Report No: 23, January 2011

IS THE QATAR-IRAQ-TURKEY-EUROPE NATURAL GAS PIPELINE PROJECT FEASIBLE?

An Analysis With Regards To International Energy Market Policies and Risks

KATAR-IRAK-TÜRKİYE-AVRUPA DOĞAL GAZ BORU HATTI PROJESİ MÜMKÜN MÜ?

Uluslararası Enerji Politikaları ve Riskler Çerçevesinde Bir Değerlendirme

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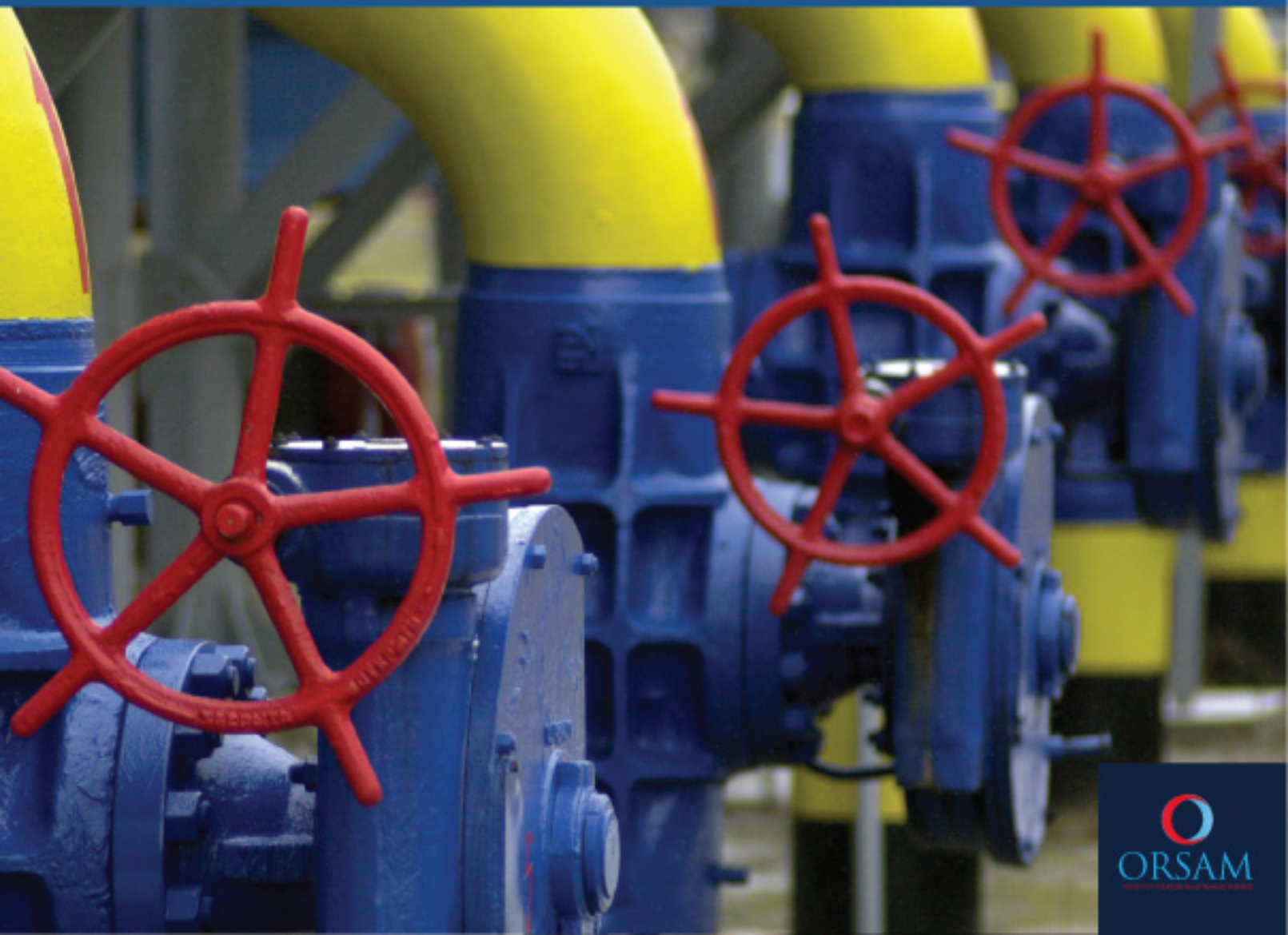

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Strategic Information Management and Independent Thought Production

CENTER FOR MIDDLE EASTERN STRATEGIC STUDIES

History

In Turkey, the shortage of research on the Middle East grew more conspicuous than ever during the early 90's. Center for Middle Eastern Strategic Studies (ORSAM) was established in January 1, 2009 in order to provide relevant information to the general public and to the foreign policy community. The institute underwent an intensive structuring process, beginning to concentrate exclusively on Middle Eastern affairs.

Outlook on the Middle Eastern World

It is certain that the Middle East harbors a variety of interconnected problems. However, neither the Middle East nor its people ought to be stigmatized by images with negative connotations. Given the strength of their populations, Middle Eastern states possess the potential to activate their inner dynamics in order to begin peaceful mobilizations for development. Respect for people's willingness to live together, respect for the sovereign rights of states and respect for basic human rights and individual freedoms are the prerequisites for assuring peace and tranquility, both domestically and internationally. In this context, Turkey must continue to make constructive contributions to the establishment of regional stability and prosperity in its vicinity.

ORSAM's Think-Tank Research

ORSAM, provides the general public and decision-making organizations with enlightening information about international politics in order to promote a healthier understanding of international policy issues and to help them to adopt appropriate positions. In order to present effective solutions, ORSAM supports high quality research by intellectuals and researchers that are competent in a variety of disciplines. ORSAM's strong publishing capacity transmits meticulous analyses of regional developments and trends to the interested parties. With its web site, its books, reports, and periodicals, ORSAM supports the development of Middle Eastern literature on a national and international scale. ORSAM facilitates the sharing of knowledge and ideas with the Turkish and international communities by inviting statesmen, bureaucrats, academics, strategists, businessmen, journalists and NGO representatives to Turkey.

Contents

PREFACE

Energy as one of the main factors of progress plays a crucial role in today's international politics. It is self-understood that the demand for energy is more urgent among developed countries. The European Union can be evaluated in this context. In fact, Europe as a main consumer of natural gas with gradually increasing dependence is located far away from gas-producing countries. This energy security risk urges the EU to develop new energy politics. Threats to energy security became more obvious in the times when the natural gas supply from Russia was cut. Europe, seeking to preserve its energy security, shows efforts to increase the diversity of transit countries and sources.

As a matter of fact Qatar emerged as an important natural gas supplier in the recent past. Qatar, with the aim of being a natural gas supplier, runs a peaceful foreign policy. Qatar, emerging as an important supplier, has competitive goals in face of a Europe which tries to preserve energy security. In this competitive environment an additional gas pipe reaching from Qatar to Europe may provide the desirable diversity of transit countries and sources. Turkey maintains a key position in the access of these resources. For this reason subject of our discussion is the question how gas from Qatar can be procured via Turkey and how the role of Turkey as a transit country might look like. In this context the project of a Qatar-Turkey pipe, providing gas from Qatar to Europe, was brought up the agenda. The project may not only contribute to Qatari and European energy policies but is also of uttermost importance to Turkey as a transit country and energy hub.

With the aim to discuss this project in detail we, as ORSAM, are publishing the following report "Can the Qatar-Iraq-Turkey-Europe natural gas pipe project be realized?" to everyone interested in this matter. In the first part of our work we provided basic data on regard to natural gas. In the following part we evaluated the importance of natural gas for Europe and its long-term dependence on imports. Subsequently, the location of Qatar's gas production facilities and the question whether the country disposes of capacities necessary to accomplish such a project were discussed under consideration of its current natural gas policy. Finally, we stressed the importance of such a pipeline for Europe, Qatar and Turkey.

As we, as ORSAM, deem this project essential not only to the stability of the Middle East and energy security but also to Turkey's role in the Middle East and its relations with Europe we worked out a report on this topic. Hence the publication of this work is our contribution to this issue. Finally, we would like to thank everybody who contributed to this work.

With best regards,

Hasan Kanbolat
Director

Report No: 23, January 2011

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CENTER FOR MIDDLE EASTERN STRATEGIC STUDIES

IS THE QATAR-IRAQ-TURKEY-EUROPE NATURAL GAS PIPELINE PROJECT FEASIBLE?

An Analysis With Regards To International Energy Market Policies and Risks

Summary

- The European Union (EU) is an important natural gas consumer, located far from the countries producing natural gas. With an increased dependence on natural gas, the EU has had some troubles in various periods particularly with the suspension of the natural gas supplies from Russia. Such problems have accelerated supply security policies of the EU to be implemented immediately.

- Being the second largest energy consumer in the world with a 16.3% share, following the USA, the European Union currently imports 50% of its energy need. This rate is expected to rise to 70% by 2030. The share of natural gas in EU energy consumption is 24% .

