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Turkey's Role and Priorities in Enhancement of Security of Oil and Gas Supplies

Yusuf Yazar



ABSTRACT

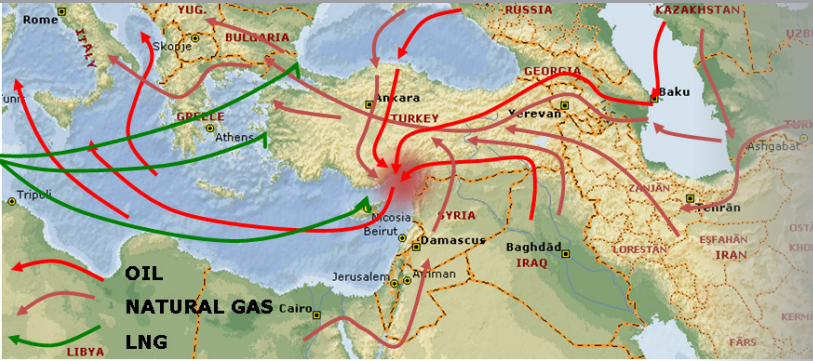
Diversification of imports in terms of sources, routes and technologies has been an important policy tool in order to improve energy security in general. Turkey has already achieved diversification to some extent in its gas supplies, evidenced by the number of pipelines and LNG options.

Geographically located in close proximity to hydrocarbon-rich regions, Turkey forms a natural energy corridor between important source countries and big consumer markets, and stands as a key country in ensuring global energy security through diversification of supply sources and routes.

Within this context, some major pipeline projects have already been realized and some others have been projected. These projects aim to contribute to regional and global energy security while strengthening Turkey's role more as an energy player. It is widely acknowledged that Turkey offers most viable routes for safe and uninterrupted flow of hydrocarbon sources to the world markets.

Strengthening the electricity transmission grid in parallel to the expansion of the generation infrastructure is also an integral part of the Turkish electricity security policy.

Turkey is enthusiastic to playing a driving and constructive role in transportation of the Caspian, Middle Eastern and Central Asian hydrocarbon resources to Europe and World Markets. For this purpose, Turkey displays its readiness for development of new projects which would both contribute to enhancing energy security of its regions and partner countries, and to improving prosperity and peace in a broader region.



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TURKEY'S ROLE AND PRIORITIES IN ENHANCEMENT OF SECURITY OF OIL AND GAS SUPPLIES

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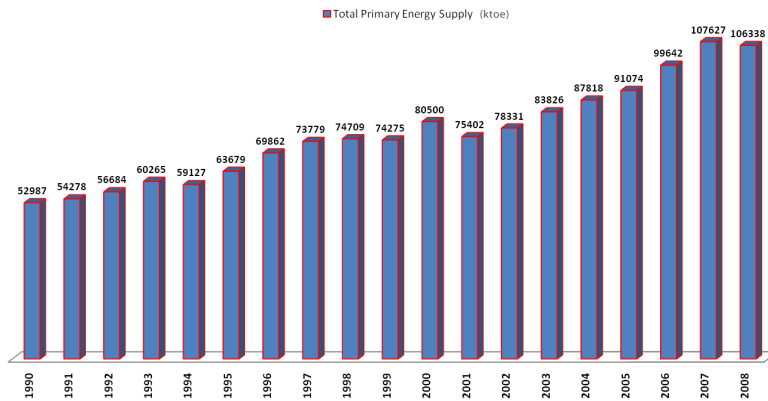
Yusuf Yazar*

Given the growing demand, limited nature of primary energy resources, geographical differences, technological trends and economic impacts, energy security has been an important strategic aspect of a secure, sustainable and competitive energy policy. Long-term energy security is largely linked to timely investments along the supply and demand chain to foster economic and social development. Short-term energy security, on the other hand, is perceived as the ability of an energy system to react promptly to sudden changes in supply and demand. Therefore, energy security has strong ties to energy supply sources, routes, technologies and the investments required in order to mobilize all these.

As far as energy security is concerned from a holistic perspective, integration of the electrical infrastructure and markets among the countries in a certain region becomes equally significant. Harnessing of natural gas in electricity generation cannot be considered independent of energy security issue in general, and natural gas supply security in particular. Therefore, it is also important to highlight that policies of renewable energy and energy efficiency should be associated with the energy security policies.

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Figure 1. Total Primary Energy Supply

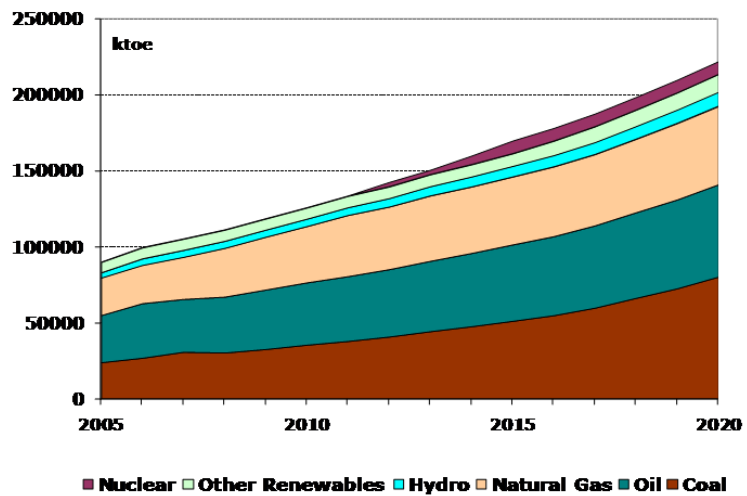


Turkey is one of the fastest growing energy economies of the world. According to the projections of the Turkish Ministry of Energy and Natural Resources, to put roughly, energy demand is expected to double in fifteen years. Therefore, ensuring secure, reliable, affordable and environmentally sustainable energy is the core of the Turkish energy policy that primarily aims to enhance its energy security in support of its growing economy.

