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# OPEC and the Fifth Fuel

**Mohammad Amin Naderian**

Undoubtedly, the goals and strategies selected by every organization or country are related to past and prevailing conditions and the context in which they are playing a role. This also applies to the atmosphere of energy decision-making. With a change in the arrangement of dominant factors on the energy scene (whether in the surrounding environment or in the inner structures of the energy sector) the change in contexts, paradigms and energy issue would follow. Since 1970s, the energy issue has been subject to transition along with rapid world changes. These changes and transitions have seriously influenced decisions and strategies adopted by consuming and producing countries.

The unprecedented increase in the world demand for energy, shift of the centers of demand and consumption growth toward developing countries such as China and India, high oil and gas shares in the world energy basket despite all efforts by western industrial countries to reduce them and an increase in the volume of oil and gas trade, falling oil and gas production in consuming countries, appearance of new oil and especially gas geography stretching along Saudi Arabia- Siberia and Canada and also significant changes in the current classification of international system, liberation and privatization of energy markets, increase in environmental worries and alteration in the living pattern in the developing countries at the beginning of the 21<sup>st</sup> century, have all caused compiling of policies aimed at creating a desirable balance between economic, environmental and security goals of energy system which has formed a difficult puzzle.

Today, the economic analysts refer to it as the Es puzzle (i.e. Efficiency, Energy security, Environment).

In fact, the basic question raised by energy policy makers in the current century is: How the required energy can be provided with most security, least pollution and highest efficiency for a sustainable development? In other words, which system can be suggested to ensure supply of energy with less carbon and more security without damaging the development and economic growth of countries and the world? Under prevailing conditions, this question is more like a puzzle named the energy puzzle. One possible solution for this puzzle is to break relations between economic activities, volume of energy demand and the level of greenhouse gas emissions. That is to say, if the world gross production can be increased without necessarily increasing demand for energy and without escalating the volume of greenhouse emissions, then a desirable energy system would be in place and the energy puzzle would be solved. Energy saving (defined as the Fifth Fuel) is one of the most practical solutions for this puzzle.

Since the first oil shock the issue of energy optimization and efficiency has always been at the center of energy policies in industrial countries. A very positive experience also exists in this respect which can be extended from industrial countries to the whole world. In its May 2007 report, the McKenzie Institute for International Studies has concluded that the growth in world demand for energy can be reduced by about 50 percent or even more in the next 15 years through energy efficiency improvements supposing the use of latest technologies and the rate of return of 10 percent or more. This figure will be

equivalent to 135 Quadrillion BTU (equal to 64 million barrels of oil per day) saving in energy. This study indicates that the developing countries like China and India and the Middle East countries particularly oil exporting states enjoy higher capacities for improvement of energy intensity index. In this report, the Middle East countries' share has been declared as 10 percent out of the 135 Quadrillion BTU energy saving in the world. This figure is equivalent to 6.4 million barrels per day for this region. The report mentions that the oil exporting countries have enjoyed economic growth and are paying more subsidies for energy (encouraging an increase in demand in these countries) through receiving more petro-dollars as a result of a hike in oil prices in recent years. The energy intensity in the Middle East countries had been 133.2 tons oil equivalent per million dollar based on parity purchasing power of 220.8 tons oil equivalent per million dollar and average world figure in the year 2004. Lack of attention to the issue of energy efficiency in these regions causes development of inefficient energy structures.

The contents of this report clearly indicate that the oil exporting countries have great potentials for investment in the area of reduction in energy consumption. OPEC member countries have been faced with lack of spare production capacity during recent years. This problem has to a large extent limited OPEC's ability to play its proper role in the international oil and energy markets. In addition, most large and high yield oil reservoirs across OPEC countries are in their second half of their life with their production curves falling. Even maintaining their level of output requires billions of dollars of investment. While carrying out optimization of energy consumption and demand in these countries using latest available world technologies will be much less costly. In this manner, most OPEC members can free more oil and gas for export by reducing their domestic

consumption. Thus by forming an institution within itself for this purpose, the organization of OPEC can create a common authority to follow up these policies and conducting R&D in this area. It seems that pursuing the policy of increasing energy efficiency will bring about a lot of social advantages for the consuming and producing countries under current circumstances.

Increase in energy consumption efficiency in OPEC countries can lead to reduction of demand for energy in the world, and consequently reducing security and environmental anxieties about increasing demand. It could also reduce to a large extent the lack of confidence prevailing in the oil market causing instability in this market and hike in prices.

On the other hand, reduction in energy intensity index in OPEC oil exporting countries increases their capability to raise their oil export, bearing various economic and security fruits for these countries. Therefore, currently it appears that pursuing the goal of energy saving within the framework of an institute for energy efficiency improvement in OPEC countries can bring about a lot of advantages for the energy producers and consumers in the world.

Right now that OPEC is unable to produce more oil to meet world demand, it can resort to production of the fifth fuel (fuel freed as a result of optimization, saving and increased energy efficiency) in order to maintain its historical place and influential position on the world energy markets.

OPEC's expanded measure for production of the fifth fuel in view of its economical and moral logic in protection of the limited energy resources and considering its positive environmental impacts will certainly be supported by public opinion in the western industrial countries. The governments in the industrial countries will also be obliged to cooperate in this respect. Consequently such a measure will also eliminate to a large degree the current pressures on OPEC.

## Europe and Challenge of Fuel Taxes

**During the previous weeks, we witnessed strikes by truck drivers or people engaged in public transport in many European countries against taxes received by governments from oil products especially gasoline and gas oil.**



Since early 1980s, almost all members of the Organization for Economic Co-operation and Development (OECD) initiated heavy taxes on oil products. The industrial countries which are OECD members mainly imposed such taxes to restrict the effects of fluctuations in world crude price on domestic economy and to achieve their energy plans. Continuous effort for energy consumption optimization, reduction of crude oil demand and diversification of energy supply (through providing the chance of competition for other energy carriers) necessitated keeping up oil products' prices for final consumers. None of the above mentioned goals and energy policies of industrial countries could be achieved under condition of cheapness of price of oil products. Also renewable energies, coal as well as nuclear energy were unable to compete with cheap oil. Even part of oil taxes received in these countries is used up to grant subsidy to other energies such as coal enabling it to compete with crude oil and maintaining its share in the energy consumption basket of those countries.

On the other hand, the importance of issues related to the environment in the following decades also encouraged more than ever the continuation of the increase in the rate of tax on oil products. New taxes were enacted named as "Carbon Tax". Certainly the issue of carbon tax was justifiable as far as

such taxes controlled crude oil and products' consumption and helped development of clean fuels. But granting subsidy to coal (having more carbon content compared to crude oil) was not justifiable. In fact, it indicated that energy strategies and policies pursued in industrial countries have higher priority compared to their environmental policies. And when these two contradict each other, it would be energy policies which take priority.

Estimates conducted by the Secretariat of the Organization of Oil Exporting Countries (OPEC) indicate that during recent decades average tax revenues of industrial countries from crude oil and oil products have been more than total revenues obtained by all OPEC members. For example during the period between 2000 to 2006, yearly average tax income of the industrial countries (members of "Group Seven") had been US \$ 50 billion more than total oil revenues of all OPEC



members put together.

Economic characteristics of crude oil and its products as an essential commodity (but with insufficient rate of decrease in demand corresponding to price rise) dictate the reality that the level of taxes should be significant so that it could leave an impact on demand. Among the said seven industrial countries, the United States and England have imposed the least and highest taxes respectively. Revenues resulting from fuel taxes are much higher in European countries compared to non-European industrial countries like USA, Japan and Canada.

In the past, wave of protests against high fuel and energy (especially gasoline and gas oil) prices was directed toward OPEC by the industrial governments. They used to turn public opinion against OPEC. And sometimes they even introduced OPEC as a factor responsible for all economic problems in the world and in industrial countries. But this possibility has not been taken place any more following the new wave of increase in world oil prices occurred during the past two or three years. Apparently, public opinion especially in European countries have realized that: Firstly – OPEC is unable to take any further action and Secondly – a large proportion of what they pay for every liter of oil products goes into their governments' pockets and has nothing to do with OPEC. It seems that revelations by OPEC Secretariat during the past decade with respect to the amount of these taxes have also been very effective.

At present, European countries have been faced with a serious challenge as a result of these strikes. Considering that these taxes are not fixed but are in the form of tax rate, they increase in proportion to the rise in price of the products. Due to limitations in refining capacities, the rate of increase of world fuel prices particularly with respect to gasoline and gas oil has been more severe than that of crude oil.

