Energy & Geopolitical Risk

Volume 3, No. 11 December 2012

International Gas Pricing: Change And Challenges

Fracking: The Newest Unconventional Petroleum

Palestine And The Arab Spring

IEA Iraq Oil Outlook 2012: A Critique

ثِق بها، إعتمِدها.

مَصرفُ لبنَانَ

Energy & Geopolitical Risk

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COMMENT

International gas does not benefit from liberalized markets, writes James Jensen. However, markets are changing rapidly causing substantive changes in prices globally- after decades of long-term contracts that saw very little changes.

The gas industry originally developed as a series of isolated regional markets. But, cross-border trade began to develop, creating different systems: gas-to-gas competition; oil price indexation; bilateral monopoly; as well as five other categories applied to internal markets, with subsidies to domestic customers.

As a result of market developments, witnessed lately in Europe, the US, and the Far East (China and Japan), Mr. Jensen concludes that: The long-term contracts in continental Europe and Asia are likely to remain, but in an uneasy mix with commodity competition; Europe may resolve the issue by a clumsy "administered market" approach that may model as if it is actually a gas-to-gas commodity market; Asia is likely to retain oil-linkage, but the level of discounting is uncertain, as more and more suppliers seek its premium prices. The prices become vulnerable to arbitrage and new low-cost competition; It is still not clear what approach the pricing among Russia, China and the Caspian states will take.

Hydraulic fracturing (fracking) is a process that has been in use in oil and gas production since the 1940s and is currently used in thousands of wells annually. But the use of fracking – and the controversy about its use – has escalated rapidly in recent years. The IEA estimates that current shale oil production from the Bakken formation in North Dakota averaged 600,000 b/d and 300,000 b/d from the Eagle Ford shale in South Texas. Combined US shale oil production from the Bakken, Eagle Ford and the emerging Nobrara, Texas Permian Basin and the Californian plays is expected to reach over 3.2mn b/d by 2025. Meanwhile, the surge in North American shale gas production besides bringing local gas prices to historic lows and improving

the competitiveness of gas against other fuels, is also having a significant effect on global markets. The IEA observes that, until a few years ago, the US was expected to become a major LNG importer, instead , "LNG imports have shrunk to a tiny proportion of demand and the US and Canada are set to become LNG exporters once the infrastructure is in place in the middle of this decade." However, Mr. David Knott points to the concerns that fracking has raised: an extremely water intensive process in which millions of gallons of fluid (a mixture of water, sand and chemicals including ones known to cause cancer), injected underground at high pressure. The process also involves trucking in and out materials and equipment with vast amount of toxic waste- all of which contribute to air and water pollution risks.

One of the failures of Western political and media reporting of the "Arab Spring" uprising during the past two years, has been to ignore the Palestinian connection, argues Mr. Tim Llewellyn, who points out that the West's news media and its politicians, are guilty in this matter- but even in the Arab world itself, Mr. Llewellyn adds, it seems that whatever Palestinian elements have been introduced into the reverberations the past two years have been emotional and ephemeral, without practical application of any kind for the Palestinians. In the case of Egypt's revolt, for example, it appeared for a while Egyptian manifestations of revolt against the Mubarak regime was going to have concrete results for the Palestinians- especially for those in Gaza. Hopes were high that the new and revolutionized Egypt would, at the very least seek new regional alliances with Turkey or Iran, and a far more rigorous opposition to Israel and political and physical help for the Palestinians.

But, one major problem for the whole Arab world, and Egypt, is how Islam and its tenets can be applied to a youthful, questing and revolutionary population, packed with vociferous women, who are at every practical level of the nation's political, academic, scientific and cultural life and development.

International Natural Gas Pricing: A Challenge To Economic Modeling

James Jensen*

North American Gas Benefits From A Liberalized Market

Unfortunately, international gas does not benefit from liberalized markets, which results in severe disequilibrium. There is, as a result, quite an imbalance today, as reflected in the international gas markets, as illustrated by average regional prices in 2011:

US Prices at Henry Hub - $4.00

UK Prices at the NBP- $9.20

German Imports from Russia at Waidhaus- $11.33

Japanese LNG (as Liquid)- $14.67

The IEA in its *World Energy Outlook 2011(WEO)* expects some degree of disequilibrium to continue for 2020 with the US ($6.70), Europe ($13.00), and Japan ($16.20).

The Question Is How To Deal With These Price Discrepancies

The gas industry originally developed as a series of isolated regional markets, often with their own government-dictated pricing system. However, as cross border trade began to develop, particularly for the European and Russian pipeline grids and for LNG, internally consistent pricing systems for trades emerged, setting precedents that largely remain in place today.

In a 2009 survey, the International Gas Union (IGU) attempted to catalog the various gas pricing systems currently in operation throughout the world. The IGU listed eight different systems, three of which are

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** *A presentation to the Energy Information Administration (EIA), Washington, D.C., 23 August, 2012*

utilized for cross border trade, as follows: (1) gas-to-gas competition – gas priced in open, free-market trade (North America and the UK); (2) oil price indexation – prices are set by formula under long-term contracts (The European Continent and Asia); (3) bilateral monopoly – the dominant pricing mechanism in deals involving the Former Soviet Union (FSU), Central and Eastern Europe and China. The other five categories apply to internal markets and most commonly are used to subsidize domestic customers (The IEA treats these as energy subsidy systems).

Ironically, Russia participates in three categories: It prices gas to European customers with Western oil-linked long-term contracts; in its dealing with FSU countries and China it utilizes bilateral monopoly pricing; and it fixes internal prices administratively, in order to subsidize its own customers.

In general, there are two major challenges to the utilization of economic models in international natural gas price projections: (1) The coexistence of market-responsive commodity gas with long-term contract supply whose pricing clauses do not reflect changes in gas prices; (2) The participation in the market of countries that do not play by Western economic rules, either in pricing to their own customers or in cross-border trade.

Why Are Contracts Needed?

Major pipeline and LNG projects are capital intensive, often front-end loaded and commonly debt-financed. Hence, the traditional long-term contract is a means of allocating risk among buyer, seller and the financial backers.

Accordingly, to protect the financial backers, a credit-worthy buyer and seller assume the debt service obligation; their risks have been traditionally shared according to the old adage, "The buyer takes the volume risk and the seller takes the price risk." That is why the traditional contract has a take-or-pay obligation for the buyer and a price escalation clause for the seller. These are usually linked to oil prices.

Why Not Switch To A Gas Market Indicator?

Since the buyer with a gas market indicator (Henry Hub, the UK's NBP, or the Dutch TTF) can easily lay off his unwanted volumes in the spot market, his risk is reduced. Risk has migrated upstream to the seller.

When confronted with gas-to-gas commodity markets in North America and the UK, LNG suppliers adapted to what might be described as "self contracting": they assumed the debt service obligation

themselves and added the gas to their supply portfolios. For example, the first three Nigerian LNG trains were sold on traditional contracts by the NLNG Venture; however, much of trains 4 and 5 were sold to ENI, Shell and Total, partners in NLNG for later resale. While the self-contracting partners assumed greater risk, they obtained destination flexibility as an offset. The value of this greater destination flexibility was illustrated in 2009/2010: When Qatar's plans for substantial shipments to the US were dashed, the ability to divert those shipments to other markets, such as Asia, proved to be a major advantage.

Meanwhile, one of the problems in liberalizing European pipeline contracts is that their fixed routing usually precludes the destination flexibility tradeoff. Older pipelines, which are largely paid off, can more easily accept spot market flexibility; while systems that are contemplating major expansion and need financing – such as the "fourth corridor" lines to the Caspian and Middle East – may not be willing to do so.

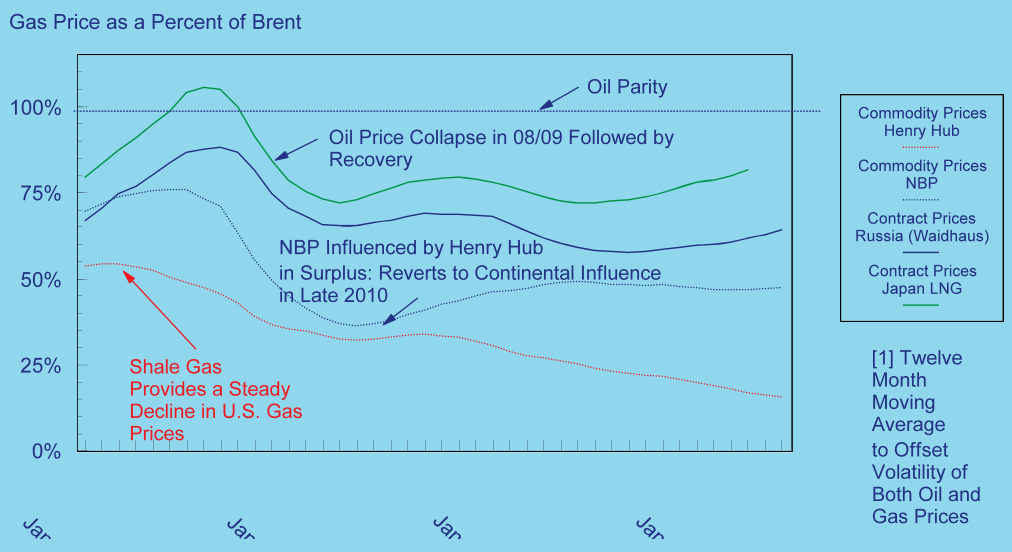
Oil Linkage And Oil Parity

While oil linkage is sometimes confused with oil parity, the two are very different and depend on the design of the price clause.

The North American Price (Henry Hub) is a gas-to-gas commodity price completely independent of oil, while European price clauses are typically linked to oil products prices and Asian clauses are linked to crude oil.

And while the UK also has a fully liberalized market, it is now a net importer. In an LNG surplus, Atlantic Basin arbitrage tends to drive its prices (NBP) down towards North American commodity prices, but when LNG is tight, they rise towards continental oil-linked levels.

