

**EVALUATING THE NATURAL GAS POLICIES OF THE THREE
NATURAL GAS GIANTS: A COMPARATIVE ANALYSIS OF IRAN,
RUSSIA AND QATAR**



ZEYNEP OKUR

JUNE 2016

**EVALUATING THE NATURAL GAS POLICIES OF THE THREE
NATURAL GAS GIANTS: A COMPARATIVE ANALYSIS OF IRAN,
RUSSIA AND QATAR**

A THESIS SUBMITTED TO

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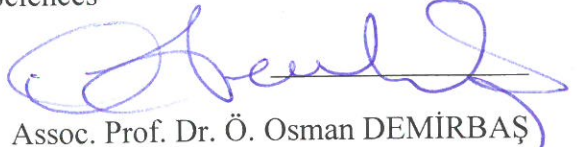
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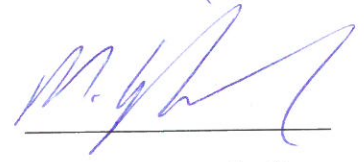
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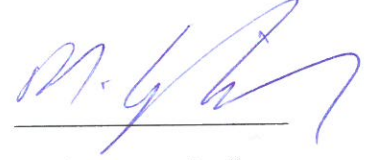
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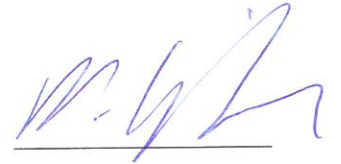


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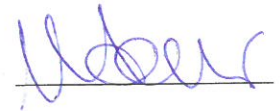
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ABSTRACT

EVALUATING THE NATURAL GAS POLICIES OF THE THREE NATURAL GAS GIANTS: A COMPARATIVE ANALYSIS OF IRAN, RUSSIA AND QATAR

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Sustainable Energy Master Program

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In recent century, natural gas has been the most accepted fossil fuels for several countries' foreign energy policy because a range of chain of events has augmented the awareness of the importance of natural gas especially since 2000s. The competition among the most significant natural gas players is the most explicit driving force behind these chains of events. In line with existing literature, this study focuses on three natural gas giants as Russia, Iran, and Qatar. The main aim of this study is to compare the natural gas role in foreign policy making in the countries respectively Russia, Iran, and Qatar by evaluating the concept of geopolitics regarding their natural gas consumption, production, reserves, and their trade movements. Afterwards, this study purposes to evaluate the current issues in the literature. This study evaluates three natural gas giant for a different perspective. For this reason, this study attempts to analyse these three giants from a new framework. This new framework will analyse these countries regarding the issue of reliability of security, long term contract, GECF membership, pipeline connection to main consumers, owns its LNG fleets, LNG Exporter, resource curse, using energy as a foreign policy tool, existing projects and investments and specified targets. Within this framework, it is concluded that each three giant

country are quite significant in the global natural gas arena. Each of them has different roles and compete each other in varying aspects.

Keywords: Natural Gas Policy, Russia, Iran, Qatar, Comparative Analysis, Geopolitics



ÖZET

ÜÇ DOĞAL GAZ DEVİ'NİN DOĞAL GAZ POLİTİKALARININ DEĞERLENDİRİLMESİ: İRAN, RUSYA VE KATAR'IN KARŞILAŞTIRMALI ANALİZİ

Okur, Zeynep

Sürdürülebilir Enerji Yüksek Lisans Programı

Tez Yöneticisi: Doç. Dr. Mehmet Efe Biresselioğlu

Haziran 2016

Son yüzyılda, bir dizi olaylar zinciri özellikle 2000lerden bu yana doğal gazın önemini arttırmış olduğundan doğal gaz, birçok ülkenin yabancı enerji politikası açısından en kabul edilebilir fosil yakıtı olmuştur. En büyük doğal gaz oyuncularındaki rekabet bu olaylar dizininin arkasındaki en belirgin itici güçtür. Mevcut literatür ile paralel olarak bu tez en büyük üç doğal gaz devi olan Rusya, İran ve Katar üzerinde yoğunlaşmaktadır. Bu tezin ana amacı, doğal gaz tüketimi, üretimi, kaynakları ve ticari hareketler açısından jeopolitik kavramını değerlendirerek sırasıyla Rusya, İran ve Katar'ın yabancı politikasında doğal gazın rolünü karşılaştırmaktır. Bununla birlikte bu çalışma, içerdiği literatürdeki güncel konuları değerlendirmeyi amaçlamaktadır. Bu çalışma, üç doğal gaz devi ülkeyi farklı bir açıdan değerlendirmektedir. Bu sebeple bu çalışma, yeni bir çerçeveden bu üç doğal gaz devini analiz etmektedir. Bu çerçeve, güvenlik güvenilirliği, uzun dönemli anlaşmalar, Gaz İhraç Eden Ülkeler Forumu (GECF) üyeliği, ana müşterilere boru hattı bağlantısı, sıvılaştırılmış doğal gaz (LNG) filosu edinme, sıvılaştırılmış doğal gaz (LNG) ihracatı, bolluk paradoksu, enerjiyi yabancı politika aracı olarak kullanma, mevcut projeler ve yatırımlar ve belirtilmiş amaçlar konularına istinaden bu üç ülkeyi analiz edecektir. Bu çerçevede, söz konusu her bir doğal gaz devi ülkenin küresel doğal gaz sahnesinde oldukça

önemli olduđu sonucuna varılmıştır. Her bir ülkenin farklı bir rolü vardır ve bu üç doğal gaz devi ülke birçok alanda birbirleriyle yarışmaktadır.

Anahtar Kelimeler: Doğal gaz politikası, Rusya, İran, Katar, Karşılaştırmalı Analiz, jeopolitik



TO MY MOM AND DAD



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CHAPTER I

Introduction

In the 21st century, natural gas as a fossil fuel has become one of the most critical and preferable energy sources in the recent global arena. Yergin and Stoppard (2003) clearly argued in their study that there has been an increasing impact of natural gas on global energy markets after becoming popular. They claimed that natural gas usage would have a large-scale control over the world economies, which are as follows: getting new advantages and disadvantages; holding new interdependencies; and gaining new political cohesions. Apart from that, Yergin and Stoppard (2003) compared with other fossil fuels; natural gas is cleaner concerning CO₂ emission. It causes competition among countries within natural gas industry.

US Energy Information Administration (2016) stated that unlike oil market, natural gas market not only has fragmented structure but also holds deficiencies of transparency. In other words, Zajdler (2012) mentioned that in natural gas market, there is a long-term contract between producer countries and consuming countries but these contracts are both absence global and regional transparency. The reason of this transparency is related to natural gas prices, which are commercially consulted. On the other hand, the way natural gas is supplied is another critical issue. It is procured via pipeline or LNG. Regarding the supply of natural gas, 'a number of concepts gain importance are as follows: security of supply, availability, accessibility, and affordability of natural gas' (Yergin 2006; pp. 69-82).

Figure 1.1 shows how the position of global primary energy consumption changed between 1990 and 2014 while Figure 1.2 demonstrates the place of natural gas consumption among the other energy sources in 2014.

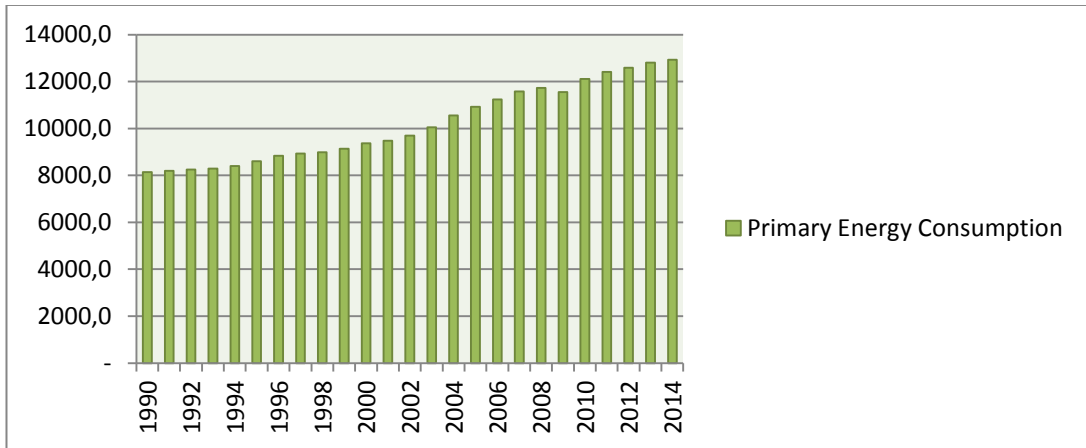


Figure 1.1 The World's History of Global Primary Energy Consumption (mtoe) from 1990 to the late 2014

Source: BP (2015)

Energy is an imperative need for foreign policy of every state. As shown by figure 1.1, between 1990 and 2014, a steady increase was observed in world's primary energy consumption. In this context, different countries attach importance to different energy sources due to their geographical location and geopolitical position. Following this, the share of global energy sources at the end of 2014 is illustrated in figure 1.2.

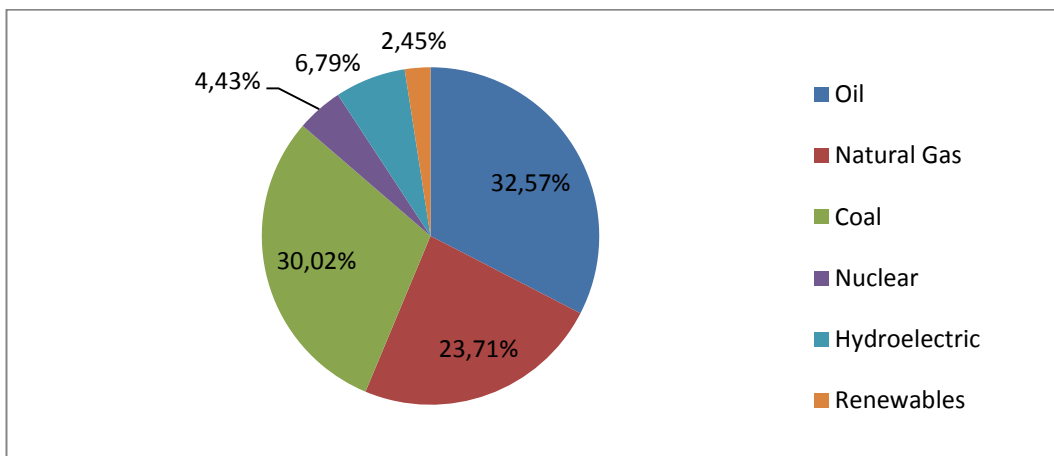


Figure 1.2 The World's Primary Energy Consumption according to Fuel Types in the late 2014

Source: BP (2015)

According to figure 1.2, the world's top three preferable energy sources are oil, coal, and natural gas whereas nuclear, hydroelectric, and renewable remain in the background. The share of natural gas was the third largest resource with 23, 71% after oil and coal in the late 2014 as the global primary energy consumption. In

addition to this, “the oil’s share was 32, 57% whereas the share of coal was 30, 02% at the end of 2014” (Figure 1.2). Although the share of oil and coal was larger than natural gas in 2014, natural gas played the most critical role in the country’s energy policies, especially by surpassing other resources regarding its significance after 1990s.

Furthermore, in recent times, exhaustion has been observed in global natural gas resources. US Energy Information Administration (2016) stated that this tiredness results in transporting natural gas more costly, recognizing the significances of location, and increasing intention of several gas producers as having monopoly power. Nonetheless, ‘global energy market has become more incorporated. “The main reason of this integration is the progress of LNG technologies and trade” (Aune, Rosendahl and Sagen 2009; pp. 39-53). In addition to this, they believed that at the beginning, natural gas supply via LNG was materialized in the regional market; however, after the growth of LNG technologies, natural gas supply with LNG has started to deliver to the global arena.

In general, world’s natural gas market is dominated by numerous players. The major producing regions are as follows: North America, which is an essential natural gas producer; South America, Middle East, Europe & Eurasia which are the largest producers and exporters; and Europe, which is main natural gas importer. They have different market structures based on geographical and political concerns, and different degrees for the supply of natural gas. In figure 1.1 and figure 1.2, the share of global natural gas production and consumption by region at the end of 2014 is clearly shown.

As shown in Figure 1.3 and 1.4, Europe & Eurasia, North America, and Middle East are the top three regions in terms of natural gas production whereas Europe & Eurasia, North America, and Asia Pacific are the top three regions with regard to natural gas consumption.

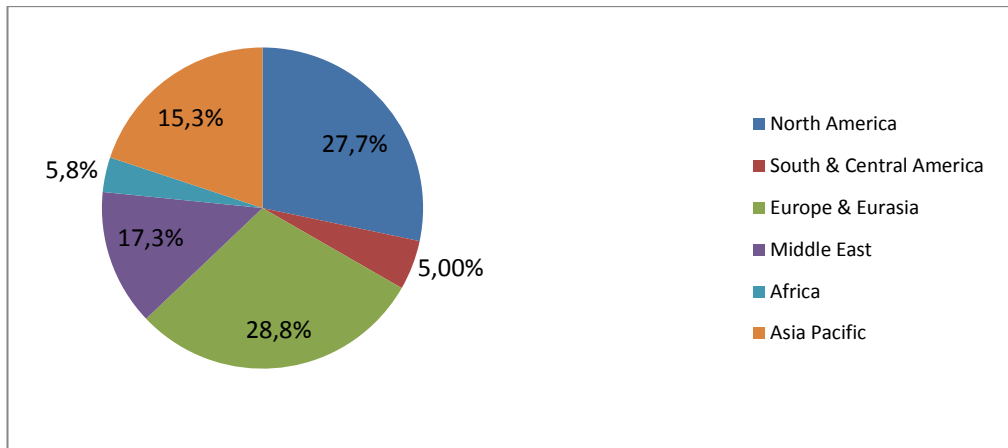


Figure 1.3 The Share of Global Natural Gas Production by Region in late 2014
Source: BP (2015)

Besides, holding largest natural gas reserves is essential for the countries in order to generate adequate natural gas and compensate global natural gas demands. In this sense, one of the most critical issues for the countries is to find out new resources and new reserves with the aim of being an influential energy player. In addition, new progresses are witnessed in the position of global natural gas reserves. In the light of these, having the biggest natural gas reserves of the countries affects the increase in global natural gas demand.

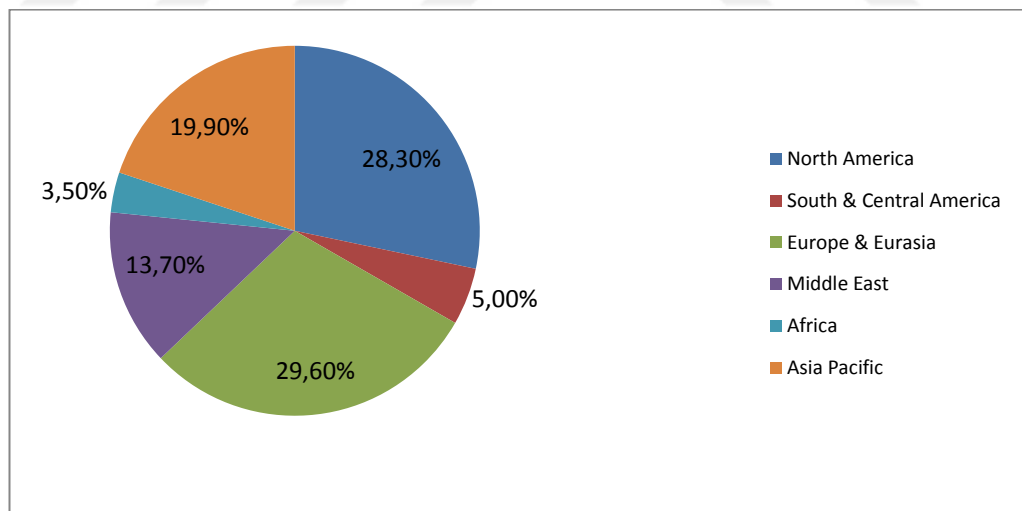


Figure 1.4 The Share of Global Natural Gas Consumption by Region in late 2014
Source: BP (2015)

The natural gas production of the countries depends on their substantial natural gas reserves.

“The shares of the world’s natural gas reserves are reported to be placed in the following regions: Middle East with 42.7%, Europe & Eurasia with 31, 0%, Asia Pacific with 8, 2%, Africa with 7, 6, North America with 6, 5%, and South & Central America with 4, 1% in the late 2014” (BP, 2015).

Following these, according to BP (2015), the top ten countries in terms of natural gas reserves held are Russia, Iran, Qatar, US, Saudi Arabia, Turkmenistan, United Arab Emirates, Venezuela, Nigeria, and Algeria. International Energy Agency (2015) noticeably stated the richest natural gas reserves for these ten countries are as follows: Russia’s Siberian fields; Iran’s South Pars; Qatar’s North fields; US’s Barnett, Saudi Arabia’s Ghawar; Turkmenistan’s Amu Darya; United Arab Emirates’ Abu Dhabi fields; Venezuela’s Anaco, Barrancas and Yucal Place; Nigeria’s Amenam-Kpono, Bonga and Akpo; and Algeria’s Hassi R’Mel.

As stated by International Energy Agency (2015), the place of global natural gas in the global energy mix will maintain its increase by 2% per year from 2014 until 2020 and regarding the world’s primary energy mix, it holds 21% share. IEA (2015) also reported that the increase of global natural gas share is expected not only to overpass coal in global energy consumption but also to outface oil in the transportation segment. Following these, the majority of countries focus more on the natural gas rather than oil and coal. In accordance with BP (2015) data, in figure 1.5, top ten countries in natural gas producing and consuming are demonstrated in the company of their total share in late 2014.

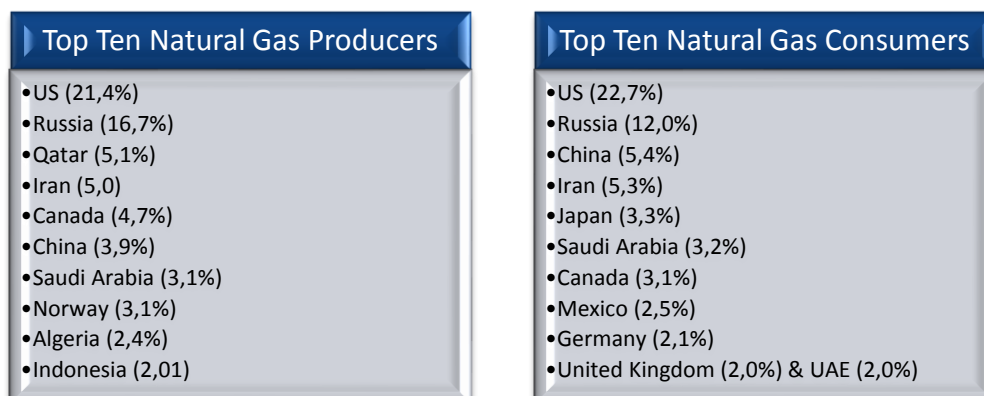


Figure 1.5 The List of Top Ten Global Natural Gas Producer and Consumer with determining their total shares in the late 2014
 Source: BP (2015)

As it is seen from the Figure 1.5, US, Russia, Qatar, Iran, and Canada are the world's leading natural gas producers respectively whereas US, Russia, China, Iran, and Japan are correspondingly the chief natural gas consumers. EIA (2015) explained that recently in US, by gaining self-sufficiency; new types of energy resources have emerged as unconventional resources called shale gas, defined as a fine-grained sedimentary rock which forms from the compaction of silt and clay-size mineral particles. This shale revolution in US concerns a number of natural gas producer, especially Russia as the main actor in this thesis. "The main reason behind is that Europe's chief natural gas supplier has been Russia so far however; US may become an alternative supplier of Europe after this unconventional revolution" (Kim and Blank 2015; pp. 95-112) In addition to this, a decline in oil prices has been observed nowadays. EIA (2015) reported that the increasing shale production of US is the primary reason of this decline in oil prices. Ramady (2014) stated that particularly; OPEC members like Saudi Arabia and Kuwait, main oil producers consider US' great shale production as a threat. Therefore, they are not only increasing production but also keep oil prices low. EIA (2015) also added that this decline in oil has influenced natural gas industry in terms of price, demand, and producers. For instance, natural gas demand increase results in intense competition and affects gas prices.

Meanwhile, the world's top ten net exporters and importers are reported by Key World Energy Statistics of IEA (2015) as exporters; Russia, Qatar, Norway, Turkmenistan, Canada, Algeria, Indonesia, Netherlands, Nigeria, and Australia, and as importers; Japan, Germany, Italy, China, Korea, Turkey, France, US, UK, and Spain. Yet, BP (2015) reported top ten natural gas exporters different than IEA (2015) reported. Top ten natural gas exporters by BP are as follows: Russia, Qatar, Norway, Canada, Netherlands, US, Algeria, Indonesia, Trinidad & Tobago, and UK.

In accordance with global natural gas consumption, global natural gas trade extends comprehensive in the company of rising share of LNG demand. Nowadays, Middle East most particular Qatar has appeared as a foremost producer of LNG that procures Atlantic basin and Pacific basin. The biggest importers of LNG are Japan and Korea following Taiwan, Thailand, and China. According to the EIA (2015), LNG imports will override the pipeline imports as a central way of supplying natural gas by 2035.

This study comprehends that energy and geopolitics are closely associated with each other especially regarding the country's natural gas trade as the core energy sources of this study and the significance of geopolitics is non-negligible. In the 21st century, natural gas has become more attractive than other fossil fuels with increasing natural gas producer and consumer countries. Besides, the natural gas geopolitics has been developed perpetually by way of new emerging gas players. In this context, this study purposely selects concentrating on three countries that are namely as top three natural gas giants namely Iran, Russia and Qatar. From this study's point of view, it is analysed whether these three gigantic natural gas players holding the foremost position affect the global gas market or not.

Hence, the main aim of this study is to scrutinize the existing natural gas policies of Russia, Iran and Qatar, comparing with each other. Moreover, this study aims to evaluate the role of these three natural gas giants from the perspectives of comparative analysis and geopolitics.

This study is divided into the five following sections. The primary section is composed of Chapter II. This study initially endeavours to stress the correlation between energy and geopolitics. The focal purpose here is to clarify the function of the geopolitics in the global natural gas market. Descriptions of geopolitics and comparative analysis will be presented as the main notions in order to recognize and assess the core subjects under the main theme. Then, major hypothetical argument is connected with the comparative analysis technique and geopolitics with three giants.

The second section of the study contains of Chapter III. In Chapter III, this study investigates the geopolitical development of Iran's natural gas industry from the shadow of Iran Islamic Revolution, Iran-Iraq War, and Iran's foreign sanctions. Furthermore, the potential of Iran's natural gas reserves, productions, consumptions, exports and imports, pipelines, and projects will be analysed with supporting graphs and tables.

The third section of the study consists of Chapter IV. In Chapter IV, this study examines the geopolitical growth of Russian natural gas market from the collapse of Soviet Union to the conflict between Russia and Ukraine. Moreover, the potential natural gas reserves of Russia, the country's position in production, consumption,

exports and imports, pipelines, and projects will be evaluated by using graphs and tables.

The fourth section of the study includes of Chapter V. In this part, the geopolitical improvement of Qatar's natural gas industry will be analysed in terms of the country's potential natural gas reserves, the position in natural gas production and consumption, the situation of gas exports and imports, potential pipelines, and projects will be indicated by using graphs and tables.

The fifth and the final section of the study comprises of Chapter VI and Chapter VII. In Chapter VI, three natural gas giants namely, Iran, Russia, and Qatar will be compared and contrasted regarding to the this study's analysis and the standpoint of Gas Exporting Countries Forum (GECF) under the concept of geopolitics. The concluding chapter is Chapter VII where main ideas and main results of this study will be presented.

CHAPTER II

2.1 Theoretical Framework

Hence, the main aim of this study is to scrutinize the existing natural gas policy of Russia, Iran and Qatar, comparing with each other via trilateral analysis in global natural gas market in terms of their natural gas policy making including the data related to production, consumption, reserves, trade, and diplomacy. Furthermore, this study will analyse the possible changes of these countries' role in the global natural gas market.

The scope of this study covers the following: the importance of top three global natural gas players; geopolitics of natural gas, and the role of these countries

2.2 Research Questions

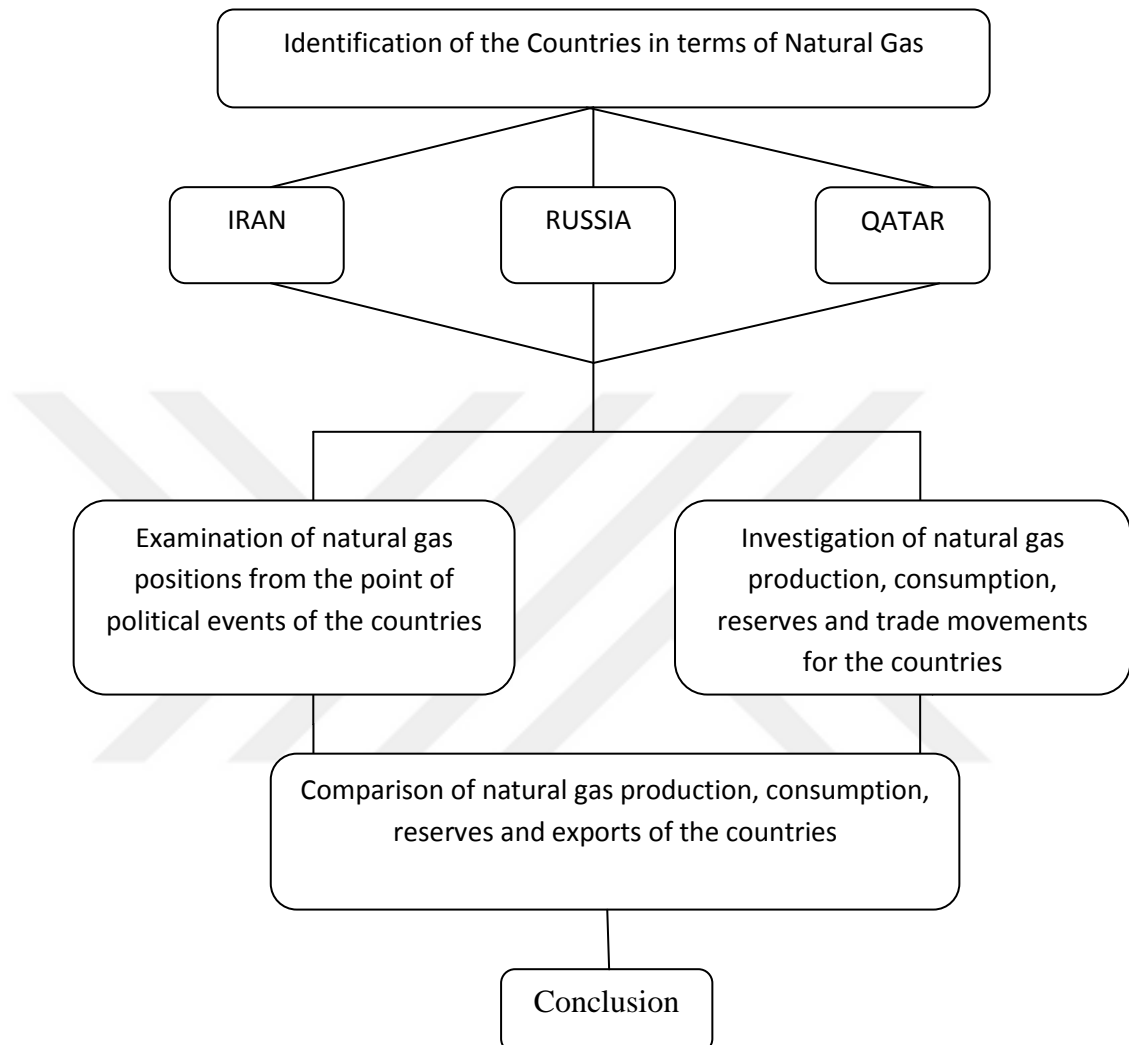
By analysing the natural gas geopolitics of three main natural gas players i.e. Russia, Iran, and Qatar, this study answers the following questions:

- i. What is the influence of sanctions on Iran's natural gas issues?
- ii. Does Iran challenge Russia's dominant position in the EU gas market as an alternative gas supplier?
- iii. Is Russia a rival to Iran with its newly emerging LNG sector?
- iv. How is Qatar using its LNG supplies to strengthen its influence on the world LNG market?

2.3 Methodology

The main instrument for examining the research questions in this study is the comparative analysis. This method is used to present the current geopolitics of three main natural gas giants in the world. This study uses the data from the World Bank Data, U.S. Energy Information Administration Statistics and Analysis, BP Statistical Review of World Energy to 2015 Workbook Data, and Oil and Gas Journal. In figure 2.1, the general characteristics of this study are illustrated. After indicating the first three countries' natural gas positions in the political agenda, the natural gas productions, consumptions, reserves, and trade movements is analysed by using

graphs and charts. Then, the countries are compared in terms of their natural gas policy and geopolitics. In consequence of these analyses, this study will reach a feasible conclusion.



**Figure 2.1 Methodology of the Thesis
(Illustrated by the author)**

As mentioned, this study takes advantage of comparative analysis which is used by many disciplines such as political sciences, social sciences, and international relations. There are different expressions for the comparative analysis in different literature reviews. For instance, the first definitions stated that “This technique is not a technique of measurement but it is based on looking at empirical relationships among variables” (Lijphart 1971; pp. 682.693). Moreover, Collier (1993) defined a comparative analysis based on Lijphart’s statements. Collier (1993) pointed out that comparative analysis is seen mostly in political and social science disciplines. He

also asserted that this method includes three components that are as follows: statistical analysis, experimental research, and historical studies. Rihoux and Ragin (2009) stated that comparative analysis is a leading ingredient for a majority of empirical scientific area.

As well as not being a narrow method, the comparative analysis is a general method especially for political phenomena. The reason for using comparative analysis is clearly identified to understand the role of three natural gas giants i.e. Russia, Iran, and Qatar. In the global natural gas market by means of similarities and differences among them, this method is used in different studies related to energy issues such as natural gas, oil, coal, and renewable. Comparative analysis has inspired a number of different studies regarding their methodology and literature. There are numerous similar studies already existing as a sample for this study.

Firstly, Roupas, Flamos, and Psarras (2011) analysed oil and gas supply for EU member states regarding the dimensions or vulnerability of oil and gas. They take advantage of the comparative analysis by using six indicators that are the key ideas for the security of supply. Secondly, Urmonas and Kanapinskas (2010) discussed the core aspects of the legal status for natural gas market regulatory institutions in Lithuania and EU member countries by using comparative analysis method. In their study, they compared Lithuania and EU member countries concerning their legal status of natural gas market regulators and legal status of commissions by analysing their positive and negative elements. They compared these features further by using tables. Thirdly, Xing and Yuan (2010) examined the energy strategy for both US and Russia in the Middle East. The literature and methodology of their study are based on the comparative analysis technique with similarities and differences. The issues of energy security and the Middle East as a strategic importance for oil and natural gas are the common issues between the US and Russia. In contrast, US wants to protect its status as the world's superpower while Russia wants to increase its economic power by using energy as a tool and improve its cooperation with Middle East in order to outface US authority. In addition, two countries have different diversification of energy policy, which was compared in their study.

Similarly, Kuntay (2014) used comparative analysis for methodology of his study. The main aim of his study is to compare regional competition of Turkey and Egypt in

the Middle East. He compared two countries in terms of their GDP development in Middle East and their economic and political capabilities in the Middle East by using graphs. Next, Campoccia, Dusonchet, and Telaretti (2014) compared six representative EU countries i.e. France, Germany, Greece, Italy, Spain, and UK concerning feed in tariffs (FiT) for solar Photovoltaic. The methodology of their study bases on comparative analysis method with supporting graphs and calculation of economic indexes. They compared six EU countries to determine their main differences regarding the implementation of FiT support policies for PV systems by means of graphs and the calculation of economic indexes. Finally, Lacher and Kumetat (2011) compared energy infrastructure and energy supply of Europe and North African states. They discussed Europe and North African states' geopolitical differences, security of energy supplies, security of renewable energy infrastructure, and their political and security threats by way of comparative analysis technique. In this way, in consideration of these different examples, this study benefits from comparative analysis method with similarities and differences among Russia, Iran, and Qatar by using graphs, tables, and charts.

2.4 Geopolitics

This study will use 'Geopolitics' together with comparative analysis to examine the role of aforementioned countries' role in global natural gas market. There is a close link between energy and geopolitics. The reason of the choosing this subject is the importance of Russia, Iran, and Qatar in both international arena and regional topics in terms of energy, economics, and politics. Competition is seen among three giant countries with regard to their natural gas geopolitics. This competition among them has an enormous potential to impact multi-polar world order and other states. Therefore, this study will examine numerous features of competition among three giants. A significant number of academic studies have focused on 'Geopolitics'. In this literature review, the definitions for geopolitics concept, the development of geopolitics, and the linkage between natural resources and geopolitics will be analysed. Before natural gas, oil had a significant role in the world's energy order. However, natural gas has become an important concept. Nowadays, all states determine their energy policy by using natural gas. For that reason, this study will evaluate three natural gas giants in the light of geopolitical concepts with the help of comparative analysis method.

Geopolitics is described as a concept. In several academic studies, there are different definitions for 'Geopolitics' in different academic literature from different times. Common definition for geopolitics cannot be found in the literature, even in the recent studies. There were two types of geopolitics as classical geopolitics and critical geopolitics, which caused the development of the term 'Geopolitics'. Chapman (2011) mentioned that there were three core ideas for determining classical geopolitics, which were American theory, British theory, and German theory.

According to Chapman (2011), Alfred Thayer Mahan (1840-1914), who was the core figure of American idea regarding geopolitics, described geopolitics as sea power, the maritime, merchant, and naval marine. Additionally, Chapman (2011) suggested that Karl Haushofer (1869-1946) and Friedrich Ratzel (1844-1904), who were the leading German geo-politicians, defined the basis of geopolitics with three key ideas i.e. the interest of nation, living space, and population. Hagan (1942) began to present in his essay two ideas about the meaning of geopolitics, which was a vital discussion among geo-politicians. Hagan (1942) firstly explained the idea of Karl Haushofer, who was one of the initial writers in German geopolitics. He described geopolitics as the origin of political deals and scientific establishment of art's basis. Another idea about the geopolitics was discovered in Berlin-Grunewald in 1928. Berlin-Grunewald was a German geopolitical school where geopolitics is defined as incorporation of political incident and geographical settings of these political experiences. In addition to this, Hagan (1942) suggested that the core scheme of geopolitics bases on the state's geographic ethics, which was the core idea of Mackinder's Heartland theory for geopolitics.

'Halford Mackinder (1904-1943), who was a British geographer, improved his geopolitical idea by discovering that history is mainly related with geographical settings and he further provided evidence to define how geography shaped state's activities all over the world history'(Sempa 2015; pp. 613-619). In the light of Mackinder's geopolitics, the concept of geopolitics has been developed further. Sempa (2015) presented the key features of Mackinder's geopolitics as follows:

- i. advantages and restrictions of geography,
- ii. conflict between sea powers and land powers,
- iii. relationship between man and geography through technological effects,

- iv. significance of history on the geographical circumstance,
- v. the importance of population impact,
- vi. definition of planet as the connection of political system,
- vii. allocation for the world's balance of power.

