand, a high energy dependency from imported resources would reach up to 73-79 percent by 2020 and 81-89 percent by 2030, mainly due to the depletion of domestic resources (BP, 2013; UPA 2013).

Since 2006, European countries have been experiencing energy disruptions as a result of increasing political influence of Russia on former Soviet states. EU and Central and Eastern European Coun-

tries (CEE) have similar challenges and objectives related to energy issues. The CEE countries have been dependent on natural gas imported from Russia and they were severely affected by the gas crisis between the Kremlin and Kiev in the past.

Substantial share of EU's natural gas demand has been supplied (almost 80 percent) by Russia, Norway and Algeria and it is expected that these countries will expand their dominant role in the medium run as far as supply potential is concerned. Import dependency of CEE countries on Russian energy will increase even more in the long run unless they geographically diversify their gas and oil import sources and routes (UPA,2013).

The Energy Policy of European Union

The historical development of energy sources generally has affected the capacity and integration of common gas transmission networks in and towards EU. A recent dispute between Ukraine and Russia in 2014 as well as the past disruptions of gas supplies in 2006 and 2009 has already rang the bell as a wake up call and stressed the need to establish a common energy policy for EU member states and radically changed the political and economic geography of the energy trade.

EU actually began forming such common energy policy to address the issues of maintaining energy security with sustained competitiveness and protecting the environment as early as 1995. To this day, EU has passed many laws and also established new strategies to strengthen the EU's energy security in terms of gas supply and to reduce the number of member states dependent on a single supplier. It was stated that the EU needed local and regional integration for energy security. The European energy policy, concerning development of new gas infrastructure, supports a liquid and competitive joint gas market through increased market participation and integration that envisions three pillars of market; integration, security of supply and sustainability. In this context, Trans-European Energy Networks, adopted by the Council of EU, has three key energy policy objectives formulated by EU for economic stability and a sustainable development in Europe as:

- Enhancing Security of Energy Supply;
- Improving the Internal Energy Market;

- Developing Sustainable Energy Markets.

The EU Commission determined short and long term priorities in order to make EU's energy infrastructure more suitable for the 21st century. The rationale behind this move is to increase the flexibility of key European gas transmission projects and to improve the integration of energy markets by ensuring differentiated connections and more alternatives for supply. EU has been taking both supply and demand-side measures into consideration for energy supply security. While supply-side measures are probably for long-term security concerns; demand-side measures, such as fuel-switching, likely to be very effective in the short term to deal with any sudden gas shortage or disruption of flow. The main aim of energy security measures is to make Europe less vulnerable to any sudden cut-off of energy supply by the providers, namely Russia.

A few positive examples from EU member states demonstrate that diversification is the key point in order to increase competition and enhance security of supply. Therefore, it is a priority for EU to build a fully interconnected and flexible energy infrastructure and network which would enable EU member states to buy oil and gas from any source in the world and to sell them anywhere in the EU, regardless of national boundaries. It would also provide more choices to gas suppliers in a bigger market to sell their production. One of the goals of this strategy is to ensure uninterrupted supply of crude oil and natural gas to land-locked EU countries in CEE which are currently dependent on limited supply routes, in case of long and unexpected supply disruptions in the conventional routes. Diversification of oil supplies and interconnected pipeline networks would also help reduce oil transportation by giant tankers, thus reducing the risk of environmental hazards in particularly sensitive and busy Baltic Sea area and Turkish Straits. It is argued that the existing infrastructure can meet energy flow via the CEE pipeline network which has been operated jointly by the countries in the region. The network was reinforced by means of interconnecting different systems and removing capacity bottlenecks and enabling reverse flows (EU, 2011:14).

It is recommended that each region in Europe should implement a plan for infrastructure which will allow physical access to at least

two different sources. The new regulation which is called as N-1 standard on security of gas supply introduced the infrastructure standards imposing additional flexibility requirements. It demands bi-directional pipelines, enhanced storage capacity and conversion to more flexible supply such as LNG/CNG.

Currently, diversification in oil and natural gas supplies of EU is achieved through three corridors; Northern Corridor from Norway, Eastern corridor from Russia and Mediterranean Corridors from Africa. However, in terms of LNG, EU member states still depends on a single source and this situation creates a high level of dependency in some regions (EU,2011:14).

In 2014, the Ukraine crisis has suddenly brought the attention back to energy security and forced EU to ensure its future energy security through an interconnected pipelines, alternative LNG sources and increased gas storage capacities as well as efficiency measures. It is widely argued that a European regional integration among member states was urgently needed for sustainable and secure energy supply in Europe. Moreover a greater solidarity between member states and EU institutions as well as external energy suppliers had to set up. While EU already started the process of trying to get agreement between 28 member states on energy and resulting climate goals for Europe during the Paris negotiations; the energy industry of EU was also subjected to EU-style energy market liberalisation along with the energy industry in number of non-EU countries bordered with EU. These developments are expected to help strengthen political and economic autonomy of the countries in the region and enable them to choose their own security orientation.

