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Notes On Pricing In The Heads Of Agreement On Natural Gas In Southern Iraq

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Introduction

The flaring of natural gas has been going on in Iraq for more than 70 years. In 2008, Iraq was classified as the fourth largest gas flaring country (after Russia, Nigeria and Iran).¹ Furthermore, the utilization of produced gas has deteriorated from 30% in 1984-90 to only 12% in 2004-08. The rest is either flared, re-injected or reduced shrunk in gas processing (see Table 1).

Table 1: Iraq – Natural Gas Production And Utilization

	Oil Production ('000 B/D)	Natural Gas (Mn Cu Ms/Year)				Utilized/Produce (%)	
		Gross Production	Marketed Production (Utilized)	Flaring	Reinjection		Shrinkage
1984	1,255	5,290	590	1,708	2,992	11.2	
1985	1,603	6,844	850	3,044	2,950	12.4	
1986	1,823	8,524	1,550	3,877	3,097	18.2	
1987	2,268	11,173	3,750	5,328	2,095	33.6	
1988	2,701	13,820	5,600	5,732	2,489	40.5	
1989	1,963	16,310	6,450	6,980	2,880	39.5	
1990	2,222	12,872	3,980	3,567	5,325	30.9	
1995	737	3,410	3,170	50	–	190	93.0
1996	740	3,480	3,240	50	–	190	93.1
1997	1,384	3,800	3,050	500	–	250	80.3
1998	2,181	4,000	2,950	800	–	250	73.8
1999	2,720	4,335	3,200	865	–	270	73.8
2000	2,810	4,350	3,150	950	–	250	72.4
2001	2,594	3,950	2,760	950	–	240	69.9
2002	2,127	3,550	2,360	950	–	240	66.5
2003	1,378	2,430	1,560	700	–	170	64.2
2004	2,107	10,500	1,000	8,000	500	1,000	9.5
2005	1,853	11,350	1,450	7,900	800	1,200	12.8
2006	1,957	11,900	1,450	6,600	800	3,050	12.2
2007	2,035	13,596	1,460	6,621	763	4,752	10.7
2008	2,281	14,781	1,880	6,005	900	5,996	12.7
Jan-Oct 2009	2,328	11,950		6,114			
1984-1990	1,976	10,690	3,253	4,319		3,118	30.4
1995-2002	1,912	3,859	2,985	639	–	235	77.3
2004-2008	2,047	12,425	1,448	7,025	753	3,200	11.7
Gas Reserves 2008, Bn Cu Ms		3,170					

Sources:

1984-1990 - Central Statistical Organization (CSO) *Annual Abstract of Statistics* 1988 and 1993, Baghdad.
1991-2008 - OPEC, *Annual Statistical Bulletin* 1999, 2004 and 2008.
2009 - Ministry of Oil (www.oil.gov.iq).

The Heads of Agreement (HOA – a non-binding document outlining the main issues relevant to a tentative agreement) between the Ministry of Oil and Shell, was arrived at late in 2008 to enhance the utilization of natural gas in southern Iraq. So far, no steps have been taken to translate the HOA into a full agreement.

In the present notes we comment on the pricing of natural gas in the HOA, mainly with regard to which international price to use and at what discount. We then refer to the consequences of linking domestic to international prices, mainly a situation that could arise in WTO membership negotiations with regard to subsidizing domestic gas consumption.

International Pricing Of Natural Gas

Pricing of gas is related to its trading mode and market structure in the different regions of the world. The way that gas is traded depends on technology, economics, and distance. Currently, there are three modes of trading: pipelines, entailing the movement of gas in its original state to nearby markets onshore or offshore; liquefied natural gas (LNG), where gas is liquefied at the origin, transported in tankers, then gasified at the end-user's destination, usually a distant market; and gas-to-liquids (GTL) whereby gas is converted to very high quality diesel fuel.

Given the technology, which mode to follow depends on availability of markets and the economics of each mode. In general, pipelines are more economic for shorter hauls and thus are preferred in local and regional trade. LNG is usually preferred for long hauls, mainly overseas markets. GTL is only a potential competitor to LNG, as it is still more costly.² For the HOA it is understood that, apart from domestic consumption, exported gas would be in the form of LNG.