These elements brought light to the development of geopolitics in the history. In fact, in the past and in recent times, the main priority of the geopolitics is the states' development and their politics. Also, the geopolitics of earth has been changed by existing events. Halford Mackinder's and Karl Haushofer's geopolitics were defined in the time of two important events i.e. First World War and Second World War. As a result, the concept of geopolitics has been progressed. This is exemplified in the study carried out by Hagan (1942): geopolitics was described to support deterministic aspects such as situation of birth, growth, life, and death; organizing the state's expansions; and competing power's rationalizations.

Another significant event in the history was the era of Cold War. In the era of Cold War, there were two important powers as US and Soviet Union that both acted for the benefit of their own geopolitical interests and hegemony. However, after the collapse of Soviet Union, the world order was transformed from bipolar world to multi-polar world. After this, the concept of geopolitics has been developed and new idea has emerged as a critical geopolitics. Dalby (2011) pointed out the critical geopolitics that appeared in 1990s connecting with both international relations and political geography, grounded on four principal subjects: space, vision, statecraft, and identity like classical geopolitics. Dalby (2011) also characterized classical geopolitics in a way that geographical links with embracement of danger, security, fear, and violence.

Moreover, different definitions of geopolitics are presented in different literatures. Sen (1975) defined the term of geopolitics as a way of measurement and examination of overall national authority like assessment of the state's internal policy in the company of the state's successful external policy in the regional and global arena. Next, in Chapman's (2011) study, there were five core definition of geopolitics which are as follows: (1) to describe civilization ordering or cultural district of polity; (2) to form a historical improvement of polity; (3) to define the physical features of territory for entire phases; (4) to describe as a national or multinational

region's position; and (5) to define geographical settings and their correlations towards political authority with regulating the component of political authority like land, oceans, natural resources, hemispheres, and sea borders. Granieri (2015) pointed out two key definitions for geopolitics in his study. He declared that it is an approach to analyse existing events, which are depended on several concepts such as history, geography, and culture. He also added that the term of geopolitics is identified not only as a study of districts but also as a study of mentalities and veracities.

Generally, the term of geopolitics analyses the impact of geographical requirements on economic and political incidents and evaluates alterations in the political structure of the states. In addition to this, the concept of geopolitics refers to all states cooperating with their environment to maximize state's interests related to their abilities, settings, and geographical dynamics.

In the light of historical improvements of geopolitics from classical geopolitics to critical geopolitics, the importance of the concept has become to be a core figure for the energy politics. Especially, at the beginning of globalization in 1970s there were seen competitions and conflicts with emerging new areas that were resulted to return the importance of geopolitics. According to Billion (2004), in war economies, natural resources became a crucial figure for state's geopolitics after following historical events such as the First World War, Arab oil embargo, Iranian Islamic revolution, Cold War, collapse of Soviet Union and Iraq's attack on Kuwait in a way that the importance of the resources geopolitics, resources vulnerability, and supply security was appreciated. The areas where natural resources are mainly used and placed are generally seen in different places in the world. This led obligatory change in energy. Therefore, pipelines, power transmission lines, and trade movements of resources cause a problem for the countries. Therefore, the concept of geopolitics becomes an essential figure for such problems. The reason why nowadays geopolitics has become indispensable for energy resources is the development of resources reserves, rapid increase in energy demand, and newly emerged energy technologies.

As suggested by Santaella (2016), from Arab oil embargo in 1973 to Arab Spring in 2011, the global oil geopolitics grew especially in the Middle East and Africa. In general, the overall improvement of oil geopolitics has been observed in these two

core regions. Pascual (2015) mentioned that the oil geopolitics went through new events in 1980s, for which OPEC member countries had to stabilize high oil prices damaging world's energy growth and oil demand. Nowadays, in oil geopolitics, an increase has been observed in global oil consumption and demand especially in China's recent oil demand influencing global oil price and economic growth. Additionally, global oil prices have decreased recently and that influences both exporters and importers of energy geopolitics.

After oil became significant, by the 21st century, natural gas has also come forth to play an important role as emerging cleaner and environment-friendly source in state's energy policy and geopolitics. According to Klare (2006), the development of natural gas geopolitics depends on the following events: Russian gas supply's gaining importance after Russia-Ukraine 2006 gas crisis, conflict between China and Japan, the plan of gas pipeline cooperation between India and Iran, and the development of US gas market. Following these, the importance of natural gas has been increasing with new producers and new gas fields.

Furthermore, natural gas, which is a more favourable natural resource for majority of the countries in 21st century, is the pioneer of energy industry by being the first environment-friendly when compared to other fossil fuels. Jaffe and O'Sullivan (2012) listed the main effects of evolving natural gas in the new global geopolitics as follows: (1) attaching importance to gas projects and investments by building pipelines, (2) achieving great powers on natural gas like US, Russia, and China, (3) breakdown of regimes of producer countries such as Russia, Iran, Saudi Arabia, and Venezuela. These have caused a geopolitical shift from oil to natural gas as well as the increase in the interaction between natural gas and geopolitics. Ydreos (2012) indicated the relation between geopolitics and natural gas in the figure below.

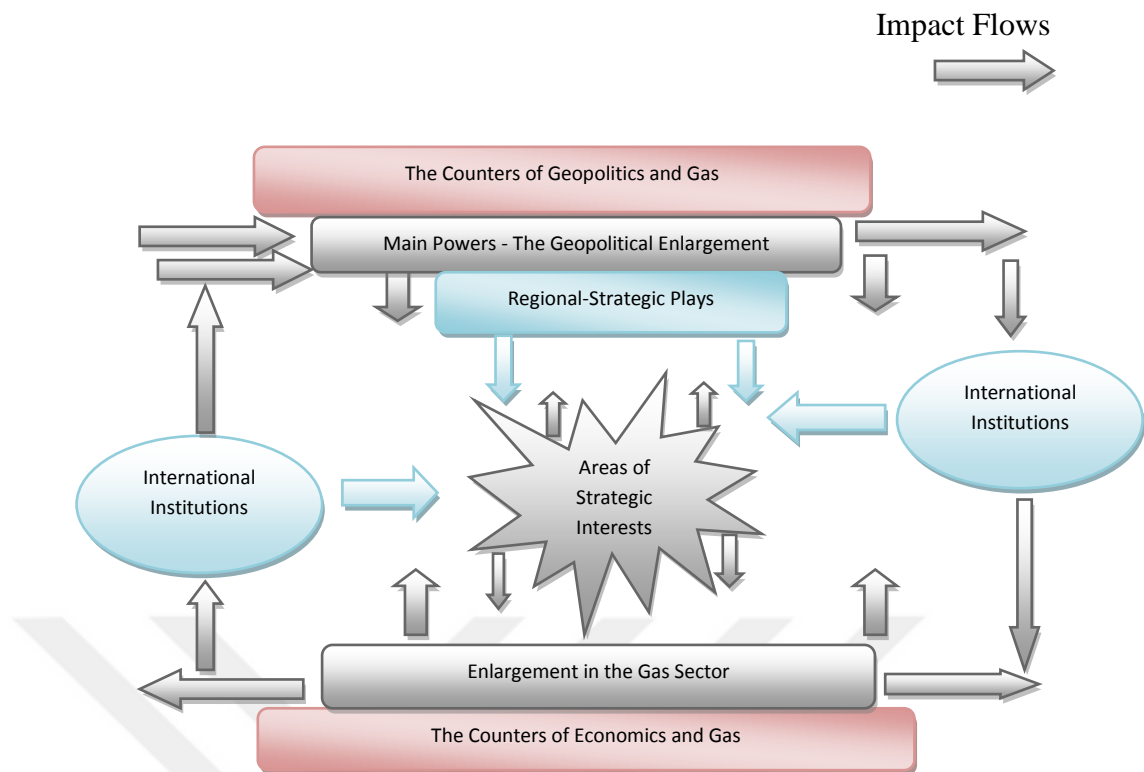


Figure 2.2 Dealing with Geopolitics and Gas Enlargement
Source: Ydreos (2012) –adopted to this study’s concept by the author

According to Ydreos (2012), there are two stages of analysis for regional and interregional gas flows in the development of geopolitical stabilities. First, the term of geopolitics, which influences the world’s economic and political system, is implemented by actors, rule makers, and other powers. Second, in practice, regional actors and regional situations are the rule makers although they are not seen as a rule maker on the global stage. When the relation between energy and geopolitics is taken into consideration, the energy security is seen as a significant factor for the state’s politics and economics. As defined before, the term geopolitics is related with power directly linked to energy. For example, when carrying natural gas especially via pipeline, security problems are observed. Energy security¹ is a key driving vigour in favour of country’s energy politics and strategies regarding geopolitics.

¹ The definition of energy security is mentioned that it is as ‘availability of efficient energy supplies at affordable prices’ (Yergin 2006; pp. 69-82). European Commission has provided a redefinition of energy security as an: ‘uninterrupted physical availability on the market for all energy products at a price that is referred to affordable consumers’. In addition to this, there are existed contemporary definitions with containing several notions. Cherp (2012) lists the main notions of energy security as follows: interruptions, availability, supplies or energy products, accessibility, sufficiency, affordability, welfare, reliability, acceptability, accountability, and sustainability.

In fact, after the collapse of Soviet Union, the great geopolitical changes in the structure of natural gas trade have not directly occurred. The development of natural gas trade has initiated when the countries began enlarging their own energy politics and strategies. Especially, Billion (2004) believed that Russia is more pretentious in the natural gas industry. The main reason of this was that global natural gas geopolitics changed after the collapse of Soviets and became a kind of geopolitical game among the countries, starting from 1989 to 2011.

Numerous actors play a crucial role in global natural gas geopolitics as the game changer. Russia is the most crucial one with its massive natural gas market, which is the first of three important indicators for this study. To understand the development of global natural gas geopolitics and its implications better, Szul (2011) classified this growth as three stages as the period between 1989 and 1991-2000, the period between 2000 and mid-2008, and the period between mid-2008 and 2011. This change of Russia's and global natural gas geopolitics is illustrated in the table below with the help of Szul's (2011) idea.

1989/1991-2000	2000/mid-2008	mid-2008/2011
<ul style="list-style-type: none"> •For Russia; Powerless and Perplexed while Western Europe; powerful •Political, economical and ideological problems in Russia •To be abused natural gas reserves by Western companies 	<ul style="list-style-type: none"> •Increasing Russia's boldness while decreasing Europe's power •Rising energy prices •Increasing revenues for Russia's budget •Booming Russian incomes •Aggregation of large quantity for foreign currency field •Domination of Russian leadership •Europe's concerns with increasing prices of imported gas •To be seen insecurity in the Middle Eastern region and to be occurred problems between US and Middle East •2004-2007 EU Enlargement 	<ul style="list-style-type: none"> •For Russia; low assertive •For Europe; more doubtful •decreasing energy prices •Effects of 2008 economic crisis •To be observed growing China •2008 Russian-Georgian War •To begin in 2009 prolonged gas conflict between Russia-Ukraine •To begin US shale production

Figure 2.3 The stages of Global Natural Gas Geopolitics with effects and developments
 Source: Szul (2011) – adopted to this study's concept by the author

As shown in the Figure 2.3, after disintegration of Soviet Union in 1990, Russia was not strong due to political and economic crisis regarding its natural gas industry

while Western Europe was a stronger player due to its dominance in sites of natural gas reserves. However, 'Russian domination on the global natural gas geopolitics has started after 2000s by holding the largest natural gas suppliers for Europe' (figure 2.3). The main reason of the Russian domination was the nationalization policy of Putin. At the same time, Szul (2011) mentioned that there were problems between Middle East and US such as Iraq-Afghanistan war, which affected the global natural gas geopolitics, especially gas trade. According to figure 2.3, the global financial crisis in 2008 had the foremost impact on the world's natural gas geopolitics. After this financial crisis, a decline in the natural gas productions and exports was observed for majority of the supplier countries. Especially after this financial crisis, Russia also faced another crisis i.e. Russia-Ukraine gas dispute in 2009. Szul (2011) stated that after this conflict, EU countries became alarmed about their energy security and they focused on an alternative supplier like LNG suppliers and newly increasing US shale productions together with increasing global gas supply. Russia's position in this geopolitical gas change will be mentioned in the next chapters in detail. Several global events like Russia-Ukraine gas disputes, Iran-Iraq war, and foreign sanctions on Iran show that there is a great linkage between energy and geopolitics when the concept of the geopolitics are taken into account for this thesis. The reason behind this relation is associated with the significance of producer countries or regions regarding their quantity and value of resources. For instance, if Russia did not hold the largest natural gas reserves as having an important geopolitical advantage or there were no oil and natural gas reserves in the Middle East with its geopolitics, crucial conflicts would not exist, which are the standpoint of this study.

On the other hand, regarding global natural gas geopolitics, Middle Eastern region is seen as another key player as of 1990s. The region, which is crucial in terms of its immense natural gas reserves and geographical position, has experienced indispensable alterations in the domestic and world's natural gas arena. Ydreos (2012) determined the key changes of the Middle Eastern region's natural gas industry in the global natural gas geopolitics as follows: (1) Iran's attractive natural gas investments and technologies, (2) Iran improving its natural gas reserves and oil reserves due to its growing political position, (3) new action in Qatar's natural gas growth as a moderation of the natural gas moratorium, (4) extensive peace period

involving Israel and its neighbouring countries (5) Middle East's growing natural gas reserves and promotion in regional gas integration with low enlargement in gas consumption due to the supplementary gas investment and price development, and (6) hesitation concerning natural gas flow via Strait of Hormuz, which resulted in concerns about security of supply and demand.

In the Middle East, Iran, which is the most important state in terms of its huge natural gas reserves by holding the world's second largest natural gas reserves, is the second important indicator in this study. After the 1990s, development in global natural gas geopolitics was witnessed. In these changes, contribution of Iran cannot be ignored. Ydreos (2012) indicated that with the help of Iran's attractive gas investments and technologies, the relation among Iran, the West, and neighbouring countries developed. However, in recent times, Iran has encountered foreign sanctions due to its intention on nuclear issue. This resulted in the decrease in Iran's natural gas projects and investments, which will be discussed later in this study. At the same time, Qatar has the third largest natural gas reserves as the third important indicator of this study. In these changes of natural gas geopolitics, Qatar is also placed an essential position with its LNG industry. EIA (2015) reported that especially in 2006, Qatar surpassed Indonesia as the first LNG exporter. Also, the country has the third largest natural gas reserves after Russia and Iran. Due to the development on Qatar's natural gas moratorium, the country's gas exports keep increasing.

Besides, Asia region, which is another significant player on the development of global natural gas geopolitics, has the greatest upward economy in the world. As reported by EIA (2015) Asia region concentrates on LNG imports and includes LNG suppliers like Malaysia, Indonesia, and Brunei. However, in 2006, the LNG geopolitics transformed and Qatar became the largest supplier of LNG by surpassing Indonesia. According to Qatar Oil and Gas Report (2016), China, Japan, and South Korea are the leading LNG markets for Qatar. In contrast, in the Asian region, China is the key changer for natural gas geopolitics due to its rapid growth in natural gas demand. EIA (2015) mentioned that as a result of increasing demand for China, the oil prices declined and this affected natural gas prices and natural gas production of great powers like Russia.

Furthermore, for the development of global natural gas geopolitics, ‘a new player emerged in 2006 in the direction of a Gas OPEC as Gas Exporting Countries Forum (GECF), which encouraged growing dialogue between natural gas producer and consumer’ (GECF 2016). Since establishment of this forum was led by Russia, Iran, and Qatar as the main players of this thesis, more competition has been observed on the geopolitical agenda. This will be discussed in the next chapters of this study.

The recent geopolitical position of world’s oil and natural gas reserves are reported on BP’s Statistical Review of World Energy (2015).

“The total oil proved reserves are located respectively as follows: 47, 7% in the Middle East; 19, 4% in South & Central America; 13, 7% in North America; 9, 1% in Europe & Eurasia; 7, 6% in Africa; and 2, 5% in Asia Pacific. On the other hand, the total natural gas proved reserves are placed as follows respectively: 42, 7% in the Middle East; 31, 0% in Europe & Eurasia; 8, 2% in Asia Pacific; 7, 6% in Africa; 6, 5% in North America; and 4, 1% in South and Central America” (BP, 2015).

Moreover, unconventional resources like shale gas become significant and it results in giving a new accelerate in global natural gas geopolitics by influencing natural gas producers and exporters. With these new sources mainly in US, competition among exporters in global natural gas geopolitics has accelerated. Pascual (2015) demonstrated the new geopolitics of energy after emergence of US shale gas and the authors of this thesis updated the diagram.

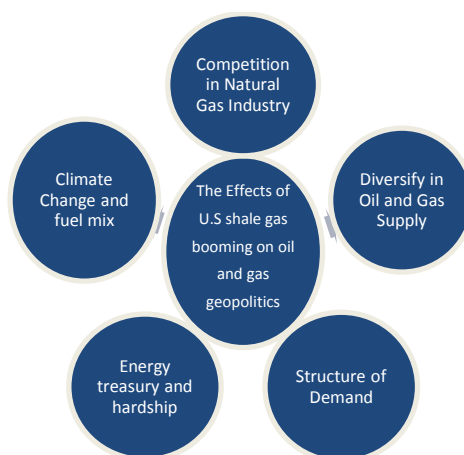


Figure 2.4 New elements of energy geopolitics for oil and gas
Source: Pascual (2015) – adopted to this study’s concept by the author

As it is shown in figure 2.4, the global energy geopolitics of oil and natural gas confronted new phenomena after US shale revolution. For instance, a number of countries recognized the necessities of varying oil and gas and increasing demand of gas and oil, and they involved in new states in natural gas market as competition accelerates.

“With the state’s economic progress, increasing oil and gas demand especially in China, shifted from coal to natural gas in US as well as shale booming, Qatar’s rising LNG position and maintaining energy super power status of Russia. The importance of new ingredients in natural gas geopolitics has augmented the promotion of transparency, diversification, and superior investment for climate and reliability of supply” (Larson 2007; pp. 215-219).

This study aims to evaluate the current issue from the containing following literature review. Afterwards, this study attempts to analyse these three giants from a new framework. This new framework will analyse these countries regarding the issue of reliability of security, long term contract, GECF membership, pipeline connection to main consumers, owning its LNG fleet, LNG exporter, resource curse, using energy as a foreign policy tool, existing projects and investments and specified targets. In this century, when natural gas is supplied to buyers, the question of adequate, competitive, and reliable supply of natural gas is a vital point. In this context, this study will be answering the question ‘Can three giants procure natural gas in a secure and reliable way?’ Another question to be answered is that the three giants have a long-term natural gas contract or not. In globalizing and competitive natural gas market, long-term contract is more essential when compared to others. However, with decreasing oil prices and increasing LNG trade, there are several impacts on the countries. Next, GECF membership is other issue that will be discussed within the framework of this study. The question of how place and importance of this forum and three giants affect the global gas market will be answered. Then, another question to be responded is whether three giants have a pipeline connection to main consumers or not. Also, global LNG market has developed recently. Other question of this study is that three giants can hold its own LNG fleets and be a LNG exporter or not. Moreover, three giants’ encountering the resource curse is another topic for this study. Resource curse is related to abundance of sources that can have potential

negative effect on the country's market. In addition, another question that will be searched for is whether the three giants have existing gas investments and projects or not. Final point of this study is whether three giants have specified natural gas targets or not. Due to these ten frameworks, this study could be answered the research questions that are: what is the influence of sanctions on Iran's natural gas issues? Does Iran challenge Russia's dominant position in the EU gas market as an alternative gas supplier? Is Russia a rival to Iran with its newly emerging LNG sector? How is Qatar using its LNG supplies to strengthen its influence on the world LNG market?

Therefore, the main purpose of this study is to analyse the existing natural gas policy of Russia, Iran, and Qatar comparing with each other with the help of trilateral analysis in global natural gas market with regards to their natural gas policy making their natural gas consumption, production, reserves, and trade movements and diplomacy and their possible changes in the global natural gas market. The reasons of choosing these three natural gas giants are as follows: located at same geography and being member of GECF.

CHAPTER III

Analysing Iranian Natural Gas Policy Making

3.1 Introduction

Iran is located in the centre of the Middle East with access to the Caspian Sea region and Hormoz Strait, and is both a leading gas producer and a crucial transit country due to its strategic location (Osgouei and Sourgun 2012; pp. 113-120). The neighbours of Iran are Turkey, Azerbaijan, Armenia, Iraq, Pakistan, Afghanistan and Turkmenistan. “Iran is the founder country for both GECF and OPEC” (Bahgat 2014; p. 126). According to World Bank Data (2015), in the Middle East and North Africa (MENA) region, Iran is the second largest economy behind Saudi Arabia. Although Iran has experienced economic recession in recent years due to international sanctions, ‘the economy of Iran has experienced 3.7% growth in recent years’ (The World Bank Data; 2015).

Today, oil prices have decreased in the world and this reduction in oil prices impacted Iran economy defectively. However, according to the World Bank Data (2015) study from 2014, Iran will experience a bigger economy in 2016. According to World Bank Data, the GDP of Iran was \$415.3 billion in 2014 while the GDP growth rate increased 1.5% in 2014. In addition to this, World Bank estimates that the GDP of Iran has expanded 0.60% in 2015 after the lifting of sanctions. Concordantly, ‘this increase was observed in the real GDP growth from 4.3% in 2014 to 1.7% in 2015’ (The World Bank Groups; 2015)

Energy sector has a huge role in Iran’s economy due to country's vast energy resources. Iran has the world’s second largest natural gas reserves. Similarly, the country has the world’s fourth largest proven crude oil reserves. As said by Akhundzada and Özkan (2014), Iran has 18, 2% of world's natural gas reserves and it has 33% of OPEC’s total natural gas reserves. International sanctions influenced Iran’s energy sector negatively. Particularly, foreign investments in oil and natural gas sector have been stagnated after international sanctions to Iran. Another negatively affected area is the state of Iran’s export due to declining oil prices. As known, “Iran exports natural gas to Turkey over 90% while it imports natural gas

from Turkmenistan over 90%” (EIA; 2015a). Nevertheless, there are some obstacles in these trade movements. The sanctions and reduction of oil prices caused Iran’s export trade relations to slow down.

On the other hand, the manifestation of Iran's primary energy consumption has an essential role in Iran’s energy sector. EIA (2015a) determined that natural gas and oil are the main sources for Iran’s primary energy consumption share. Only these sources' share is 98%. The proportion of sources of Iran’s primary energy consumption is specified and compared in detail between the years 2013 and 2014 in the following chart.

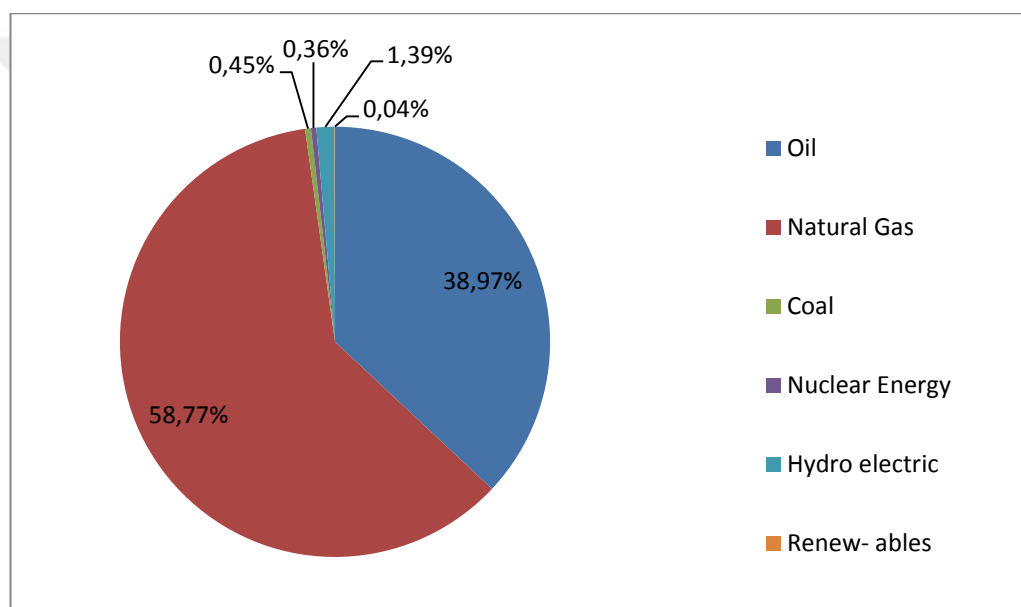


Figure 3.1 Iranian Primary Energy Consumption by fuel (mtoe), 2013
Source: BP (2015)

Figure 3.1 and Figure 3.2 demonstrate the fluctuations of Iran’s primary energy consumption shares from 2013 to 2014. According to the figure 3.1, the share of natural gas was the initial fuel type with 58,77% in 2013 while oil was the second important source with 38,97% in 2013. Similar to figure 3.1, in figure 3.2 natural gas and oil are in the first two places. However, variations have been seen in share numbers.

The share of natural gas increased 58,77% in 2013 to 60,79% in 2014 but the share of oil decreased from 38,97% to 36,98%. Hydroelectric is the third important source for Iran's primary energy sources.

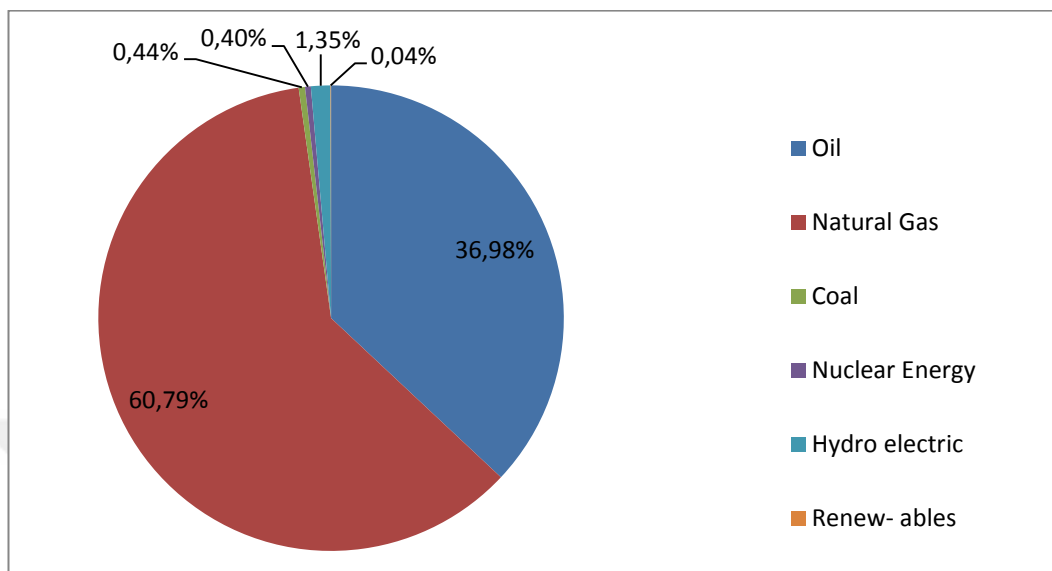


Figure 3.2 Iranian Primary Energy Consumption by fuel (mtoe), 2014
Source: BP (2015)

'In 2013, the share of hydroelectric was 1,39% then this share was reduced to 1,35% in 2014' (Figure 3.1.1 & Figure 3.1.2). These charts show that coal, nuclear energy and renewable sources are the other fuel types of the primary energy consumption in Iran.

Moreover, as shown in the graph below, there is not much increase from 2012 to 2013. According to EIA (2015a), in 2013 Iran used primary energy equivalent to nearly 244 million tons oil.

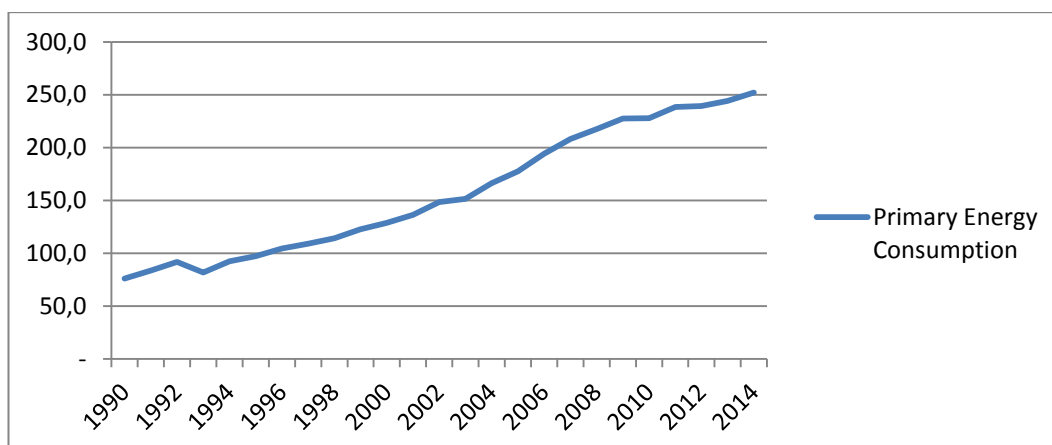


Figure 3.3 The History of Iran's Primary Energy Consumption, 2014
Source: BP (2015)

This Figure 3.3 illustrate that there was a constant increase in Iran’s primary energy consumption after 2004. In addition to this, there was also growth from 2011 to 2014. ‘Although Iran is presently a net importer, it puts away a huge amount of its gas. The country’s’ production and export has risen due to its eagerness to apply its plans (Bahgat 2014; p. 121).

Nevertheless, electricity industry is essential for Iran’s energy policy and natural gas market. An example of this is the study carried out by the EIA (2015a) in which natural gas is the main fuel source for Iran’s electricity generation with approximately 70% of total production. ‘The most crucial target of Iran’s energy subsidy reform has boosted electricity price by %25 in the beginning of 2014 and has risen for a second time for %20 in 2015 in order to meet restrictive demand development and to be helpful to consumption development because of having force in Iran’s generation structure (EIA; 2015a). The one reason for Iran’s increasing electricity consumption is Iran’s newly discovered gas field which is South Pars gas fields. Another vital aim of Iran’s energy subsidy reform for electricity industry is to increase its electricity exports to neighbour countries. According to EIA (2015a), under a contract; Armenia, Pakistan, Turkey, Iraq and Afghanistan are provided electric power by Iran while Iran is supplied electricity by Azerbaijan and Armenia.

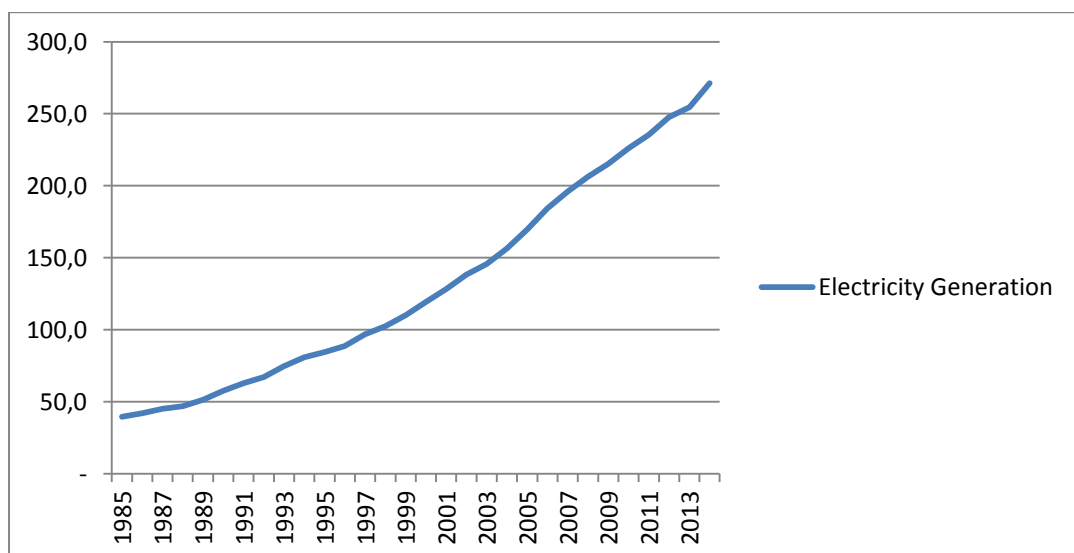


Figure 3.4 Iran’s Electricity Generation (Terawatt-Hours) in 2014
Source: BP (2015)

In figure 3.4, there has been a gradual growth in the country’s electricity generation after the Revolution and Iran-Iraq war. After Iran Islamic revolution and Iran-Iraq

War, country manages to actualize its subsidy reform that is related to increasing its electricity exports and its demand and consumption rates as mentioned in previous paragraphs.

3.2 Development of Natural Gas Industry in Iran

3.2.1 Iran Islamic Revolution in 1979

Iran Islamic Revolution in 1979 was a turning point for the Iran's history, not only politically but also economically. As known, Iran's economy is mostly based on energy exports. Therefore, jeopardizing the stability could result as down turn in economy and energy industry. As seen in the case of 1979 Islamic Revolution, there were observed dramatic changes in the country's energy market and economic indicators. Furthermore, the foreign policies of each state are usually based on economy, geo strategy and having natural resources which are also important for Iran's policy. In the cold war period, Iran was a crucial ally for USA. However, after revolution Iran was against USA.

Furthermore, Iran Islamic Revolution influenced not only Iran's economy but also the country's energy industry like oil and natural gas industry. The natural gas market of Iran had also changed due to Iran Islamic Revolution. As reported by BP (2015), natural gas production of Iran declined from 9, 0 bcm in 1979 to 4, 8 bcm in 1980 because of 1979 Revolution while the country's natural gas consumption reduced from 5, 4 bcm in 1979 to 4, 8 bcm in 1980. However, there has not been seen any alteration in Iran's history of total proven natural gas reserves after the Revolution. This can be illustrated briefly by BP (2015) by the following: the country's total proven gas reserves were same in 1980, in 1981 and 1982 with 14, 1 trillion cubic meters.

The Iranian economy is mostly based on energy exports due to its rich natural resources like natural gas and oil. The economy of Iran was almost under the control of state domination. After the Revolution, Iran had to adopt a self-sufficient economy. "After Iranian Islamic Revolution, there has been observed a lower increase in Iran's energy consumption which caused low economic expansion for Iran while low expansion in domestic production and low economic development caused a decline in energy consumption of Iran" (Abbasinejad, Farahani and Ghora

2012; pp. 444-455). Hence, Iran's market share of natural gas was influenced to change by lower growth of energy demand in Iran after the Revolution. Another indicator affected by the Revolution is the Iran's primary energy consumption. As said by BP (2015), between the year 1979 and 1980, the primary energy consumption of Iran was decreased from 39, 4 mtoe in 1979 to 35, 5 mtoe in 1980. According to Mazarei (1996), after Revolution, Iran focused on economic restructuring which was an advantage in short term, but an uncertainty was seen in economic policy of Iran such as increase in budget deficit and rising inflation which caused balance of payment crisis which in turn caused increased black market activity in Iranian Rial or foreign exchange rate of Iran.

As a consequence, the Revolution showed that there was not only political change but also economical change, particularly in energy consumption, economic growth, balance of payment, foreign exchange, GDP, inflation, budget, energy industry mostly in natural gas and oil.

