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China in Search of Oil and Sovereignty in the Deep Sea Waters

Emergence of China in the deep sea oil and gas exploration market made headlines in the world last month. At 09.38 hours China local time on Wednesday 9th of May 2012, China National Offshore Oil Corporation's (CNOOC) deep sea drilling mast went into operation.

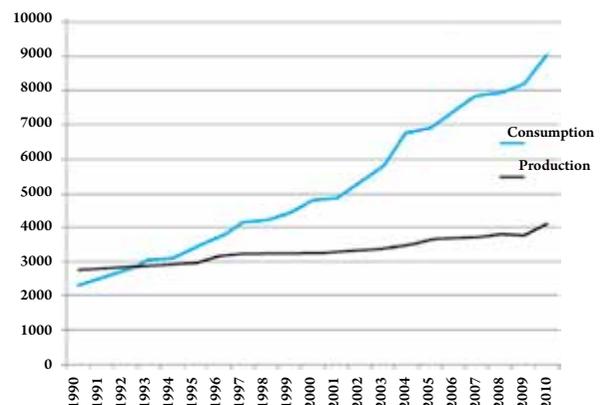
Drilling takes place in the South China Sea just 320 kilometers southeast of Hong Kong where the depth of water is 1500 meters.

It has taken the Chinese corporation three years to manufacture this semi-submersible drilling platform and cost them US\$952 million. The platform is 114 meters in length, 90 meters in width and 137.8 meters in height and weighs some 31 thousand tons. According to China's State Shipbuilding Corporation (CSSC), this mast can drill wells as deep as 12000 meters in waters as deep as 3000 meters. Beginning of these drilling operations is associated with a number of significant points:

1- Due to her high economic growth rate for over two decades now, China's demand for energy has been on the growing more than any other state in the world. Sustainable and high economic growth rate and its impact on the welfare and lifestyle of the Chinese people make higher demand

for energy inevitable. For two years in a row now, China has registered herself as the world's leading consumer of energy. Should China fail to cater for her energy requirements, then her dependence on energy, imported energy in particular can serve as a threat to that nation's hasty economic growth and for that matter, the Chinese maintain a dynamic presence in all spheres of energy production.

Diagram 1 illustrates China's crude oil production and consumption status. China has become an importer of oil since 1993 while pace of consumption has proved to be way beyond production of oil. Currently, China imports over 5.5 million barrels of oil per day and for that matter, the nation is



in immediate need of increasing local output.

Rate of China's production and consumption of crude oil in 20 years (1000 barrels per day)

Consumption Production

South China Seabed is estimated to contain 145 to 190 million barrels of crude oil and 16 trillion cubic meters of natural gas reserves constituting about one third of China's total oil and gas reserves. With deep sea water exploration technologies available, now China has access to these reserves.

Relevantly, China is a Gas Shale rich nation as well, standing third in the world. The Chinese have recently tendered an international bid for the development of their Gas Shale fields.

2- Regardless of reserves available in South China Sea, China's access to the know-how for the manufacture and operation of deep sea water drilling platforms is of key significance. Any sea depth beyond 300 meters is considered deep and drilling in such depths requires access

to sophisticated technologies, for only semi-submersible drilling platforms can be employed in the deep sea waters and only a few countries have access to the technology for the manufacture of semi-submersible platforms. And a restricted number of giant oil companies have access to the technology required for operating semi-submersible drilling platforms. However, this is the first time that a Chinese company initiates to independently carry out drilling operations in the deep sea waters and China is the first among the other five regional states namely Taiwan, the Philippines, Indonesia, Malaysia and Vietnam which has started exploring hydrocarbon resources in the South China Sea.

A Chinese specialist has recently claimed that the above mentioned drilling platform can resist severe sea swells and wave shocks which have emerged since the 20th century as a result of climate change and avoid any accident similar to BP's drilling tragedy in the Gulf of Mexico in 2010.

The Chinese companies are expected to dominate the market for the export of deep sea water drilling equipment and services in the near future.

3- China's drilling operations are carried out in a short distance from a region called Scarborough Shoal. This region



which has been highlighted in illustration No. 1, is composed of a number of small rock islands over whose sovereignty China and the Philippines maintain

age old differences and disputes, therefore, drilling operations by China in this region implies that the Chinese do plan to consolidate their position here, though similar differences and disputes reside between China and Taiwan as well.

In the ceremonies marking inauguration of drilling operations in the South China Sea, the managing director of CNOOC stated: "gigantic drilling masts serve as our portable and strategic weapons for promoting development of marine oil industries." He added: "these drilling operations help us provide security of energy for China and at the same time consolidates our sovereignty in our territorial waters."

This measure by the Chinese triggered the Philippines' wrath and hundreds of Philippine nationals staged protest demonstrations in front of the Chinese embassies at home and abroad.

The recent move by the Chinese and their statements once again reveal the very fact that the question of energy is both political and strategic while oil and gas reserves serve to be geopolitical phenomena."

US Oil Policy and the WTI Brent Sprea



Mohammad Sadegh Memarian

Historically the normal price for WTI has been around \$3/B above Brent, due to the respective crude oils quality differential and the freight costs for transatlantic exports of Brent to the US. As of 2009 the differential has been reversed and widened to around \$20/B and even reached \$29/B in September 2011. Based on our calculation given ongoing political conditions, the reversed value of this spread could be easily extended to \$33/B (including the normal spread of \$3/B).