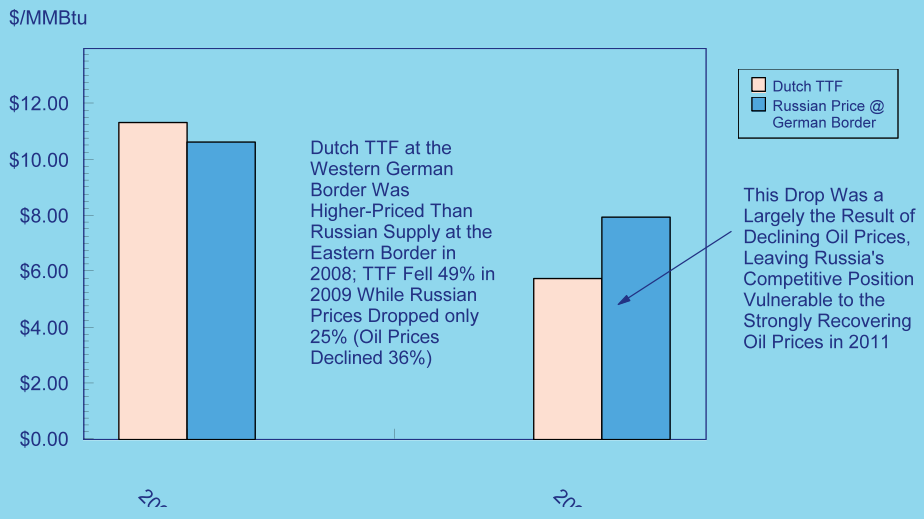
Figure 1
OIL LINKAGE IS NOT OIL PARITY
PRICES OF CONTRACT AND COMMODITY GAS AS A PERCENT OF BRENT CRUDE OIL PRICES
TWELVE MONTH MOVING AVERAGE [1]



The market events in 2009/2010 (the worldwide recession; a long-awaited surge in LNG supply; and the development of shale gas, taking North America oil out of the market for LNG imports and sharply reducing regional gas prices) unleashed competition among the three somewhat incompatible cross-border pricing systems, forcing them to adapt to one another. Hence, the growing surpluses transmitted North America's very weak pricing to Northern Europe via LNG terminals and UK pipeline links to the continent. And in a weak market, some retail customers, who buy on short-term contracts, dumped take-or-pay surpluses on the spot market, exacerbating the price decline. However, as the pipeline suppliers lost market share, they were forced to renegotiate some contracts "temporarily".

Figure 2

THE COLLAPSE OF WEST EUROPEAN GAS PRICING UNDER THE INFLUENCE OF LNG ARBITRAGE - GERMAN BORDER PRICES (WEST - DUTCH TTF HUB; EAST - RUSSIAN GAS @ WAIDHAUS) 2008 VERSUS 2009



EU Efforts To Liberalize Gas Markets

The position of the traditional contract suppliers becomes untenable when their oil-linked supply must compete with cheaper spot gas delivered through a third-party access system.

Commodity gas is most readily available in Northwest Europe – the "Combat Zone" – with easy access to North Sea pipeline and LNG terminal supply; Germany has proved to be a main battle ground. Meanwhile, competition has been less severe in other regions of Europe, both because of more limited access to cheap commodity gas and because liberalization in some countries is less advanced.

Thus, pipeline suppliers have been able to tailor their pricing adjustments to individual markets, using four major approaches to contract adjustment. One, favored by buyers, has been complete Hub indexing which would make them fully competitive with spot gas. This has been the position of both E.ON and RWE in Germany, as well as PGNiG in Poland, which has been negotiating with Gazprom with price arbitration as a possible backup (E.ON has settled).

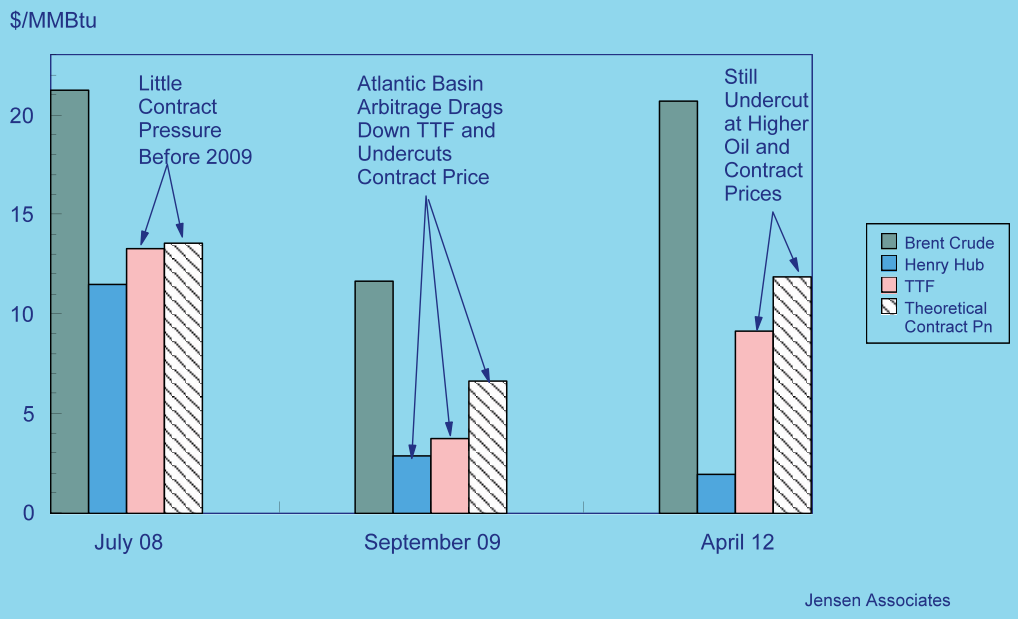
Among the sellers, Gazprom's preferred approach has been to include a Hub index (15%) in its oil formula. But that has usually been ineffective; therefore it has also given a discount between 6% and 10% off the pricing term to some customers. This has been taken in addition to the Hub index term in the case of the German purchasers, but on the original oil-linked term in the case of ENI in Italy and GDF Suez in France.

In contrast, Statoil has reduced the take obligation for some contracts, initially by 25%, letting the buyers take the remainder at spot prices. And through it all, Statoil's adjustments seem to have been better able to preserve its market share than have Gazprom's.

Challenge To Continental Oil-Linked Contracts

The challenge to Continental oil-linked contracts took place in two waves. The first, in 2009/2010, resulted from the collapse of the commodity Hub prices – NBP and Dutch TTF. The effect on oil-linked prices was partly moderated by the contract effect of declining oil prices. But then, as rising NBP and TTF prices took some of the pressure off in 2011, rising oil prices drove up the oil-linked prices again. The following examples of contracts though the various market periods offer one way of understanding the challenge.

Figure 3
THE RELATIONSHIP AMONG PRICES DURING THREE MARKET PERIODS



AN EXAMPLE OF A EUROPEAN PRICING TERM

(USING DOLLARS INSTEAD OF EUROS AND MMBTU INSTEAD OF KWH)

Oil Market Share

Pass Through Factor

Conversion Factor Tonnes to MMBtus

Change in Product Price From Base Price

$$Pn=Po+MS_{LFO}*PTF_{LFO}*CF_{LFO}*(Pn_{LFO}-Po_{LFO})$$
$$+MS_{HFO}*PTF_{HFO}*CF_{HFO}*(Pn_{HFO}-Po_{HFO})$$

Where Pn = The Current Price, LFO = Light Fuel Oil, HFO = Heavy Fuel Oil, and Po = Base Price in $/MMBtu and Product Prices in $/Tonne

AN ILLUSTRATIVE EXAMPLE WITH REAL NUMBERS

(FORMULA ROUGHLY BASED ON 2002 MARKET CONDITIONS)

$Pn=\$3.00+60\%*0.5*0.253*(Pn_{LFO}-\$300)+40\%*0.5*0.282*(Pn_{HFO}-\$130)$

Some Results:

In July 2008 with Strong Prices for Both Oil and Gas
Pn=$13.56 Brent - $123 HH - $11.45 TTF - $13.27

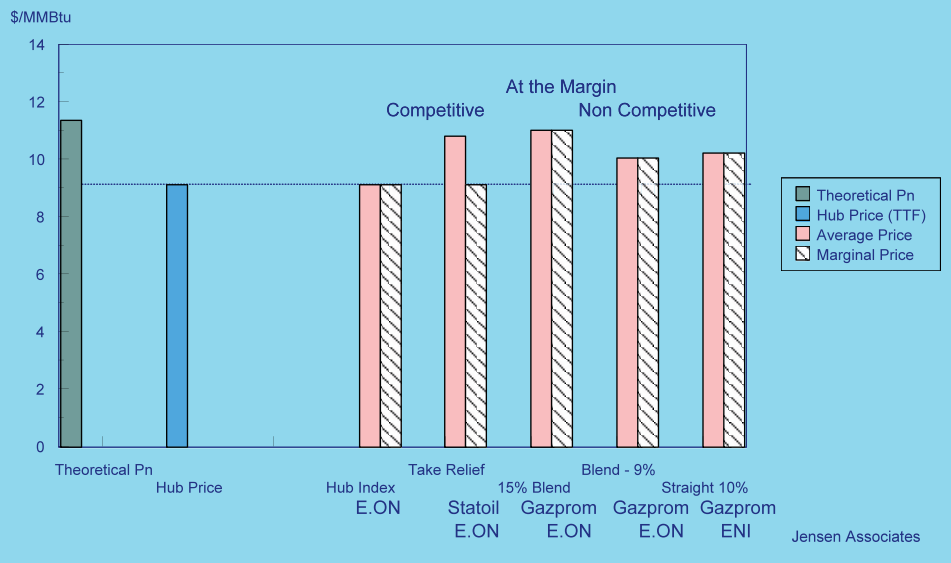
In September 2009 with Weak Oil and Gas Prices
Pn=$6.60 Brent - $67 HH - $2.88 TTF - $3.75

In April 2012 with Weak HH Prices, Other Prices Strong
Pn=$11.87 Brent - $120 HH - $1.92 TTF - $9.12

The Illustrative example can also be used to show how the adjustments operate: In April 2012, the theoretical example contract price – Pn – was $11.37 compared with TTF at $9.12. While full Hub indexing enables the buyer to compete with spot gas, Statoil's approach of partial relief also enables the buyer to compete at the margin, while preserving some original revenue for the seller.

