ENERGY SECURITY STRUGGLE IN CASPIAN REGION FROM THE VIEW OF IMPORTANT PIPELINE PROJECTS

by Oğuzhan Akyener

ABSTRACT

Caspian Region encloses the countries having important energy resources (oil & gas), which attracts all major energy players in the world. As a result of this appeal of the energy resources; from the view of supply and demand security, there is a critical balance and a very complex struggle among these major players.

To analyze the oil and gas supply-demand balances in the field of energy security policies: in the first place, it is better to define the main players in the region. Furthermore, in order to evaluate the long-term development plans; it is very important to examine the planned and existing transferring infrastructure in the region (pipelines, ports, transformation facilities, railroads, etc.).

In this study, initially, by mentioning the importance of Caspian Region for world energy markets, portfolios of the important players who are active and who want to be active in this region will be analyzed. Secondly, definitions of the energy security for each important player in the region will be determined and possible targets for each player's energy security definitions will be estimated. For analyzing these targets and the struggle observed for these targets, after mentioning the relevant resource development plans and the supply/demand potentials, the situations of the existing and planned transportation capacities of the pipelines will be described. By this way, the results of the struggle in energy security in the region will be predicted.

"Having an attractive geo-political importance due to the existing energy resources of the region, Caspian magnetizes nearly all of the important energy players of the world."

INTRODUCTION

Geographically, by involving the countries that have important portion of oil and gas reserves of the world, Caspian is an important region from the sight of energy. In addition to having huge oil and gas reserve potential, standing in between two important energy-demanding markets such as Europe and China-India increases the geo-political importance of the Caspian Region.

Hence, having an attractive geo-political importance due to the existing energy resources of the region, Caspian magnetizes nearly all of the important energy players of the world.

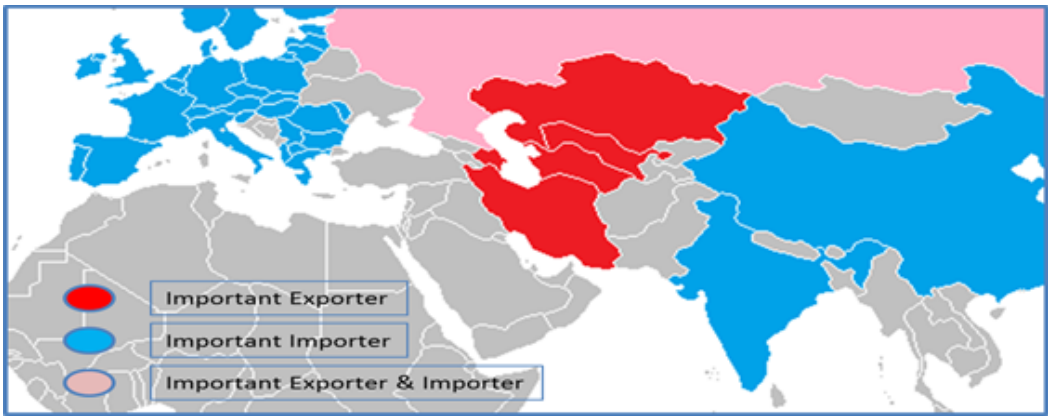
IMPORTANT PLAYERS IN ENERGY STRUGGLE IN CASPIAN REGION

To elect important energy players in Caspian Region; potential suppliers in the region, huge consumers importing from the region and other politically dominant governments have to be studied.

Interests of these players in the region can be observed from oil/gas import – export values, private E&P or service companies working in the region and political attitudes.

Russia, Azerbaijan, Iran, Turkmenistan, Kazakhstan & Uzbekistan are the countries that have existing important energy resources potential in the region. India-China and European Union (EU) can be accepted as the important energy demander (importers) countries from the region. US & Japan are other important energy players which are also active in Caspian Region with their private oil & gas companies (other than important levels of oil/gas imports like EU-China and India).

Hence, not being an importer or exporter, being located far from the region and other geographical conditions, US and Japan will not be considered as important players in the energy struggle in Caspian Region. Indeed, from the sight of parallel political attitudes, US can be accepted as standing at EU's side. US are one of the main dominant countries in the region. By the way, from the energy politics side; US directly support EU's ben-



Map 1: Important players in energy struggle in Caspian Region.

efits in order to weaken Russia and China's involvement.)

Note: Due to very few activities and interests in the region, some important international energy players such as Canada, Australia, Saudi Arabia, Iraq, South Korea etc. are not taken into account.

As a result, as shown on Map 1; Russia, Azerbaijan, Iran, Turkmenistan, Kazakhstan, Uzbekistan, India, China & EU can be accepted as the main important players in the energy struggle in Caspian Region.

Table 1 gives brief information about today's energy statistics of these players.

The reserves, productions, consumptions, demand value (consumption-production), one year total production/reserves values (which will give information about the development and investment rate on the resources) and the GDP dependencies of each players of oil and gas production is given in Table 1 above.