There was strong consensus among analysts about the main underlying factor for this spread reversal – excessive inventories at the Cushing, Oklahoma, delivery point for West Texas Intermediary crude oil. Because WTI is a land locked crude oil, close to full capacity oil inventories at Cushing will insert a downward pressure on WTI prices.

However, this line of arguments emphasizes the role of market fundamentals and over simplifies the role of USA oil policy and the structure of oil pricing.

After the agreement to reverse the Enbridge oil pipeline as of November 2011, to send oil from Cushing to the Gulf of Mexico refineries and thereby ease the inventory surplus in Cushing, the price correction led to a reduction in the reverse spread of WTI Brent to about \$10/B. The reverse spread remained at around \$10/B, until recently, before once again approaching \$20/B. Now, whenever this differential reaches \$20/B, WTI prices will depend upon Brent and will start moving in the direction in which Brent leads. This is beyond 20\$/B the WTI Brent reverse spread, with taking the role of leader and WTI acting as follower (Figure 1).

This in turn will limit the maneuvering power of US oil policy vis-a-vis Europe to the maximum range of 20-23\$/B at which precautionary oil inventories can be used to

reverse the spread of WTI Brent. This implies that whatever weakens the European oil market will influence the US oil market to the same magnitude. In this way Europe's planned oil embargo sanction against Iran has transmitted itself to the US market in the form of surging gasoline pump prices. This phenomenon highlighted the tightness of the oil market to the White House authorities and has become a major issue in the presidential election campaign.

Through this process, price effect of the Enbridge oil pipeline reversal and consequently the role of overloaded inventories at Cushing have been revealed to be around \$10/B.

If the above picture is correct, then we will still be left with an unexplained value of \$20-23/B out of \$30-33/B, i.e. about \$20/B on current trading screens. Now, if the reasoning for the reverse spread of WTI Brent cannot be explained fully by fundamentals, then it should be investigated through other areas and mainly the geopolitics of oil.

Interpreting the WTI Brent Spread

It not intended to analyze this issue here, but instead to shed some light on US oil policy and the recent olitical developments around the globe through different interpretations of this incident as follows:

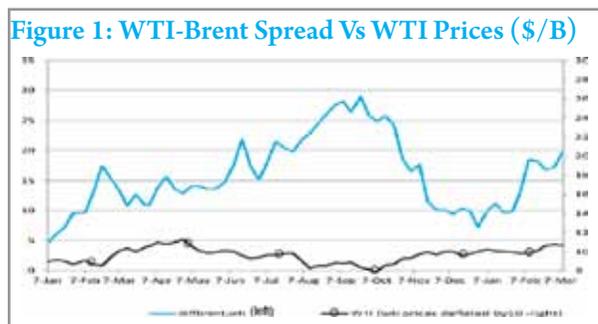
1. The first reading of the reversed spread of WTI Dated Brent prices indicates that the Cold War era has been revived between the West and the Eastern bloc, although with different geopolitical and geostrategic structures.
2. Meanwhile, political disputes between the two sides of the Atlantic Basin have been intensified. Although sometimes volatile and variable, nonetheless their

magnitude is quite deterministic.

3. The US, by using its precautionary inventories, can suppress WTI prices vis a vis Dated Brent. This causes the WTI Dated Brent spread to be reversed to varying degrees from \$10/B to \$20/B recently, after the correction for the Enbridge oil pipeline reversal. In this way, the US has gained a partial advantage over Europe that enables it to overcome ongoing international economic and political pressures on its economy. This could be achieved by keeping WTI prices well below the critical value of \$100/B, beyond which prices are seen as to western countries' economic growth, including that of the US. It is worth noting that the average WTI price for the period 7 June 2011 to 30 March 2012 is about \$98/B. However the US, by refusing European access to the inventories, has caused challenges at a time of international economic crisis. The price for Dated Brent has risen to at least \$10/B and of late to \$20/B higher than WTI, despite the correction through the Enbridge oil pipeline reversal. In terms of total crude oil costs this differential range will amount to around \$13 23/B. This implies that Brent prices will be in the range of \$113 123/B when WTI is hovering around \$100/B. These price levels, given the financial frustrations facing European economies, mean they are for the time being hardly able to recover, which is politically very meaningful.

4. The European embargo of Iranian oil is scheduled to be implemented at the beginning of the third quarter, a season for high oil demand, sometimes accompanied by counter seasonal stockdraw. Now, if the European share of Iranian oil cannot find its way to the oil market and is effectively eliminated, then Europe will have to handle its economic crisis at even higher oil prices.

5. On the other side stand eastern Asian countries like China, Japan, South Korea and India, with powerful economies that could digest more comfortably crude oil prices close to \$150/B. If the recent economic growth of these countries has seen some slow down, it is mainly due to the economic crises in the western countries and especially in the Eurozone area. Since these countries are mainly export oriented economies, shrinkages in demand



in the main western economies will affect the main Asian economies through shrinkages in their exports. Indeed, their economic slowdowns have nothing to do with the current level of oil prices. As evidence quoted by OPEC, "China is considering allowing the three domestic state oil majors to determine local retail oil product prices as long as international crude oil prices are below \$130/B. If the international crude oil price is higher than \$130/B, the government would intervene and set the price."

6. Russia as one of the main players Russia is one of the largest beneficiaries of higher oil revenues because of higher oil prices, but it is also at the forefront of current political disputes, along with Iran.