But Gazprom's 15% indexing (a "Blend"), and further discounting as it appears to have offered E.ON, and straight discounting as it supposedly offered ENI and GDF Suez, all provide the same average and marginal price (which, in this illustration, is non-competitive).

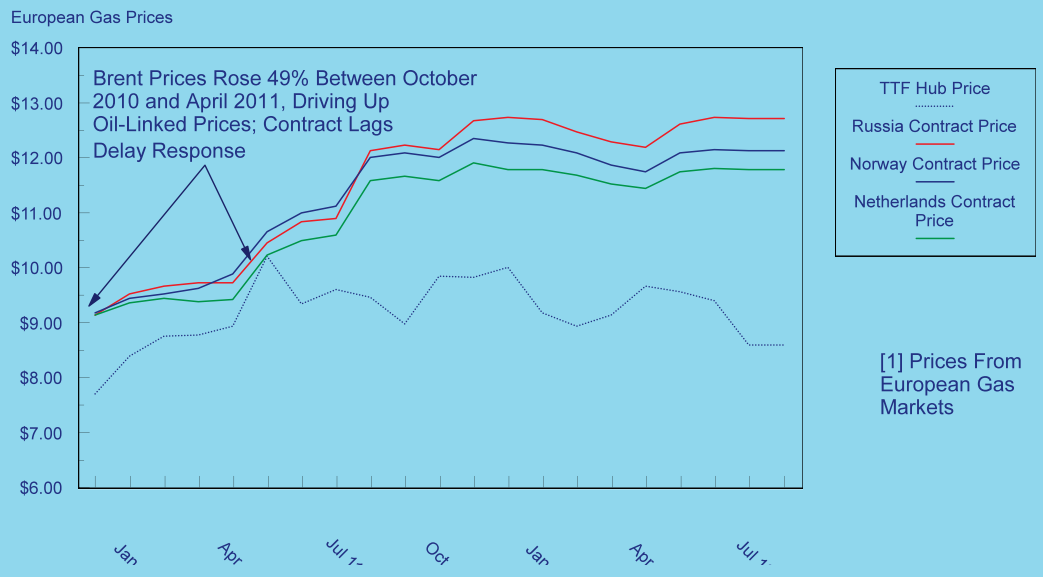
Figure 4
THE PRICING CONSEQUENCES OF THE VARIOUS APPROACHES TO THE RECONCILING OF OIL-LINKED CONTRACTS WITH SPOT MARKETS
(THE SITUATION IN APRIL 2012)



Russia's Competitive Problem

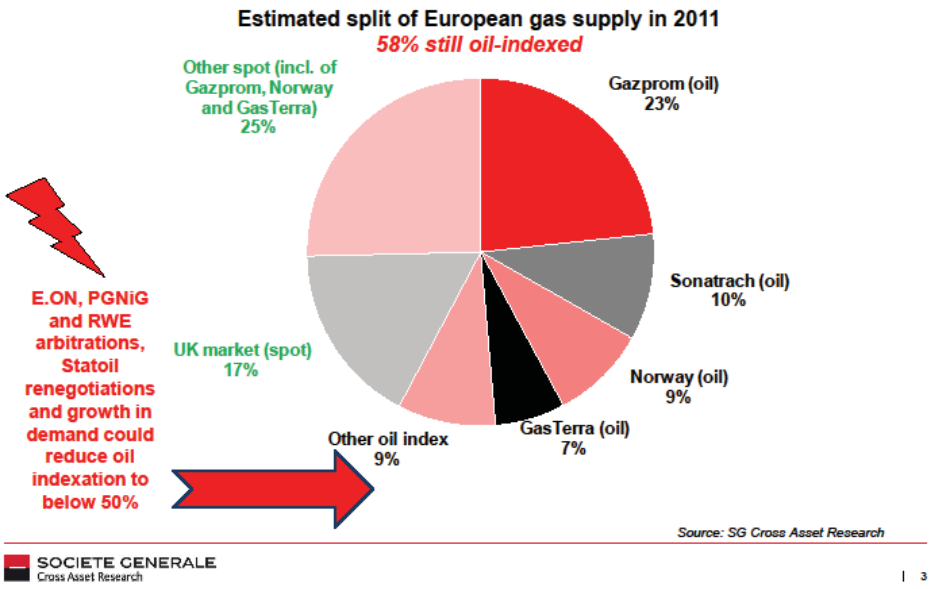
Time series of spot prices and German contract prices from the Netherlands, Norway and Russia shows Russia's competitive problem. Recent Norwegian prices have been below Russian prices. The Dutch prices to Germany are even lower: one source asserts that some contracts include a 25% Hub (TTF) index to the oil term. If that applies to contracts that are included in the German export price, it would explain the

Figure 5
BEHAVIOR OF CONTINENTAL GAS PRICES SINCE LATE 2011
TRADED DUTCH HUB PRICES [1] VERSUS GERMAN CONTRACT PRICES FROM RUSSIA, NORWAY AND THE NETHERLANDS



behavior of the Dutch price series.
In 2011, Societe General's Thierry Bros estimated that 58% of European supply was still oil-indexed (the following figure is from his presentation to an International Energy Forum Conference in Qatar, May 2011). Mr. Thierry further estimated that oil-indexing will slip to 55% in 2012 and voiced a common European view that if the average falls below 50%, the situation will become unstable. The instability view is reinforced by the fact that many of the non-competitive contracts are held by electric generators which have been switching to coal at these gas price levels; gas is pricing itself out of the market. But commodity competition is highly regionalized and it is not clear. The Hub indexing will easily spread to the Iberian Peninsula and to the South and East of the EU. More than 68% of the pipeline supply of the 12 countries in those regions comes from Russia and Algeria, suppliers that are trying to hold the line on oil-linkage (Gazprom gave Italy less generous terms than Germany). And the March settlement between E.ON and Gazprom apparently did not include full indexing but rather a combination of partial indexing and further discounts; since it also supposedly has price reopeners, it may not represent a long term resolution of the problem. Thus, a hybrid system (partial Hub indexing with occasional added discounts) which attempts to track changes in the market administratively, but is not truly market responsive, is more likely for much of Europe.

Figure: European Supply: On The Verge Of Being Mostly Spot Indexed?



The Japanese Approach To Oil-Linkage: Northeast Asia & China

Japanese firms utilize a simple formula which is linked to the Japanese Customs Cleared Price for Crude Oil- JCC or the "Japanese Crude Cocktail", or: P=C+S*JCC , where P is the price in $/mnBTU, C is the "slope", a dimensionless number applied to JCC in $/B.

Because of the constant, gas prices do not rise proportionately with oil prices as do European prices. A typical formula: P=$0.80+0.1.485*JCC; in this case, when JCC= $100/B, P=$15.65. Because oil prices have gone through wide swings over time, "S-curves" (sometimes caps and/or floors) were introduced at one point in Asian contracts. S curves reduce the slope at upper and lower "pivot points"; thus, they have the effect of protecting the buyer at high oil prices and the seller at low oil prices. But as oil prices began to move to much higher levels in 2004/2005, S-curves increasingly put the seller at a disadvantage. With the tight Asian LNG markets towards the end of the decade, producers were successful in removing most of them with the exception of high-cost Australia.

Figure 7
AN "S CURVE" ILLUSTRATED
BASIC SLOPE - 0.1485, PIVOT POINTS @ $65 AND $90, MODERATED SLOPE - 0.0696

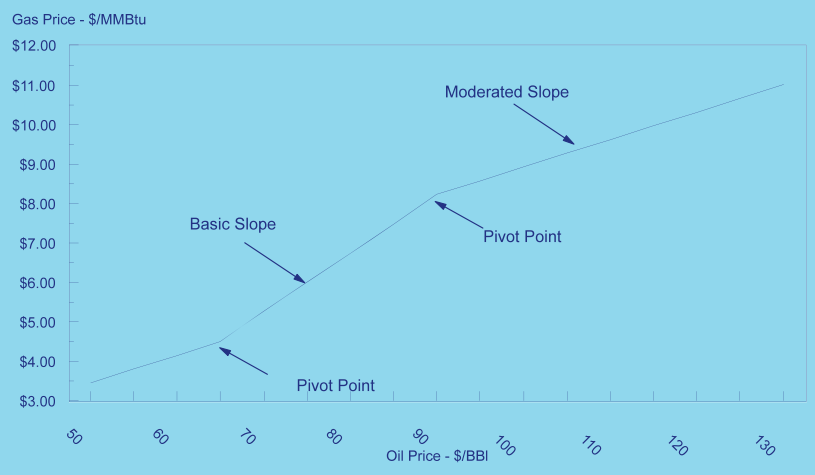
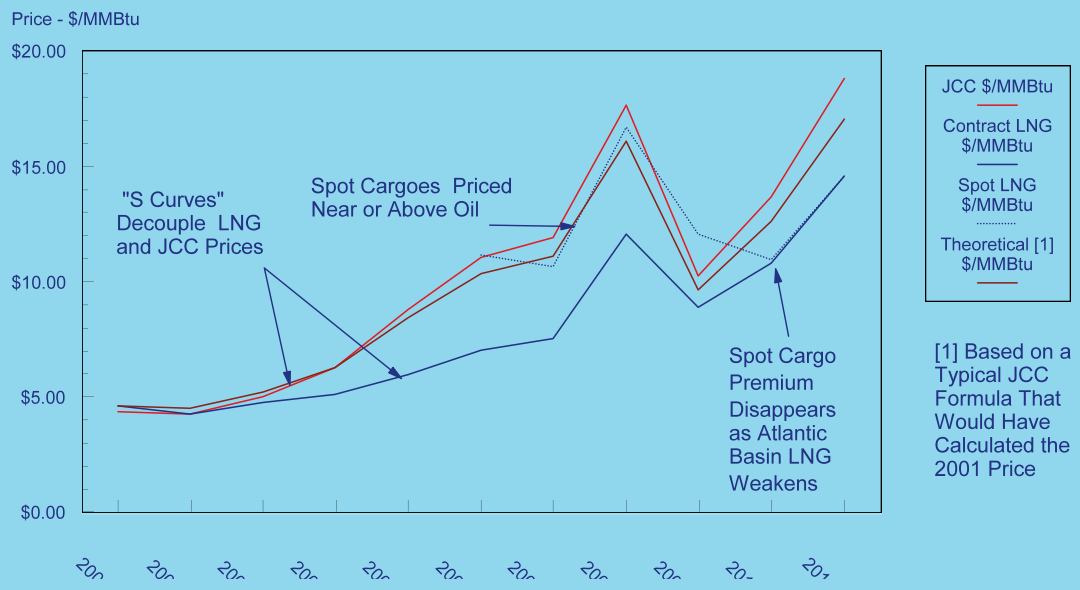