The European security of supply model created by European Commission takes into account the supply potential, demand projections, transportation capacity and supply costs as well as market behaviour. According to European Commission estimates, the demand for natural gas in Europe and in Balkans will almost double by 2030. In order to prepare Europe for this, European Commission launched The Energy Corridor Optimisation For European Markets Of Gas, Electricity And Hydrogen (ENCOURAGED) project to evaluate and establish the economically optimal energy corridors for EU and its neighbouring countries. Energy analysts expect that pipelines will be the dominant energy transportation mean in the future for Europe. In this context, following the first Russian natural gas crisis occurred in January 2006, Nabucco emerged as a

response to the energy security concerns, and became the flagship project of the Southern Gas Corridor (SGC). This corridor was established as an initiative for natural gas supply from Caspian Sea region and the Middle East to Europe and launched in 2008 by the European Commission (EC, 2007).

Ukraine has been an important transit country for Russian crude oil exports and is still the largest energy transportation corridor of natural gas from Russia to Europe. The amount of physical gas flows from Russia to Europe through Ukraine is around 82 bcm and this amount is almost half of the annual natural gas import of EU (BP, 2013). In addition, Russia uses the southern leg of the Druzhba pipeline to transport crude oil, with capacity of 400 kb/d, to central Europe. It is the main artery through Northern Ukraine to Central and Eastern European countries such as Hungary, Slovakia, Czech Republic and Bosnia-Herzegovina. The Druzhba pipeline is the largest source of crude oil for these countries (IEA, 2014).

As a result of the dispute between Ukraine and Russia, EU tries to diversify its natural gas supplies away from Russia, hence to reduce its import dependency on Russian gas. EU envisions that the energy corridors should never be located over a limited geographical area, even if the suppliers or transit countries are considered to be reliable. EU plans to overcome energy disruption through geographical diversification of import sources. In order to achieve this target, EU set up an interconnected delivery infrastructure and supply network supported by pipelines all over Europe and its neighboring regions. Norway and Libya are other substantial gas suppliers which are also considered as not sustainable and not reliable for Europe. Buying extra supplies of LNG is always a possibility but this would result in relatively high prices for Europe.

The European Commission's energy security assessment, dated May 2014, states that most of the CEE countries are taking measures to limit the damage if the worst-case scenario occurs; Russian gas being cut off. For example, Finland created some excess capacity to use other fuels for power generation; Estonia has natural gas connections with Latvia which has a larger gas storage capacity than its annual need; Lithuania plans to have a floating terminal to store and re-gasify liquefied natural gas from other sources by the end of 2014. However, countries like Poland, Germany and

Slovakia still import significant amount of natural gas from Russia through the Ukraine. These countries also serve as a further transit route for Russian gas to the westward parts of Europe. Hungary's import dependency on Russian natural gas is around 98 percent but the country has a two-way gas connection with Croatia's LNG terminal, and is also working on two-way pipeline link to Slovakia. Greece has an LNG terminal providing gas from other countries, hence reducing its dependency on Russia. Romania is the only exception with its sizeable gas production of its own. It produces 90 percent of its annual demand through domestic resources only imports 10 percent of its annual consumption from Russia. Over all, alternative sources for EU member states can only partially replace the Russian natural gas coming through Ukraine (IEA, 2014; Tagliapietra, 2014b:8).

However, Europe is not in a hopeless situation in the medium and long run. There is significant natural gas potential in Caspian Sea region which can be transported to Europe if the right investments are made in a timely manner. Countries in the region have sizeable reserves and Europe can secure its future gas supply by constructing new pipelines and LNG infrastructure. Azerbaijan, as one of the significant suppliers, has already responded to the EU's Southern Corridor initiative to bring Caspian gas to the European market. Turkmenistan is another alternative supplier and already has been trying to build a pipeline across the Caspian sea-bed between Turkmenbasy and Sangachal Terminal in Baku in order to flow its gas to Europe. With this project, Turkmen natural gas will reach to Balkans and Central Europe through Turkey via Baku-Tbilisi-Erzurum pipeline which is interconnected to The Trans-Caspian Gas Pipeline. When this pipeline is realised, Turkey will play a key role as a transit country in the future in terms of supplying energy to Central and Eastern European Countries (Buchan, 2014:7; IEA, 2014).

European Union's Natural Gas Strategy

EU's current energy strategy emphasizes on building an efficient energy infrastructure and a greater interconnection among EU member states, external suppliers and transit countries through energy infrastructure projects, pipelines, LNG terminals and electricity grids. Even though these are considered as the key components for a smooth and sustainable energy supply for consumers, it is also essential to have a diversified energy sources and routes in order

to maintain reliable and uninterrupted flow of energy. For that purpose, EU adopted the N-1 standard regulation on security of natural gas supply in 2010, following yet another dispute between Russia and Ukraine in 2009. The N-1 standard regulation requires member states to make sure that their domestic gas companies could deliver gas to customers even in case of a cut-off by their largest supplier. However, N-1 regulation does not set any uniform standard on storage and allows national governments to decide in terms of implementation of this rule. In other words, national governments can set their own criterias for gas companies to demonstrate their ability to satisfy the domestic demand (Giamouridis and Poleoyannis, 2011:3; IEA,2014).