Iran A Focal Point

Iran, seemingly a focal point of these disputes, is facing somewhat different scenarios with respect to the eastern countries and their self-imposed sanctions:

1. Europe's oil embargo, which theoretically will be effective as of 1 July, will if it is not followed by Asian countries like China, Japan, South Korea and India only result in a redistribution of the world oil supply, given the near full capacity operation of OPEC production. This resembles previously imposed US sanctions against the import of Iranian oil products in 1995. This only resulted in a redistribution of world oil supply, with temporary oil price

rises due to time lag adjustments in oil supply distribution.

2. If the 600,000 b/d that is Europe's total of Iranian crude oil imports does not find its way to the oil market, and if European domestic oil demand is not also reduced accordingly, then the outcome will be a price jump to balance the oil market shortages. Alternatively, it is possible Europe's share of Iranian oil will be met by other producers and tapping oil inventories. In this likely scenario, for the time being the impact on oil prices will be neutralized.

3. A much less likely scenario is that total Iranian oil exports of 2.6mn b/d are completely blocked, due to implementation of a full scale embargo with an assumption that other oil producers will fill the gap. This would be mainly

a psychological gesture, since if there was excess oil production capacity available at this scale there would not be a question of a price crisis at all. Alternatively, it may be assumed that the resulted supply gap could be filled by using western strategic oil reserves. Due to the present disputes within the Atlantic Basin, this is out of the question for the time being. Furthermore,

historically it has been proved that such cooperation needs powerful cohesion. Due to the attitude of IEA members in the past, in practice it would be very hard to rely upon such a strategy as a useful oil policy.

4. Recently announced US European oil policy is to use both approaches together – a combination of tapping US and European strategic inventories along with extra barrels from the excess capacity of oil producing countries. Theoretically this strategy sounds more plausible than the earlier ones. But the basis for this null hypothesis can be rejected, since excess capacity is almost low due to the current oil price crisis. Furthermore, as long as the reverse

spread of WTI Brent continues, using strategic inventories is a political gesture rather than a practical rescue.

In order for recent US European oil policy to be successful, there are at least two prerequisites: the existence of spare production capacity and elimination of the reverse WTI Brent spread. Meanwhile, the time dimension is also another deterministic factor to be taken into account, especially if the duration of any possible conflict is beyond six months.

Ramp Up

US oil policy will continue with WTI prices hovering around \$100/B and Dated Brent prices fluctuating in the \$110-120/B range – price levels that are fully compatible

settlement, which is what all these campaigns are about.

Under these circumstances, historical evidence shows that oil prices will climb to their new attainable equilibrium levels.

In a worst scenario, if Iran faces military strikes, oil prices will be indeterminable. In the short run, due to the high tensions and resultant high oil price volatility, the task of determining the extent of respective political dimensions will become quite difficult, if not impossible. With a lack of such political dimensions, one cannot determine the respective oil price trends. In this scenario, not only will oil prices climb to their maximum attainable equilibriums, even worse, if the created conflict could not be controlled in the short term, then prices may bypass those theoretically

justified equilibriums and hang upon an unconditionally created equilibrium, supported by the uncontrolled tensions and imbalanced world geopolitics.

These processes could be proactively initiated by Iran and are supported by its allies. In such ways, it will allow oil prices easily to bypass the critical level of \$100/B for WTI – as happened recently – and



with the eastern Asian countries' oil policies. Of course, for any price above \$120/B for Dated Brent the respective price for WTI will bypass the critical level of \$100/B. With this scenario for world geopolitics, the ongoing struggle between the US, Europe and Asia plus Russia will result in further weakening of the European Union, most likely collapsing it into a smaller and more efficient union.

Most likely Iran will not face any military strike, but economically it will be squeezed as much as possible. But with huge oil revenues it could resist till a new settlement of the world political order is reached. Politically its future is highly dependent on the shape of any new global political

remain there for at least six months. This initiative by Iran has prompted the IEA to warn that the stand-off between Iran and the West was bringing the burden of oil prices on the global economy near to levels last seen in 2008. As it mentioned in above, after the price adjustment has taken place for the Enbridge pipeline reversal, the WTI Brent spread could widen to a maximum of \$23/B. It has also become clear that when the Dated Brent price exceeds \$120/B, the WTI price will follow suit and passing the critical level of \$100/B. This price level could not only slow the US economic recovery, but also make it worse. The early effect of this has been reflected in gasoline prices in the US.

Japan submits bill to insure tankers with Iran oil

Japan's cabinet ministers approved and submitted a special bill to parliament on Monday to enable the government to provide insurance cover for Iranian crude imports once a European Union ban on insurance and reinsurance takes effect on July 1.

The insurance scheme would enable the Japanese government to provide direct payments of up to \$7.6 billion

in the event of a critical incident on tanker carrying Iranian crude bound for Japan, the transport ministry said in a statement.

Japan intends to keep importing oil from Iran and has been lobbying the EU to be exempted from the ban on insurance and reinsurance of Iran's oil exports, with no indication of success so far.

EU Says Ban on Insuring Iranian Oil Will Proceed as Planned



Europe's sanctions on insurance for Iranian oil shipments won't be lifted or suspended as Asian importers look to governments to cover cargoes.

Insuring ships carrying crude from the Persian Gulf country will be banned when the European Union's embargo takes effect July 1, Michael Mann, foreign-policy spokesman for the 27-nation bloc, said yesterday in Moscow. The rules apply to 95 percent of the world's tankers because they're covered by the 13 members of the London-based International Group of P&I Clubs.