3.2.2 Iran-Iraq War (1980-1988)

Another effect of Iran Islamic Revolution is Iran-Iraq War that was between 1980 and 1988. As a result of this war, both countries' human and financial resources were damaged. Iran and Iraq ceased to be a threat for a long time. One of the effects of the war was on the energy industry. The economy cannot be ignored when analysing the energy industry.

The first noticeable decline is seen in Iran's energy consumption. Abbasinejad, Farahani and Ghora (2012) determined that after the war, the growth rate for the energy consumption of Iran regressed to 5.2%. In parallel with the decline in energy consumption, the growth of the GDP rate was slow in Iran-Iraq War as the Iranian Islamic Revolution. Based on the changes in energy consumption of Iran, a transfer from oil to natural gas has been observed after the war. Besides, Mazarei (1996) stated that the main impact of Iran-Iraq War was diminishing oil revenues that caused foreign exchange surplus in natural gas market.

Moreover, when examined from another point of view, there was a decrease in Iran's real tax revenue, government expenditures, capital expenditure, and budget deficit, which affect the natural gas industry. According to Mazarei (1996), the share of

government expenditure in GDP of Iran went down from 42.6% in 1978 to 16.0% in 1989 during the war while the portion of capital expenditure in GDP of Iran decreased from 15.6% in 1978 to 3.1% in 1989 throughout the war and exchange rate fell down from 75.0% in 1979 Revolution to 77.4% in 1989. As it is shown in the results of each war, the country's investments declined with Iran-Iraq war. As a result of the War, the natural gas market share has increased while a decrease was seen in the rate of oil market for Iran. In addition to this, Mazarei (1996) mentioned in his article that, due to decline in Iran's imports after the war, Iran's tax revenue of GDP fell from 8.4% in 1979 to 3.7% in 1979 with budget deficits in the country.

The war ended in 1988 and one year after the war Iranian government created a plan, which was about recovering Iran's lost position. Mazarei (1996) also pointed out in his article that the year between 1989 and 1990, the government made first five year plan which targeted to take measures about inflation, the stability of economy and price liberalization. For instance, "this five year plan which aimed to diminish inflation within the country from annual rate with 28.5 % in 1988 to 8.9% in 1993, also targeted to promote subsidy reforms and original investment projects about natural gas, privatization and reducing budget deficit" (Amirahmedi (1996); pp. 123-147). After the war, Iranian government worked towards to improving itself. This is exemplified in the work undertaken by Mather's (2009) article. He indicated that Akbar Hashemi Rafsanjani, Mohamed Khatami and Ahmed Nejad who were successful presidents, supported laissez faire policy which was against the government control and wanted to maintain not only economic liberalization but also to reduce sectoral disparity like natural gas market.

In other respects, a major change in natural gas industry of Iran has been observed in the war. As illustrated in the graph below, between the year 1980 and 1988, which was the time period of Iran-Iraq War, there was stability in Iran's proven natural gas reserves. However, the graph demonstrates that there was a sharp rise in both 1988 and 1989. After the war, figure 3.5 reveals that there was a rise in 1990. The reason of this development of natural gas reserves is that 'a new gas field was discovered in 1990, which was South Pars Gas field' (EIA; 2015a).

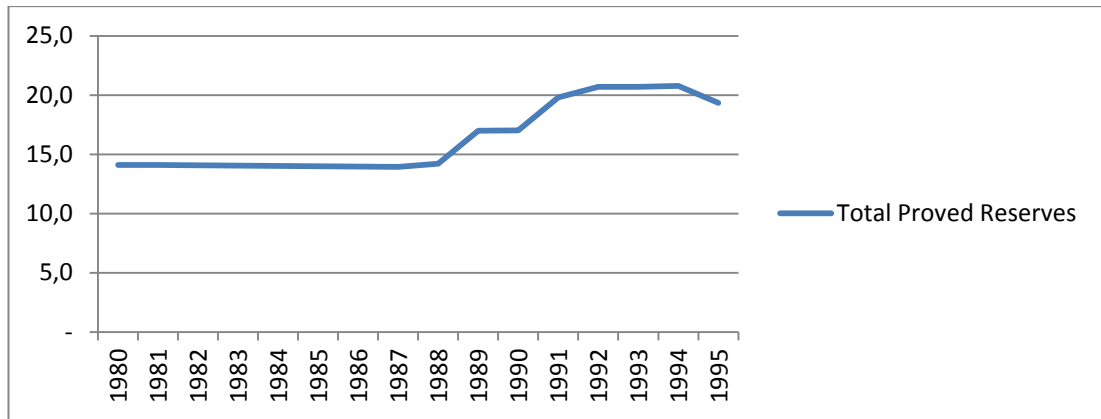


Figure 3.5 The situation for Iran' Natural Gas of Total Proved Reserves' History in Iran-Iraq war (tcm)

Source: BP (2015)

Moreover, figure 3.6 shows the country's natural gas production in the period during Iran-Iraq War while figure 3.7 demonstrates the Iran's natural gas consumption in the Iran-Iraq War. The amount of Iran's natural gas production is projected to fall after 1979 Iranian Islamic Revolution as the following figure 3.6 shows. In contrast, this graph reveals that in Iran's natural gas production, there has been a fluctuation during the war between the years 1980 and 1988 and the increase has been monitored until 1991. Nevertheless, this graph shows that there has been a sharp drop after 1991 while there has been a steep increase since 1993.

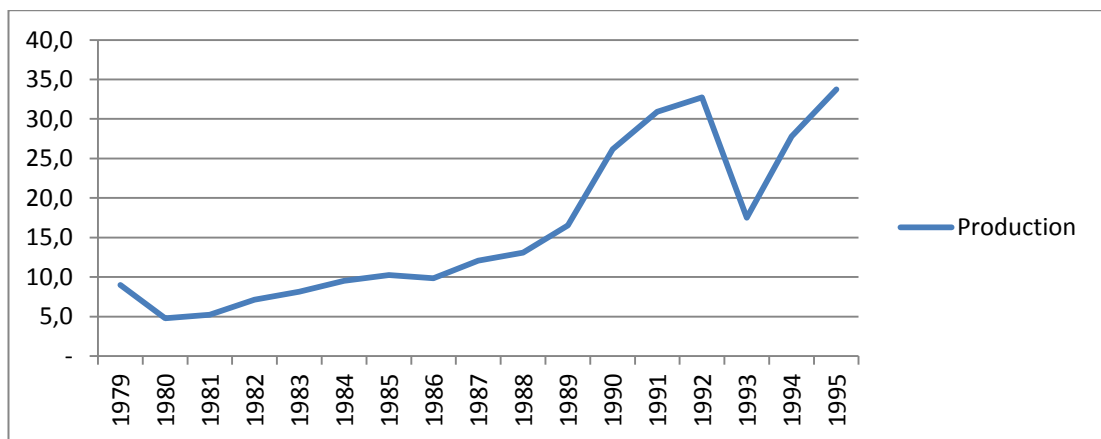


Figure 3.6 The situation of Iran' Natural Gas Production in Iran-Iraq war (bcm)

Source: BP (2015)

Concordantly, there has been a sharp decrease in Iran's natural gas consumption from the year 1990 to 1993 as seen in the graph below, when there has been an upsurge after 1993 just like the Figure 3.6 which was the situation of Iran's natural gas production in Iran-Iraq War.

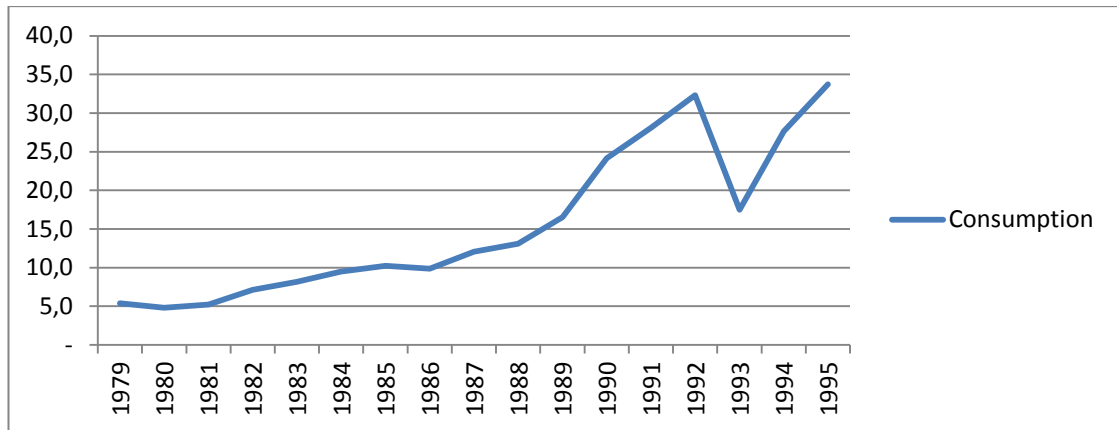


Figure 3.7 The situation of Iran' Natural Gas Consumption in Iran-Iraq war (bcm)

Source: BP (2015)

On the other hand, one of Iran's most important basins was affected by this war. North Pars gas field is the second biggest basin in Iran. According to Osgouei & Sorgun (2012), the draft of the North Pars fields for its development was delayed due to Iran-Iraq war. However, after the war, this field's growth continued again.

As a conclusion, Iran has Energy Companies for its energy industry just like other countries. National Iranian Oil Company (NIOC), National Iran Oil Refining & Distribution Company (NIORDC) and National Iran Oil Engineering, National Iranian Gas Company (NIGC), the National Iranian Gas Export Country (NIGEC) and Construction Company (NIOEC) are its main energy companies. According to Iran Oil & Gas Report (2014), the most important activity of NIGS will be its disposition to build a gas storage plant. In the Sarajeh basin, which was located South of Tehran, the country's first gas storage plant was planned to be constructed in April 2010 by NIGC.

3.2.3 The International Sanctions to Iran

Power struggle is the core focus of international relations. In international arena, diplomacy, sanctions, and war are major tools for the countries' policies. If there is a disagreement between the countries in international arena, the war is the last resort and the sanctions are the first preference that comes to mind in internal and foreign affairs. The sanctions are generally materialized economically, martially and politically with the aim of preventing the introduction of goods into the country,

intervention to quotas and foreign exchange market, implementing embargos, boycotts and blockades. The evidence of these can be clearly seen in the case of Iran's recent international sanctions. Osgouei and Sourgun (2012) hold the view that due to Iran's inclination to support the distinction of plutonium, the enrichment of uranium and expanding nuclear activities by using weapons of mass destruction, Iran has faced with international sanctions. This way, "Iran signed an additional protocol in 2003 with International Atomic Energy Agency (IAEA)" (Osgouei & Sorgun, 2012; pp. 113-120) and 'in 2006 the UN commenced economic sanctions primarily in opposition to Iran' (Emerging Market Monitor, 2007; p. 22). In addition to this, "in 2010, United Nations Security Council decided to make new decisions concerning the sanctions on Iran in terms of financial constraint, extended cargo control and extended arms embargo, in order to avoid Iran's nuclear activities and its improvement effort for its nuclear weapons system" (Akbaş & İnalçık 2013; pp. 21-44). In addition, international sanctions involved several sector or source such as banking, insurance, shipping industry, energy industry and technology.

In fact, the relationship between Iran and US was not good enough due to their past. As mentioned before, both countries' relations broke down with Iranian Islamic Revolution. In addition to this deteriorating relation, their relations worsened after 2011 terrorist attacks to twin towers. Therefore, US opposed to Iran's nuclear activities because US claimed that Iran abused nuclear power as a terror tool. Not only US but also western powers protested Iran's nuclear acts.

The US and UN sanctions on Iran caused destructive effects in Iran's economy and its energy industry such as natural gas market. The negative effects of the international sanctions are observed in Iran's natural gas pipeline projects such as Iran-Pakistan natural gas pipeline, Iran-Pakistan-India natural gas pipeline and Tabriz-Ankara natural gas pipeline. Munir, Ahsan and Zulfqar (2013) assumes that Pakistan's Oil and Gas Development Company rejected to finance Iran-Pakistan pipeline due to US sanctions and the nuclear contract between Western countries and Iran. Next, "during the construction of the Iran-Pakistan-India natural gas pipeline, the energy investors ceased their investments due to sanctions" (Sahay & Roshandel 2010; pp. 74-92). Also, the LNG sector of Iran was not wealthy and Iran inclined to create LNG projects. However, due to the recent sanctions, these projects were unable to be implemented. For instance, Sahay and Roshandel (2010) mentioned that

there was an LNG project between Iran and India in order to construct an LNG plant but the pressure of sanctions prevented this intention. Moreover, Ankara wanted to invest in Iran's natural gas industry, because Turkey was facing with the PKK disruption on the pipelines in 1990s. This way, "two countries made a deal in the late 2000s" (Bahqat 2014; pp. 121-132). Bahqat (2014) claimed that although, TPAO which is a Turkish state-owned company, invested in Iran's natural gas market especially in Iran's gigantic South Pars natural gas deposits in order to increase natural gas exports and production but this contract has not been put into practice, not by a long shot. As mentioned before, Turkey is a large importer of Iran. Even though 'Turkey imported 6.9 bcm of gas via Tabriz-Dogubayazıd pipeline, this import declined with the sanctions and there has been a shortage in gas revenue' (Carter 2014; pp. 41-61).

Furthermore, another affected area in Iran's natural gas market is the country's natural gas fields. The projects of South Pars natural gas basin and Pars LNG fields had its share of sanction impacts due to "having insufficient finance and investments caused by sanctions that also both caused recession on gas production in these fields and the postponement of the LNG projects" (Houshisadat 2015; pp. 458-475). Another example of affected Iran's LNG projects is the LNG plan between Iran and Gazprom. "Alexander Medvedev, who is the deputy CEO of Gazprom, stated that if Iran does not get rid of international sanctions, they could not support these joint LNG export projects with Iran" (Golara, Bonyad and Omidvar, 2015; pp. 24-30).

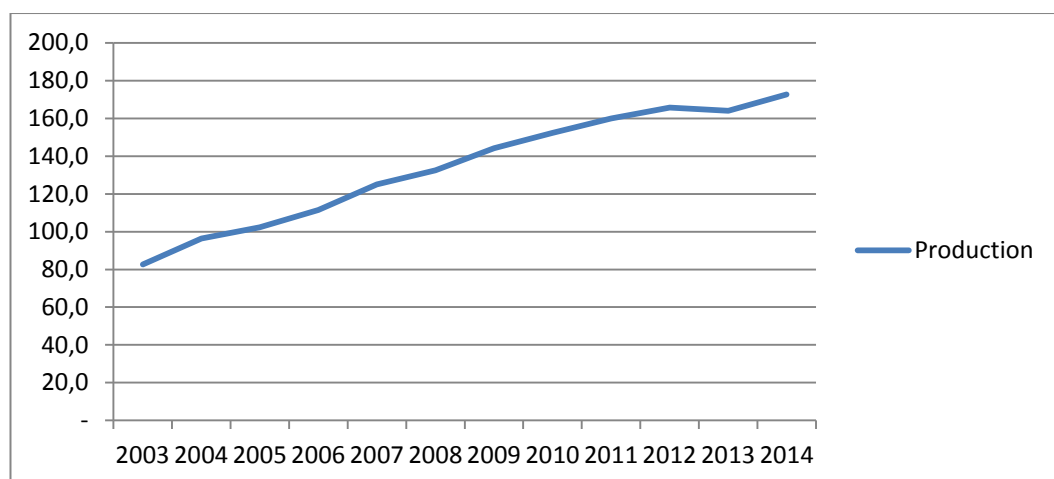


Figure 3.8 The situation of Iran' Natural Gas Production during the International Sanctions on Iran (bcm)
Source: BP (2015)

As a similar effect to Iran's natural gas investments, Golara, Bonyad & Omidvar (2015) specified that the investment and support of Total, Royal Dutch Shell, BP and Chile's Sipetrol were attracted to Iran's natural gas market in order to invest. However, they put their investments on hold and they could not invest in new natural gas projects due to sanctions and financial risks.

Additionally, figure 3.8 and figure 3.9 illustrate that there has not been much change in the Iran's natural gas production and consumption. However, between the year 2004-2005 and 2010-2013, the natural gas consumption of Iran decreased due to critical effects of sanctions. According to Heidari, Katircioglu & Saeidpour (2013), due to lack of foreign investments in Iran gas market with sanctions, short expansion rate of production has been observed.

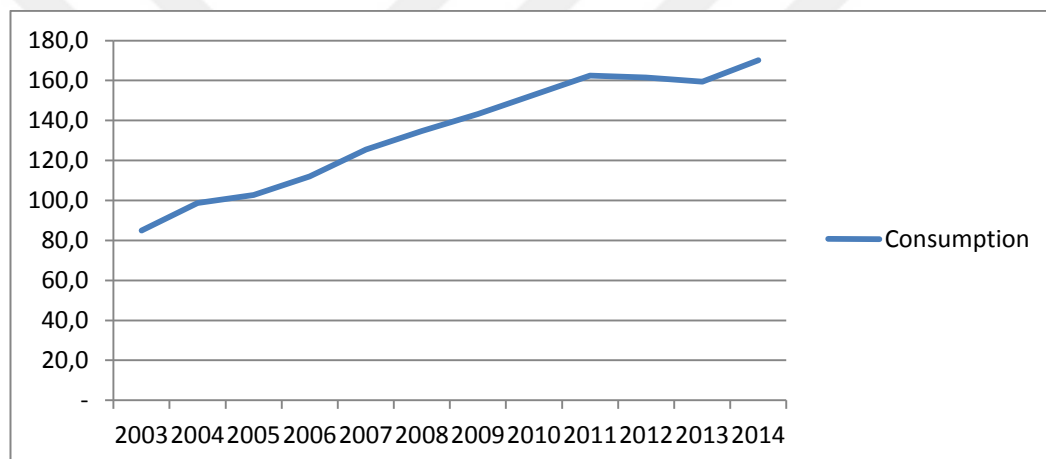


Figure 3.9 The situation of Iran' Natural Gas Consumption during the International Sanctions on Iran (bcm)

Source: BP (2015)

To sum up, during the international sanctions on Iran, the country has encountered a number of political and economic challenges. Energy industry of Iran is another remarkable area. Particularly, foreign investments did not desire to invest in Iran's natural gas market because of the risks after the sanctions. Also, a number of natural gas pipeline and LNG projects could not be practiced. Then, Iran's economy faces with problems such as high inflation and economic recession. Even though Iran's nuclear intentions not only influenced western powers but also its regions, it looks like the country will not give up the nuclear activity as a foreign policy tool or as energy resources.

3.3 Natural Gas Market in Iran

3.3.1 Reserves and production

Since 1979 revolution, the economy of Iran has been under its poor influence. This downturn of Iran's economy hits the energy industry and, downstream and upstream markets of the country. For instance, there is a strong state authority in Iran and this causes some risks in the market. "These difficulties are the risk of low economic expansion, restricted rule of law and undistinguished infrastructure" (Iran Oil and Gas Report, 2014; pp. 1-118). According to Iran Oil & Gas 2014 Report, expansion rate of Iran's oil and gas sector is damaged due to deficiency of foreign investment to natural gas production and a narrow entrance allowance of capital. The main reasons of these problems are recent sanctions. "But investments for natural gas production managed to rise more than 3%" (Iran Oil and Gas Report, 2014; pp. 1-118). Although Iran deals with many complications in terms of the condition of its energy market after revolution, it is still a significant natural gas producer in the world. "After United States and Russia, Iran is the third biggest dry natural gas producer in the world" (EIA; 2015a). As shown in figure 3.10 below, a sharp reduction was observed in production between 1992 and 1993.

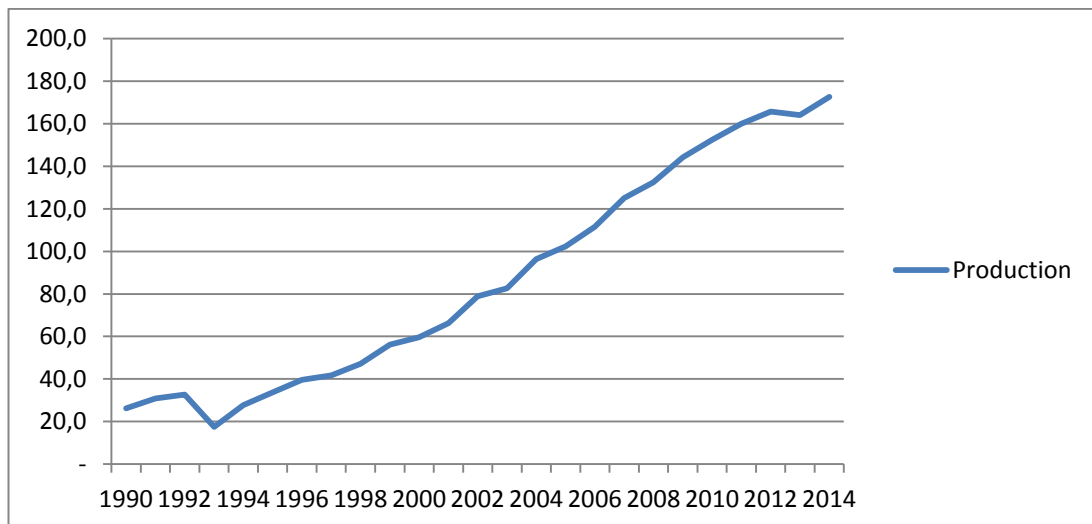


Figure 3.10 Iran's Natural Gas production (bcm), 2014

Source: BP (2015)

Additionally, as seen in the graph above, there was a decrease between the years 2011 to 2012. However, after 2012, the natural gas production of Iran has grown.

Figure 3.10 and figure 3.11 reveal that Iran has produced and consumed equal amount of natural gas. These two graphs show that, in 2012 production and consumption decreased. Iran Oil & Gas Report 2014 stated that, in 2012, Iran produced 156 billion cubic meters of natural gas, which is similar to the consumption ratio in the table below. Also, this report added that the reason of this reduction is the gas scarcity at that time. Therefore, in 2012, natural gas production and consumption was inadequate. In addition to this, “the country overcomes this inadequacy of gas by recovering its available deposits, expanding its new discoveries and construction of foremost deposits like South Pars and North Pars” (Osgouei and Sorgun, 2012; pp. 113-120).

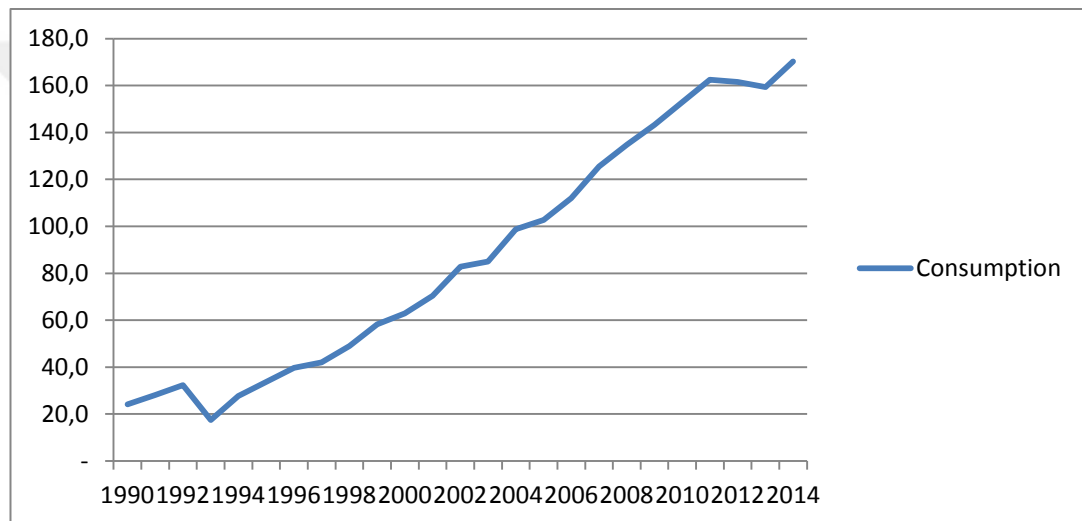


Figure 3.11 Iran’s Natural Gas consumption (bcm), 2014
Source: BP (2015)

Nevertheless, figure 3.10 and figure 3.11 show after 2013, a surge was seen. For example, ‘in 2013, Iran’s gross natural gas production was about 8.1 tcf while Iran’s consumption in 2013 was 5.6 tcf’ (EIA; 2015a). Iran Oil & Gas Report 2014 predicted that the amount of Iran’s natural gas production would be 176 bcm by 2017 while the amount of country's natural gas consumption will be 199 bcm by 2022. In addition to this, the reasons for this increase of Iran’s natural gas consumption are countries’ shifting from oil to gas in the domestic energy mix, and the strong subsidization of Iran’s gas market. In other words, “having low price for domestic suppliers of Iran’s natural gas paves the way for increased natural gas consumption in Iran” (Heidari, Katircioglu & Saeidpour 2013; pp. 638-645).

Moreover, sanctions on Iran have influenced natural gas production of Iran. According to EI (2015a), there has been inadequate financing and unsatisfying foreign investments in the market after sanctions. Also, Iran is predicted to be among the foremost natural gas producers and exporters all around the world due to its reliance on the country's giant proven natural gas reserves. Nonetheless, this prediction has seen a number of challenges. According to EIA Arab Oil and Gas Directory of Iran (2015), the reasons of these obstacles are related to growth of natural gas zone, which faces with contractual, technical, and financial obstacles. However, the production of natural gas for Iran has grown especially with Iran's new natural gas reserves especially South Pars gas area. Before analysing Iran's natural gas fields, Iran's total natural gas reserves are shown in the graph below.

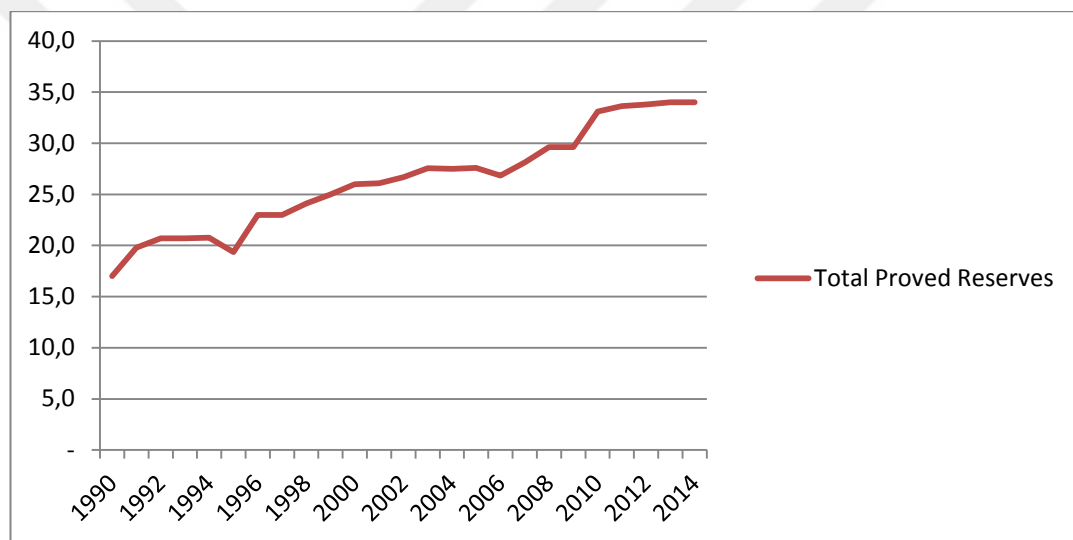


Figure 3.12 Iran's total proven Natural Gas Reserves, 2014 (tcm)
Source: BP (2015)

According to figure 3.12, there was a sharp increase after 2009, but after 2010, there was a consistent rise. For example, when looking at the history of Iran's natural gas reserves, 'the total amount of natural gas reserves was 29,6 tcm in 2009 and this rate grew from 29,6 tcm to 33,1 in 2010' (BP; 2015). BP Statistical Review of World Energy 2015 also stated that this amount was 33, 6 tcm in 2011 and 33, 8 tcm in 2012 while in 2013 and 2014 this rate was 34, 0 tcm. BP 2015 Workbook data added that in the world's total proven natural gas reserves, Iran had 18, 2% tcm in 2014. Moreover, "in 2015 Iran has the second biggest proven natural gas reserves with the 1, 201 tcf of gas" (EIA; 2015a).

Moreover, in the graph below, Iran's total natural gas reserves is compared with other Middle Eastern countries. And the figure 3.13 shows that Iran has the most natural gas reserves, and the following countries are Qatar, Saudi Arabia, and United Arab Emirates. To be clearer, BP 2015 Statistical Review is a more useful data in order to understand the position of Iran's natural gas reserves in the Middle East. In the Middle East, Iran has the leading natural gas reserves with 18, 2%; Qatar has the second biggest natural gas reserves with 13, 1%; and with the 4, 4% Saudi Arabia is third and United Arab Emirates is the fourth with 3, 3% (BP, 2015).

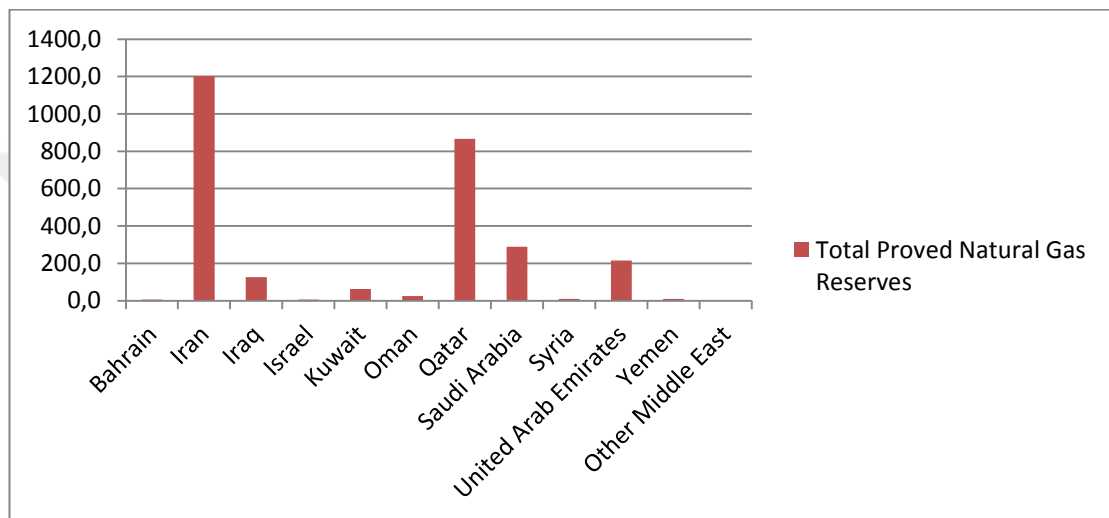


Figure 3.13 The position of Iran's total proven Natural Gas reserves in the Middle East, 2014 (tcm)

Source: BP (2015)

Because Iran holds great quantity of unimproved and identified natural gas reserves, the country is not expected to find new natural gas reserves (BP; 2015). However, Iran's exploration is restricted, yet 'the country found four grand reserves in 2011 which are as follows: Khayyam, Forouz B, Madar and Sardare Jangal' (EIA; 2015a). Also, "South Pars, North Pars, Tabnak, Golshan, Kish, Kangan, Forouz, Lavan and Ferdowsi are Iran's main natural gas fields which are less developed and utilizing domestic demand" (Houshisadet 2015; p. 463). Another article mentioned these newly founded reserves in a different light. Osgouei & Sorgun (2012) said that since 2000 total natural gas reserves of Iran has increased by 12% due to reconsideration of South Pars deposits and newly found gas deposits in Tabnak and Hama, which are the main ones. 'Hama deposit' holds 4.69 tcf natural gas while Tabnak field' holds 30.017 tcf of natural gas' (Osgouei and Sorgun, 2012; pp. 113-120).

According to EIA (2015a), Iran overrides Russia in 2013 due to becoming the world's biggest gas-flaring country. Also, in recent years the natural gas production of Iran has been rising due to the new deposits in South Pars. Osgouei and Sorgun (2012) indicated that South Pars, which is geological extension of massive North deposit of Qatar with 459.1 tcf, is the first principal offshore gas area and North Pars is the second area for Iran's natural gas reserves. Bahgat (2014) stated that South Pars was first realized by National Iranian Oil Company (NIOC) in 1990 containing 24 segments and it provides majority of Iran's natural gas reserves. In addition to this, 'the South Pars makes up 61% of the gas fields of Middle East' (Houshisadat 2015; pp. 458-475).

3.3.2 Exports and imports

For a number of countries, Iran's export and import relations play a considerable role in country's energy profile. According to EIA's Independent Statistics and Analysis (2012), Iran which does not possess the competence to export by means of Liquefied Natural Gas export terminal for global markets, procures below 1% of global natural gas exports. Besides Houshisadat (2015) believed that Iran will aim to become one of the foremost worldwide LNG and gas exporters in the future, but the country's energy market encounters two core obstacles, which are high domestic consumption and foreign sanctions. Also, Houshisadat (2015) mentioned that if Iran should solve challenges such as inadequate amount of foreign investments, great domestic consumption and additional solid gas necessities, the country's possible LNG export would be implemented by 2020. A notable example of Iran's LNG is seen in India case. 'Although in 1990s the government of India intended to contact with Iran about LNG program, there were many difficulties in terms of financing and politics. The intention of India could not be materialized, due to these problems' (Ford 2004; pp. 44-46).

Additionally, 'Iran imports gas from Turkmenistan and exports its gas to Turkey, Armenia and Azerbaijan' (Bahgat 2014; p. 127). International sanctions effected Iran's import movements. As known, there is a relationship between Iran and Turkmenistan in terms of natural gas trading. At the same time, these two countries are related with each other in terms of the following: "Iran being in a possible condition to preserve regional peace and security; concerning the issue of attaining

international waters, Iran is a key figure for Turkmenistan; being on the transportation route for exporting Turkmen gas to Europe” (Atai & Azizi 2012; pp. 745-758). Besides, Iran takes its gas from Turkmenistan but Turkmen gas import, which is critical for Iran in order to for Iran to gather industrial demand in northern Iran and seasonal peak demand, experienced a decline in 2012 and 2013 due to sanctions. According to EIA (2015a), in 2012, natural gas imports of Iran diminished over 35% and in 2013, this rate went down by 21%.