For the future estimations;

Table 2 below shows the future gas consumption estimates of important gas consumers.

The increasing gas demand of China and India can be observed in Table 2 above. Graph 1 below shows the changes in oil import values of the biggest consumers in 2035.

Again, from Graph 1, the huge increase expectations in India and China's oil exports in 2035 in contrast to the decrease in EU, US and Japan are observed.

From the suppliers' side in the Caspian region, Table 3 below shows the oil and gas export potential estimates of the Caspian energy suppliers in 2035.

		Azerbaijan	Turkmenistan	Uzbekistan	Kazakhstan	Iran	Russia	India	China	EU
Proved Oil Reserves	billion bbl	7	0.6	0.6	30	157	87.2	5.7	17.3	7.9
Oil Production	m bbl/d	872	222	68	1728	3680	10643	894	4155	1762
Oil Consumption	m bbl/d	98	100	82	265	1971	3174	3652	10681	12700
Demand Volume	m bbl/d	-779	-122	14	-1463	-1709	-7469	2758	6426	10938
1 year Prod/Reserves		0.045	0.133	0.041	0.021	0.008	0.044	0.056	0.086	0.080
RESULT		SUPPLY	SUPPLY	X	SUPPLY	SUPPLY	SUPPLY	DEMAND	DEMAND	DEMAND
Proved Gas Reserves	tcm	0.9	17.5	1.1	1.3	33.6	32.9	1.3	3.1	1.9
Gas Production	bcma	15.6	64.4	56.9	19.7	160.5	592.3	40.2	107.2	153
Gas Consumption	bcma	8.5	23.3	47.9	9.5	156.1	416.2	54.6	146.6	456
Demand Volume	bcma	-7.1	-41.1	-9	-10.2	-4.4	-176.1	14.4	39.4	303
1 year Prod/Reserves		0.017	0.004	0.052	0.015	0.005	0.018	0.031	0.085	0.081
RESULT		SUPPLY	SUPPLY	SUPPLY	SUPPLY	SUPPLY	SUPPLY	DEMAND	DEMAND	DEMAND
GDP	billion$	98	47.5	104.7	231.3	997.4	2504	4784	12380	15630
Oil & Gas Rate in GDP	%	0.38	0.64	0.21	0.30	0.19	0.24	0.01	0.02	0.01
RESULT		DEPENDENT	DEPENDENT	DEPENDENT	DEPENDENT	DEPENDENT	DEPENDENT	X	X	X

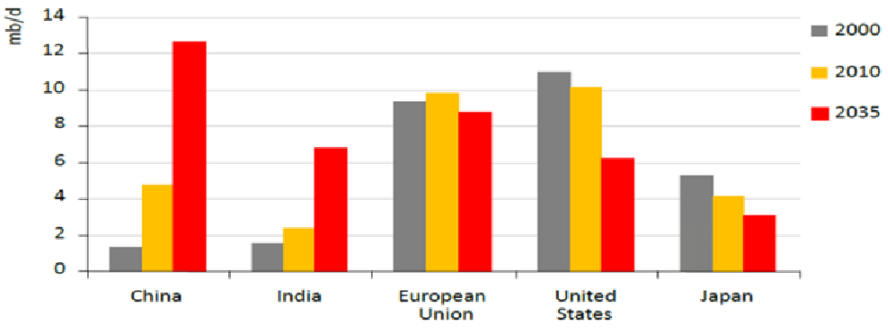
Table 1: Energy statistics of the main energy players in Caspian Region.[1]

"Russia, Azerbaijan, Iran, Turkmenistan, Kazakhstan & Uzbekistan are the countries that have existing important energy resources potential in the region. India-China and European Union (EU) can be accepted as the important energy demander (importers) countries from the region."

"For both import and export to be continuous, secure and economic, diversification of resources and markets, decreasing transportation costs, obtaining political-economic stability are important."

	2008	2015	2020	2025	2030	2035	2008-2035*	Change vs. NPS 2035**
OECD	**1 541**	**1 615**	**1 691**	**1 773**	**1 865**	**1 950**	**0.9%**	**192**
North America	815	841	872	924	986	1 052	0.9%	138
United States	*662*	*661*	*668*	*700*	*741*	*786*	*0.6%*	*122*
Europe	555	574	608	636	653	667	0.7%	38
Pacific	170	200	210	213	226	231	1.1%	15
Japan	*100*	*118*	*122*	*123*	*127*	*127*	*0.9%*	*10*
Non-OECD	**1 608**	**2 070**	**2 328**	**2 611**	**2 912**	**3 182**	**2.6%**	**405**
E. Europe / Eurasia	701	755	786	824	857	876	0.8%	38
Russia	*453*	*474*	*487*	*504*	*522*	*528*	*0.6%*	*25*
Asia	341	576	715	864	1 049	1 244	4.9%	309
China	*85*	*247*	*335*	*430*	*535*	*634*	*7.7%*	*239*
India	*42*	*81*	*104*	*134*	*176*	*234*	*6.5%*	*57*
Middle East	335	428	470	536	592	632	2.4%	23
Africa	100	139	154	164	170	173	2.1%	9
Latin America	131	172	203	224	245	258	2.5%	26
Brazil	*25*	*48*	*66*	*76*	*88*	*98*	*5.1%*	*21*
World	**3 149**	**3 685**	**4 019**	**4 384**	**4 778**	**5 132**	**1.8%**	**597**
European Union	*536*	*553*	*587*	*609*	*621*	*636*	*0.6%*	*38*