It is a widely known fact that the growth in energy demand, especially natural gas which is mainly driven by increasing electricity demand, can be met with relatively low cost especially in the existence of large reserves. However, the bottleneck does not arise from supply side but it is the result of characteristics of the supply network including transit routes, especially in the case of gas where pipelines are necessary to deliver it to end users. The geographical diversification of import sources would decrease the dependency on the largest exporter, Russia. As an alternative source, the natural gas can be imported from North Africa and the Middle East to Europe only in liquified form. After importation of liquified gas, the reverse process to turn liquified gas back into natural gas and delivery of it to the end users are very costly.

However, even in the absence of these high levels regasifying expenses, geographical limitations and Russian control on supply networks make it impossible for countries like Poland, Slovakia and Hungary to purchase LNG in economical prices. Also, due to declining gas production and expensive delivery costs, energy supply from the natural gas resources of Norway, Netherlands and Denmark is hindered. Characteristics of the European supply network do not allow these countries to be a long-term solution (TJF Report, 2014).

Although the existing energy supply network connects CEE countries to Russian natural gas sources, there is no link between the countries in Baltic and Central Europe as well as EU and Central Asia. In other words, the current network is not highly intercon-

nected. It is expected that the EU's dependence on Russian gas imports would grow and at the same time CEE countries are very limited in their ability to reduce their dependence on Russian gas imports. In theory, dependence may be reduced by direct foreign investment on the Russian natural gas sector. However, it is argued that these investments are high risk projects as long as the development projects are controlled by Russian government and there is not enough security to ensure that there will be no future take over action by Russian administration (TJF Report, 2014).

Analysts have a consensus on the fact that future European energy mix will be dominated by natural gas. Hence, natural gas imports will increase steadily over the next few decades due to both depletion of domestic resources and rising demand in EU countries as a result of environmental concerns. After recent disputes between Russia and EU, it is essential and vital that natural gas flows from Caspian Sea region to Europe continuously as promptly and efficiently as possible through new energy transmission projects (Facrell, 2013:85).

The Middle East and the Caucasus regions provide challenges and opportunities in terms of energy supply security for the Central and Eastern Europe as a whole. It is believed that the international energy projects promote mutually beneficial cooperation, cut transaction costs, mitigate problems of asymmetrical information, and decrease uncertainty among partners. Such international cooperation can impact state policies in a positive direction through changing the costs and benefits of various alternatives without reducing self-interest of the states, rather increasing it. In other words, integration allows mutually interdependent political and economical units to enjoy benefits of which they would lack if they would behave individually (Giamouridis and Poleoyannis, 2011:3; IEA, 2014).

In the middle of this on-going political and economical rivalry, Turkey will be strongly affected by the construction of large pipeline and energy transmission projects and should be prepared to adapt its investment strategy to accommodate such possibilities. Since the mid-1990s, Turkey's membership journey into the European Union has required harmonization of standards and legislations. This process, in a way, prepared Turkey for its future role in EU's

energy security arena. In addition to political integration, the reform packages of Western-style laws in order to meet EU guidelines made Turkey more reliable partner in energy investments for EU members (Petersen,2012: 51).

Turkey: As an Energy Corridor between East and West

Turkey is the world's 18th largest economy and has experienced an averaged of 5.2 percent real GDP growth rate between 2002-2012. Turkey is considered as a newly industrialized country (NIC) with slightly over one trillion USD of GDP (PPP), 15,029 USD of GDP per capita (PPP) and with 0,722 Human Development Index (HDI) according to 2013 statistics of World Bank.

Turkish economy is one of the fastest growing economies in the world during the last decade. However, Turkey imports 70 percent of its energy needs and it is projected that this figure could increase upto 74 percent by 2030. While its domestic oil and natural gas production will decrease in the future, its consumption will double especially due to increasing transportation needs in the next two decades. The electricity demand is expected to increase as well by 50 percent in the next 25 years. Therefore, Turkey needs to set sound energy policies for both internal and external markets in order to face these challenges. The internal policy should focus on the exploitation of domestic energy resources and increasing energy efficiency of the technologies supported by the Strategic Energy Technology Plan, which is expected to improve the provision of new and clean energy sources and play a key role for a sustainable future (WB-2013).

The energy security concerns have been main drivers for energy strategies constituted for energy sector reforms. The reforms restructuring electricity and natural gas markets, have contributed much to improved energy security. Moreover, investment in energy efficiency, renewables, and nuclear energy are considered as necessary policy instruments. Therefore the renewable energy technologies and energy efficiency programs have been promoted and the country's first nuclear facilities at Mersin, Akkuyu and Sinop are at the process of building. Atiyas et al. (2012:103) suggests that the alternative technologies would also reduce dependence on imported fuel, cut long-run energy costs and reduce local pollution as well

as greenhouse gas (GHG) emissions.

