Lazard Insights
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Summary

Shifting Fundamentals in the Oil and Gas Industry

Featured Speaker: **Peter Hunsberger,** Managing Director, Research Analyst

The relationship between the price of oil and the price of natural gas in the United States has materially diverged—after an extended period when the two commodities moved more or less in tandem—due to a dramatic increase in U.S. gas production from shale gas plays. We examine this dynamic and how the recent trends may offer potential opportunities to investors.

Oil to Gas Ratio

Exhibit 1 shows the relationship of oil prices to U.S. natural gas prices since 1995. It also shows a horizontal line at 6:1, which represents the energy equivalency of one MCF[1] of gas to one barrel of oil. Leading up to 2006, the oil to gas ratio typically traded in a range of 6-9x, not too far from its energy equivalent values. Around 2006, the ratio began to widen a bit to 10-11x, and, more recently, we have seen the oil-to-gas ratio shift higher, to 15-20x or more. Looking out to 2011, the futures market is pricing oil and gas at about 20 to 1.

Why is this happening? We think there has been a fundamental shift in the relationship of global oil to U.S. gas prices. Shale gas plays are a game changer for North American supply. The cost of supply is falling; gas is disconnecting from oil.

Exhibit 1
Oil to Gas Ratio

As of 8 November 2010
Source: Credit Suisse
The horizontal line (orange) represents energy equivalency at 6 MCF per barrel of oil.

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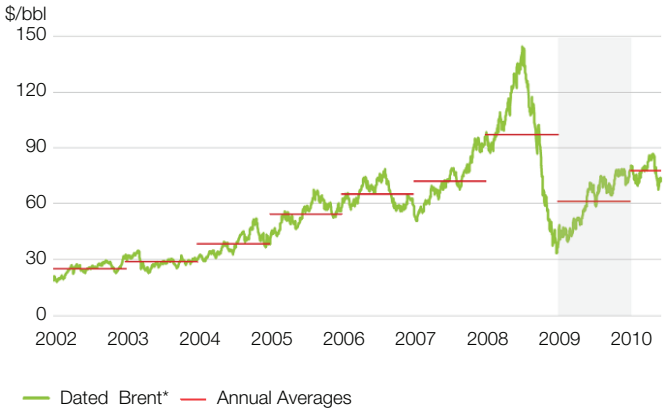
Why Are Oil and Gas Prices Different?

We highlight some of the differences between oil and gas markets. Oil is a global commodity, while gas is regional. Oil is a scarce resource, while gas is somewhat more abundant. Access to remaining reserves of oil is limited, while access to gas is relatively easy. Finally, oil is used primarily as a transportation fuel, for which there are currently few substitutes. Gas, on the other hand, has a number of substitutes that can be used for power generation—including coal, nuclear, hydro, solar, and wind.

Oil Prices Have Resumed an Uptrend

Taking a deeper look at oil market fundamentals, Exhibit 2 shows the trajectory of oil prices over the past 9 years. After spending much time in the previous decade trading between $15 and $25 per barrel (bbl), oil prices have been trending higher over much of the current decade, reaching a peak above $140/bbl in July 2008. The global economic slowdown caused oil prices to fall sharply in the second half of 2008, revisiting prices under $40/bbl. Since then, oil prices have resumed an uptrend and are currently trading near $85/bbl.

Exhibit 2
Crude Oil Prices



BP Statistical Review of World Energy 2010; includes data from Platts

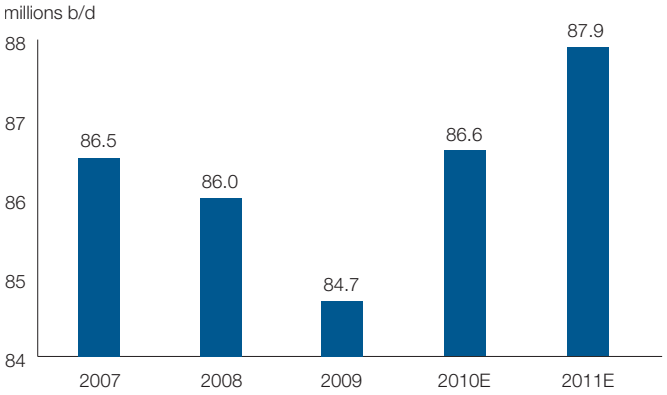
Source: BP

* Brent is an accepted world benchmark crude oil, which is used to price two thirds of the world's internationally traded crude oil supplies.

Demand Down in Recession, Now Recovering

Oil demand (Exhibit 3) declined from approximately 86 million barrels per day (mmb/d) in 2007 to under 85 mmb/d in 2009, but it has been recovering since then. Most forecasts for 2010 global oil demand are now above 86.5 mmb/d, with further growth anticipated in 2011.