Table 2: 2035 World gas consumptions[2] (units are bcma).



Graph 1: 2035 World oil imports.[3]

	Oil (bbld)	Gas (bcma)
Azerbaijan	250 000	40
Turkmenistan	250 000	140
Uzbekistan	0	80
Kazakhstan	2 100 000	60
Iran	No Estimation Due To Sanctions	No Estimation Due To Sanctions
Russia	6 000 000	350

Table 3: 2035 Caspian energy suppliers' export estimations.

As seen from Table 3, in 2035, there will be a decrease in Azerbaijan and Russia's oil export capacities (mainly due to production decline in maturing fields). For gas export potentials, all the players will increase their supplies.

ENERGY SECURITY DEFINITIONS FOR EACH PLAYER

Generally, for an exporter country, energy security means to be able to continue economically and safely for exporting her resources. In the opposite side, for an importer country, to be able to economically and safely continue to import demanded resources.

For both import and export to be continuous, secure and economic, diversification of resources and markets, decreasing transportation costs, obtaining political-economic stability are important. That is why; these factors are important energy security issues for all players. To briefly describe main energy security definitions for each player in the region:

AZERBAIJAN

- An important oil and gas exporter in the region:
  - Today having an oil exporting capacity of more than 750 000 bbld
  - Today having a gas exporting capacity of more than 7 bcma
- Due to existing & planned pipeline projects and geopolitical conditions, Azerbaijan becomes the energy gate of Caspian Energy Resources to Europe (Although it is more economical to transport some energy resources in Caspian Region to Europe through Iran or Russia, due to EU & US strategies, Azerbaijan is the unique political choice).
- New resource potentials are mainly gas and all are usually deep offshore (Means: not easy to develop).
- International huge oil companies are interested for investment.
- Main energy security targets are:
  - To develop new offshore gas fields with the foreign investors
  - To access to European gas markets via the planned pipelines
  - To be an important gas supplier for EU and by this way get EU & US's political supports
  - To continue to securely access existing markets: for gas - to Turkey and Georgia; for oil - to Ceyhan, Supsa & Novorossiysk
  - To get more production with the new investments and development plans from the most important oil field ACG
  - To have more control over the existing and future projects in Azerbaijan
  - To construct more offshore drilling platforms for continuous development activities in Caspian Sea
  - To reach gas export capacity of 50 bcma in 2035
  - To solve conflicting claims over the maritime and seabed boundaries of Caspian Sea with Iran & Turkmenistan
  - To be an energy hub in the coming 30 years by transporting Turkmenistan and Kazakhstan oil & gas resources via existing and planned pipelines
  - To construct the region's biggest refinery and become an important oil products supplier in the region
  - To construct gas power plants and become an electric supplier in the region

TURKMENISTAN

- An important gas exporter in the region:
  - Today having an oil exporting capacity of more than 100 000 bbld
  - Today having a gas exporting capacity of more than 40 bcma
- A lack of sufficient foreign investments.
- Being located far from the important markets.
- Lack of sufficient oil export pipeline infrastructure.
- Majority of gas is exported to Russia and some portion of gas is exported to China and Iran.

"Azerbaijan becomes the energy gate of Caspian Energy Resources to Europe due to existing & planned pipeline projects and geopolitical conditions."

"Majority of Turkmen gas is exported to Russia and some portion of gas is exported to China and Iran."

- Important portion of gas reservoirs are high pressure and temperature reservoirs and have high percentages of H2S and CO2; means not easy to develop due to economical & technical aspects.
- Due to important gas reserves, having attraction of all other players in the region.
- Main energy security targets are:
  - To get attraction of new foreign investors and develop more gas fields
  - To continue to securely access to Russia, Iran and China's gas markets
  - To increase the capacity of transportation to access China's gas markets
  - To access to Pakistan, India and European gas markets via planned pipelines
  - To complete the construction of these relevant pipelines (TAPI & Trans Caspian)
  - To reach gas export capacity of 230 bcma in 2035 (expected to be more than 140 bcma)
  - To reach oil export capacity over 1 million bbld in 2035 (expected to be more than 250 000 bbld (due to expected increasing condensate production; but new infrastructures to transport will be needed)
  - To complete East-West pipeline inside Turkmenistan and have the ability to transport South East resources to the Caspian Sea markets (Then from Trans Caspian to EU (also seems uneconomic))
  - To solve conflicting claims over the maritime and seabed boundaries of Caspian Sea with Iran & Azerbaijan