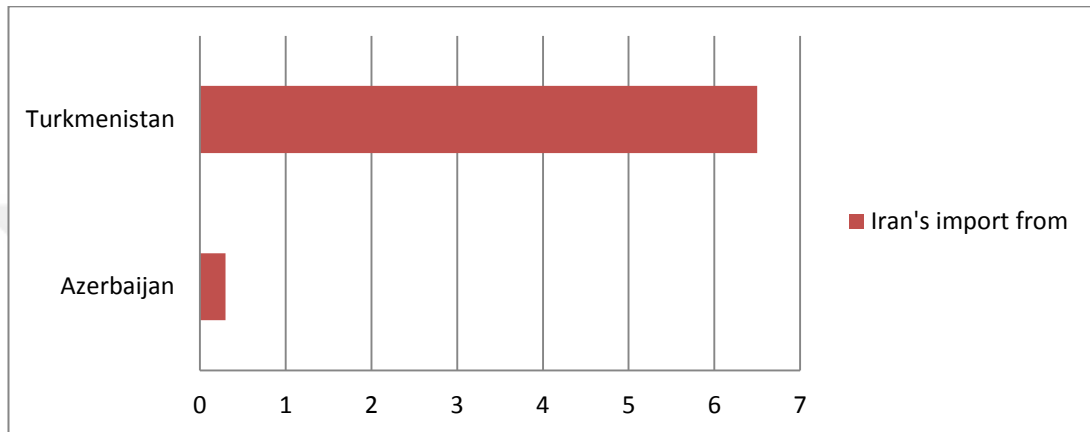


Figure 3.14 Natural Gas Trade Movements of Iran by pipeline, 2014 (bcm)
Source: BP (2015)

As seen in the figure 3.14, Iran’s natural gas imports are largely from Turkmenistan. According to BP (2015), the total import rate was 6.9% by pipeline in 2014. The shares of this trade are as follows: ‘from Azerbaijan 0, 3 bcm and from Turkmenistan 6, 5 bcm gas compared to previous year when Iran imported gas from Turkmenistan at an amount of 4, 7 bcm in 2013’ (BP; 2015). As a result, “Iran is considered as a small net exporter of natural gas” (Iran Oil & Gas Report, 2015; p. 51).

On the other hand, Iran exports to Turkey, Armenia, and Azerbaijan. EIA (2015a) predicted that Iran exported natural gas to these three countries approximately about 810MMcf per day. However, Iran provides gas to Turkey over 90% in accordance with the terms of an existing 25-year agreement while Iran supplies gas to Armenia at an amount of only 6% and to Azerbaijan only 3%.

3.3.3 Pipelines and projects

Similar to other countries’ gas markets, the pipelines are important for the Iran’s natural gas market in order to transport gas. However, in some cases, LNG is also

preferred if pipelines are not inadequate in terms of fulfilling the demand. In its own region, Iran is an essential gas supplier. As known, total natural gas trade movements of a country are based on both export and import and also Iran has the world's second largest natural gas reserves. Therefore, Iran gives an importance to natural gas pipelines in order to export and import gas in accordance with the respective agreements between its neighbours. In contrast, the countries' natural gas market encountered several problems, which also influenced pipeline and projects. As mentioned before in the previous parts, international sanctions, increased natural gas demand, and transporting natural gas through oil wells negatively affected Iran energy industry. In the light of these facts, the pipelines and projects are also affected. According to Iran Oil and Gas Report (2015), the pipeline of natural gas imports connects Iran to Azerbaijan (capacity: 10bcm) and Turkmenistan (capacity: 20bcm) while the pipelines of natural gas exports connects Iran to Turkmenistan (capacity: 10.2bcm) and Armenia (capacity: 2.3bcm). Iran has four regional pipelines, which are "Iran-Pakistan pipeline, Iran-Iraq pipeline, Iran-Oman pipeline, and Iran-UAE Gas contract" (EIA; 2015a).

First, International Iran Times mentioned that the pipeline was built for the first time in 1995 and this was called peace pipeline through which the Iranian natural gas fields in South Pars sent gas to Pakistan and India. However, India gave up this pipeline because of Iran's insisted demand. Another example of the relations of Iran-Pakistan-India is seen in Sahay and Roshandel' (2010) study. They indicated that Iran-Pakistan-India (IPI) pipeline has some obstacles. They thought that IPI pipeline not only would complicate the regionalizing of the global energy trade for a number of Asia's districts like South Asia and West Central Asia, but also create the problem of declining transportation prices and other logistical problems. Because of these problems, IPI pipeline, this was the main intention of the countries, but was never materialized. Then, Iran sends its gas from South Pars gas area to Pakistan with the help of this pipeline. However, EIA (2015a) indicated that construction of Iran-Pakistan pipeline was completed from South Pars gas field to border of Pakistan but Pakistan did not manage to finish the segment within its own borders due to the fear of US sanctions. As said by Natural Gas Asia (2015), the initial stream of gas to Pakistan would have been initiated in December 31, 2014 in accordance with the agreement that was signed in 2009 between Iran and Pakistan. Nonetheless, Munir,

Ahsan and Zulfqar (2013) stated that the US sanctions on Iran interrupted this pipeline project. Iran-Pakistan pipeline for Pakistan supplied 21.5 million cubic meters of natural gas daily. After the lifting of sanctions, this pipeline projects put for re-evaluation. Since there are energy scarcity and power cuts in Pakistan, the country has difficulty paying the high cost of the pipeline project. Therefore, China supported the construction of the pipeline. According to China National Petroleum Corporation, with a 2\$ billion contract, China supported the construction of 700 kilometres from Gwadar which is the port of Pakistan, to Nawabshah which is a province of Pakistan, so Pakistan built the pipeline from the other part of Gwadar to 80 kilometres shy from borders of Iran. In addition to this, as said by International Iran Times (2015), China provided 85% of the capital to Pakistan to pay for this pipeline project. As shown in the following map, the route of Iran-Pakistan pipeline can be seen clearly.



Figure 3.15 Iran-Pakistan Pipeline route map

Source: WOGNEWS, 2015

Moreover, there were a number of challenges concerning Iran-Pakistan pipeline before the project was finalized. Both sides encountered various obstacles while implementing this pipeline. On Pakistan side, the country encountered critical energy crisis previous years. “If Pakistan deals with its energy needs, the country can focus on the Iran-Pakistan Pipeline which is the most practical and best choice with low prices” (Munir, Ahsan and Zulfqar 2013; pp. 161-178). Munir, Ahsan and Zulfqar (2013) stated the advantages of Iran-Pakistan pipeline. They said that this pipeline helped not only to recover Pakistan’s energy needs mix but also to avoid the

decreasing local gas reserves of Pakistan. Turkmenistan is the most critical natural gas partner for Iran. “The primary contract for this pipeline commits 274 bcf of natural gas per year, for more than 25 years” (EIA; 2015a). Munir, Ahsan and Zulfqar (2013) mentioned that the cost of Iran-Turkmenistan pipeline is approximately \$3 billion to Pakistan. They also determined the advantages of Iran’s side in their article. Iran suggested building electricity transmission system close to pipeline that depends on Iran’s electricity grid connected with Pakistan- India and China in order to sell electricity. Therefore, this is an important advantage for Iran. However, the Iran- Pakistan pipeline is negatively affected due to the problems faced by Iran caused by US sanctions and UN sanctions.

Second proposed regional pipeline is Iran-Iraq pipeline through which Iran exports its natural gas to Iraq. EIA (2015a) mentioned that the gas flow of Iran-Iraq pipeline is 320 bcf per year under primary contract within five years. Nonetheless, Iranian Fars Energy Agency declared that the pipeline has started to provide gas to Iraq with 25 million cubic meters under the agreement and helps to run Mansourieh power plant in Iraq. Indeed, Iran-Iraq pipeline will start importing earlier than before. However, the government of Iraq undertakes an operation against ISIS so the construction of Iran-Iraq pipeline delayed. According to Iran Daily News (2015), the pipeline, which is 270 kilometer long and starts from Charmaleh that is located in Iran’s Kermanshah district, to Naft Shahr that is a town in Iran, to Iraq territory. Iran Daily News (December 29, 2015) also confirmed that the pipeline initiates 5 million cubic meters daily and this number will get to 35 million cubic meters daily in the forthcoming days. Iran Oil & Gas Report (2015) reported that Iran-Iraq pipeline which would be broadened in order to provide gas to several countries like Lebanon and Jordan launches from Assaluyeh that is close to South Pars deposit in Iran and continues to supply gas to Iraq’s three power plants.

Third planned regional pipeline is Iran- Oman. According to Natural Gas Asia (2015), in 2013, there was an agreement between Iran and Oman and the content of the agreement was about Iran-Oman pipeline on which Iran planned to export 28 million cubic meters natural gas daily to Oman for 15 years. Natural Gas Asia mentioned in its September 2015 news that the pipeline, which is 400 kilometres long, is divided as onshore (land part) which has 200 kilometres expanded from Rudan to Hormozgan district and offshore (Seabed part) parts, which has another 200

kilometres linking Iran and Oman. According to EIA (2015a), both countries have the same opinion that Iran exports natural gas to Oman via Iran-Oman natural gas pipeline with 350 bcf. However, the fulfilment of the construction of the pipeline encountered difficulties. The most significant problem is the disagreement about the cost between two countries. 'Iran supposes that the cost of natural gas should be \$11 or \$14 million British thermal units (MMBtu) however Oman offers \$6 or \$8 MMBtus' (EIA June 19, 2015).

Final projected regional pipeline is Iran-United Arab Emirates (UAE). 'Under the contract, Iran supplies natural gas from its Salman deposit to UAE' Sharjah' (EIA; 2015a). Since there is a conflict between two countries about cost and volume, the interview of the contract was not finalized. As a result, the international arbitration is involved (EIA June 19, 2015).

On the other hand, Iran Oil and Gas Report (2015) determined that the main domestic pipeline of Iran is Iranian Gas Trunkline (IGAT) which supplies natural gas to Iran's deprived northern regions in terms of natural gas scarcity, due to the declining import from Azerbaijan. Likewise, Iran Oil and Gas Report (2015) reported that Iran has three pipelines that are used for natural gas import which are as follows: Kazi Majomed-Iran gas import pipeline, Korpezhe-Kurt Kui gas import pipeline and Dauletabad-Sarakhs-Khangeran gas import pipeline while Iran-Turkey gas export pipeline and Iran-Armenia gas export pipeline are the exporting pipelines for Iran. Moreover, Iran Oil and Gas Report (2015) indicated four proposed Iranian pipelines that are SAGE Subsea export pipeline, Kuwait-Iran pipeline, Iran-Iraq-Syria pipeline, and Iran-Turkey pipeline II.

As mentioned before, Iran mostly imports gas from Turkmenistan. There are two pipelines between two countries that are Korpezhe-Kurt Kui gas import pipeline and Dauletabad-Sarakhs-Khangeran gas import pipeline. 'Korpezhe-Kurt Kui pipeline which is held by National Oil Engineering & Construction Company (NIOEC), supplies gas from Korpezhe gas deposit which is in North West of Turkmenistan to Kurt Kui deposits in Northern Iran' (Iran Oil & Gas Report 2015; pp. 1-143). This pipeline is vital for Turkmenistan in terms of 'politics and strategy because of the fact that this pipeline made Turkmenistan admitted to the initial Post-Soviet energy prosperous republic' (Atai and Azizi 2012; pp. 745-758). Iran Oil and Gas Report

(2015) indicated that In December 2009, second pipeline from Turkmenistan, which is Dauletabad-Sarakhs-Khangeran, was opened in order to supply gas to Iran and to expand the energy exports of central Asian countries from Russia. According to Iran Oil and Gas Report (2015), the construction of the pipeline was entitled in the later December 2010 with a capacity of 16.5 bcm, due to this pipeline, natural gas import capacity of Iran from Turkmenistan increased by 20 bcm.

On the other hand, Iran generally exports its gas to Turkey. This gas trade relationship of two countries is materialized via Iran-Turkey pipeline. “The pipeline was started in 1996 and it was finished in 2001” (Iran Oil and Gas Report 2015; pp. 1-143). Tabriz, which is located in North of Iran, exports its gas to Turkey. Besides, Iran-Turkey pipeline that is run by National Iranian Oil Company unites the Baku-Tbilisi-Erzurum gas pipeline (BTE). However, there are some pressures. The most important threat is that the pipeline is usually faced with terrorist attacks to steal gas. Iran and Turkey also have a second proposed natural gas pipeline. “Iran made an agreement in 2010 via Turkey to Europe to build 660 kilometres of gas pipeline for less than \$1.29 billion” (Iran Oil and Gas Report 2015; pp. 1-143). Other evidence shows this pipeline in a different light. According to Natural Gas Europe (2014), in 2008, Iran-Turkey-Europe (ITE) pipeline’s length was supposed to be approximately 5,000 kilometres but there were some problems in terms of investments in gas industry, capacity, effects of sanctions and costs. As demonstrated in the figure below, the route of ITE pipeline can be understood more clearly.

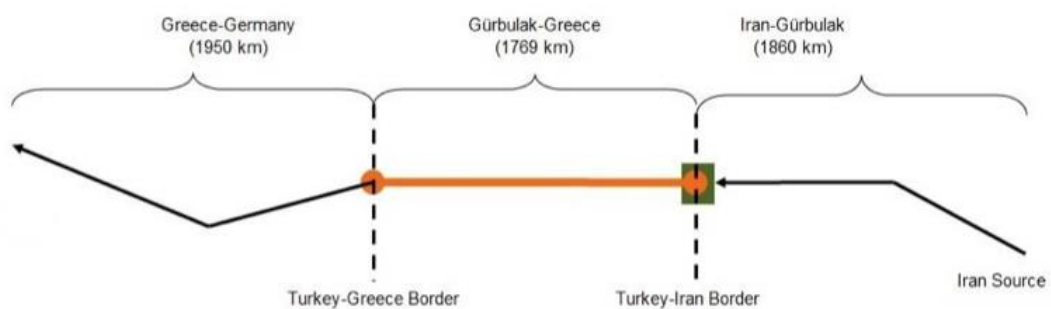


Figure 3.16 Iran-Turkey-Europe (ITE) Gas Pipeline Route
Source: Natural Gas Europe, 2014

Therefore, Iran did not manage to recover its economy completely during the Iranian 1979 Revolution and Iran-Iraq war due to vast infrastructural damage and losses for

the country. For instance, there was a decline in oil revenues, an event of balance of payment crisis, rising budget deficit and inflation. The following years, Iran's economy recovered slowly due to country's economic liberalization tendency that also affected Iran's natural gas market. However, after these events, discovery of new natural gas fields which is South Pars, provided prestige for Iran. Due to giant South Pars gas fields, Iran's natural gas production and its export have been increased.

In contrast, Iran has supported nuclear activities nowadays but a majority of countries protested Iran's nuclear behaviours and this issue became an international problem in world policy. A number of countries argued that Iran used nuclear power as a terror tool. Although Iran has huge natural gas reserves and oil reserves, the country desired to enlarge its nuclear power as a primary source. For this reason, Western countries and regional countries of Iran could not take its nuclear activities kindly.

In fact, Iran is considered as a significant power for all countries due to its geostrategic and geographical location in terms of allocation of rich energy resources. Generally, if one country has huge amount of energy sources, that country is a powerful country. Therefore, Iran is an important power in international arena.

CHAPTER IV

Analysing Russian Natural Gas Policy Making

4.1 Introduction

Russia is a significant player in international arena due to its gigantic natural gas reserves. EIA (2015b) reported that Russia is not only the chief producer of crude oil but also is the second biggest producer of dry natural gas with 22.1 trillion cubic feet and third largest exporter of coal in the world. The study by Yang, Yang, Bishop, and Shen (2013) has found that, the evidence of Russia as a natural gas producer country shows that Russia possessed 27% of the world natural gas reserves, pursued by Iran with 16% and Qatar with 15%. The leading natural gas producer and pipeline operator of Russia is Gazprom, which is a state controlled energy company. In addition to the country's important role in the world, Russia has the world's biggest natural gas reserves.

In the 21st century, economy is essential for each country's internal and foreign policy. Considering the economy of Russia, natural gas industry is a decisive component of economic policy of Russia in 21st century. Nowadays, the decrease of oil prices affects Russia's foreign policy as other countries. "Due to falling oil prices, while the inflation of Russia decelerates, the real income and the federal budget revenue also decreased in 2015" (The World Bank Data, December 9, 2015). The federal budget revenue is crucial for Russia because it is based mostly on natural gas and oil. Additionally, the most important proof of Russia's economic rate is declared by World Bank Data (2015) which shows that Russia's economic growth rate diminished by 3.8% in 2015. The World Bank data also proved that, after 2009 currency crisis, in Russia's economy, there still has been recession, such as exchange rate of Ruble losing 28% of value compared to US dollar. "Since 2014, there has been a reduction in the Russia's annual GDP growth rate with a decrease of 0.6% in 2014, followed by 3.8% in 2015 and with 0,6% in 2016" (The World Bank Data; 2015).

Russia plays a critical role for EU due to its contribution to oil and natural gas. According to EIA (2015b), Russia provides 30% of its crude oil to EU while EU receives 90% of its natural gas from Russia. Apart from that, EU is an important

market for Russia in terms of its revenue. The reason for this is that, Russia exports natural gas and oil to EU and this affects its economy.

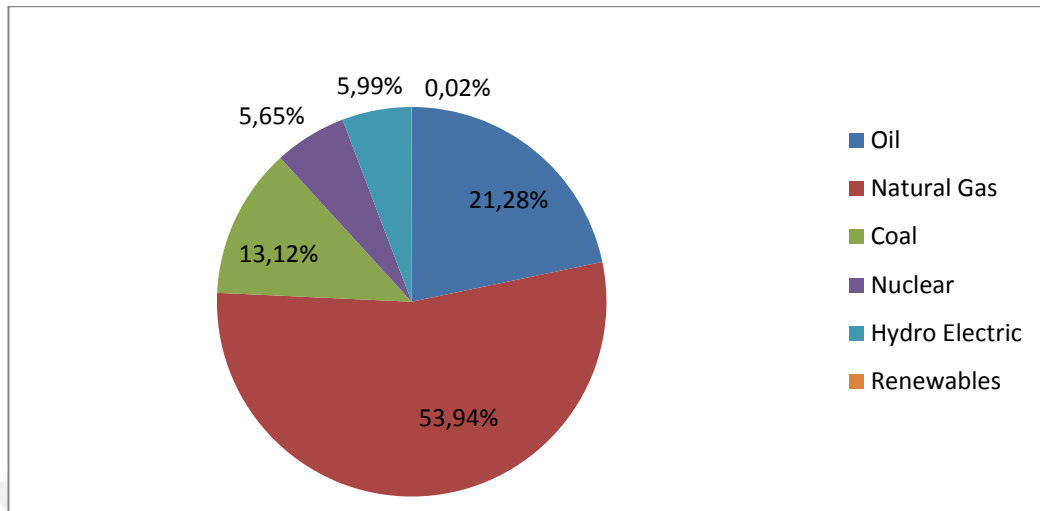


Figure 4.1 Russia's Primary Energy Consumption, 2013 (mtoe)
Source: BP, 2015

Figure 4.1 and figure 4.2 illustrates which energy resources takes part in Russia's primary energy consumption between the years 2013 and 2014 in the pie charts below.

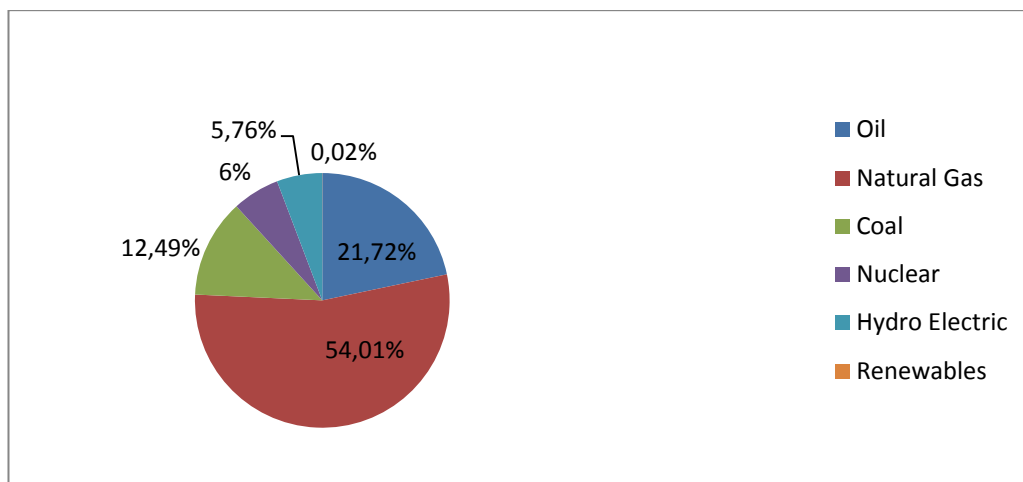


Figure 4.2 Russia's Primary Energy Consumption, 2014 (mtoe)
Source: BP, 2015

It can clearly be seen that natural gas is the leading resource while oil is the second vital resource of the country's primary sources for both pie charts. The rate of natural gas and oil was projected to rise in both 2013 and 2014. According to figure 4.1 and figure 4.2, there has been an increased rate of natural gas from 53, 94 in 2013 to 54,

oil in 2014 while the rate of coal increased from 21, 28% in 2013 to 21, 72% in 2014. However, the rate of coal dropped from 13, 12% in 2013 to 12, 49% in 2014 as the third important resource of the country's primary energy sources (Figure 4.1 & Figure 4.2). Figure 4.2 demonstrates that nuclear, hydroelectric and renewable energy accounted for 6%, 5, 76% and 0, 02% respectively in 2014.

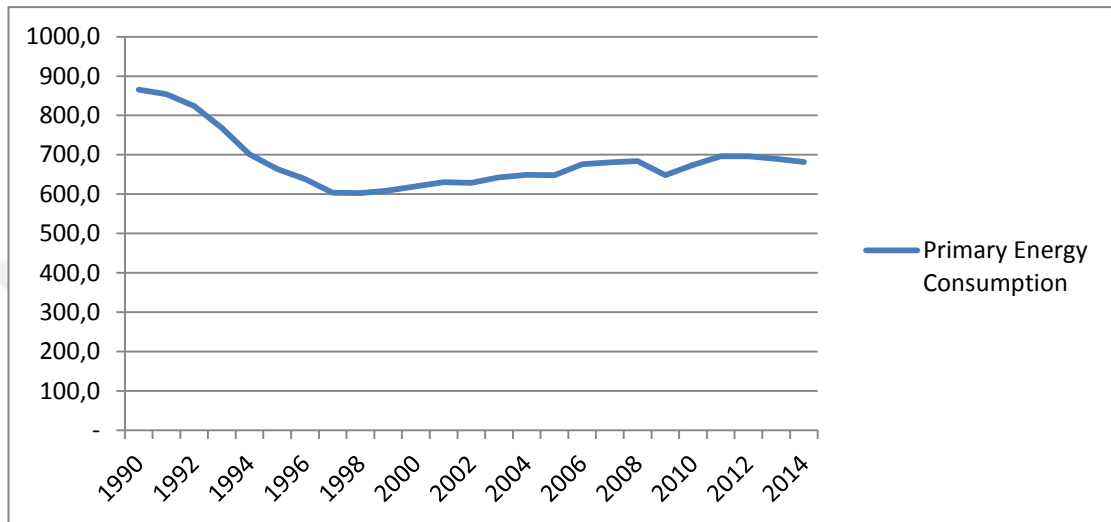


Figure 4.3 The History of Russia's Primary Energy Consumption, 2014 (mtoe)
Source: BP, 2015

In 2013, 'the total energy consumption of Russia was 689, 9 mtoe but this overall consumption decreased in 2014 to 681, 9 mtoe' (EIA; 2015b). The history of the country's primary energy consumption in 2014 has been illustrated in the graph above. After 1990, there has been a slight decline in the primary energy consumption of Russia. In addition to this, from 2008 to 2009, there was a decrease due to the financial crisis in these periods.

On the other hand, Oil and Gas Industry Profile (2014) stated that Rosneft Oil Company, Lukoil, and Gazprom are the foremost energy companies for Russia. "Rosneft is the primary dominating gas producer of Russia with 12.79 bcm while Gazprom not only is the world's largest vertically incorporated energy company with its giant natural gas reserves but also it is the biggest company of Russia as a producer and operator" (Oil and Gas Profile: Russia 2013; pp. 1-35). Also, Lukoil is the biggest private oil company in the world.

Russia plays a critical role in the world's energy market. The country is also existed in world's energy arena in terms of its electricity production. This is exemplified in the data undertaken by EIA (2015b) that shows that in the world, Russia is the chief producer and consumer of electric power with over 230 gigawatts of installed power generation. Figure 4.4 shows the history of Russia's electricity generation in 2014 in the graph below.

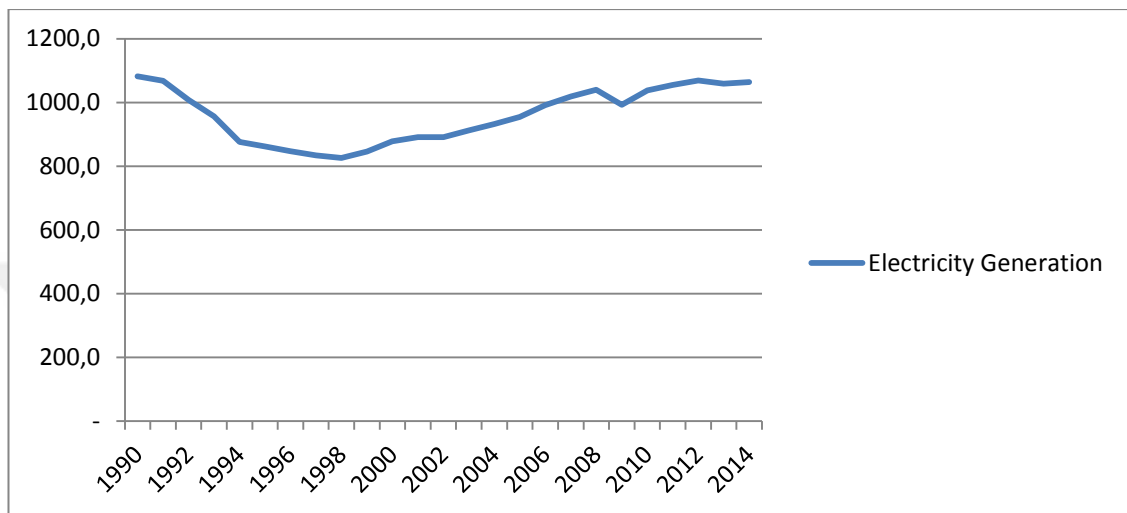


Figure 4.4 The history of electricity Generation of Russia, 2014 (TWh)
Source: BP, 2015

A decline has been observed between 2008 and 2009 due to the financial crisis as a parallel to the graph of Russia's primary energy consumption. The reason of this similarity is that, fossil fuels and other resources are determining factor in country's electricity generation. According to EIA (2015b), the ratio of oil, natural gas and coal accounts for 67% of electricity generation of Russia while nuclear and hydropower accounts for 16% and 16% respectively. In addition to EIA (2015b) data, in 2013 Russia exported electricity generally to Kazakstan, China, Lithuania, Belarus, and Finland with about 18 BkWh while it imported electricity commonly from Kazakhstan about 5 BkWh in 2013.

4.2 The Development of Natural Gas Industry in Russia

4.2.1 The Russia's Position in Natural Gas Market after the Collapse of Soviet Union

In the 1970s, the term energy was not a priority for the state's policy because security was one of the core issues at that time. The reason for this is that, the state

has been struggled with internal and external disorder with the revolution. The establishment of Soviet Union was based on Bolshevik Revolution, which was a significant event in the world. Due to this revolution, there has been observed a transformation from socialism to capitalism. The country has encountered domestic conflicts and economic problems.

Afterwards, the state started to focus on both security and energy. According to Green & Sagers (1985), the five-year plan that was prepared between 1981 and 1985, was based on energy industry, especially natural gas. Green & Sagers (1985) illustrates this point clearly. They mentioned in their study that natural gas output increased from 435 bcm in 1980 to 630 bcm in 1985 with a rate of 45%. On the other hand, during the time of Boris Yeltsin who came into power after the collapse of the Soviet Union, there was not only economic and political instability but also there was an economic crisis causing a foreign debt to IMF.

Although there was an economic instability in Yeltsin period, the natural resources like natural gas and oil were already available which provided foreign exchange inflow, and the investors hoped to invest in these natural resources. However, “the economy of Russia fell down more than 40% between the years 1990 and 1998” (Sagers 2007; pp. 651-698). Following this, in 1998, the Russian economic crisis occurred which affected not only the country’s economy, inflation and energy industry but also the investors’ investment on natural gas.

After the fall of Soviet Union (1990s), there were changes in economy but also there were a number of changes in Russia’s energy industry in terms of primary energy consumption, natural gas reserves, natural gas production & consumption and electricity generation. Sagers (2007) mentioned that since the Soviet Union era, the natural gas price has been low, but the natural gas price became higher after the disintegration period. As mentioned before, fossil fuels, nuclear power, hydroelectric and renewable resources are constituted the Russia’s primary energy consumption. The figure 4.5 illustrates how the Russia’s position of primary energy consumption has been changed after the collapse of Soviet Union in the graph below.

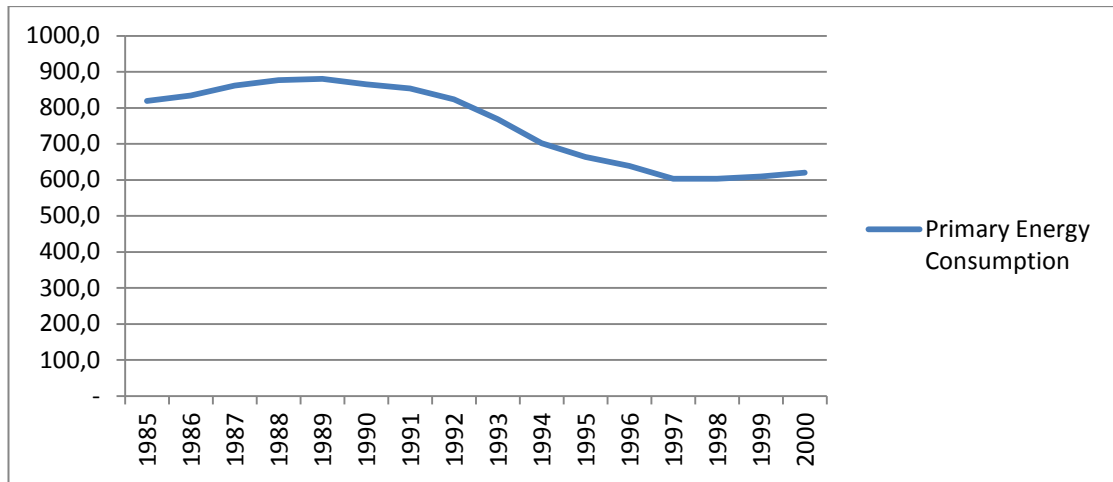


Figure 4.5 The Primary Energy Consumption History of Russia after the collapse of USSR (mtoe)

Source: BP, 2015

Between the year 1985 and 1990, there was a slight increase in primary energy consumption of Russia while there a gradual decrease was observed after the disintegration of Soviet Union (figure 4.6). For instance, ‘the primary energy consumption of the country rose from 819, 4 mtoe in 1985 to 865, 4 mtoe in 1990 while this rate fell down from 865, 4 mtoe in 1990 to 620, 0 mtoe in 2000’ (BP; 2015).

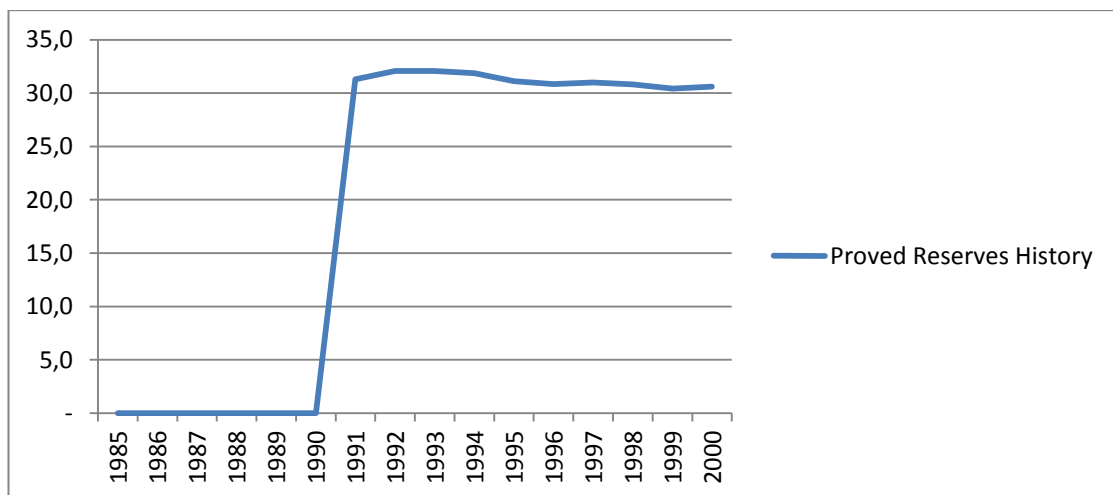


Figure 4.6 The condition of Proven Natural Gas Reserves History of Russia after the collapse of USSR (tcm)

Source: BP, 2015

Before the collapse of Soviet Union, there was an absence in the country’s proven natural gas reserves. Figure 4.6 reveals that the country did not possess proven natural gas reserves before 1990. Conversely, there has been a steep increase in

proven natural gas reserves from 1990 to 1992, which was the time of fall of Soviet Union. ‘The total proven natural gas reserves went up from 31, 3 tcm in 1991 to 32, 1 tcm in 1992’ (BP; 2015).

In the following figure 4.7 and figure 4.8, it is demonstrated that, how natural gas production and consumption of Russia has changed respectively after the downfall period.

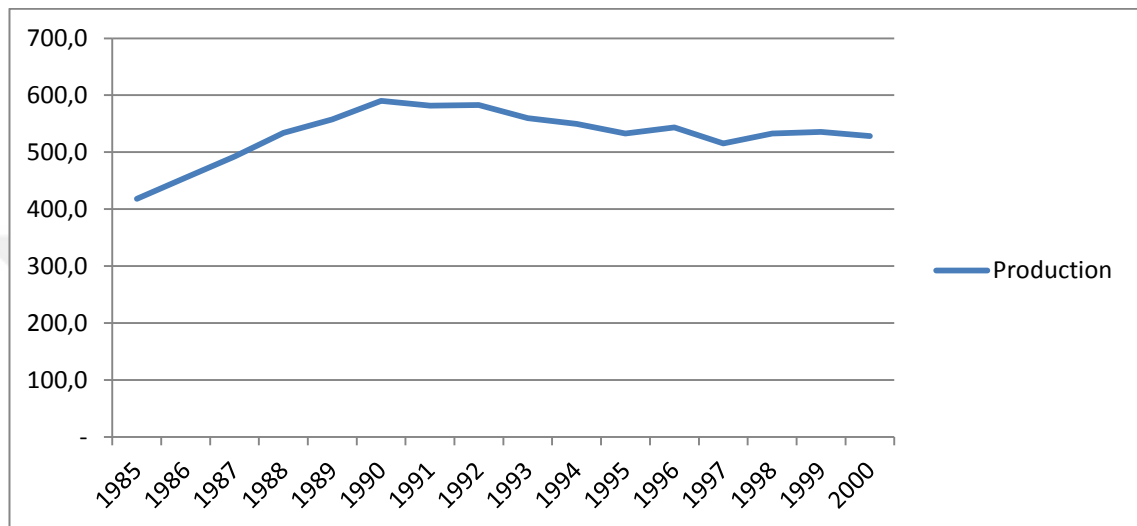


Figure 4.7 The condition of Natural Gas Production of Russia after the collapse of USSR (tcm)
Source: BP, 2015

The trend figure 4.7 illustrated above shows that there has been an increase between 1985 and 1990 in the natural gas production of Russia. After 1990, there has been a reduction in the gas production. The evidence of the drop in natural gas production after 1990 can be clearly found in several different studies by Rumer (1992), Sagers (2007) and BP (2015). “There was been a drop in Russia’s natural gas production in 1991 with the rate of 14%” (Rumer 1992; pp. 36.41). Likewise, ‘Russian natural gas production reduced to 571, 1 bcm in 1997’ (Sagers 2007; pp. 651-698). By contrast, “the country’s natural gas production went down from 590, 0 bcm in 1990 to 528, 5 bcm in 2000” (BP, 2015). These studies indicate that natural gas production of Russia was affected after the disintegration period. However, the country has managed to recover both its economy and its position in energy market in a short time period. In addition to this, the relation between natural gas supply & demand is also a remarkable indicator when analysing its production. Sagers (2007) also viewed that there was a lack of natural gas supply due to increasing gas demand.