As for the market structure, different domestic/foreign sources shares and institutional set-ups have led to different pricing arrangements. These arrangements may converge in the future, in the various markets, but currently they are different. In Asian and most European markets, which depend on imported gas, pricing is linked to the price of crude oil or oil products (usually through contracts). For instance, in Japan and in other Northeast Asian countries, gas price is linked to the cost of imported crude oil. Prices of Algerian LNG imports into Europe were first linked to the average price of a basket of crude oils, but later to the price of a mix of oil products. In the US, Canada and the UK, which have a high share of domestic supply, liberalization of the market has led the price of gas largely but not wholly to be determined by short term commodity trading.³

These two methods have led to diverging pricing for gas after 2005 in the related markets. The two figures below⁴ represent two markets with different mechanisms for pricing: the US market where the gas price is mainly determined in spot trading; and the European markets (excluding the UK), where the Russian gas price is largely oil or oil products related. It is clear in general that before 2005, gas and crude oil prices were moving in tandem in both markets. Since 2005, however, the two prices diverged in the US market⁵ while continuing their related movement with the oil price (though with a wider gap) for Russian gas in Europe.⁶ The divergence between oil prices and gas prices in the US market is expected to widen in 2010 and afterwards.⁷

Figure 1: Prices Of WTI Crude And Natural Gas In The US (B/D And B/D Of Oil Equivalent)

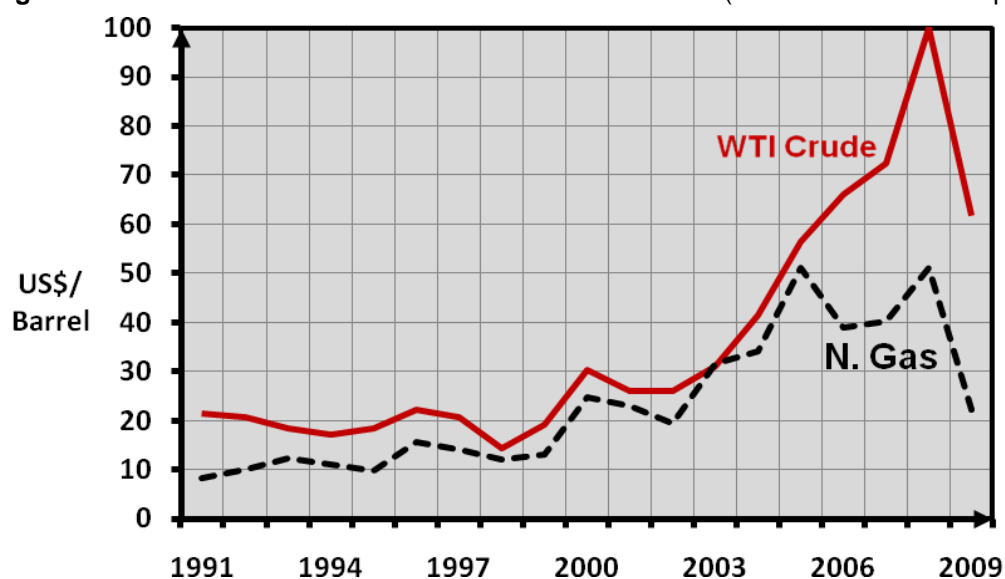
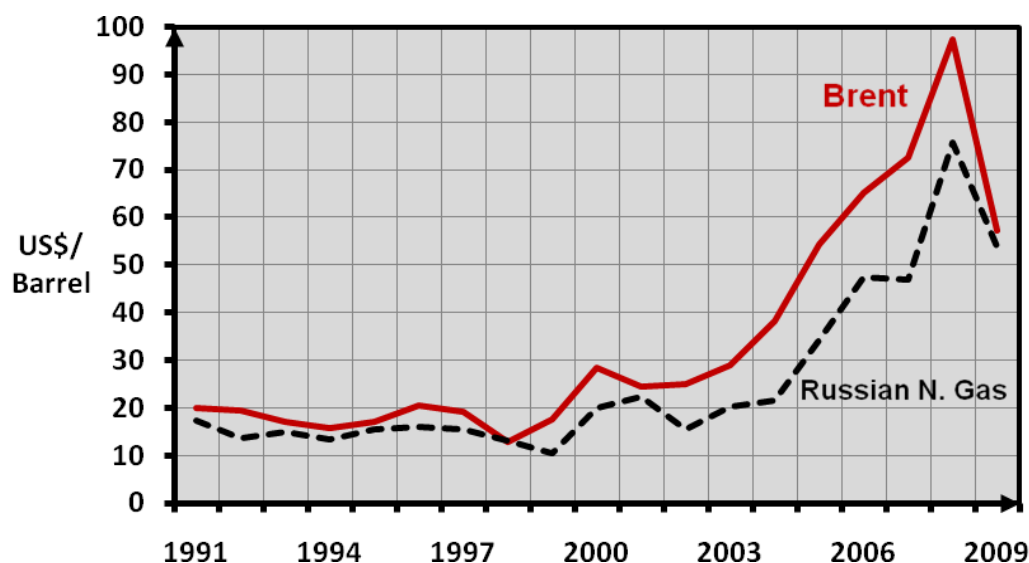