UZBEKISTAN

- An important gas exporter in the region:
  - Today having a gas exporting capacity more than 9 bcma
- A lack of sufficient foreign investment.
- Being located far from the important markets and land locked in all sides.
- A lack of sufficient export pipeline infrastructure.
- Majority of gas is exported to Russia and some portion of gas is exported to China and Iran.
- Important portion of gas reservoirs are high pressure and temperature reservoirs and have high percentages of H2S and CO2; means not easy to develop due to economical & technical aspects.
- Due to important gas reserves, having attraction of all other players in the region.
- Main energy security targets are:
  - To get attraction of new foreign investors and develop more oil and gas fields
  - To continue to securely access to Russia, Kazakhstan & Kyrgyzstan's gas markets
  - To increase the capacity of transportation to access Russia's gas markets
  - To access to China's gas markets via Central Asia-China Pipeline after capacity extension
  - To reach gas export capacity of 80 bcma in 2035
  - In the short term; increase gas to liquid converting process capacities to reduce oil imports
  - To explore and develop possible oil shale reserves
  - To construct new facilities to decrease flaring of associated gas and increase usage (Today nearly 2 bcma gas is flared)

KAZAKHSTAN

- An important oil exporter in the region:
  - Today having an oil exporting capacity of more than 1,4 million bbld
  - Today having a gas exporting capacity of more than 10 bcma
- International huge oil companies are interested for investment but also there are some obscurities on legal regulations.
- An important oil exporter for European Markets (with more than 50% of oil production) and also China (more than 15%).
- All gas exports are transported to Russia

(Mainly for gas processing plants).

- Geographically important dependency to Russia for oil exports.
- More than 85 percent of gas produced in Kazakhstan is associated gas. Nearly 5 bcma part of gas production is reinjected.
- Main energy security targets are:
  - To continue to securely access to existing oil markets through Russia, Azerbaijan and also China's oil markets
  - To develop the giant oil field Kashagan and continue developing of new phases of other 2 giant fields; Tengiz & Karachaganak
  - To reach oil export capacity of 2,5 million bbld in 2035
  - To have more control over the existing and future projects in Kazakhstan
  - To increase the capacity of transportation to access China's oil markets
  - To complete the construction of Eskene-Aktau Pipeline for domestic oil transportation, and domestic natural gas pipeline system for gas distribution and for meeting the gas import demand from Uzbekistan and Russia
  - To construct Trans Caspian and Kazakhstan-Turkmenistan-Iran Oil Pipelines for market diversification of oil exports
  - To reach gas export capacity of 60 bcma in 2035

IRAN

- Iran holds the world's second largest proven gas reserves and world's fourth largest proven oil reserves.
- Very important oil & gas exporter in the region:
  - Today having an oil exporting capacity of more than 1,7 million bbld
  - Today having a gas exporting capacity of more than 10 bcma (Only Turkey is importing gas from Iran)
- Is a member of OPEC.
- Holds the Strait of Hormuz, which is an important route for oil exports of Persian Gulf Countries.
- International sanctions negatively affected all parts of the oil and gas market in Iran including; the export & import movements, development of new fields, new transportation projects, foreign investments and etc. (For example: In spite of the above oil export capacity, today Iran can export less than 800 000 bbld).
- If Iran cannot find a peaceful solution to stop the sanctions and change all scenarios, then the main energy security targets can be:
  - To continue to securely access to existing oil markets, which are 50% China & India, 20% Japan & N. Korea and 20% Turkey & Spain & Italy & Greece
  - Find some back doors to perforate the sanctions such as:
    - More swap agreements in oil & gas trade movements
    - To increase the swap capacity; making investments in anti US & EU countries
  - Prepare suitable legal legislations for foreign investors to make investment in development projects in Iran
  - Develop shared reservoirs as specially South Pars Field:
    - By developing gas fields, export the gas as LNG by constructing relevant facilities
    - Make agreements with Turkey to sell extra gas, develop the transportation capacities and make Turkey to construct an LNG facility if needed
    - Make suitable agreements with Pakistan for gas export
      - Assist Pakistan for her internal gas distribution system
    - Develop the construction of Iran-Iraq-Syria Gas Pipeline

RUSSIA

- Russia holds the world's largest proven gas reserves and world's eighth largest proven oil reserves.

"International huge oil companies are interested for investment in Kazakhstan but also there are some obscurities on legal regulations."

"International sanctions negatively affected all parts of the oil and gas market in Iran including; the export & import movements, development of new fields, new transportation projects, foreign investments and etc."