Figure 4.8 shows that there has been a decline in the natural gas consumption of Russia after 1990 similar to natural gas production. ‘The natural gas consumption of Russia has dropped from 407, 06 bcm in 1990 to 360, 4 bcm in 2000’ (BP; 2015).

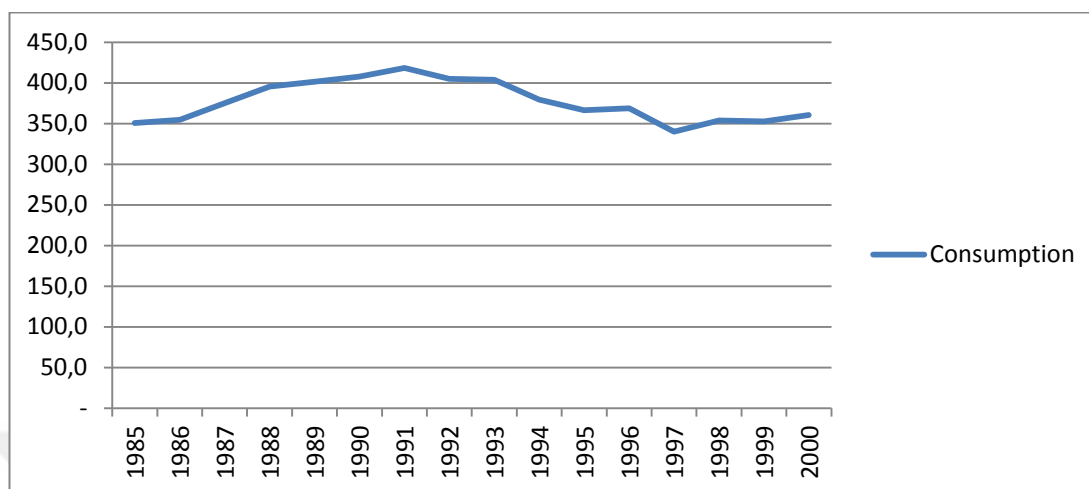


Figure 4.8 The situation of Natural Gas Consumption of Russia after the collapse of USSR (bcm)

Source: BP, 2015

Furthermore, the condition of natural gas exports & imports and pipelines has faced with a number of amendments after the era of Soviet Union.

<u>Indicators</u>	<u>In 1990</u>	<u>In 2000</u>
Total Natural Gas Exports	206.8 bcm	217.8bcm
<i>a)Former Soviet Republic</i>	96.3 bcm	129.0 bcm
<i>b)Outside of Former Soviet Union</i>	110.5 bcm	88.8 bcm
Total Natural Gas Imports	36.4 bcm	37.4 bcm
<i>a)Former Soviet Republic</i>	36.4 bcm	37.4 bcm
<i>b)Kazakhstan</i>	4.1 bcm	5.3 bcm
<i>c)Turkmenistan</i>	32.3 bcm	29.1 bcm
<i>d)Latvia</i>	-	0.6 bcm
<i>e)Uzbekistan</i>	-	2.4 bcm
Pipeline use/changes in storage	66.2 bcm	53.1 bcm

Table 4.1 Comparison of the changes in Russia's gas exports & imports and pipeline use from 1990 to 2000 after the disintegration period

Source: (Sagers 2007; pp. 651-698)

As shown in the table above, gas exports has grown from 206, 8 bcm to 217, 8 bcm while gas imports has increased from 36, 4 bcm to 37, 4 bcm between the years of 1990 and 2000. Figure 4.9 has separated both gas exports and gas imports as being in the former Soviet Republic and outside of the former Soviet Union. The country mostly imported gas to Turkmenistan at a rate of 32, 3 bcm in 1990 and 29, 1 bcm in 2000 while Latvia which imported gas the least, supplied gas at a rate of 0, 6 bcm in 2000 (Figure 4.9.). However, there was a decrease in the pipeline usage with an amount of 13, 1 bcm between those years in the figure above.

4.2.2 The Disagreement between Ukraine and Russia

Ukraine is an important country for Russia and Europe because it is a transit country for natural gas transportation. Additionally, ‘Ukraine is the biggest European consumer of natural gas as the country consumes approximately 60 bcm annual natural gas’ (ICPS Newsletter; 2009). Russia supplies 30% of Europe's natural gas through Ukraine while %60 of Ukraine's natural gas comes from Russia. This shows that Russia is an important natural gas supplier. However, there was a crisis between two countries in 2006 and in 2009 concerning natural gas. “On January 1 2009, Russia cut natural gas that it provided to Ukraine, which in turn interrupted its gas to reach Western Europe” (Market Watch; 2006). The reason of 2009 gas dispute was that Ukraine did not pay Russia, which increased the gas prices in 2006. Therefore, Russia broke off gas flow to Ukraine. According to ICPS Newsletter (2009), Ukraine has faced with IMF dept due to rising gas prices and economic crisis so the country had debts and did not pay the gas fee on time to Gazprom.

On the other hand, there are number of implications due to gas disputes between Russia and EU. Russia is a known distributor and supplier in other central European countries but after the gas dispute Russia started to lose its prestige and the European countries lost confidence in Russia” (ICPS Newsletter 2009; pp. 1-2). From the viewpoint of EU, EU started to focus on diversification of its sources and its energy security after Russia's behaviours.

Moreover, how Russia’s natural gas reserves, production, and consumption were affected after Ukraine-Russia gas crisis is another point. In figure 4.9 below, the situation of Russian natural gas reserves has been illustrated.

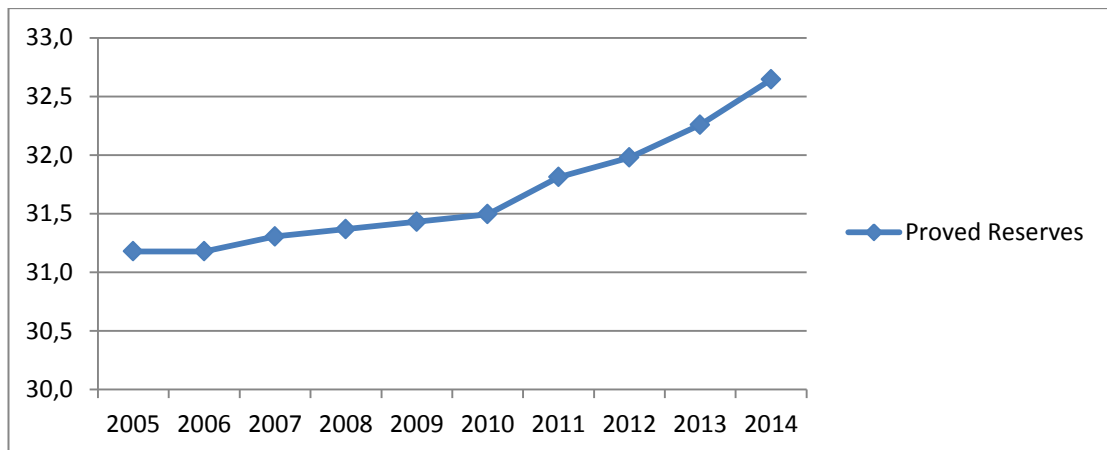


Figure 4.9 The situation of Russia’s Proven Natural Gas Reserves during the time of Ukraine-Russia Disputes (tcm)
Source: BP, 2015

Figure 4.9 demonstrates that the total proven natural gas reserves of Russia has increased gradually in the time of 2006 and 2009 gas dispute between Ukraine and Russia. ‘Between the year 2006 and 2009 the natural gas reserves of Russia increased from 31, 2 tcm in 2006 to 31, 4 tcm in 2009 as seen in the graph above’ (BP; 2015). In the graph below, the condition of Russian natural gas production is demonstrated since Russia’s gas cut to Ukraine.

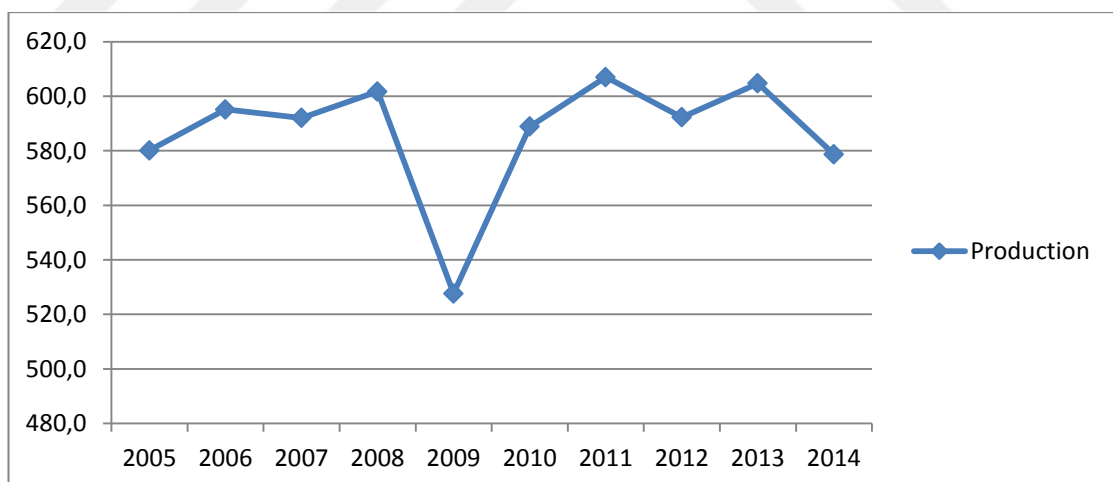


Figure 4.10 The condition of Russia’s Natural Gas Production during the time of Ukraine-Russia Disputes (bcm)
Source: BP, 2015

Figure 4.10 shows that there has been a decrease since 2006 Ukraine-Russia gas dispute. Due to 2006 dispute, several European countries such as Germany, Poland, Hungary, France, and Italy encountered a decrease in their supplies of Russian natural gas. In addition to this, there has been a sharp decline between the year 2008

and 2009. The reason of this decline was both 2008-2009 financial crises and Russia–Ukraine gas disputes. The evidence of declining Russian gas production in 2008-2009 can be evidently seen in the BP (2015) shows that the natural gas production fell harshly from 601, 7 bcm in 2008 to 527, 7 in 2009 bcm while there has been steep increase in gas production between the year 2009 with 527, 7 and 2010 with 588, 9 which can be observed more clearly in the graph above. According to Fjaertoft (2010), not only Russia’s gas export volumes to Europe decreased 40% but also the country’s export volumes of gas to CIS dropped 50% because of financial crisis and gas disputes. Moreover, Fjaertoft (2010) stated that Gazprom delayed the country’s 2009 gas investment program and upstream projects which caused gas revenue to go down. Following 2008-2009 events like financial crisis, the natural gas price also decreased ‘from 10, 79 US dollars per million Btu to 4, 85 US dollars per million Btu’ (BP, 2015). This reduction in natural gas price influenced the country’s natural gas consumption.

How Russia’s natural gas consumption has been changed during the Ukraine-Russia gas crisis can be seen in the graph below.

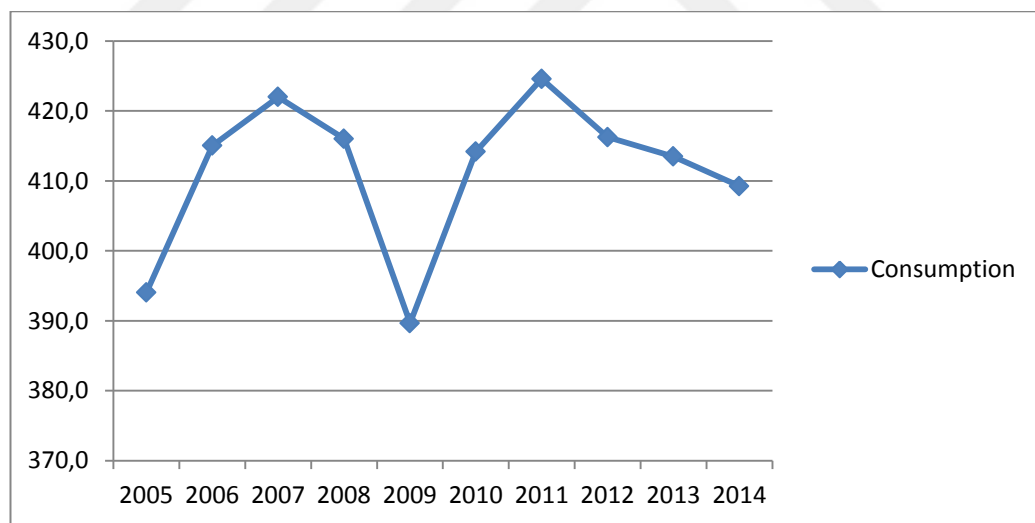


Figure 4.11 Natural Gas consumption of Russia during the time of Ukraine-Russia disagreement (bcm)

Source: BP, 2015

As it can be seen in the Russia’s gas production graph, the figure 4.11 illustrates that there has been a decline in the country’s gas consumption between 2008 and 2009. The reason of this decline is the same with in gas production decline that was the financial crisis in 2008 and 2009. In 2006 and 2009, a gas dispute affected the

Russia's natural gas consumption. Between the year 2006 and 2007 there was a rise from 415 bcm in 2006 to 422 bcm in 2007 due to cold weather while there has been decline too from 416 bcm in 2008 to 389 bcm in 2009 (BP, 2015).

As stated before, EU was the most affected region of the event of Russian interruption of gas transportation to Ukraine. In addition to this, in July 2014, EU did not support Russia's behaviour on Crimea annexation² because of a security threat; therefore, EU implemented sanctions on Russia. Following these events, Russian gas consumption and production were distressed. For instance, there has been a reduction after 2013 in Russia's gas production and consumption (Figure 4.10 and Figure 4.11). The main reason of this decline was the EU sanctions on Russia in 2014 due to Russia's annexation of Crimea and the effects of Ukraine-Russia gas dispute. Thus, European Commission (2015) stated that the initial diplomatic precaution was approved by the European Council in March 2014 when EU approved to provide both economic and political reforms to Ukraine. These several EU measures are as follows: '(1) embargo on the imports and exports of three leading energy companies of Russia, three main defence companies, and five key state owned banks for a long period of time (2) ban on gas trade, technologies, goods and financial instruments like bonds for Russia' (European Commission; 2015). Because of the recent falling oil prices, Russia's energy industry, mainly natural gas industry, is influenced. The condition of country's natural gas production and consumption has been changed and there has been a decline in the Figure 4.10 and Figure 4.11. In addition, the Russian industrialization movement was a critical issue for the country. The main reason of this was that there has been observed a growth in the country's economy and the trade of natural resources.

4.3 The Natural Gas Market in Russia

4.3.1 Reserves and Production

Russia is in a commanding state in the global natural gas market. Russia is not only home to the world's biggest natural gas reserves but also it is the world's leading gas

² Salushev (2014) stated that on March 2014, there was a referendum about the annexation of Crimea and after one day the Crimean parliament conveyed its request about the affiliation to Russia. Then, UN Security Council issued a decision which referendum was not a legal. However, Russia officially annexed Crimea on April 2014. The main reason of Russian annexation of Crimea was that Crimean Tatars did not want to any conflict and security problems with the Russian society who lived in Crimea.

producer. BP (2015) indicates that Russian proven natural gas reserves were 1152, 8 tcf or 32, 6 tcm at the end of 2014. Additionally, EIA (2015b) reported that natural gas reserves of Russia were around 1,688 tcf in January 1, 2015. To put this into perspective, the total European and Eurasia natural gas production was 28, 8% of the world in 2014 and Russia's share in European and Eurasia natural gas production was 16, 7% in the same year while Russia's total proven reserves accounted for 17, 4% of total proven gas reserves of Europe and Eurasia which held 31% of the world's natural gas reserves in 2014 (EIA; 2015b). Thus Russia keeps its leading position as a global natural gas producer and supplier with its giant natural gas reserves. This foremost position of Russia influences not only the foreign policy of Russia but also the country's relations with the energy consumer countries.

Gazprom is positioned in the core of the country's natural gas production. In other words, "Gazprom is the most crucial actor as a primary gas producer by producing more than 80% of the gas in the natural gas market of Russia and Gazprom is the biggest natural gas producer and exporter in the world" (OAO Gazprom Annual Report; 2014). Also, Gazprom has the most important gas reserves in Russia which are located not only in West Siberia such as Urengoy, Yamburg, Medvezhye and Zapolyarnoye and in Yamal Peninsula such as Bovanenkovskoye and Kharaseveyskoye fields, but also in Barents Sea such as Shtokman, in Volga Region such as Orenburg, and in Southern Russia such as Astrakhan. In figure 4.12, the natural gas production of Russia has been illustrated between the years 1990 and 2014.

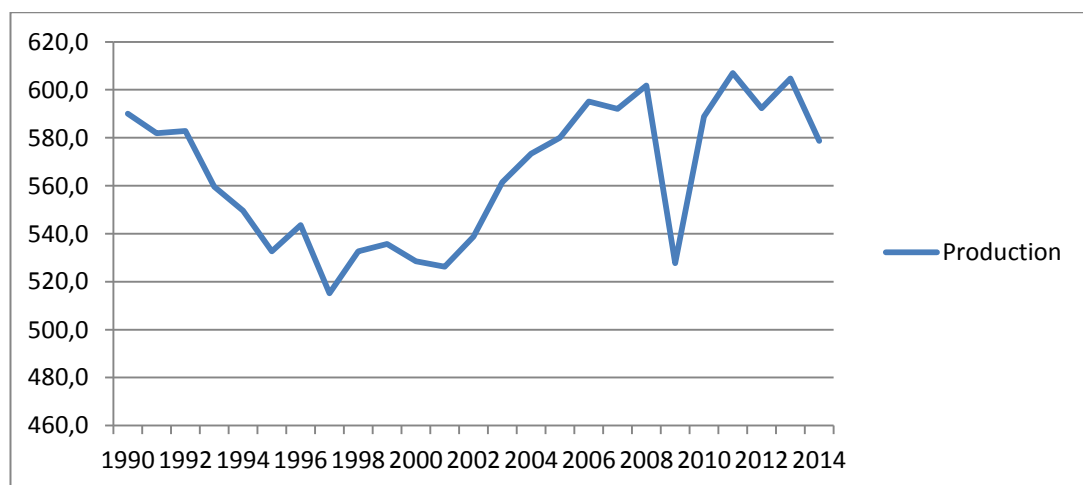


Figure 4.12 Russia's Natural Gas Production, 2015 (bcm)
Source: BP, 2015

There has been a sharp decrease in Russia's gas production after the year 2006 in the graph above due to Russia-Ukraine natural gas disputes. BP (2015) reported that in 2006 the natural gas production of Russia was 595, 2 bcm but in 2007 there was a reduction, which was from 595, 2 bcm to 592, 0 bcm. Concordantly, OAO Gazprom Annual Report (2014) announced that the gas production of Gazprom decreased from 85.9% to 83.9% in 2006 while Novatek, Lukoil and Rosneft which is another Russian gas company, have been producing natural gas which is approximately one third of gas production Gazprom's. During Russia-Ukraine gas conflict in 2006, an increase was observed in the global natural gas prices. According to BP (2015), the global natural gas price increased from 6, 76 US dollars per million Btu in 2006 to 6, 95 US dollars per million Btu in 2007. Due to decreasing gas production of Russia in 2006, the domestic demand of the country's natural gas demand also dropped off. This caused obstacles to the new investments of the country. Moreover, the natural gas consumption was affected by 2006 Ukraine-Russia crisis. In the graph below, its impact can be seen clearly.

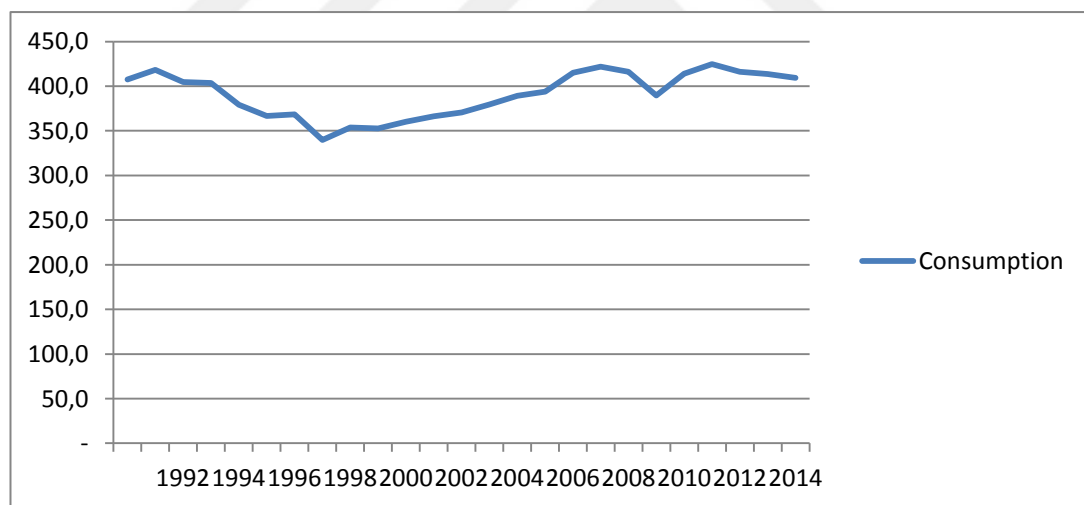


Figure 4.13 Russia's Natural Gas Consumption, 2015 (bcm)
Source: BP, 2015

According to BP Statistical World Review (2015), the natural gas consumption of Russia was 415, 0 bcm in 2006; 422, 0 bcm in 2007 and 416, 0 bcm in 2008 respectively, drawing a parallel with the country's natural gas production.

On the other hand, there has been a decrease in the natural gas production and consumption of Russia after the collapse of Soviet Union in 1990s as shown in the figure 4.13 and figure 4.14, "Russian natural gas production fell from 590, 0 bcm in

1990 to 581, 9 bcm in 1991 while the country's gas consumption went up from 407, 6 bcm gas in 1990 to 418, 2 bcm gas in 1991" (BP; 2015). At the same time, the global natural gas prices were reduced from 1, 64 US dollars per million Btu in 1990 to 1, 49 US dollars per million Btu in 1991 during the period of Soviet Union (BP, 2015). Prior to the year 2000, there has been a rise and a fall in the natural gas production and consumption that can be seen in the figure 4.12 and figure 4.13 due to economic problems in the Yeltsin period, who was the country's leader at that time. After Putin's presidency in 2000, Russian economy has recovered which affected its natural gas market. There has been an increase in both Russian gas production and consumption after 2000 (Figure 4.13 and figure 4.14). According to BP Statistical Review of World Energy (2015), the natural gas production was 526, 2 bcm in 2001, 538, 8 bcm in 2002 and 561, 5 bcm in 2003 while gas consumption was 366, 2 bcm in 2001, 370, 7 bcm in 2002 and 379, 5 bcm in 2003 respectively.

In 2009, there was another important event for Russia, which was the second gas dispute between Russia and Ukraine, and it affected Russia's natural gas market. An example of this is the report carried out by BP (2015) which shows that Russian natural gas production surged from 527, 7 bcm in 2009 to 588, 9 bcm in 2010 rising the country's gas consumption from 389, 6 bcm in 2009 to 414, 1 bcm in 2010. Also, the global natural gas prices can be seen in the figure 4.15.

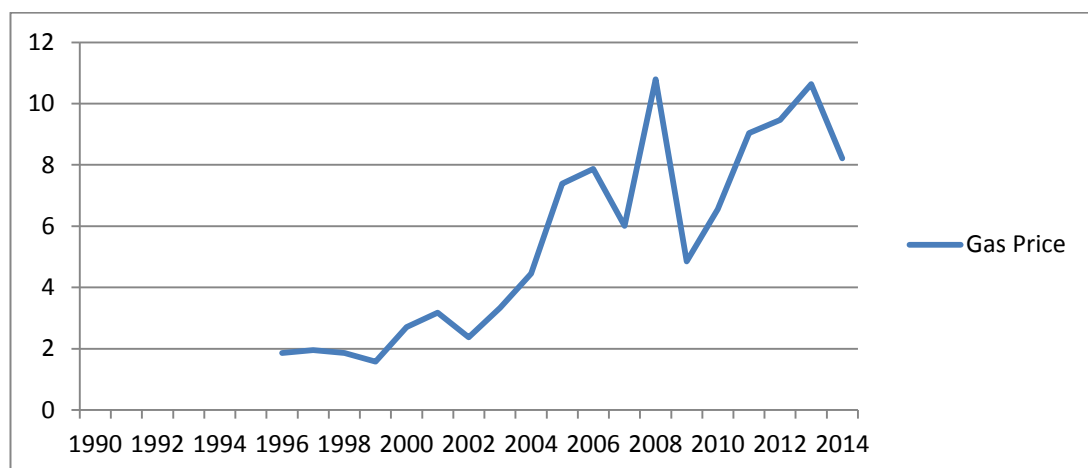


Figure 4.14 Global Natural Gas Prices, 2015 (US dollars per million Btu)

Source: BP, 2015

According to BP (2015), the natural gas price sharply decreased from 8, 85 US dollars per million Btu in 2008 to 3, 89 US dollars per million Btu in 2009. The reason of this decrease was the global financial crisis that was affected the Russian

economy and its energy industry such as natural gas and oil. During the Russia-Ukraine 2006 gas dispute, 'Russia wanted to procure gas subsidy for its economy with the help of its dual gas pricing or gasification policy which referred to the low price domestic sales, low price sales from Common Wealth of Independent States (CIS) and high price sales to Europe' (Spanjer 2007; pp. 2889-2898). Spanjer (2007) also added that Gazprom, who was the chief factor in the country's dual gas pricing policy, got both 20% of federal budget revenue and 20% of currency revenues in 2000. As mentioned in previous parts, Russia encountered US sanctions in 2014. This event also affected its natural gas production and consumption as seen in the figures above. For example, 'the natural gas production fell down from 604, 7 bcm in 2013 to 578, 7 bcm in 2014 while the gas consumption reduced from 413, 5 bcm in 2013 to 409, 2 bcm in 2014' (BP; 2015).

In other respects, natural gas reserves play an important role for the Russia's energy policy. As known, Russia is a leading actor due to having world's biggest natural gas reserves. The findings of the BP (2015) data showed that the total share of Russian natural gas reserves in Europe and Eurasia was 17, 4% at the end of 2014 with 32, 6 tcm of natural gas reserves. After the collapse of Soviet Era, the natural gas production and consumption decreased accordingly. However, there was an increase in country's gas production and consumption after 1998 due to its economic growth and increased value of its currency. To meet the rising domestic demand, Russia needed its rich gas reserves.

Russia possesses several crucial natural gas reserves. Numerous studies have examined the issue of Russia's natural gas reserve areas differently. The country's most important reserves are in Northern West Siberia if recent times are concerned. According to Sagers (2007), North West Siberia is also called Nadyum-Pur-Taz or NPT, which provides approximately 90% of natural gas output of the country during the Russian-Ukraine gas crisis in 2006. Sagers (2007) included his article that there were three gigantic deposits in West Siberia which are as follows: Medvezh'ye, Urengoy and Yamburg which were the biggest fields but now their production fell down irrevocably due to country's increasing economic and domestic demand. By contrast, EIA (2015b) reported that nowadays West Siberia is the biggest gas reserve due to its three enormous fields, which are Yamalo-Nenets with 53.7 bcf of gas in 2013, Khanti-Mansiisk with 3.5 bcf of gas in 2013, and Tomsk with 0.5 bcf of gas in

2013. Additionally, in the West Siberia, Gazprom is the largest producer. Sagers (2007) mentioned that Yamburg gazdobycha, which was the biggest area, Urengoygazprom, Nadymgazprom and Noyabr'skgaz dobycha, which have 15 deposits with 500 bcm per year, were the four key endeavours of Gazprom while Neocomian and Cenomanian have not been discovered yet. If we compare EIA (2015b) data with Sagers's (2007) articles, there were three productive fields in West Siberia, which are Yamburg, Urengoy and Medvezhye respectively and are owned by Gazprom, and their output dropped.

EIA (2015b) mentioned that East Siberia and the Far East, Urals-Volga, Komi Republic and North Caucasus were the other significant areas of natural gas reserves for Russia. In order to supply natural gas, the investments of Gazprom and the country's other energy companies like Lukoil, went to invest in new gas areas which are Yamal Peninsula, Eastern Siberia and Sakhalin Island. Sagers's (2007) and EIA (2015b) facts are compared below which demonstrates the list of Russia's natural gas reserve areas respectively.

West Siberia	Tyumen Oblast, Khanty-Mansiyok and Autonomous
Yamal-Nenets	Autonomous Okrug, Urengoygazprom, Yamburggaz dpycha, Nadymgazprom, Noyabr'skgaz dobycha, Tyumentransgaz, Purgaz, Purgazdobycha and Nortgaz
Noril'sk Area	Krasnoyarsk Kray, Tyumen fields and Tomsk Oblast
North Caucasus	Krasnodar Kray, Adegay Republic, Stavropol Kray, Rustov Oblast, Dagestan Republic and Chechen Republic
Volga	Astrakhan Oblast, Volgograd Oblast, Samara Oblast, Saratov Oblast, Tatarstan Republic and Kalmyk Republic
Ural	Orenbung Oblast, Perm Oblast, Bashkortostan Republic and Udmurt Republic
Yamal Peninsula	Bovanenkova and Kharasavey (logistical, economical and technological problems)
Other Siberian	Yakutia-Sakha Republic and Sakhalin Oblast
East Siberia & Far East	Sakhalin Oblast (LNG), Noril'sk and the Republic of Sakha, Irkutsk Oblast (leading gas producer in this area; discovering to project to provide gas to China, Korea)
North Region	Kami Republic and Neneta Okrug

Table 4.2 Russia's Natural Gas Production Areas in terms of its geographical division

Source: Sagers (2007)

West Siberia	Yamalo-Nenets, Khanti-Mansiisk and Tomsk
East Siberia & the Far East	Sakhalin (mostly produce LNG), Irkutsk, Krasnoyarsk and Yakutsk
Urals-Volga	Orenburg, Astrakhan and others
Komi Republic	
North Caucasus	

Table 4.3 Russia's Natural Gas Production Areas in terms of its geographical division

Source: EIA (2015b)

On the other hand, LNG is essential for Russian energy market. It is mostly located in the region of East Siberia and Far East and it is used for supply for Japan, Korea, India, China, Taiwan, and Thailand. 'Prigorodnoye' as the first LNG plant in Southern Sakhalin Island and a part of Sakhalin-II project, was established on February 18, 2009' (Bradshaw 2010; pp. 330-359). The region of Sakhalin is a gas generating area while being a major provider for Asian market as an LNG producer. For this matter, increasing gas supply for Asian market is Russia's gas strategy in the future. Sidortsov (2014) determined that Sakhalin-II project is also referred as Sakhalin Energy LNG deposit in the West which produces 14, 9 bcm or 526, 2 MMcf of natural gas.

Therefore, Russian energy companies give importance to natural gas production. According to EIA (2015b), the total Russian natural gas production of the country's companies was 64. 6 bcf. EIA (2015b) reported their distribution ratios which are listed as follows: Gazprom with 47.2 bcf of gas; Novatek with 6.0 bcf of gas; Rosneft with 2.6 bcf of gas; LUKoil with 2.0 bcf of gas; Surgutneftegaz with 1.2 bcf of gas; ITERA with 1.2 bcf of gas; PSA operators 2.7 bcf of gas; Others with 1.8 bcf of gas. These are the leading independent gas producers of Russia. By contrast, BP' (2015) report showed a different number than EIA' (2015b) report which showed that the natural gas production was 58, 5 bcf in 2013.

4.3.2 Exports and imports

As mentioned before, Gazprom plays a key role in the Russian natural gas industry. Gazprom is not only the world's biggest natural gas producer, but also it is the leading natural gas exporter in the global arena. The relationship between Europe and Russia is based on natural gas export. Europe is the foremost natural gas export

market for Russia and Russia is the essential market for Europe in terms of its natural gas imports.

According to EIA (2015b), Germany, Turkey, Italy, Belarus, and Ukraine are the top five countries for Russia's natural gas export. 'Gazprom supplied 161.5 bcm of natural gas to Europe and Turkey in 2013 while 40 bcm of natural gas was provided to Germany in the same year' (OAO Gazprom Annual Report; 2014). The figure 4.15 demonstrates the share of Russia's natural gas export market more clearly. The apple pie chart illustrates that Russia's export rates via pipeline in 2014 are Germany with 19%, Turkey with 13%, Italy with 11%, Belarus with 9%, Ukraine with 6%, Japan with 6%, and Belgium with 5% and others with 31%.

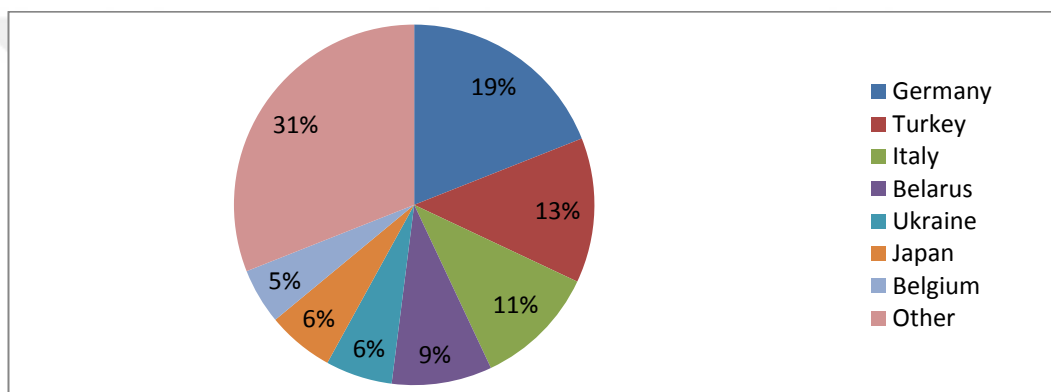


Figure 4.15 The total share of Russia's natural gas Exports in 2014
Source: EIA; (2015b)

In contrast, BP (2015) divided the natural gas exports shares of Russia between Europe and Former Soviet Union. In 2014, Europe's total natural gas import was 361, 9 bcm of natural gas while 147, 7 bcm of this natural gas share was provided by the Russia. In the same year, the total natural gas import of Former Soviet Union was 73, 8 bcm while Russia supplied 39, 8 bcm of gas from this total import rate. BP (2015) reported that countries' share of Russia's natural gas export to Europe via pipeline in 2014 were: Germany with 38, 5 bcm of gas, Turkey with 26, 9 bcm of gas, Italy with 21, 3 bcm of gas, Belgium with 9, 9 bcm of gas, Poland with 8, 9 bcm of gas, France with 7, 0 bcm of gas, Hungary with 5, 2 bcm of gas, Czech Republic with 4, 7 bcm of gas, Slovakia with 4, 3 bcm of gas, Austria with 3, 9 bcm of gas, Netherlands with 3, 5 bcm of gas, Finland with 3, 1 bcm of gas and other parts of Europe with 8, 8 bcm of gas. 'Countries' share of Soviet Union's natural gas export to Europe via pipeline in 2014 were: Belarus with 17, 9 bcm of gas, Ukraine with 12,

9 bcm of gas, Kazakhstan with 4, 3 bcm of gas and other parts of Former Soviet Union with 4, 6 bcm of gas' (BP, 2015). Although Russia is the foremost natural gas exporter and producer, 'the country imported natural gas from Kazakhstan at an amount of 10, 9 bcm of gas; Turkmenistan at an amount of 9, 0 bcm of gas; Uzbekistan at an amount of 4, 1 bcm of gas and Azerbaijan at an amount of 0, 2 bcm of gas in 2014' (BP; 2015).