The diversification between energy fuels and technologies as well as import sources is a standard strategy for improving energy security. It is necessary to develop safe, sustainable natural resources and renewable energy with low carbon technologies including nuclear energy for promoting reliable, affordable and efficient supply of energy. Turkey is believed to have a golden opportunity in terms of its energy security because of its unique location on energy transit routes of main energy corridors between neighbouring eastern producers and western consumers. In this context, it is necessary to achieve and maintain the integration in energy and transportation areas between Turkey and major producers on the east like Russia, Azerbaijan, Iran and Turkmenistan (EC, 2007).

In this framework, energy transportation is of a high strategic importance for Turkey due to two reasons. First, Turkey is an energy poor country and contribution of the domestic energy production is very small, with approximately 23 percent of the total energy consumption. Although Turkey does not have enough domestic energy production of oil, natural gas and even coal; since 1980's, a rapid economic development has led to a significant increase in energy demand. As a founding member of the OECD and the member of G-20 major economies, its economy is heavily dependent on imported energy and this negatively affects its energy supply security. For the last decade, a high rate of import dependence and increased cost of energy imports, with 22 percent of total import expenditures being spent on energy imports, caused to deteriorate trade balance and current account balance (TJF Report, 2014).

Second, as one of the NICs located between two continents, it has an important role to provide energy transmission between energy-rich regions of the Caspian Sea region and Middle East and consumers in Europe and elsewhere. As uninterrupted energy supply at competitive prices is a prerequisite for the smooth functioning of the national economy, per capita energy use, energy intensity, reserves-to-production ratio, share of renewable energy and net import dependency are other major economic indicators for sustainable energy supply security (Atiyasat.all, 2012:164). As it was the case in the past, today Turkey plays a very crucial role through its existing and projected pipelines which makes Turkey a regional player in energy transportation (Erdal, 2011; WDB, 2013).

Turkish Energy Policy

It is estimated that Central Asia and Caspian Sea regions will be new energy centers in the world with their rich energy reserves as shown in Table 1. Since the outbreak of the current dispute between Russia and Ukraine; Turkey's role, as a strategic energy transit for distribution or delivery of oil and natural gas to the West, has been increasing. New energy projects provide a unique opportunity for Turkey to realize its long-term strategic objective of becoming a key energy corridor between energy rich countries in the East and energy importing European markets in the West.

The Ministry of Energy and Natural Resources (MENR) of Turkey announced that the main objective of energy and natural resources policy of the country is to increase its energy supply security both in the short-run and long-run. Thus, Turkish energy and natural resources strategy targets exploration and production of the domestic fossil fuels resources in order to reduce import dependency and diversify energy supply by achieving maximum use of domestic resources in production of electricity. In addition, investments and investment incentives on renewable energy resources as well as on construction of nuclear plants have been supported by new legal regulations (MENR, 2014).

Turkish energy sector is subjected to structural changes aiming at harmonization with the EU energy and environmental strategy in order to comply with the European internal energy market regulations to reduce CO₂ emissions. The strategies have been determined in accordance with matters of energy supply security where it is defined by the Ministry as "providing the energy resources to all consumers adequately, with high quality, at low costs, securely and in consideration of the sensitivities about the environmental matters" in the regional and global effectiveness of the country in the field of energy, environment and natural resources (MENR, 2014).

The Southern Gas Corridor beyond Nabucco: TANAP¹ and TAP
The Caspian region has significant oil and natural gas reserves from both offshore deposits in the Caspian Sea itself and onshore fields

¹ TANAP project was developed by Azerbaijan's state energy company, SOCAR, in collaboration with Turkish energy transmission company, BOTAS, and the Turkish national energy company, TPAO, is expected to deliver Shah Deniz gas to Europe through a new pipeline which will pass from the eastern border of Turkey to the western border.

in the Caspian basin. The oil and gas reserves are primarily focused on the coastal countries of the Caspian Sea; Russia, Iran, Kazakhstan, Turkmenistan, Azerbaijan and a small part of Uzbekistan's territory, along with its energy resources in the Caspian region. These countries have emerged as important global energy producers of natural gas (US.EIA,2014).

Russia is a major producer and exporter of oil and natural gas, and its economy largely depends on energy exports. It holds 1,688 trillion cubic feet (Tcf) of natural gas reserves, which account for about one-third of the world's total proven reserves. Russia is the largest gas producer and third largest producer of oil in the world, after Saudi Arabia and the United States as of January 1, 2013. Iran holds the world's fourth largest proved crude oil reserves and the world's second largest natural gas reserves. Despite the country's abundant reserves, Iran's oil production has substantially declined over the past few years and natural gas production growth has slowed down.

Table 1.Caspian Basins: Proved and Probable Reserves

Country	Crude oil (billion bbl)	Natural gas (Tcf)*
Azerbaijan	7	35
Iran	0.5	2
Kazakhstan	31.2	85
Russia	80	104
Turkmenistan	1.9	19
Uzbekistan	0	72
TOTAL CASPIAN	48.2	292
<i>Notes: Proved + Probable reserves exceed the value of proved reserves in EIA's International Energy Statistics.</i> <i>* Trillion Cubic Feet.</i> <i>Source: US.EIA,2014</i>		

International sanctions have greatly affected Iran's ability to produce and its energy sector. Sanctions have caused a number of cancellations or delays of major projects, resulting in declining of its oil and gas production capacity (US EIA, 2014).