Figure 2: Prices of Brent Crude And Russian Natural Gas In Europe (B/D And B/D Of Oil Equivalent)



Prices of gas exports from the Mediterranean and the Gulf are determined according to the market structure of the importing region (largely tied to crude oil/products prices). Actual return, however, depends on the netting back of the price (ie price in the importing region minus the cost of refrigeration, transportation, and degasification).

The Heads Of Agreement

As with all schemes in the oil sector in Iraq, the HOA had been exposed to criticism, mainly: the invitation of Shell without involving other companies in transparent bidding; the deal offers a monopoly to Shell that extends for 25 years and includes the entire southern region; and it imposes international prices on domestic consumers, thus denying them energy subsidies that are followed by all oil producing countries. Even the World Trade Organization (WTO) has not prevented Saudi Arabia from subsidizing its domestic consumers.

Present production of gas in the south and the possible order of magnitude of future production are shown in the following Table 2.

Table 2: Present And Potential Production In The South Of Iraq

	Oil Production		Net Available Natural Gas: Production minus 10% shrinkage & losses			
	('000 B/D)		(Mn CFD)		('000 BOE/D)	
Actual						
- 2008		1,671		856		151
- Jan-Oct 2009		1,655		855		151
Projection	Min	Max	Min	Max	Min	Max
- 2016-2021	3,200	4,600	1,536	2,208	271	390
- 2022-2035	5,400	8,500	2,430	3,825	429	676

Source: actual figures from Ministry of Oil website (www.oil.gov.iq).

Note: Oil and gas production for 2016-35 is based on results of Rounds 1 and 2 licensing as of end-2009.

Using an oil-related price of \$33.90/barrels of oil equivalent (BOE) in 2009 (60% of the Basrah oil price),⁸ the value of net available gas could increase from \$1.9bn in 2009 to \$3.4-4.8bn annually in 2016-21 and to \$5.3-8.4bn annually in 2022-35.

International Price Of Gas In The HOA⁹

In general, the pricing of raw gas (ie gas bought from the South Gas Company (SGC) by a joint venture to be formed between the SGC and Shell)¹⁰ in the HOA is said to be linked to international or 'world market' prices for gas. The method or scheme of international pricing for the Iraqi gas is not mentioned in the HOA. Therefore, the scheme needs to be established first. This will be related directly to the main importing markets. It is clear from the above that there are different regimes of pricing in different regions. Would the price be referred to LNG spot pricing in the US/UK or to oil-related long term contract pricing (Figures 1 and 2)?

The choice of market against which to price Iraqi natural gas would make a difference to revenues as long as the various international markets follow different pricing mechanisms. With the expected rise in oil prices in the future, and until pricing mechanisms converge in various gas markets (analogous to the oil markets, say), the oil-related pricing (in Asia and most of Europe) seems more advantageous for Iraqi gas.

