

Table 1: GTL – Product Valuation (Typical Cost of Production)

	Cost per barrel		Cost per MBtu LNG
	GTL	Refinery	
Natural Gas	\$6–10		\$0.6–1.0
Crude Oil		\$18–25	
Operating costs	\$3–4	\$2–3	\$0.2–0.3
Cash costs	\$9–14	\$20–28	\$0.8–1.3
Capital costs	\$9–14	\$4–7	\$1.8–2.0
Cost of Product	\$18–28	\$24–35	\$2.6–3.3
	Integrated GTL 100 Kb/d	Standalone Refinery 100 Kb/d	Full chain LNG 7.3MMtpa

GTL ventures in an area of economic uncertainty. The overall profitability of a GTL plant can, therefore, be benchmarked against crude oil prices.

The GTL-FT should not, however, be viewed as a standalone business based on purchased gas conversion to high-value liquid product. It should, rather, be viewed as a gas-monetisation option, and the economics of the upstream facilities need to be accounted for in the overall assessment.

The Internal Rate of Return (IRR) for a typical project based on an integrated facility is much higher than one based on standalone facilities. This is primarily due to the additional products, such as condensate and NGL liquids, produced from the reservoir while processing only the lean gas in the GTL facility.

An illustrative IRR profile at various crude oil prices is shown in Figure 3.

The cost of the GTL facility will be largely determined by its location and

be specific to particular site conditions and the availability of appropriate infrastructure. Qatar currently provides some of the most attractive frameworks for implementation of GTL projects, with its opportunities for further integration with other facilities and infrastructure within an industrial set-up.

Conclusions

The main reasons for GTL to be the ‘flavour of the year’ can be summarised as follows:

- Diversification of resource monetisation
- Substantial technology and capital cost improvement potential
- Profitable and comparable economics to LNG alternative
- Large market for the products

Qatar exhibits characteristics which are conducive to GTL venture developments and can rightfully claim to be the capital of the GTL world.

Why Oil Prices Have Moved Higher

Paul Horsnell

The central point to be made about the move up in oil prices is that it reflects structural rather than cyclical issues. That is to say that higher prices are not the result of a random coincidence of short-term factors that could easily go away again. Instead, the move represents a significant structural shift upwards from the circumstances of the 1990s. Over the past two years, that shift has become reflected in longer-term market values, as is seen in the time curve for West Texas Intermediate (WTI) crude oil prices (Figure 1).

The back end of the oil price curve stayed between \$18 and \$21 for almost the entire period from 1986 to 2002. Whether prompt prices were at \$40 or \$10, longer-term prices rarely strayed from the narrow \$18 to \$21 band. A powerful consensus formed around the view that oil prices could not be sustained at levels above that band, and indeed that the longer-term trend had to be downwards. Over the past two years that consensus has been shattered by the sharp move up along the entire price curve. Over the course of 2004, crude oil for December 2010 delivery has not traded below \$27, and it has at points traded above \$30. Even during periods of weaker prompt prices, the middle and back of the curve have remained robust, with any moves down creating a burst of consumer hedging that has supported prices.

We see the move up in prices as being a drama in two acts. The first act was the period in which the market realised that the \$18 to \$21 consensus was too low for longer-term equilibrium. The second act has been a period in which further upwards pressure has arisen, primarily because of the consequences of keeping prices too low in the 1990s and creating absolutely the wrong set of market signals. In other terms, in the first act the market signalled that prices had to be higher to avoid a longer-term capacity crunch, and in the second act it signalled that just maybe things had been left a bit too late.

Figure 3: Economics of GTL

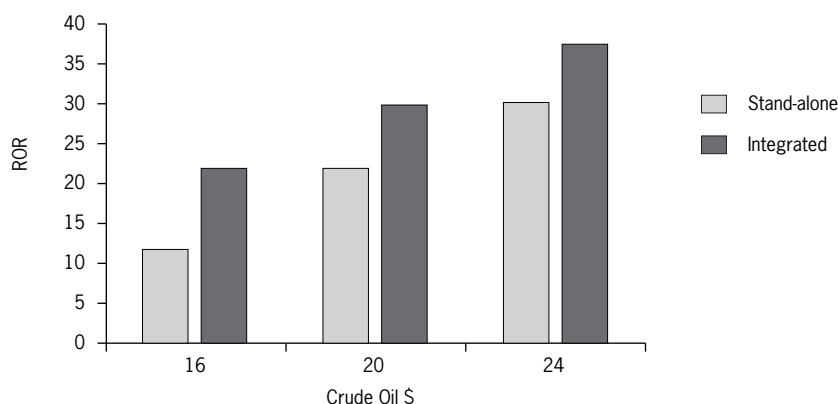
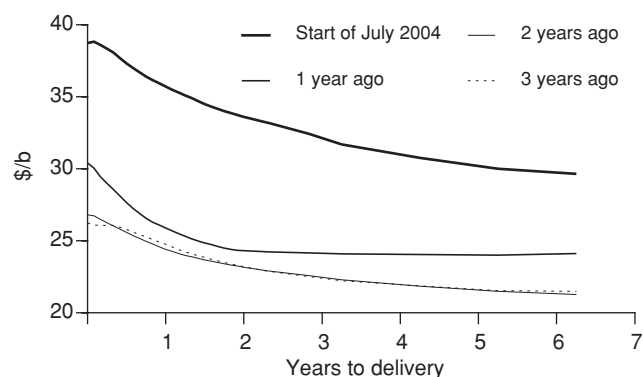