Kazakhstan has an estimated 30 billion barrels of proven oil reserves and 85 trillion cubic feet (Tcf) of proven natural gas reserves as of 2013. The Tengiz and Kashagan fields are two of the

largest oil producing fields in the world. The Caspian Pipeline Consortium (CPC), which runs from Tengiz to Novorossiysk in Russia on the Black Sea Coast, is currently exporting Tengiz oil which accounts for nearly a third of total production of the country. Kazakhstan is a land locked country and therefore it does not have a seaport. This makes the country mainly dependent on pipelines for transportation of hydrocarbons. The country is an important oil and gas exporter and at the same time a transit country for pipeline exports from Turkmenistan and Uzbekistan. The existent infrastructure delivers oil to export markets through a pipeline to the Black Sea via Russia mentioned above, and another pipeline to the Mediterranean via Azerbaijan and Turkey; and through rail to Batumi, Georgia on the Black Sea. Kazakhstan has a contract with the Baku-Tblisi-Ceyhan (BTC) Pipeline Company to supply up to 500,000 bbl/d of oil via the BTC pipeline (US EIA, 2014). Azerbaijan has an estimated 7 billion barrels of proven crude oil reserves and roughly 35 trillion cubic feet (Tcf) of gas reserves as of 2013.

The country has emerged as an important oil and natural gas producer and exporter by being Caspian's most important strategic export source to the Europe. The largest hydrocarbon basins are located offshore in the Caspian Sea, particularly the Azeri-Chirag Guneshli (ACG) structure, which account for 75 percent of Azerbaijan's total oil output with about 5 billion barrels in 2013 (Karayianni, 2012:8; BP, 2014; US-EIA, 2014). Azerbaijan has three main export pipelines and exports about 80 percent of its oil through the BTC pipeline. The rest is sent by other two pipelines and also by truck and rail. The oil industry was transformed with the construction of the BTC pipeline which began its operations in 2006 while oil was delivered for the first time in October 2008. It provides a large transportation capacity out of the Caspian Sea which did not rely on using the congested Turkish straits or crossing Russian territory (US-EIA, 2014; OGI, 2014).

In 1994, the so-called "Contract of the Century" was signed between The State Oil Company of Azerbaijan Republic (SOCAR)² and the Azerbaijan International Operating Company (AIOC)³ which is a consortium of ten energy operating companies.

² The State Oil Company of Azerbaijan Republic (SOCAR) is responsible for producing oil and natural gas in Azerbaijan. It operates country's two refineries, runs country's pipeline system, and manages country's oil and natural gas imports and exports.

³ The AIOC includes BP, Chevron, Inpex, Statoil, Turkiye Petrolleri, Exxon-Mobil, SOCAR, ITOCHU and Hess.

The AIOC, led by BP, has invested in construction of several pipelines, including the South Caucasus Pipeline and the Baku-Tbilisi-Ceyhan (BTC) Pipeline which is one of the largest projects in the world.

It has also invested in extracting oil and natural gas from ACG oil fields in Azerbaijan's major offshore projects which provide oil to the BTC pipeline. Azerbaijan, Georgia, and Turkey are engaged in an active cooperation process of energy export and transit sectors which are heavily regulated and controlled mostly by state monopolies. This heavy state control has resulted in a state-centric harmonization process with a finite number of actors and strong compliance from participants.

The integration and cooperation process would provide;

- 1- Substantial Reduction on transaction costs for both state-owned and private enterprises which benefit from the reductions of inefficiencies and barriers to export.
- 2- Opportunity as a result of having deep ties to global markets, international financial institutions and certain national sectors which would increasingly be unified into a supranational system as a whole.

Azerbaijan has emerged as one of the world's large natural gas producers with a huge potential of new gas resources which is ready to flow into global markets via BTC. Recently, thanks to pipeline projects like BTC, Turkey has also become a key transit country as a result of being located on the shortest route of potential gas export from the Caspian Sea region to Europe. Following projects are the examples of several oil and gas pipeline projects, in use or under construction, to supply energy from the Caspian Sea region and the Middle East to the Balkans and Western Europe through Turkey.