Figure 2. A Demand Projection for Primary Energy

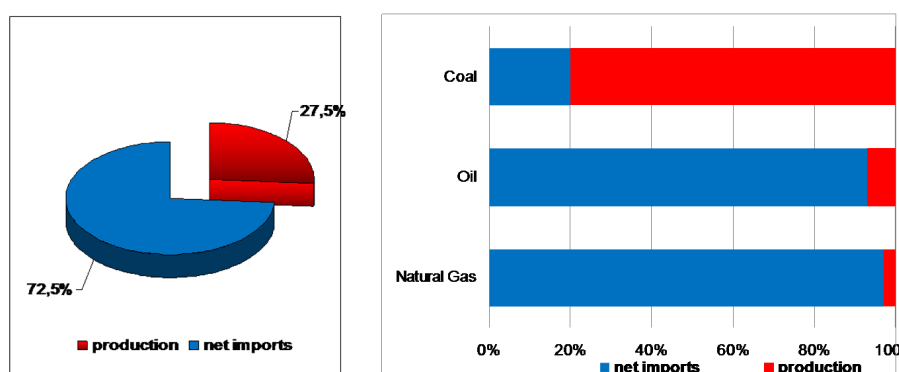
(was publicized in 2005 and to be revised soon)

“Reference Scenario : 110 % increase until 2020”



Nevertheless, despite its growing energy demand, Turkey's primary energy sources are highly limited. As of 2009, around only 24 % of the total energy demand is met by domestic resources while the rest is supplied from a diversified portfolio of imports. Furthermore, natural gas already has a share of one-third in Turkey's total energy consumption.

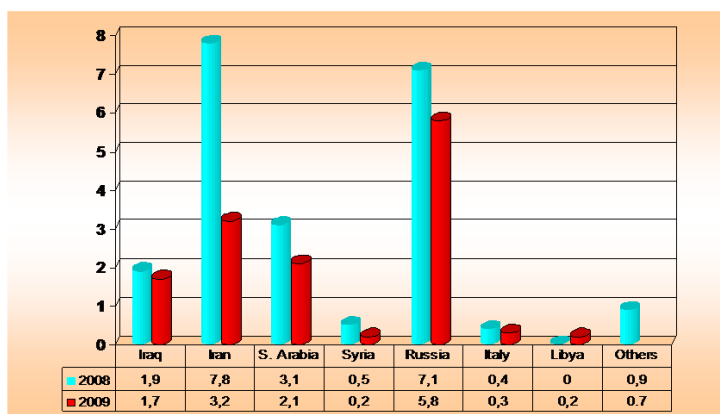
Figure 3. Import Dependency
"Relative Insufficiency of Indigeneous Resources
as compared to the Growing Energy Demand"



Figures are for year 2008.

Diversification of imports in terms of sources, routes and technologies has been an important policy tool in order to achieve and improve Turkey's energy security. Turkey has already achieved diversification to some extent in its gas supplies, evidenced by the number of pipelines and LNG options. However, there is a need for further diversification in terms of source country diversification as nearly 62% of the country's import has been from Russian Federation in recent years.

Figure 4. Diversification of Crude Oil Imports



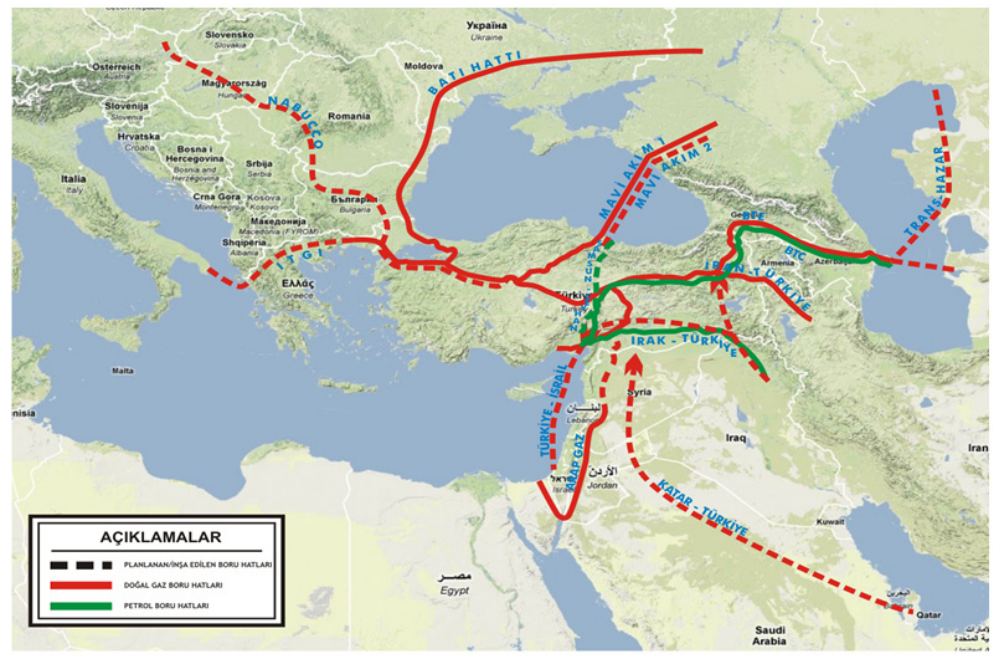
Turkey imported 14,2 Million tones of crude oil in 2009. Crude oil came mainly from Russia (40%), Iran (23%), and S. Arabia (15%)