Under condition of very high world oil prices, currently such taxes do not have their initial justification. Sufficiently high oil prices facilitate saving and consumption optimization plans, diversification plans and creation of opportunity for other energy sources and even environmental considerations. But it seems European countries are facing a number of problems for reduction of these taxes or related tax rates. The first problem is that governments' budgets have become accustomed and dependent to these taxes during the past four decades. With reduction of economic growth rate and consequently reduction of income taxes, the governments' reliance on taxes will also be increased. Of course, it may be possible to change tax rate without changing the absolute amount of tax. But they will face the second problem by doing so. The second problem is mainly related to the European Union (EU). In view of economic integration and removal of boundaries across the EU zone, prices of basic goods should be uniform among the Union's member states. Thus, individual countries can not individually change prices or tax rates. In this respect, reaching agreement in the Union will also be very difficult. As was pointed out previously, another possible problem is that such taxes also act as a defensive cushion or flexible spring for controlling impacts of shifts of world oil price fluctuations to domestic economy and thus can not generally be abandoned.

It is predicted that this challenge will create much more problems for industrial countries particularly European countries especially in case of continuation of current trend of world prices. It will ultimately force these countries to abandon greediness. And even if they do not cancel these taxes, at least they would employ more flexible mechanisms alleviating the pressure of these taxes on people.

**Director**



## NIGC subsidiaries not ready for privatization: Official

The subsidiary companies of National Iranian Gas Company (NIGC) are not geared up for privatization, says Parviz Rahat, a member of Special Committee set up in NIOC to implement Article 44 of Iran's Constitution (calling for the privatization of State-run companies).

According to NaftNews, Reahat added: "NIGC is the only specialized mother company in Iran's petroleum ministry whose subsidiaries are not ready for privatization. This is because the price of gas is heavily subsidized for domestic consumption in Iran,

and that's why the companies in question make no profit".

Providing a comparison, Rahat went on to explain: "Gas is supplied in Iran at a range of Rials 100 to Rials 700 per every cubic meter, while its global price is about Rials 3,000 per cubic meter. That is why no one will be interested in buying the shares of gas companies as long as subsidies are in place".

In related news, Reza Kasaie Zadeh, managing director of NIGC told the Moj news agency: "Article 44 can be implemented in NIGC only when either the price of gas is liberalized or the exact amount paid as gas subsidies are calculated and paid to the private

sector by the government once the gas companies have been privatized".

The NIGC chief had lately proposed the idea of privatizing the 'whole' of NIGC together with all of its 44 subsidiary companies, which he said had not yet been accepted by Iran's Privatization Org.

The NPC boss had also recently proposed the privatization of the 'whole' of Iran's petrochemical industry. Referring to this, Rahat commented: "Yes, it can be done in theory! In practice however, one has to see if the private market is actually capable of digesting such a huge financial burden".

## Contractor soon for 3D of Khanguiran gas field

The contractor for the 3D seismic data acquisition of Iran's Khanguiran gas field will soon be named.

The Iranian Central Oil Fields Company (ICOFC) had earlier held a tender for the seismic operation in this gas field, which is located in Northeast Iran near the boarder with Turkmenistan.

Apparently, the JV of Iran's OEID and the Chinese LPEB is the lowest bidder in the tender and is likely to be awarded the seismic project in the coming days.

The 3D seismic shoot of Khanguiran gas field, foreseen to be concluded in 10 months' time, will be covering an area of 450 sq km, and will be concentrating mainly on the lower layers of the

field including its 'Kashaf Roud' layer. Major other bidders in Khanguiran seismic project were; BGP Iran Kish, Dana Geophysics, OEOC and Kavoshgaran Zharf.



## Sinopec is eager to start Yadavaran project: NIOC MD

In an interview with the latest issue of the Persian weekly 'Shahrvand-e-Emrouz', Sayfullah Jashnsaz, managing director of NIOC, was asked various questions. Following is the translation of excerpts of parts relevant to the oil industry:

Asked how serious he thought the Chinese Sinopec was in developing Iran's Yadavaran oilfield, Jashnsaz replied: "Sinopec is very eager to start the project, but the contract is waiting to receive the needed endorsement by the Economic Council. Hopefully it will be done in a month".

The NIOC boss also disclosed

that Sinopec had already submitted a 2.5-year scheduled plan for the start of oil production in Yadavaran, which would be resulting in the production of some 100,000 bpd of crude.

As for the start of drilling in Iran's exploratory targets of the Caspian Sea, Jashnsaz said: "Fabrication of Alborz semisub drilling platform, which has to be used for the purpose, has been completed and it is undergoing some tests. The trouble is that the three tugboats, under construction in Iran, are not yet ready to carry Alborz to the drilling locations. That is why Khazar Oil Company will be hiring three tugboats".

The NIOC MD hoped that the tugboats would be hired soon

and the Caspian drilling would get underway in a month's time.

The question is how available are the sort of boats needed for the job in the whole region, and then could that one-month window promised by Jashnsaz for the start of drilling in the Caspian be realistic?

Asked about the rumored changes in NIOC management team and the list of 15 top managers to be replaced, allegedly directed from outside NIOC, Jashnsaz denied the existence of such a list and said changes were internal affairs of NIOC and no list was given to him by anyone. He also said he knew nothing about any changes in the management of NIOC Int'l Affairs and its Corporate Planning Dept.

## Saudi summit calls for more oil investment

The final statement of the summit of oil producing and consuming nations issued on Sunday in Jeddah called for more investment in oil production and greater financial market transparency.

The statement also said current record high oil prices and oil price volatility was harming the world economy.

"Current prices and their

volatility are detrimental to the global economy, and in particular the economies of least developed countries," the statement said.

Earlier, addressing the conference, Saudi Arabia's King Abdullah launched an offensive against oil "speculators".

The king announced that Saudi output has risen to 9.7 million barrels a day, the highest figure since 1981, in a bid to defuse market tensions that have forced the price of a barrel up to almost 140 dollars.

He also said his country would give \$1.5 billion to efforts to ease energy shortages in poor countries.

He told the 36-nation summit that Saudi Arabia was "very concerned" about consumers everywhere. He blamed increased oil consumption and taxes on fuel, but added: "Among other factors behind this unjust increase in oil prices is the abhorrent act of speculators seeking to undermine the market."

## Oman and Iran shake hands over Kish project

Iran says it has reached a preliminary agreement with Oman to develop a big gas field on Kish Island involving Omani upstream investment and gas being piped to Oman's Qalhat liquefied natural gas plant.

A work plan has been agreed and a development plan will follow in three months, said Naji Sa'douni, head of Petroleum Engineering & Development Company (PEDEC).

The development of Kish's nearly 50 trillion cubic feet of gas will be under a buy-back arrangement over four years, he said.

The volume of exports to Oman will be 1 billion cubic feet per day initially, doubling by the end of the contract period,

according to Sa'douni.

PEDEC, a National Iranian Oil Company subsidiary in charge of buy-back negotiations, had also been talking with China National Petroleum Corporation about an upstream stake but those talks appear to have stalled.

Project management consultant Pars Petro Zagros Engineering & Services is drawing up a master development plan.

Two onshore wells have already been drilled on Kish, one before the 1979 revolution and the second in the 1990s. Last year, PEDEC commissioned one offshore appraisal well Kish-3 to be drilled by Iranian company Kepco, which has since been trying to secure a jack-up rig for the job.

The drilling of 12 wells to tap the newly discovered gas reserves

in the Persian Gulf was this year awarded to National Iranian Drilling Company (NIDC). The state driller said last week that the contract was now in effect.

Iran has been talking with Oman since mid-2007 about supplying gas from several sources, including Kish and the shared Hengam-West Bukha field, to be piped to the Qalhat facility. The plant, which has a capacity of 3.3 million tonnes per annum of LNG, is underused due to gas shortages.

Oman LNG runs two other LNG trains aside from Qalhat for a total capacity of 10 million tpa, but actual production is below that total.

NIOC announced the gas find in Kish in 2005 with reserves put by some at 48 trillion cubic feet.

## India likely to ink gas pipeline deal with Iran

India is likely to sign the gas pipeline deal with Iran in the next 4-5 weeks, in an exclusive interview to NDTV Petroleum Minister Murli Deora said India has managed to resolve most differences with Iran and that there is no pressure from the US not to go ahead.

He met with the Iranian minister on the sidelines of the Jeddah oil summit. It was an unscheduled meeting but one

that has clearly yielded positive results.

The Left which criticized the government for going slow on the deal have said it's a positive step but they won't be taking the heat off the government just yet, that's because the Left is still strongly against the nuclear deal and according to the CPI's D Raja, the two deals aren't linked.





## Loan for phases 15&16 of S.P certain: Contractor



Allocation of a one-\$ Bln loan for the development of phases

15&16 of Iran's South Pars gas field is now firm and certain, says Rostam Ghasemi, an official of Khatam-ul-Anbia HQ, in charge of the project.