Exhibit 3
Global Oil Demand



IEA Oil Market Report, 10 September 2010

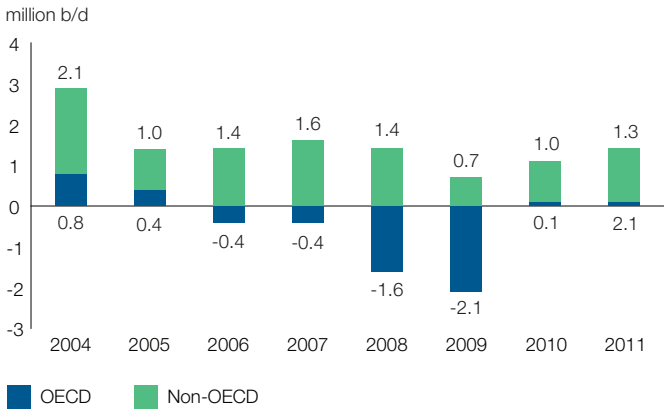
Source: OECD, IEA

OECD Demand Has Stalled, but Emerging Demand is Robust

The complexion of demand has been geographically bifurcated, as shown in Exhibit 4. OECD demand has shown pronounced declines in 2008 and 2009 but appears to be on track for slight growth in 2010. In contrast, developing market demand has been robust, growing each year since 2004, even during the 2009 global recession.

Drilling down a bit further on the demand picture, we would highlight China as a huge engine of growth in global demand. In 2010, China's demand is likely to reach 9.0 mmb/d,

Exhibit 4
Oil Demand Growth: 2004 – 2011



Source: ISI Energy Research

The Organization for Economic Cooperation and Development (OECD) is an international economic organization of 33 countries founded in 1961 to stimulate economic progress and world trade.

accounting for roughly 14% of total global demand. We note that China has a population of approximately 1.3 billion people today, while per capita energy consumption is still well below that seen in OECD nations. As per capita income increases in China, India, and other developing markets, we expect oil consumption to increase too.

Iraq: How Much Supply Growth?

Turning to the supply side of the equation, we highlight Iraq and Brazil as two potentially significant oil producers to watch. In Iraq, current production is approximately 2.4 mmb/d. However, recently signed contracts with a diverse array of global oil companies have set the stage for a potentially explosive increase in supply in coming years. Terms of the new contracts call for an increase in output to approximately 12 mmb/d, representing a five-fold increase from current production.

We note that this is relatively "easy," low-cost oil. There is very little geologic risk. It is not offshore, or in deepwater, or technically challenging oil. The caveat, of course, is that the situation on the ground must be safe enough to allow work to proceed. Many observers think Iraq could reach 4-5 mmb/d of output by later in the decade, but few see the country reaching the 12 mmb/d targeted level.

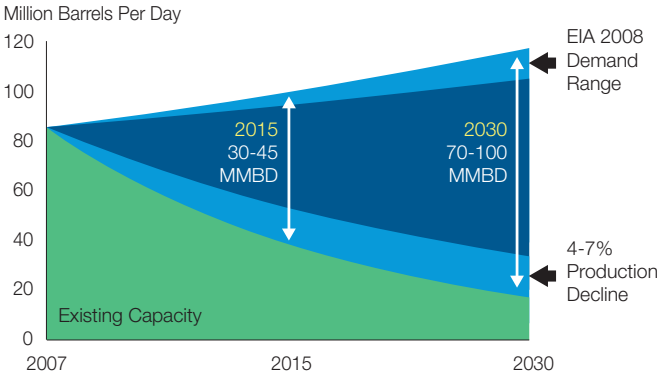
Brazil: How Much Growth and When?

Here we examine Brazil's potential impact on global supply. Petrobras is currently producing 2 mmb/d of oil in Brazil, but they are targeting this to double to 4 mmb/d by the end of the decade. This will be paced by 1 mmb/d of new production from the pre-salt discoveries in the Santos Basin. The pre-salt play is a very recently discovered trend in deepwater areas off Brazil. Various sources have indicated that this play could contain more than 50 billion barrels of oil. For perspective, that is about three to four times as big as the giant Prudhoe Bay oil field in Alaska, discovered in the mid-1970s. We expect massive amounts of capital spending here in coming years, with Petrobras alone aiming to spend $45 billion per annum on its upstream and downstream opportunity set.