- Very important oil & gas exporter in the region:
  - Today having an oil exporting capacity of more than 7.4 million bbld
  - Today having a gas exporting capacity of more than 175 bcma
- In addition, an important gas importer in the region.
- Russia – EU's largest energy resources importer (2009).[4]
  - 36% of the EU's total gas imports originate from Russia
  - 31% of the EU's total crude oil imports originate from Russia
  - 30% of the EU's coal imports originate from Russia
- The EU – Russia's largest trade partner for the energy goods.[5]
  - 80% of all Russian oil exports go to the EU
  - 70% of all Russian gas exports go to the EU
  - 50% of all Russian coal exports go to the EU
- Most of Russian parts of the Caspian Sea are unexplored and undeveloped but may hold large hydrocarbon reserves.
- Most important oil producing fields in Russia are mature and having a declining production trend.
- Russia has an extensive domestic and export pipeline network.[6]
- Main energy security targets are:
  - To continue to securely access to existing oil and gas markets (mainly EU, China, Japan, Turkey)
  - To continue the market share volumes, dominance and influence on EU oil & gas markets
  - By importing oil or gas from Turkmenistan – Kazakhstan & Uzbekistan, increase export capacity (also buy cheaper and sell with higher prices)
  - Get prepared for oil & gas supply infrastructure for the increasing demand in China
  - For having an alternative gas route to Central Europe, avoiding Ukraine's territory, construct south stream gas pipeline
  - Make investments to explore new oil & gas resources
  - Use the technology, some enhanced recovery methods and make investments for new phases of development to avoid decreasing production trends in the important maturing oil fields

"Caspian region -where important gas supply potentials exist- has always been directly related to the huge importers' energy security issues, such as EU and Turkey."

INDIA

- India is the fourth largest energy consumer in the world after US, China and Russia.[7]
- Very important oil & gas importer:
  - Today having an oil importing capacity of more than 2.7 million bbld
  - Today having a gas importing capacity of more than 14 bcma
- Most of the oil imports are supplied from the Middle East countries (64%) and only lower than 6% rate is coming from Iran.
- All natural gas demands are met by (usually long term) LNG imports and the internal gas production (In 2011, India was the 6th largest LNG importer in the world).
- There is an important incremental rate in oil and gas demand for India.
- In addition, India is an important oil importer, due to the refinery capacity; she is a net exporter of petroleum products.
- Up to 2.6 tcm unconventional gas resources (coalbed methane) potential is estimated to exist in onshore and offshore India.
- Main energy security targets are:
  - Meet the increasing energy demands
  - Make India an energy independent country;
    - Development and exploration of unconventional resources (such as coalbed methane and shale gas)
    - Investment on new exploration and development projects

- Decrease the usage percentage of motor fuels
- Energy efficiency
- Make investments on gas pipeline infrastructure to meet the increasing gas demand
- Construct TAPI pipeline and import Turkmen gas
- If there is a solution for the US sanctions on Iran; construct IPI (Iran-Pakistan-India) Pipeline to import Iranian gas
- Increase LNG terminals import capacities and make more long-term agreements with the sellers
- With the Indian oil and gas companies, take part in important oil and gas E&P projects all over the world

CHINA

- China is the world's most populous country and the largest energy consumer in the world. Rapidly increasing energy demand has made China extremely influential in the world energy markets.[8]
- Very important oil & gas importer:
  - Today having an oil importing capacity of more than 6,4 million bbld
  - Today having a gas importing capacity of more than 40 bcma
- Most of the oil imports are supplied from the Middle East countries (50%) and from Caspian suppliers; 10% from Iran, 7% from Russia, 4% from Kazakhstan.
- There is an important incremental rate in oil and gas demand for China.
- Up to 10 tcm unconventional gas resources (coalbed methane) potential is estimated to exist in onshore and offshore prospects.
- Main energy security targets are:
  - Meet the increasing energy demands
  - Diversify supply sources, make long term contracts
  - Development and exploration of unconventional resources
  - Set domestic wholesale energy prices
  - Investment on new exploration and development projects by mostly focusing on western interior provinces and offshore fields
  - Apply enhanced recovery methods for maturing fields
  - Energy efficiency
  - Make investments on construction and integration of domestic oil & gas pipeline infrastructure
  - Increase the oil supply capacity from Russia & Kazakhstan and gas supply capacity from Turkmenistan (also add Uzbekistan to the supplier list)
  - Make relevant agreements and build pipelines for gas supply from Russia to China (two pipelines with total capacity of 80 bcma + Altai Pipeline with capacity 30 bcma)
  - Construct an oil import pipeline from Myanmar to bypass the potential choke point of Strait of Malacca
  - In the short term, complete the construction of gas pipeline from Myanmar (with a capacity of 12 bcma)
  - With the Chinese oil and gas companies, take part in important oil and gas E&P projects all over the world
  - Increase gas storage capacity up to 32 bcm
  - Solve territorial disputes with Japan

EU

- EU is the largest energy consumer structure in the world.
- Most important oil & gas importer in the world:
  - Today having oil importing capacity of more than 10 million bbld
  - Today having a gas importing capacity of more than 300 bcma
- 36% of the EU's total gas imports originate from Russia and around 28% is from Norway, and other important portion is from Algeria, Qatar, Nigeria and Libya.
- A central gas import system and policy

"Most of Russian parts of the Caspian Sea are unexplored and undeveloped but may hold large hydrocarbon reserves."