According to Iranian ISNA news agency Ghasemi also said: "The needed approvals for the loan have been obtained from Iran's Economic Council and the Board of Governors of the Foreign Exchange Reserve Fund (FERF), and it will be paid through the country's Bank of Mine & Industry".

Meanwhile, Mohammadreza Pishro, managing director of Bank of Mine & Industry, confirmed to ISNA that the

problem with securing the loan for developing phases 15&16 had been resolved.

In related news, following lengthy debates, NIOC has now decided for certain that phases 15&16 of Iran's South Pars gas field will replace phase 13, but no decision has yet been made on the replacement for phase 13, which was allocated to the 'Persian LNG' project.

Asked to comment on the issue, Gholam Hossein Nozary, Iran's oil minister told ISNA: "To find a suitable replacement for phase 13, we are in talks with Shell and Repsol".

## Russia interested in N. Azadegan and South Pars: Nozary

Russia is interested in developing Iran's North Azadegan oilfield and two phases of South Pars gas field, says Gholam Hossein Nozary, Iran's oil

minister.

According to the Mehr news agency, Nozary added: "Negotiations with Russia were constructive and will probably reach a conclusion in three months' time. They have asked for further data on North Azadegan and the two

phases of South Pars.

Reaching an accord with Russia may need longer, but we are trying to arrive at a deal in the next three months". Russian Gazprom Neft has recently shown its interest to invest in Iran's oil and gas projects.

## AMAK fully ready by summer end

The project to gather the associated gases of Bangestan layers of Ahvaz, Maroun, Mansouri, Abtymour and Koupal oilfields (AMAK), has so far made an overall progress of 99.86%, says Mohammad

Bijanfar, manager of the project with Petroleum Engineering & Development Company (PEDEC).

According to the news agency of Iran's oil ministry, Bijanfar said AMAK would be fully operational by the end of the first half of this year.

The AMAK project started in year 2000 and was supposed to be completed in March 2007. Some 240 mcf/d of the sour associated gases of the said fields was due to be gathered and treated in 7 stations and then loaded onto the national gas grid.

## Iran's OPEC Ex-governor: Fast Growth of Oil Industry, Key to National Strength

**H**ossein Kazempour Ardabili has stepped down from his position as Iran's OPEC governor after working for 24 years and reached retirement. He considers serious and speedy development of petroleum industry as the sole proper way for Iran to promote its national strength. Kazempour sees the current situation in the oil market as worrying for the producers and refers to some behind-the-scene strategic issues with respect to oil. Possible repetition of the Price War can perhaps be considered as his most important warning to OPEC. A selection of Kazempour's recent interviews with Persian language publications is offered here:

- We have recently witnessed a hike in the price of oil despite slowdown in the world's economic growth and lack of decrease in demand along with an increase in supply. This trend does not quite follow the economic logic. In your view, what is the reason for current market development?

Generally, the reduction in demand announced by IEA is linked to past erroneous projections. It means that before the beginning of the year, the buyers project higher figures for demand and later gradually make revisions in the level of their demand projections. This is in fact a part of their technique in order to encourage investment, increase OPEC and non-OPEC supply and try to provide supply equivalent to the declared demand. Today, decreasing reviews are done in

order to reduce the pressure of price hikes. It is a fact that supply is sufficient in the market and sometimes excess supply of oil, gas and unsold crude oil can be seen in tankers on the water. The surplus production available in the market is primarily related to the sour and heavy crude oil. Possibly, we will also observe an increase in their production. These issues have currently occurred simultaneous with economic slowdown in the US economy. This slowdown will also reach to Europe followed by Japan and later



by China and India diminishing previous acceleration of their economic growth rate.

- Are the current price differential rates between various crude oils normal? Did price differentials reach this level in the previous years too?

No, it has not reached this high level. Sour and heavy crude oils produce less gasoline. Consequently demand for light crude oils such as Libyan, Algerian and Nigerian oils will increase when the price of gasoline rises. This level of oil supply is not sufficient for current capacity of gasoline production. The price will sharply increase especially if a crisis occurs (for example in Nigeria). This issue raises the gasoline price and boosts in turn the price of light oil. In these circumstances, gasoline-producing centers are less willing to buy heavy crude. As a result, heavy crude oil produced mainly in Persian Gulf countries such as Iran (like Soroush, Nowrooz and Azadeghan fields) will be left over in the producer country and can not be sold. Therefore, the price gap between various heavy and light oils will be more and more significant. This differential depends on the form of supply and sale of these crude oils.

- In recent days, there were some rumors about reduction of Iran's oil output. What is your view?

This issue will naturally take place. Because loading and keeping 300,000 or 400,000 barrels of oil in tankers everyday would not be possible. We are obliged to reduce production and speed up wells' repairs. Thus, the phenomenon of surplus production capacity occurs. It is hoped that this situation will not lead to a Price War. That is to say excess supply of oil will not cause

competitions among OPEC members to give discounts.

- Some sources estimate the volume of Iran's oil on water as 25 million barrels. Is it correct?

It is likely. Some times Iran kept about 20 million barrels on water.

- At a time when consumers are searching for those responsible for price hike, doesn't Iran's decision to reduce output bring about political consequences?

In my view, if we reach the conclusion that output should be reduced, we should state clearly the volume of our oil on water as well as the level of demand reduction which we are facing. We should then announce that our output will increase as soon as an increase in demand occurs. But if we use this issue against consumers (telling them we shall reduce oil production if they impose sanctions against us), I believe this is not basically in our interest and will be a mistake.

- In March, the brokers signed more than 88,000 paper contracts which was about doubled compared to March last year. It also showed a large increase compared to the paper contracts signed February this year. Why such amount of capitals has suddenly invaded the paper oil market?

The reason that pension funds and investment banks have rushed into the oil sector is because other economic sectors are now facing problems. Thus, investments will mostly be directed toward speculation markets and commodities with high rates of security of supply and demand. Consequently, if future markets generate income, the capital will move toward them. In such a market, the currency value is protected and the rate of

return of investment is suitable. It is only sufficient that new demand is generated in such a market.

- Has this factor so much power to determine the market's direction and keep price up?

The factor is very powerful. Today, incomes of the oil companies working in future market have gone up to such high levels that are called windfall profits. Therefore a portion of an increase in prices is due to existence of huge capitals in future markets showing future prices at high level. When it is seen that price still goes up even when one of the producers raises output by 150,000 barrels per day, it is an indication that the physical or real market's share has been diminished in comparison with the paper market. This creates anxiety for the producers since despite surplus oil production, the market still witnesses price hikes.

- Oil stocks have been highly increased in OECD countries achieving highest ever records. Despite high inflation, stock-building is continuing in the USA. Why are they building stocks with expensive oil?

The USA has constantly added to its strategic reserves. There is a strategic view behind this huge volume of stock-building. That is to say it is always worrying that the consumers store large oil volumes especially at high prices. The experience has shown that such actions may be done with the incentive of carrying out particular plans in the future. Precaution must be taken since increasing stocks in the consuming countries more than the capacity of their resources and reserves should make all producers anxious. Although they claim that stock building is merely intended as a protection against any cut in oil flow.

- Can the increase in strategic reserves be sign of future incidents?-

This can be one of the assumptions but it does not imply that it is definite. However, the experience has proved that the oil consumers try to prevent future crises through increasing their strategic reserves. For example, in various crises such as the Arab-Israel war, imposed war against Iran, occupation of Kuwait, driving Saddam out of Kuwait and attack on Iraq it can be observed that the prelude to such movements have always been increasing oil reserves by the consumer countries. But it seems unlikely the world could bear the cost of increasing stocks for long in order to pile up oil for a future incident. Of course, caution is needed in this respect. Building stocks at these prices suggests that there is a security concern rather than a commercial one.

- The producer countries particularly Iran have not much benefited from the hike in oil price. If the crude oil price has had a good growth rate, in return, equipment and oil installations have been facing with an inflation of 250 percent. How does OPEC confront such a situation?

The price of oil should be compared with its alternatives. In reply to the question that what level of oil price is a just price, it should be said that it would be a price that firstly: provide income needed by the oil producers, secondly: maintains and increases their share in competition with other energy carriers in the market and ensures enough investment for the producer for capacity development to meet extra demand. Also, acquisition of technology and access to the market is naturally a part of this trend.

- Can a figure be specified for it?

A suitable price is a price that oil can manage to compete with other carriers, provides suitable



revenue for oil producing countries ensures investment for them and allows them to have access to the market and latest technology. But it is natural that we are facing with imported inflation in the oil and gas sectors. Because when all are going after development of their resources due to high oil prices, there will be a shortage of rigs and pipes. Also, expertise and



technical know-how will be limited. In addition, the capacity of consultancy firms and engineers will be loaded and prices climb to higher and higher levels. Capacity building should be conducted in proportion to this situation which of course requires time. We are witnessing that our universities are moving toward the petroleum industry and other industries are changing direction and moving in the direction of providing requirements for oil and gas industries. Thus, the price has caused resources to be directed toward the requirements and be allocated in such sectors. Naturally, there are some delays but the reason why people are not benefiting from the growth in the oil price is rooted in the increase in costs. Today, the oil income is used up to import consumer goods. While undoubtedly, the price increase should be the main vehicle for the national economic development.