Figure 8

THE DECOUPLING OF JAPANESE LNG AND CRUDE OIL PRICES THROUGH "S CURVES" AS JCC (OIL) PRICES RISE - A COMPARISON OF OIL, CONTRACT LNG, SPOT LNG, AND THEORETICAL [1] PRICES



Northeast Asia And China: Impact Of 2009 Recession

LNG demand for Japan, Korea and Taiwan dropped 6.3% from 2008 to 2009, but China's growth of 42.1% left the combined total off only 2.3%. And the Fukushima disaster in March 2011, when coupled with Chinese growth, meant that East Asian LNG demand in 2011 was actually 30% greater than it had been in 2008.

Qatar's efforts to remarket the LNG originally intended for the US was expected at one point to disrupt Asian pricing; however, the tight market and Qatar's interest in preserving price stability meant that prices were not significantly affected.

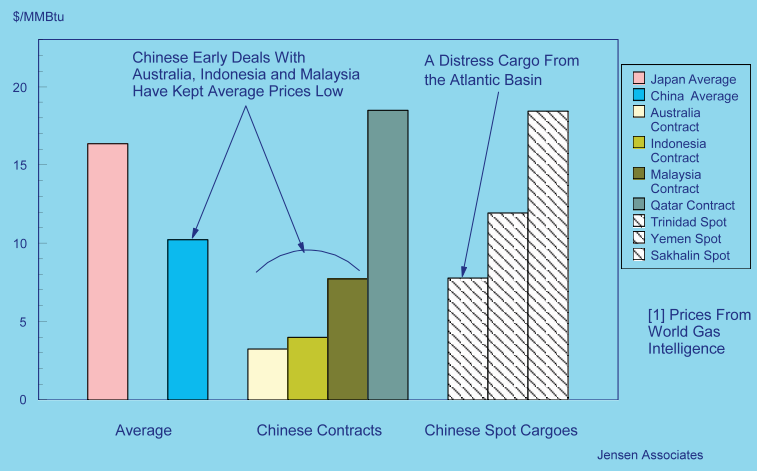
East Asia's imports are either in the form of LNG or from merchant monopoly pipelines. Thus, there is no commodity competition as there is in northwest Europe. And because the economies have not liberalized, there are no significant retail customers to provide competition for suppliers with contracts. Although spot LNG cargoes are freely traded, the size of a transaction – roughly 300 NYMEX Henry Hub contracts – and the need to have an import terminal, limit their competitive effectiveness. As a result, the typical oil-linked pricing clause has remained largely intact in East Asia despite the LNG surplus elsewhere and it is not easy to see what will change that.

However, this does not mean that there is no competitive pressure on Asian prices. Suppliers compete by changing the slope or the constant in the traditional formula, or they may utilize S-curves, offer reopeners or limit the range over which the clause operates (POR). There are also non-price terms – upstream equity participation, buyer destination flexibility, buyer built tankers – to sweeten the deal. Probably the most dramatic exercise in discounting was the two original contracts for the Chinese Guandong and Fujian terminals. Australia's North West Shelf, Indonesia's Tangguh and Qatar's RasGas were all in competition to supply the two terminals.

While RasGas dropped out, the other two sought "First Mover" status in the Chinese market and provided substantial discounts. Australia got the Guandong contract at a capped FOB price of $2.89 and Indonesia the Fujian contract at $2.66 (OIES-NG-9). At an equivalent Japanese ex-ship price, that represented discounts of 16% for Guandong and 23% for Fujian below the then-current prices; but oil – and JCC formula – prices rose rapidly. Thereafter, those contracts, together with a late Malaysian contract, now look like bargains.

Can It Happen Again?

Figure 9
AN ILLUSTRATION OF ASIAN CONTRACT AND SPOT PRICING [1]
EXAMPLE BASED ON MARCH 2012



In the 2008 tight Asian market, Qatar attempted to establish an oil-parity pricing precedent. Although its original goal – a slope of 0.1700 plus a constant – was largely unsuccessful, Qatargas did manage a slope of 0.1600 in contracts with PetroChina and CNOOC (supposedly, non-price terms were also involved). But since then, competition from Australian and Papua New Guinea projects have eroded the slopes, according to trade press reports, suggesting that Asia-Pacific LNG recently accepted a 0.1380 slope in Kogas contract.

The fact that competing suppliers have been high-cost Australian projects and Qatar – with its desire to hold the line – means that a repeat of the early Chinese experience is unlikely. In its WEO2011, the IEA's projected Japanese prices going forward are roughly 70% of world oil prices, while its European estimates are only 57%. Since recent Asian contracts (at Japanese ex-ship equivalent and $100/B oil price) are above this level, the IEA's Asian projection seems, if anything, conservative.

The following two figures illustrate that the supply economics for the largest competitive sources, particularly Australia, are high enough to provide some protection for the Asian premium; the premium is also supported by the costs of pipeline supply to China from Russia and the Caspian (although they often behave as if costs do not count).

Figure 10
EXAMPLES OF THREE DIFFERENT APPROACHES TO PRICING TERMS IN RECENT ASIAN OIL-LINKED CONTRACTS [1]

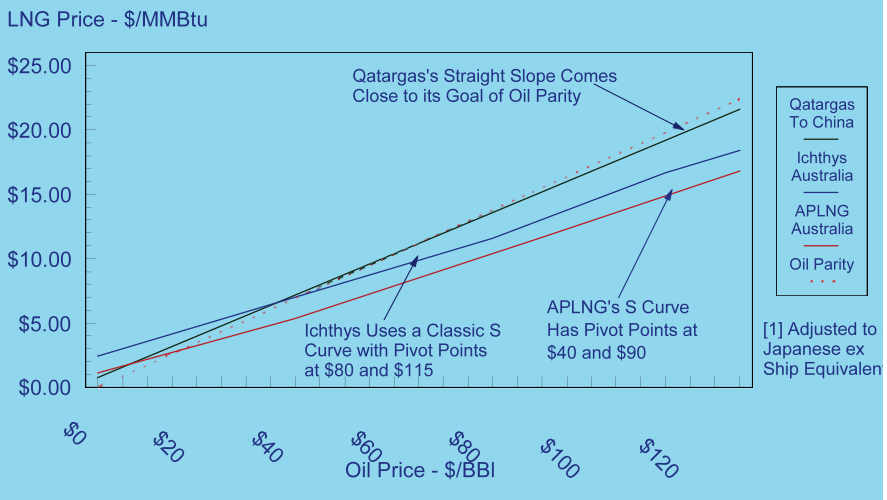
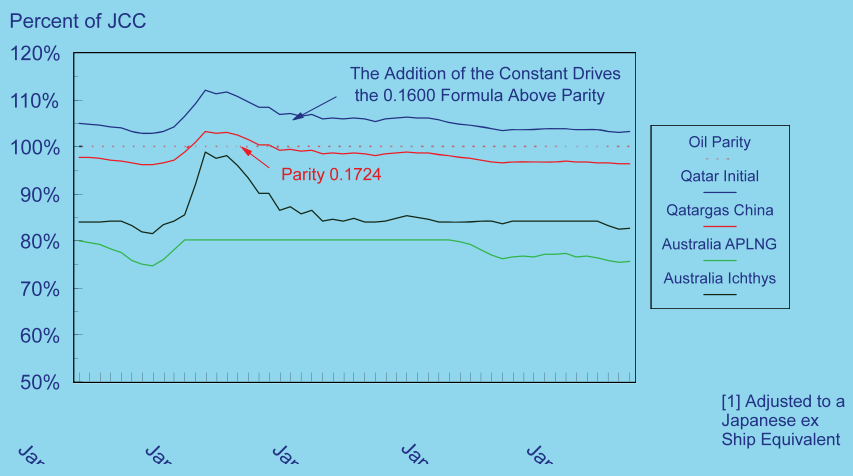


Figure 11
A COMPARISON OF SEVERAL ASIAN CONTRACTS [1] WITH OIL PARITY



North American LNG exports to Asia look competitive in this context.

Figure 12
ILLUSTRATIVE COSTS OF DELIVERING LNG TO JAPAN IN 2020 ASSUMING 2011 COSTS AND PROJECTED 2020 PRICES (IEA WEO 2011 FOR JAPAN, EIA AEO 2011 FOR U.S.)

