

## Iran and Qatar: Bilateral Cooperation to utilize gas market opportunities

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*Presented to:*

*33<sup>rd</sup> IAEE International Conference "The Future of Energy: Global Challenges, Diverse Solutions" June 06-09, 2010, Rio de Janeiro, Brazil*

### *Introduction*

The Islamic Republic of Iran and Qatar with their huge natural gas reserves in the Middle East, will maintain their specific position in the future international natural gas trade. About 30% of the world's proven gas reserves and 73% of the Middle East's proven gas reserves are situated in these two countries. One of the important and essential energy strategies of both countries is to have a more active presence in international gas markets through increased utilization of their common gas fields known as "North Dome in Qatar" and "South Pars in Iran".

Despite their ownership of this huge gas reserve, the two countries are different in as far as their local gas demand potentials, international interactions within the framework of their effort aimed at absorbing technical know how and financial resources, the speed with which they are pursuing their long term gas export goals as well as their proximity to major consumption centers. On the other hand, and due to the fact that maintaining a coordinated pace of gas production and gas export objectives is a major and effective policy in the commercialization of related projects, bilateral cooperation of the two countries and multilateral synergies with other regional and world gas producers gain a paramount importance.

Studies show that Qatar's gas development plans, namely increasing its LNG capacity to 77 MMt/y as well as meeting the "Dolphin pipe" gas requirement (about 33bcm/y), together with its gas production projections for the next two decades (169 bcm in 2030), will most Probably confront the country with an "LNG capacity bubble" and "gas pipe capacity bubble" at least during the next two decades.

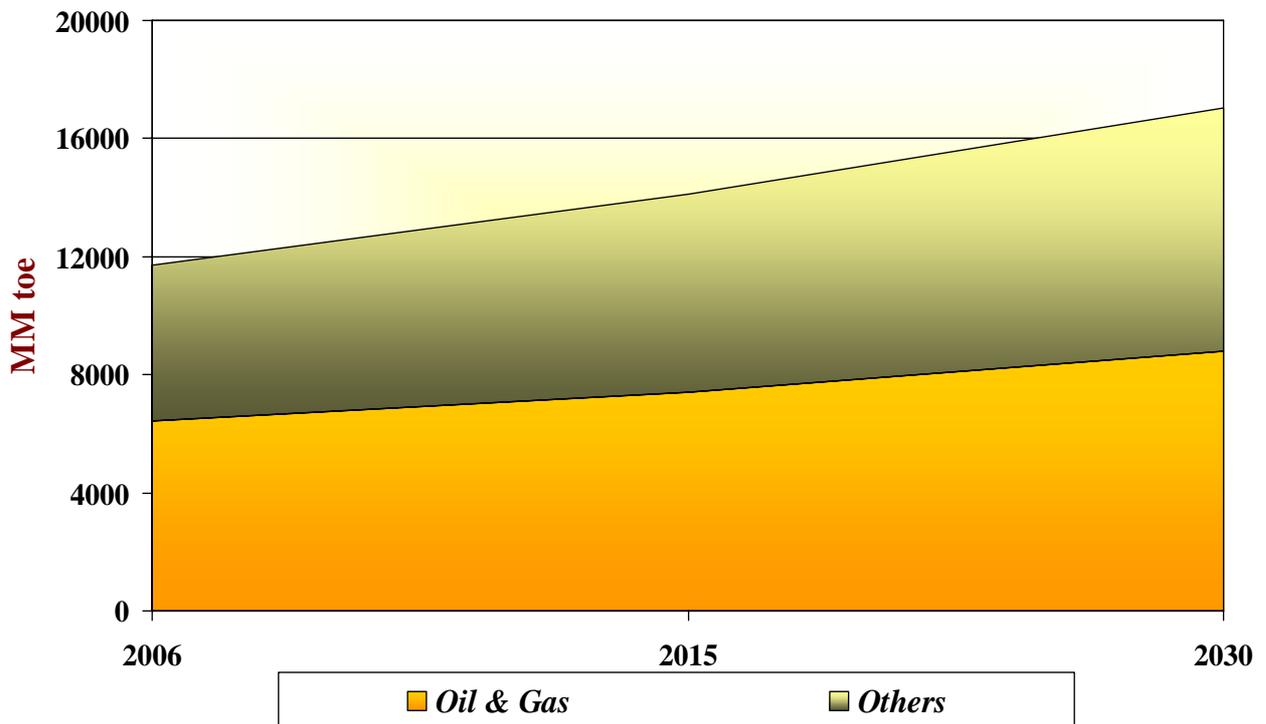
I.R.Iran and Russia as a first and second priority respectively can have an extensive cooperation with Qatar to reduce and eliminate the "gas capacity bubble", since they relatively enjoy the same conditions as far as their gas reserves and their proximity to the consumer countries, are concerned.

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Fossil hydrocarbons especially oil and gas has always had the largest share in the world energy consumption basket. Also global energy demand forecast shows that these two kinds of fuel will have the largest share in the upcoming decades. New surveys show that the global energy demand in the next two decades (by 2030) will enjoy an annual average growth rate of 1.6% and will reach to 17 billion tons oil equivalent of which almost 55% is allocated to oil and gas (Fig.1).