Additionally, in recent years the gas export of Russia to Europe raised because of the decrease in Europe's own production, and the growth of natural gas usage in electricity generation. According to the Energy World Magazine (2016), the natural gas export of Gazprom increased by 8, 2% with 158, 6 bcm of gas to CIS countries and following that, Germany is the second biggest exporter while Turkey is the second market for Russian gas export. In 2015, the demand of Russian gas from Europe increased especially for the France. An example of the France and Russian gas export relations is the news carried out by the Gazprom's official webpage on December 2, 2015 that states that Gazprom's export to France increased from 6.6 bcm of gas in 2014 to 8.7 bcm of gas in 2015 with a 32% increase. Another example is the news stated by the Gazprom's official webpage on February 2, 2016 that states that Russian export rate to Austria increased by 11.5 % from 2014 to 2015. This news also mentioned that the gas admission to Austria increased by 76.2% from 2015 to 2016.

On the other hand, LNG trade is another alternative for Russia in order to provide gas to other countries. Sidortsov (2014) determined that among the global LNG export activity, the total share of Russia's LNG export was 0.6 %. As mentioned before, Prigorodnoc plant, which is located in southern Sakhalin Islands under the Sakhalin II project, is important for Russia as it is the first LNG plant of Russia. EIA (2015) reported that the capacity of Sakhalin LNG has been 9.6 million tons of LNG per year.

"This LNG export is delivered to Asian countries, which are Japan, South Korea, India, China, Kuwait, and Taiwan" (Bradshaw 2010; pp. 330-359). BP (2015) announced that in 2014, Russian total LNG export was 14, 5 bcm to the respective countries which were Japan with 11, 5 bcm, South Korea with 2, 6 bcm, China with 0, 2 bcm, Taiwan with 0, 1 bcm and Thailand with 0, 1 bcm. Japan and South Korea

is the biggest LNG purchasers. In figure 4.19, Russian LNG export has been demonstrated.

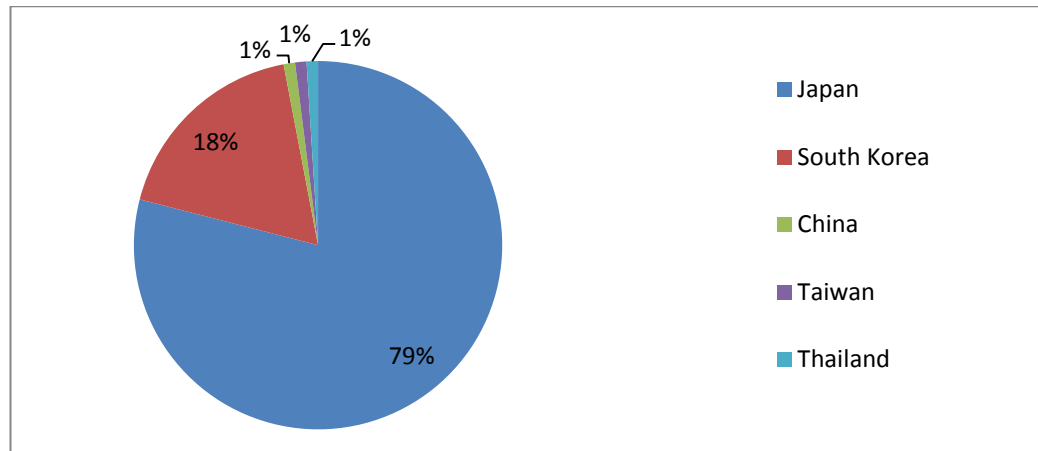


Figure 4.16 The total share of Russia's LNG Exports in 2014
Source: BP, 2015

According to trend illustrated in 4.19, Japan was the leading LNG export partner for Russia with 79% and South Korea was the second partner with 18% in 2014.

In 2013, Shadrina (2014) indicated that, Russia approved two export policies: Russian gas export to EU will continue to be monopolized by Gazprom while Russian LNG export to Asia will be liberalized. However, Russia changed this policy in the same year. According to EIA (2015b), Russia altered its gas exports policy to allow LNG export from Novatek and Rosneft. This can be shown briefly by the EIA (2015b), whose second LNG facility is in Yamal Peninsula of which's construction started in 2013. Novatek owns the 60% share of this facility and the rest is owned by both Total and CNPC with 20% shares. The capacities of these three terminals are 5.5 million tons of LNG per year and their operation is planned to start in 2017. "Gazprom has two LNG export projects that are Vladivostok LNG and Baltic LNG with annual capacities of 15 Mt and 10 Mt respectively" (Sidortsov, 2014; pp. 323-343).

EIA (2015b) indicates that, the LNG facilities are categorized as one operating, one in construction, six in planning phase and two delayed. These facilities are as follows: (1) operating Sakhalin LNG, (2) in construction Yamal LNG, (3) in planning phase Baltic LNG, (4) Vladivostok LNG, (5) Sakhalin LNG, (6) Far East LNG, (7) Gydan LNG, (8) re-gasification projects, (9) and delayed ones are Pechora LNG, and (10) Shtokman LNG.

Although Russia is the leading natural gas producer and exporter, the country imported natural gas from Azerbaijan, Kazakhstan, Turkmenistan, and Uzbekistan. According to BP (2015), Russia imported 0, 2 bcm of natural gas from Azerbaijan; 10, 9 bcm of natural gas from Kazakhstan; 9, 0 bcm of natural gas from Turkmenistan and 4, 1 bcm of natural gas from Uzbekistan in 2014. For instance, “Azerbaijan provides approximately 0, 2 bcm of natural gas from its Shah Deniz II gas fields to Russia” (Diecknöner 2012; pp. 153-181).

Therefore, for Russia's economy, one of the most important areas is natural gas export, especially after the collapse of Soviet Union in 1990s. Europe is an important market for Russian gas export. Natural gas demand of Europe increased through the years, especially cold seasons. For this reason, the Russia's natural gas policy is based on raising its gas exports and creating structural gas projects in order to diversify its direction of gas export and invigorate its gas export market. Moreover, ‘The gas export market of Russia will grow over 30% by the end of 2030 and over 50% by the end of 2050’ (Paltsev 2014; pp. 262-270). Due to Ukraine-Russia gas crisis and the sanctions of EU, the Russian export to Europe declined which caused Russia to focus on Asian market in terms of LNG export. For instance, “the natural gas export of Gazprom to Europe declined when the Russia-Ukraine crisis occurred and ‘natural gas export to France dropped by 25-30%, to Austria by 33% and to Italy by 25%’ (OAO Gazprom Annual Report; 2014). According to Gazprom Annual Report (2014), the gas demand of China will reach to 450-550 bcm by 2030. This also caused Russian awareness of Asian market to increase.

4.3.3 Pipelines and Projects

Europe is the leading natural gas export market for Russia. Russia supplies its natural gas mostly via pipelines. US Energy Information Administration (2015) divided Russian pipelines into two parts; its Western pipelines are as follows: (1) Yamal-Europe, (2) Blue Stream, (3) Nord Stream, (4) Urengoy-Ukhta, Bovanenkovo-Ukhta and Ukhta-Torzhok, (5) Soyuz and Brotherhood or Urengoy-Pomary-Uzhgorod, (6) Southern Corridor pipelines, (7) Turkish Stream-Line I. (8) Turkish Stream-Lines II-IV and (9) South Stream; and its Eastern pipelines are as follows: (1) TransSakhalin, (2) Sakhalin-Khabarovsk-Vladivostok, (3) Power of Siberia, phase I and (4) Altai/Western route and (5) Power of Siberia.

There are four operating pipelines among Russia's Western pipelines, which are Yamal-Europe, Blue stream, Soyuz & Brotherhood and Nord Stream. Wright (2009) stated that the Russia's Yamal-Europe pipeline was constructed in order to supply natural gas from West Siberian area to Poland and Germany that is Russia's biggest natural gas importer, and Northern Europe with the help of Belarus. In addition to this, 'the capacity of Yamal-Europe pipeline is 1.2 tcf per year while the total length of the pipeline is over 1, 000 miles' (EIA; 2015b).

Another operating Western pipeline is Blue Stream pipeline that started its operation in 2003. In its 2015 reports, EIA (2015b) mentioned that the capacity of Blue stream pipeline is 0.6 tcf per year while the total length is 750 miles. Due to this pipeline, natural gas is supplied from Western Siberia to Turkey over Black Sea. Turkey is also important for Russia as a transit country in order to supply gas to Europe across Ukraine and Belarus.

Nord Stream is other operating Western pipeline that started operating in 2011. "The capacity of the pipeline is 1.9 tcf of natural gas per year with 760 miles total length" (EIA; 2015b). Due to this pipeline, natural gas is provided from Russian West Siberia to Germany and Northern Europe across the Baltic Sea. Wright (2009) thought that Nord Stream, which was an expensive pipeline with 5.8 billion Euro cost, encountered some problems such as security problems and the risk caused by Baltic Sea ecosystem. In addition to this, 'the most crucial aim of this pipeline is to provide a transit system to United Kingdom' (Wright 2009; pp. 36-40). In spite of the fact that this pipeline experiences security problems, it supplies natural gas reliably and stably.

Soyuz and Brotherhood or Urengoy-Pomary-Uzhgorod is the final western operational pipeline that was the initial natural gas export pipeline to Europe during the Soviet Union. EIA (2015b) mentioned that the capacity of pipeline is over 3.5 tcf per year with over 2, 800 miles total length.

On the other hand, two important operational Eastern pipelines are TransSakhalin and Sakhalin-Khabarovsk-Vladivostok. These pipelines are mostly related to LNG export. 'TransSakhalin pipeline was initiated in 2008 with the capacity of 0.3 tcf per year and 500 miles total length' (EIA; 2015b). TransSakhalin pipeline supplies natural gas from Sakhalin areas to the Sakhalin LNG plant, Prigorodnoye and

Southern Sakhalin Island. Sakhalin-Khabarovsk- Vladivostok is the most significant operational Eastern pipeline for Russia. The operation of the pipeline started in 2011 with the capacity of 0.2 tcf of natural gas per year but later this amount is increased to 1.1 tcf per year with 1, 120 miles total length. Due to this pipeline, natural gas is provided to Asian market such as Korea. According to Bradshaw (2010), with 1, 830 km length, Sakhalin-Khabarovsk-Vladivostok Eastern operational pipeline provides natural gas from Khabarovsk and Primorskiy krays which are domestic consumers to Vladivostok area where an LNG plant is located. Bradshaw (2010) cited that the pipeline has 7 bcm capacity of natural gas a year which will be increased to 28 bcm per year in order to export the gas out of the country. Moreover, between Russia and Korea, there is a diplomatic relationship concerning natural gas. Vorontsov (2012) addressed that Korea bought gas from Russia with the help of this Sakhalin-Khabarovsk-Vladivostok pipeline on June 23, 2009 and aiming 30 bcm capacity.

Apart from these operating pipelines, there is one cancelled pipeline, South Stream. This pipeline sent gas from West Siberia and Urengoy to Southeast Europe across the Black Sea. 'The capacity of this pipeline is 2.2 tcf per year with an offshore length of 560 miles' (EIA; 2015b). In addition to this, it was terminated at the end of 2014 and moved to Turkish Stream. According to Wright (2009), South Stream pipeline, which is a joint venture between Gazprom and a big Italian company ENI in order to supply Russian gas to Europe via Bulgaria, aimed to bypass Turkey. Although this pipeline was canceled, Dieckhöner (2012) believed that, the South Stream pipeline is more favoured in terms of transportation and political costs. He suggested in his study that, if Russia supplies its gas from Yamal Peninsula to Europe using South Stream, the country could benefit from that by preventing high costs. Additionally, he considered that this pipeline is a better alternative for both Europe and Russia. For Europe, this pipeline is strengthens the energy security of Europe but it is more useful for Russia because it diversifies its natural gas supply route to Europe. Another author, Paltsev (2014) mentioned in his study that if this pipeline continued, South Stream could have linked Russia to Bulgaria via Black Sea and Serbia, Hungary, Slovenia, Austria and Italy respectively.

On the other hand, there are two Eastern pipelines that are under construction which are power of Siberia, phase I. and power of Siberia. The power of Siberia, phase I. pipeline, which will start operating in 2017, will supply gas from East Siberia,

Yakutia deposit and Chayodinsk field to Northeast China and Eastern Russia as the Eastern route. ‘The capacity of this constructed Eastern pipeline will be 1.3 tcf per year while its total length will be 1, 370 miles’ (EIA; 2015b). Secondly, power of Siberia pipeline which is targeted to initiate after 2019, will export gas from mostly East Siberia, Yakutia region, Chayodinsk and Irkutsk region, Kovytko to Northeast China and Eastern Russia while gas will be provided to Asian market via planned Vladivostok LNG pipeline.

Russia has planned pipelines in both West and East. In Western, Turkish Stream-line I. and Turkish Stream-lines II & IV are scheduled to be built. A notable explanation for Turkish Stream-line I can be found in EIA’s 2015 report. The pipeline is planned to be finalized in late 2016 and it will send gas from Russia’s West Siberia to Turkey. Moreover, “the total length and the capacity of the pipeline will be over 500 miles and 0.6 tcf of gas per year respectively” (EIA, 2015b). The Turkish Stream-lines II & IV are projected to be completed in 2019 in order to export gas from West Siberia to Southeast Europe via Turkey. According to EIA (2015b), the capacity of the pipeline will be 1.7 tcf of gas per year with over 500 miles of total length. In East, “the pipeline of the Altai & Western route is planned to start operating after 2020 in order to supply gas from West Siberia to China with 1.1 tcf of total capacity per year and 1, 620 miles of total length” (EIA, 2015b).

Recently, the new pipeline project is at the top of the agenda of Russia, which is called Nord Stream II pipeline project. As mentioned before, Nord Stream I pipeline has a number of advantages such as providing dependable & steady gas flow with technical consistency. Alexey Miller, who is the deputy chairman of Gazprom Board of Directors since 2002, said in the 5th St. Petersburg International Gas Forum on October 6, 2015 that the pipeline project of Nord Stream II inspires the Nord Stream I pipeline in terms of its operation and construction. He also added that the main target market for this pipeline project is Austria and the main reasons of this project are to diversify the country’s transportation direction, to expand the country’s market and production.

Nowadays, the main topic between Russia, Greece, and Italy is new natural gas pipeline projects. According to the news of Russian News Agency (TASS) on February 24, 2016, Alexey Miller, the head of Gazprom, Theodoros Kitsakes, the

head of Greek gas supplier DEPA and Marc Benayoun, the head of Italy's Edison, signed a memorandum in order to provide Russian natural gas to Europe. In other words, the Russia's plan to export natural gas to Europe is across Black Sea via Greece or from Greece to Italy by using Russian Southern route to Europe. In addition to this news, the countries proposed to revive the ITGI Poseidon Project, which is the Turkey-Greece-Italy transit pipeline project. As known, Turkey-Greece-Italy pipeline, which was planned to supply gas from Azerbaijan Shah Deniz over Greece to Italy was postponed. Greece did not give up its intention since the cancellation of Turkish Stream pipeline and this cancelled pipeline project is now referred as the Russia-Greece-Italy pipeline. Russia has giant natural gas reserves and this situation makes the country one of the biggest natural gas suppliers of the world. After the collapse of Soviet Union Russia managed to recover its gas market by the development of fields and infrastructure. Due to Gazprom, which plays a significant role in Russian natural gas industry, natural gas market of Russia became a gigantic factor in the world energy market due to owning massive natural gas reserves and pipelines.

Moreover, Russia and Europe depends on each other in terms of natural gas. Due to decreasing gas production of Europe, Europe needs to be supplied natural gas from Russia. For this reason, Europe is the biggest natural gas exporter of Russia. The most important gas exporters of Russia are Germany, Turkey, Italy, Belarus, Ukraine, Japan, Belgium and others. Due to the Russia-Ukraine gas disputes between 2006 and 2009, EU's trust towards Russia is damaged. This caused Russia to suffer under EU sanctions after 2009 Ukraine crisis. The exporter countries worried that a security problem might occur due to Ukraine crisis.

Recently, the most significant natural gas reserve areas are in West Siberia, Urengoy, Medvezh'ye and Yamburg fields which supplies gas to Europe. In contrast, Russia focuses on Asian market in terms of LNG. LNG is also essential for Russia and the most vital areas are in East Siberia and Far East. These fields are utilized to procure LNG to Asian markets such as Japan, China, Korea, India, Taiwan, and Thailand. In addition to this, nowadays Russia has a new LNG project, Sakhalin II, which is planned to supply LNG to Asian market. The most crucial goal of this project is to diversify Russian supply route.

Therefore, recently the decreasing oil prices affected Russia's natural gas market in terms of natural gas prices and gas trading partners. The Ukraine-Russia gas disputes also damaged Russian export. Despite these problems, Russia is still the biggest gas supplier and producer of the world and a major number of countries depend on Russia for natural gas. Additionally, Putin's impact plays a crucial role for both Russian economy and energy industry. After Putin's election victory in 2000, there has seen changes in the economic policy such as renationalization of companies, declining oligarchies. This caused to negative effect on the liberalized market like small decrease in oil and natural gas production in 2000s.



CHAPTER V

Analysing Qatari Natural Gas Policy Making

5.1 Introduction

EIA (2015c) stated that there are three reasons why Qatar is a vital actor in the international energy market. These are being at the heart of Persian Gulf, having the world's largest LNG reserves, being the biggest LNG exporter. According to EIA (2015), Qatar is also a member of the Organization of the Petroleum Exporting countries (OPEC) by being the second-smallest oil producer among other OPEC members and the country is a member of the Gas Exporting Countries Forum (GECF). In the international arena, Qatar follows a balanced and realist policy by utilizing its location towards its political and economic interests. A well-known example of Qatar's policy is addressed in the study of Koçgündüz (2011). She determined that Qatar gives importance to its relations with US by signing an agreement in 2005 between two countries about establishing the largest LNG terminal. "Qatar also maintains moderate relations with Iran and Iraq due to the security and political risks of these two countries" (Koçgündüz 2011; pp. 71-81). In addition to this, Qatar is essential for EU's energy diversification in terms of its natural gas export due to the fact that EU wants to decrease its dependency on Russia.

In Qatar's energy industry, natural gas is decisive factor. As said by EIA (2015c), the most important proof is that Qatar has the third biggest proven natural gas reserves and is the second natural gas exporter in the world. Because EIA (2015) reported that Qatar has the biggest LNG capacity and gas to liquid (GTL) capacity by being the largest LNG exporter, the status of Qatar's natural gas industry is very important in the global energy market. Asia region is the most essential market for the country's gas export. According to EIA (2015c), the country has four core state owned energy companies which are, Qatar Petroleum (QP), Qatargas Operating Company Limited (Qatargas), Qatar Gas Transport Company and Ras Laffan Company Limited (RasGas). EIA (2015c) mentioned in its report that Qatar Petroleum is in command of the upstream & downstream oil and natural gas sector of the country while others focus on LNG activities.

On the other hand, energy sector, especially natural gas is a key element for Qatar’s national economy. Natural gas revenues contribute to Qatar's national economy. Nowadays, the decline of oil prices affects Qatar’s real economic growth. ‘The economic growth of Qatar increased from 4.1% in 2014 to 7.3% in 2015 drawing a parallel with fallen oil prices’ (Qatar Economic Outlook; 2015-2017). According to World Book Data (2016), the GDP growth rate decreased from 4.6% to 4.0% annually while GDP per capita was 96, 732 US\$. In addition to this, “the real GDP growth was 7.3% in 2015 and 6.6% in 2016 while it will be expected to be 6.0% in 2017” (Qatar Economic Outlook; 2015-2017).

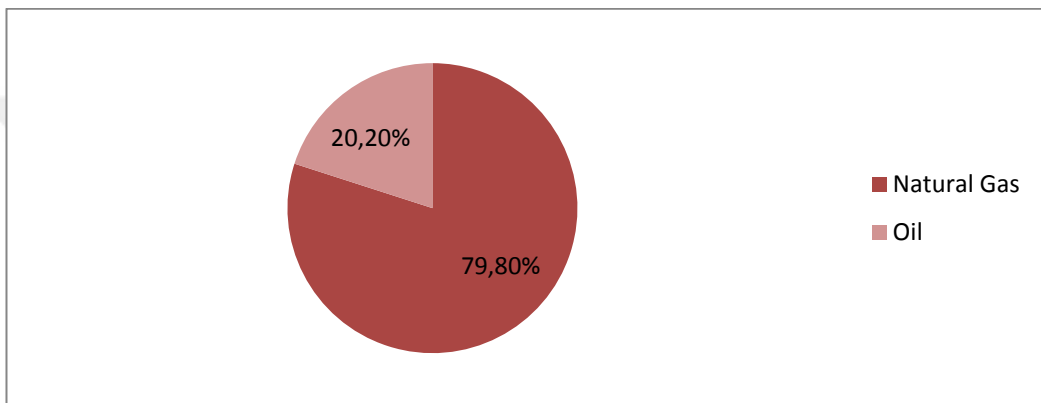


Figure 5.1 Qatar’s Primary Energy Consumption by fuel type, 2013 (mtoe)
Source: BP, 2015

Qatar has two major resources of primary energy consumption, which are natural gas and oil. In the charts below, the country’s primary energy consumption has been illustrated and compared between 2013 and 2014.

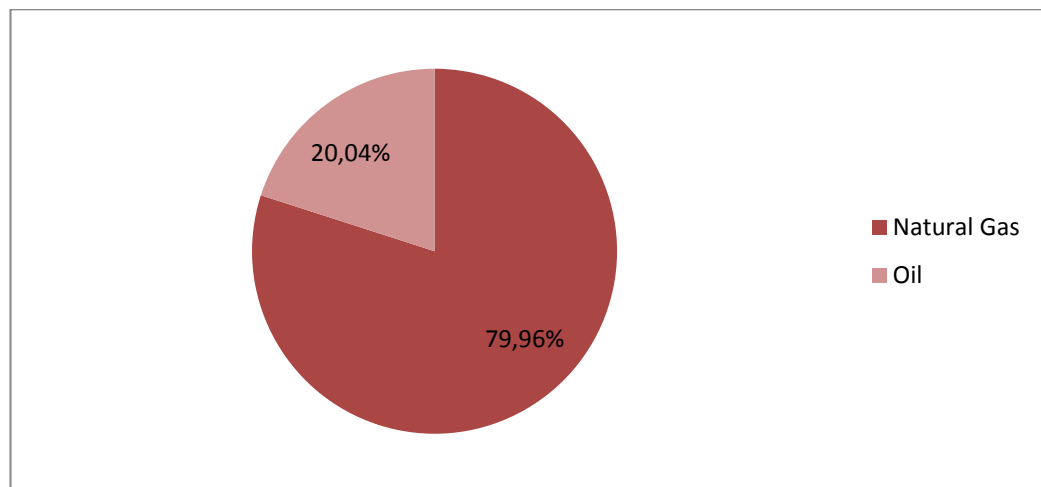


Figure 5.2 Qatar’s Primary Energy Consumption by fuel type, 2014 (mtoe)
Source: BP, 2015

Both figure 5.1 and figure 5.2 show that natural gas has been the leading resource. There has been small increase for natural gas from 79, 80% in 2013 to 79, 96% in 2014. In contrast, oil has declined from 20, 20% in 2013 to 20, 04% in 2014.

Moreover, the history of Qatar’s primary energy consumption has been illustrated in the figure 5.3. The chart shows that after 2008, there has been a steep rise. In that time, there was a global financial crisis but this event did not affect Qatar’s primary energy consumption. According to (2015), the primary energy consumption increased from 23, 6 mtoe in 2008 to 28, 5 mtoe in 2009; 33, 6 mtoe in 2010; 42, 2 mtoe in 2011; 45, 0 mtoe in 2012; 46, 2 mtoe in 2013 and 50, 5 mtoe in 2014. The reason of this increase after 2008 is Qatar’s substantial LNG activities.

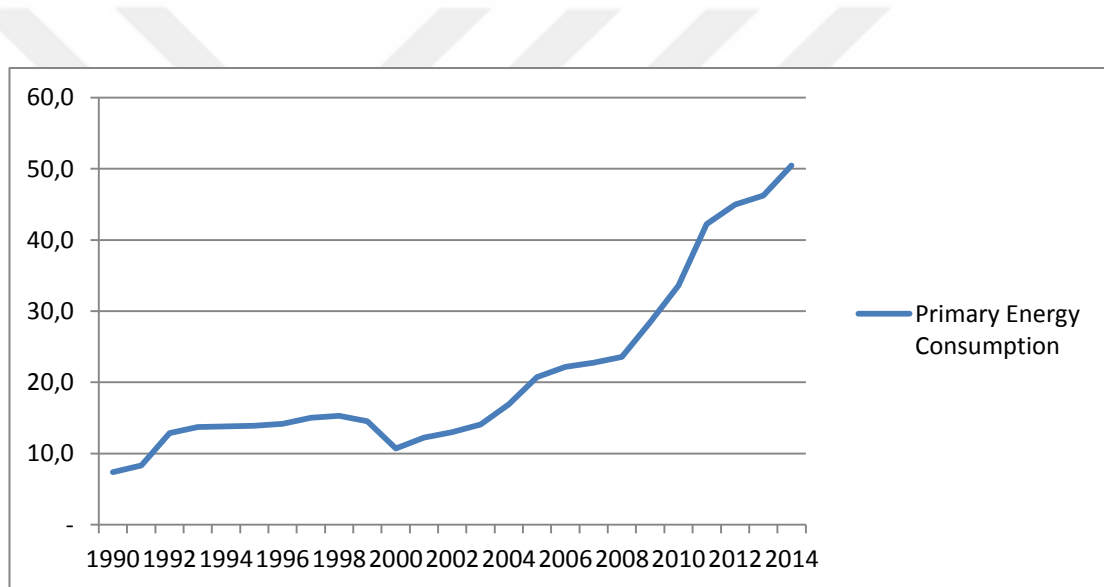


Figure 5.3 The history of Qatar’s Primary Energy Consumption, 2014 (mtoe)
Source: BP, 2015

After 2008 global financial crisis, ‘the total primary energy consumption of the Middle East increased from 661, 5 mtoe in 2008 to 685, 7 mtoe in 2009 while Qatar’s contribution to primary energy consumption in the Middle East also went up from 23, 6 mtoe in 2008 to 28, 5 mtoe in 2009’ (BP; 2015). Furthermore, there is an increasing trend of the country’s primary energy consumption in chart above. According to BP (2015), total primary energy consumption of Middle East increased from 793, 3 mtoe in 2013 to 827, 9 mtoe in 2014 while the involvement of Qatar in the Middle East energy market increased from 46, 2 in 2013 to 50, 5 mtoe in 2014. In

other words, ‘Qatar's contribution for primary energy consumption of Middle East was 5,82 in 2013 and 6.10% in 2014’ (BP; 2015).

Qatar’s economy experienced a big growth recently, which caused the country’s energy demand to increase, especially for electricity. According to EIA (2015c), the entirety of Qatar’s capacity for electricity generation depends on natural gas but possible solar power projects are at the top of the country's agenda. As known, natural gas and oil is the only source for energy consumption and other resources does not exist in the country. For electricity generation, coal, natural gas, and nuclear power are important for all countries. In contrast, the only resource for energy generation is natural gas for Qatar. The LNG growth of Qatar caused a number of things that are as follows: increasing electricity demand and electricity generation. The main reason for the growth of Qatar LNG is Qatar’s booming economic activity. The country is planning to increase its electricity power production from 8.6 gigawatts in 2015 to 13 gigawatts in 2018 due to new projects at Umm Al Haul and Ras Laffan that will increase electricity generation capacity of Qatar by 51% in 2018.

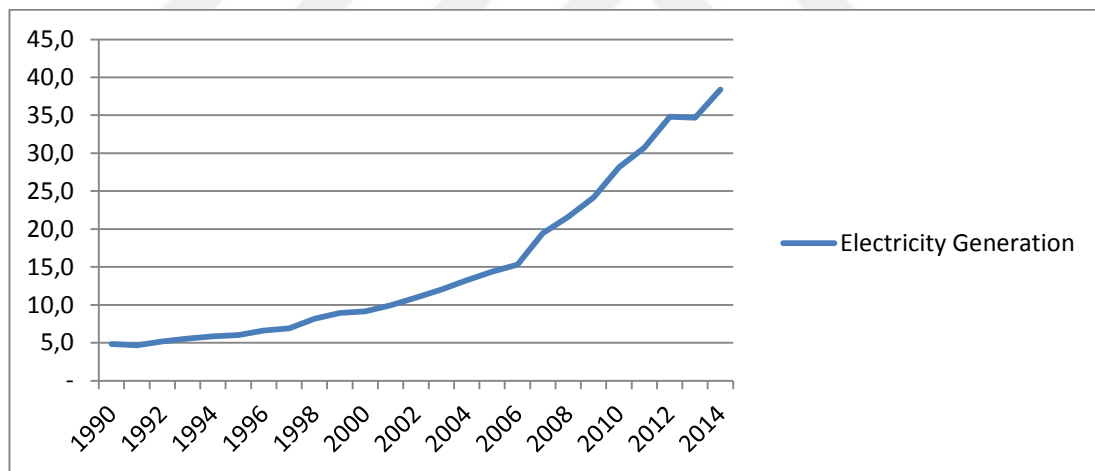


Figure 5.4 The history of Qatar’s Electricity Generation, 2014 (TWh)
Source: BP, 2015

Figure 5.4 shows the history of Qatar’s electricity generation from 1990 to 2014. Generally, there is a consistent increase. After the 2008 global financial crisis, there has been an increase from 21, 6 terawatt-hours in 2008 to 24, 2 terawatt-hours in 2009. According to BP (2015), the electricity generation of Qatar was 38, 4 Terawatt –hours in 2014.

5.2 Natural Gas Market in Qatar

5.2.1 Production and Reserves

Qatar is not only the world's fourth biggest natural gas producer but also it is the second leading natural gas producer in the Middle East. EIA (2015c) reported that the natural gas production of Qatar has increased from 176, 5 bcm in 2013 to 177, 2 bcm in 2014 or 17, 1 bcf per day, in 2013 and 2014. According to BP (2015) World Book Data, the total natural gas production of Middle East was 601, 0 bcm in 2014 with the total share of 17, 3% of the world's natural gas production while the contribution of Qatar's production in the share of Middle East was 5, 1% in 2014. The distribution of natural gas production is more than just the range of natural gas consumption for both the Middle East and Qatar. A notable example for this is reported in the BP (2015) World Book Data: the rate of the country's gas consumption was 44, 8 bcm in 2014 with 1, 3% and following that, the total gas consumption of Middle East was 465 ,2 bcm with 13, 7%. Figure 5.5 demonstrates the history of Qatar's natural gas production from 1990 to 2014 in the graph below.

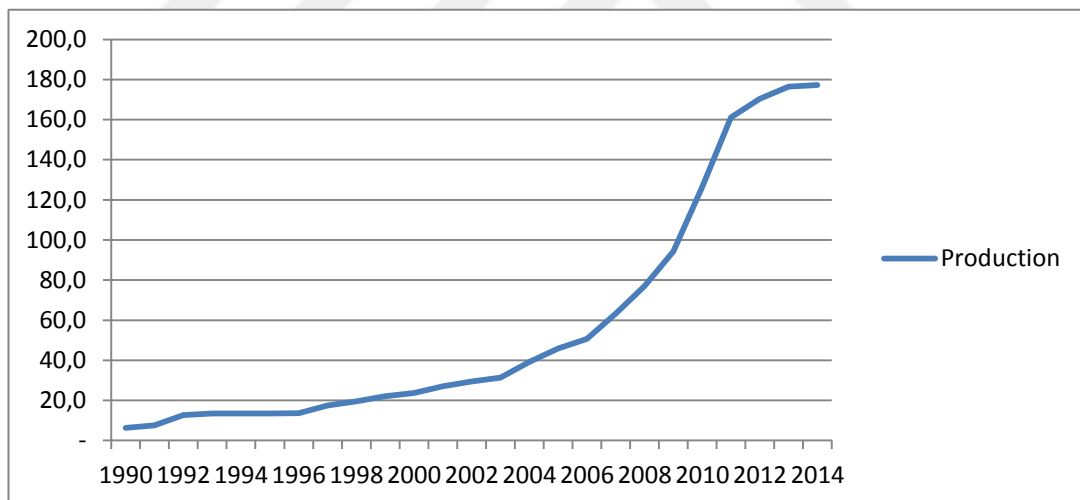


Figure 5.5 The History of Qatar's Natural Gas Production in 2014 (bcm)
Source: BP, 2015

The graph illustrates that there has been a considerable growth in Qatar's gas production after 2003. As it is said by BP (2015), Qatar's natural gas was production was 31, 4 bcm in 2003 which went up to 177, 2 bcm in 2014. In contrast, the increase in country's gas consumption after 2008 is illustrated in the figure 5.6 below. According to Qatar Oil & Gas Report (2016), the country's gas production was 165, 62 bcm in 2015 which is expected to rise to 168, 93 bcm in 2016.