- Becoming an important natural gas supplier over the last few years, Qatar is a country with rich natural gas reserves that can ensure source diversity in natural gas supply for the EU – the later has been seeking to reduce its dependence on Russia. Questions are raised as to whether the Qatar natural gas can be transported to Europe with low prices and serve as a supply route diversification and, when Qatar natural gas is transported to Europe over Turkey, as a transit country, what the role of Turkey will be.

- As an increased demand in gas coincides with a decreased production, Europe's import dependency culminates and causes supply security concerns. In view of gas consumption estimation figures and future projects it can be said that a pipeline that transports natural gas from Qatar to Europe would make significant contributions to EU's supply security as it considerably allays the dependency problem.

- Located at the center of the Persian Gulf, Qatar is the country with the third largest natural gas reserves, after Russia and Iran. The proved natural gas reserves of Qatar are around 25.25 trillion m^3 as of January 1, 2009. Qatar has almost 15% of the world's natural gas reserves.

- A pipeline that will start from Qatar and reach the European Union through Iraq and Turkey will truly ensure the diversification of sources and routes and thus contribute to the supply security.

- A pipeline from Qatar to Europe is helpful for providing demand security for Qatar and also compulsory when taken into consideration the world LNG markets progress.

- With realizing such kind of a project an important step would be taken in the path of becoming an energy hub for Turkey. Being an energy hub means that producers bring their gas to Turkey and market therein. In order to establish an energy hub infrastructure investments such as pipelines and storage facilities should be made as soon as possible.

- In case of the realization of this pipeline project, Turkey will gain an important advantage in the pipeline competition. Trying to become a base in the energy sector, Israel is also working on oil and pipeline projects passing through its own territories. In case of the realization of Qatar - Turkey pipeline project, Turkey's status in the Middle East will be strengthened through a pipeline that will pass through its own territories, instead of Israel and other neighboring countries.

Introduction

The European Union (EU) is an important natural gas consumer, located far from the countries producing natural gas. With an increased dependence on natural gas, the EU has had some troubles in various periods particularly with the suspension of the natural gas supplies from Russia. Such problems have accelerated supply security policies of the EU to be implemented immediately.

The establishment of supply security requires various measures to be taken. The first one of such measures is to ensure the diversification of sources. Diversity of sources means non-dependence to a single source of supply and ability to obtain gas from more than one source. Thus, in case of a trouble in one source, negative affects of supply cut-offs will be reduced or eliminated through procuring gas from other sources. The other measure is to ensure diversification of routes in order to provide supply security. The diversification of routes means the transportation of gas coming from a source to the consumer through different routes. The diversity of routes is important particularly when the natural gas carried through pipelines over transit countries is ceased due to the risks that may be associated with transit countries. Measures such as the construction of storage facilities and ensuring cooperation with other consumer countries are also important with regards to the establishment of supply security.

Becoming an important natural gas supplier over the last few years, Qatar is a country with rich natural gas reserves that can ensure source diversity in natural gas supply for the EU – the later has been seeking to reduce its dependence on Russia. In fact, the Qatar natural gas has been exported to Europe in the form of LNG and new projects, aiming to increase the re-gasification capacity of Europe, will be realized soon. However, LNG transportation is a complicated process which requires gas to be liquefied, transported through special tankers, stored, and regasificated when needed. Accordingly, additional calculations are required, in order to decide whether transportation via pipelines or in the form of LNG is more economic with respect to transportation of natural gas between producers and consumers. Questions are raised as to whether the Qatar natural gas can be transported to Europe with low prices and serve as a supply route diversification and, when Qatar natural gas is transported to Europe over Turkey, as a transit country, what the role of Turkey will be.

This report will highlight the questions mentioned and will discuss the importance of natural gas for Europe and the dependence of the European Union on importation in the long-term by citing basic data about natural gas. Furthermore, the report will examine Qatar's role in the natural gas production and whether such a pipeline can be developed with regards to its natural gas policies. Finally, in the last section we will underline the characteristics, risks and significance of the pipeline for the EU, Qatar and Turkey.

I. NATURAL GAS

A. Definition of Natural Gas and its Types

Natural gas is a type of hydrocarbon gas that is formed through the exposure of plants and animals, which are organic materials, under high pressure and heat in an oxygen deficient environment with sand, mud and other materials in a very long term such as millions of years, between the layers of the ground; composed of combustible gases such as methane, ethane, propane, butane and pentane; colorless and odorless and is lighter than air; burns in a cleaner manner unlike other fossil fuels and emits lower levels of carbon dioxide, vapor and a little amount of nitrogen oxide into the air. [1]

Natural gas, is extracted from the ground through wells, purified from the water, other

gas types, sand and other particles, and refined in processing units to make it ready for consumption.[2,3]

Natural gas has several forms. The term *condensate gas* is used to describe pentane to octane hydrocarbon fractions which exist in a liquid form at ordinary atmospheric temperature and pressure. *Natural gas liquids (NGLs*) is the term used to describe the ethane, propane and butane fractions which are extracted from a gas stream. The term *wet gas* is used to describe condensate and natural gas liquids, *dry gas* is used to describe any combination of methane and ethane. [4] Similarly, *associated gas* and *non-associated gas* are different forms of natural gas. *Associated gas* exists in solution or in close contact with crude oil or condensate deposits. The production of this type of gas depends of the production of the crude oil or condensate deposits with which it is associated. Consequently, any interruption to the production of crude oil or condensate might also interrupt the production of the associated gas. *Non-associated natural gas* is the natural gas which can be produced physically and economically without dependence upon the production of any crude oil or condensate gas. [5]

B. Significance of Natural Gas

Particularly the lessons learned from the oil crisis that took place between 1973 and 1980 made the use of natural gas important due to the desire to decrease dependence on oil. What makes natural gas so valuable is undoubtedly the fact that it is a green energy product. Natural gas, which is a fossil energy source like oil, is an environment-friendly energy source that burns without emitting ash and cinder and does not produce air polluting sulphur-dioxide following its burn.[6] While all the traditional solid and liquid fuels emit some gases into the atmosphere, which have adverse effects on the environment and human health, during combustion, natural gas, also referred to as the clean energy source, has a very limited polluting effects on the environment.[7]

Used particularly in residential and commercial sectors for heating purposes, natural gas is also important for industrial sector. Furthermore, due to the lowness of the unit set power construction cost and the shortness of the construction period, natural gas is used increasingly in combined cycle plant electricity production.[8] In fact, the natural gas combined cycle plants attract an increased attention in the world with their short construction periods, low investment costs, efficient operation and minimum environmental impact.[9]

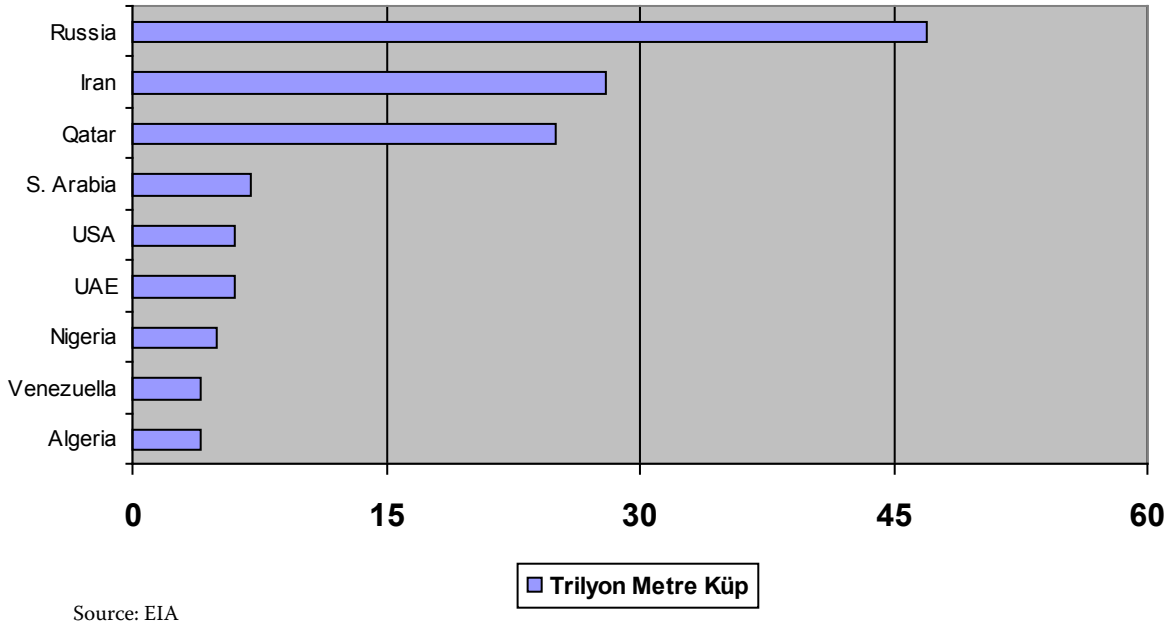
Together with a decrease in the share of nuclear plants in energy production natural gas gains more importance. Particularly the nuclear plants, which were constructed with old Russian technology in the Eastern European countries, cause these countries to waive from nuclear energy in energy production and turn towards natural gas as an alternative, due to their risks and the high costs of taking these risks under control.