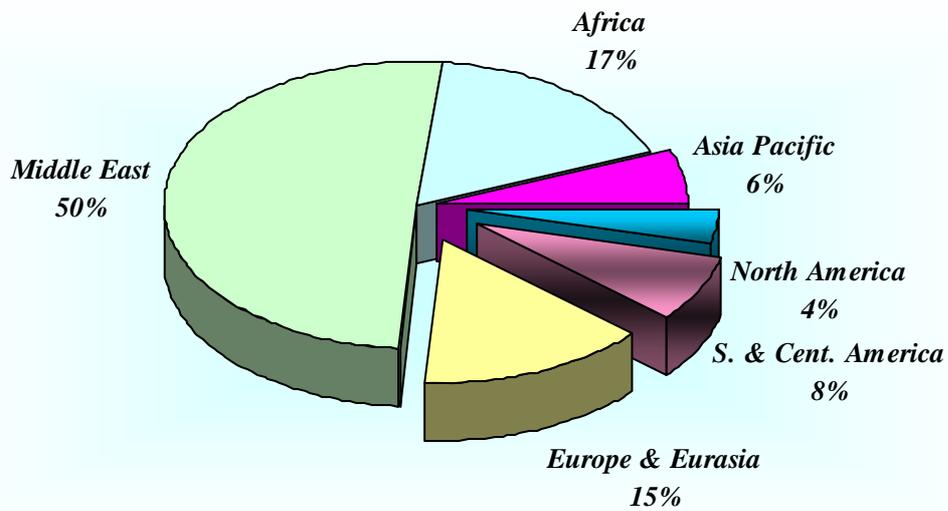
**Fig.1: World Primary Energy Demand Projection  
(2006-2030)**



One of the main characteristics of the global oil and gas market is geographical imbalance of oil and gas reserves and long distance between oil and gas reserves and main consumption centers. Surveys made indicate that The Middle East is rich in hydrocarbon resources and reservoirs, holding about 51% of the global oil and gas reserves in 2008.

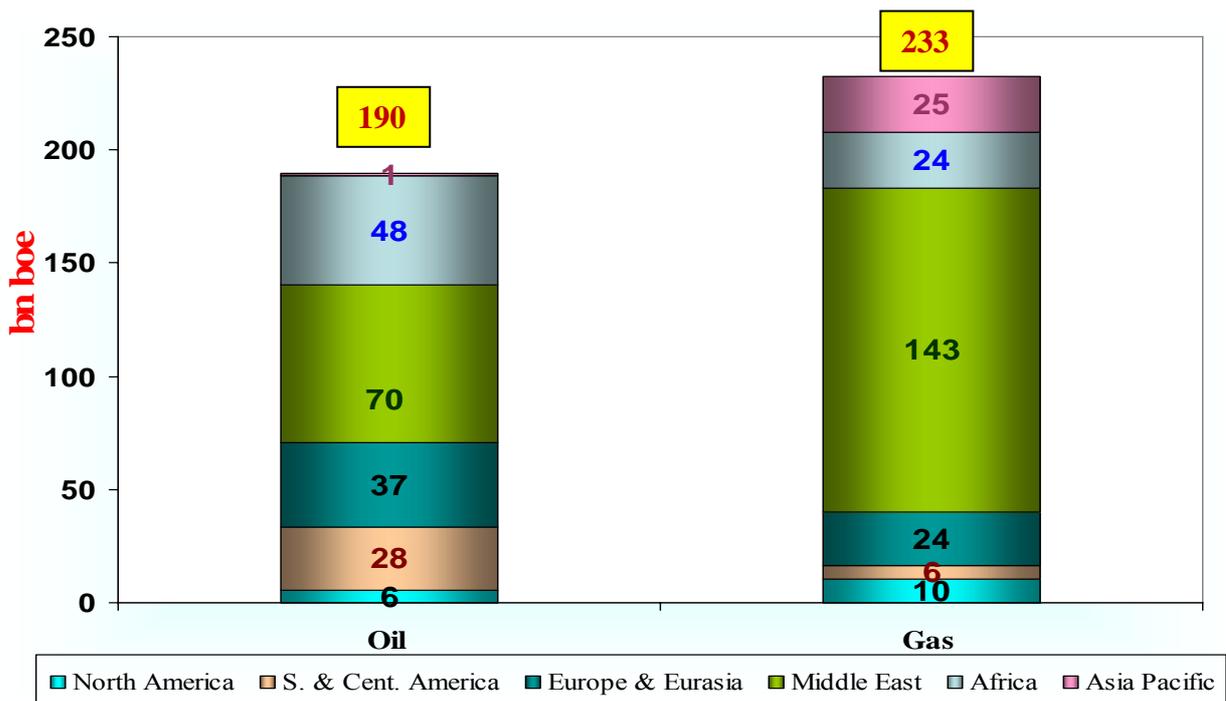
A review of changes in global hydrocarbon reserves shows that additions to existing reserves has been close to 422 billion barrel oil equivalent (bnboe) during recent decade (1998-2008), 50% of the total addition (213 bnboe) of which belongs to the Middle East region, which 25% (106 bnboe) belongs to Qatar and 19% belongs to Iran (79 MMboe) – (Fig. 2).

**Fig 2: Breakdown of Additions to Oil&Gas Reserves in the World  
(During 1998-2008)**



In the recent decade, changes in the hydrocarbon reserves of the all countries in the Middle East point to rising natural gas volumes, as increasing gas reserves was almost 25% more than increasing oil reserves. This development is more considerable respectively in Qatar and Iran (Fig.3).