**- Countries like Kuwait and Saudi Arabia managed to benefit from this opportunity?**

Their foreign exchange reserve funds are very high and have not at all been used up for irregular import of consumer goods as was the case in Iran.

In those countries, the oil revenue has mainly been used up for investment and building infrastructures. Under the condition of economic stagnation in developed countries, many oil producing countries are using their capital for

investment, purchase of factories and engineering and software companies from the developed countries. They are making

huge investments in different areas. All these activities will provide them the opportunity for creation of future wealth.

**- Do OPEC members including Iran and Saudi Arabia have similar policies?**

In my view, Iran and Saudi Arabia have many common points of view regarding the oil issue. There are also many joint interests between these two countries. Competitions that naturally occur in marketing and production should by no means be interpreted as disagreement and something unnatural. We are partners and rivals within OPEC. We are partners to maximize our benefits, increase oil share worldwide and set the price of oil to a desirable value capable of competing with other energy carriers. We believe supply should reach to a level to meet world requirement so that the world is more dependent on this commodity and more inclined to use it and thus reducing attention to other energy carriers. And we can work on this carrier (oil). On the other hand, OPEC members are rivals with each other since we produce a single commodity for selling it to a single market.

- Today, our partnership takes precedence over our rivalry or vice-versa?

We should show tact by always putting more emphasis on partnership. It is completely a wrong policy if our rivalry in marketing and market share harms our partnership (which also involves the nation's public interests). At present, we have entered into partnership with Saudi Arabia. If Saudi Arabia raises its output under US request, this is a political move with little effect.

- During the years you were in OPEC, did you ever have the impression that the US exerts a direct influence on OPEC decisions?

Undoubtedly, USA tries to influence members and their policies. But in my view, it is essentially incorrect that members take decisions under US influence. OPEC is an organization comprising of members grouped together based on national interests and collective will. Recent US charges against OPEC proves this point.

- In your opinion can Iran and USA reach a constructive interaction with each other with respect to oil?

Definitely they can. Political and economic factors are linked together. Anyhow, we have problems with one of the world powers and that power has also announced its problems with us. There are topics defined by the US as its interests and we have also interests for ourselves such as issues relating to Afghanistan and Iraq which can be fulfilled within the national sovereignty of these countries. Certainly as long as we fail to have a united definition of these basic facts, we can not have a dialogue. Of course, there also exist other interests for us such as our interests in Lebanon and Palestine.

- You worked in the oil industry for 24 years. Do you think oil is still a tool of our power and leverage for bargaining or not?

Iran is still the second oil producer in OPEC. We have increased production capacity a great deal (although it is not enough). We must remove all the obstacles on our way for accessing technology and market in the petroleum industry. The removal of these obstacles requires political cooperation with the world. We are going to face problems if the petroleum industry could not play its role in development of economic power (consequently national power). We tried a lot and are trying to minimize the impacts of the pressures. We must try to eliminate the obstacles for development of oil and gas. Certainly such a move is not only related to our petroleum industry. The Foreign Ministry and the government policies should also render assistance to the Petroleum Ministry. Without extensive investments and acquisition of international efficient technology and removal of the obstacles for free access to the markets, in the oil industry, we can only maintain our production capacity for a limited period at 4.2 million barrels per day.

- What is your understanding of the oil market in the future?

There will be more players in the oil market. Other factors are getting ahead of fundamental factors which are influencing the market and in principal this is not good from producers' viewpoint. It should be said that demand will have an increasing trend in future and supply will face limitation. Therefore, the oil price will have an increasing trend in future.

- With Iran's oil experiencing change and transformation, how do you see the future of the petroleum industry?


I hope the obstacles for accessing capital, technology and market in the petroleum industry are removed through a comprehensive policy at the national level to enable this industry to attain its real place in proportion to its share in the world reserve.

# LNG Market Potentials in the Asia-Pacific Region

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## Abstract:

 Today, the transport of natural gas in the form of LNG is considered as one of the most cost-effective ways to provide for remote energy markets need. The importance of natural gas export has encouraged gas-rich countries to build LNG facilities due to the fact that natural gas export via pipelines is mainly limited to neighboring countries. Thus, LNG is expected to play a key role in the global energy markets and natural gas industry in coming years.

In this article, the Asia-Pacific region which is regarded as one of the most decisive and important markets from the viewpoint of natural gas production and consumption are examined. To this end, LNG supply and demand is analyzed and the outlook is depicted for 2020.

This paper reveals that the uncontracted LNG demand in the Asia-Pacific region according to demand reference scenario, will rise to 2.4 million tons and 53.6 million tons in 2010 and 2020 respectively. The region has great potential for LNG import in coming years and it is expected that in 2020 horizon, at least 11.76 million tons and at most 32.7 million tons of uncontracted LNG demand is met by the suppliers out of the region.

Therefore considering Asia-Pacific potential market and Iran's huge natural gas reserves and

because of accessibility of this market, Iran has the opportunity to play an important role in the LNG supply side. It is necessary that Iran's energy authorities should make appropriate decisions in order to secure a considerable share of this market.

Key terms: supply, demand, the Asia-Pacific market, export, LNG

## 1- Introduction:

LNG is taken into account as a competitor for natural gas transported by pipeline to the markets. In the case that the distance is short and markets are relatively large, usually pipeline has the lower cost. In other words, generally LNG is the best technology for transporting the natural gas on the long distances.

Collection of factors such as higher prices of natural gas, decrease in LNG production costs, increase of LNG demand and gas producers' tendency to economic production from remote gas reserves cause the increase of gas trade in the form of LNG.

Regarding the effects of such factors, world LNG trade has started a new evolution and expanded with the Annual Average growth rate of about 10.7% between 1995-2006 period (from 92 bcm<sup>1</sup> to 211.08 bcm). In 1995, there were 8 exporting and importing countries in the world while their number increased to 13 exporting countries and 17 importing countries in 2006.

The greatest development in LNG trade occurred in the Asia-Pacific region. In 2006, about 60% of the

world LNG import belonged to three countries including: Japan, Korea and Taiwan. Because of limited natural gas reserves and the shortage of international pipeline network for natural gas transportation from other regions, LNG import in order to secure the natural gas demand in this region, is unavoidable.

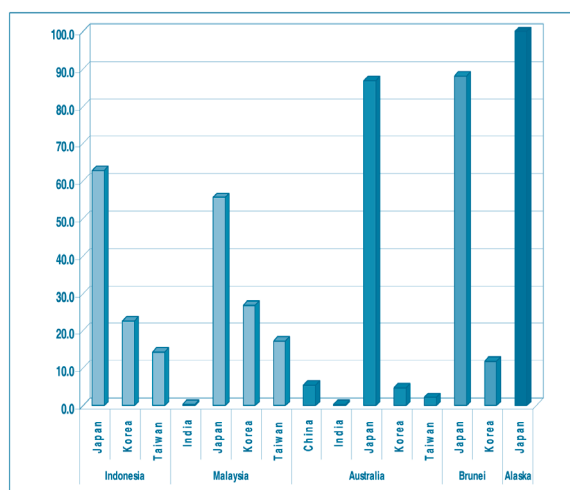
Also the LNG demand in new markets such as India and China will increase in coming years. India's LNG import started in the beginning of 2004, while China started its LNG import from second half of 2006. Similarly, other countries of this region will import the LNG because of energy security problems and limitation or decrease in domestic gas reserves.

Expected developments in the Asia-Pacific LNG demand, will require enough investment in order to build the new capacity for LNG supply. This region has been the world's largest LNG supplier recently and about 41.3% of world LNG market demand was supplied by 5 exporters of this region such as Australia, Brunei, Indonesia, Malaysia and Alaska in 2006. Expected growth of LNG demand at this market will provide an appropriate opportunity for LNG suppliers that have some new capacities under construction or under planning.

## 2- LNG supply:

The growth of LNG production in the Asia-Pacific to a position where it accounts for close to 41.3% of supply has been driven by the needs of Japan, supplemented more recently by the emergence of Korea in 1986 and Taiwan in 1990 as importers. The plants in Alaska, Brunei, Indonesia, Malaysia and Australia were all developed initially to meet the demand of Japanese power and gas utilities in LNG. Trains were added to the Indonesian and Malaysian plants to supply Korea and Taiwan. In 2006, as shows in figure 1, Japan, Korea and Taiwan were the main markets for production

**Figure 1 : Asia-Pacific LNG export in 2006 (%)**



Source: BP Statistical Review of World Energy 2007

from these plants. In 2006 this three countries imported about 98.7% of region's LNG output.