The EU delayed the ban on insurance against risks including spills and collision until July 1 amid discussions with government and industry officials about its global reach. As negotiators meet in Moscow today for talks on the Iranian nuclear program, the embargo's nearing implementation date puts pressure on countries seeking to continue buying the nation's oil as they consider sovereign coverage for shipments.

"Vessels need liability insurance to

trade, and if they want to go to Japan, China or India, where is the liability insurance going to come from?" Mike Roderick, a partner at international trade-law firm Clyde & Co. in London, said by phone today. "The only parties with deep-enough pockets are sovereign governments."

Iran's daily crude exports will fall by 1 million barrels in the year's second half as sanctions enter force, the International Energy Agency estimates. The U.S. and Europe suspect the Persian Gulf country's nuclear program involves weapons development. The Tehran government, facing four sets of United Nations sanctions, says it is enriching uranium for civilian and medical purposes.

Japan's cabinet advanced a bill to provide sovereign insurance to tanker operators that carry Iranian oil. The measure must be approved by the national parliament. Ship owners in India have also asked for government coverage and China has underwritten some shipments, according to the IEA.

Iran's Parsian bank halts guarantees for India imports



Iran's Bank Parsian has stopped issuing payment guarantees for Iranian importers who buy Indian goods, because its account that was set up to skirt Western sanctions does not have the necessary funds in rupees.

New Delhi and Tehran in January had agreed on a barter-like system to settle 45 percent of their \$10 billion-plus a year oil trade in rupees, which are not freely traded internationally, and use them to repay Indian exporters of other goods.

In this arrangement, letters of credit (LCs) would have guaranteed payments and smoothed trade, which could have helped Iran's economy as sanctions squeeze its oil sales and revenues.

"We have decided to stop opening letters of credit because we are committed to pay beneficiaries when

they present (the shipping documents for) the goods," Bank Parsian's vice-president for international affairs, Mohajeri Tehrani, told Reuters by telephone from Tehran on Tuesday.

"From two, three months we are waiting to receive funds from them (Indian oil firms). But unfortunately they have not paid so far to our account with (India's) UCO Bank," Tehrani said.

Indian refiners are waiting to make payments into the account at UCO Bank until New Delhi implements a planned exemption for them from a hefty local tax, which was announced in March and can take up to 60 days to be put into effect.

Uday Narayan Mitra, general manager for treasury, international and finance at UCO Bank, declined to comment.

CNPC says Iraq's Halfaya oilfield in operation



State-owned China National Petroleum Corp said the first phase of Iraq's Halfaya oilfield had started operating and had a production capacity of 100,000 barrels per day.

CNPC, which is the first foreign oil company to sign an oil service contract in Iraq after former president Saddam Hussein was toppled, said the Halfaya project had come on stream 15 months ahead of schedule.

CNPC has started preliminary work on the second phase of Halfaya, which will bring the capacity to 200,000 bpd.

Iraq signed a contract in 2010 to develop Halfaya with CNPC, France's Total and Malaysian state company

Petronas, for a fee of \$1.40 per barrel. CNPC has a 37.5 percent interest in the consortium.

Halfaya is CNPC's largest overseas project as an operator.

Last year, CNPC completed construction of the first phase of Al-Ahdab oilfield in Iraq, with a capacity of 60,000 bpd.

CNPC, the parent of PetroChina, also received its first cargo of crude oil as payment for helping to develop Iraq's Rumaila oilfield last year.

China's crude oil imports from Iraq rose 17 percent on year to 5.95 million tonnes, or 359,000 bpd, in the first four months of this year.

Aramco to boost 2013 rigs to record high

Saudi Arabia may raise the number of its drilling rigs to a record high above 150 next year as it ramps up exploration for unconventional gas, industry sources said. The rigs will mainly be aimed at an increase in drilling for unconventional gas in the

Red Sea area and will include some rigs in the oilfields of Shaybah and south of Ghawar, the sources said. The number of rigs operating in Saudi back to levels seen in the early 2008 oil boom at around 130, up from 100 at the end of the third quarter last year.

Iraq to add 60,000 bpd at south oilfields in June

Iraq will boost its oil production by 60,000 barrels per day (bpd) in June through increased output from two locally developed oilfields in the south, the head of the state-run South Oil

Company said on Thursday. Dhiya Jafaar, head of the South Oil Company, said additional oil output would come from Luhais oilfield in Basra province and Nassiriya oilfield.

US exempts 7 countries from Iran sanctions



The United States said on Monday it would exempt seven emerging economies including India from tough new sanctions after they cut back on oil from Iran, but the punishment still loomed for China.

Secretary of State Hillary Clinton added India, Malaysia, South Africa, South Korea, Sri Lanka, Turkey and Taiwan to the list of those exempt from the sanctions. In March, she

made exemptions for European Union nations and Japan.

Clinton said the seven economies exempted on Monday have all "significantly" reduced crude oil purchases from Iran.

However, the United States did not announce an exemption for China – which is heavily dependent on oil from Iran and elsewhere to power its giant economy.

Japan lower house passes bill to insure Iran oil imports

Japan's lower house passed a bill on Friday to provide government guarantees on insurance for Iranian crude cargoes. The bill will now be sent to the upper house, where opposition parties have the majority

but have signaled their support. It will become law by around June 27 if passed before the current parliamentary session ends next Thursday, said a government official who requested anonymity.

India moves to start rupee payments for Iran oil

India removed a hefty tax and took other steps to ease payments in its rupee currency for some imports of Iranian oil as it seeks to continue purchases - albeit reduced -- in face of Western sanctions

that blocked an earlier payment method. India on Thursday finally exempted payment in rupees for oil imports from Iran from the local tax and allowed advance payment for exports to Iran.