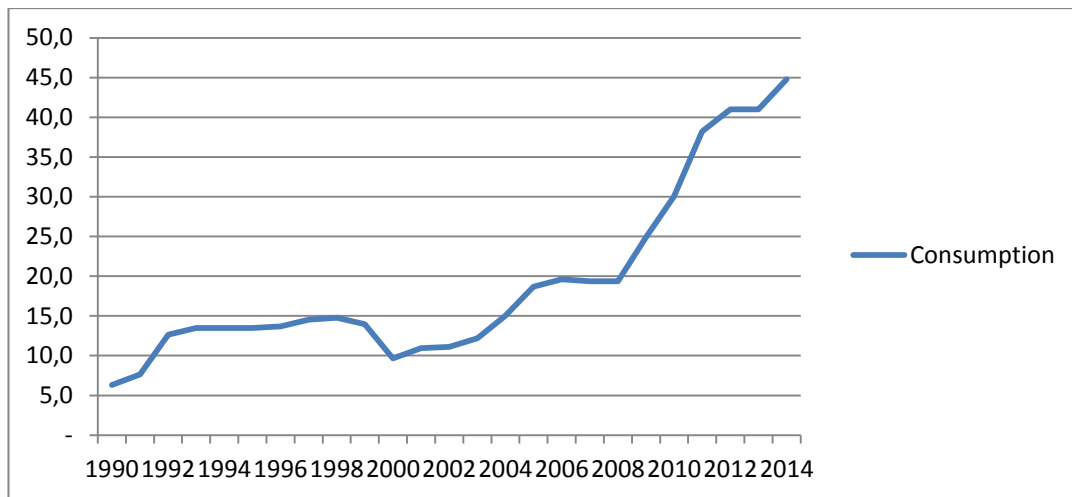


Figure 5.6 The History of Qatar’s Natural Gas Consumption in 2014 (bcm)
Source: BP, 2015

In accordance with BP (2015), there was an increase in the country’s gas consumption from 19, 3 bcm in 2008 to 44, 8 bcm in 2014. There was a global financial crisis between 2008 and 2009 while the Qatar’s consumption was growing. The reason why the country’s natural gas consumption increased is due to Qatar’s increasing domestic gas demand and its economic growth. According to Qatar Oil & Gas Report (2016), the natural gas consumption of the country was 41, 09 bcm in 2015 which is expected to reach 43, 56 bcm in 2016 due to emerging energy intensive industries.

For Qatar’s gas production, there are two significant players, which are Qatar Petroleum and RasGas. These are responsible for producing and marketing of not only LNG but also oil. In addition to these other vital actors are as follows: ‘(1) Qatar Petroleum with 62 bcm of gas production and 54% marketing share; (2) Total Qatar with 5.7 bcm of gas production; and (3) Occidental Petroleum with 2.4 bcm of gas production (4) Shell also contributes to Qatar’s gas production and marketing’ (Qatar Oil & Gas Report 2016; pp. 1-100).

On the other hand, the country’s natural gas reserves are considered significant among global natural gas reserves, which is the reason why Qatar has the world’s third biggest natural gas reserves. EIA (2015c) declared that in 2015 Qatar’s natural gas reserves were 872 tcf. The North Field is home to the chief area of Qatar’s natural gas reserves and LNG. “Most of the country’s gas reserves exists in this area which was discovered in 1971 but also a number of smaller fields are also present in

the country” (EIA; 2015c). The major player of the country's natural gas production is Qatar Petroleum that wants to find new gas fields in order to boost the country’s gas production. Following this, “Qatar Petroleum announced the discovery of country’s new natural gas reserve in Block 4 which is the north coast of Qatar and contained over 2.5 tcf of savable reserves in 2013” (EIA; 2015c).

Recently, the new Barzan Gas Project has become an important supply for the country’s natural gas production and reserves. According to EIA (2015c), the Barzan gas project was started in 2011 and the operation of this project commences in 2016 with the capacity of 1.4 bcf natural gas per day and \$10.4 billion of cost. EIA (2015c) pointed out another contributor to gas production that is called North Field moratorium project. This is the new North Field gas project; was planned in 2008; expected to start operating in 2015 and expected to reach its greatest production capacity in 2017. Additionally, “the main aim of the Barzan gas project is to provide not only high domestic gas but also massive infrastructure and higher industry development with the help of the main actors of the project, Qatar Petroleum and Exxon Mobile” (MEED: Middle East Economic Digest, 2011; p. 17). In figure 5.7, the history of Qatar’s natural gas reserves has been illustrated from 1990 to 2014.

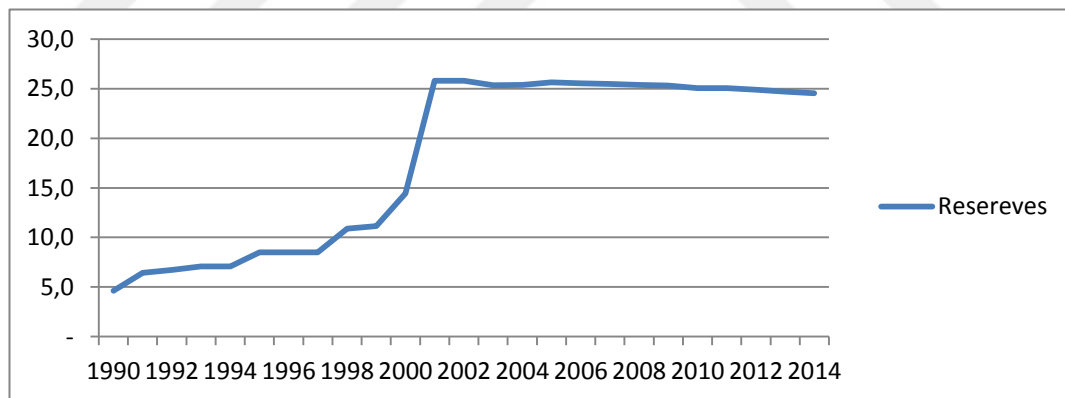


Figure 5.7 The History of Qatar’s Natural Gas Reserves in 2014 (tcm)
Source: BP, 2015

The figure 5.7 demonstrates that after 2001, there has been a stable decrease in the Qatar’s natural gas reserves. According to BP (2015), Qatar’s natural gas reserves went down from 25, 8 tcm in 2001 to 24, 5 tcm in 2014. Another point worth mentioning is the position of Qatar’s gas reserves in the Middle East. BP (2015) reported that in 2014 the total amount of natural gas reserves of Middle East was 42, 7% of the world with 79, 8 tcm of gas while the share of Qatar’s total natural gas

reserve in the Middle East was 13, 1% with 24, 5 tcm of gas. In addition to this, ‘the country’s natural gas reserves provided 24, 5 tcm of natural gas in 2016 that is expected to decline to 23, 1 tcm of gas by 2024’ (Qatar Oil and Gas Report; 2016).

On the other hand, LNG plays an important role for Qatar’s gas production and reserves. As mentioned before, QatarGas, which is the biggest LNG production company and founded by Qatar Petroleum with share of 70%, and another important LNG production and marketing company for the country is Exxonmobile and RasGas with the share of 30%. Also, a number of LNG terminals exist in Qatar by RasGas and QatarGas. In table 5.1, Qatar’s LNG terminals have been illustrated with their capacity, completion date, and ownerships.

Terminal	Capacity	Completion Date	Ownership
RasGas I	9.2 bcm	1999	Qatar Petroleum with 63%; Exxon Mobile with 25%; Kogas with 5%; LNG Japan with 3%
RasGas II	19.5 bcm	2004	Qatar Petroleum with 70%; Exxon Mobile with 30%
RasGas III	21.5 bcm	2010	Qatar Petroleum with 70%; Exxon Mobile with 30%
QatarGas I	13.8 bcm	2005	Qatar Petroleum with 65%; Exxon Mobile with 10%; Total with 10%; Mitsui with 7.5 %; Marubeni with 7.5%
QatarGas II	21.5 bcm	2009	<u>Train IV:</u> Qatar Petroleum with 70%; Exxon Mobile with 30% <u>Train V:</u> Qatar Petroleum with 65% ; Exxon Mobile with 18.3% ; Total with 16.7%
QatarGas III	10.8 bcm	2010	Qatar Petroleum with 68.5%; Conoco with 30%; Mitsui 1.5%
QatarGas IV	10.8 bcm	2011	Qatar Petroleum with 70%; Shell with 30%

Table 5.1 Qatar’s LNG Terminal
Source: Qatar Oil & Gas Report, 2016

Apart from these, the oil and gas report (2016) clearly stated the future position of Qatar’s natural gas reserves, production, and consumption. In the table below, the country’s natural gas condition between 2019 and 2024 is illustrated.

	2019	2020	2021	2022	2023	2024
Natural Gas Production	172.7 bcm	173.5 bcm	173.9 bcm	174.8 bcm	174.9 bcm	174.4 bcm
Natural Gas Consumption	49.9 bcm	51.9 bcm	53.5 bcm	56.7 bcm	58.4 bcm	60.2 bcm
Natural Gas Reserves	24, 0 tcm	23, 8 tcm	23, 7 tcm	23, 5 tcm	23, 3 tcm	23, 1 tcm

Table 5.2 The future position of Qatar’s natural gas indicators between 2019 and 2024

Source: Qatar Oil & Gas Report, 2016

According to the table 5.2, Qatar’s natural gas production is estimated to increase to 174.4 bcm; the country’s natural gas consumption is expected to raise to 60.2 bcm; and the country’s natural gas reserves will be expected to decline to 23.1 tcm between 2019 and 2024.

On the other hand, shipping LNG as LNG fleet plays an effective role in the Qatar’s gas trade markets. Qatar Gas Transport Company i.e. Nakilat and RasGas are the leading responsible players in order to shipping the country’s LNG. “In Qatar Gas I, there is fleet of ten built vessels that all of their capacities are 135.000 cubic meters or 4.8 mcf and 297.50 m of length” (QatarGas Transported Company). In addition to this, Qatar Gas listed the name of these LNG vessels of key areas in Qatar as follows: Al Zubarah, Al Rayyan, Al Wagbah, Broog, Al Khor, Al Wakrah, Zekreet, Doha, Al Bidda and Al Jasra, which supply fleet for Japan. Likewise, there are also five ships in Qatar Gas. They are Dukhan, LNG Aries, Norman Lady, Methane Polar, and Gimi, which are all responsible for carrying the LNG of Nakilat to Spain.

As Qatar is the global leader as LNG exporter, the country maintains to progress its fleet with the purpose of fulfilling world’s natural gas demand. Like Nakilat, RasGas attaches importance on shipping within its LNG supply chain. When delivering LNG by fleet to the customers, both Nakilat and RasGas concentrate in line with two objectives that are secure and reliable shipping. ‘The fleet of RasGas includes 27 vessels with the capacity of 138.000 million cubic to 151.700 million cubic built

under agreements with split shipping companies and consortia such as Qatar shipping, Maran Gas Maritime, the Japanese-led consortium of Mitsui OSK, NYK, K-Line the JS Nakilat, and Teekay Nakilat Cooperation' (RasGas).

Furthermore, QatarGas Transport Company or Nakilat pointed out that QatarGas is the leading player regarding the growth of new group LNG tankers that are Q-Flex and Q-Max with 210.000cm and 266.000cm cargo capacities. Their capacity is bigger than Qatar fleet. RasGas indicated that like Nakilat, RasGas has both Q-Flex vessels each with 210.000 mc and 217.700 mc of capacity and Q-Max vessels with 266.000mc of capacity.

Every vessel of Nakilat and RasGas are essential in order to meet the transportation needs of LNG industry in Qatar and supply LNG as clean, safe, cost effective, and environment-friendly to the country and the world. In accordance with Nakilat, each new vessel like Q-Flex and Q-Max are utilized to bring LNG from QatarGas I, QatarGas II, QatarGas III, and QatarGas IV to the world market. As known, RasGas and Nakilat are the leading companies for the country's energy industry. Due to these two vessels, Qatar has managed to increase its position in the global natural gas arena by gaining numerous advantages. The evidence of the advantages of these two vessels can clearly be seen in the case of RasGas, which diminished the cost of shipping from 30% to 35%. This provides the influential and competitive benefit for Qatar in terms of its economy and global LNG market. Another advantage of these two fleets is the fact that Q-Flex vessel gain superior place when compared to Nakilat and RasGas in supplying the requirements of their customers. For instance, Q-Flex vessel's shipping capacity has been improved to easily reach two third of global LNG terminal while Q-Max is presently the biggest LNG transporter in the global arena. Therefore, these fleet and vessels are the significant profit for the Qatar's role in the global natural gas industry as the leading LNG exporter and second key natural gas exporter.

Therefore, Qatar is a major player in the global LNG market and natural gas market. Also, the country is following South Africa and Malaysia closely in terms of their gas-to-liquids (GTL) technologies, which is a technique to transform dry natural gas into liquid fuels. Qatar Petroleum, Qatar Gas, and RasGas are the main actors of Qatar's natural gas market with their investments and projects.

5.2.2 Exports and imports

Qatar is the world's biggest LNG exporter and the second leading natural gas exporter in the world. Qatar has kept its place as the largest LNG exporter since 2006 by owning long-term supply contracts. In 2006, which was a brilliant year for the country's LNG industry in terms of gaining market revenue, Qatar's LNG and natural gas industry started to play an active role in the US, Korean, Japanese and Indian markets. In other words, 'the year 2006 was the milestone for the country's LNG and gas market and it of surpassed Indonesia with the help of its giant North field which resulted in an increase in Qatar's trade function in the country's main markets which are Europe, Asia and US' (Dargin 2007; pp. 136-142). In addition to this, the United Arab Emirates and Oman are the other natural gas exporters of Qatar.

According to Qatar Oil & Gas report (2016), Qatar Gas and RasGas are the chief exporters of Qatar, which operates seven trains and corresponds to total LNG export capacity of 105.6 bcm. "In 2014 Qatar exported approximately 4.3 tcf of natural gas as the second largest natural gas exporter" (EIA; 2015c). "The LNG export capacity of Qatar is dominating in the global LNG trade with 77 million tons per year (MMt/y) or 3.7 tcf which divided between Qatar Gas with 42 MMt/y and RasGas with 35 MMt/y" (EIA; 2015c). Not only Qatar's natural gas export increased but also Qatar's LNG exports went up between 2015 and 2016. Qatar's natural gas export increased slightly from 124.5 bcm in 2015 to 125.4 bcm in 2016 while LNG export of Qatar rose from 103.0 bcm in 2015 to 104.9 bcm in 2016.

BP (2015) stated that in 2013 the share of Qatar's pipeline exports in the world was 2.81% while its share of LNG exports in the world market was 32.46%. In contrast, in 2014, the share of Qatar's pipeline export in the world was 3.02% and the share of LNG export was 31.02%.

On the other hand, Qatar's main export targets of natural gas via LNG are Europe, US and Asian markets. In the graph below, the country's natural gas export (via LNG) markets in 2014 is illustrated.

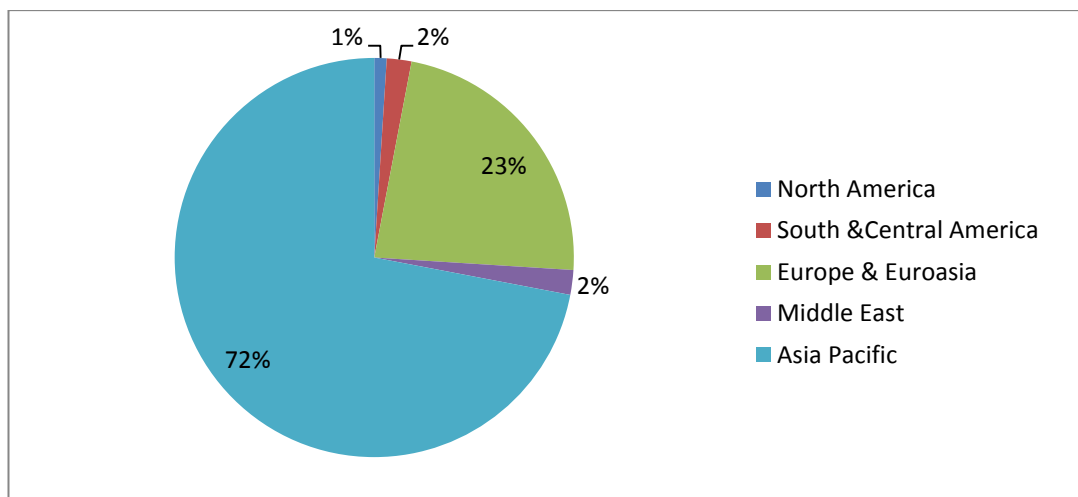


Figure 5.8 Qatar's Natural Gas trade movements via LNG in 2014
Source: BP, 2015

According to figure 5.8, Asia Pacific is the primary LNG export area for Qatar with the share of 72%; Europe & Eurasia is the second main LNG export market for the country with a share of 23%; Middle East and South & Central America is the third vital market with the same amount of 2%; and North America is the final important market with a share of 1%. By way of illustration, BP (2015) shows which countries are core LNG export markets for Qatar which are as follows: Mexico with 1, 4 bcm in North America region; Argentina with 0, 9 bcm, Brazil with 0, 6 bcm, Chile with 0, 1 bcm and other South & Central America with 0, 1 bcm, in the South and Central America region; Belgium with 2, 9 bcm, France with 1, 0 bcm, Italy with 4, 3 bcm, Spain with 3, 0 bcm, Turkey with 1, 1 bcm, United Kingdom with 10, 4 bcm and other Europe and Eurasia with 0, 9 bcm in the region of Europe & Eurasia; Thailand with 1, 3 bcm, China with 9, 2 bcm, India with 16, 2 bcm, Japan with 21, 9 bcm, Malaysia with 0, 1 bcm, South Korea with 17, 7 bcm and Taiwan with 8, 0 bcm, in Asia Pacific region; and all Middle Eastern countries with 2, 3 bcm.

Moreover, in the graph below, the natural gas exports countries of Qatar via pipeline in 2014 has been demonstrated. In contrast, EIA (2015c) revealed different information on Qatar's LNG exports than BP (2015). For instance, according to BP (2015), the shares of Qatar's LNG export markets are Asia with 72%, Europe with 23% and others with 5% in 2014.

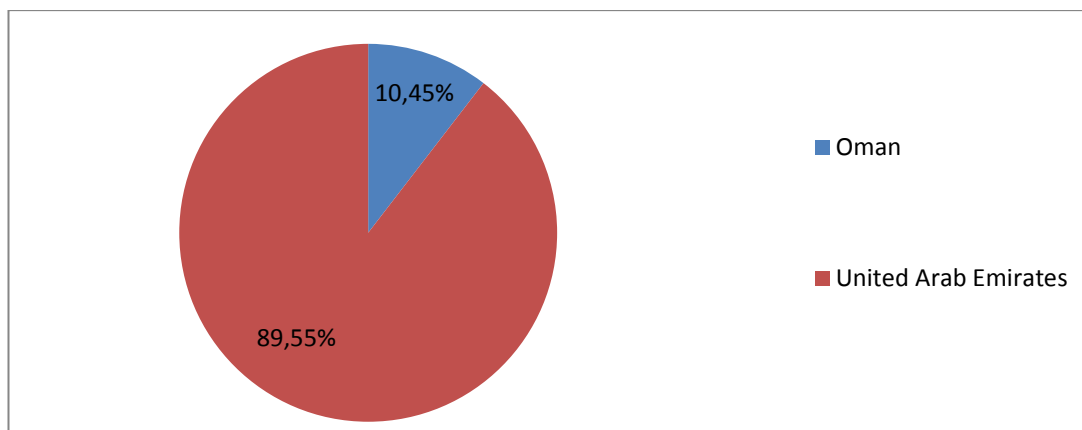


Figure 5.9 Qatar's Natural Gas trade movements via pipeline in 2014

Source: BP, 2015

According to figure 5.9, in 2014 United Arab Emirates had the largest portion of Qatar's natural gas export market through pipeline with 89.55% while Oman is the second important country for Qatar's natural gas export via pipeline with 10.45%. In other words, "in 2014 Qatar supplied natural gas to United Arab Emirates with an amount of 18, 0 bcm of gas and Oman received natural gas from Qatar at an amount of 2, 1 bcm of gas" (BP; 2015).

Regarding Qatar's future position in the natural gas export market via pipeline and LNG, there is an important discovery in Qatar Oil and Gas report (2016).

	2019	2020	2021	2022	2023	2024
Natural Gas Export via Pipeline	20.5 bcm	20.0 bcm	20.0 bcm	20.0 bcm	19.5 bcm	19.5 bcm
Natural Gas Export via LNG	102.2 bcm	101.6 bcm	100.4 bcm	98.0 bcm	97.0 bcm	94.7 bcm

Table 5.3 The future position of Qatar's Natural Gas trade movements via pipeline and LNG from 2019 to 2024

Source: Qatar Oil & Gas Report, 2016

According to table 5.3, there is a drop of 1.0 bcm of gas in the Qatar's natural gas exports through pipeline from 2019 to 2024 while a decline is also seen in the LNG exports of Qatar at an amount of 7.5 bcm of gas from 2019 to 2024.

On the other hand, in terms of LNG transportation, LNG fleet plays an important role in the Qatar's gas trade markets. Qatar Gas Transportation Company, or Nakilat and

RasGas, are the leading players responsible for shipping the country's LNG. 'QatarGas I. has a fleet of ten vessels with a total capacity of 135.000 cubic meters or 4.8 mcf and a length of 297.50 m' (QatarGas Transported Company). In addition to this, QatarGas listed the names of these LNG vessels that operate in key areas of Qatar, which are as follows: Al Zubarah, Al Rayyan, Al Wagbah, Broog, Al Khor, Al Wakrah, Zekreet, Doha, Al Bidda and Al Jasra which belongs to the supply fleet for Japan. Likewise, there are also five ships in Qatar Gas. Their names are Dukhan, LNG Aries, Norman Lady, Methane Polar and Gimi, and they are all responsible for carrying the LNG of Nakilat to Spain.

As a global leader in LNG export, Qatar aims to develop its fleet in order to fulfil the world's natural gas demand. Like Nakilat, RasGas gives importance to shipping of its LNG supply chain. When delivering LNG with a fleet to the customers, both Nakilat and RasGas concentrate on two main objectives, secure and reliable shipping. 'The fleet of RasGas includes 27 vessels with a total capacity of 138.000 million cubic meters to 151.700 million cubic meters which are built via agreements with split shipping companies and consortia such as Qatar shipping, Maran Gas Maritime, the Japanese-led consortium of Mitsui OSK, NYK, K-Line the JS Nakilat and Teekay Nakilat Cooperation' (RasGas).

Furthermore, QatarGas Transport Company or Nakilat pointed out that QatarGas is plays the leading role in the development of a new group of LNG tankers, which are Q-Flex and Q-Max with 210.000cm and 266.000cm of cargo capacities. Their capacity is bigger than Qatar fleet. RasGas indicated that Just as Nakilat, RasGas has both Q-Flex vessels, each with a 210.000 mc and 217.700 mc of capacity and Q-Max vessels with a 266.000mc of capacity.

Every vessel of Nakilat and RasGas are essential for meeting the transportation needs of LNG industry in Qatar and to supply LNG in a clean, safe, cost effective, and environmentally friendly way to the country and the world. Fittingly for Nakilat, each new vessel, such as Q-Flex and Q-Max are utilized to bring LNG from QatarGas I, QatarGas II, QatarGas III, and QatarGas IV to the world markets. As known, RasGas and Nakilat are the leading companies of the country's energy industry. Due to these two vessels, Qatar managed to increase its position in the global natural gas arena by gaining numerous advantages. The evidence for the

advantages of these two vessels can be clearly seen in the case of RasGas that reduced the cost of shipping by 30% to 35%. These benefits provide competitive advantage for Qatar's economy and global LNG market. Another advantage of these two fleets is that Q-Flex became the main vessel for Nakilat and RasGas and manages to meet the requirements of their customers. For instance, Q-Flex vessel's shipping capacity easily provides enough LNG for two third of global LNG terminal capacity while Q-Max is presently the biggest LNG transporter in the global arena. Therefore, these fleets and vessels provide a significant advantage for the Qatar's role in the global natural gas industry and helps Qatar to hold its place as the leading LNG exporter and second key natural gas exporter of the world.

5.2.3 Pipelines and Projects

Qatar owns one gas export pipeline named Dolphin Energy pipeline. According to Qatar Oil & Gas report (2016), the pipeline is 182 km long with a capacity of 90 million cubic meters per day or 33 bcm per year, and is owned and controlled by the Dolphin Energy in Abu Dhabi. The Dolphin Gas pipeline is responsible for supplying gas to United Arab Emirates and Oman. With respect to Koçgündüz (2011), Qatar supplied 2 bcf of natural gas via Dolphin gas pipeline that are split among three energy companies, Mubadala Development Company with a share of 51% and France Total and Occidental having the same amount of 24.5%. Following these, Qatar Petroleum and these three shareholder energy companies made a 25-year agreement for sending natural gas to Abu Dhabi and Dubai in the region of United Arab Emirates. Apart from this gas trading between United Arab Emirates and Qatar, the country also sends its gas to Oman through Dolphin pipeline.

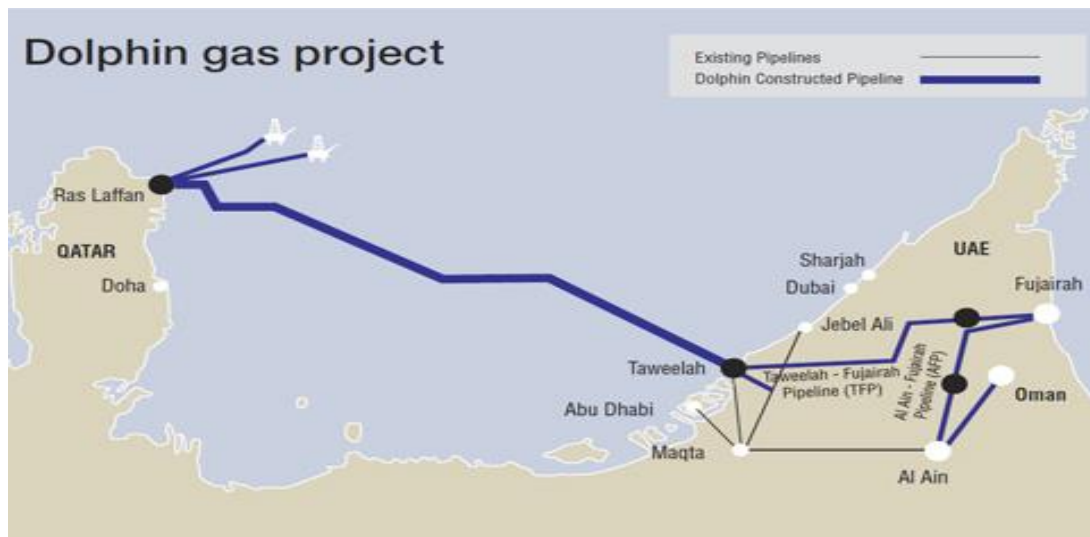


Figure 5.10 The Map of Qatar’s Dolphin Gas Pipeline Projects

Source: TOTAL

(<http://total.afaq.msp.fr.clara.net/afaq2/desc.aspx?AId=44&issue=7>)

In the map Figure 5.10, the route of country’s Dolphin gas Pipeline project and the countries involved in this pipeline can be seen clearly.

In the past, the Dolphin Gas pipeline was known as Gulf Cooperation Council (GCC) gas pipeline. Qatar’s gas in the North Field was supplied via GCC gas pipeline to a number of Gulf Cooperation Council members such as Saudi Arabia, Kuwait, Bahrain and United Arab Emirates. “Although the GCC gas pipeline had advantages in terms of being capital intensive for LNG, it was canceled in 1989 GCC summit meeting due to political disputes” (Dargin 2007; pp. 136-142). Later, the GCC gas pipeline is reshaped into Dolphin gas pipeline. According to Dolphin Energy (2015), In July 2007 the Dolphin gas pipeline started its operation for Qatar in order to send gas to United Arab Emirates and Oman.

Moreover, another gas pipeline project was planned between Dubai and Qatar. According to Oil and Energy Trends on May 2008, the aim of this pipeline project was to export 400 mn cfd of LNG from Qatar to Dubai through 200 miles. Although, in 2007 Dubai started to receive 700 mn cfd of gas via pipeline from Qatar and this pipeline project was delayed.

In conclusion, Qatar invigorated its political relations between United Arab Emirates and Oman with Dolphin gas pipeline. Due to the pipeline, Qatar strengthened both its economy and its regional statue as a LNG exporter. Qatar is a regional power as the

fourth biggest natural gas producer in the world world's second biggest natural gas producer in the Middle East, the world's largest LNG exporter, world's second major natural gas exporter and has the world's third largest natural gas reserves. Qatar Petroleum and RasGas are important companies for the country's LNG and natural gas industry as they are the chief producers and operators of the industry. The North field is the country's leading natural gas reserve area. In addition to this, Dolphin gas pipeline is Qatar's one important pipeline for exporting natural gas to Oman and United Arab Emirates that are the biggest importers for Qatar. In contrast, Qatar supplied its gas to North America, South & Central America, Europe, and Eurasia, Middle East and Asia Pacific region via pipeline.

On the other hand, Qatar has an important project called Barzan gas project. The main objective of this project is to provide the largest natural gas production. As a result of this project, Qatar will become more powerful, and its prestige will increase in the global LNG and natural gas arena.

CHAPTER VI

A Trilateral Scrutiny: Comparative Analysis of Iran, Russia and Qatar

In the globalized gas market, Gas Exporting Countries Forum (GECF) plays a vital role. In this intergovernmental organization, Russia, Iran, and Qatar as the global natural gas masters are arbiter countries. According to GECF (2016), these three giants together, own approximately 54% of the world's total natural gas reserves, which is why GECF is an important organization in the global arena with these three member countries. In addition to this, recently there have been a number of changes within the global natural gas industry, for example, 'increasing share of LNG supply in the energy industry, globalization of the gas market and booming unconventional gas industry which influenced both global natural gas exporters and importers' (Jaffe and O'Sullivan 2012; pp. 4-26). Following that, flourishing unconventional gas supply mostly affects the members of GECF, especially Russia, Iran and Qatar. Even though these top three countries are world's biggest natural gas exporters, 'US and Canada emerged as significant players due to their increasing shale gas and tight gas reserves' (EIA; 2015). Before analyzing these developments and comparing these three gas giants, first we will examine when GECF is established, what is its purpose, and how it affects the global gas market.

'Increasing the institutionalization of GECF is the main purpose of the forum's member countries, which are Algeria, Bolivia, Egypt, Equatorial Guinea, Iran, Libya, Nigeria, Qatar, Russia, United Arab Emirates, Venezuela and Trinidad and Tobago while the observer countries are Kazakhstan, Oman, Iraq, Azerbaijan, Netherlands, Peru and Norway' (Ortung & Overland 2011; pp. 53-66). According to GECF (2015), on May 19-20 2001, GECF set up its first ministerial meeting in Tehran, Iran, with its ten member countries that were Algeria, Brunei, Indonesia, Iran, Malaysia, Oman, Qatar, Russia, Turkmenistan, and Norway (observer). During this first ministerial meeting, the forum has adopted two essential goals that are as follows: (1) improving relations between gas producers; producers and consumers; governments and energy companies, and (2) creating a transparent and enduring energy market. In the history of GECF, there have been seventeen ministerial meetings, from the first meeting in Tehran in 2001 to 17th meeting in Tehran in 2015. According to GECF webpage, this final GECF meeting was on 21 November 2015 in

Tehran, Iran, attended by twelve member countries that were Algeria, Bolivia, Egypt, Equatorial Guinea, Iran, Libya, Nigeria, Qatar, Russia, Trinidad and Tobago, United Arab Emirates, and Venezuela, and six observer countries, Iraq, Kazakhstan, Netherlands, Norway, Oman, and Peru. The main topics of this final meeting were: (1) recognizing the importance of the collaboration and management between the member countries of GECF, (2) to focus on recent events in global gas market such as rising gas demand, (3) addressing the role of GECF in the world gas market in terms of LNG and transportation via pipelines (4) booming unconventional gas supply and (5) criticizing the status of gas price.

GECF's major goals can clearly be seen in the official webpage of GECF. The chief purposes of the forum's missions can be listed as follows: encouraging the use of clean, cost efficient, sustainable and productive natural gas resources; supplying natural gas in order to develop sustainable resources; supporting the relations between gas suppliers, consumers and companies; and giving importance to reliable source of natural gas and confidential source of supply. Likewise, Wagbara (2007) examined forum's key targets from a different standpoint that are respectively: to encourage, unified and stable gas prices, to improve supply-demand model, to establish reasonable gas revenue by setting the gas prices in accordance with supply-demand model.

On the other hand, there are various speculations on the subject of whether if GECF can transform like Gas-OPEC that is one of the main challenges of the forum. This idea of Gas-OPEC concerns several importers because they are afraid of the possibility of forum to take OPEC's characteristics as an example. For instance, OPEC limited the oil production due to increasing oil prices in 1970s first and second oil shocks. If GECF follows Gas-OPEC's model, the forum might act in a similar fashion, setting quotas for gas production with the purpose of keeping and managing gas and oil prices stabilized. Therefore, several importer countries cannot support this forum. However, this forum has an important position in global natural gas market with its significant gas holder countries like Russia, Iran and Qatar.

Even though these three members has the leading positions in the forum, each member country have equal say in the decision making process which is transparent and open, and this process doesn't take the member countries' export and production

activities into account . In other words, in each ministerial meeting, the decisions and solutions are decided by unanimous voting. At the same time, GECF indicated that all gas exporting countries could join the forum if they share the same goals and interests. For instance, participation of US in the forum is an important topic due to its booming unconventional gas market. This development of US gas market concerns the members of GECF, especially Russia, Iran and Qatar. Because these three countries are important supplier of EU and Asian markets, they do not want new competition in the gas industry and they thought that the emergence of unconventional gas resources of US could decrease the power of GECF. As a result, the forum will discuss membership of US in the forum. BP (2015) claimed that US would be self-sufficient in terms of energy production if the country maintains its shale production. This causes a threat for the positions of Russia, Iran, and Qatar.

As mentioned before, Russia is a significant player in the forum and it wants to establish a trade association similar to OPEC. If Russia can achieve its intention, GECF would be the second energy cartel after OPEC. The reasons for Russia's intent to set up a similar trade association are as follows: Russia intent to control global natural gas prices to use energy as a tool to increase its global statue as a leader. Therefore, Russia will gain the most profit if GECF can be established. However, materialization of this intention is not possible due to several challenges. The most significant difficulty is the fact that natural gas prices are determined by long-term contracts due to gas industry's fragmented structure unlike oil. Hence, the GECF has difficulty in controlling natural gas prices like OPEC. Unlike oil, the storage capacity of natural gas is limited because creating gas storage capacity is expensive. The GECF cannot set gas prices daily and the gas flow is not provided by this organization. The geography is another difficulty. The members of GECF are not close to each other as the members of OPEC. Moreover, if Russia wants to establish a gas cartel, the country needs to make alternative pipelines because Russia provides its gas only through EU. For this reason, Russia should highly investment in new pipelines and the country should focus more on LNG technologies. If this cartel is to be established, the member countries need to have high technology and large investments. Besides, launching of a gas cartel threatens EU because Russia's largest gas exporter is EU and the establishment of a cartel can damage the EU's economy and energy security. In addition to this, EU can implement sanctions on Russia due

to a potential gas cartel. Indeed, all gas consumer countries can be damaged by this cartel because it prevents their economic growth. Because of these problems, OPEC can be considered a cartel but GECF will not be in long period.

On the other hand, Russia's this intention must be acknowledged and accepted by every member country of the forum because as mentioned before, the decision making process of the forum is based on majority voting. However, Qatar and Iran thinks that establishing a gas cartel is not a good idea because it is against their interests. As a result, there is a disagreement between Russia, Iran, and Qatar. For instance, Russia is the leading gas market for EU and so Russia wants to protect its chief position while Qatar is a leader with its LNG industry for EU and the country wants to increase its LNG capacity. Iran is also a 'sleeping giant' with its gigantic gas fields without the US and EU sanctions. It can be clearly seen that each three giant wants to keep their importance on the global gas market and Iran and Qatar cannot support Russia's intentions.