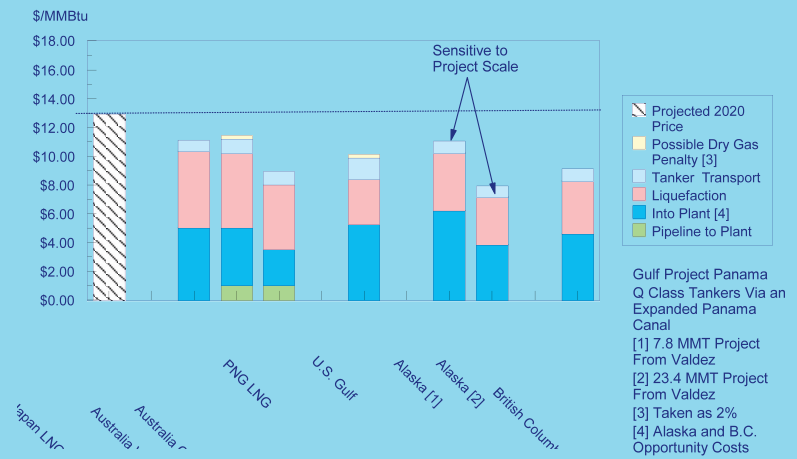
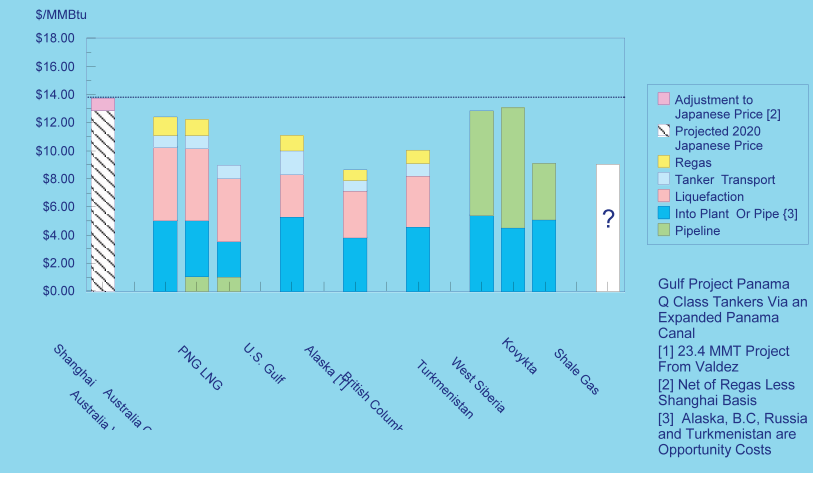


Figure 13
ILLUSTRATIVE COSTS OF DELIVERING NATURAL GAS TO SHANGHAI IN 2020 ASSUMING 2011 COSTS AND PROJECTED 2020 PRICES (IEA WEO 2011 FOR JAPAN AND EUROPE, EIA AEO 2011 FOR U.S.)



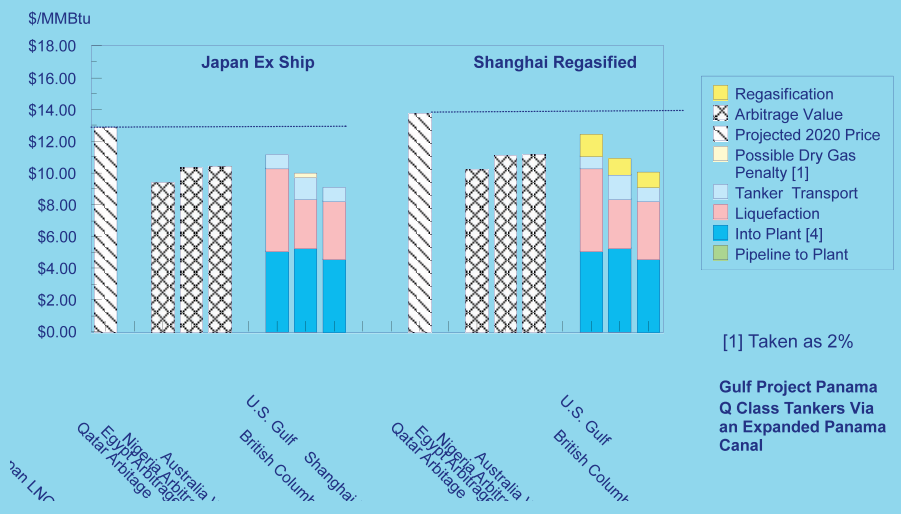
Three developments have the potential to undermine this Asian premium price structure: US LNG exports; possible Atlantic basin arbitrage of Asian prices; new , large and cheap supplies seeking markets.

Most North American contracts differ from traditional LNG export contracts. LNG projects have traditionally been driven by producers who wanted to monetize stranded gas discoveries. While that may remain true in British Columbia and Alaska, the Gulf coast projects will rely on freely-traded commodity supply where monetization is not an issue. Since so far, the buyers are contracting for FOB purchases with a Henry Hub escalator, the typical logic of sellers discounting for market share does not apply; buyers get the rent and have a vested interest in price stability.

The principle advantages that buyers have is the use of weak Henry Hub prices and weak tanker rates as a bargaining lever in other contract negotiations; it is not clear how effective this will prove to be. Another potential LNG supply which could undermine Asian prices is the possibility of arbitraging European prices via some other LNG exporter. While Qatar has that potential, so far it seems to be more interested in preserving the existing price level than discounting for market share. But suppliers in North and West Africa could also be price spoilers, as the following figure illustrates the economics of three potential arbitragers using the spread between the IEA's European and Japanese prices for 2020. And finally, there is also the possibility of large, new, low-cost discoveries that can threaten the established price structure. At the moment a prime candidate is offshore East Africa where Mozambique, and to a lesser extent Tanzania, have made significant finds. If this gas is, as rumored, of high quality with good NGL content and is developed by outside companies without a stake in Asian price stability, it could be an Asian game changer.

Figure 14

ILLUSTRATIVE COSTS OF ARBITRAGING EUROPEAN 2020 PRICES TO TO JAPAN AND SHANGHAI IN 2020 ASSUMING 2011 COSTS



Conclusion

-The long-term contracts in continental Europe and Asia are likely to remain, but in an uneasy mix with commodity competition.

-Europe may resolve the issue by a clumsy "administered market" approach that may model as if it is actually a gas-to-gas commodity market.

- Asia is likely to retain oil-linkage, but the level of discounting is uncertain; as more and more suppliers seek its premium prices. The prices become vulnerable to arbitrage and new low-cost competition.

-As to pricing among Russia, China and the Caspian states- Churchill's quote about Russia may apply, "A riddle, wrapped in an enigma, inside a mystery".

Fracking: The Key For Shale Oil And Gas Revolution

David Knott*

Hydraulic fracturing (fracking) is a process that has been in use in oil and gas production since the 1940s and is currently used in thousands of wells every year. But the use of fracking – and controversy about its use – has escalated rapidly in recent years. This is because fracking is one of the enabling technologies, along with horizontal drilling and improved seismic data acquisition, which have led to large-scale production from previously inaccessible oil and gas shale formations. Until recently, production of oil and gas from shale formations has been both technically and economically unfeasible. Yet so rapid has been the development in the US of some of the largest shale resources in the world that the global oil and gas outlook is being turned upside down.

Fracking Process

The US Geological Survey (USGS) says that to produce oil and gas from shale formations, it is necessary to increase the interconnectedness of the pore space (the permeability) of the shale so that the hydrocarbons can flow through the rock mass and be extracted through production wells. This is normally done by fracking. "Fracking causes small earthquakes," USGS observes, "but they are almost always too small to be a safety concern." Besides the produced oil and gas, the process also returns fracking fluids and formation waters to the surface: "These wastewaters are frequently disposed of by injection into deep

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wells. The injection of wastewater into the subsurface can cause earthquakes that are large enough to be felt and may cause damage."

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"Hydraulic fracturing is accompanied by microseisms that can be recorded with sensitive listening devices and analyzed with established scientific methods," says API. "Microseismic mapping is used to understand and optimize field development of the resource, well completions and stage treatments. This monitoring produces extensive data, and thus microseismic activity associated with hydraulic fracturing is thoroughly understood. A review of published research shows no cases of injuries or damage as a result of the very low level of seismicity related to this well completion technique, in more than one million applications."

Fracking Concerns

Washington-based non-governmental organization Food and Water Watch maintains that fracking is an extremely water intensive process in which millions of gallons of fluid – "typically a mix of water, sand and chemicals, including ones known to cause cancer" – are injected underground at high pressure. The process involves trucking in heavy equipment and materials and trucking out "vast amounts of toxic waste – all of these steps contribute to air and water pollution risks and devaluation of land that is turning our communities into sacrifice zones. Fracking threatens the air we breathe, the water we drink, the communities we love and the climate on which we depend. That's why over 250 communities in the US have passed resolutions to stop fracking, and why Vermont, France and Bulgaria have stopped it."