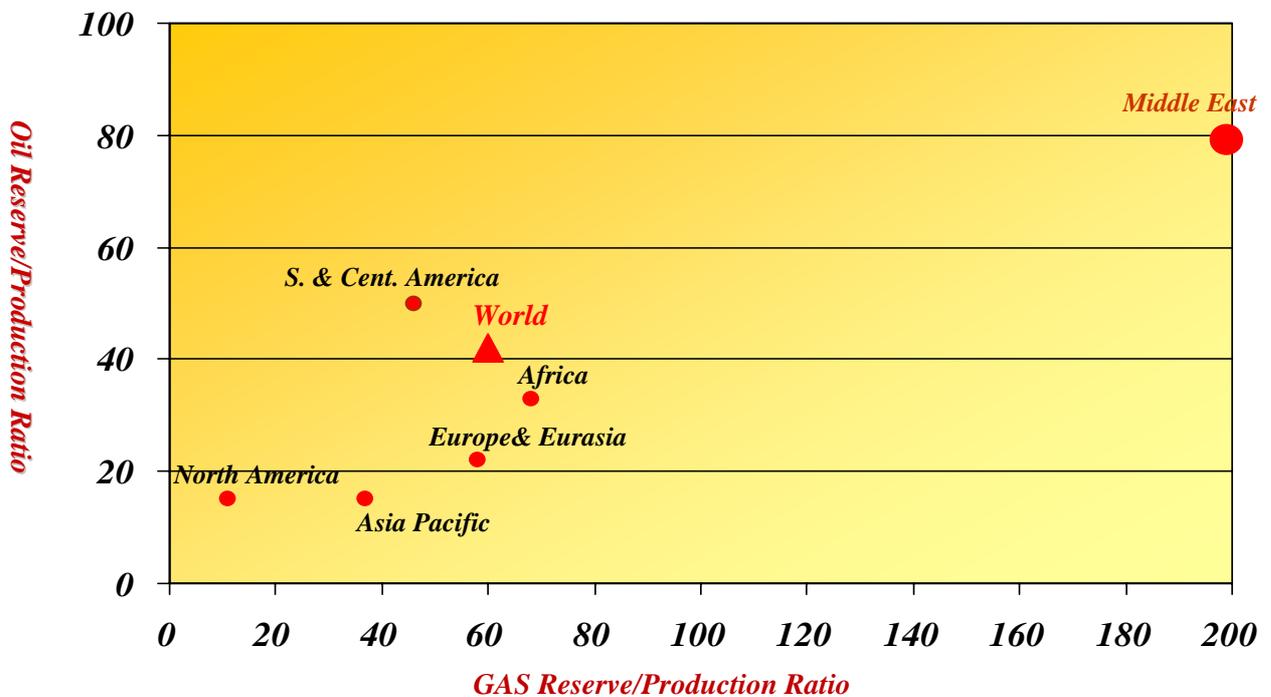
**Fig3: Breakdown of Additions to Oil&Gas Reserves in the World  
by Region (During 1998-2008)**



Iran and Saudi Arabia was respectively holder of the largest hydrocarbon resources in the Middle East in 2008. Natural gas was the dominant fuel in Iran, accounting for 58% of hydrocarbon reserves and crude oil was the dominant fuel in Saudi Arabia, accounting for 85% of hydrocarbon reserves.

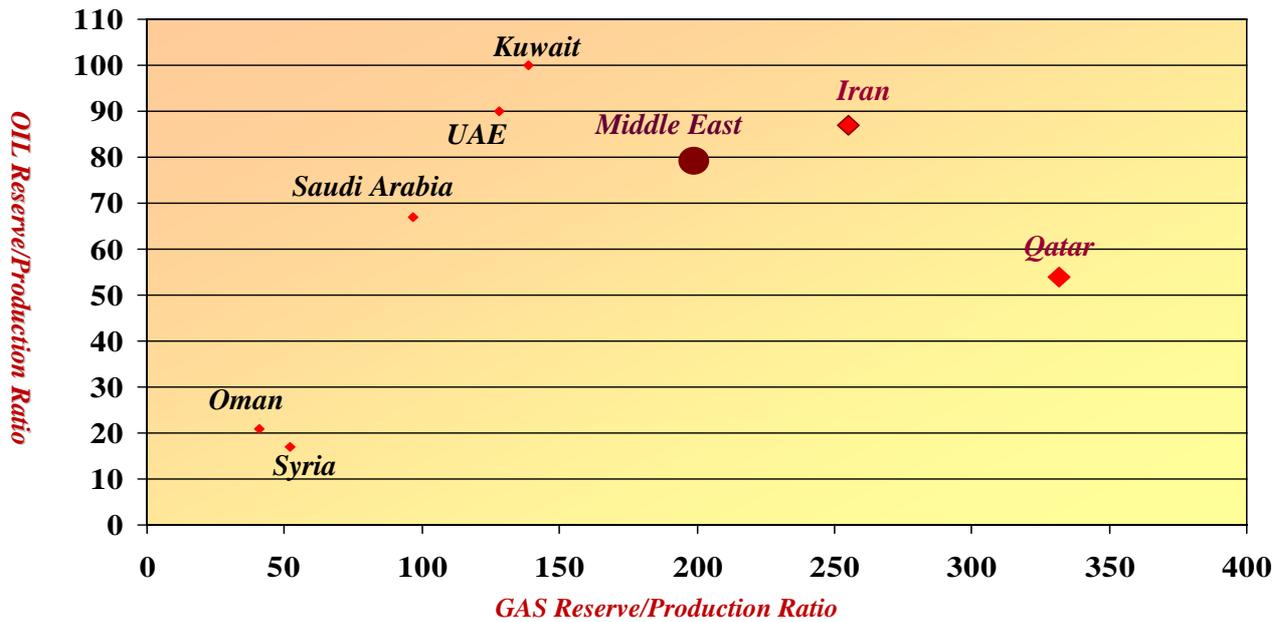
Reserve to Production ratio (R/P ratio) in every country or every region is an important indication for viability of a region in the commercial markets or having the potential for entering into the market. Studying this index in the world's different regions shows that Middle East accounts for the highest rate in oil and gas sector in 2008 (Fig.4).