C. Natural Gas Consumption

The share of natural gas, which is used largely in industry, heating and electricity production, is naturally increasing in the world's energy resources consumption. In the last few years, as a result of the invention of vehicles working with natural gas, we see that natural gas is also used in the transportation sector. The statistical data provided by EIA (Energy Information and Administration), indicate that the world natural gas consumption, which was 1.5 trillion m^3 in 1980, increased to 2 trillion m^3 in 1990 and a total of 2.94 trillion trillion m^3 in 2006.

The largest natural gas consumer country in the world is the United States. The United States is followed by the European Union and Russia. The natural gas demand is rapidly increasing in the Middle East and Africa. In the meantime, a high natural gas demand increase is expected in the developing countries in Asia and Southern and Central America. Moreover, a rapid demand increase is also expected in de-

Natural Gas Reserves by Country as of January 1, 2009



Source: EIA

veloping countries in the years to come. Taking into consideration the increase in demand, the world natural gas consumption is expected to rise by a 1.6% annual average increase to 4.33 trillion m^3 by 2030.[10]

D. Natural Gas Reserves and Natural Gas Production

40.5% of known natural gas reserves are located in the Middle East, 31.5% in Asia, 3.6% in Europe, 8.2% in Asia Pacific and 7.8% in Africa, respectively. The most important natural gas reservoirs in the world are located in the Russian Federation, Algeria, Iran, Qatar, Saudi Arabia, Nigeria and Indonesia.

E. The Transportation of Natural Gas

When the natural gas reserves and the consumer regions are examined, it is seen that natural gas is an energy source that is usually produced in places that are far from the main consumer regions, i.e. that is usually not consumed where it is produced. This requires the safe transportation of natural gas for long distances. For the efficient and effective transportation of natural gas from the region where it is produced to the region where it is consumed, usually an intense pipeline network with sufficient capacity is built and natural gas is transported through applying high pressure into this pipeline for its move.[11] This usually requires the pipeline to cross via the territories of another country and cross border (transit) pipelines are built to this aim.[12]

Another transportation method for natural gas is the transportation of liquefied natural gas over the seas via tankers. *Liquefied natural gas* (*LNG*) refers to the gas that is liquefied through freezing at minus 160 degrees and is formed predominantly of methane[13]. The transformation of gas into a liquid product decreases its volume by one-six hundredth and enables the shipping of gas in large volumes through specially designed sea crafts. When the liquefied gas is delivered to its delivery point the liquid product will be transformed again into gas.

Although it is possible to transport large volumes of gas with the LNG method, the application of the liquefaction method in the source country and its re-gasification again in the final

destination, increase the cost of this method significantly. When compared with pipelines, LNG can only compete with pipelines for distances over 4800 kms.[14]

II. EUROPEAN NATURAL GAS DEMAND

A. Rise of European Natural Gas Demand

With the discovery and development of the Groningen gas field 1959 in the Netherlands, the gas supply to Europe started and this region became the monopolistic supply source for seven Western European countries. With the start of significant amounts of cross border gas delivery in 1960s, this period is regarded as the start of the European gas market. In this period, some European countries made small-scale gas production to meet the local consumption.[15]

In this early stage of the market the LNG technology was applied to diversify gas-supply and access outer-European sources: Starting with UK's Canway Island terminal in 1964 and followed by the construction of re-gasification plants in France, Italy and Spain, until the end of the decade Algerian and later Libyan gas reached a growing share of European supply.[16]

European gas demand was boosted by the oil crisis in 1973 which triggered a growing trend to substitute oil with gas in the heating as well as in the electricity sector. In consequence, the number of importing countries in Western Europe rose to eleven during the 1970s. This trend was brought forward through additional successful explorations in the North Sea, mainly on Norwegian and British territories but also in Danish and Dutch waters. While the British fields solely met domestic demand, Norway situated itself as export country through the construction of two offshore pipelines (Norpipe and Frigg) and supplied gas to the UK and the European mainland.[17]

In the beginning of the 1970s another important player entered the (Western-) European gas market: Having been a supplier to Central Europe after the completion of the Brotherhood pipeline in 1967, the former Soviet Union at this time started delivery of its Wolga-Ural-gas to Western Europe through the completion of the Transgaz Pipeline through Czechoslovakia.[18]

In the 1980s the development of the European gas market showed a continuing growth in demand, which required the extension in existing import capacities: Algeria enlarged its LNG capacities in order to supply more import terminals, which were build in Belgium, France and Spain. In addition the country was linked to the European pipeline-system via the Transmed offshore pipeline.[19] Despite the cold war the Soviet Union emerged as one of Europe's main supplier of natural gas by finalizing projects such as the exploitation of the Western Siberia fields and the further construction of major transmission lines (Progess, Norther-Light-Extension, etc.).[20]

During the 1990s the last remaining EU-members (except for Malta and Cyprus) Ireland, Portugal and Greece were connected to the European gas-grid. Therefore – and due to the general increase in demand – a growing need to build new transport capacities evolved. Mainly Algeria and Norway secured their dominant position as supplier through the construction of additional pipelines (Transmed extension, Maghreb-Europe, Zeepipe, Europipe I, Norfra).[21].

The release of the EU-gas directive in the year 1998 marks a corner stone in the development of the natural gas market. Although the following political process mainly dealt with market structures and liberalization the next years showed also important changes on the supply side. They were significantly driven by growing ambitions to diversify import sources in most European countries. As a result more remote countries such as Trinidad & Tobago, Nigeria, Qatar, Oman, the UAE (all via LNG) and Iran

(via Pipeline to Turkey) started exporting to Europe. [22]

Despite these new market entrances the major volumes were still supplied from the established exporters Algeria, Russia and Norway. Consequently additions to the transport capacities from these countries were completed in the past years, e.g. the Yamal-Europe and the Europipe II. Parallel to these pipeline projects also LNG re-gasification capacities were enlarged by projects in Greece, Portugal and Spain. The construction of the Bacton-Zeebrugge Interconnector in 1998 turned UK to the third EU-net-exporter (beside the Netherlands and Denmark) of natural gas, although this position will only last for a short time given the declining UK production.[23]

B. Development of the European Gas Demand

Being the second largest energy consumer in the world with a 16.3% share, following the USA, the European Union currently imports 50% of its energy need. This rate is expected to rise to 70% by 2030.[24] The share of natural gas in EU energy consumption is 24%[25]. The natural gas demand of the European Union has increased by 95% in the last 25 years from 291 billion m^3 (1985) to 568 billion m^3 (2008). In the coming years, due to the use of natural gas in heating, industry and electricity production facilities[26] it is expected to be most rapidly growing energy source in Europe.[27] The estimates indicate that the natural gas demand in Europe will increase by 1.6% per year to 692 billion m^3 by 2020.[28] The estimates vary for different institutions. For instance, according to the scenario drawn up by European Commission DG Transport and Energy, while the gas demand of the European Union, Switzerland and Balkan countries was 221 billion m^3 in 2000, it is expected to rise to 472 billion m^3 by 2030 in the lowest scenario and to 652 billion m^3 in the main scenario.[29]

Table below[30] provides the natural gas estimates of European countries, including Turkey, for the years 2015 and 2020. In this table, the average scenario indicates that the total gas consumption in 2020 is estimated to be 700.4 billion m^3.

C. European Natural Gas Imports

1. Dependence of European Natural Gas Supply on Imports

Today, the countries in Europe producing natural gas are Denmark, Norway, Holland and United Kingdom. Although some other countries such as Germany, Romania and Italy also engage in natural gas production, the low levels of natural gas production in these countries allows the natural gas produced only to be used in their domestic consumption.[31]

Around 44% of Europe's gas need is met from outside the region. In this respect, 42% of EU's gas import is made from Russia.[32] Russia is followed by Norway with 24%, Algeria with 18% and other countries that largely export LNG with 14%.[33] Particularly the LNG imported by Spain and France is procured from Qatar, Algeria, Nigeria, Trinidad/Tobago, Egypt, Oman, Libya and Norway.[34]

As of January 1, 2009, the proved natural gas reserves of Europe are estimated to be around 6077 billion m^3.[35] This amount corresponds to 2.8% of the world reserves. Under current production rates, Europe has 19 years of reserve life.[36] Information about gas sources regarding Europe indicate that the local gas production in Europe will decrease as of 2010. Although there are debates about the pace of this decrease, as the EU and the IEA[37] both agree, the failure of the development of additional gas fields will increase the import dependence.[38] The dependence on imports in energy (oil and natural gas) is expected to be at circa 66%. There might be a 15 % increase in Europe's total energy consumption. It is estimated that by 2030, EU's total oil production will decrease to %73 and natural gas production will decrease to %59. However it is expected that EU's dependence