Global Developments in Gas Industry



Natural Gas has several good reasons to play a greater role in global energy mix. This study is conducted to provide the audience with a brief overview and clear picture of global developments in gas industry, from the energy mix to LNG shipping rates.

Saeid Khoshrou

Global Energy Mix

Primary energy use has been rising over the past 20 years, reached 12 BOET (Billion Oil Equivalent Tons) in 2010. Natural gas and Coal consumption has grown with a faster pace than crude in this period. To put it another way, Natural gas has been taken more and more market share so that it accounts for about 24% of global energy use, up significantly, during the past two decades. Oil remains the world's leading fuel, at 33.6% of global energy consumption, but continued losing market share for the 12th consecutive year.

Regions differ from one another in their energy mix, for

example in US, coal and natural gas accounts for less than 70% while in Middle East, they accounts for about 99%. China, as the largest energy consumer in the world, has a completely different pattern for energy use. Coal accounts for about 70% of its energy mix while gas accounts for only 4% of its energy use. With this energy mix and fast-growing economy, china is, and will remain an attractive target market for gas exporters in foreseeable future.

There are several reasons why natural gas will play a greater role in the global energy mix. Compared with other fossil-fuel, natural gas leads to lower emissions of greenhouse energy gases and local pollutants. It can help to diversify energy supply; so improve energy security. The global natural gas resources base is vast and widely dispersed

geographically. Total recoverable resources could sustain today's production for over 220 years.

The share of natural gas is set to continue increasing in the future and according to recent IEA study it will surpass the coal consumption and will take the second place in Energy mix, with a growth of 4% of its share. Power Generation remains the dominant sector for gas demand. It is projected to account for about 27% of global energy mix in 2035.

Global Reserves

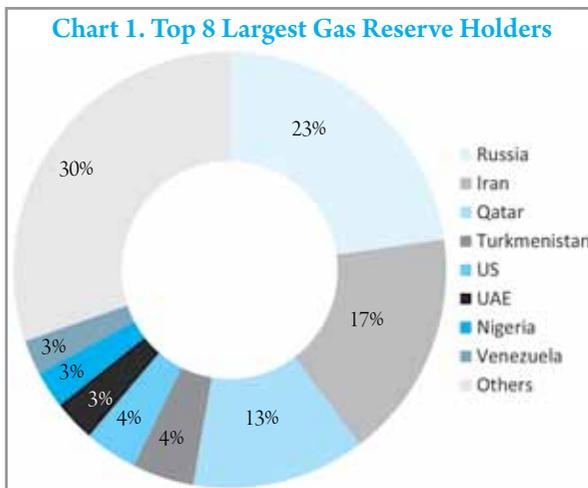
Proved conventional Natural Gas reserves were estimated at about 187 in 2010, up from 126 in 1990. According to Cedigaz, gas reserves has increased more than 7 tcm in 2011. Middle East share of these resources is about 40%, grow 7% from 1990. More than 70% of world gas reserves are located in 8 countries (see chart). Russia, with 24%, Iran with about 17% and Qatar with 13% are the biggest natural gas holders. According to recent study conducted by Cedigaz, entitled "Natural gas in the world," released in Dec. 2011, global Proved Natural Gas reserves are estimated at 195 Tcm. The Middle East showed the highest increase, (+3.5) mostly as a result of new additions/re-evaluations in Iran. CIS also showed a strong increase (+1.4) mostly in Turkmenistan.

EIA estimated unconventional natural gas reserves at around 196 tcm. With taking them into account, total recoverable natural gas could sustain today's production for about 220 years. Contrary to conventional gas

reserves, unconventional gas reserves widely dispersed geographically, from US to China. India, China, and Indonesia are projected to have a significant Shale Gas reserves but they are still in the early stages of development of unconventional gas. With a production of about 150 Bcm of Shale Gas, the US has had an impressive performance using unconventional gas reserves. A study prepared for an American natural gas trade body by IHS Global Insight, forecast that shale gas will account for 60% of all natural gas production up from 32% now, in America by 2035 and support 16m jobs. The study projected that capital spending in American shale gas would amount to \$1.9 trillion



between 2010 and 2035. For Americans, shale gas means cheaper heat, cheaper electricity, cheaper transportation and more jobs. That is the reason why the US put plenty of investment to increase production of shale gas. Although, use of hydraulic fracturing in unconventional gas production has raised serious environmental concerns and might lead to put a pressure on its production growth.



Supply and Demand

Global natural gas production significantly increased to 3.19 tcm in 2010, with a significant growth of 7.3%. (y-o-y), and reached around 3.3 tcm in 2011. Production growth slowed by half in 2011 and is expected to slow further in 2012, with total production increasing 2% to 3.45 tcm, according to JBC Energy forecast. The US and Russia are top producers with a production of about 650 and 640 bcm in 2011. Despite that, we anticipate a decline in Europe gas

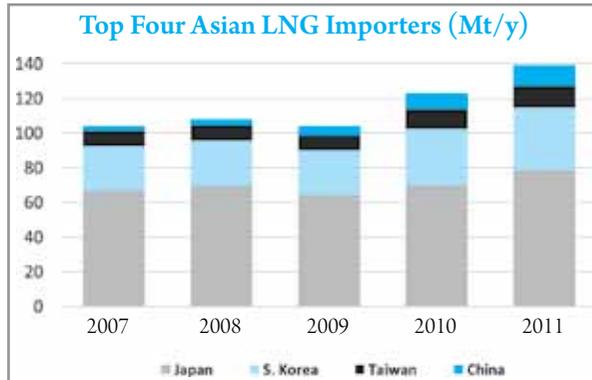
production in 2012. The Middle East, Asia and Africa are driver factors of production growth. The biggest production additions are anticipated to come from the middle east (+35), Asia (+13), and Africa (+11). JBC Energy estimated total gas production in the Middle East to grow to 558 bcm this year. In Asia, total supply may rise to about 488 bcm, mostly seen in China. India is the major Asian country where its gas output is anticipated to drop to 40 bcm (-2 bcm y-o-y) in 2012.