**Fig.4: Breakdown of Oil & Gas Reserve/Production Ratio in the World (At the end 2008)**



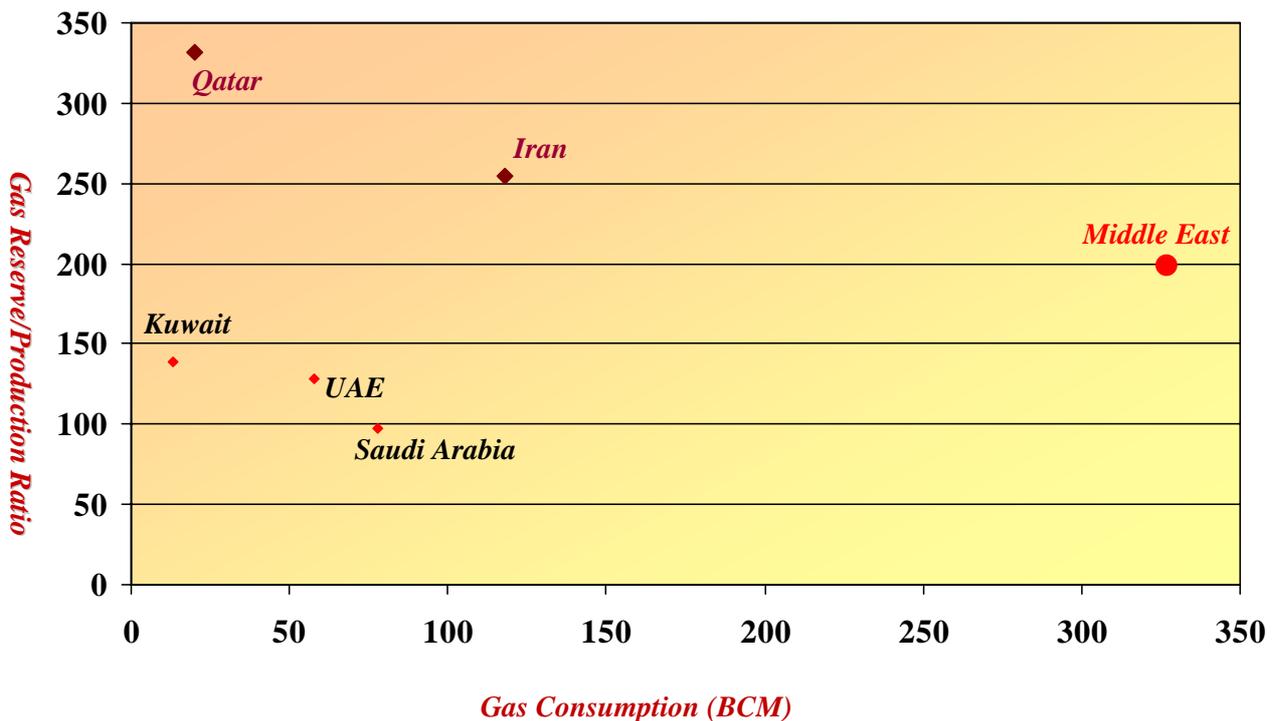
Comparative Study of this index in the Middle East oil and gas sector as well proves the viability of the Middle East in the natural gas market compared with oil (the gas R/P ratio is 199 years, while that of oil is 79 years). Among the countries in the region, Iran and Qatar enjoy the highest index for viability of gas reserves respectively; and Kuwait, UAE and Iran have the highest index for viability of oil reserves respectively (Fig.5).

*Fig.5: Breakdown of Oil & Gas Reserve/Production Ratio in the Middle East (At the end 2008)*



On the other hand, comparing gas R/P ratio index with gas consumption of the Middle East countries in the year 2008 implies the great potential viability of Iran and Qatar in the international gas market. Therefore, in light of the special characteristics of gas reserves of the Middle East countries, Iran and Qatar are the second and third holders of gas reserves in the world, and largest owners of gas reserves in the Middle East, that will occupy a specific position in future international natural gas trade (Fig.6).

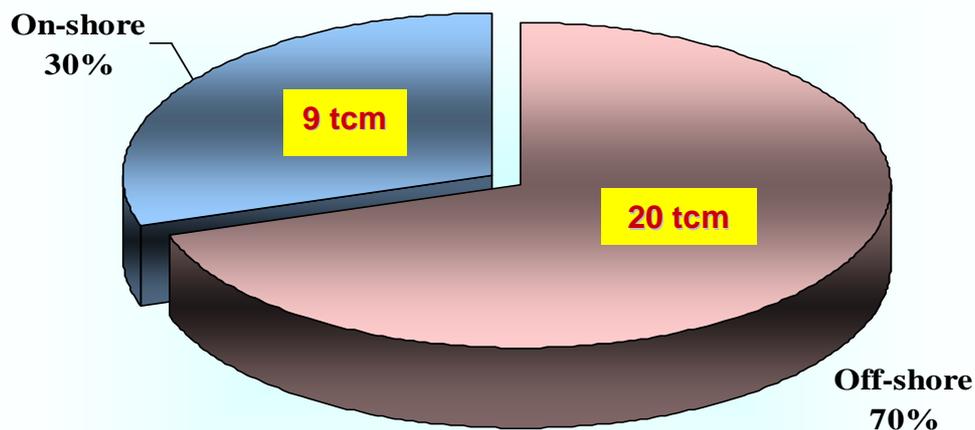
*Fig.6: Breakdown of Gas Reserve/Production Ratio and Consumption in the Middle East (in 2008)*



Iran has been identified as a high priority markets for the gas sectors. The priority is a result of the high gas reserves, high level of investment now and anticipated, to increase gas production from existing fields and developing new gas fields to meet both domestic requirement and export commitment.

Iran gas reserves have increased considerably in recent decade. New exploration caused to increase gas reserves 5.5 trillion cubic meters (tcm) during 1998-2008. Iran is the world's second ranking holder of gas reserves with 29.61 tcm proven gas reserves (in 2008), of which almost 70% is offshore and 30% is onshore (Fig. 7).