Despite the shut down of two trains at the Arun plant in Indonesia, caused by the failure to find new gas reserve to replace declining production from the giant Arun field, Asia-Pacific LNG production capacity reached to 76.1 mtpa in mid 2007.

In table 1, the capacity that has been shown for Arun plant is based on the contracted volume of LNG rather than the production capacity the four Arun trains that remain in operation. It is expected that further trains at the Arun plant will be close down as LNG sale contracts expire at the end of current decade. Complete mothballing of the plant is expected by around 2010. Alaska's kenai project is also reported to be running short of gas and the existing sales contract may not be renewed when it expires in 2009. The remaining LNG plants listed in table 1, are all expected to remain in production until after 2015.

This region's under construction capacities of LNG production has reported about 40 mtpa that with operation from these projects, total production capacity will increase to 116 mtpa.

It's expected that Tangguh new facilities with the total capacity of 7.6 mtpa as a second Indonesian



**Table 1 : Asia-Pacific LNG production capacity, June 2007**

country	Location/Project	Liquefaction		Storage		Start up
		No.of trains	capacity (Nominal ) mtpa	No.of tanks	Total capacity m3	
USA	Kenai- Alaska	1	1.2	3	108000	1969
Brunei	Lumut	5	7	3	176000	1972
Indonesia	Arun 1 (Train1-3)	3	6.6	4	508000	1978
	Arun 2 (Train4&5)	2				1984
	Arun 3 (Train6)	1				1986
	Bontang 1 (Train A&B)	2	22.2	4	380000	1977
	Bontang 2 (Train C&D)	2		1	127000	1983
	Bontang 3 (Train E)	1				1989
	Bontang 4 (Train F)	1				1993
	Bontang 5 (Train G)	1				1997
	Bontang 6 (Train H)	1				1999
Malaysia	Malaysia LNG	3	8.1	4	260000	1983
	MLNG- Dua	3	8.7	1	65000	1995
	MLNG- Tiga	2	6.8	1	120000	2003
Australia	Australian LNG- NWS (Train1-3)	3	7.5	4	260000	1989&1992
	Australian LNG- NWS (Train4)	1	4.5			2004
	Darvin LNG- Baya undan	1	3.5	1	188000	2006
Total		33	76.1	26	2192000	

LNG production center, can be an appropriate substitute for Arun facilities.

Russia is constructing its first liquefaction plant in Sakhalin that is expected to be operational by the end of 2008. Each train capacity is about 4.8 mtpa and located in the south of Sakhalin. This project feed gas will provide by offshore gas fields that located in the north of Sakhalin. Until now, the sales

contracts of about 6.8 mtpa of this capacities have been signed with Japan (3.4 mtpa), Korea (1.5 mtpa) and Mexico (1.9 mtpa) and the remaining 2.8 mtpa capacity must be marketing. The first plant of this project will be operational by the end of 2007.

Also this region's planned and expansion projects include: four projects in Australia, one project in

Bolivia, Brunei and Indonesia, two projects in Russia and one project in the USA.

Australia's two under construction projects including North West shelf and Gorgon and the Sunrise planned project, has planning based on discovery of the new reserves in the northern and North West shore. One of these projects that are the first floating LNG project in the world will feed from the Sunrise gas field. Total capacity of Asia-Pacific planned projects is estimated about 69.8 mtpa.

Gorgon gas field was discovered in 1980 and new discovery activities at this region increased this field reserves to 50 tcf. Probable plan for transportation of this field's gas by pipeline to NWS facilities that previously considered, at present because of current plans for development a separated plant, has been suspended.

Brunei has plans to add one plant to its facilities by the end of current decade too, but disputes between Brunei and Malaysia upon gas reserve that will feed this plant, have made the realization of this project uncertain.

With the completion of all these planned project,

region's LNG production capacity will increase to more than 185 mtpa.

### 3- LNG demand:

Security of Certain sale market in order to support the investments in expensive facilities of this industry is the one of main challenges in LNG industry that in most cases is taken into account as the most effective factor in investors' decisions.

Although, long term contracts are the basis of LNG sales and purchase in markets, but because of markets liberalization, short term contracts also have had increasing trend and expected to continue in the future too. These markets provide new challenges and opportunities for sellers.

At this section the LNG current markets as well as new and emerging markets have been analyzed.

Japan, Korea and Taiwan are the main buyers at this market. In 2006, the LNG share in Japan, Korea and Taiwan's gas demand was about 96.7%, 99.82% and 85.7% respectively. This region's LNG reception terminals capacity is about 272.5 mtpa that belong to countries such as Japan, Korea, Taiwan, India and China with the capacity of about 178,

**Table 2 : Asia-Pacific under construction LNG capacities, June 2007**

country	Location/Project	Liquefaction		Storage		Start up
		No.of trains	capacity (Nominal ) mtpa	No.of tanks	Total capacity m3	
Indonesia	Bontang Train I	1	3.5			2007
	Tangguh (Irian Jaya)	2	7.6			2008
Russia	Sakhalin (Sakhalin Energy)	2	9.6	2	200000	2008
Australia	NWS T5	1	4.5			2008
	Barrow Island (Gorgon)	2	10			2010&2012
Peru	Camisea LNG	1	4.5			2009
Total		7	39.7	2	200000	

**Table 3 : Asia-Pacific planned and expansion projects, June 2007**

country	Location/Project	No.of trains	capacity mtpa	Start up
Australia	Tassie Shoal	3	2.5	2011
	Pilbara		6	2010
	Browse		10	2012
	Greater Sunrise	1	5.3	2009
Bolivia	Margarita (Pacific LNG)	2	7	2010
Brunei	Lumut (Train 6- Expansion)	1	5	2010
Indonesia	Sulawesi (Donggi LNG)	2	7	2012
Russia	Ust-Luga	1	6	2011
	Murmansk (Shtockman)	2	12	2015
USA	Alaska- North Slope( Train 1-4)		9	
Total		17	69.8	

58.7, 20, 12 and 3.7 mtpa respectively.<sup>3</sup>

In 2006, LNG import accounted for about 32% of regions gas supply that consist of 20% internal trade and 12% imports from out of region.

In 2006, about 63.2% of LNG import was provided from internal trade that Indonesia was it's largest supplier and about 36.8% provided from out of regions mainly by oman, Qatar and UAE.

Japan, known as the largest importer in this region, imported about 60.6% of region's LNG in 2006 and other countries like Korea, Taiwan, India and China contributed some 25.25%, 7.5%, 5.9% and 0.73% respectively to the region's consumption.

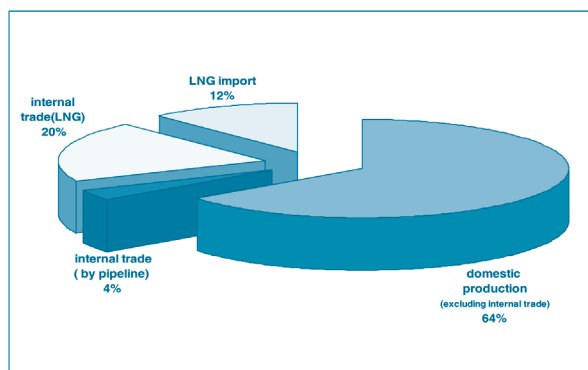
According to IEEJ report<sup>4</sup>, Asia-Pacific LNG demand will increase to about 115.5 mtpa in 2010 and 162 mtpa in 2020 at reference case.

Asia-pacific LNG market's outlook considering long term contracts and demand outlook, will be analyzed in the next section.

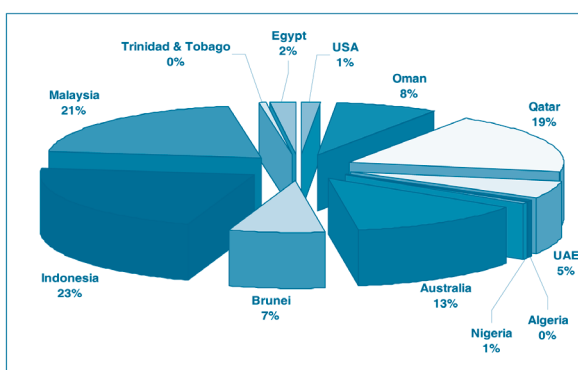
### 3-1- Traditional markets:

#### 3-1-1- Japan:

Japan has very few indigenous natural resources and mainly relies on imports for nearly all of it's energy needs. It started to import LNG to diversify energy supply away from an over-dependence on

**Figure 2: Asia-Pacific natural gas supply structure in 2006**

Source: BP Statistical Review of World Energy 2007

**Figure 3: Asia-Pacific LNG import by sources in 2006**

Source: BP Statistical Review of World Energy 2007

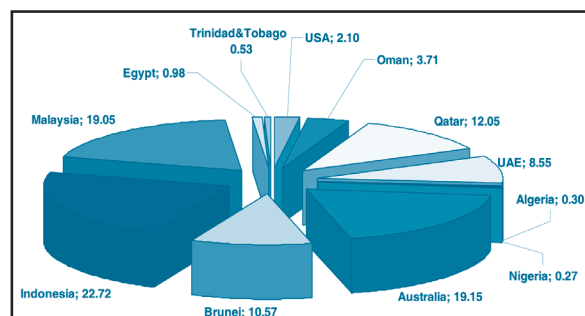
imported oil and to access a clean burning fuel at a time when there was serious concern over pollution in the main cities.