In recent years, Turkey has also concentrated on increasing the use of indigenous energy resources in a cost-effective manner. It is believed that ensuring larger shares for renewable and nuclear energy in the country's energy mix will create opportunity to diminish the share of natural gas. Hence, energy strategies related with renewable and nuclear energy should also be considered from the perspective of natural gas supply security.

At domestic sphere, Turkey has embarked on an energy strategy targeting comprehensive liberalization and establishment of a competitive energy market with an investor-friendly environment. Since 2001, Electricity, Natural Gas, Petroleum and LPG Market Laws have been enacted to enforce private sector involvement under policy guidance, independent regulation and supervision. However, there are a number of challenges ahead particularly with respect to the competitive natural gas market. To respond to this particular problem, Turkey aims to develop a sound investment environment based on competition, which would also cover the substantial demand growth in its energy sector. In doing so, the primary source of reference would be the EU energy acquis.

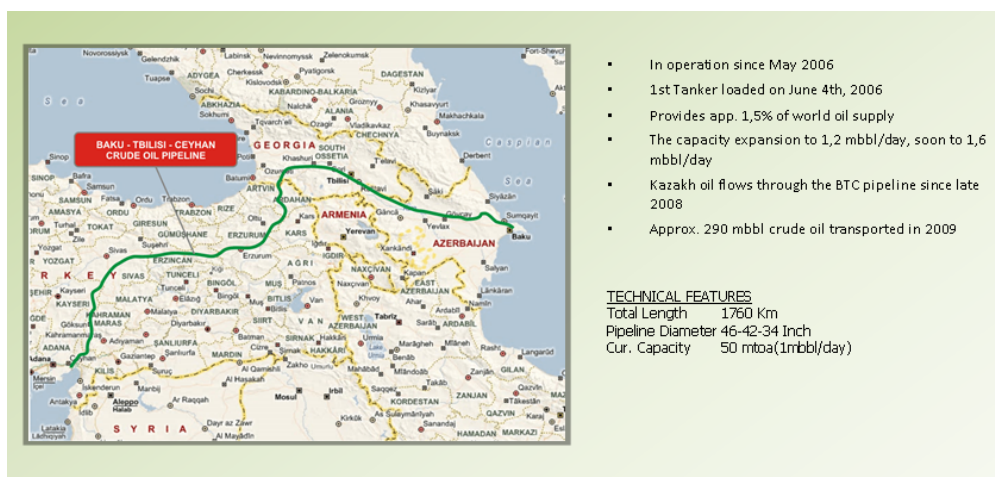
Geographically located in close proximity to around 72 % of the world's proven gas and oil reserves, in particular those in the Middle East, the Caspian basin and the Central Asia, Turkey forms a natural energy corridor between important source countries and big consumer markets, and stands as a key country in ensuring global energy security through diversification of supply sources and routes. Therefore, Turkey attaches great significance in its energy strategy to undertaking an energy corridor role between producer and consumer markets and aims to be an energy trading hub in the region.

Map 1. Oil and Gas Pipeline Projects
"Turkey's role in Energy Security"



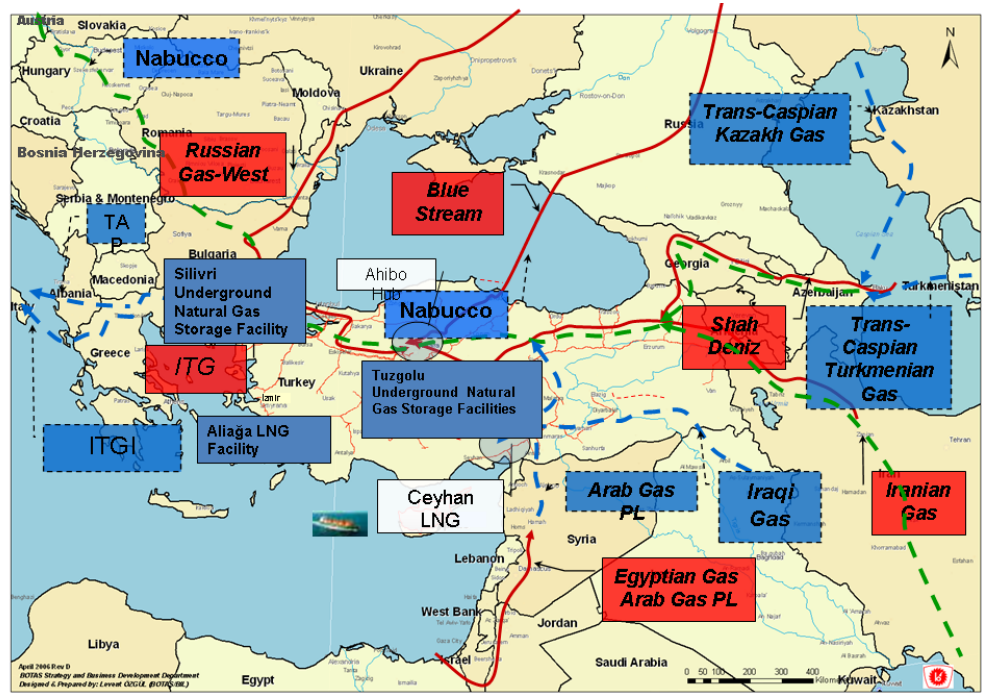
Within this context, some major pipeline projects have already been realized and some others have been projected. These projects aim to contribute to regional and global energy security while strengthening Turkey's role more as an energy player. It is widely acknowledged that Turkey offers most viable routes for safe and uninterrupted flow of hydrocarbon sources to the world markets.