"India is the fourth largest energy consumer in the world after US, China and Russia."

"Rapidly increasing energy demand has made China extremely influential in the world energy markets."

exists for the union.

- 31% of the EU's total crude oil imports originate from Russia and around 10% from Norway and other imports are originate mainly from Libya, Saudi Arabia, Kazakhstan & Iran, Nigeria, Azerbaijan, Iraq and other middle east countries.
- Some members of EU is directly dependent on Russian gas import, this situation becomes a strategic constraint for the union's energy security issues.
- Main energy security targets are:
  - Continue to meet the energy demand in a sustainable, competitive and secure way
  - Less greenhouse gas and carbon emissions
  - Use more biofuels
  - Increase market competition
  - Focus on the Caspian gas market and work on potential supply possibilities for diversity of resources;
    - For the initial step, transport Azerbaijan gas to EU (with SCPX-TANAP-TAP)
    - For the second step, transport Azerbaijan's future gas to EU (after extending the capacities of existing pipelines and also construct IAP)
    - For the third step, transport Iraq or/and East Mediterranean Sea gas to EU (after the extension of constructed infrastructure in the previous steps and also construct Nabucco West)
    - For the fourth step, transport Turkmen gas to EU (Trans Caspian) (but seems not-economic)
  - Check for other gas supply potentials via pipeline or LNG
  - Develop a Strategic Energy Technology Plan to develop technologies in areas including renewable energy, energy conservation, low-energy buildings, fourth generation nuclear reactor, clean coal and carbon capture
  - Develop an Africa-Europe Energy partnership for the continent to be a sustainable energy supplier for EU
  - Decrease gas imports, increase efficiency, use more renewables
  - Develop and implement common energy policies with all EU members

IMPORTANT PIPELIES IN THE REGION & CAPACITIES

Pipeline capasities and regional energy players are listed in Table 4.

ANALYSIS

To check all the players' 2035 extra supply and demand potentials on Map 2 & 3 (2035 value – today's value):

In 2035:

- EU does not need extra oil supply so; main item for EU energy security is gas.
- China and India need very important amount of oil supply and they will not meet their demand only from the Caspian Region. Moreover, oil supply in the Caspian region will decrease (as 1.2 million bbl/d) in spite of the expected production increase in Kazakhstan. (The assumption is made by considering that there will not be a solution for the sanctions on Iran. If a solution to the sanctions can be addressed, Iran will change all the oil supply potential in the region. Otherwise, India and China will have to find oil supplies from the Middle East-North America or Africa).
- From this view, meeting both oil and gas demands are the most important energy security issues for India & China.
- There is totally 428 bcma extra gas supply with the Caspian Region players and 895 bcma extra demand from the region. This means struggle in gas demand security will be deepened.
- For logical analysis of this struggle, some other items also have to be considered such as:
  - Other gas demanding markets those can get supplies from this region such

		OIL					GAS				
		Name of Pipeline	From (Supply Country)	Through (Countries)	To (Markets)	Capacity (million bbld)	Name of Pipeline	From (Supply Country)	Through (Countries)	To (Markets)	Capacity (bcma)
AZERBAIJAN	EXISTING	BTC	AZERBAIJAN	AZ-GEO-TR	WORLD	1,2	SCP	AZERBAIJAN	AZ-GEO	TURKEY	8
		WREP	AZERBAIJAN	AZ-GEO	WORLD	0,15	GAZI-MAGOMED-MOZDOK	AZERBAIJAN	AZ-RUS	RUSSIA	1
		NREP	AZERBAIJAN	AZ-RUS	WORLD	0,3	BAKU-ASTARA	AZERBAIJAN	AZ-IRAN	NAKCHCIVAN	0,5
		RAILWAY	AZERBAIJAN	AZ-GEO	WORLD	0,22					
	FUTURE						SCPX	AZERBAIJAN	AZ-GEO	TURKEY-EU	16
							TANAP	GEORGIA	TURKEY	EU	16
							TAP	TURKEY	GRE-ALB	ITALY	10
							IAP	ALBANIA	MONT-BOSN	BALKANS	5
TURKMENISTAN	EXISTING						CAC	TURKMENISTAN	TURK-UZB-KAZ	RUSSIA	100
							KORPEZHE KK	TURKMENISTAN	TURK	IRAN	13
							DAULETABAT-KANGIRAN	TURKMENISTAN	TURK	IRAN	6
							CENTRAL ASIA-CHINA	TURKMENISTAN	TURK-UZB-KAZ	CHINA	40
							BUKHARA-URALS	TURKMENISTAN	TURK-UZB-KAZ	RUSSIA	20
	FUTURE						EAST-WEST	TURKMENISTAN	TURK	CASPIAN	30
							TAPI	TURKMENISTAN	TURK-AFG-PAK	INDIA	34
							TRANSCASPIAN	TURKMENISTAN	AZ	TURKEY-EU	30
							CENTRAL ASIA-CHINA X	UZBEKISTAN	UZB	CHINA	+18
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Table 4: Caspian energy players and existing & future pipeline capacities.