European Gas Demand

	Consumption (bcm)				Growth rate (%/year)			
	2006	**2007**	**2015 Aver**	**2020 Aver**	**2007-2015**	**2006-2015**	**2007-2020**	**2006-2020**
United Kingdom	90.7	91.0	104.0	107.0	1.7%	1.5%	1.3%	1.2%
Production Pipeline Import LNG Import	79.8 7.3 3.6	72.3 17.3 1.5	28.0 52.0 24.0	15.0 64.0 25.5	-11.25% 14.7% 41.9%	-11.0% 24.4% 23.5%	-11.4% 10.6% 24.6%	-11.3% 16.8% 15.0%
Germany	93	84.0	89.0	92.0	0.7%	-0.5%	0.7%	-0.1%
Production Pipeline Import LNG Import	16.5 79.8	15.1 68.9	9.2 79.8	6.2 83.8 2.0	-6.0% 1.9%	-6.3% 0.5%	-6.6% 1.5%	-6.8% 0.7%
Italy	87.8	83.5	95.0	102.0	1.6%	0.9%	1.5%	1.1%
Production Pipeline Import LNG Import	10.8 73.9 3.1	9.7 71.3 2.5	4.2 80.8 10.0	0.0 90.0 12.0	-9.9% 1.4% 19.3%	-10.0% 1.0% 13.9%	1.7% 13.1%	1.4% 10.2%
France	50	46.7	54.0	56.0	1.8%	0.9%	1.4%	0.8%
Production Pipeline Import LNG Import	1.2 34.9 13.9	1.1 32.7 12.9	34.0 20.0	33.7 22.3	%0.5 5.6%	-0.3% 4.1%	0.2% 4.3%	-0.2% 3.4%
Spain					%	%	%	%
Pipeline Import LNG Import	10.8 24.4	11.0 24.2	18.0 36.0	21.0 37.0	6.3% 5.1%	5.8% 3.3%	5.1% 3.3%	4.9% 3.0%
Other 27 EU Countries	163.2	154.9	202.5	209.1	3.3%	2.4%	2.3%	1.8%
Production Pipeline Import LNG Import	212 256.5 51.7	197.1 251.4 47.4	131.0 356.4 111.2	80.0 417.0 127.5	-5.0% 4.5% 11.1%	-5.2% 4.5 % 8.9%	-6.7% 4.0% 7.8%	-6.7% 3.5% 6.7%
TOTAL 27 EU COUNTRIES	520.2	495.3	598.5	624.5	2.4%	1.6%	1.8%	1.3%
Production Pipeline Import LNG Import	212 256.5 51.7	197.1 251.4 47.4	131.0 356.4 111.2	80.0 417.0 127.5	-0.5% 4.5% 11.1%	-5.2% 3.7% 8.9%	-6.7% 4.0% 7.8%	-6.7% 3.5% 6.7%
Turkey	31.7	36.5	62.0	66.0	7.1%	7.7%	4.8%	5.4%
Production Pipeline Import LNG Import	0.7 25.3 5.7	0.3 30.6 5.6	55.0 7.0	59.8 6.2	10.1% 9.0%	9.0% 2.3%	6.8% 0.2%	6.3% 0.6%
Switzerland, Central European Countries	8.6	8.2	9.5	9.9	1.9%	1.1%	1.5%	1.0%
Production Pipeline Import	1.8 6.8	1.8 6.4	1.3 8.2	0.9 9.0	-4.0% 3.1%	-3.6% 2.1%	-5.2% 2.7%	-4.8% 2.0%
TOTAL	**560.5**	**540.0**	**670.0**	**700.4**	**2.7%**	**2.0%**	**2.0%**	**1.6%**

on oil imports will reach %94 and dependence on natural gas imports will reach %84 in year 2030.[39] Even the development of alternative energy sources are taken into account, rising consumption and sinking production increases the Europe's dependency on natural gas imports.

2. Problems Regarding Natural Gas Imports

The dependence of Europe on imports is a cause for concern due to the interruptions of gas supply in three out of the last four winters. In January 2006, Russian Gazprom ceased the gas flow to Ukraine due to natural gas price, transit charges and the unpaid debts. The three-day long interruption ended with the compromise of the parties. In January 2008, upon the cessation of gas flow from Turkmenistan Iran, Iran suspended the gas export to Turkey in order to compensate for the lost gas inflow. Turkey suspended the gas export to Greece for the same reason. Eventually, Gazprom increased the gas export to Turkey.[40]

On January 1, 2009, Russia decreased the gas delivery at the Ukraine border, due to disagreements with Ukraine, but continued the gas supply to the distributors through Ukraine. On January 7, all gas exports through Ukraine were stopped. Although the main reasons of disagreement were the same as in 2006, the end of the gas flow cessation was made possible at the end of three weeks, rather than three days as in 2006. Russia and Ukraine blamed each other for the cessation of gas flow through the pipeline. The gas flow resumed only after January 20, when Russia and Ukraine reached an agreement about the price and pipeline transit charges[41].

Despite the political problems between Morocco and Algeria over Western Sahara and the major disagreements over the transit price, there has been no cessation in the gas flow from Algeria to Europe yet.[42] Thus, the main problem about the gas flow to Europe stems from the gas flowing through Russian pipelines. In this respect, it should be noted that the majority of the pipelines carrying gas from Russia to Europe were constructed in the Soviet era, when there were no borders at the Eastern bloc. With the end of the Cold War, problems emerged among the former Soviet countries in the Soviet pipeline system, due to the lack of transparency in the access conditions of export capacity, the lack of clear criteria for the regulation of transit charges and the increasing gas debts. The continuation of the conflict between Russia and former Soviet countries threaten the gas supply security for Europe. Around 90% of the gas exports of Russia to Europe pass through Ukraine and Belarus before reaching the EU borders. The 2004 gas conflict between Russia and Belarus, the 2006 and 2009 conflicts over gas price with Ukraine and other conflicts with other countries in 1990s indicate Europe's vulnerability to the problems in Eastern European transit countries. Although the transit risks tend to decrease as the EU borders expand, being located at the end of the pipeline crossing through many countries constitute a constant uncertainty factor for European gas importers.[43]

Apart from these, the concerns about the monopoly of Russia in transit carrying of Central Asian and Caspian gas are mounting. Having the network enabling the transportation of Central Asian and Caspian gas to Europe, Russia purchases contracted amounts from the countries in this region and sells them again to the European market. Therefore, ensuring the variety of routes particularly to ensure that gas in this region can be carried to the EU from routes other than Russia is important and projects such as Nabucco are developed in this respect.[44]

The interruptions in the gas supply due to the problems experienced between transit countries and Russia, which is one of the main suppliers of the EU, displayed the importance of creating new sources alongside Russia. Although the Union members in the European Union have varying strategies about the estab-

lishment of supply security, the common aspect among them is the clear policy to reduce their increasing dependence on Russia.[45]

On the other hand with Russia's strategy to use energy as a tool in foreign politics EU woke up to the reality that a one sided dependency on Russia in energy supply might cause serious problems in near future. In fact, Russia's credibility as a safe access to energy resources has been damaged seriously in public. Besides political trust, because of its energy politics, Russia is unable to meet EU's constantly increasing energy needs alone despite its important reserves. Production in West Siberia and Yamal, which are important gas production centers, is decreasing. Local consumption is also rising faster than estimated. It is expected that Russia's local consumption will reach 654 bcm in 2030. Russia is required to make new investments in order to meet EU's increased energy needs. However it is very interesting that Russian natural gas giant Gazprom made comparatively less research and development in the last 15 years. In this context it is expected that unless new investments made, amount of Gazprom's exports to the EU will fall. Taking into consideration the increase of demand in the EU, it is clear that even the amount of Russia's exports does not fall; Russia's share among countries exporting gas to the EU is most likely to decrease.[46]

As a last point it should be noted that, EU's import dependency on natural gas should not be considered only a matter of access to source countries and uninterrupted gas flow. Increase in demand of transit countries, which are located closely to the EU makes a projection of those countries with their demand and consumption increases indispensable, as well as the need to reach agreements with producer countries within this context and also to cooperate with transit countries.