**Fig7: Breakdown of Gas Reserves in Iran  
(Year 2008)**



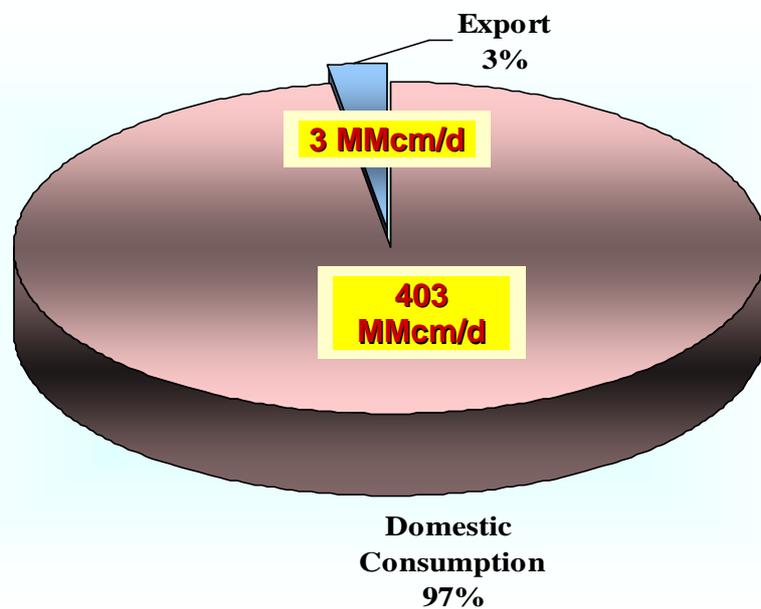
In the area of natural gas, Iran's energy policy objectives defined mainly on the basis of three major principles of establishing the security of supply, increasing the utilization of natural gas resources, substitution gas for oil products and promotion of Iran's status in international gas markets.

To respond to domestic and export requirements, natural gas produced mainly from independent fields, while associated gas is mainly produced for injection into oil fields. The giant South Pars, which is the second largest independent gas field in the world, is a major source of Iran's gas production. This field is situated on Iran and Qatar joint borderline, 97 km<sub>s</sub> from southern Iran. According seismic studies and experimental drilling, the area of the field is estimated at 9700 square

km<sub>s</sub>, 3700 square kms of which is in Iranian waters and the remaining 6000 square km<sub>s</sub> in Qatari waters.

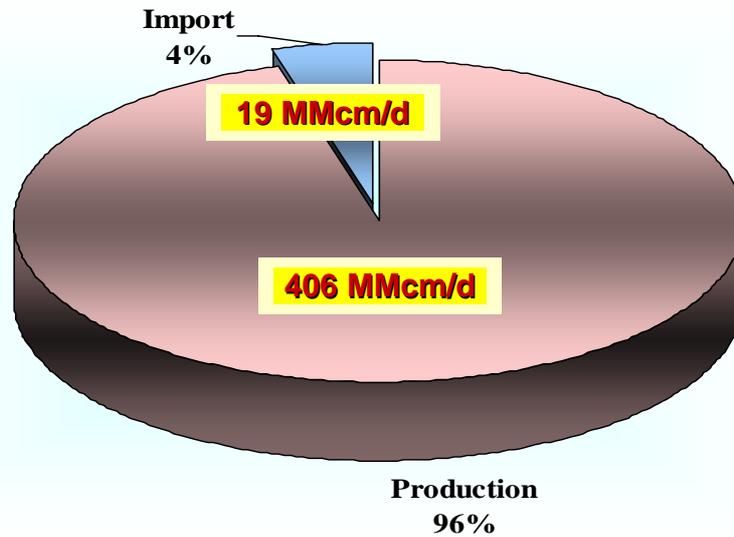
Studies show that lean gas production of Iran has enjoyed annual average growth rate of 7.5% during recent decade (1998-2008) and has reached to 406 MMcm/d in 2008. So far, a significant portion of the gas production allocated to local consumption and only small part exported to international market. Iran exported only 2.5% of lean gas production to other countries during recent decade (Figure.8).

**Fig8: Breakdown of Lean Gas Consumption in Iran  
(Year 2008)**



In utilizing its geographical advantages, the advantages of its neighborhood with gas supplying countries, and in its attempts at reducing gas transportation costs for very long north to south distances in the country, and to meet domestic demand at peak consumption points for certain regions in the country, the Islamic Republic of Iran began importing gas from Turkmenistan in 1997. Iran's total gas supplies (production plus imports) in the recent decade (1998-2008), enjoying an average annual growth of about %7.7, was 424 MMcm/d in 2008. 4% of that total was made up of imports (Figure. 9).

**Fig9: Breakdown of Gas Supply in Iran  
(Year 2008)**



Since 1979, within the framework of gas trade, Iran's energy policy underwent considerable developments. After the culmination of the imposed war in 1988 and the start of five-year economic, social and cultural development plans, expansion of domestic gas consumption and natural gas trade became important goals of the nation's energy policy. Studies were carried out on Iran's activities in international markets, which resulted in the conclusion of two long-term gas contracts.

The contract for import of gas from Turkmenistan was signed in 1995, and imports began in 1997. The term of contract is 25 years and the volume of gas to be delivered is to rise gradually to a maximum level of 8 bcm. To build the required infrastructure, Iran constructed a 40-inch, 60 kms pipeline from Iran- Turkmenistan border to Kordkoi. Iran imported 54 bcm of Turkmenistan gas by the end 2008. It worth to mention, Iran extended this contract last year and based on new extended gas contract, the volume of gas will be delivered increase to rise gradually to a maximum level of 14 bcm by 2012.

The contract for export of Iran's gas to Turkey was signed in 1996. Based on the contract, gas delivery was to begin at a volume of 3 bcm for year, and rise to 7 bcm/y after 3 years. The export volume is ultimately to rise to the level of 10 bcm/y. A 40-inch, 253 kms pipeline was built from Tabriz to Bazargan boarder point for this purpose. Iran's gas export to Turkey formally began in December 2001, and was a turning point in Iranian trade operations in international energy and gas markets. Turkey is in fact the bridge linking Iran and Persian Gulf countries with potential European gas markets. Total gas export of Iran to Turkey was 29 bcm by the end 2008.