Map 2. Baku-Tbilisi-Ceyhan Crude Oil Pipeline



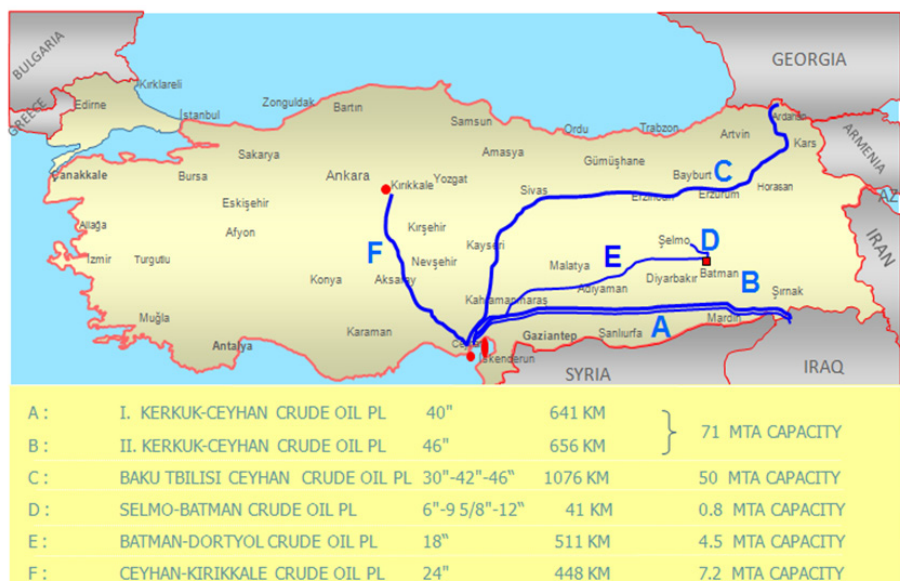
The East-West Energy Corridor concept has been elaborated in cooperation with Turkey's partners and neighbours to help diversify the energy supply routes for the transportation of Caspian hydrocarbon resources to the world markets through safe and alternative routes. Approx. 1800 km long Baku-Tbilisi-Ceyhan (BTC) Crude Oil Pipeline, as the pioneer of the east-west energy corridor, has been in successful operation since May 2006.

Map 3. Turkey as an East-West Energy Corridor

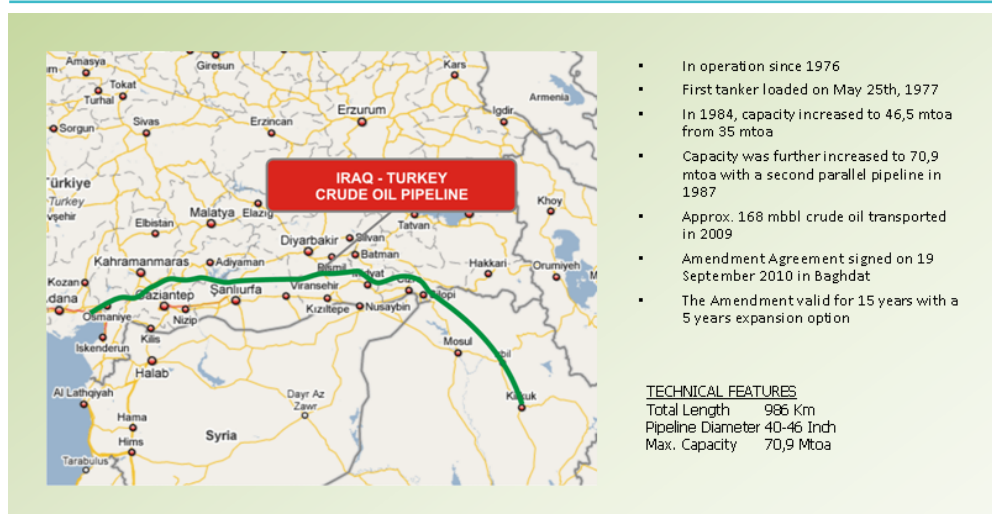


Having started its operations in 1976, the Iraq Turkey Crude Oil Pipeline was followed with the construction of the second parallel pipeline which was finalized in 1987. The total capacity reached annually 70, 9 million tonnes. The expired Agreement has been renewed and extended for 15 years from 2010 on through an Intergovernmental Agreement signed on 19th of Sept. 2010 in Baghdad.