D. EU's Natural Gas Supply Projects

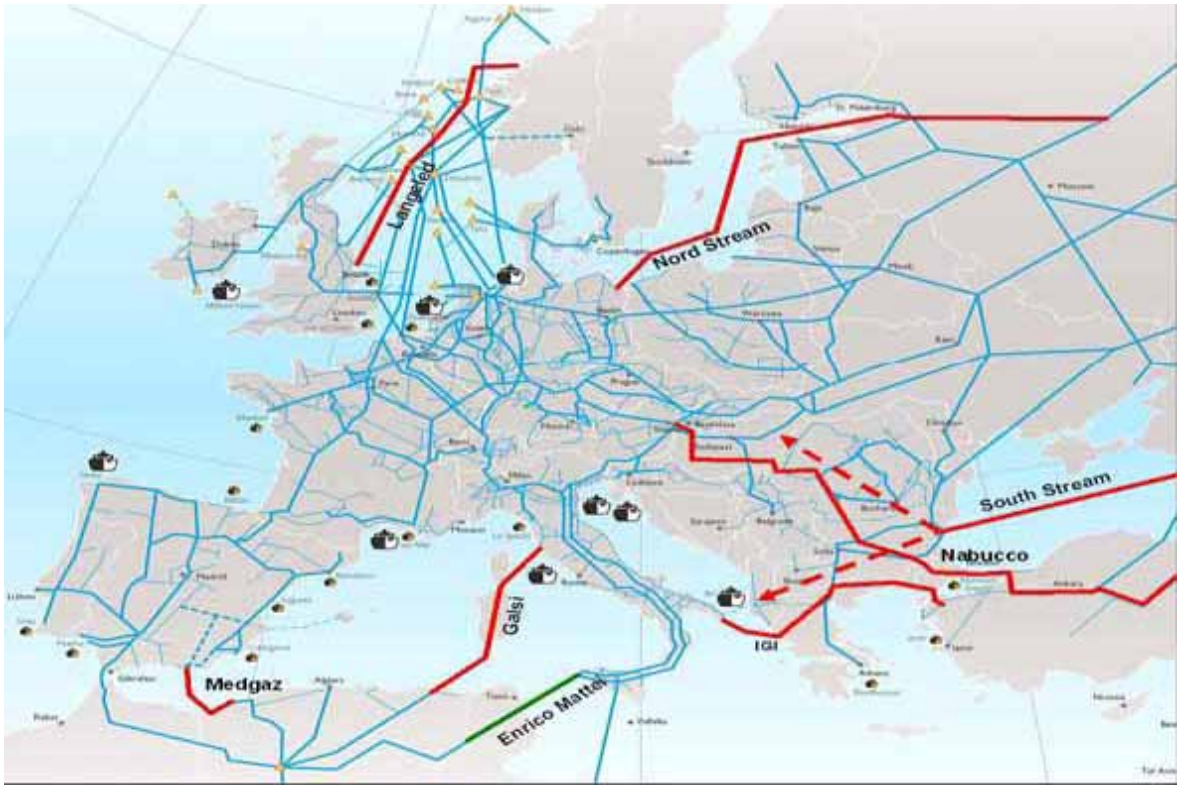
As mentioned above, the development of projects to increase the diversification of sources and routes is of uttermost importance for European gas supply security. In fact, around Europe, there is sufficient gas to maintain supply security until 2030. However, the main problem is about the development of investments and infrastructure that will enable the transportation of such gas to Europe.

The European Union wants the exploitation and procurement of rich energy resources[47] located in the Central Asian and Caspian region to ensure higher resource diversity. In this respect, the main aim is the signing of natural gas purchase contracts with Azerbaijan, Turkmenistan, Iraq and other neighboring countries in order for the gas of these countries to be transported to the EU. In the long term, provided that political conditions are fulfilled, sources such as Iran and Uzbekistan are expected to supply gas in this respect.[48]

It is aimed that the gas procured from main suppliers such as Russia and Algeria and other new sources will reach the EU through different routes and the problems in transit countries will be avoided or minimalized. In this regard, there are efforts to realize pipeline and LNG liquefaction and gasification facilities, to ensure the variety of routes. Although there are a number of LNG and pipeline projects today, these projects are on hold due to the lack of appropriate conditions in view of exploration and production investments.[49]

The projects developed to increase the diversification of sources and routes to supply natural gas to the EU will be mentioned below.

Pipeline Projects for Gas Imported to Europe, 2008



1. Pipeline Projects

The problems that were experienced with Ukraine in 2006 and 2009 indicated the importance of pipeline routes excluding Ukraine for the Russian gas and directed Europe to search for new routes. In this respect, the European Union is running the **Nord Stream Pipeline Project**, which excludes Ukraine in the north and Belarus in the south. With this project, the Russian gas will pass through the pipeline in the Baltic Sea and reach Europe through Germany. The pipeline will have an annual 55 billion m^3 gas procurement capacity and is expected to start operation before 2015.[50]

Among the projects aiming to carry the Central Asian and Caspian gas sources to Europe in a line referred to as the Southern Gas Corridor, the South Stream and Nabucco Projects are particularly important. While the South Stream Project is including the plans of a pipeline that has an annual 63 billion m^3 procurement capacity reaching Europe through the Black Sea, the **Nabucco Project** includes the plans of a pipeline that has an annual 31 billion m^3 capacity reaching the EU through Turkey. Both projects mainly target Azerbaijan and Turkmenistan gas resources. Therefore, although it is usually claimed that these two projects compete with each other[51], significant steps are taken towards the realization of both projects.[52]

Another pipeline project run by the European Union is the **Trans-Adriatic Pipeline** (TAP). In this project, Iran and Azerbaijan's gas will be procured through a pipeline passing from Greece and Albania to reach the Puglia region in Italy and, later, to Northern Europe. The pipeline is expected to have a 10 billion m^3 capacity and is planned to start operation after 2012.[53]

Turkey-Greece-Italy Pipeline Project aims the extension of the current pipeline between Turkey and Greece to reach Italy. Within the frameworks of the **Medgaz Project** a 210 km.

long sub-marine pipeline is to be constructed between Algeria and Spain to procure gas. The pipeline is designed with 8 billion m^3 capacity and is planned to start operation by mid-2010[54]. Aiming to carry Algeria's gas to the EU, **GALSI** project aims to build a 9 billion m^3 capacity pipeline that starts from Algeria to reach the Sardinia region in Italy. The operation of the pipeline is planned to start after 2015.

The project aiming to carry Norway's gas to Switzerland and Denmark is called the **Skanled Project**. The capacity of the pipeline accounts for 8.75 billion m^3 according to pre-estimations. However, due to economic recession, the project partners decided to postpone the project.[55]

2. LNG Projects

The LNG import in Europe is expected to be 99 billion m^3 in 2010, 220 billion m^3 in 2020, 254 billion m^3 in 2030. In other words, the European LNG trade is expected to increase from around 25-27% to 35%. Due to the increase in the LNG demand, Europe has been planning many gasification facilities with low, medium and high capacities. In the following page the table shows the LNG gasification facilities planned to be constructed in Europe.[56]

E. Interim Conclusion

As illustrated above, the development of the European gas market has always been shaped by the increasing gas demand. As the demand increased, new pipeline routes and new LNG facilities were constructed for the procurement of gas from the existing sources of supply and the entering of new supply sources into the market was enabled.

As an increased demand in gas coincides with a decreased production, Europe's import dependency culminates and causes supply security concerns. In view of gas consumption estimation figures and future projects it can be said that a pipeline that transports natural gas from Qatar to Europe would make significant contributions to EU's supply security as it considerably allays the dependency problem.

As a matter of fact, past-time experience proved the fact that although new pipeline and LNG projects are designed in order to reduce the problems arising out of import dependency and to provide supply security, these projects cannot always be realized. For this reason each project aimed at the supply of natural gas to the European Union must be analyzed carefully.

III. QATAR'S NATURAL GAS SUPPLY

A. Qatar Natural Gas Production and Consumption

Located at the center of the Persian Gulf, Qatar is the country with the third largest natural gas reserves, after Russia and Iran. The proved natural gas reserves of Qatar are around 25.25 trillion m^3 as of January 1, 2009.[57] Qatar has almost 15% of the world's natural gas reserves. The majority of Qatar's natural gas is located at the North Field, which is an enormous sea field. The North Field is defined as the region with the largest non-associated gas reservoirs in the world.[58] The region is located at the sea border between Iran and Qatar and while the part in the Iranian territory is called South Persian, the part that is actually in the south and in the Qatar territory is called the North Field.[59] 62% of the reserves in this region are estimated to be at Qatar's territories, while 38% belongs to Iran.

The natural gas reservoirs in Qatar were first found in 1971 during the oil search studies conducted by Shell in the North West Dome.[60] Natural gas production could only be started in 1990s. The most important reason for the delay in the production of natural gas was that for the newly independent Qatar Emirate, oil was the priority. As a result of the decreases in the