"EU is the largest energy consumer structure in the world."

as Turkey, Japan, Korea and etc.

- Other supply potentials from Africa-North America or Middle East (but more extra LNG capacities have to be constructed for such an option)
- EU policy to diversify gas supply resources and mitigating gas dependency to Russia
- There is going to be a struggle among the gas suppliers in the region (Mainly between Russia and others)
- Effects of unconventional resources in supply and gas prices
- Long and short term gas prices effects
- Pricing, sale & contract mechanisms
- Success possibilities of planned pipelines & development projects
- Iran and the sanctions

After shortly analyzing supply-demand balances in the region between the energy players in 2035, it is observed that the struggle is going to be mainly on the gas resources and gas supply securities.

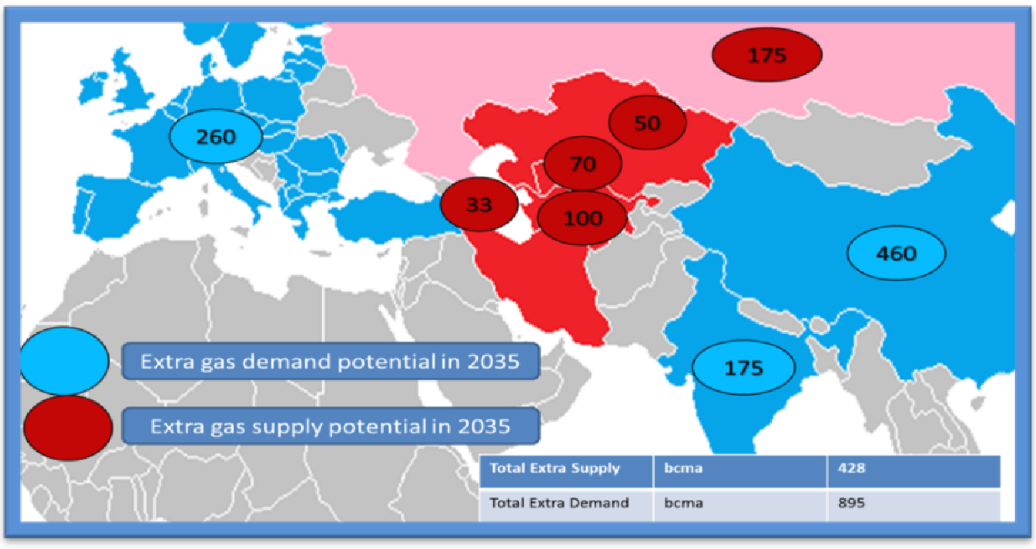
Subsequent to selecting gas for evaluating the supply-demand balances, the other most important factor that is going to determine the results of this struggle and the changes in the balances are the transportation capacities of the gas pipeline projects.

In addition to the suitable capacities of the pipelines, the tariff estimations, transportation costs and the market prices also have to be considered in analysis.

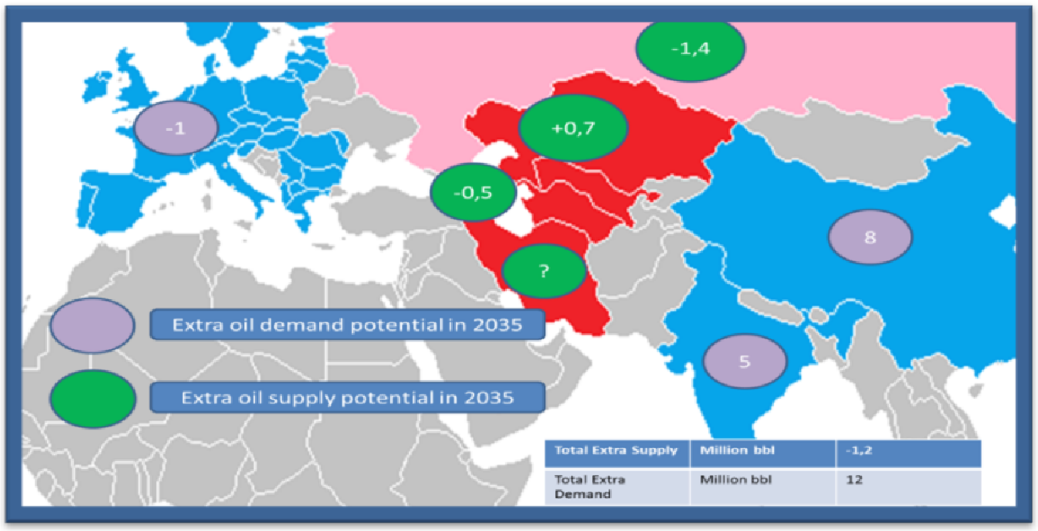
After checking the future available transportation capacities of pipelines in the region (as assuming future pipeline constructions will successfully be completed), Map 4 below is prepared, which is showing each suppliers' transport capacity available in 2035.