Looking at longer-term, according to IEA Global Gas Production will reach 5.1 tcm in 2035, Unconventional Natural Gas will account for about 24% of total production, up from 12% now. China becomes one of the world's largest gas producers, although to satisfy rising domestic demand, imports will also be needed.

World gas consumption growth slowed to about 2% in 2011, down from 3% in 2010. JBC Energy expects it to remain unchanged at 2% in 2012, with a total consumption reaching 3.44 tcm. Asia, the Middle East and Central and South America will be the drivers of demand growth. Gas demand in Asia is expected to grow by 40 bcm reach 668 bcm in 2012.

China's appetite for gas continued to grow in 2011. According to most recent figures, natural gas consumption in china grew more than 25% in 2011, reached about 134 bcm, gas imports increased to around 31 bcm, up 90% year-on-year.

In Europe, gas demand is forecast to decline by 1% to 576 bcm. A stagnation economy in the region is partly to blame. European gas import requirements should fall 1% to 264 bcm this year.

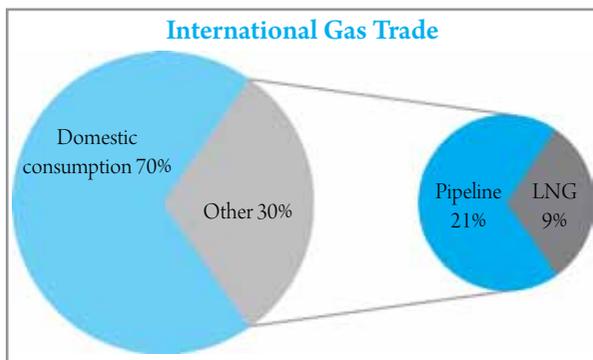


Trade

Global gas production is estimated at around 3.3 tcm in 2011; One-third of it was traded. Global natural gas trade was increased by a robust 10.1% in 2010 and another 10% in 2011. LNG accounts for 30.5% of global gas trade and sets to continue growing. A significant rise in LNG shipments was driven by a 53.2% increase in Qatari shipments. Among LNG importers, the largest growth was seen in Japan, SK and China in 2011. China imported 31bcm natural gas in 2011, a growth of 90 year on year. China LNG imports leapt 31% to 12.2mt in the same period. Japan and South Korea LNG imports surged 12% to 78.3 mt and 36.5 mt respectively.

European LNG demand increased significantly in the first half of the last year but in the early of second half entered a downward trend. Higher-paying and fast-growing Asian market leads to LNG absorption. It is worth mentioning that US re-exported 24 cargoes since 2010; 19 of them in 2011. Of these, 12 cargoes went to Asia, nine to Europe and three to South America. Substantial increase in the US shale gas production is the primary reason for this trend.

World pipeline shipments grew by 5.4% led by growth in Russian and Turkmenistan (+17) exports in 2011. Russia and Turkmenistan showed significant increase of pipeline exports. Russia exported 150 bcm of gas to Europe in 2011, up from 138.6 bcm the year earlier. Russia meets more than 50% of Europe's gas import requirement. Germany, Turkey, and Italy are the biggest gas importer from Russia. (see the chart)



Infrastructure

LNG Industry composed of 25 liquefaction Plants with a capacity of 280 mt/year. Only two export projects are schedule to come on stream in 2012, with total capacity of 9.5 mtpa (million ton per annual). In a longer-term, eight new liquefaction plants are expected to come on stream by the end of 2015 providing 50 Mt/year production capacities, of which six are currently under construction. The trend of expansion in LNG supply has accelerated since the Japanese nuclear accident in March 2011, which created even greater demand for LNG. As a result, LNG liquefaction projects in the pacific Basin are now of greater interest to companies and have been given a new impetus to move forward.

Global re-gasification capacity sharply increased by more than 40 Mt in 2011. Two terminals are slated for start up, an addition of 8.5 mt/y to the re-gasification capacity. It is expected to increase 20% by the end of 2015, an additional capacity of 126 Mt/year. Of which, 21 projects with total capacity of 79 mt/year are already under construction.

Pipeline wise, the first line of Nord Stream with a capacity of 27.5 Bcm/year opened in early November 2011 and, the launch of second line is scheduled for fourth quarter of 2012. The full capacity is 55bcm per year when the second phase is completed. Gazprom and its foreign partners are to start feasibility studies for the third and fourth lines of the Nord stream gas pipeline in the next few months. Nord Stream pipes Russian natural gas under the Baltic Sea to Germany and onward to Europe, bypassing Ukraine,

currently the main route for Russian natural gas to Europe.

In central Asia, Turkmenistan-China pipeline is expected to reach its full capacity of 30bcm/y.