		Capacity Bcm /year	Start Date	Operator
Spain	Barcelona	1.65 - 1.95 Mm3/s	2010	Enagas
	Huelva	1.35 – 1.65 Mm3/s	2015	Enagas
	Reganosa	0.4 – 0.8 1.35 Mm3/s	2013	Reganosa
	Bilbao	0.8 - 1.2 Mm3/s	2012	Bahia de Bizkaia Gas, SL
	El Musel	0.8 Mm3/s	2011	Enagas
Canary Islands	Las Palmas de Gran Canaries	0.15 Mm3/s	2012	Endesa / Cepsa
	Santa Cruz de Tenerife	0.15 Mm3/s	2011	Endesa / Cepsa
France	Le Havre- Antifer	8,0	2012	Gaz de Normande
	Dunklrk	6 – 12	2012	EdF
	Pegaz	6 – 9	2013	4Gas
	Montoir de Britagne	10.5 - 12.5	2010	GRT Gas
	Montoir de Britagne	12.5 - 16.5	2013	GRT Gas
	Fos sur Mer (Marseilles)	8,0	2015	Shell Energy Europe
Germany	Wilhemshafen	5,3	2010	RWE Gas Midstream / Excekerate
	Wilhemshafen	10,0	2011	Energy / Nord – West Ölleitung
United Kingdom	Grain LNG III	7,0	2010/11	Transco
	Teesside	20,0		ConocoPhillips and associates
	Carwey LNG	5.4		Callor / LNG Japan / Osaka Gas
	Fleetwood	15,0	2010+	Canatxx Club
	South Hook I Midford Haven	10.5	Completed	Qatar Petroleum - Exon Mobil - Total
	South Hook II Midford Haven	10.5	Completed	Qatar Petroleum - Exon Mobil - Total
Italy	Livorno		2011	OLT Toscana / Endesa – Amgal
	Roslgnano (Toscano)	8,0		Edison Spa
	Giola Tauro (Calabria)	12,0		LNG MedGas Terminal
	Trieste – Zaule	8,0	2012	Gas Natural Internacional
	Ravenna (Emilla Rovagna)	8,0		Atlas LNG
	Porto Empedocle (Sicilia)	8,0	2011	Ionia Gas SRL
	Melili Sicilia	8 (phase1) 12 (phase 2)		Gaz de France
	Civitavecchia (Lazio)	12,0		Covagnia del Gas di Civitavecchia Srl
	Brindisi (Puglia)	8,0		Brindisi LNG (%100 British Gas)
Holland	Gate (Rotterdam)	12,0	2011	Gasunle &Vopak, Essent, DONG / OMV, EON Ruhrgas
	Lion Gas LNG (Rotterdam)	9,0	2011	4 Gas,EnBW
	On the sea 40 km far from Rotterdam		2010	TAQA Energy B.V.
	Eernshaven	40522,0	2012	Essent /Gasunie / Vopak
Poland	Swinoujscie port	38474,0	2012	Polskie LNG
Ireland	Shannan Estuary	4,0	2012	Shannon LNG (Hess LNG Lt / Poten & Partners)

oil revenues in 1980s, the natural gas started to gain importance.[61]

In 2008, the natural gas production in Qatar was around 76 billion m^3. This rate is around five times more than the rate in 1995. Of this amount, 20 billion m^3 was used in local consumption and the remaining 56 billion m^3 was exported. 70% of the exported amount was exported through LNG and the remaining amount was exported through pipelines. With regards to LNG, 12.03 billion m^3 natural gas was exported to South Korea, 11.32 billion m^3 to Japan, 8.4 billion m^3 to India, 4.6 billion m^3 to Spain and 0.8 billion m^3 to the USA. The remaining gas exported was sent to the United Arab Emirates through Dolphin pipeline.[62]

Considering that Qatar's current and potential projects are in operation in 2005 and will continue for 25 years, the following table occurs.[63]

B. Transportation of Qatar Gas to International Markets

Qatar General Petroleum Corporation (QGPC) initiated a three-phased project in the years when natural gas production started. According to this project, the first phase was planned to *improve the natural gas production to meet the local consumption needs*; the second phase was planned *to construct pipelines to export gas to neighboring countries such as Dubai, Bahrain, Saudi Arabia and Kuwait*; and the third phase was planned to *construct a liquefaction facility for LNG exportation*.

With regards to the first phase, the works to improve the North Western Region, which was planned for 1990, were delayed particularly due to Iraq's invasion of Kuwait; the project could only be realized in 1991. A large portion of the produced gas was used in local electric-

Sphere of Use for Gas	Daily Volume (BCFD[64,65], TCF[66])	Volume of Use for 25 Years	Proportion to Total Reserves
Local Consumption	2.0 BCFD	18.3 TCF [518 bcm]	(2.0 %)
LNG Projects	6.0 BCFD	54.8 TCF [1551 bcm]	(6.1 %)
Pipeline Projects	4.6 BCFD	42.0 TCF [1189 bcm]	(4.7 %)
GTL Projects	2.0 BCFD	18.3 TCF [518 bcm]	(2.0 %)
Total	14.6 BCFD	133.4 TCF [3777 bcm]	(14.8 %)
Remaining	27.2 BCFD	766.6 TCF [21707 bcm]	(85.2 %)

This table shows that Qatar's natural gas reserves will be sufficient for at least 100 years.[67] The magnitude of natural gas reserves means that Qatar can be a source for other LNG and pipeline projects as well. As can be seen from the recent projects developed by Qatar, Qatar considers Europe as an important market for natural gas exportation. In the following section, Qatar's natural gas exportation projects and the progress about these projects will be explained.

ity plants and industrial facilities and some of the gas was injected to the Khuff reserves in Dukhan oil field.

1. LNG

Although the LNG exportation was initially a project which was designed to be developed after the construction of regional pipelines, the developments led to the development of LNG export instead of pipelines. Regarding

the second phase, pipelines were planned to be constructed to carry an annual 10 billion m^3 natural gas to the east and an annual 16.5 billion m^3 to the west. This pipeline project was brought up in GCC[68], which is a forum bringing the countries that will be connected with the line together, in November 1989 and was called the GCC Pipeline Project.[69] Extension of the GCC Pipeline Project to Pakistan and India under the name Gulf-South Asian Pipeline was also discussed at some point.[70]

The GCC Project met many obstacles mainly because of the border conflicts between Qatar and neighboring GCC countries and the bilateral political disagreements. Moreover, the discovery of significant gas reserves in 1990 on its territories, made Saudi Arabia act rather reluctant to allow transit flow for the pipelines to cross from its country.[71] The next year, Kuwait was invaded by Iraq and Dubai did not want to make large amounts of payment for the gas to be injected to increase the oil production. Abu Dhabi, which wanted to sell gas to Dubai, did not regard an underwater project that will cross from its waters to Dubai favorably. Bahrain, which had low gas demand contrary to the estimates, withdrew from the project due to the border conflicts with Qatar over Havar Islands.[72]

Moreover, in the same period, two separate pipeline projects were developed. Among these projects, the project, which was aimed to carry gas from Doha to Karachi being politically very significant with 1600 kilometers length, could not be realized.[73] The plans to carry natural gas first to Israel and then to Southern Europe met political obstacles for the associations made between the project and the Arab-Israeli peace.

Such political obstacles caused the acceleration of efforts for the transportation of Qatar gas as LNG, which does not require transit flow from GCC countries.[74] In fact, although Japan, which is one of the largest buyers in the world, had wanted to purchase LNG from Qatar in 1980s, later on it approached the Qatar LNG project with hesitation because of the lack of security in the region due to the war between Iran and Iraq in this period and the sinking of many LNG sea craft.[75] Also with the effect of economic depression in the country, Japan opted for Australia North West Shelf instead of Qatar. But despite all these obstacles, Chubu Electric from Japan and Qatar signed a 25-year

Qatar LNG Infrastructure, November 2009			
Unit	Liquefication Capacity	Start of Operation	Main Market(s)
RasGas Facilities			
Train 1&2	2 x 3.2 MMt ()	August 1999	South Korea
Train 3	4.7 MMt ()	February 2004	India
Train 4	4.7 MMt ()	August 2005	Europe
Train 5	4.7 MMt ()	March 2007	Europe & Asia
Train 6	7.8 MMt ()	October 2009	China
Train 7	7.8 MMt ()	2010	China
QatarGas Facilities			
Train 1&3	3x 3.2 MMt	December 1996	Japan & Spain
Train 4	7.8 MMt ()	April 2009	UK
Train 5	7.8 MMt ()	September 2009	UK
Train 6	7.8 MMt ()	2010	US
Train 7	7.8 MMt ()	2011	China & North America

Source: EIA

contract in 1992, which took effect in 1997. The fact that Mobil took part in the project, instead of BP, which has withdrawn from Qatargas in 1992 putting the realization of the project in jeopardy, reassured all the investors about both the country's and the project's reliability. Mobil played an important role for the project to become a competing project in the international arena. Qatargas was a project participated by QGPC, Mobil, Total, Marubeni and Mitsui companies and the American, French and Japanese interests were reflected.

North Field gas field made Qatar both a large gas exporter in the region and a major international player with LNG transportation.[76] Qatar LNG sector is run by Qatar LNG Company (Qatargas) and Ras Laffan LNG Company (Rasgas), respectively. These companies have a total annual 76 billion m^3 liquefication capacity with 11 liquefication facilities (train). RasGas Train 7 and QatarGas Train 6&7 are expected to start operation in 2010 and 2011. Thus, the annual liquefication capacity is planned to reach 106 billion m^3 with a total 14 liquefication facilities.

Qatar generally supplies natural gas to South Korea, Japan, India, Spain and the USA,[77] with 20 to 25 years long term sale contracts[78]. With the start of operations in Qatar Gas Train 4 and 5, United Kingdom will become a country buying natural gas from Qatar. This shows that Qatar is spending effort to increase its terminals to sell natural gas to Europe.