Export of LNG along with export of natural gas through pipelines is another objective of Iran within the framework of the country's energy policies. For this reason, the Islamic Republic of Iran has planned the construction of LNG facilities during next 10 years. The Islamic Republic of Iran has taken into account the projects for establishment of three LNG plants with the total capacity of 37 million tons per year in the ten-year Development plan (Iran-LNG project with the maximum capacity of 11 million tons per year, Persian-LNG with the maximum capacity of 16 million tons per year and Pars-LNG with the maximum capacity of 10 million tons per year).

In addition to the above-mentioned projects constructing two other LNG plants, one the CNOOC-LNG project with the participation of China with the capacity of 20 million tons per year (through utilizing North Pars gas field) and SKS-LNG project with the participation of Malaysia with the capacity of 9 million ton per year (through utilizing the gas produced in Golshan and Ferdowsi fields) being studies and negotiated.

I.R.Iran and Qatar, Despite their ownership of huge gas reserves, there are different in as far as their Domestic gas demand potentials, international interactions within the framework of their effort aimed at absorbing technical know how and financial resources, the speed with which they are pursuing their long term gas export goals as well as their proximity to major consumption centers. On the other hand, and due to the fact that maintaining a coordinated pace of gas production and gas export objectives is a major and effective policy in the commercialization of related projects ,bilateral cooperation of the two countries and multilateral synergies with other regional and world gas producers gain a paramount importance.

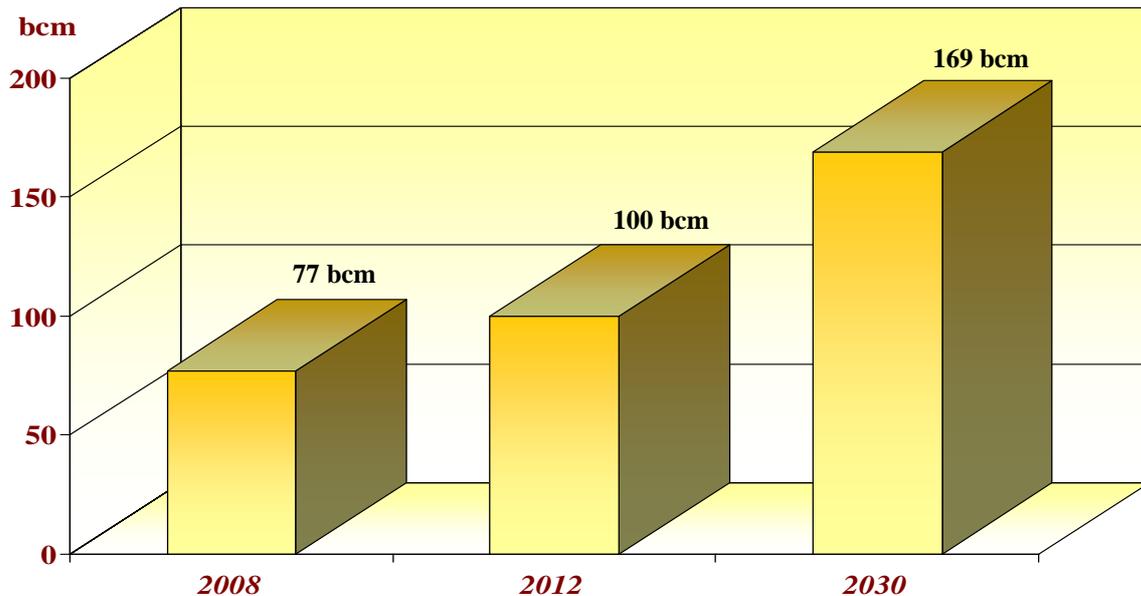
According to oil & gas journal, Qatar's recoverable natural gas reserves stood at approximately 25.5 tcm as of January 2008. This country contains the world's third largest natural gas reserves, behind Russia and Iran, and the largest non-associated gas field in the world. The majority of Qatar's natural gas is located in the massive offshore North Dom field which is extension of Iran's South Pars field.

Qatar Petroleum (QP) plays a dominant role in Qatar's natural gas sector, leading upstream production and playing an important role in downstream projects.

Qatar's focus on natural gas development tends to be large-scale projects linked to LNG exports or the promotion of downstream industries that utilize natural gas as feedstock. Therefore, foreign company involvement has favored international oil companies with the technology and experience in integrated mega-projects, including ExxonMobil, Shell, and Total.

The Qatar's giant North Dom gas field has dominant share in gas production basket (more than 90%). Qatar gas production has enjoyed an annual average growth rate of 14.6% during recent decade (1998-2008) and has reached to 210 MM cm/d (77 bcm/y) in 2008. According to IEA projection<sup>2</sup> Qatar gas production will reach to 100 bcm/y by 2012<sup>3</sup> and to 169 bcm/y by 2030 (Fig. 10).

**Fig.10: Qatar Gas Production (2008-2030)**



Qatar's non-diversified gas resources may act as a factor threatening the expansion of the country's ambitious export plans.

According to the country's energy minister in an October 2007 statement, results of a study to assess the full potential of Qatar's giant North Dom gas field aren't expected until the end of decade. Therefore this country will be not able to expect how much gas will be available to meet its growing gas and LNG export commitments.

Study of Qatar gas consumption trend shows that Qatar gas consumption with annual average growth rate of 3% during recent decade (1998-2008) has reached to 20 bcm in 2008. Gas demand of this country will reach to 23 bcm<sup>4</sup> by 2012, to 28 bcm<sup>5</sup> by 2018 and to 40 bcm<sup>6</sup> by 2030 (Fig. 11).