Figure 1: Time Curve of WTI Prices (\$/b)



Source: Barclays Capital

The main component in the first stage of the move up in prices has been the increase of at least \$10 in longer-term prices. There are several strands behind the justification of this rise, but three key elements can be isolated. First, and most important, several key producers face economic challenges due to high birth rates and the consequent implications for social expenditure and labour markets. Low oil prices did not give those producers an adequate ability to deal with those challenges, and therefore low prices proved to be both unsustainable and undesirable. Secondly, changes had been taking place in global oil demand, which was becoming less sensitive to prices and more closely linked to longer-term structural changes in emerging economies. Finally, non-OPEC supply was beginning to struggle in mature areas. Outside the Former Soviet Union, non-OPEC supply growth has been stagnating, providing a further support for higher prices.

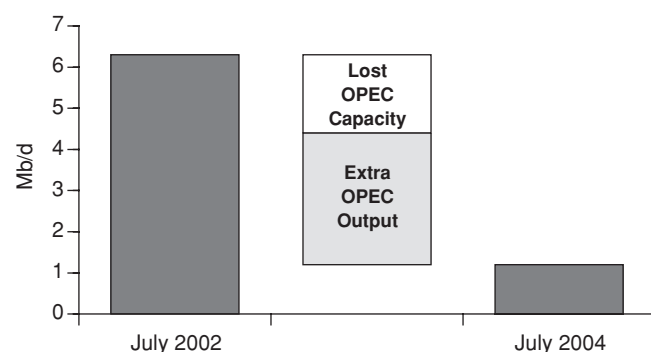
Price rises this year have been part of another phase, which has added further upwards pressure particularly at the front end of the price curve. The fundamental influences that helped producers to achieve more acceptable prices in the first phase, have continued with increased vigour and have started to get a little out of hand. The main dynamic has been a rapid increase in demand combined with a moribund supply side. This combination has reduced the amount of slack available at several points along the supply chain. This lack of flexibility, particularly in the downstream, is to the greatest extent the legacy of a lost decade.

In the 1990s, capital and commodity markets treated energy as if it was a declining industry with a permanent and irremediable overhang of excess capacity. It was seen as needing little new investment, and hence the returns to capital were derisory. The markets were wrong, or at least went far too far. Further, much of the ethos under which some OECD governments looked at energy was shown to be dogmatic and incorrect. In reality energy is an expanding industry with large and increasingly urgent capital requirements. By getting that wrong for a whole decade, conditions were created for the current decade to be one in which the main theme throughout the energy industries has been dislocations and the erosion of spare capacity down to suboptimal levels.

In the case of the upstream oil industry, spare capacity has shrunk dramatically over the past two years in the face of rampant demand growth, as is shown in Figure 2. Sustainable capacity is an often elusive concept and difficult to pin down precisely. However, on Barclays Capital estimates, global spare sustainable oil production has shrunk from about 6.3 mb/d in July 2002 to 1.3 mb/d in July 2004. This erosion of 5 mb/d over so short a period is perhaps the best illustration of quite how strong demand dynamics have been in relation to supply dynamics.

The 5 mb/d reduction in spare capacity can be split into two elements. First, there has been a reduction in sustainable capacity within OPEC, and most especially in three member states. In Venezuela, the oil workers' strike led to a significant loss of capacity. In Iraq, the legacy of a decade of under-investment under sanctions appears to have been exacerbated by the post-war policies of the coalition, and sustainable capacity has been reduced. In Indonesia, an increase in decline rates and a shortage of new projects has led to a consistent fall in capacity. While capacity has increased elsewhere in OPEC, the net change over the past years has been a reduction in sustainable capacity of more than 1.5 mb/d. The other, and more important, element in the reduction in slack is the extent to which OPEC has had to increase output to attempt to keep the market balanced. The need for this has in turn been created by the extent to which global demand has outpaced non-OPEC supply.