Focusing its energy policies mostly on LNG trade, Qatar is also trying to create an LNG spot market.[79] To this aim, the establishment of the International Mercantile Exchange (IMEX) is planned under the supervision of Qatar Finance Center Regulation Agency.[80] For Qatar, LNG transportation helped to overcome the geopolitical uncertainties particularly stemming from the dependence on neighboring transit countries.[81]

2. Pipelines

a. Regional Pipelines: *Dolphin* and *Al-Khaleej* (*EGU)* Projects

Today, the only project that allows Qatar gas to be carried through pipelines is the *Dolphin Project*.[82] The project envisages the transportation of Qatar gas to the United Arab Emirates and Oman through pipelines. The company entitled Dolphin Energy is entitled to carry North Field natural gas to Abu Dhabi and Dubai under the contract signed with Qatar Petroleum for 25 years. Being the first energy line aiming exportation among the Gulf Cooperation Council countries and built as 364 km long under the sea, the line has started the delivery of natural gas. The gas, which was decided to be carried to Oman through a contract with Oman Oil Company, is also planned to be transported to Pakistan.

This project carries a political, more than commercial, meaning for Qatar. With the project, Qatar aims to develop political ties with United Arab Emirates and Oman and develop its power in the region without Saudi Arabia.[83] The start of operation in the Dolphin Project and the first delivery of natural gas to Oman are considered important steps towards the GCC integration.[84]

Al Khaleej (Enhanced Gas Utility-EGU) Project was formed in 2000 by Qatar Petroleum and Exxon-Mobil East Marketing Limited Company.[85] With the 1.2 billion $ worth project, the aim is to develop the North Field initially for local consumption and to carry natural gas to Bahrain and Kuwait through pipeline. The first phase of the project to provide gas for local consumption started operation in 1995.[86] In 2002, Qatar, signed an agreement with Bahrain for 5 - 8 billion m^3 gas transportation and with Kuwait for 10 billion m^3 gas.[87] Kuwait pipeline was shelved due to political disagreements between Saudi Arabia and Qatar. The Bahrain pipeline project is still on hold.[88]

b. Pipelines Targeting the EU

Today, there are no pipelines connecting Qatar to Europe and the Qatar gas is carried to European ports through tankers as LNG. However, EU officials regard pipeline projects to transport natural gas from Qatar to Europe favorably. European Commission Energy and Transportation General Director Ioannis Samouilidis indicated that based on a 2005 feasibility study, such pipeline projects can contribute significantly to EU gas source variety and are possible to be developed.[89] In this respect, EU countries, which want to improve relations with gas producer countries, also attempt to intensify relations with Qatar.[90] Nowadays there is some news on the agenda that a pipeline project is aimed to be realized, which is starting at Qatar and connected to Turkey.[91] The next chapter will explore technical details about such a pipeline and the significance of this line for the parties.

C. Interim Conclusion

The magnitude of natural gas reserves shows that Qatar can support new LNG and pipeline projects in addition to existing LNG and pipeline projects. When Qatar's energy politics analyzed as from the date that it started natural gas activities, it is seen that Qatar has moved towards LNG as a result of neighbor countries' political obstacles for its initiatives for cross border pipelines. However as understood from Qatar's recent projects it regards Europe as an important market.

Having long term gas supply contracts with EU countries gained importance for Qatar as a result of the USA's intensive shale gas investments. In near future LNG sales to USA will not be possible and EU customers seem more reliable.

A pipeline from Qatar to Europe is helpful for providing demand security for Qatar and also compulsory when taken into consideration the world LNG markets progress.

IV. QATAR-TURKEY PIPELINE PROJECT

Qatar's and Europe's interests reveal that a pipeline between Europe and Qatar can be developed. But is it possible that this pipeline can be built on a route crossing Turkey? This chapter will examine this question.

A. Potential Qatar - Turkey Pipeline (A Route Working)

The route illustrated on the map envisages the most economic route for a pipeline to be built between Qatar and Turkey. According to this route Qatar – Turkey Pipeline is planned to start from Ras Laffan in Qatar, pass through Qatar, Bahrain, Saudi Arabia, the neutral zone, Kuwait waters and then finally enters Iraqi waters. Planned to be 550 km long in the sea pillar, the pipeline's depth was calculated as 30 - 40 meters average. However, this depth is calculated to reach 70 meters maximum. Reaching Iraq at the Fao/Basrah point, the pipeline is planned to extend to Haditha along the Strategic pipeline, then to reach Ceyhan following Iraq – Turkey pipeline and then to reach Ankara following a parallel route to Ceyhan – Kırıkkale oil pipeline. The length of the pipeline over the territories is estimated to be 1200 km in Iraq, 650 km in Iraq – Turkey pipeline route and 500 km between Ceyhan and Ankara, having a 2900 km length in total with the sea pillar.

The pipeline is planned to have an initial capacity of 20 billion m^3 annually. However, it is possible to design the capacity alternatively as 30 billion m^3. In the scenario based on 20 billion m^3 capacity, the cost of the sea pillar accounts for 6.3 billion $, the territory pillar 1.6 billion $ amounting up to 8 billion $. Alternatively, in the scenario based on 30 billion m^3 capacity, the cost of the pipeline was calculated as 8 billion $ for the sea pillar, 2.1 billion $ for the territory pillar and a total of 10.1 billion $.

Results obtained after initial route workings, reveals that the project could be realized in economical terms. However because of its cross border nature, political risks should be taken into account in addition to an economical analysis. Below are some evaluations with respect to those political risks.

B. Points to Be Considered in Deciding on the Pipeline Route

Above mentioned pipeline route which is to be built in order to connect Qatari gas to Europe has been designed by taking into account the economical concerns. However the below mentioned political risks should be taken into account by deciding on the pipeline's route.

1. Iraq

a. Basra Area

As being one of the problematic areas of Iraq previously, stability has been provided in Basra for the last two years upon disarmament of militia forces by Maliki. However this stability can come to an end taking into consideration the possibility of the occurrence of new problems between Shiites depending on the political developments in Iraq. This risk should be taken into account in terms of the project.

b. South Province Area

The South Province Area, with a strong Shiite population and relative stable political conditions, is the most problem-free area for the designed route. However it is possible that stability may be threatened in case the current government does not adopt a flexible policy according to current developments. Gulf countries can be reluctant to a pipeline built to be in this area because of Shiites close relationships with Iran. On the other hand Shiites can also be reluctant to the project for Iran not to lose its shares in the natural gas market. In fact Iraq depends on the support of its neighboring countries along the gulf, which have taken different stances towards Iraq in the course of time. On the other hand in case of a successful realization of the project, such a pipeline may also contribute to an increased stability in the region.

c. Hadise Area

However, when we take a glance at the Sunni regions we face severe problems in view of the pipeline project. The designed route reaches to Hadise in Anbar, after crossing Musanna,

Kadisiye, Najaf and Karbala. Located between Hit, where Sunni-Arab resistance started in Iraq and Fallujah, which is the most important stronghold of resistance, this region is a place where Sunni Arab resistance is very strong. Although it seems that security has been provided by USA, which convinced local clans to join Iraqi military forces as half militia organizations, there are still assassinations and bomb attacks. In case the designed pipeline crosses close to the old Iraq pipeline, which is located between the southern border of the Selahattin Province and the western border of the Diyala Province, security of the pipeline may come under an immediate threat.

It should be noted that Al-Qaida is still exalting its influence on the Diyala Province in Iraq. Secondly, existing energy lines are constantly subject to attacks. Thirdly, there might be problems as witnessed in the Province of Anbar, motivated by local clan rivalry.

It is very important for the economy of Iraq and the economic interests of the people that short-term employment opportunities will arise during the construction period. However, it should be kept in mind that this opportunity can be exploited by local clans.

d. Musul-Duhok Area

The most important part of the designed pipeline is the last section. If the pipeline crosses through Musul and Duhok, a debate may flare up. In this region, the Kurdish Government in the North overstep the administrative power granted by the Constitution in order to extend their territories. However, the central government as well as Arabs and Turkmens living in the region are resisting to this policy. In fact, this conflict of interests among different groups is likely to be fueled by the construction of an international pipeline crossing the region. Increasing importance of this region, which might trigger quarrels between Arabs and Kurds may further complicate the problems. It is known that the USA is planning to bring disputes to an end by the establishment of a UN force in the region. Provided that such a UN force is established, security of the pipeline may be ensured. Until a final decision on the pipeline route is made, these developments should be followed up closely.

2. Region Countries

Approaches of the states in the region towards the construction of such a pipeline can vary according to different economical and political observations. Being one of the three most important natural gas resources, Iran, may object to the project. Iran can be reluctant that gas of Sunni country, located at the opposite side of the gulf, is transported via Iraq. Iran may increase its pressure on political parties and legal institutions and the Iraq Government as well.

It is possible that Saudi Arabia may benefit from the project by transporting its associated gas via this pipeline and reach the EU market. However, it is also possible that Saudi Arabia, wishing to be the leader of the Arab world does not like that Qatar becomes an energy giant. In such a case other states, which do not want to damage their relationships with Saudi Arabia will not support the project.

C. Significance of the Project for the Parties

The significance of a pipeline project transporting Qatari gas to Europe via Iraq and Turkey will be discussed below.

1. Significance for the EU

LNG sent from Qatar account for 15% of EU's total gas imports. Sending such a high proportion of gas, Qatar provides a significant benefit for the EU's supply security. However, an increase of the share of LNG in European gas imports may cause a decline in the benefits provided by the variety of supplies.[92] Therefore, a pipeline that will start from Qatar and reach the European Union through Iraq and Turkey will truly ensure the diversification of sources

and routes and thus contribute to the supply security.