Japan does not have a national pipeline network since the terrain and rights of way issues have made pipeline construction prohibitively expensive. The distribution of natural gas has been achieved by developing LNG receiving terminals on the coastline of Honshu and Kyushu Islands, with the main concentration around the major cities of Tokyo, Osaka and Nagoya. There are currently 25 terminals in operation in Japan, all of which are owned directly or indirectly by the LNG importers. There are individual pipeline networks around each of the LNG terminals and in the main consumption centers of Tokyo, Osaka and Nagoya. These distribution networks are gradually expanding and now reach most of the densely populated areas, giving approximately 65% of Japanese households access to natural gas.

Japanese gas consumption shows limited variation between the months and, hence, the LNG import profile across the year is very flat.

Security of supply concerns have forced Japan to diversify its sources of LNG imports. It bought LNG from all the LNG producers excluding Libya in 2006. Indonesia is the largest LNG supplier to

**Figure 4 : Japan LNG import by sources in 2006(%)**



Japan. In 2006, this country provided about 22% of Japan LNG supply.

Japan has signed some long term contracts with suppliers such as UAE, Australia, Brunei, Indonesia, Malaysia, Oman, Qatar, Russia and USA for LNG import that their volume are more than 60.5 mtpa. The volume of these contracts with regard to expiration of some and conclusion of some new contracts in 2010 and 2020, will reach to 65.2 and 60.5 mtpa respectively.

In 2006, Japan's contracted LNG demand was estimated about 54.8 mtpa. In regard to Japan's estimated LNG demand and long term contracts, this country's uncontracted demand volume will be about 12.5, 21.5 and 30.5 mtpa based on low, reference and high demand scenarios respectively in 2020.

### 3-1-2- Korea:

Korea's first LNG imports in 1986, came from

**Table 4 : Asia-Pacific LNG demand outlook (mtpa)**

	2004	2006	2010			2020		
			Low	reference	High	Low	reference	High
Japan	56.48	60.09	61	66	71	73	82	91
Korea	21.94	25.06	23	24.5	26	26	31.5	37
Taiwan	6.7	7.49	10	10.5	11	12	13	14
India	1.93	5.86	8	8.5	9	15	16	17
China		0.73	5	6	7	12	14.5	17
Others*						4	5	6
Total	87.05	99.23	107	115.5	124	142	162	182



**Table 5: Japan long term LNG contracts during 2010-2020(mtpa)**

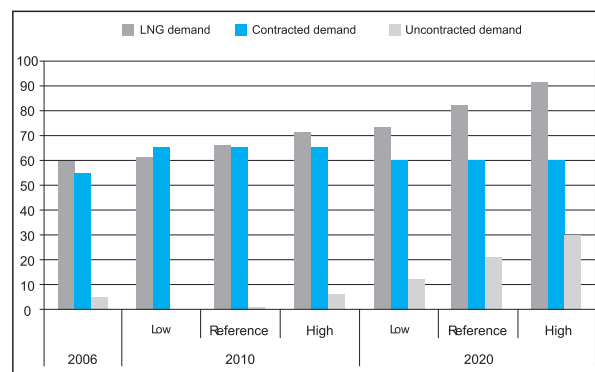
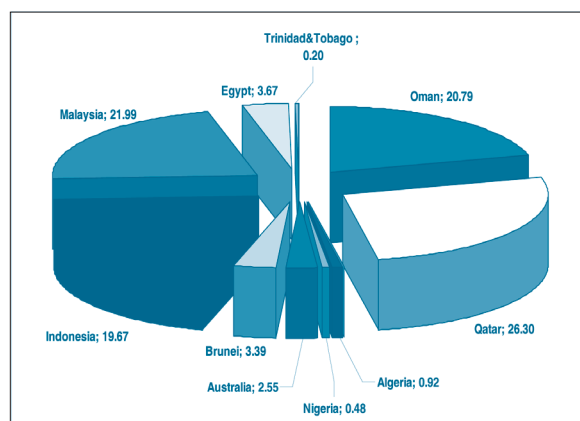
	2006			2010	2020
	long term contracts	LNG import	contracted volume <sup>1</sup>		
UAE	4.3	5.14	4.3	4.3	4.3
Australia	11.8	11.51	11.51	14.2	14.2
Brunei	6	6.35	6	6	6
Indonesia	17.8	13.65	13.65	16	12.5
Malaysia	12.7	11.45	11.45	12.7	12.7
Oman	0.7	2.23	0.7	1.4	1.4
Qatar	6	7.24	6	6	6
Russia	0	0	0	3.4	3.4
USA	1.2	1.26	1.2	1.2	0
Others	0	1.26	0	0	0
Total	60.5	60.09	54.8	65.2	60.5

Indonesia and Malaysia, taking advantage of spare capacity in, and expansions of, projects originally built to supply Japanese buyers. By the mid-1990s demand had grown sufficiently for Korea to underpin the development of a Greenfield development. Commitments to the construction of the RasGas project in Qatar and Oman LNG were made on the basis of contracts with Kogas. In 2006 this country bought LNG from all the LNG producers excluding Libya, UAE and USA.

Kogas' monopoly broke in 2005 when the Pohang steel company (Posco) terminal, at Kwangyang in the south of the country came to

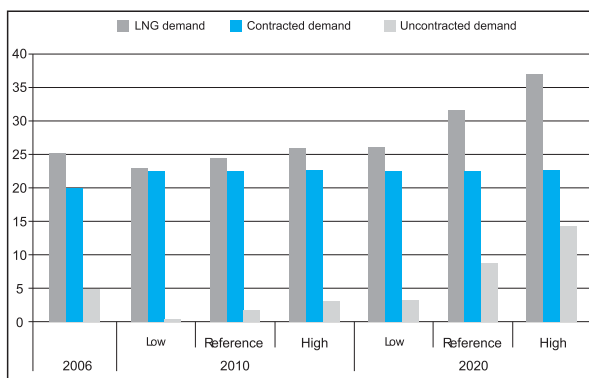
operation.

In contrast to Japan, Korea has developed a natural gas pipeline infrastructure that now extended to most part of the country, making regasified LNG available to the majority of potential consumers. This has encouraged gas use in the residential and commercial and industrial sectors, which accounted for 48% and 17% of consumption respectively in 2003. The remaining 35% of consumption was in the power sector. The dominance of the residential and commercial sector, where consumption is largely for heating, has result in the wide swing between gas use in the winter months

**Figure 5: Japan LNG import outlook during 2006-2020 (mtpa)****Figure 6 : Korea LNG import by sources in 2006(%)**

Source: BP Statistical Review of World Energy 2007

**Figure 7 : Korea LNG import outlook during 2006-2020 (mtpa)**



and in the summer months. Kogas has managed the demand seasonality through a combination of storage capacity, some seasonality in off-take in long-term contracts and the purchase of cargoes on a spot and short-term basis during the winter months.

Qatar is the largest LNG supplier to the Korea and accounted for about 26% of this country's LNG import in 2006.

Korea's LNG import has been increased with the average annual rate of 10.15% during the 1998-2006 and expected that has the most rapid growth between three Asian's major markets.

The volume of Korea's Long-term LNG contracts is about 20 mtpa that will increase to 22.7 mtpa in 2010 and 2020. Its contracted demand was estimated about 19.93 mtpa (about 79.53% of total demand) in 2006.

Korea uncontracted demand volume will be about 3.3, 8.8 and 14.3 mtpa based on the low, reference and high demand scenarios respectively in 2020.

### 3-1-3- Taiwan:

Taiwan is the smallest of the established LNG importers in Asia. In 2006, it imported 7.49 mtpa through a single terminal at Yung-An, near Kaoshiung, in the south of the country. The Chinese petroleum corporation (CPC) operates the terminal and is the monopoly importer of LNG and marketer of gas in the country. CPC has long-term contracts for LNG supply with Indonesia and Malaysia.