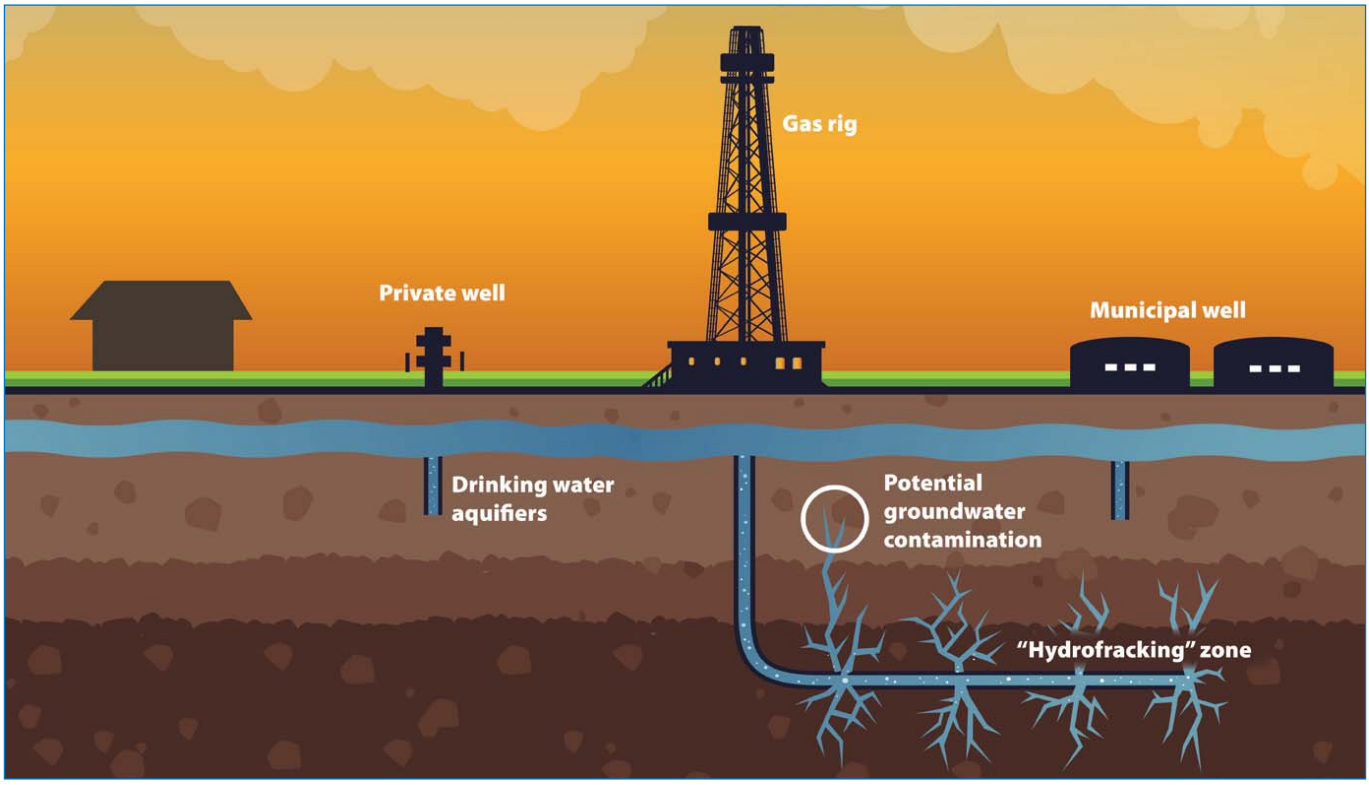
New York-based Natural Resources Defense Council (NRDC) announced in September the creation of its Community Fracking Defense Project to provide legal and policy assistance to towns and local governments seeking added control or protection from fracking in their communities. NRDC senior attorney Kate Sinding said: "For too long, communities around the country have had little defense against the oil and gas companies that sweep into their neighborhoods and start fracking without regard for the impacts on the people who live there." NRDC Midwest director Henry Henderson added: "As the rush to extract natural gas from our communities expands dramatically into the Midwest, it is essential to protect the ability of citizens to assure that those activities do not foul our water, air, community, health and safety."

Responding to environmental questions and public controversy over growing US shale gas development, Washington-based think-tank the Worldwatch Institute completed an assessment in 2010 of what happens beneath the surface during horizontal drilling and fracking in deep shale formations. Mark Zoback, Stanford University geophysicist and co-author of the assessment, said: "Microseismic data have shown us that a properly designed hydraulic fracture job stimulates gas production only within the shale formations, which are typically hundreds of feet thick and thousands of feet deeper than drinking water supplies. For this reason, the risk of fractures propagating from deep shale formations to underground sources of drinking water, which has been the subject of much debate, appears to be extremely low." The report concludes that faulty well construction and, in particular, poorly cemented casings, as well as above-ground contamination due to leaks and spills of fracturing fluids and waste water, pose more significant risks to the environment.

Shale Oil/NGLs Impact

The International Energy Agency (IEA) believes that the global energy map is being redrawn by the resurgence of oil and gas production in the US. In the World Energy Outlook 2012, launched in London on 12 November, the IEA says: "Energy developments in the US are profound and their effect will be felt well beyond North America – and the energy sector. The recent rebound in US oil and gas production, driven by upstream technologies that are unlocking light tight oil and shale gas resources, is spurring economic activity – with less expensive gas and electricity prices giving industry a competitive edge – and steadily changing the role of North America in global energy trade. By around 2020, the US is projected to become the largest global oil producer, overtaking Saudi Arabia until the mid-2020s." The agency predicts that rising oil production and improved fuel efficiency in transportation will lead North America to become a net exporter around 2030. This will complete the switch in international oil trade towards Asia, and increase concerns about the security of strategic routes for the export of Middle East oil to Asia.

The IEA estimates that the US is currently producing 600,000 b/d of shale oil from the Bakken formation in



North Dakota and 300,000 b/d from the Eagle Ford shale in south Texas. Combined US shale oil production from the Bakken, Eagle Ford and the emerging Niobrara, Texas Permian Basin and Californian plays is expected to reach over 3.2mn b/d by 2025. Additionally, NGL output from shale gas plays in the US is projected to grow by 1mn b/d by 2020 to 3.2mn b/d. Canadian shale oil production averaged 190,000 b/d in 2011 and is expected to exceed 500,000 b/d by 2035. Outside the US, the IEA predicts that production of shale oil and NGLs is unlikely to make a big contribution to global oil supply before 2020. Only China is expected to pass the 200,000 b/d mark by then, with the potential for smaller contributions from Argentina, Mexico and Russia.

OPEC's own latest long-term forecast – the *World Oil Outlook 2012 (WOO 2012)*, published on 8 November – factored shale oil and gas production into the organization's predictions for the first time. In the report's foreword, OPEC Secretary-General 'Abd Allah al-Badri observed: "It is evident that this resource will contribute to the overall energy mix, but when looking outside of the US, shale resources remain in the early stages of development. A diversity of factors such as costs, water and well services availability, regulation, concerns over potential environmental impacts and energy prices, will shape the future of shale oil and gas."

Nevertheless, OPEC concedes that shale oil development is moving rapidly in the US, where production has markedly increased and has already passed 1mn b/d. In the WOO 2012 reference case, "an estimate of 2mn b/d and 3mn b/d for shale oil is assumed to emerge by 2020 and 2035, respectively. Lower growth after 2020 is justified by the fact that the best shale oil plays will be tapped first. Their contribution in the medium term will continue to come only from North America. In the longer term, however, modest contributions might also come from other parts of the world."

Shale Gas Prospects

The surge in North American shale gas production, besides bringing local gas prices to historic lows and improving the competitiveness of gas against other fuels, is also having a significant effect on global markets. The IEA observes that, until a few years ago, the US was expected to become a major importer of LNG. "Instead," says *WEO 2012*, "LNG imports have shrunk to a tiny proportion of demand and the US and Canada are set to become LNG exporters once the infrastructure is in place in the middle of this decade. Projects that were being undertaken in exporting countries with a view to the North American market have had to seek alternative destinations." This has impacted gas exporters selling LNG on an oil-indexed price basisunder long-term contracts. Buyers have been using any flexibility in contracts to enable switching to cheaperalternatives. The IEA predicts that annual North American LNG exports will reach 35 bcm by 2020 and more than 40 bcm by 2035, of which two-thirds is expected to go to Asia.

OPEC's *WOO 2010* notes that there is clear potential for shale gas on the world energy scene. In particular,

the report envisions shale gas replacing coal in electricity generation and for use as feedstock in the petrochemicals sector. The report argues that shale gas development is in its infancy, with considerable uncertainties about the size of the resources, the economics of development and the potential contribution to future supply. "Currently, shale gas production is coming primarily from North America (mainly the US)," said the outlook. "Total shale gas production in the US jumped from 15bn cfd in 2010 to 25bn cfd in 2012. Replicating the success of US shale gas development internationally requires addressing many key challenges including water shortages, a lack of infrastructure, higher population densities, a shortage of skilled labor and the NIMBY ['not in my back yard'] effect."

The US Energy Information Administration (EIA) also says that, despite the magnitude of estimated shale gas resources worldwide (see table), commercial shale gas development outside of North America "is likely at least five to 10 years away." However, the agency notes that China's estimated 1,275 trillion cu ft of technically recoverable shale gas is one-third higher than the estimate for the US. China National Petroleum Corporation completed its first horizontal shale gas test well in March 2011. The company is now moving quickly to explore China's shale reserves in partnership with international gas producers such as Shell and Chevron: "Energy hungry China is unlikely to hesitate to develop what now seems to be a truly staggering domestic unconventional gas resource."

EIA says that one of the reasons that major shale gas development outside the US is 5-10 years away is that most countries lack the specialized horizontal drilling equipment and fracking expertise to exploit unconventional gas resources. "Moreover," EIA warns, "residents of many countries, especially in Europe, are raising concerns about the environmental safety of shale gas development and are closely monitoring stories about associated water and air pollution." The agency concludes that if the US fails to demonstrate that shale gas can be extracted safely by ensuring that development is adequately regulated and best practises are adopted throughout the industry, some countries will "follow the French example and put a halt to such activity. Shale gas has the potential to drastically alter the landscape of global energy markets, and in countries like Poland [which depends on coal for almost 60% of its primary energy use] it could contribute significantly to emissions reductions. But whether and when this change comes will hinge on public confidence in the natural gas industry."

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Fracking Concerns

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Palestine and the Arab Spring

Tim Llewellyn*

One of the most remarkable failures of Western political and media reporting of the "Arab Spring" uprisings during the past two years, has been to ignore the Palestine connection. The West, and to a great extent the Arab media, have logged and reported these political and social phenomena without mention of the Palestinians in Israel and the Israeli-occupied territories or the Palestinians' almost equally oppressed brethren, more than four million, in the refugee camps of the neighbouring Arab states.