Prices

After a freefall during 2009, gas prices in Asia and Europe rebounded reaching about \$18 in Japan and \$10 in Europe. In Europe prices were last seen at about \$9.40 mmBtu, 12 % higher than a year ago. Turning to Asia, spot LNG is finally showing signs of stabilizing after spending much of 2011 around \$18 mmBtu.

During the first half of January the Nymex Henry Hub

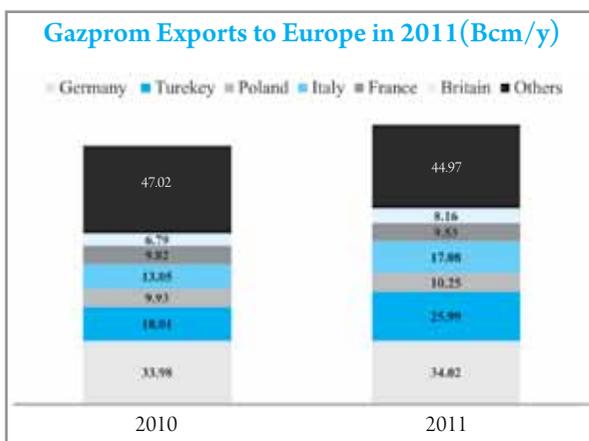


dropped to ten-year low of around \$2.3 mmBtu and shocked producers into cutting output. On Jan. 27 second largest producer, Chesapeake, announced an 8% (5.2 bcm per year) cut to production which its impact was brief.

In Japan, prices haven't fall significantly compared with other regions. But it has increased over the past 2 years. After earthquake and Tsunami and nuclear crisis, Japan started to take LNG cargoes from every exporter throughout 2011, even sourcing volumes from Norway for the first year on record.

In Europe and US annual average gas prices sharply dropped. In Europe prices rebounded to about \$10 mmBtu but in US there is no signs of rebounding, mostly thanks to Shale Gas production.

According to Gazprom figures, between 31 January and 11 February, calls from Europe for extra gas supply rose to some 50% above expected levels. At the same time, domestic gas demand also climbed to about 2 bcm per day.



As the Russian government obliged Gazprom to prioritize domestic supply, the spikes in demand across the two market saw the company struggle to fulfill gas requests. Gazprom decreased gas deliveries to Europe. As the result, day-ahead prices at the main European gas hubs, had spikes as high as \$16 per mmBtu. However, prices quickly normalized at a price below \$10 per mmBtu.

Storage levels, at about 164 bcm in Atlantic Basin is still well above the three year average, approaching to Spring with this Storage surplus, adding more pressure on sentiment. JBC energy expected gas price to gradually increase in US but still well below than other region. In Asia, gas price will be lower while, in Europe will be higher. It can be interpreted as a possible price convergence between regions. In the US, another month of low inventory draws kept the Nymex Henry Hun front month contract around \$2.5-\$2.6 per mmBtu. Inventory levels were reported at 76 on February 24.

In Asia, spot LNG March prices was reported \$14.70 per mmBtu, while prices for April delivery had climbed to over \$15 per mmBtu at the beginning of March.

LNG Shipping Rates

Big price difference between the regions make LNG charter market Red Hot, the situation became so dire that leading ship owner, Golar LNG brought a 36-year-old tanker, Gimi, back to service for charter.

Since topping \$100,000 per day for the first time last July, LNG tanker charter rates have been on an upswing, buoyed by strong growth in Asia demand and ongoing shortages of vessels. In the first two months of 2012, day rates for Conventional-seized LNG carriers averaged range from \$120,000 per day, 50% more than a year earlier. It is worth noting charter rates in 2010 averaged just \$43,600/day, according to Morgan Stanley.

One reason for the ongoing tightness is that only a few new ships are expected to be delivered this year and only a handful of existing vessels will be available for re-charter. Just two, or possibly 3, new carriers are expected to enter the service in 2012 to add to the 374 now in the global LNG

fleet. This is the lowest annual number since 2001. Even though 22 new carriers are expected to be delivered next year, the market is so tight that "shipping capacity is expected to remain a bottleneck beyond 2013," according to Morgan Stanley.

Rising number of LNG purchasers, higher volumes of LNG trade, dwindling number of newly built vessels and less LNG imports by the US were associated with the sharp increase in shipping charges. The number of LNG importing states has jumped from 12 to 23 in the past ten years. During this period of time, construction of LNG import terminals has doubled and even tripled to the



extent that currently the capacity of re-gasification units is two times more than gas liquefaction units. This is under circumstances that few suppliers or purchasers of LNG have access to majority of LNG carrying vessels within long term contracts, thus, concurrent with growth in

regional demand, significant pressure is exerted on LNG carrier market.

The sharp rise in the US gas production due to higher volumes of available shale gas and a drop in local demand include some other factors impacting bloom of LNG shipping market. The US produced 650 billion cubic meters of gas in 2011 compared to 442 billion cubic meters in 2007 while, imports dropped over 50%. Therefore, more LNG was available to be supplied to the European and Asian markets. For instance, until 2008, over 75% of Trinidad and Tobago's export LNG was supplied to the US market, a figure which currently stands at less than 25% and the rest is supplied to Europe and Asia. The distance between this

country and European and Asian destinations is four times more than that of the US. The same is true in the case of African exporters of LNG such as Algeria and Nigeria.

Qatar can play an adjusting role here. This country may transfer a portion of its LNG products to various markets. If Qatar signs more term contracts with buyers in Northeast from the Atlantic Basin so long-haul trips to northeast Asia from countries like Nigeria and Norway would be replaced with shorter-haul journeys from Qatar, freeing up ships and keeping rates from rising. However, in case Qatar insists to supply LNG to European markets even at lower prices, one can expect a more tense situation in the market.