The power sector is the main user of natural gas accounting for nearly 70% of consumption in 2003. The main driver of future natural gas demand growth in Taiwan will be the power sector, since government policy is to increase gas-fired power

**Table 6: Korea long term LNG contracts during 2010-2020(mtpa)**

	2006			2010	2020
	long term contracts	LNG import	contracted volume		
Australia	0.5	0.64	0.5	0.5	0.5
Brunei	0.7	0.85	0.7	0.7	0.7
Indonesia	5	4.93	4.93	4.2	4.2
Malaysia	4.8	5.51	4.8	4.8	4.8
Oman	4.1	5.21	4.1	4.1	4.1
Qatar	4.9	6.59	4.9	4.9	4.9
Russia	0	0	0	1.5	1.5
Yemen	0	0	0	2	2
Others	0	1.33	0	0	0
Total	20	25.06	19.93	22.7	22.7

**Table 7: Taiwan long term LNG contracts during 2010-2020(mtpa)**

	2006			2010	2020
	long term contracts	LNG import	contracted volume		
Indonesia	3.5	3.12	3.12	3.5	3.5
Malaysia	3.9	3.56	3.56	3.9	3.9
Others	0	0.81	0	0	0
Total	7.4	7.49	6.68	7.4	7.4

generation for environmental reasons. The government has also wanted to promote the development of an LNG receiving terminal in the north of the country, where demand for both power and natural gas is growing most rapidly.

This country's long-term LNG contracts were about 7.4 mtpa in 2006 and will be constant in 2010 and 2020.

Taiwan's uncontracted demand volume based on reference scenario, will be about 3.1 and 5.6 mtpa in 2010 and 2020 respectively.

### 3-2- New markets in Asia:

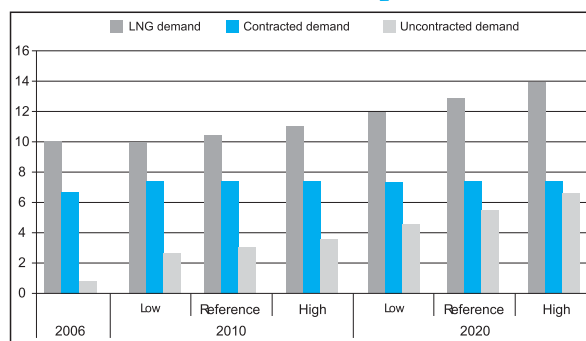
As growth in the LNG requirement in the established markets of Japan, Korea and Taiwan has slowed, producers in the Asia-Pacific and in the Middle East have looked for alternative outlets for their planned output. Middle East producers have the advantage of being able to access markets in the Atlantic Basin, but for Asia-Pacific producers the distance to Europe and the US east coast are too far to make those markets a realistic market option, although they are providing an outlet for surplus production on a short-term basis.

India and China have for many years been seen as markets with the potential to import large volumes of LNG and provide outlets for Asia-Pacific producers. India finally imported its first cargo of LNG in early 2004 and China imported in the second half of 2006. Other potential markets including: Philippine, Singapore, Thailand and New Zealand.

### 3-2-1- India:

In India, natural gas consumption has risen faster than any other fuel in recent years, and the Indian government has been encouraging the construction of gas-fired power generation. The potential for domestic gas production is limited, and pipeline imports face major political and geopolitical challenges, so leaving LNG is well placed to meet rising gas demand. Over the last ten years many LNG import terminals have been proposed around the coast of India but few have moved beyond the feasibility study stage.

At present, 3 receiving terminals are in operation: Dahej, Hazira and Dabhol. The Dahej terminal has been developed by Petronet, a consortium of Indians companies with some foreign partnership. India's first cargo of LNG from Qatar RasGas plant imported into this terminal on January 30<sup>th</sup>. The LNG import increased from 1.93 mtpa in 2004 to 5.86 mtpa in 2006 and this country in addition to

**Figure 8: Taiwan LNG import outlook during 2006-2020 (mtpa)**

Qatar imported cargoes from Oman, UAE, Algeria, Egypt, Nigeria, Australia and Malaysia.

Petronet has signed two 20&25-year contracts for import 7.5 mtpa from RasGas announced plans to double the capacity of Dahej.

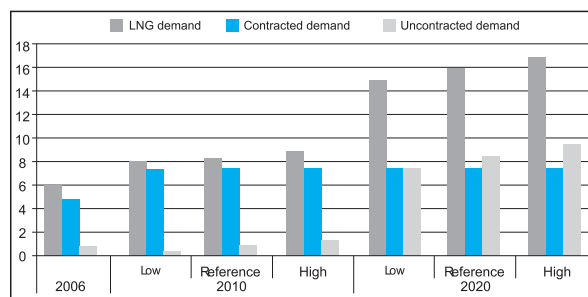
The second India terminal with the capacity of 5 mtpa, came to stream by shell (74%) and Total (24%) at the end of 2004 as well as dabhol terminal with the capacity of 2 mtpa has operated in 2006.

Many of the planned terminals in India had been abandoned or put on hold, but plans for a few had survived, including Petronet's second terminal with the capacity of 2.5 mtpa at Kochi on the south-west coast.

As India enters the LNG Business, the main question over the eventual demand level remain the price at which LNG can be delivered to customers. The price of domestic gas has been subsidized at a level that makes it difficult for regasified LNG to compete, especially in the largest potential demand sectors of power and fertilizers. Petronet had secured an agreement with RasGas for the price of LNG to be fixed for the first five years of supply as a way of helping the market for the regasified LNG development, but many potential customers are still concerned that the price is too high.

India's long-term contracts volume during the period of 2006-2020 is about 7.5 mtpa and uncontracted demand will increase to 7.5, 8.5 and 9.5 mtpa respectively based on low, reference and high scenarios in 2020.

**Figure 9: India LNG import outlook during 2006-2020 (mtpa)**



### 3-2-2- China:

LNG has been on the agenda in China for over a decade as a way of providing a clean-burning fuel to meet rising energy demand in fast growing economies of the southern and eastern coastal provinces, where there are major concerns over the pollution levels. China's first LNG terminal near Shenzhen in the Pearl River delta came on stream at the second half of 2006. The terminal has been developed by a consortium of CNOOC (33%), BP (30%) and the buyers of regasified LNG in Guangdong Province and Hong Kong (37%).

Supply from the terminal will come initially from Australia's North West Shelf project under a contract for 3.5 mtpa of LNG to be delivered on a FOB basis. As part of the deal CNOOC acquired a share in North West Shelf gas reserves.

China's second terminal is planned in Fujian. It is being developed by CNOOC and local interests to receive 2.6 mtpa of LNG under a long-term contract with Indonesia's Tangguh project. Fujian

**Table 8 : India long term LNG contracts during 2010-2020(mtpa)**

	2006			2010	2020
	long term contracts	LNG import	contracted volume		
Qatar	7.5	4.99	4.99	7.5	7.5
Others	0	0.87	0	0	0
Total	7.5	5.86	4.99	7.5	7.5



**Table 9: China long term LNG contracts during 2010-2020(mtpa)**

	2006			2010	2020
	long term contracts	LNG import	contracted volume		
Indonesia	0	0	0	2.8	2.8
Australia	3.5	0.73	0.73	7.5	7.5
Total	3.5	0.73	0	10.3	10.3

terminal will be operate in early of 2008. The deal to purchase LNG from the Tangguh project included the sale by BP of a 12.5% share in the Tangguh project reserves to CNOOC.

At present there are plans for at least 14 new terminals under consideration in May 2007, each with capacity of 2-3 mtpa. If all these terminals go ahead they will take China's LNG import capacity to more than 39 mtpa.

In 2006 China imported about 0.73 mtpa of LNG under long-term contract with Australia's North West Shelf project.

In regard to China's estimated LNG demand and long term contracts, this country's uncontracted demand volume will be about 1.7, 4.2 and 6.7 mtpa based on the low, reference and high demand scenarios respectively in 2020.

Other potential LNG importer at this region including Philippine, Singapore, Thailand and New Zealand that expected their demand increase to 4, 5 and 6 mtpa based on low, reference and high scenario respectively in 2020. These countries

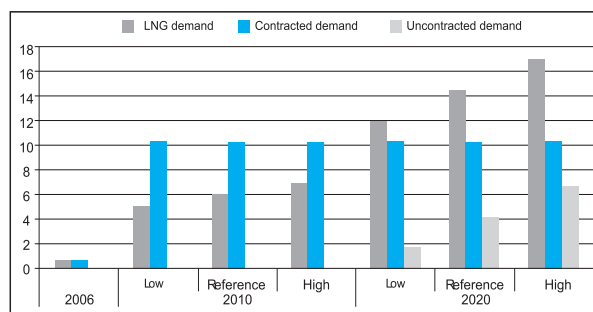
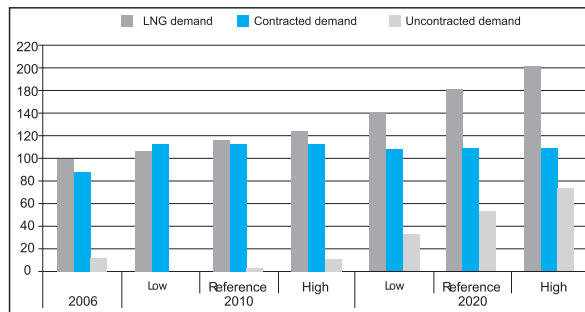
have not signed any contract for LNG purchase yet.