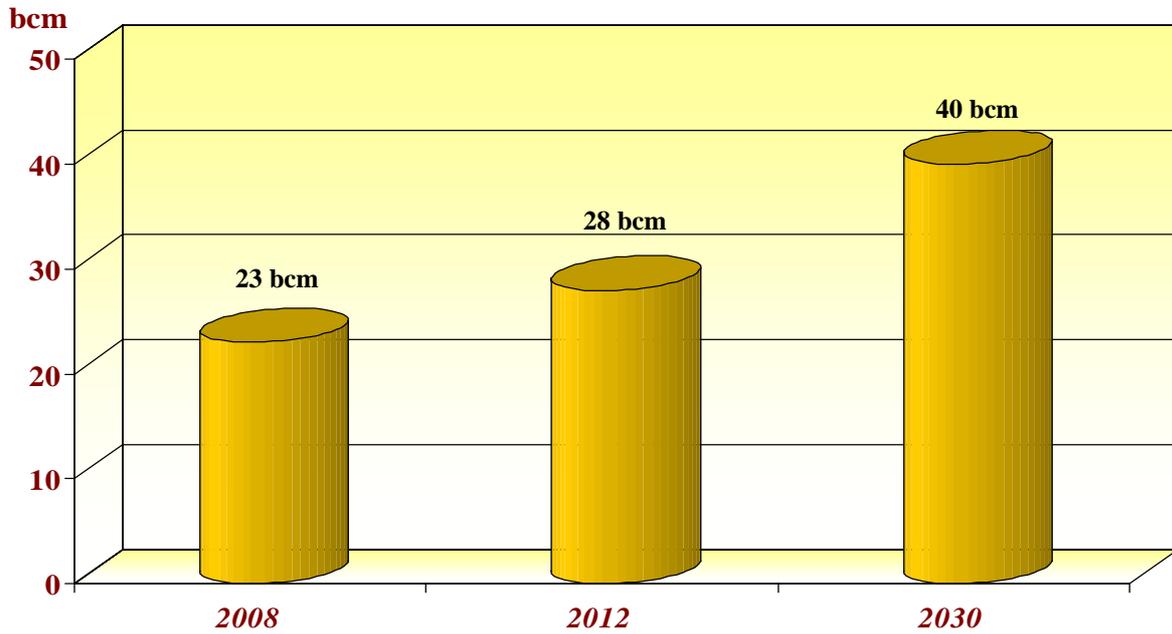
2- World energy outlook 2008(IEA)

3- Anticipated based on IEA-2008 report

4 -Business Monitoring International (BMI) -Report Q3 2009

5- Business Monitoring International (BMI) -Report Q3 2009

**Fig.11: Qatar Gas Consumption (2008-2030)**



A major energy policy of Qatar in the gas sector is increasing its gas exports to major corners of the world in a bid to convert itself into "the gas exports hub in the Middle East."

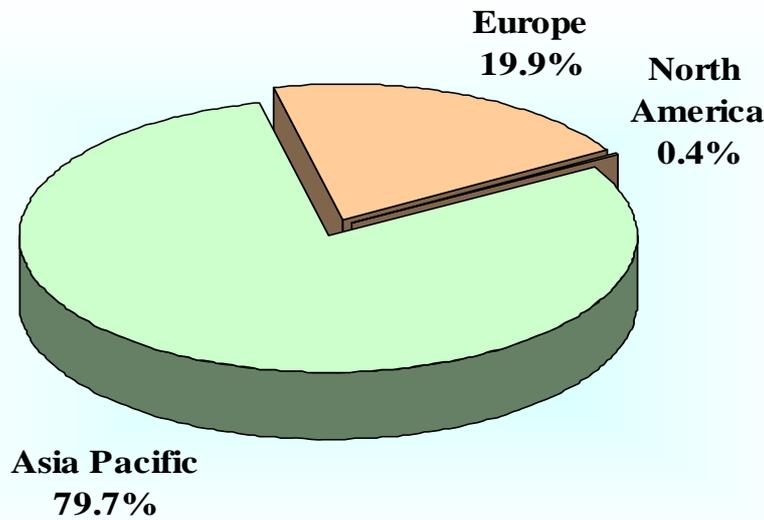
It worth to mention that During 2008, Qatar exported over 74% of gas production (57 bcm ) and only 26% of gas production(20 bcm) allocated to Domestic consumption.

In 2008, Qatar exported nearly 17 bcm gas by Dolphin pipe to UAE and 40 bcm LNG by tanker which approximately 79.7% went to Asia Pacific, 19.9% to Europe and less than 1% to the North America (Fig.12).

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6 -Anticipated based on "Business Monitoring International(BMI)-Report Q3 2009"

**Fig12: Breakdown of Qatar LNG Export  
(Year 2008)**



Studies show Qatar’s gas export capacity will increase considerably by 2012. New gas export (both by tanker and by pipe) capacities of Qatar are as follows:

**❑ Gas export by pipe**

The “Dolphin Project” was initiated in 2000 with the aim of further utilizing Qatar's North Dom field gas resources, in the form of piped gas exports. Gas transmission capacity of this pipe will be about 3.2 billion cubic feet per day (91 MMcm/d). The first phase of the Dolphin Project valued at most \$4 billion, will involve the production and distribution of 2 bcf/d of gas (56.6 MMcm/d) to the U.A.E. Further piped gas exports to Kuwait and Bahrain estimated at 1.2 bcf/d(34 MMcm/d) is expected.

**❑ LNG export**

Qatar LNG industry is specifically in the monopoly of two companies, “Qatargas” and “Rasgas”. Qatargas pioneered the liquefied natural gas industry in Qatar. This company was established in 1984 and since then the Company has progressively established itself as a leading player in the LNG industry. The shareholders in this venture are Qatar Petroleum, ExxonMobil, Total, Mitsui and Marubeni.