Map 4. Crude Oil Pipelines



Map 5. Kirkuk – Ceyhan Crude Oil Pipeline



As every country in the world, Turkey recognizes the importance of Turkish Straits for global energy supply security because of its unique geographical position, and also respects to related international treaties that regulate the free trade conditions through Turkish Straits. The City of Istanbul, and commerce and industry in and around Istanbul depend on the Istanbul Strait being open to shipping traffic. Some 13 million people live near the Istanbul Strait, and some 40% of Turkey's GDP are generated in Istanbul region. However, the dense shipping traffic that the Straits experience on a daily basis forces us to consider alternative ways for global energy transportation. Recent developments about tanker traffic through Turkish Straits caused apprehension in public. It has been reported that the climax of dangerous goods' transportation via Turkish straits had been reached with the total number of vessels passing through the Istanbul Strait reaching a peak in 2007 with 56,606 vessels. Forecasts show that the estimated total crude oil and other hazardous cargo volume is not declining but rising in time. Almost 20% of the ships carry dangerous goods, petroleum products and crude oil. In addition, non-tanker shipping traffic increases in line with GDP growth of Black Sea littoral states and their export/import volumes. The incremental hydrocarbon exports via the Black Sea have turned the Turkish Straits into a tanker highway, which causes serious concerns. Elimination of these risks by shifting export routes from the Turkish Straits to by-pass crude oil pipelines is Turkey's preference in general. Indeed, increasing traffic volume potential signals the necessity to introduce measures which would mature existing traffic regulations and increase level of standards in terms of environmental security.

Figure 5. Implications for Istanbul Strait Congestion
Annual, Monthly and Daily Average Vessels Statistics

Years	ISTANBUL				ÇANAKKALE			
	# Vessels	# Vessels with hazardous cargo	Monthly Average	Daily Average	# Vessels	# Vessels with hazardous cargo	Monthly Average	Daily Average
1996	49,952	4,248	354	12	36,198	5,658	471	16
1997	50,942	4,303	359	12	36,543	6,043	504	17
1998	49,304	5,142	429	14	38,777	6,546	546	18
1999	47,906	5,504	479	16	40,582	7,266	605	20
2000	48,079	6,093	507	17	41,561	7,529	627	21
2001	42,637	6,516	543	18	39,249	7,064	588	19
2002	47,283	7,427	619	20	42,669	7,637	636	21
2003	46,939	8,107	675	23	42,648	8,114	676	22
2004	54,564	9,399	783	26	48,421	9,016	751	25
2005	54,794	10,027	836	28	49,077	8,813	734	24
2006	54,880	10,153	846	28	48,915	9,567	797	26
2007	56,606	10,054	838	28	49,913	9,271	773	25
2008	54,396	9,303	775	26	48,978	8,752	729	24
2009	51,422	9,299	775	25	49,453	9,567	797	26

The Istanbul Strait
 • Length: 31 km
 • Width: Varies from approx 700m to 1500m at different location
 • The Strait presents exceptional difficulties, as the passing vessels have to change their course 12 times, and in four places by more than 45 degree.

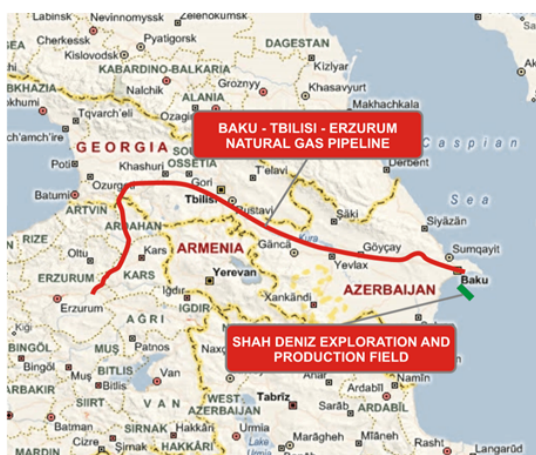
In response to aforementioned concerns with heavy ship traffic on Straits, Ceyhan Terminal on the Mediterranean Coast stands as a major energy terminal in its region and is expected to increase its contribution to the global energy trade by the realization of planned projects. Turkey considers Samsun-Ceyhan route as the most reasonable and preferable route among the emerged purposed routes so far. Turkey and Russia displayed their supports several times for the project at the highest level. In this direction, studies are underway to conclude an Intergovernmental Agreement among the relevant states.

Map 6. Samsun – Ceyhan Crude Oil Pipeline Project



Similarly, the Baku-Tbilisi-Erzurum (BTE) natural gas pipeline project which was designed to deliver Azeri Shah Deniz gas to Turkey has been operative since July 2007. Indeed, it has been completed in parallel to Turkey-Greece gas pipeline project. With this pipeline, transportation of Azeri gas to Greece, namely, to Europe has become possible.