Long-term Oil Supply Challenge

Exhibit 5 is a reminder of the daunting challenge faced by the oil industry today. In the chart, the light blue wedge at the top is an estimated range of future demand growth. The light blue wedge in the middle of the graph is an estimated range of future production declines from existing fields, estimated

Exhibit 5
Long-term Oil Supply Challenge



Source: 2008 Updated NPC Global Oil and Gas Study , 2009 Chevron Corporation

U.S. Energy Information Administration (EIA) is the statistical and analytical agency within the U.S. Department of Energy. EIA collects, analyzes, and disseminates independent and impartial energy information to promote sound policymaking, efficient markets, and public understanding of energy and its interaction with the economy and the environment.

at 4-7 % per annum. The green wedge at the bottom represents existing production, which declines over time.

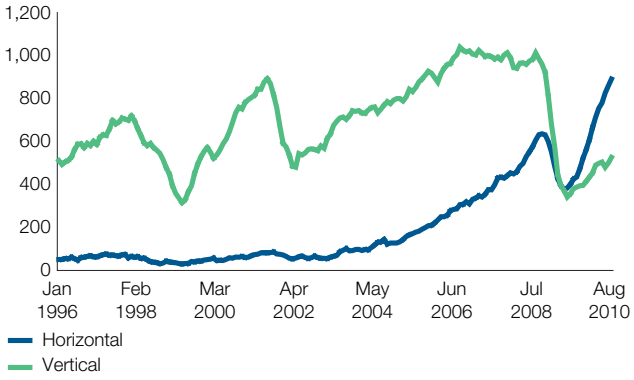
The graph highlights the reality that there are two hurdles to supply growth in coming years. The first is the challenge of meeting increased global demand, which is expected to be in the range of 0-2% per annum. On top of this, however, is the reality that existing production is likely to decline at more than 4% per annum. Adding these two elements together, it seems likely that significant incremental production capacity will be needed in coming years to meet demand. The graph suggests that 30-45 mmb/d of incremental supply will be required by 2015. For perspective, the midpoint of that estimate represents more than 40% of current global oil demand.

Natural Gas: Too Much Supply

Shifting to natural gas, we see very different dynamics at work—at least in a North American context. In our view, the industry has done a fabulous job of creatively unlocking the riddle of shale gas, and this has caused a step change lower in cost-of-supply trends.

Currently, and in spite of gas prices hovering under $4/MCF, the U.S. gas rig count is near an 18-month high. Making matters worse, the horizontal rig count is at new highs. Horizontal drilling has become the method of choice for tapping shale reservoirs, displacing the traditional vertical drilling approach. Exhibit 6 depicts the shift from vertically drilled gas wells, which peaked in the 2006-2008 period, to horizontally drilled wells, which are reaching new highs today.

Exhibit 6
Rig Count Shifting to Horizontals



As of August 2010

Source: Baker Hughes, Credit Suisse

Horizontal wells are much more productive than vertical wells. Industry is now using longer and longer laterals to open more of the productive formation to the well. Additionally, they are increasing the number of "frac stages," which used to be one or two per well and now may be 18 or 22 or even 28 stages per well. The bottom line is higher flow rates and increased reserve recoveries per well.

At this point, it appears there are no shortages of shale opportunities to drill in the United States. The limiting factors today are frac capacity and personnel.

Natural Gas: With Low Gas Prices, Why Are They Drilling?

In the face of fairly disappointing gas prices, why are industry players drilling so many gas wells? Some operators justify the drilling on economic grounds, arguing that their costs are so low that they can still make money with gas prices under $5/MCF, maybe even under $4/MCF. But beyond this somewhat debatable claim, there are some other, less obvious reasons for the active drilling campaigns. First, many exploration and production (E&P) companies are drilling to hold leases on the vast acreage positions they assembled in various shale plays. Essentially, it boils down to "drill it, or lose it" on the leases.

Secondly, there are now numerous joint ventures formed with big international oil companies that help U.S. E&P companies fund development of their fields. The big oils have deep pockets, longer investment horizons and fixed drilling commitments–so these plays will see continued drilling in spite of current weak gas prices.

A third factor providing support to current drilling is the use of gas price hedges by many E&P companies. These hedges, which were particularly significant in 2009 and 2010, help protect cash flows, allowing companies to spend beyond what underlying cash flows would otherwise permit.

Finally, we would highlight the rise of the liquids-rich shales as a factor contributing to high levels of drilling. Higher value liquids components enhance play economics–but drilling for liquids will also add new gas supply.

Opportunities

We believe there are opportunities that flow from the disconnect between oil and gas prices. Economics for oil producers look advantaged compared to those drilling for gas. We think it also makes sense to consider companies who benefit from low gas prices: if you are a North American chemical company using gas as an input, low gas prices may benefit your operations. Lastly, in oil services, there may be opportunities in those companies that can enable oil projects and shale gas exploitation.

Notes

1 MCF is the abbreviation for one thousand cubic feet of natural gas.

Important Information

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