Qatar's Rasgas is owned jointly by the public sector company Qatar Petroleum (70% shares) and ExxonMobil (30% shares). This company treats, liquefies and exports LNG to countries across Asia, Europe and North America.

At the present, Qatar’s LNG production capacity is 38 MMt /year (Rasgas, 28.5 MMt/y and Qatargas, 9.5 MMt/y) and according to Projections, the LNG production capacity of this country will increase to 77 MMt/y (equivalent 105 bcm/y) in 2012 (in the case, there aren’t delay in bringing the additional train onstream).

**❑ Gas-to-Liquid projects**

At the present, there is the world’s biggest Gas-to-Liquid (GTL) plant, Oryx, with a capacity of 34 Mbbbl/d in Qatar which was commissioned in 2006. The Oryx project uses about 330 MMcf/d(3 bcm/y) of natural gas feedstock from the Al Khaleej field

The second Qatar’s GTL plant, Peart project, is under construction at the shell (49%) and Qatar petroleum (51%), with a capacity 140 Mbbbl/d. the first phase of this plant is expected to start up at the end of 2010 with a capacity of 70 Mbbbl/d and the second phase at the end of 2011 with a total capacity of 140 Mbbbl/d and use 1.6 bcf/d (15 bcm/y) of natural gas and 100 Mbbbl/d condensate and NGL feedstock.

Regarding to above mentioned, Qatar’s gas production, domestic gas demand and natural gas and LNG export capacity during the next decades will be as follows:

	<b>Unit: bcm</b>	
<b>Year</b>	<b>2012</b>	<b>2030</b>
<b>Gas Production</b>	<b>100</b>	<b>169</b>
<b>Gas demand</b>	<b>167</b>	<b>196</b>
- Domestic demand	<b>23</b>	<b>40</b>
- LNG export	<b>105</b>	<b>105</b>
- Gas export by pipe	<b>21</b>	<b>33</b>
- GTL project (Indirect gas export)	<b>18</b>	<b>18</b>
<b>Gas Supply &amp; Demand Balance</b>	<b>-67</b>	<b>-27</b>

Regarding to Qatar’s gas production and total demand (domestic demand and export) balance as well as Necessity for the meeting domestic gas demand, therefore, Qatar will most probably confront with an “*LNG capacity bubble*” and “*gas pipe capacity bubble*” at least during the next two decades. This reality will be an effective factor in increasing the cooperation between Iran and other world and regional owners of gas reserves with Qatar to contain the “*gas capacity bubble*” and maintaining the economic viability of gas and LNG projects of Qatar.

I.R.Iran and Russia as a first and second priority respectively can have an extensive cooperation with Qatar to reduce and eliminate the “*gas capacity bubble*”, since they relatively enjoy the same conditions as far as their gas reserves and their proximity to the consumer countries, are concerned. Therefore, the scope and volume of these bilateral and multilateral interactions must be on the following common and long term interests.

Iran is acting as a bridge between the Caspian Sea littoral countries to the north and the Persian Gulf and India and Pakistan to the southeast, as well as Turkey and Europe to the northwest. As a result of its huge natural gas reserves, the extensive domestic gas supply network, over 640 km<sub>s</sub> of coastal boarder in the Caspian sea, and over 1200 km<sub>s</sub> of coastal frontier on the Persian Gulf and the sea of Oman, Iran is a decisive factor in eliminate the big Challenge of Qatar’s “*LNG and pipe capacity bubble*” in long-term.

In playing a similar role and in protecting its long term national interests, Iran should always keep the following factors in mind:

- In light of the above-mentioned facts, and Qatar's role in future gas and LNG markets, and also in light of Iran's policy aiming at expanding its activities in those markets, Iran and Qatar's cooperation and ties in the area of commercial gas and LNG activities have to be defined in a consolidated and long term framework, so that political and economic tensions resulting from international disputes would pose the least of threats to Iran's investments in this field.
- To enhance and maintain its gas and LNG projects' economic viabilities, Qatar is to embrace regional cooperation, first with Iran and second, with Russia. Thus, Iran's participation as the main supplier of the feed for LNG installations or the Dolphin pipeline, will increase Iran's vulnerability in the long term, whereas its deeper participation in LNG projects (including the utilization of Qatar's potential liquefaction capacities through supplying part of the gas feeds and compensating for liquefaction costs) and Qatar's pipelines through general joint ventures or unitization contracts between the two countries or their oil companies, would guarantee Iran's long term benefits in a better way. This joint venture could include development of different phases of South Pars, as well as financial, technical and operational cooperation in the establishment of new LNG installations in Iran, together with installation of regional and

ultra-regional gas pipelines. This type of joint venture, on the other hand, will prevent "the loss of Iran's gas and LNG demand potentials in the region and across the world".

- Facilitating the flow of investments together with technical, economic, and managerial cooperation between Iran and Qatar would certainly improve the execution of gas development projects.
- Participation of Iran in the Dolphin pipeline project, with India and Pakistan being its final gas export destinations.
- Iran and Qatar's regional cooperation would break Russia's domination over European gas market and would prevent Russia from keeping Europe's gas supplies under its monopoly. The use of “swap” and “transit” mechanisms alongside "cooperation in financing and liquefaction installations of Iran" as well as "cooperation in supplying the LNG installations' feedstock and even gaining shares in Qatar's LNG installations" can facilitate Iran's penetration into the Middle-East and European gas markets, while hindering "Russia's gas supply monopoly in this region".
- Further cooperation of Iran and Qatar with Caspian regional states (Central Asian countries and Caucasia) in enhancing participation in supplying the gas needs of Nabucco to meet the European gas requirements would increase the role of the Middle East in Europe.

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