As a result of Map 4:

- Both China & India do not have enough planned gas transportation capacities in 2035 to meet their demands. Both countries can negotiate on having more supplies from Turkmenistan & Uzbekistan. For China, always there will be a possibility to have more gas from Kazakhstan and Russia, however, range of extra investments and gas prices are important.
- EU also will not have enough transportation capacities in 2035. New LNG projects, Azerbaijan – North Africa and Eastern Mediterranean gas resources will be important for EU's gas security future.
- Russia will have huge amount of extra supply transportation capacity and to EU (Assuming South Stream with 63 bcma will be agreed with EU and completed). However, it will be better for Russia to agree with China, develop new trans-



Map 2: 2035 Extra gas supplies and demands.



Map 3: 2035 Extra oil supplies and demands (unit: million bbl/d).

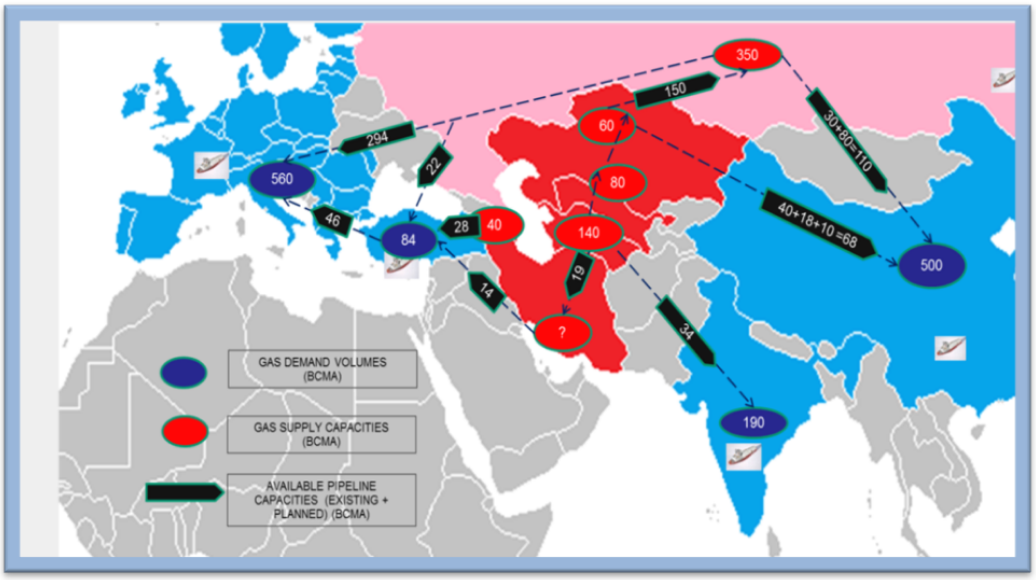
portation facilities and export her gas to huge demander southern neighbor (Also today's sanctions and political problems have to be taken into consideration).

- For Turkmenistan, it will be better to increase the transportation capacities to India and China and make extra exports to those countries. In the EU side; there are important political and economic problems waiting for solutions (economic problems will be more difficult to solve due to the pricing regulations of EU and high tariffs), that is why gas supply of Turkmenistan to EU does not seem to be logical.
- For Uzbekistan and Kazakhstan, both have to decrease gas exports to Russia and make better sale agreements with China and increase their pipeline capacities to China.
- Russia, have to secure her dominancy in all markets and continue to import Caspian gases to export to the other importers.

"In 2035, EU does not need extra oil supply so; main item for EU energy security is gas."

SUMMARY

Energy supply-demand balances in the Caspian Region are very important and should



Map 4: Available pipeline capacities in 2035 (including open volumes of existing lines + new pipelines, units are in bcma).

"Suitable capacities of the pipelines, the tariff estimations, transportation costs and the market prices also have to be considered in analysis."

be very carefully followed by the main players in the region. It is very important to analyze today's and future supply-demand potential scenarios to be able to absorb these balances correctly. In addition to the supply-demand potentials, transportation capacities in the region are also very important.

As a result of this study, it is observed that there are struggles and even more important struggles are expected to happen on gas supply balances between all energy players of Caspian Region. Pipeline capacities and politics are important determining key factors among these balances.

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"Pipeline capacities and politics are important determining key factors for the gas supply balances between all energy players of Caspian Region."