Oil pipelines in Use, Under Construction or Planned:

- **Iraq–Turkey (Kirkuk–Ceyhan) Oil Pipeline:** It is Turkey's oldest oil pipeline with 970 km length from Kirkuk in Northern Iraq to Ceyhan in Turkey. It is under operation since 1977 with a capacity of approximately 20 million tonnes of oil per year.
- **Baku–Tbilisi–Ceyhan (BTC) Oil Pipeline:** It transports oil from the offshore Azeri-Chirag-Guneshli oil field via Georgia to the Turkish port of Ceyhan, mainly for exporting into global markets. The pipeline began its operation in 2006. The BTC pipeline system

runs around 1,100 miles from the Sangachal terminal near Baku, through Azerbaijan, Georgia, and Turkey, to the Mediterranean port of Ceyhan. The imported oil is shipped from Ceyhan to global markets by tankers. Recently the BTC pipeline system also transports approximately 1.2 million bbl/d amount of Kazakh oil, which is carried from Kazakhstan by tankers across the Caspian to the Sangachal Terminal near Baku (US-EIA,2014;OGJ,2014;ET,2014).

- **Baku–Tbilisi–Erzurum (BTE) Gas Pipeline:** It is also called as South Caucasus Gas pipeline and is designed to transport natural gas from the Sangachal terminal in Baku to Turkey via Georgia. First deliveries through the pipeline began on September 2006. The construction of the second branch of the Baku–Tbilisi–Erzurum gas pipeline began on October 2014 in Baku. Azerbaijan announced that this is the official inauguration of the construction of the Southern Gas Corridor that is the Trans-Anatolian route, TANAP, running through Turkey and the Trans-Adriatic gas Pipeline, TAP, from Greece to Italy as part of the new gas supply route to Europe and Turkey.
- **Iran–Turkey Natural Gas Pipeline:** The pipeline started deliveries of gas in 2001, with a capacity of 10 billion m³ of natural gas per year from Tabriz (Iran) to Erzurum.
- **The Blue Stream Gas (sub-sea) Pipeline:** It was constructed to deliver gas from Stavropol Krai in Russia, under the Black Sea, to the Durusu terminal in Turkey. It started to supply its full capacity of 16 billion m³ of Russian gas per year, with a length of 1,213 km, in 2005.
- **Iraq-Turkey Natural Gas Pipeline Project:** It is proposed to run parallel to the Kirkuk–Ceyhan oil pipeline (its length has not yet been specified) and to transport approximately 10 billion m³ of gas per year from the north-eastern part of Iraq to Turkey and to support BOTAS' gas delivery system
- **Persian Natural Gas Pipeline Project:** It is a natural gas pipeline project planned to transport Iranian natural gas from South Pars field in Iran to Europe through Turkey. The first step was made by signing a Memorandum of Understanding between Turkey and Iran to build the pipeline in 2008. But, almost no progress has since been reported by either Iran or Turkey mainly due to pressure on Turkish government by the West.

- **Arab Natural Gas Pipeline:** It is a 1,200 km long natural gas pipeline project which is expected to deliver 10.3 billion m³ of natural gas per year through Egypt, Jordan and Syria into BOTAS gas delivery system.
- **South Stream Natural Gas Pipeline Project:** The project will connect Russia with Europe's consumers by shipping Russian natural gas to Bulgaria and hence to continental and West Europe. The pipeline passes through Turkey's exclusive economic zone in the Black Sea. This pipeline project, led by Gazprom and Eni, is proposed to have a capacity of 60 billion m³ of gas per year. However, recently Russia declared that the project will not be realized as a reaction to Western response to Russia's annexation of Crimea.
- **Trans-Anatolian Gas Pipeline Project (TANAP):** It provides the shortest route to Europe is through Turkey, which will make the country an important transit point. Shah Deniz Stage 2 is a giant gas project which will open up the Southern Corridor. In October 2011, Turkey and Azerbaijan signed a number of agreements regarding prices, supply volumes and the transit of gas which Azerbaijan exports to Turkey. It is agreed that additional 10 billion m³ of Azeri gas supplies would transit Turkey annually and reach the borders of Greece in order to feed with gas the TAP. TANAP project's construction has started in March 2015.

The current dispute between Russia and Ukraine underlines the need for Europe to have multiple, hence diversified and secure energy supply routes to the market. Central Asian, Middle Eastern and Eastern Mediterranean gas reserves will be transported via Southern Gas Corridor (SGC) to Europe through Turkey (ET, 2014). European Commission began the SGC in order to diversify its supply sources away from Russia and to develop the infrastructure necessary for transporting natural gas from the Caspian Sea region and Middle East. The SGC is expected to flow natural gas primarily from Azerbaijan, Turkmenistan, Iraq and Iran to Europe in the long run. It is planned to transport Azerbaijan's natural gas from Shah Deniz Stage 2 (SD-2) Gas Field and other fields in the southern Caspian Sea to European Union territory through Italy in the short run. It is one of the largest energy projects in the global energy business in terms of initial investment costs, technical complexity, territorial coverage and multinational involvement.