Furthermore, the LNG projects are the projects that are the most expensive and the most complicated in terms of technical feasibility compared to other energy projects. European Union's further investments in LNG to meet the total energy demand may cause the payment of higher bills for gas by the EU consumers.[93]
The LNG supply method is a more energy- and greenhouse gas-intensive method than the pipelines due to the additional processing of the gas in this method.[94] Gas carried as LNG is in fact a purer gas compared with the gas carried through pipelines. However, this quality of LNG is in fact a source of problem for Europe, because the final consumer facilities were constructed according to the lower quality pipeline gas. For that reason, these facilities need to be adjusted to LNG.

With Qatar - Turkey Pipeline, a new gas source will be ensured for the Nabucco Pipeline Project, which foresees the transportation of Caspian natural gas to Europe. As indicated above, Nabucco and South Stream Projects target the same gas source. Procuring gas from sources other than these sources will ensure a more efficient operation for the Nabucco Project and will serve the supply security in Europe.

2. Significance for Qatar

Qatar is currently an important and successful gas exporter with its current LNG facilities. Although there have been various attempts for pipeline projects in the past, these projects could not be realized for reasons stated above. LNG transportation, compared with pipelines, provides the flexibility to reach different markets in line with daily market conditions, to Qatar.[95] However, because of the variations in LNG prices based on conjectural developments it is difficult for Qatar to maintain the current revenue from LNG exportation, in the future.

Moreover, just like how the diversification of routes is important for EU, the expansion of the European market is important for the sustainability of Qatar gas production. In fact, ensuring the *security of demand*, which has the same meaning with supply security for the source country, is critical for all producer countries, including Qatar. While consumer countries need continuous, uninterrupted, safe and cheap gas supply, producer countries also need to make sales continuously, without interruption, to guarantee a steady income flow.[96] At a time when natural gas is still a preferred energy resource, finding a reliable sale market and transporting natural gas to this market through different routes will naturally and significantly serve the security of demand for natural gas in Qatar.

Researches and investments made by USA for shale gas make such kind of a project more important for Qatar. Shale gas, which is known for a long time but could not be exploited due to technological reasons, is the natural gas that is produced from shale.[97] With the technology developed by USA, hydraulic cracks are composed in the less impermeable shale rocks and natural gas is moved to drilling wells through those cracks.

It is expected that USA invested in natural gas production with shale gas technology, will ensure half of its total gas consumption from shale gas till 2020. It means that imports of USA will fall significantly and Qatari gas and other LNG resources should go to either Europe or Asia.[98] Since Qatari gas already competes[99] with existing regional producers such as Australia, Malaysia and Indonesia, importance of Europe market increases for Qatar.

Decreasing imports of USA will cause that also Canada, which exports to USA, should find new LNG customers[100], which means that Canada can also make LNG exports to Europe. On the other hand, USA can enter world markets as an exporter in near future if gas oversupply occurs as a result of shale gas production.

Probability of the transportation of Canadian and USA gas to world markets via LNG means that a competition with respect to natural gas market may emerge. This competition makes the connection of Qatari gas to Europe via pipeline a sine qua non condition.

Furthermore, with a pipeline to reach from Qatar to Europe, Qatar will have the chance to realize an important pipeline project, linking its resources directly to the EU. With this pipeline, Qatar's relations with Turkey and Europe will be strengthened and the country will get closer to the political spheres of Europe.

3. Significance for Turkey

Turkey, with its crucial position located in the center, provides the most appropriate option for the transportation of energy sources in Central Asia and Middle East to Europe. With the Baku Tbilisi Ceyhan Oil Pipeline Project, which was developed to benefit from Turkey's location and is the first example of transit projects, the Caspian oil is transported to the world markets successfully through the Ceyhan station. With this project, Turkey has proven to be a reliable and stable transit country both in legal terms and with regards to security. The Nabucco pipeline project, developed to carry the Caspian and Middle Eastern natural gas to Europe through Turkey, has made significant progress. This project is planned to start operation in 2014. The project has shows evidence of Turkey's commitment to serve as a transit country. Each pipeline project to be developed in addition to BTC and Nabucco projects will contribute to Turkey's aim of being an active transit country. A pipeline between Qatar and Europe to pass through Turkey is an important step to be taken for Turkey's goal of being a transit country. Turkey will thus take over an important position particularly in the strategic sense. Having a say over the pipeline route has become an important geopolitical matter. As argued by *Vinagradov*, whoever owns the pipeline can either control the flow of hydrocarbons or insist on earning most of the profits from it.[101]

With realizing such kind of a project an important step would be taken in the path of becoming an energy hub. Being an energy hub means that producers bring their gas to Turkey and market therein. In order to establish an energy hub infrastructure investments such as pipelines and storage facilities should be made as soon as possible. Instituting a gas trade center upon establishment of this infrastructure a point will be constituted that sellers and buyers meet. This will provide a real gas to gas competition.

In case of the realization of this pipeline project, Turkey will gain an important advantage in the pipeline competition. Trying to become a base in the energy sector, Israel is also working on oil and pipeline projects passing through its own territories. In case of the realization of Qatar - Turkey pipeline project, Turkey's status in the Middle East will be strengthened through a pipeline that will pass through its own territories, instead of Israel and other neighboring countries.

Moreover, such a project will help the development of political and commercial relations with its neighboring country, Iraq. In addition to these, leadership to such a project will become a source of prestige for the realization of other major projects.

There might be economical vitality in construction and industrial sectors since the project is likely to be realized by Turkish firms, as well as the procurement of expensive materials such as the pipeline itself might be taken over by local companies. The places where the pipeline will pass through will experience more economic activity and the locals will have employment opportunities. Moreover, the tax revenue to be collected from the pipeline or the transit flow charges will provide significant revenue for Turkey in the economic sense. This project will be a part of the initiatives to ensure EU–Turkey

integration and is an inter-dependence project for both the EU and Turkey.

4. Significance for Iraq

A natural gas pipeline project to pass through Iraq will also have important consequences for Iraq. First of all, it will provide economic upswing and create significant employment opportunities. Since a pipeline that will pass through Iraq will also enable the connection of Iraqi natural gas to this pipeline, when the time comes, it will contribute to ensuring the diversification of sources for Europe and to security of demand for Iraq. Thus, new investment costs will be avoided and time will be saved for such a project.

Conclusion

In today's world, energy is considered one of the most important indicators for the increase in welfare and sustainable development. However, the limited nature of energy sources and the continuous increase in energy consumption require that energy producing and exporting countries develop and implement strategies with regards to the production, processing, transportation and delivery of the energy products promptly.

This requirement is illustrated especially for Europe, which has limited energy resources. Recent developments have demonstrated the importance of reliable transit both for oil and natural gas, and displayed the importance of ensuring the diversification of routes to Europe.

The Qatar–Turkey pipeline project can be regarded as a project that can contribute particularly to the diversification of routes for Europe. In fact, Qatar natural gas which has been exported to Europe as LNG in certain volumes is serving the diversification of sources in Europe. But an increase in LNG exports may cause dependence on LNG in an inverse proportion and threaten the supply security.

Qatar–Turkey pipeline project will help to ensure the demand security for Qatar. Considering the fact that Qatar has gas reserves for at least 100 years, it is important for Qatar to reach as many markets as possible at a time when the demand for natural gas is high in the commercial sense. Since decrease in LNG demand in USA will cause competition between LNG exporting countries, importance of a pipeline aiming to reach European markets for Qatar rises,

Project has a vital importance for Turkey in terms of its targets as being a transit country and an energy hub. Since Turkey will be able to get gas from this line, it will contribute to its supply security. Project will enable Iraq to connect its gas to the pipeline when Iraqi gas is ready to be transported and help to provide stability and is also important for Iraq.

Taking into consideration the benefits of the project with respect to European supply security, Qatar's demand security, Turkey's aims regarding being an energy hub and political stability of the region, it is possible to accept that political and social effects of the project will be very high in addition to its economical feasibility.

However regional political risks should be kept in mind. It can be said that there is a certain risk with respect to the transit country Iraq due to the political environment and the ambiguity in the region. In order to eliminate those risks route of the pipeline should be switched to less risky regions and Turkey, USA and EU should assume an active role on the project. Since the final destination of gas is EU, it is unlikely that the cooperation developed between EU and Iraq contributes to stability.

On the other hand, one ought to bear in mind that such kind of a project which includes Gulf States inter alia Iraq, Saudi Arabia and Qatar, will provide a mutual dependency and this dependency will help for the stability of the region.

In this report, evaluations have been made on regard of a pipeline which is to be constructed linking Qatar to Europe. In this context the route most preferably from an economic perspective was taken into consideration. Although this route might be subject to above mentioned political risks, the benefits, which could be achieved if such a project is realized, would outpace those risks. The author finally reaches the conclusion that such risks should not impede the realization of the project. In the next step, new route feasibility studies should be made on this subject, taking into consideration the concepts for the mitigation of regional concerns and political risks, to determine the most convenient route.

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