According to GECF's official webpage, the forum plays a key role in the global market as it holds 67% of world's proven natural gas reserves, 65% of world's LNG trade, and 63% of world's pipeline trade. If we divide this between three giants, Russia, Iran and Qatar; 'Russia holds 30% of world's natural gas reserves, Iran 15% of the world's natural gas reserves and Qatar with 9% of the world's natural gas reserves' (Wagbara 2007; pp. 1224-1237). Russia, Iran, and Qatar are the main actors of the forum and there are several differences between them concerning their natural gas production, consumption, reserves, and their economic status.

To begin with, let us compare and contrast these three giants in terms of their enormous natural gas reserves. In the graph below, the condition of natural gas reserves of Russia, Iran, and Qatar has been illustrated between the years 1990 and 2014. The graph demonstrates that between 2008 and 2009 the volume of natural gas reserves for three countries stabilized. In keeping with BP (2015) data, the volume of Russia's natural gas reserves stayed the same with 31, 4 tcm; the volume of Iran's gas reserves remained constant with 29, 6 tcm; and Qatar's volume was 25, 4 tcm between the years 2008 and 2009. At that time, there was a significant global financial crisis. Russia and Iran are affected more than Qatar from the financial

crisis. However, these numbers show that the volume of natural gas reserves was not affected for each of these three countries.

Another outstanding point in the graph is that, Russian natural gas reserves were not available in 1990. The reason of this drop in Russian gas reserves was the collapse of Soviet Union due to the country's efforts to reform its domestic policy. In contrast, figure 6.1 shows that the natural gas reserves of Iran and Qatar were accessible in 1990. 'Iran had 17, 0 tcm of natural gas reserves while Qatar had 4, 6 tcm of natural gas reserves in 1990' (BP; 2015).

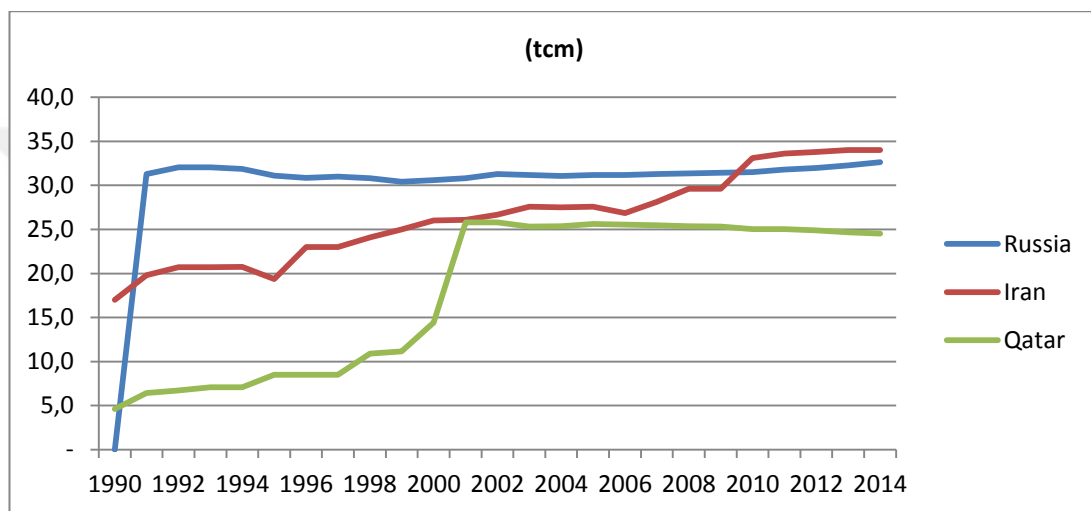


Figure 6.1 Comparing Russia, Iran and Qatar in terms of their potential natural gas reserves history from 1990 to 2014

Source: BP, 2015

In spite of the fact that Russia did not have any natural gas reserve potential before, after 1990, the country's gas reserves have increased dramatically. As demonstrated in the figure 6.1. Russian potential natural gas reserves were more than Iran and Qatar after 1990. In 1991 Russian gas reserves were at an amount of 31, 3 tcm of gas while Iran's gas reserves were 19, 8 tcm total and Qatar's were reported as 6, 4 tcm of gas. The figure 6.1 also indicates that, after the year 2000, the natural gas reserves of Qatar reached its highest point due to the discovery of new gas fields in the region. A notable example of this increment is seen in the BP' 2015 Statistical Review of World Energy Workbook in which Qatar's gas reserves went up from 14, 4 tcm of gas in 2000 to 25, 8 tcm of gas in 2001 and Qatar became the owner of world's third largest natural gas reserves. At the end of 2014, the global natural gas reserve leader was Russia with 1152, 8 tcf of gas or 32, 6 tcm of gas reserves. Following Russia,

Iran had the second largest reserves with 1201, 4 tcf or 34, 0 tcm of gas and Qatar has the third largest gas reserves with 866, 2 tcf or 24, 5 tcm of gas. As seen in the graph above, Russia has the biggest gas reserves although Iranian gas reserves started to surpass Russia's after 2014.

We can follow that with the analysis and comparison of the world's three natural gas giants in terms of the condition of their natural gas production and consumption. These three countries are among the world's top five natural gas producers, and the evaluation of their natural gas production status is as follows: Russia is the second biggest natural gas producer behind US; Iran is the third biggest natural gas producer after US and Russia; and Qatar is the fourth largest natural gas producer after the US, Russia and Iran.

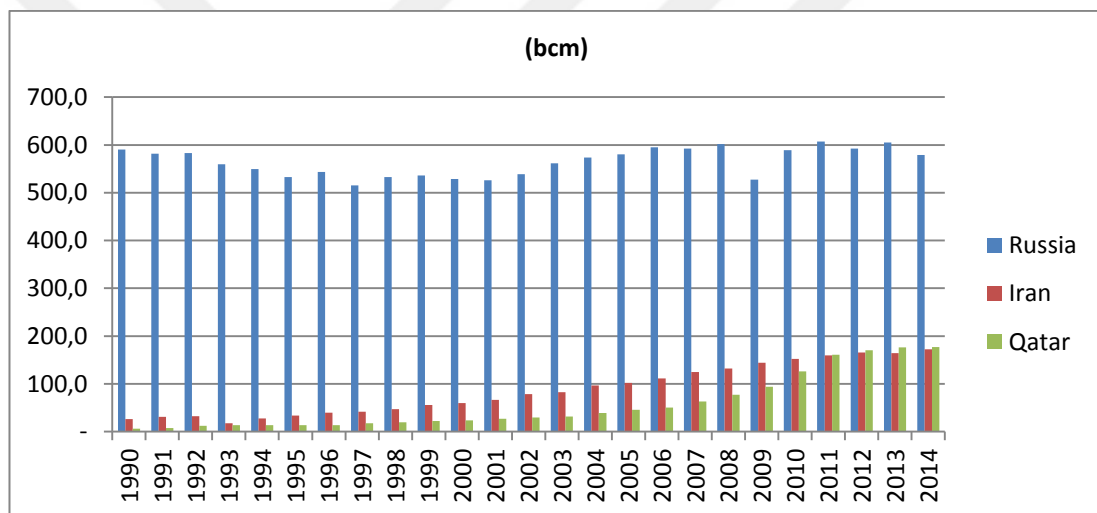


Figure 6.2 Comparison of Russia, Iran, and Qatar in terms of their natural gas production history from 1990 to 2014
Source: BP, 2015

In figure 6.2, Russia, Iran and Qatar have been compared with regards to their historical positions of their natural gas production between 1990 and 2014. In general, the graph shows that there has been a slight increment in natural gas production of Iran and Qatar while there has been a fluctuation in the Russian natural gas production since 1990. Just as it can be seen in the figure 6.2, the 2008 and 2009 were the most problematic years for Russian economy due to the global financial crisis and the Russia-Ukraine gas dispute. In reference to BP (2015), the Russian natural gas production sharply decreased from 601, 7 bcm in 2008 to 527, 7 bcm in

2009. Meanwhile, the natural gas production of other two countries increased on the same years. For instance, Iranian production went up from 132, 4 bcm in 2008 to 144, 2 bcm in 2009 while gas production of Qatar increased from 77, 0 bcm in 2008 to 94, 2 bcm in 2009. The reason of this increase of Iranian gas production is the discovery of Iran's giant natural gas fields in South Pars, and as for Qatar, new gas reserves were discovered in Qatar's North field. Another outstanding point in the graph 6.2 is that, Qatar's gas production has been increasing since 2006 because Qatar became the world's leading LNG exporter.

Additionally, between the years 2013 and 2014, the Russian natural gas production declined compared to the gas production of Iran and Qatar. 'Russian gas production diminished from 604, 7 bcm in 2013 to 578, 7 bcm in 2014' (BP; 2015). The main reason of this decline is that Russian natural gas production dropped due to the fact that the Brent oil prices' decline from 108, 66 US\$ per barrel in 2013 to 98, 95 US\$ per barrel in 2014. In fact, a majority of the countries were affected by the falling Brent oil prices but Russia was the most affected country. However, 'in these times, Iranian gas production increased from 164, 0 bcm in 2013 to 172, 6 bcm in 2014 while gas production of Qatar increased from 176, 5 bcm in 2013 to 177, 2 bcm' (BP, 2015).

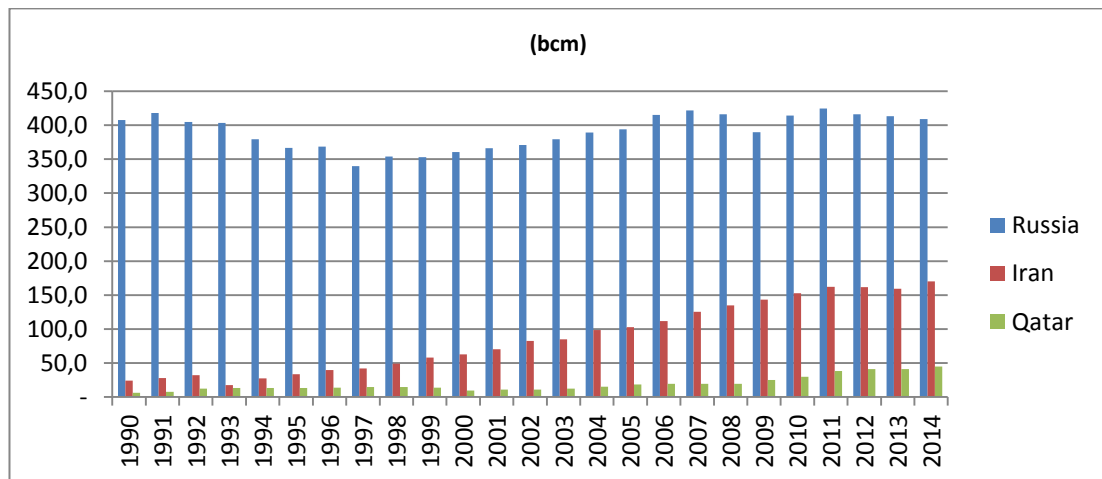


Figure 6.3 Comparison of Russia, Iran, and Qatar in terms of their natural gas consumption history from 1990 to 2014
Source: BP, 2015

Moreover, figure 6.3 shows the comparison of natural gas consumption history of Russia, Iran, and Qatar since 1990. Another reason why Russian natural gas

production declined from 2008 to 2009 is due to decreasing Russian natural gas consumption which ‘fell from 416, 0 bcm in 2008 to 389, 6 bcm in 2009’ (BP; 2015). In addition, there were also other causes that reduced natural gas production and consumption of Russia between 2008 and 2009, which were decreasing gas demand, increasing LNG production and economic crisis. In the meantime, Iran’s gas consumption increased from 134, 8 bcm in 2008 to 143, 2 bcm in 2009 while gas consumption of Qatar rose from 19, 3 in 2008 to 24, 9 bcm in 2009. There were newly discovered gas fields South Pars of Iran and North field of Qatar. Hence, gas production and consumption of those two giants were not affected from financial crisis in 2008 and 2009. Qatar’s and Iran's gas consumption has been growing since 2000.

Overall, the gas production and consumption of Qatar and Iran should be compared to their own region that is Middle East while Russia's should be compared to its own region, which is Europe & Eurasia. This is exemplified in the study undertaken by BP (2015). At the end of 2014, in the global gas market, the total share of Middle Eastern gas production was 17, 3%. The Iran’s share of gas production in the Middle East was 5, 0% while Qatar’s contribution was 5, 1%. At the same time, in the global gas market, the total share of gas production of Europe and Eurasia was 28, 8% at the end of 2014 in which the Russia has a contribution of 16, 7%. On the contrary, at the end of 2014, the total share of Middle Eastern gas consumption was 13, 7% in which Iran’s share was 5, 0% and Qatar’s share was 1, 3 correspondingly. In the global gas market the total share of Europe & Eurasia for the gas consumption was 29, 6% in which Russia’s portion was 12, 0%. These numbers proved that Russia is a core global leader in gas production and reserves, and is bigger than Iran and Qatar.

In other respects, Russia or Russia’s Gazprom is the primary natural gas exporter while Qatar is both the second largest natural gas exporter and leading LNG exporter of the world. The LNG market is among the top position in the global gas market in recent times. With regard to comparison of LNG status of Russia, Iran, and Qatar, Iran does not have any capacity to export or import LNG unlike other two. The reason of this is that, there is not sufficient LNG infrastructure to export or import LNG in Iran. For Russia and Qatar, LNG trade plays a vital role in their gas exports but Qatar is the core country for LNG exports, surpassing Russia in that respect. Both Russia and Qatar export gas via LNG to Asia Pacific. ‘Qatar supplied 74, 4 bcm

of gas via LNG at the end of 2014 to Asia Pacific region' (BP, 2015). However, 'Russia provided less gas than Qatar with 14, 5 bcm of gas via LNG to Asia Pacific' (BP; 2015).

	RUSSIA	QATAR
China	0, 2 bcm	9, 2 bcm
Japan	11, 5 bcm	21, 9 bcm
South Korea	2, 6 bcm	17, 7 bcm
Taiwan	0, 1 bcm	8, 0 bcm
Thailand	0, 1 bcm	1, 3 bcm
India	-	16, 2 bcm
Malaysia	-	0, 1 bcm

Table 6.1 Comparison of Russia and Qatar in terms of their LNG trade movements in Asia Pacific Region in 2014
Source: EIA, 2015

As illustrated by table 6.1, in the Asia Pacific region, Qatar is the most dominant LNG supplier. In Asia Pacific, Japan is the leading LNG market for Qatar and Russia, but Russia supplied 11, 5 bcm of gas via LNG to Japan while Qatar exported LNG to Japan nearly two times more than Russia with 21, 9 bcm. Actually, Qatar's total LNG export was 103, 4 bcm in which Asia Pacific's share was 74, 4 bcm via LNG. Qatar's other LNG export regions are Middle East with 2, 3 bcm; Eurpe & Eurasia with 23, 6 bcm; South & Central America with 1, 7 bcm and North America with 1, 4 bcm. However, the LNG market of Russia is only in Asia Pacific. The difference in amount of gas export via both pipeline and LNG for Russia and Qatar in late 2014 can be clearly seen in the table 6.2.

	RUSSIA	QATAR
Natural Gas Exports via Pipeline	187, 4 bcm	20 ,1 bcm
Natural Gas Exports via LNG	14 ,5 bcm	103, 4 bcm

Table 6.2 Comparison of the Gas Export of Russia and Qatar at the end of 2014
Source: EIA, 2015b and EIA, 015c

Another way of providing natural gas is via pipeline. Russia and Qatar export their natural gas using both LNG and pipelines while Iran supplied its gas only via pipeline. Pipeline trade movement comparison of Russia and Iran is as follows: Iran exports its 90% of natural gas to Turkey. Both Iran and Russia supplies gas to Europe. According to BP (2015), Iran provided 8, 9 bcm of gas to Europe while Russia exported 147, 7 bcm of gas to Europe at the end of 2014. In Europe, Iran's only gas export market is Turkey with an amount of 8, 9 bcm while Russia supplies gas to numerous European countries but also Russia supplies 26, 9 bcm of gas to Turkey still more than Iran. As mentioned before, Iran also exports its gas to Armenia and Azerbaijan. Qatar supplies its gas via pipeline to Middle East and provides 2, 1 bcm of gas to Oman and 18, 0 bcm of gas to United Arab Emirates.

Economic issues are important factors for all markets of Russia, Iran, and Qatar. These three GECF members have the world's largest economies. Qatar has the world's third major economy and has the second largest economy in the Middle East, Russia is the sixth largest economy, and Iran is the nineteenth biggest economy of the world. The economies of all three countries are based on energy industry, especially natural gas and oil. If these countries encounter problems in their economy, their energy industry will also be affected. For instance, recently, Russia encountered several challenges that were economic crisis, recent sanctions, and depreciation of ruble, Syrian Civil War, and decreasing oil prices. These issues affected Russian economy and its energy industry. Nevertheless, Russia is still the leading country in the natural gas market.

Even though Iran is under the effect of foreign sanctions, it is still the third largest natural gas producer of the world after US and Russia and can be considered as a sleeping giant. Because of sanctions, Iranian economy and energy market is damaged. For instance, Iran's various natural gas investments and projects are cancelled. After the sanctions are lifted, Iran will begin to recover its economy and energy industry. In addition to this, Iran should focus more on LNG marketing in order to compete with Qatar and Russia.

In the figure 6.4, the GDP growth rate of Russia, Iran, and Qatar has been compared between the years 2014 and 2017. A country's GDP growth rate is important for the country's energy industry and economy.

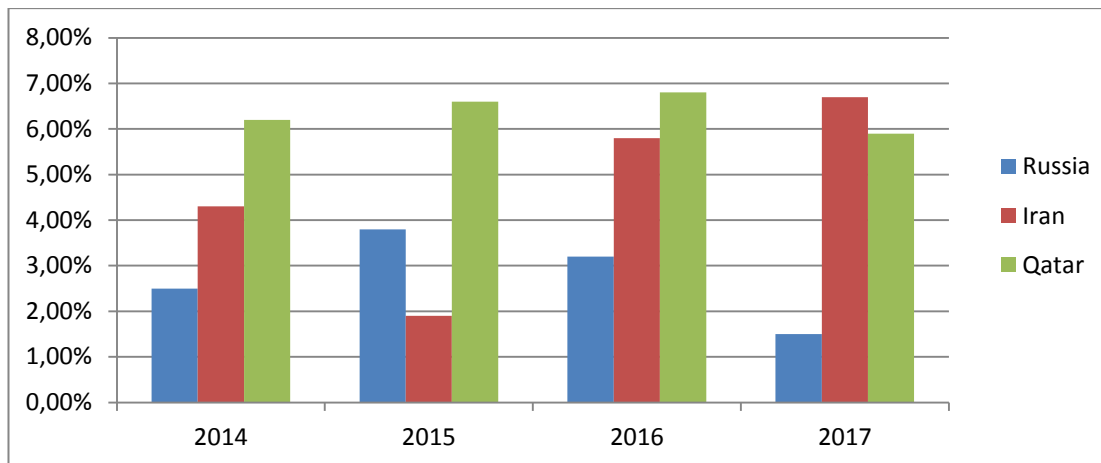


Figure 6.4 Comparison of the GDP Growth Rate of Russia, Iran, and Qatar between the Years 2014 and 2017

Source: The World Bank Data

According to the graph above, Iran's GDP growth rate declined from 4.3% in 2014 to 1.9% in 2015 while Russia's GDP growth went up from 2.5% in 2014 to 3.8% in 2015 and the GDP growth of Qatar also increased from 6.2% in 2014 to 6.6% in 2015. The reason of declining Iranian GDP growth is US and EU sanctions. However, after the sanctions are lifted, the country's GDP growth started to reach 5.9% in 2016. The GDP growth of Russia fell down from 3.1% in 2016 while Qatar's GDP growth rate went up to 6.8% in 2016. The reasons of Russia's decreasing GDP growth are economic crisis, ruble's depreciations and falling oil prices. According to the World Bank forecasts, the 2017 GDP growth rate estimations of these three countries will be as follows: Russian GDP growth will decline to 1.5%; Iranian GDP growth will increase to 6.7%; and Qatar's GDP growth will decrease to 5.9%.

All three giants have a say on the issue of natural gas market leadership while being in competition with each other. When Qatar surpassed Indonesia in 2006, it became the superior LNG trader of the world. In other words, Qatar is considered as a monster in terms of global LNG production and export. Due to its advanced LNG technology, capacity to use to bigger classes' vessels and its low cost LNG vessels and fleet, Qatar is the brain of the global LNG sector. This is a satisfactory reason for why Qatar is among the first three giants in the world's natural gas market. However, this may become a threat for the Russia's leadership in the European natural gas market. Due to the Russian annexation of Crimea and Russian dispute with Ukraine, EU countries are concerned whether if their energy security will be exposed to

danger or not. For this reason, they may turn to an alternative supplier or market such as Qatar's LNG market. EU can also turn to other market like US shale gas. As known, after US shale boom, there has been many changes observed in the global natural gas market such as decreasing oil prices. Russia encountered several challenges after US shale gas revolution that suddenly became an alternative market for Europe. The EU countries have already acted with deliberation towards the issue of Crimea annexation and Ukrainian conflict. The US' flourishing shale gas, declining oil prices and Qatar's massive LNG trade can make things difficult for Russia.

On the other hand, Iran tries to recuperate after the recent challenges it faced such as international sanctions that are now lifted. During international sanctions, Iran's numerous fields have been damaged, such as its economy, its projects, and investments in natural gas industry and its natural gas trade. However, Iran will stay under the radar in the natural gas industry as a silent giant. Its enormous South Pars natural gas fields are the number one reason for Iran's place as one of the top three natural gas giants of the world.

Therefore, all three natural gas giants play a significant role in the global natural gas arena as the member countries of GECF. In the forum, Russia shows its intention to establish a gas cartel similar to OPEC. However, this intention is unlikely to be materialized for many years. After the lifting of sanctions, Iran's economy and energy industry will try to recover. Before lifting sanctions, the investments of foreign companies have failed but then the investments became to come alive. If the country focus more on LNG market and use its giant gas reserves effectively for production, Iran may threaten Russia's position in the market. Qatar is also an important competitor for Russia and global gas market with its giant LNG trade. It looks like all three countries will continue to hold their positions as global natural gas leaders for many years.

CHAPTER VII

Conclusion

Following 1990s, a consisted enlargement was witnessed regarding the awareness of natural gas resources. The main reason was the changing natural gas geopolitics by new emerging global natural gas players. Although the world was on the cusp of a new age of natural gas profusion after 1990s, the world has confronted a new competition in natural gas market among gas suppliers on account of surfacing undiscovered oil and natural gas, especially with US shale revolutions.

Moreover, after 1990s and collapse of Soviet Union, Russia guaranteed rigorously its status as not only holding one of the most largest natural gas reserves but also being the biggest natural gas producer in the global natural gas arena. However, after US shale booming, Russia began concerning about its position of leading gas producer. Meanwhile, there was a gas conflict between Russia and Ukraine, which was resulted in reaction of the European countries. The highlighting reason of this reaction was that Russia implemented high natural gas prices through Ukraine when supplying natural gas. Therefore, the European countries concerned about their energy security. This damaged Russian popularity and the domination of natural gas sector.

Besides, in this competitive arena of natural gas, Iran is another important competitor since it has the second biggest natural gas reserves after Russia. Nonetheless, Iran was exposed to foreign sanctions in long period of time, which resulted in spoiling the country's economy and energy market, mainly its natural gas industry. Yet, Iran is still a silent giant with its enormous natural gas reserves potential. On the other hand, Qatar is the third significant player in the competitive gas arena. Since Qatar is the foremost LNG producer and exporter, the country is a non-ignorable competitor in the global natural gas sector. Hence, this study analyses the features and significances of these three natural gas giants with the assist of comparative analysis perspective as well as the concept of geopolitics.

Within this context, this study reaches a numerous interpretations about three natural gas giants. In table 7.1, the focal arguments of this study are demonstrated elaborately.

CRITERIAS	IRAN	RUSSIA	QATAR
Reliability of Security	-	-	+
Long Term Contract	+	+	+
GECF Membership	+	+	+
Pipeline Connection to Main Consumers	+	+	+
Owens its LNG Fleet	-	-	+
LNG Exporter	-	+	+
Resource Curse	+	+	-
Using Energy as a Foreign Policy Tool	+	+	-
Existing Projects and Investments	+	+	+
Specified Targets	+	+	+

Table 7.1 Final Evaluation of the Three Natural Gas Giants from this Study's Framework – Illustrated by the author

Based on all these investigations, a number of implications are inferred at the end of this study as they are shown in the table above. The first argument of this study refers to reliability of security. The first argument concludes that the reliability of security perception cannot be mentioned for Iran and Russia while it was deduced that reliability of security phenomenon for Qatar is in question. For the sake of example, Russia is the key supplier in terms of natural gas for European countries. When Russia and Ukraine was in gas conflict, Russia cut gas supplies to Ukraine that concerned European countries. As it is known, one way of sending Russian gas to Europe is pipeline through Ukraine and when Russia cut its supply, Europe is affected in terms of security threat. As it is known, energy security issue is the Europe's main energy strategy. Therefore, Europe believed that Russia is not reliable on one level when procuring its gas due to this conflict. Moreover, Iran has the second largest natural gas reserves after Russia with its South Pars field. As

mentioned before, Iran centred its attention on the nuclear energy resulting in several negotiations, especially in energy sector since the nuclear issue is very controversial for the majority of the countries. They cannot support this critical issue since it is a big threat for the country's energy security. After Iranian nuclear actions, all states interrupted its natural gas investments, gas projects, and pipeline projects in the course of nuclear concerns. Therefore, they believed that Iranian gas could not be reliable. In contrast, when it comes to Qatar as the biggest LNG producer and exporter, there are not seen any counter attacks against security issue. For that reason, the reliability of security is valid for Qatar.

In the second argument of this study, long-term contract is submitted. It was inferred that all of three countries have long-term gas contracts. In order to increase gas production and gas infrastructure, long-term contracts are needed and more preferable for several countries. As it is known, the only way of funding new immense and uncertain investments is realizable by means of long terms gas contracts. In 1979, during Iranian Islamic revolution, the gas production declined and this decline resulted in deficiency in private sector investments, which consequently resulted in decline in gas contracts. However, from the beginning of 2000s, the country initiated and rearranged its foreign investments according to emerging buyback contracts by aiming to get its previous gas fields and to keep its productions. Afterwards, Iran developed its buyback contracts to long-term contracts with sanctions. The main example is between Iran and Turkey supplying 90% of natural gas from Iran under a long-term gas contracts or 25-year contracts. On the other hand, Russia also has long-term gas contracts. The majority of Russian long-term gas contracts are signed among European countries. This contract can be reviewed on the official webpage of Gazprom. It is signed between Latvia, Germany, Austria, Belarus, Netherlands, United Kingdom, Serbia, and Armenia. The main target of these contracts is to provide safety, continuity, flexibility, and accountability of gas supply to the buyers. Qatar also has long-term gas contracts as a chief LNG supplier of European and Asian countries. Qatar's 80% of LNG supply is based on long-term deals that provide flexibility and liability to the buyers.

Third argument of this study refers to membership of GECF. All of three gas giants are the member of this forum as leading countries. However, Russia is the most dominant player in the GECF by targeting a number of critical intentions. The

biggest dream of Russia via GECF is to maintain and amplify its dominant position over other states due to holding a number one massive natural gas reserves. Establishing a Gas-OPEC is other intention for Russia but Iran and Qatar does not take this kindly. However, recently, Russia and Qatar has become the most visible, prevailing states in the forum since Russia is a leading natural gas exporter and Qatar is the chief LNG exporter. Therefore, Qatar and Russia compete with each other due to their leading positions as GECF exporters, and this causes high tensions between two exporters.

Fourth inference of this study is about the pipeline connection to main consumers. All of the three countries contain pipeline connection through the major consumer countries. Qatar holds only one pipeline connection with consumers, which is Dolphin energy pipeline, to supply to United Arab Emirates and Oman. Moreover, Russia procures its gas via several pipelines to consumers as follows: via Yamal-Europe pipeline to Poland and Germany; via Blue Stream to Turkey and; via Nord Stream to Germany and Northern Europe. Next, Iran has four pipeline ways connecting with consumer countries like Iran-Pakistan pipeline, Iran-Iraq pipeline, Iran-Oman pipeline, and Iran-United Arab Emirates pipeline.

Next implication is presented as owning LNG fleet. Both Russia and Iran do not possess LNG fleet. Qatar is the foremost in holding its own LNG fleet in the global gas market. This provides several benefits for the country. As mentioned before, two new classes of LNG fleets are Q-Flex and Q-Max known as leading vessels in the world. The most significant benefits of Qatar's fleets are as follows respectively: having high level of security, reliability, using a reduced amount of fuel, producing less than 30% of emission when compared to others, and holding the largest capacity. These paved the way to gain advantage for Qatar in terms of its global position as a chief LNG producer and exporter giant.

Subsequently, LNG exporter is another argument for the result of this study. Iran does not hold the status of LNG exporter unlike Russia and Qatar; however, Iran aiming to enlarge their LNG strategy has several LNG projects initiatives. Russia intends to spread out its supply opportunities and by this way, the country will modify its gas supply centre on the road to Asia Pacific region like East China. This intention is also observed in the Iranian market. If Iran's LNG intention is

materialized, Iran will gain numerous advantages with its LNG projects that are mainly related to flexibility of using gas in support of its domestic consumption and amending its exports to market prices. Although Iran has these benefits, the country's LNG projects can face budget restriction, political intervention, lack of international collaborator and risky projects. In addition to this, the main purpose of Iran's LNG spot market is to supply LNG with lower prices than Qatar supplies to Asian market. Unlike Qatar plays an active role in the LNG market as being a chief supplier. Due to increase in Qatar's LNG exports to Europe and Asia region, Russia and the country's natural gas monopoly Gazprom have encountered problems. In addition to this, after the increase in Qatar's LNG to Europe within the LNG spot market, there has been an important decrease in natural gas prices causing several problems in the global natural gas industry. In addition, Russia has begun to supply natural gas via pipeline as being an exporter but Russia remains in second place with respect to Qatar in terms of LNG exports.

Furthermore, the argument of resource curse³ is the other significant result for this study. In Russia, there might be a natural resource curse. The main evident of this is that Russian economy is based on both oil and natural gas and they are main players in the federal Russian budget. In addition to these, nowadays, decreasing oil prices and increasing gas prices has affected Russian economy due to country's oil and natural gas-based economy. Moreover, like Russia, Iran might experience the natural resource curse because of its oil and natural gas-based economy. However, Qatar does not witness a natural resource curse unlike Russia and Iran. Qatar has abundant resources and its own LNG, Qatar has managed to augment its natural gas investments. Therefore, the country runs to diversify its economy.

After that, using energy as a foreign policy tool is another remarkable argument for this study. It is concluded that unlike Qatar, Iran and Russia use energy as a foreign policy tool. Each state wants to focus on making stronger their positions in the international ground by the use of their political and economic relations, their military capability, and other available and accessible indicators on their foreign policy. Nevertheless, Iran and particularly Russia use energy as a foreign policy tool.

³ Resource curse is referred also a paradox of plenty and to be defined that 'states ground on the abundance of natural resources in their economy such as oil and natural gas that paves the way for less economic development and rising GDP in the long run' (Ahrend 2005; pp. 584-609).

Iran utilizes energy as a foreign policy tool due to its world's second largest reserves in South Pars fields, its gas production capacity, and its gas supply to buyers. Moreover, Russia uses energy more than Iran does as a foreign policy tool due to its gas pipes and one of the largest reserves when compared to Russian army. The main reason of using energy for Russia is to strengthen the country's position in international arena. The main evident of the capabilities of Russia in support of using energy as a foreign policy tool are as follows: the country's huge reserves, productions, pipes, exports, intending to maintain its chief supplier of Eurasia, main dependence of consumers through Russia like Europe or EU, and aiming to supply LNG to Asian market.

Meanwhile, other attractive arguments of this study are allied to existing projects and investments. All of three natural gas giants have existing projects and investments. However, Iranian gas projects and investments are barely recuperated because of being exposed to foreign sanctions. However, after lifting sanctions, Iran's all projects and investments will begin to recover by each passing day as a silent giant. Moreover, Russia has also several existing projects and investments. Some of them are as follows: LNG, diversifying its gas route, dealing with natural gas between Russia and China via Siberia and Altai gas pipeline, South stream pipeline, and Turkish Stream pipeline. However, Russian projects and investments are damaged due to decreasing oil prices, currency depreciation of ruble, and its economic crisis. Qatar also has several existing gas projects, investments, and upstream gas projects without any challenge due to its wealthy and growing economy. In particular, aiming to grow, having largest position in the global LNG market, and having a growing economy are the main reasons why Qatar's projects and investments progress better.

Final argument of this study is linked to the specified gas targets of three giants. Iran, Russia, and Qatar have critical future targets in terms of natural gas. After lifting sanctions of Iran, Iran plans to increase its natural gas production and its share in global natural gas exports by 2025. In addition to this, Iran will develop its LNG market and improve LNG supply to surpass Qatar in Asian market. Following Iran, Qatar also will increase and protect its position in favour of leading LNG producer and exporter, which will boost its production. Besides, Russia also plans to maintain its dominant position and status by holding chief natural gas reserves and as the second biggest producer. Moreover, Russia will augment its LNG activities through

Asian market by aiming to overtake Qatar like Iran. The targets of three natural gas giants are same, which causes competition in international arena with the intention of being number one natural gas player in the world.

As a consequence, this framework will be used to evaluate the countries in terms of reliability of security, long term contract, GECF membership, pipeline connection to main consumers, owning LNG fleet, LNG exporter, resource curse, using energy as a foreign policy tool, existing projects and investments and specified targets.

In this context, it appears that each of these countries is reasonably important in the international natural gas market. As a result of this study, a framework is constituted for several arguments and these arguments are evaluated by the concept of geopolitics and comparative analysis method. Each of them do not want to lose its leading status and even, they plan surpassing each other in the global energy arena.

Following the analysis, it is also important to determine the answers of the research questions that are raised in the introduction. It is observed that there is a clear impact of sanctions on the development of Iranian natural gas sector. Insufficient funding and lack of investment due to the international sanctions undermine the development. Furthermore, it might be suitable to state that Iran has a potential to challenge the dominant position of Russia in the international gas market if Iran could be its cards well and pursue its integrations strategy to the world markets. LNG is a crucial issue in global gas markets. However, it is difficult for Russia to challenge Qatar in this aspect due to prioritization of pipelines in its energy exports policy. Moreover, this study believes that the rivalry between Iran and Russia will be based on piped gas rather than LNG supplies.

To sum up, it is concluded that these three countries are named respectively as follows: Iran as a 'silence or sleeping giant', Russia as a 'dominant giant' and Qatar as a 'luster or shining giant'. Iran is a silence giant because deteriorated Iranian economy and energy sector begin to recover after lifting foreign sanctions. And the country turns into this competitive natural gas market secretly. Although Russia encountered several problems like Russia-Ukraine gas dispute and lost the European country's trust, Russia is named as a dominant giant due to its enormous natural gas reserves. Besides, Qatar is named as a luster giant due to its massive LNG productions and exports. Due to the principal positions of these three giants from the

perspective of natural gas geopolitics, competition and struggle is growing among them because they do not want to lose their leading positions.



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