Map 7. Baku – Tbilisi – Erzurum Gas Pipeline



SALE AND PURCHASE AGREEMENT FOR 6,6 bcm OF GAS WAS SIGNED ON 12 MARCH 2001

IN OPERATION SINCE JULY 2007

IN 2008, 4,7 bcm
IN 2009, 4,96 bcm
IMPORTED (TOTAL ~6 bcm)

IN 2014, 2nd PHASE OF SHAH DENIZ WILL BE OPERATIONAL

TECHNICAL FEATURES
Total Length 915 Km
Pipeline Diameter 42 Inch
Max. Capacity 11 bcma

For gas deliveries to Europe via Turkey, two important projects have been undertaken so far. The first project, Turkey-Greece Natural Gas Pipeline, is one of the strategic expansion projects towards Europe which is then planned to be extended up to Italy. The 296 km long Turkey-Greece Interconnector is in operation since November, 2007. In October, 2009, a “Joint Declaration” oriented towards ITGI Project has been signed between Turkey and Italy. Both countries reiterated their political support to the project and companies involved; start-up of the ITGI Project is forecasted as 2016.

Map 8. Turkey – Greece – Italy Gas Pipeline Project

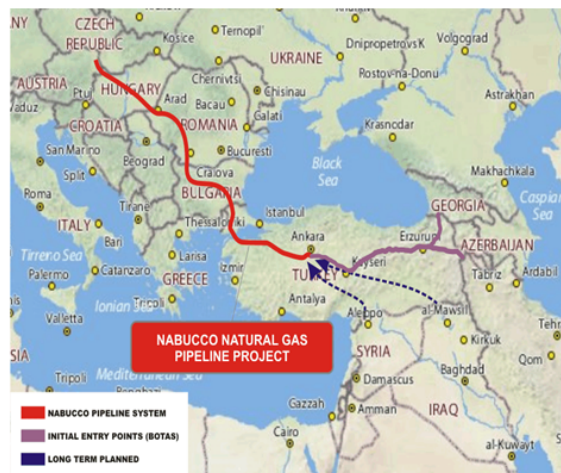


- ON NOVEMBER 18, 2007 GAS SUPPLY STARTED ON ITG
 - Construction completed **late 2007**
 - **Natural Gas Sales and Purchase Agreement** was signed on December 23, 2003 in Ankara, by Botas and Depa. Accordingly, delivery volume by the line will be 750 MCM to DEPA. The line is operational since late 2007.
 - **BOTAS, DEPA and Edison** are in cooperation for the project. Technical feasibility study is completed and studies are ongoing.
 - **IGA signed on the 26th of July 2007 in Rome**
 - Latest MoU signed by Botas, Depa and Edison on the 17th of June 2010

TECHNICAL FEATURES
ITG Length 296 Km
Total Length 808 Km
Pipeline Dia. 36 Inch
Max. Capacity 12 bcma

Studies are well underway among the respective institutions of the countries and the European Commission for realization of the Nabucco Project. The concerned project has great geopolitical significance from the diversification perspective as it will secure access to new gas supplies from new sources through different routes. Shortly, the project has its own merits in terms of commercial and political interests. Having reached an agreement based on the principles of mutual solidarity, mutual equality and interdependence, the Nabucco Intergovernmental Agreement (IGA), signed in Ankara in 2009, entered into force on 1st of August this year. So far, authorized representatives of the Nabucco Gas Pipeline GMBH and partner companies announced their desire to complete the project by the end of 2014, allowing the first gas to flow by that time. However, it so seems that difficulties regarding supply of sufficient amount may affect the proposed schedule.

Map 9. NABUCCO Gas Pipeline Project



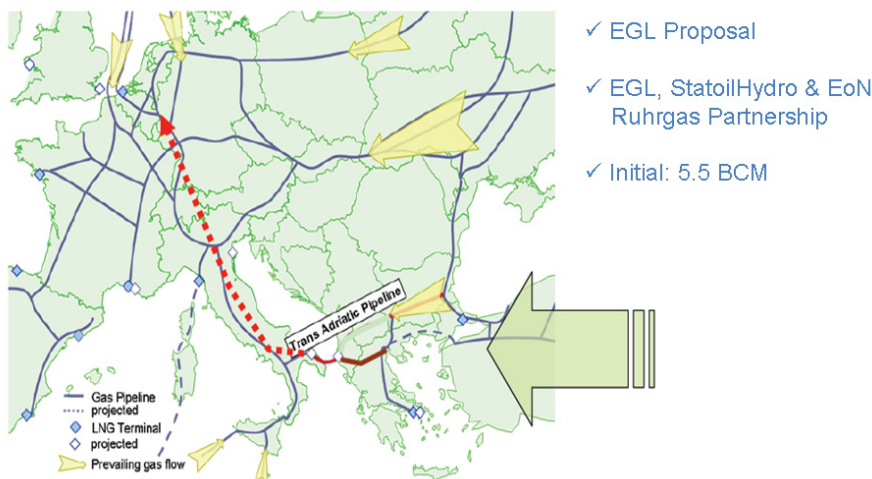
- GERMAN RWE HAS BEEN THE 6TH PROJECT PARTNER ON FEBRUARY 5TH, 2008
- THE NABUCCO INTERGOVERNMENTAL AGREEMENT (IGA) WAS SIGNED IN ANKARA IN 2009
- NABUCCO TO START OPERATION BY 2014

TECHNICAL FEATURES

Total Length	3300 Km
Pipeline Dia.	42-56 Inch
Max. Capacity	31 bcm/a

Furthermore, Turkey gives its support to the Trans Adriatic Pipeline Project in line with its policy of enhancing energy security of EU countries. With regard to the project a Memorandum of Understanding on Energy Cooperation including gas transit was signed in November, 2009 between Turkey and Switzerland.