Sum Up

To conclude, natural gas will play a greater role in global energy mix. Natural gas is a flexible fuel that is used extensively in power generation and competes increasingly in most end-use sectors. Gas resources are abundant, well spread across all regions and recent technological advances have supported increase global trade. Unconventional natural gas resources are now estimated to be as large as conventional resources. With such a vast gas reserves, conventional and unconventional, and globalization of LNG trade, gas supply security is no longer a severe issue. Unconventional gas production becomes increasingly important, meeting more than 40% of the increase in demand.

Timely and successful gas industry development depends on a complex set of factors. Lower economic growth, greater cost or other obstacles to unconventional gas production, higher achievements in energy efficiency, changes that improve the relative competitiveness of other fuels, are some of the uncertainties about the gas development. Yet uncertainty in other energy sector can be seen as an opportunity for natural gas.

Global primary gas demand is expected to reach 5.1 tcm and the share of natural gas in the global energy mix increases from 21% to 25 % in 2035, pushing the share of coal into decline overtaking it by 2035. Gas will replaces some coal in power generation in china, India and the United States.

The strongest centers of growth in natural gas production

are expected to be the Middle East, Russia, Caspian Sea region, North America, China and Africa. China becomes one of the world's largest gas producers, although to satisfy rising domestic demand, imports will also be needed. China ambitious policy of gas use, lower growth of nuclear power and more use of natural gas in road transport are driver factors of increasing the share of gas in energy mix.

Effective, transparent and stable regulatory frameworks are still needed in some regions, particularly for unconventional gas. Trade between the main world regions will increase of around 620bcm split evenly between pipeline and LNG. Natural gas markets are becoming more



global and regional prices are expected to show signs of increased convergence, but the market does not become truly globalised.

North America will remain largely self-sufficient and is therefore likely to be essentially isolated from inter-regional trade. China will grow to become one of the largest importers of natural gas globally, as Russia and the Caspian region increasingly export both west and east.

The different overall global energy mix results in differences in the required type and scale of energy-supply infrastructure. Cumulative investment in gas-supply infrastructure amounts to around \$8 trillion, but there is slightly reduced supply investment in other fuels. In the near term, there is an urgent need to invest in LNG capacity in some regions. The pricing of gas relative to other fuels has a strong influence on fuel choice. The increasingly demand is fully met, but the market progressively tighten and the gas glut disappears before 2015.

Shale Gas, Asia Demand Focus of WGC

The impact of growing gas supplies on the global energy landscape and the prospect of deeper declines in Iranian oil exports as Western sanctions bite will dominate talks at a gas conference in Malaysia.

The World Gas Conference in Kuala Lumpur takes place this year in the heart of the Asian region, where energy hungry economies such as China and Japan are driving rising gas demand.

The same countries are wrestling with how to ensure short-term oil supplies if the flow from Iran is disrupted.

Global gas demand could rise by more than 50 per cent between 2010 and 2035 and account for a quarter of the world's energy mix, overtaking coal to become the second-largest primary energy source after oil, the International Energy Agency has projected.

The world is also seeing cheap new shale gas supplies from the United States, which could compete on world markets with traditional suppliers of liquefied natural gas, such as Australia and Qatar.

Oil executives, regulators and industry experts will also discuss how to exploit potentially massive shale gas reserves in China, as well as big gas finds in East Africa and other places such as offshore Israel.

Growth in gas trapped in shale formations in the United States and China over the next 20 years could match gains made in conventional gas in Russia, the Mena combined, the IEA has said.

Global energy markets are also set to be transformed by deeper cuts in Iranian oil exports, with European Union sanctions targeting shipments by one of the world's top producers due to kick in from July.

Low US gas prices have prompted a string of United States LNG export proposals over the past year. Natural gas in Europe and Asia is several times more expensive than the United States, where record production from newly developed shale deposits has pushed prices to 10-

year lows.

LNG exports from the United States will put pressure on existing suppliers to Asia, who have been selling it at crude oil-linked prices.

Already, Chinese and Japanese companies have been signing up for future US supplies and investing in North American LNG export facilities, including one in west Canada.

Japan, the world's largest LNG importer, has been racing to secure supplies to replace lost nuclear capacity following the Fukushima nuclear power crisis.

Explorers are turning their attention to East Africa after the recent large gas finds. Discoveries in eastern Africa in the past year have sent shares in small explorers soaring, prompted takeover battles and rattled gas producers in other regions.

Thailand's PTT Exploration and Production is in a bidding war with Royal Dutch Shell for UK-listed Cove Energy, which has an 8.5 per cent stake in a gas find offshore northern Mozambique.

The heads of Exxon Mobil, Shell and Total, and state oil companies such as PetroChina and Malaysia's Petronas, are due to attend the conference and will also focus on the pace of growth in the Asian region.

BP has said natural gas is projected to be the fastest growing fossil fuel globally to 2030 at an average annual rate of 2.1 per cent, with non-OECD countries accounting for 80 per cent of the global rise in gas consumption.

While natural gas has a strong long term demand outlook, concerns are rising that the euro zone crisis could spark an economic slowdown globally and hurt energy consumption. Weak demand in Europe could prompt the world's largest gas producer, Russia, to change its strategy and target China instead.

Other suppliers will also be targeting China, where gas only accounts for about 4 per cent of its energy mix compared with about 25 per cent in developed countries.