The Link To The International Price

The link to the international gas price itself needs to be looked into closely. Pricing of raw gas that the joint venture will buy from SGC is to be determined according to a mechanism described in Clause 3 (h) of the HOA.¹¹ The mechanism can be summarized in the following three equations/definitions (the author's symbols):

$$\begin{aligned} \text{Compensation for Raw Gas} &= \text{Fixed Percentage} \times \text{Revenues} && (A) \\ \text{Revenues} &= (\text{Sale of Gas, LNG, LPG, NGLs}) \times P_g && (B) \\ P_g &: \text{a Value (price) linked to International Market Prices} && (C) \end{aligned}$$

It is worth noting that the 'fixed percentage' is less than 100%, which implies a discount, therefore, the smaller the percentage the higher the discount. In the light of the limited elaboration given in HOA and quoted in Notes 11 and 12 of this article, the following questions arise:

Question 1: How To Determine The Fixed Percentage In Equation (A)?

This is answered in Clause 3 (h) of the HOA by suggesting the development of an 'Economic Model' by Shell and the Ministry of Oil. This is a loose end that invites the following observations:

- It is stipulated that the model 'calculate[s] cash flow based on projected gas volumes, capital cost and operational cost, Raw Gas compensation and taxes.' There is a circular problem here. This model is supposed to calculate the 'compensation of Raw Gas' yet in this statement 'compensation of Raw Gas' is supposed to be an input in the calculation.
- There could arise a clash of interests in a situation whereby Shell (a partner in the joint venture) is entrusted with the task of training the staff of the other partner (SGC) on an economic model that would affect the shares of the two partners. The lower the 'Fixed Percentage', for instance, the lower the income SGC gets for the sale of the raw gas. (One could argue that what SGC foregoes from the sale of raw gas is regained on the sale of treated gas; but what SGC foregoes on raw gas it foregoes in full, while sales of treated gas would be shared by SGC and Shell, a clear loss of a half by SGC).

Question 2: How Does P_g Link With International Market Prices Of Gas In Definition (C)?

International experience indicates varying percentages of discounts from the international price that are usually negotiated in the specific deal. For instance, in North Africa a 15% discount is used, so that instead of using the 'full' international price in the calculations of the government's and foreign partners' share, 85% of the international price is used.

Subsidizing Domestic Gas Consumption And WTO Membership

The price for the dry gas and other forms of gas sold to the domestic consumer is specifically required in HOA Clause 3 (i – k) to be linked to international market prices.¹² Even with this stipulation, it is possible to subsidize the sale of dry gas to domestic consumers through the budget. However, there is a serious problem that could arise with the WTO in the membership negotiations.

In the accession negotiations between Saudi Arabia and WTO, it seems that WTO has accepted that Saudi Arabia can subsidize the sale of ethane and methane to domestic consumers on the grounds that these elements of natural gas 'had no international reference price in the Gulf region'.¹³ Establishing an international reference price as is explicitly suggested in the HOA, therefore, would make the Saudi precedent irrelevant and could lead to objections to the subsidy by other WTO members.

To mitigate this, the natural gas used domestically should not be linked to international market prices. Alternatively, it needs not be part of the agreement between the Ministry of Oil and Shell together. It is better to procure gas through the Ministry of Oil for use directly by domestic customers at subsidized prices.

Recommendations

- Establish the method of international pricing of Iraqi gas. With the expected rise in oil prices, in the future, and until pricing mechanisms converge in various gas markets in the world, oil-related pricing seems more advantageous for Iraqi gas.
- Spell out the elements of the economic model/mechanism through which the gas price is related to the

international price. Minimize or eliminate possible discounts.

- Subsidize selective domestic consumers.
- Pegging the price of domestic industrial and commercial consumption to international levels would deny the Iraqi industries an important advantage over foreign competitors.
- In anticipation of objections in WTO membership negotiations, over subsidizing domestic consumption, domestically consumed gas needs not be part of the agreement between the Ministry of Oil and Shell or any other agreement.

Notes:

1. Global Gas Flaring Reduction Partnership (GGFR), 'Estimated Flared Volume from Satellite Data', 2009.
2. J Jensen (2004), 'The Future of Gas Transportation in the Middle East: LNG, GTL And Pipelines', Annual Conference of the Emirates Center for Strategic Studies & Research, Abu Dhabi, 27 September 2009 (www.JAI-Energy.com).
3. J Jensen (2009), 'Fostering LNG Trade: Developments in LNG Trade and Pricing', Energy Charter Secretariat, Brussels.
4. Constructed using data from: IMF (2009), 'Commodity Prices 1960-2009', (www.imfstatistics.org/imf).
5. During 2009 spot gas prices in the US remained under pressure as a result of negative GDP growth, weakening consumption and rising gas output.
6. The widening gap after 2001-02 in oil-related gas pricing is most likely the result of lagged adjustments to changes in oil prices and also to an S curve arrangement (whereby a floor and a ceiling for the oil price are established within which the slope of the relationship between gas and oil prices are adjusted).
7. EIA (2009), 'Annual Energy Outlook 2010' Reference Case.
8. Average prices of gas in the world varied widely in 2009. Russian gas in Europe averaged \$54/BOE (close to Brent's \$57/B). US domestic gas (an average of domestic and imported gas prices) averaged to \$22/BOE for the same period. In October 2009 the difference narrowed: while Russian gas fell to \$37/BOE, US domestic gas rose to \$23/BOE (IMF 2009). If these prices are netted back to Basrah, the range of possible 'international' prices of Iraqi gas becomes wide. Note that netted back costs make important fraction of the price. See Note 3 and J Jensen (2009), 'LNG – Its Role in the Internationalization of World Gas Markets', Presentation to Columbia School of International and Public Affairs, New York, 7 October 2009 (www.JAI-Energy.com).
9. HOA quotations are from the 'Heads of Agreement' document circulated online in late 2008.
10. 'Raw gas means any gaseous effluent in its natural state at the gas/liquid phase separation.'
11. '(h) The compensation of Raw Gas purchased pursuant to Clause 3 (g) will be linked to international market prices through the following mechanism: compensation for Raw Gas will be set as fixed percentage of the revenues received by the Joint Venture for selling products (gas, LNG, LPG and condensate) that result from processing and treating the purchased Raw Gas. The products will be sold at prices linked to international market prices and therefore any change in international market prices will directly impact the Raw Gas compensation. There will be appropriate audit rights for the Ministry on the realized revenues.
 - 'The parties will determine the fixed price percentage based on an Economic Model developed by Shell and the Ministry. The Economic Model will with a reasonable degree of certainty calculate cash flow based on projected gas volumes, capital cost and operational cost, Raw Gas compensation and taxes. The purpose of the Economic Model is to assist the parties in a transparent way in the decision-making. Shell will provide the Economic Model and provide training to the Ministry representatives who participate in the formation of the Joint Venture or the JMC.
 - 'The compensation for Raw Gas will be adjusted (both upwards and downwards) if certain economic parameters such as the fiscal regime or cost structure of the Joint Venture undergo significant changes resulting from eg changes in the industry cost environment, gas composition and gas pressure.'
12. '(i) The Parties anticipate that:
 - The Joint Venture will, following a jointly agreed planning process, sell to the Ministry its products (dry gas, LPG and condensate) for domestic consumption at prices linked to world market prices, which the Ministry then sell to (end-) consumers;
 - Upon a formal request of the Ministry to be preceded by a jointly agreed planning process, the joint Venture will directly sell to (end-) consumers its products (dry gas, LPG and condensate) for domestic consumption at prices linked to world market prices;
 - The Parties agree that any delivery points for domestic sales are the battery limits of the Joint

Venture installations; and

- The Joint Venture will export its products (dry gas, LNG, LPG and condensate) at prices linked to world market prices;

'(j) Shell (and/or its affiliates) will off-take and purchase any LNG produced by the Joint Venture; and

'(k) The Parties acknowledge that, in view of the economics of the gas industry, the long term planning and optimization and substantial investments to achieve an optimal solution for Iraqi gas development, the Joint Venture will be the sole gas company engaged in business, as defined in Clauses (1) Purpose, and (2) Scope, and in Clause (3), in the South of Iraq (Basrah), and providing gas for domestic and export markets and generating revenues from gas marketing activities.'

13. 'The representative of Saudi Arabia noted that pricing of natural gas (including methane and ethane) was quite different from the pricing of natural gas liquids (NGLs – butane, propane and natural gasoline). Natural gas was not sold for export due to the high costs of liquefying, transporting and re-gasifying such gases, and therefore had no international reference price in the Gulf region', WTO (2005), 'Report of the Working Party on the Accession of the Kingdom of Saudi Arabia to the World Trade Organization', Document WT/ACC/SAU/61.