Map 10. Trans-Adriatic Pipeline Project



As a recent progress, another worth-mentioning project is the concluded Turkey- Azeri gas transit negotiations. The signed agreement and MOUs address several aspects of exporting of Azeri gas Phase I and Phase II. Regarding Phase II, according to the Protocol and the MoU, the gas which will be produced from Shah Deniz Phase II will be delivered to Turkey and onwards Europe. Azerbaijan's increasing export capacity enhances implementation chances of the planned projects within the concept of 'energy corridor'. Similarly, Turkmenistan is among the largest gas producers with good prospects for further production. Ensuring flow of gas from Turkmenistan through Caspian has long been attracting interest from the policy makers and companies. Various alternatives have been studied to bring into existence a Trans-Caspian gas flow. In this general context, Turkey hopes that, ultimately, uncertainties will disappear and Turkmenistan gas will be introduced as a new source of supply for Turkey and EU over the next years.

Map 11. Trans-Caspian Natural Gas Pipeline Project



The pipeline projects linking the Caucasus, Central Asia, and the Middle East to Europe will make substantial contribution to the region's integration with the West. Secure and commercially profitable pipelines will help enhance stability and prosperity in the region. Considering the system as a whole, and to make it more effective, Turkey aimed also to increase its natural gas storage capacity. Silivri underground storage facility (of capacity of 2.2 bcm) located at the north shore of the Marmara Sea had been taken into service in 2007. New underground storage projects also have been developed recently both by state owned pipeline company BOTAS and a private sector company in the Tuz Golu basin in Central Anatolia.

Map 12.



With regard to the Arab Natural Gas Pipeline Project, which foresees transportation of Egyptian Gas to Turkey and onwards Europe via Jordan, Lebanon and Syria, the pipeline has been reached Homs (Syria); and Jordan, Lebanon and Syria have begun to receive Egyptian Gas. The construction of the remaining part between Homs (Syria) and Turkoglu (Turkey) has not been completed along with Gas Sale and Purchase Agreement between Egypt and Turkey due to lack of a supply commitment from Egyptian side.

Map 13. Arab Gas Pipeline Project



- THE EGYPTIAN GAS IS CURRENTLY BEING SUPPLIED TO SYRIA
- A MoU WAS SIGNED ON FEBRUARY 16, 2006 BETWEEN TURKEY AND EGYPT
- RELATED IGA HAS NOT BEEN SIGNED BETWEEN TURKEY AND EGYPT SO FAR
- TURKEY AND SYRIA SIGNED MoU's (dated 20 August 2009, and 23 December 2009) REGARDING INTERCONNECTION OF NATURAL GAS GRIDS OF TWO COUNTRIES.
- TURKISH AND SYRIAN GRID INTERCONNECTION BY LATE 2010

TECHNICAL FEATURES

Total Length	1200 Km
Pipeline Dia.	36 Inch
Max. Capacity	10 bcm/a

On the other hand, Turkey and Syria signed two Memorandums of Understanding in 2009 regarding interconnection of natural gas grids of two countries. The MoUs cover the issues such as gas sale to Syria from Turkey, gas transit to Syria and other Arab countries via Turkey (especially Iranian and Azeri gas), transit of Egyptian gas to Turkey via Syria and delivery of Syrian gas to Turkey in the future.

With respect to Iraqi natural gas, it is widely known that besides oil, Iraq has substantial gas resources at its disposal. With Iraq's security situation getting increasingly better, energy investment in the country is expected to flourish. For Iraqi gas, reaching European markets seems both a desirable and achievable objective; in fact Iraqi political authorities already expressed their interest in Nabucco project. Turkey deems essential Iraq's participation in Nabucco Project as one of the main potential gas providers in the sense that it would not only turn its natural gas reserves into an export commodity, but also make contribution in improvement of the political stability of the country in particular, and of the region in general.