The SGC consists of three pipeline segments. These are:

1. *South Caucasus Pipeline (SCP) or Baku-Tbilisi-Erzurum pipeline,*
2. *Trans-Anatolian Natural Gas Pipeline Project (TANAP), and*
3. *The Trans-Adriatic Pipeline (TAP), along the route from Shah Deniz and Baku to Italy.*

In recent years, Azerbaijan has become one of the most important oil suppliers to the Italian market thanks to Baku-Tbilisi-Ceyhan (BTC) pipeline. Now, similarly the construction of Trans Adriatic Pipeline AG (TAP) will provide a significant role to Azerbaijan in Italian natural gas market. The final infrastructural shape of the Southern Gas Corridor will likely be drawn by the pipeline joint of TANAP and TAP. (Tagliapietra, 2014-b:6: US-EIA, 2014). The South Caucasus Pipeline (SCP) is the first part of the Southern Gas Corridor (SGC), with approximately 700 kilometers in length, and runs from Baku, Azerbaijan and Georgia to the border of Turkey. Since 2006, Baku-Tbilisi-Erzurum pipeline was interconnected to SCP pipeline and has been transporting natural gas from the Sangachal terminal in Baku to Turkey via Georgia. The construction of the second branch of the Baku-Tbilisi-Erzurum gas pipeline began on October 2014. The construction of the Southern Gas Corridor will be completed by the Trans-Anatolian Route (TANAP) running through Turkey and the Trans-Adriatic Gas Pipeline (TAP) from Greece to Italy as part of the new gas supply route to Europe and Turkey (Jarosiewicz, 2014).

TANAP will deliver the natural gas from the natural gas reserves located in the Shah Deniz-2 Field in Azerbaijan, as well as other gas fields in Azerbaijan and in other possible neighbouring countries to Turkish domestic market and to the European countries. Governments of Turkey and Azerbaijan signed a Memorandum of Understanding on December 2011 in Ankara. A joint consortium was constituted for this project by State Oil Company of Azerbaijan (SOCAR), Petroleum Pipeline Corporation of Turkey (BOTAS) and Turkish Petroleum Corporation (TPAO) (ET, 2014). As it was mentioned earlier, the construction of the project has begun in March 2015. TANAP, as one of the world's largest energy projects, has been envisioned in four phases. The first phase will be accomplished with a planned initial flow of natural gas in 2018. Shah Deniz Phase II will flow gas from Azerbaijan via Georgia to Turkey through TANAP and will reach the Turkey-Greece border. In the

amount of 10 bcm/annual, natural gas will flow via TAP through Greece and Albania to Italy to the European market. The second phase aims to increase annual gas capacity up to 16 bcm by the end of year 2020. Third phase aims to reach annual capacity of 23 bcm as of 2023. Finally, the fourth phase is planned to reach to the level of 31 bcm/annual in 2028. The project is considered as an alternative route for transportation of Turkmenistan natural gas to Turkey and Europe (ET, 2014; TANAP, 2014; IEA, 2014).

TANAP project is expected to provide significant contributions in terms of:

- *Secure supply of natural gas to European markets and*
- *Adequate supply for increasing demand of natural gas in Turkey while contributing to the socio-economic development of the country.*

Azerbaijan, as the main shareholder of TANAP, has operating rights via SOCAR with 80 percent shares and also will remain the main investor proportional to its ownership stake, in 2014. Turkey's state companies, BOTAS and TPAO have 15 percent and 5 percent shares respectively. Estimated construction cost ranges widely from 7 billion USD to 12 billion USD depending on the capacity and scalability of the SCP and TANAP pipelines. The project is expected to make important contributions both to the security of natural gas supply and to the regional targets of the partner countries in the field of energy (TANAP, 2014). The Trans-Adriatic Pipeline (TAP) is the third segment of the strategic Southern Gas Corridor which will add to Europe's security of supply. It is planned to connect with TANAP at the Turkey-Greece border. Then it will run across Greece, Albania and on the seabed of the Adriatic Sea, ending in southern Italy. Turkey, as a transit country for energy supply to the EU, has been supported by EU and a giant collaboration in the field of energy between Turkey and Azerbaijan has been realized on June 2012 (TANAP, 2014).

The European Commission regarded Turkmenistan as an integral part of the planned Southern Corridor and also potentially as the main gas supplier into the Southern Gas Corridor. Following negotiations between EU Commission and Turkmenistan about Turkmen natural gas, delivery of Turkmen gas into the projected Trans-Caspian Pipeline (TCP) which will be connected to Europe via TANAP was agreed. Turkmenistan proposes to supply up to 40

bcm/annual of gas into the Southern Corridor (TANAP, 2014). The Nabucco gas pipeline project (25-30 bcm) aims at directly connecting the Caspian Sea and the Middle East regions' gas resources to the EU gas markets. Western part of the Nabucco project envisions the construction of a pipeline from the Turkish-Bulgarian border to Austria through Bulgaria, Romania and Hungary. The project aims to reach alternative suppliers, sources, and routes due to the Russia-Ukraine natural gas disputes. It is expected that European dependence on Russian energy, as Russia being the biggest supplier of gas to Europe, will lessen due to diversification of the natural gas suppliers and delivery routes. The project has strategic importance not only in terms of diversification of supply but also stimulation of competition in the Trans-European Networks Energy (TEN-E) program. Although the Nabucco is supported by the European Union and the United States, it unfortunately created a negative legacy in Turkey as far as the energy cooperation with the EU is concerned. It is recommended to revive the EU-Turkey natural gas relations, especially considering that the market and political environment on which Nabucco project was developed is rapidly transforming. The Nabucco project aims at reducing Europe's energy dependence on Russian energy and is in competition with the Trans-Adriatic Gas Pipeline Project for Shah Deniz II gas. In 2013, Azerbaijan's State Oil Company (SOCAR) won a tender to take control of Greece's national natural gas transmission system operator, DESFA. Then, Azerbaijan and The Shah Deniz Consortium determined the criteria to select the best route on the basis of commerciality, project deliverability, engineering solutions, operability, scalability and financial deliverability. As a result of these criteria, TAP was selected as the final choice among the four competing pipeline projects. Later, as a result of this decision, the General Assembly of the project sponsor of Nabucco Gas Pipeline project decided to suspend its operation and began liquidation procedures (ENTSOG-2014; Jarosiewicz, 2014).