Therefore, total uncontract demand at Asia-Pacific region are estimated about 33.6, 53.6 and 73.6 mtpa based on the low, reference and high scenario respectively in 2020.

#### 4- Concluding remarks:

At present, Asia-Pacific LNG production capacity has reached to 76.1 mtpa. Similarly the capacity of under construction and planned projects are estimated about 39.7 and 69.8 mtpa respectively. Also Arun and Kenai's plants with the total capacity of 7.8 mtpa, will be closed down as LNG sales contracts expire, because of gas shortage, at the end of current decade.

With the operation from some under construction capacities, total LNG production capacity will increase to 103 mtpa in 2010 in this region. This capacity with regard to realistic scenario (operation from 50% of planned capacities), will increase to 142.9 mtpa during next two decade. In optimis-

**Figure 10 : China LNG import outlook during 2006-2020 (mtpa)****Figure11: Asia-Pacific LNG import outlook during 2006-2020 (mtpa)**

**Table 10: Asia-Pacific LNG demand structure during the next two decade (mtpa)**

		2010	2020	
Region's uncontracted LNG demand	low scenario of Asia-Pacific LNG Demand	0	33.6	
	reference scenario of Asia-Pacific LNG Demand	2.4	53.6	
	high scenario of Asia-Pacific LNG Demand	10.9	73.6	
			Realistic scenario of Asia-Pacific LNG production	Optimistic scenario of Asia-Pacific LNG production
Planned increases in Asia-Pacific LNG production capacities that have not signed any sale contractes		1	40.9	61.84
Providing the region's uncontracted LNG demand by out of region's producers	low scenario of Asia-Pacific LNG Demand	•	•	•
	reference scenario of Asia-Pacific LNG Demand	1.4	12.7	0
	high scenario of Asia-Pacific LNG Demand	9.9	32.7	11.76

tic scenario (operation from 80% of planned capacities), it will reach some 163.84 mtpa. Therefore, total increase in LNG production capacity until 2010 (with regard to under construction capacities) and based on realistic and optimistic scenarios for 2020, will be about 26.9, 66.8 and 87.74 mtpa respectively.

Until now, the sales contracts of about 6.8 mtpa of Russia's LNG production capacities have been signed with Japan (3.4 mtpa), Korea (1.5 mtpa) and Mexico (1.9 mtpa). Moreover the sales contracts of about 7.6 mtpa of Tangguh project capacity in Indonesia have been signed with Chinese (2.8 mtpa), Korea (1.2 mtpa) and North

America's (3.6 mtpa) consumers.

Australia has signed some LNG export contracts from it's under construction plants too. These contracts including a 3.5 mtpa contract from plant 5 in NWS project to Chinese buyers and two 4 mtpa contracts with Chinese and North America's buyers from Gorgon project.

So, out of total increase in the region's LNG production capacity by 2010 and based on realistic and optimistic scenarios in 2020, only about 1, 40.9 and 61.84 mtpa respectively, will remain to meet the region's future uncontracted demand.

This region's total uncontracted demand based

on reference scenario, in 2010 and 2020 will be about 2.4 mtpa and 53.6 mtpa respectively. This shortage can be met by both Asia-Pacific producers and others. In past years, about 99% of this region's LNG production has been purchased by domestic buyers (Asia-Pacific buyers), so it is assumed that total capacity of region's new capacities are absorbed by domestic consumers.

In 2010, out of total uncontracted LNG demand, about 1.4 mtpa and 9.9 mtpa based on the reference and high scenarios of demand respectively will be met by the out of region's producers. In the realistic scenario of LNG production and based on reference and high scenarios of demand, about 12.7 and 32.7 mtpa of uncontracted LNG demand will be provided by out of region's producers in 2020 respectively. These volumes with regard to Optimistic scenario of production and high scenario of demand will decrease to about 11.76 mtpa.

Generally, it's expected that in 2020 at least 11.76 mtpa and at most 32.7 mtpa of Asia-Pacific uncontracted LNG demand are met by the out of region's producers.

Asia Pacific region has got great potentials for LNG import in future and the competition between LNG producers for that area will increase. The Middle East countries especially Qatar have been planned for different projects to expand their LNG export to this region and also Russia is constructing its first liquefaction plant in Sakhalin that is expected to be under operation by the end of the current decade. In this regard, Iran and Yemen are also planning to enter into the market.

Therefore, considering Asia-Pacific potential market and Iran's huge natural gas reserves and because of accessibility of this market, Iran has the opportunity to play an important role in the LNG supply side. It is necessary that Iran's energy

authorities should make appropriate decisions in order to secure a considerable share of this market.

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## Endnotes

- 1- bcm: billion cubic meter
- 2- tcf: trillion cubic feet
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- 5- contracted volume (demand) refers to the LNG amounts which is import on behalf of the long term contracts.

## Oil Majors Say U.S. Restrictions Delay Iran Projects



**Source: Wall Street Journal**

Global oil and natural-gas companies seeking to slake the world's energy thirst by investing in Iran are increasingly finding that difficulties accessing U.S. technology because of sanctions are forcing them to delay planned investments in the country.

Despite an urgent need to replenish reserves, Anglo-Dutch oil giant Royal Dutch Shell PLC and Spanish-Argentine Repsol YPF said they wouldn't sign a \$10 billion contract to enter South Pars, the Iranian side of a giant natural-gas field shared with Qatar. Instead, the two oil giants are considering entering later phases of the project.

OMV AG, of Austria, and France's Total SA also have delayed final commitments to enter Iranian ventures. All the projects involve liquefied-natural gas, or LNG, a form of super-cooled gas that can be exported by tanker.

"Due to American sanctions, we can't apply American technology or equipment," Shell Chief Executive Jeroen van der Veer said at a May 20 shareholders meeting. "We will need longer for the preparation of the project."

The impact of these delayed investments is significant. International oil supply from Iran, the second-largest exporter after Saudi Arabia in the Organization of Petroleum Exporting Countries has stagnated in recent years in a range of 2.2 million to 2.5 million barrels a day of oil.

Its natural-gas reserves, second only to Russia, are estimated at 971 trillion cubic feet, including 436 trillion cubic feet for the South Pars field. But projects to extract and export this resource have been delayed. Three phases of the South Pars development handled by StatoilHydro ASA are now scheduled to reach full production mid-2009, two years behind schedule.

As a result, Iran has yet to become a net exporter of gas. It produces more than 16 billion cubic feet of gas daily, but all of that is consumed domestically. Its slow

progress is in sharp contrast with the rapid development of the Qatari gas fields, which are rolling out a string of gas-export projects.

U.S. sanctions against Iran have existed for nearly three decades because of the country's alleged support of terrorism but were hardened with the Iran and Libya Sanctions Act of 1996.

For years, some U.S. companies continued operating in Iran using a legal loophole that authorized foreign subsidiaries to maintain such business. But after the Sept. 11, 2001, attacks and tensions over the country's nuclear program, Washington has started to scrutinize U.S. companies' Iranian businesses more closely, while some pension funds also have campaigned for an end to U.S. business in Iran. As a result, units of some U.S. companies are pulling out.

The U.S. plays a major role in sectors such as oil-field services as well as oil drilling and gas turbines. Halliburton Co., which disclosed about \$50 million of Iran revenue for 2003, ended all works in the Islamic Republic in April last year. The U.S. engineering giant had come under pressure from a New York firemen pension fund and received a U.S. grand-jury subpoena for its Iran business in 2004.

Without U.S. technology, Iran has had to completely redesign its flagship Iran LNG plant — also using South Pars gas — after General Electric Co. said it could no longer sell gas turbines because of U.S. sanctions, Iran LNG says on its Web site. The Web site doesn't specify when the issue arose, and no one responded to a request for comment.

The absence of GE technology could be particularly problematic for future projects. GE's gas turbines control half of the world's market share and are strongly represented in the LNG sector.

Iran denies sanctions are hurting foreign oil and gas investment. "Sanctions are an opportunity," said Iranian Oil Minister Gholamhossein Nozari at an April conference. "So many countries need our gas."