Map 14. Iraq-Turkey Natural Gas Pipeline Project

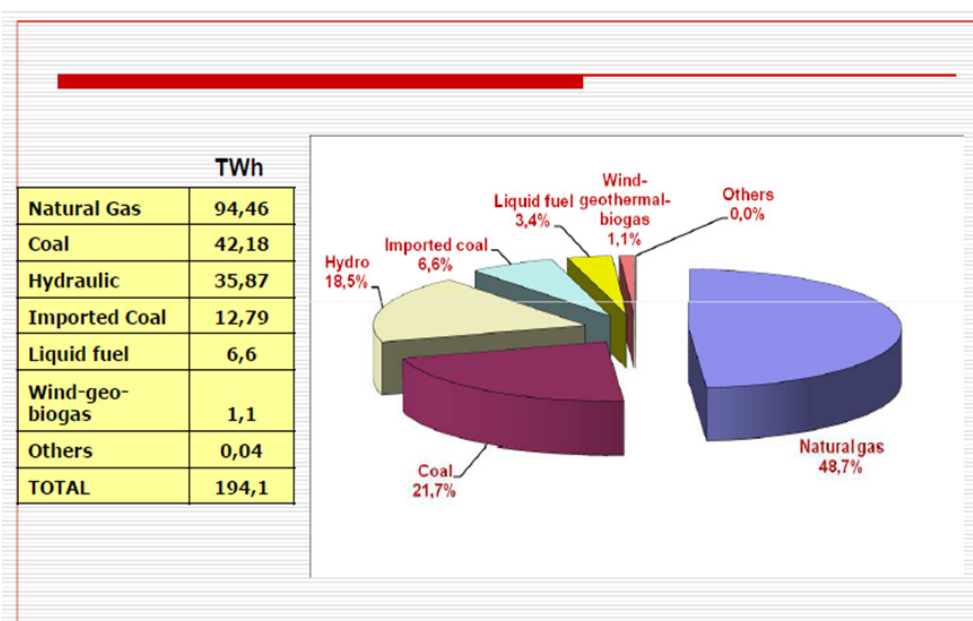


Increase in gas demand is expected to continue in consumers' markets; just as gas consumption is in gas producing countries. Some analyses estimate that within 20 years some of the gas exporter countries will turn into net-importer countries. Hence drawing on the gas supply security point of view, in the long run, alleviation of the tension in the relationship between Iran and USA governments is believed to pave the way for a fruitful atmosphere which would enable Iran to become a part of the solution.

On the issue of electricity infrastructure, Turkey aims at fully utilizing its indigenous hard coal and lignite reserves, hydro and other renewable resources such as wind and solar energy in order to meet rapidly growing electricity demand in a sustainable manner. Integration of nuclear energy into the Turkish energy mix will also be an important contribution in order to meet growing electricity demand while avoiding increasing dependence on imported fuels.

Figure 6. Electricity Market by figures, 2009

Breakdown of electricity generation by resources



Strengthening the electricity transmission grid in parallel to the expansion of the generation infrastructure is an integral part of the Turkish electricity security policy. Acknowledging the significance of electricity interconnections, Turkey has connections with all of neighboring countries.

Map 15. Electricity Interconnections of Turkey



Moreover, Synchronous parallel operation with the European Electricity System (ENTSO) is another policy priority of the country as physical integration of the Turkish electricity system with that of the European countries will provide significant trade opportunities, thus contributing to regional integration and energy security. With the completion of improvements on transmission system and production facilities, synchronous parallel operation with ENTSO-E CESA has been kicked off on September 18, 2010. Following one year trial parallel operation, membership process will be initiated.

Other important project in this regard is Mediterranean Ring Project (MEDRING). The concerned project, which is also listed as a "Priority Project" of the EU Trans European Energy Network, envisages electrical interconnection among the countries bordering the Mediterranean Sea. Within the scope of this project, some technical studies have been performed resulting in the necessity of performing additional studies. Following the execution of further studies, interconnection of the power grids of the North African and South Europe Countries will be ensured and the electricity trade will be initiated.

The regional energy projects, where Turkey is an active participant, will open up a new avenue for cooperation among the countries in the region and reinforce the ties between Europe and Asia. Building on the aforementioned achievements, Turkey will continue its efforts to contribute significantly to global energy security. Interdependency between the countries as both producer and consumer is an essential peculiarity of the energy security. Therefore, competition to a certain extent is understandable between the projects which address to the same challenge.

To conclude, once again it should be emphasized that Turkey is dedicated to playing a driving and constructive role in transportation of the Caspian, Middle Eastern and Central Asian hydrocarbon resources to Europe and World Markets in a timely, reliable, cost-effective, environmentally sound and high-quality basis. For this purpose, through the spirit of multilateral cooperation, Turkey put forth its full efforts for development of new projects which would both contribute to enhancing energy security of its regions and partner countries, and to improving prosperity and peace in a broader region.

The last but not the least, the issue Turkey's accession process to the EU is of great significance. Turkey has been conducting accession talks with the EU since 2005 and energy constitutes an important aspect of the relations between Turkey and the EU. However, despite the relative weight of the issue at hand, negotiations related to the energy chapter have not been opened yet due to non-technical matters. With its dynamic energy market, modernized energy infrastructure, developed regulatory framework and unique geographical location, EU membership of Turkey could contribute extensively to the energy security of EU and wider Europe.

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Yusuf Yazar

Yusuf Yazar got his B.S. degree in engineering from Yildiz University - Istanbul in 1977. He received his MS degree in geodetic surveying from Kandilli Observatory and Earthquake Research Center at Bogaziçi University, Istanbul. Intermittently until 1988 he worked as an engineer for several construction and civil engineering projects both in Turkey and abroad. From 1988 to 2003, he served as a lecturer at the Engineering Faculty in Anadolu University and Osmangazi University (both are in Eskisehir, Turkey). Since early 80s he contributed to several monthly or bi-monthly journals writing mostly on international relations. In 2003, he was assigned to the Energy Market Regulatory Authority as Advisor to President. Since February 2004 he occupies the position of 'deputy undersecretary' in the Ministry of Energy and Natural Resources. In his capacity as deputy undersecretary he participated in several international energy conferences.

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