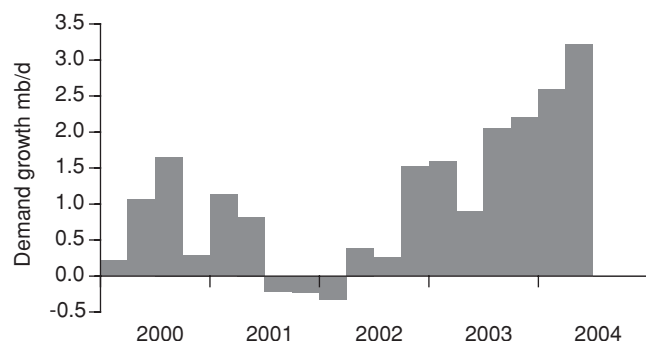
Figure 2: Spare Upstream Production Capacity (mb/d)



Source: Barclays Capital

The year-on-year changes in global demand are shown on a quarterly basis in Figure 3. Apart from the temporary reduction in growth caused by SARS in Q2 of 2003, there has been a clear acceleration in demand growth over the past two years. The previous conventional wisdom that prices above \$20 would cause demand growth to cease has turned out to be very wrong. The highest prices for 20 years have been accompanied by the fastest demand growth for 25 years, because income effects have dominated price effects. Price elasticities appear to be much lower than was expected, and GDP sensitivities appear to be much larger. The surge in growth has happened on a global basis, although it has been led most strongly by the USA, China, India and Latin America.

Figure 3: Growth in Global Oil Demand (mb/d)



Source: Barclays Capital

In the face of so strong a demand surge, the supply side has been caught rather flat footed. Outside of the Former Soviet Union, non-OPEC supply fell between July 2002 and July 2004. All non-OPEC growth has come from the Former Soviet Union, and most particularly Russia. Output from the Former Soviet Union has increased by some 2 mb/d over the past two years, well short of demand growth, but enough to have stopped the world completely running out of spare capacity. This has left OPEC to take up the slack. OPEC has found that by the current quarter the call on its crude oil has exceeded even very recent expectations by up to 4 mb/d. Given the lags involved in bringing new capacity on stream, it is hardly surprising that this great a shock should have compressed spare capacity so significantly. That compression has also been reflected in the downstream. For several years the lack of flexibility in US refining has been having a major impact on prices and causing frequent product price spikes. This year, the demand shock has meant that the tightness in oil refining has become a global phenomenon.

The scale of demand growth, and the associated reduction in spare capacity, has been so great as to render as unnecessary any other explanations for the additional push up in prices this year. However, there are two other explanations which have gained wide coverage and acceptance. We believe that both are incorrect and unhelpful.

The first of the alternative explanations is that higher prices are due to the actions of speculators. To be specific, it is alleged that there has been a rush by hedge funds and commodity trading advisors to buy oil. The suggestion that normally goes with this theory is that higher prices are not justified, because hedge fund buying must necessarily involve a decoupling from fundamentals. There are two problems with this theory. First, hedge fund buying is not necessarily unrelated to views of the fundamentals. Earlier this year, some analysts said that the funds were artificially inflating prices, because the fundamentals implied lower prices due to an impending huge surplus of oil in Q2. The reality proved to be quite the reverse, but nobody has said that in retrospect maybe the hedge funds were buying on the basis of what proved to be the correct view of the fundamentals.

The other problem with the speculative driven market theory is, however, far more serious. The reality is that

speculators have in fact been net *sellers* of oil in 2004. In the first week of 2004, net speculative (i.e. non-commercial) long positions across all US oil futures contracts amounted to 115.5 million barrels (mb). By the last week of June, those positions had shrunk to just 32.5 mb. In other words, a period of rising prices has been accompanied by net selling by speculators of 83 mb. Far from creating any unsustainable bubble, speculators have on balance had a depressive impact on oil prices in 2004.

The second alternative view is the 'fear' or 'risk' premium theory. This is ingenious and runs as follows. An analyst will take a view as to what the fundamentally justified level of oil prices is, sometimes by reference in isolation to the level of US crude oil inventories, sometimes just by the contention that their own price forecast must be the correct fundamental price. The gap between the actual price and this 'fundamental' price must then be due to something which is 'non-fundamental'. If you then say that this something else must be fear of supply outages from terrorism or other shocks, you must have a 'fear premium'. By this method you also have an exact measure of that premium. Then analysis becomes very easy, because every daily change is explainable. Prices fall, so clearly the fear premium must have contracted, prices rise so clearly there must be a larger fear premium. The problem of course is that the result is used as an assumption. It is assumed that the model used to derive the fundamental price is correct and that there has been no structural shift upwards in prices. This process then generates the result that there has been no structural shift upwards in prices because all the increase is fear or risk. In other words, the fear premium theory is the intellectual equivalent of the three card trick.

It is best to avoid attributing the sustained strength of prices to speculators or artificial notions such as the fear premium. In so doing, one runs the risk of missing the true reasons. Oil prices have moved higher due to structural factors and not temporary or artificial distortions. Indeed, from the point of view of securing longer-term supplies and market balance, any significant move lower in the short to medium terms would hold some dangers.

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