Only in Syria, where Palestinians sympathetic to the uprising against the Assad regime and its machine have been in combat with government forces and armed government sympathisers, including the Palestinian Popular Front-General Command, a long-time arm and agent of the Syrian regime, has the Palestinian dimension emerged.

In the West, it seems – especially among broadcasters such as the BBC, whose coverage of the Palestinian issue is lame and distorted in Israel's favour, mainly because of Israeli and pro-Israeli lobbying – it was fine for Arabs to rise up against Arab regimes, even if those rebellions involved force of arms, as so rigorously became the case in Libya. In Libya, Western arms were deployed to help topple Colonel Mu'ammar al-Qadhafi. In Syria, such intervention is now being freely discussed in Washington and London. Already, the West is turning at the very least a blind eye towards the infiltration of arms and fighters into the heart of Syria, and may soon do more to give active military help.

Tim Llewellyn was the BBC Mideast Correspondent, based in Beirut and later Nicosia, in the mid-1970s, 1980s and early 1990s. He covered all the regional wars and situations of that time, the most important being the Islamic Iranian Revolution of 1979. But the Palestinian issue remains the central one.

Rebellion, however, is not so commendable, under Western eyes, when Palestinians protest against Israel – whether peaceably or by use of rockets – as they do periodically in and around Gaza. This is not to say that firing rockets at Sderot or other Israeli cities is a good idea. But it needs to be explained why people might do it. That aspect of Western understanding goes missing when background reporting is applied, or as is the more normal case, not applied at all, to the Palestinian case.

There is no why and wherefore here in Western reporting. This phenomenon takes on a different, admonitory tone – or just flatly ignores the grotesque situation of all Palestinians under occupation, in exile, or second-class citizens in Israel. The very relevant "Arab Uprising" fact that of all the Arabs between the Atlantic and the Gulf those in Palestine have been the most consistently oppressed and maltreated, under force of arms, and are the only Arabs remaining under what is effectively colonial rule, denied freedom, independence and political rights, has been widely ignored, as if Israel were a special case beyond consideration. Which it often seems to be.

I single out the West's news media, and its politicians, as guilty in this matter---but even in the Arab world itself it seems that whatever Palestinian elements have been introduced into the reverberations the past two years have been emotional and ephemeral, without practical application of any kind for the Palestinians, certainly not any that can be seen as producing concrete results in the near future.

As the academic Reem Abu El Fadl recently pointed out in the *Journal of Palestine Studies* (Winter Edition 2012), "Palestine and the Egyptian-Israeli relationship...figured prominently in protestors' slogans and demands throughout 2011", and reflected Egyptians' continuing concern with the Palestine-Israel issue since the mid-1940s. But this was always at the popular level. Egypt, even under Nasser, never allowed Palestinian interests to override or even inform the actions and policies of the state.

At least Gamal Abdul Nasser maintained a hostile stance towards Israel, and therefore was seen as a hero and model, a tough and defiant representative of the Arabs. He was no stooge of the Palestinians, but they saw in him an Arab leader who had the wider cause of the Arabs, and therefore the Palestinians, at his heart. Not all Palestinians' political cadres appreciated this, but all of them knew that without Egypt they were in limbo.

Egypt's policy, in the mid-1970s, after President Anwar Sadat's venture into Israel , altered the picture. Both Presidents Sadat and Husni Mubarak, with US and Israeli policies at the forefront, had since the Egypt-Israel peace treaty of 1979, worked to minimise the Palestinian issue and demean the Palestinian image. Mubarak cooperated with Israel to enforce the siege of Gaza and the battle against Hamas and connived

with Israel and with the Palestinian Authority in maintaining the disastrous status quo of Mahmoud Abbas's feeble governance, Palestinian disunity and political helplessness.

However, from the beginning of the *Aqsa* Intifada in late 2000, growing Egyptian popular protest against Mubarak's regime singled out for sharp attack Egyptian policy, or lack thereof, on Palestine. Egyptian protesters, bearing Palestinian flags and images, embraced everyone---Muslim Brotherhood youth, Nasserists, Leftists and liberals, men and women, secular and religious. Egyptian volunteers travelled to the refugee camps of Lebanon to try to bring support and sustenance to Palestinians in their most deprived circumstances. These Egyptian protests and these feelings found their physical apotheosis in the mass rallies and assaults on the Israeli Embassy last autumn, with Ahmad al-Shahat scaling the 21 storeys of the mission's downtown edifice and raising the Egyptian flag in place of the Star of David. The Israeli Ambassador and his staff fled the Embassy for good to safer and more remote Cairo premises. This was not a pyrrhic victory. Israel is wounded by this sort of humiliation and rejection, though in the Western media it will have been neatly portrayed as "Muslim hooligans" attacking an outpost of pro-American sense and sensibility.

It appeared for a while that this popular Egyptian manifestation was going to have concrete results for the Palestinians, especially the more than one and a half million of them in the tiny, besieged Gaza Strip—70 per cent of them refugees from the *Nakba* of 1948. The then-Foreign Minister, Nabil al Arabi, opened the *Rafah* Crossing, the only official contact Gaza had with the outside world. He announced that all of Egypt's international agreements were open to revision. Hopes were high that the new and revolutionised Egypt would, at the very least, seek new regional alliances (Turkey, Iran?) and a far more rigorous program of opposition to Israel and political and physical help for the Palestinians, wherever they may be. (Syrian complications threw a major spanner in these works.)

The re-election of Barack Obama to the US presidency will have been seen throughout Egypt in particular and the Arab world in general as better than the alternative, but unlike in November 2008 there has been no universal raising of hopes and little expectation of any rigorous pressures on Israel emanating from Washington, DC. The Egyptian Government is, for the moment, content to leave foreign policy and the growing Salafist-inspired security problems of the Sinai to the generals, who are no friends of Hamas, and to concentrate on pressing domestic matters: the economy, lack of expectations among the vast youth-dominated population, unemployment, industrial unrest, regional inequities, corruption and concentrations of wealth among the few. There is also the question of to what extent Islamic law and cultural impositions will or can be extended in a population that is broadly devout but not instinctively fundamentalist. In many urban centres, Cairo, Alexandria and along the long reaches of the Nile, and at the Red Sea resorts, the population is often or has to appear to be cosmopolitan and is in practical terms dependent on the free flow of European and other foreign tourists interested in access to ancient Egyptian and therefore non-Islamic history and artefacts and, in the northern hemispherical winter, free access to sea and sunshine... and alcohol.

One major problem for the whole Arab world, and Egypt, is how Islam and its tenets can be applied to a youthful, questing and revolutionary population, packed with vociferous women, who, are at every practical level of the nation's political, academic, scientific and cultural life and development.

None of these all-embracing matters is of any help to the Palestinians, however they are tackled.

Since Mursi became president, the military leadership was changed and shoved at least partly to one side. Relations between Gaza and Egypt and therefore Hamas and Egypt have improved. After Egypt's crackdown on those lifeline tunnels into Gaza in August this year, after terrorist attacks killed 16 Egyptian soldiers, the situation improved. UN sources say there are between 300 and 400 tunnels operating, bringing out exports of flowers and agricultural export for Europe (but not for Israel or the West Bank) and bringing in everything from motor cars and construction materials to heavy weapons.

It seems, however, that two political factors operate both to allow and restrict this Gaza-Egypt relationship: Israel allows the trade because it is anxious to see Gaza become separated from the rest of Palestine and forced into the arms of Egypt, thus a de facto removal of 1.6mn Palestinians from the Holy Land's, or Mandate Palestine's, demographic arithmetic and from any ultimate hope or chance of joining East Jerusalem and the West Bank in any Palestinian state. Egypt shies away from such concepts as a Free Trade area with Gaza for precisely the same reasons---it does not wish to become responsible for the problems of Gaza, it is wary of Hamas, and it does not wish to be party to any Israeli-US scheme of hiving off a great chunk of Palestinian territory.

In Israel itself, early fears of the "Arab Spring"---which after early euphoria now seems to be entering a somewhat moribund period---voiced by Israeli leaders seem to have been unfounded, in the short term. Israel's official reactions to any change in the region's fortunes or leaderships have usually provoked alarm in what is, after all, preternaturally a paranoid state: the addled status quo in the Arab world, with corrupt and unthreatening potentates, kings, emirs and dictators on all sides, was that with which Israel felt at home. In Egypt, the most important element in Israel's regional survival, matters seem unlikely to change. Israelis will have noted the Muslim Brotherhood's and the new Egyptian leader's reluctance to mention Israel publicly or with undue hostility. In Israel itself, the wide public indifference to Palestinian suffering and discontent in a largely complacent and prosperous nation means that the right-wing leadership can concentrate its armoury of threats and propaganda on Iran, a tactic which the West and the Western media play into with enthusiasm. Any interview or public event with any Israeli official sees the topic of Iran dominate, and Western interviewers or politicians are strangely averse to pressing the Palestinian issue.

But there are more important matters than Egypt's redefinition of itself: as the British Prime Minister, Harold Macmillan, once said, when pressed as to what had unnerved him most as a political leader: "Events, dear boy, events". The "events" in question this time are on Palestine's and Israel's doorsteps. The savagery and regional implications of the burgeoning civil war in Syria, which now threatens Jordan, Turkey and Lebanon, and even has spilled over into the trading of gunfire across the Syrian Golan Heights---a border that has lain dormant for nearly forty years—has far more cause to concentrate Israeli minds than any new policies or thinking that may have emerged in the rest of the turbulent Arab world. Regional war involving Iran is one possibility down the line, which might well bring Hezbollah into the fight and cause havoc inside Israel (as well as Lebanon).

Beyond that, there is the possibility that an end to the Assad regime might bring in a government more sympathetic to the West, more Sunni in makeup and therefore more willing to break relations with Iran and cut its arteries to Hezbollah. But this is only one of many possible outcomes. We forget that Syria is Syria, whoever is running it, and that it holds a unique position, normally, of respect and authority throughout the Arab world: it is Syria, after all, that suffered the near-calamitous divisions of spoils by the Western powers after the First World War, and in the process saw its integral region of Palestine separated and traduced by the British and the Zionists.