The Shah Deniz Consortium selected Italy as the final destination of the Southern Gas Corridor even though Italian market is currently over supplied and highly diversified. The Consortium justified its decision by pointing at the high gas prices and a strong commercially viable market in Italy. Azerbaijani experts claim that the situation of over supply in the Italian market is an asset for the Shah Deniz Consortium and Azerbaijan, be-

cause the Shah Deniz gas could easily be carried to neighboring European countries through existing and new gas pipelines from the Southern part of Italy northwards (TJF Report, 2014). These two developments prepared the ground for achieving a gas distribution network for Caspian Sea gas in Southeastern Europe. For the first time, Azerbaijani gas can go directly into EU markets. It is important to secure natural gas imports as promptly and efficiently as possible from Azerbaijan to Europe. The practical realization of this strategic objective is achieved through the Southern Gas Corridor (SGC) and the Shah Denizgas field that will bring Caspian gas to Europe. The estimated amount of the natural gas that will be transported from Azerbaijan's Shah Deniz-2 (SD-2) region is around 1.2 tcm. It is one of the largest gas developments in the world and it will surely help increase energy flow to European markets through the opening of the new Southern Gas Corridor (IEA, 2014). The main risk to the SGC comes from its competitor; the prospective South Stream Gas Pipeline by Russia. It is a politically motivated project with rather little economic sense. If SGC is realized, Russia will lose its ability to set prices using oil indexation and monopoly power over energy markets (TJF Report, 2014). It is projected that Europe will be largest natural gas market by 2035. The EU countries need cheap gas to maintain the competitiveness of their products and to resist against challenges including competition from emerging markets, rising global energy demand and unreliable suppliers, especially from the Middle East. It is believed that total amount of gas that will flow through the SGC cannot sufficiently meet Europe's demand. However, it will definitely contribute to diversification of energy sources, boost competition in Europe and provide end buyers a leverage to negotiate gas prices with other suppliers (UPA, 2013; TANAP, 2014). Finally, SGC projects including TANAP, as strong alternative energy routes, will contribute to energy security of Turkey and Europe. Besides they will be a valuable step to achieve Turkey's regional ambitions in the energy sector. It will require direct investment of 8 billion USD via SGC and this amount will also contribute to the Turkish economy. The SGC will start to deliver gas from Azerbaijan to Turkey in the second quarter of 2018 and rapidly will extend to Europe as early as 2019 (IEA, 2014; TANAP, 2014).

Conclusions

Turkey does not have a significant amount of fossil fuel reserves and increasing energy demand has been met by imported natural gas leading high level of dependency on external suppliers. The security of natural gas supplies, as one of Turkey's main policy objectives, can be assured only with the diversification of natural gas supplies. Besides meeting energy need, Turkey wants to become a regional natural gas hub in the long run. It is certain that the real underlying force of this development will come from the demand side. As in the famous old English proverb, "Where there's a will, there's a way." Since majority of countries producing natural gas are located around Turkey, it will likely to have the potential to transport significant volumes of gas to the EU. But this potential will become a reality only if the EU market actually needs more natural gas supplies and Turkey could establish solid relationship with all natural gas producing countries in the region by means of dealing in the right way with the current infrastructural, commercial, and political barriers. A prior but major natural gas crisis between Russia and Ukraine occurred in January 2009 and caused humanitarian crises in several Central and Eastern European countries that were strongly dependent on Russian gas supplies through Ukraine. This crisis paved the way for the promotion of the opening of the Southern Gas Corridor with the original concept of the Nabucco pipeline and finally via TANAP and TAP. The recent dispute over Ukraine fueled these worries even more. As a result, newly developed gas reserves in Caspian Sea Region will have high influence on security of supply and diversification of routes and resources in all countries all over Europe. These developments can potentially effect the EU-Turkey energy relations by means of new transmission projects with more capacities. The prospect of the Southern Gas Corridor and the outlook of Turkey's potential to become a regional energy hub can be addressed to energy related negotiations between EU, gas producers and transit countries. Turkey should express its intention to deepen policy dialogue with key partners, countries in the region based on mutual benefit and interest in order to strengthen energy security, economic competitiveness and sustainability.

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