Finally, what of the Palestinians themselves? You may ask, which Palestinians? This is a fractured community, in the region, of the region, beyond the region: refugees, exiles, occupied, third-rate inhabitants of Israel, not a single Palestinian on this earth able to claim his full and original political and human rights as a man or woman.

In the Occupied Territories there seems to be paralysis. The Israelis treat passive resistance as they treat military resistance, with brutal force and arbitrary rules of arrest and imprisonment, for children, for anyone, without any semblance of the rule of law they proclaim or that which operates in the western nations they seek to emulate. Leading politicians such as Marwan Barghouti are locked up on doubtful terrorist charges for a dozen years, and it is unlikely that any time soon Israel could take the plunge that Britain took in the 1990s and try to deal fairly with the "terrorists" of yesterday, like Gerry Adams and Martin McGuiness, who are now respected and effective political leaders in Great Britain and Ireland.

The Palestinians themselves, still in shock after the impact of the West's and the Zionist's invasions and depredations of the past 90 years, remain divided and incapable. The Outside is split from the Inside, the exiles and refugees from those in the Israeli-Occupied Palestinian Territories; the Palestinian leader, Mahmoud Abbas, is widely regarded as a quisling and his apparent willingness to abandon the right of Palestinian return, on Israel TV, must have brought morale to a new low. Even inside the remaining shreds of Palestine, the divisions are physical. There is no longer a coherent Palestinian entity, and the core, Jerusalem, has been cordoned off to millions of Palestine's native Muslim and Christian, indigenous inhabitants.

Despite all this and despite the incoherence of the "Arab Spring"---more of a late winter, some would say---the Palestinian cause remains the dominant worry for those who wish to pursue and consolidate the Zionist experiment, and it remains at the core of Arab revulsion at the way in which Arab rights and pride have been suborned and ignored and over-ridden by the outside world. After all, Iran, not an Arab nation of course, is at the leading edge of the struggle to support Palestine and reduce Israel's power in the region, and until Syria's implosion Turkey was reflecting a unique Nato pose as a harsh and physical critic of Israel's malign treatment of all the citizens of the former Ottoman Empire. Only two years ago I saw posters in Turkish (Latin) script, hanging across the hallways of the *Hammidiyeh* Souk in Damascus, praising Turkey's leaders.
The "Arab Spring" brings with it the hope of new alliances and formations, when the new governments have had time to mature. But there may well be within that lead time an apocalyptic trauma, involving Syria, Iran, Israel and all the neighbouring states, and after which, and only after which, the councils of the world will have to take note and impose some disciplined solution on what has become a rolling and menacing chaos.

Nobody but America can do anything about Israel.

No substantial change has ever taken place in the Arab Middle East without a war preceding it, for better or for worse.

It is up to the United States and its European partners to try to avert this dreadful outcome. The Middle Eastern nations themselves, absorbed by their internal ructions, do not have the capability or the collective verve or nerve to change matters in Palestine.

Critique Of IEA Iraq Oil Outlook 2012 Coverage And Challenges Facing Iraq's Oil Sector

Thamir Uqaili*

This article discusses the main issues covered by *IEA Iraq Energy Outlook 2012* and the challenges facing the federal hydrocarbon plans. In the absence of long-term strategy and planning on the part of Iraq's Ministry of Oil, the issues discussed here are guidelines for :

* Reconstruct and upgrade of the country's infrastructure
  - Provide necessary services to the nation
  - Rebuild the army and preserve stability and Iraq's unity

The Role Of Iraq National Oil Company (INOC)

The role of INOC in developing experts and personnel, mentioned in the Outlook Report, played an important role in building Iraq's upstream oil sector in the years prior to the Iraq-Iran war. However this function received a low priority since the first Gulf-War, a function that the MoO could not pick up, because of the many challenges it was facing during that period:

* Weak central departments
  - Modest capabilities of the National Operators, technical and management aspects
  - Vacant post of Deputy Oil Minister for the Upstream Sector

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** Mr. Uqaili was Head of Engineering at SOC, and Fields General Manager at NOC. Mr. Uqaili also held the posts of General Manager of Planning at the MoO and Board Member of INOC.*

- Very slow progress of the refining industry
- Weak and ineffective Parliamentary Oil & Gas Committee
- Complete rejection of the use of ex-MoO expertise

The Central Production Scenario

The outlook central scenario is

	2011	2015	2020	2025	2030	2035	
Million b/d:	2.7	4.2	6.1	6.9	7.5	8.3	

The *Outlook* Forecast includes 500-850 thousand b/d from Kurdistan Region (KRG) starting in 2020, but subject to shaky KRG-Federal Government relations bearing in mind the possibility of cessation of Kurdistan production in the near future. This scenario is in line with what the author anticipated as an attainable plateau (million b/d) in a presentation delivered to the Oil & Money Forum of November 2010:

Operators	Potential	PPT	Surplus capacity
Awarded IOCs	8	6	2
National	4.500	3.150	1.350

The production potential of fields under national operators can satisfy domestic demand (refining & industry) and provide and contribute to global supply during shortage periods..

The Water Injection Mega Project

The *Outlook Report* acknowledges that four years after the start of FEED, it will be necessary to see the first phase of 2 mn b/d commissioned. The delay will cause a serious water shortage that cannot be remedied as suggested by the Report.

The remedy is to compliment water injection with ESPs that are needed now and will be constantly needed to keep up with increasing water cuts in the produced oil.

It is noted here that the water injection rate in Rumaila Field is already significantly below the required amount. That, in addition to the corrosion of the injection system, the Sub-standard water specs and poor monitoring is now a serious problem. The Southern Oil Company (SOC) cannot alone adequately keep up

with the water shortage problem. A service company is required to look after coordination between the users and ensure proper monitoring of the entire water injection network.

The Surface Installations

Bottlenecks in storage and transportation of the crude oil are not being resolved in tandem with crude oil availability from the fields:

- PS1, Tuba and Zb-1 tank farms have not undergone expansion.

- Zb-2 tank farm, part of IPSA, is still out of use without renovation to utilize it as part of the common storage facility in South Iraq.

- Major changes are required to modify the current separation stations to allow handling high WC produced oil. The present limit is 25%. This measure seems to be pending approval of the permanent field development plans of the awarded fields that will include water injection receipt, transportation and handling produced formation water.

- The pipeline capacity to Fao, is still limited by that of the two Basra- Fao landlines.

- The restoration of Fao as onshore storage facility is partially complete. Solid pumping from the fields to the offshore terminal is being applied. There is no cushion for storage in the event of rough weather and delays in sea-loading, the result of which is temporarily reducing the flow from the field in such cases.

The Export Facilities

The closure of the Straits of Hormuz is disastrous for Iraq's oil exports in the absence of alternatives:

- Recovery of the designed export capacity of the two Iraq-Turkish pipeline system (Kirkuk-Ceyhan).

• Recovery of the designed capacity of the strategic Basra-Kirkuk pipeline plus constructing a second line.

• Plan for the new Iraq-Jordan line is still on paper. Meanwhile, with political risk high in Syria, exports from western Iraq either do not exist or would be threatened.

Dependence On Oil Income

While, oil exports remain Iraq's main source of revenue, no credible measures have been taken to :

* Resolve disputes with neighbouring countries regarding Iraq's water share from sources flowing from neighbouring countries to Iraq.

• Adapt modern water and irrigation policies to ensure conservation of domestic resources.

Cost Of Projects And Oilfield Services

Project and services costs, already 50-100% higher than international prices, are even increasing higher, without effective interference from the MoO. There have been reports that well drilling and services are way above the maximum levels registered, in general. In the Kurdistan Region, there are cases whereby drilling has cost $ 26-100 million per well.

Other Challenges Facing Field Development

The following are added challenges to the abovementioned:

• Gas network and utilization: Absence of strategy and long-term planning for both associated and free gas.

• The need for new technical recruitments/ contracts.

• Immediate need for:

  • Reforming and structuring the training facilities
  • Applying criteria for selection of trainees and monitoring personnel development.
  • Intensifying on-the-job training.
  • Arranging for Consulting Agreements with Ex-MoO Experts.

• Legislative reform: Hydrocarbon Federal Law, INOC, MoO.

• Enhance the State Oil Marketing Organization (SOMO) to handle more effectively the rising production capacity of the country.

• Speed up the completion of a National Integrated Hydrocarbon Plan in consultation with former MoO officials.

• Minimize the tribal threat in West Qurna and Mdaina District: Local tribes are enforcing their own conditions on IOCs and contractors to employ their unskilled people. Current influence in West Qurna seems to be spreading to other areas with possible effect on the activities in Majnoon, Ben Umar and Halfaya Fields' present and future activities.

Energy & Geopolitical Risk

Since the later part of the 19th century oil and gas have dominated the lifestyle and welfare of the human species. The pursuit of oil and gas has brought about technological innovations that have produced both beneficial and harmful consequences for the development of human welfare. On one hand they have helped to improve the quality of human life and contributed to the reduction of disease, illiteracy, poverty and insecurity. On the other hand no other source of energy has created such devastating and unabated political instability among nations. The ensuing geopolitical risk identification, management and mitigation with respect to energy sources constitutes a central factor in the modern international relations. Their ramifications cross all boundaries among the mutually dependent economic, political, social and environmental factors that shape the plans and aspirations of nations.

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Cross-border behavior is to varying degrees attributable to the uneven distribution of energy resources, which is a significant factor in assessing the ensuing risk profiles of sovereign nations. The security of global supply and demand of energy significantly determines the flow of energy resources and their derivatives to their intended destinations within a stable price régime. This position is further enhanced as the world is increasingly interconnected and characterized by irreversible dynamic interdependence.

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