



Markets At A Glance

Oil Painting By Numbers

At the risk of sounding like a broken record (or a scratched CD as the case may be), in this Markets at a Glance we will once again revisit one of our favourite topics: **Oil**. We don't mean to be long in the tooth on this subject, for, as our readers are well aware, we've already written about **Hubbert's Peak** and **Peak Oil** on quite a few occasions since our first article on oil in April, 2004. This time around we won't bore you with the theories and hypotheses, and the whys and wherefores, of imminently declining global oil production. Nor will we mention the world's ultimate demise when it finally realizes that there just isn't enough of the stuff to go around anymore. Verily, our views in this regard are already well known to those who read our articles.

Rather, we will merely be connecting the dots (painting by numbers if you will) on a canvas of interesting data points that have come to light recently. Truth be told, the dynamics in the oil market are changing so rapidly that it is a topic worthy of frequent visitation. The problem, as we see it, is one of mathematics – the numbers just aren't adding up. Global oil demand is expected to increase by 1.8 million barrels per day this year (according to the IEA), and yet everywhere we look we see evidence that production is falling short of expectations. Countries that were supposed to grow production and be the “saviours” (Russia, Mexico, and perhaps even Saudi Arabia) are showing signs of peaking production, and countries that are already in decline are declining more rapidly than expected (U.K., Norway, and Indonesia). More and more experts (executives of oilfield services companies like Schlumberger and Baker Hughes for example) are now saying publicly that the average decline rate of the world's oil wells is **8%**! – a shockingly high hurdle to overcome with new production.

The implication of an 8% decline rate is that 6.7 million barrels per day of new production must be found every year just to break even (let alone meet growing demand). Although data on decline rates is difficult to come by, we suspect that 10 years ago nobody was using decline rates greater than 5% (we've even seen ranges as low as 1-3%). Let's be conservative and assume 5%. That means in 1995, when oil production was 71 million barrels per day, the world needed to find 3.5 million barrels per day in order to break even on production. To overcome today's decline rates means that we have to find over 3 million barrels per day more of new oil than we did 10 years ago. Based on recent evidence, that just ain't happening. Furthermore, 10 years ago it was known that OPEC could increase production by 10 million barrels per day over the next decade, and Russia by 3 million. (That's how we got from 71 million barrels per day to 84 million.) The rest of the world (non-OPEC/Russia) has merely flatlined. If OPEC and Russia flatline today, then global oil production is sure to go down.

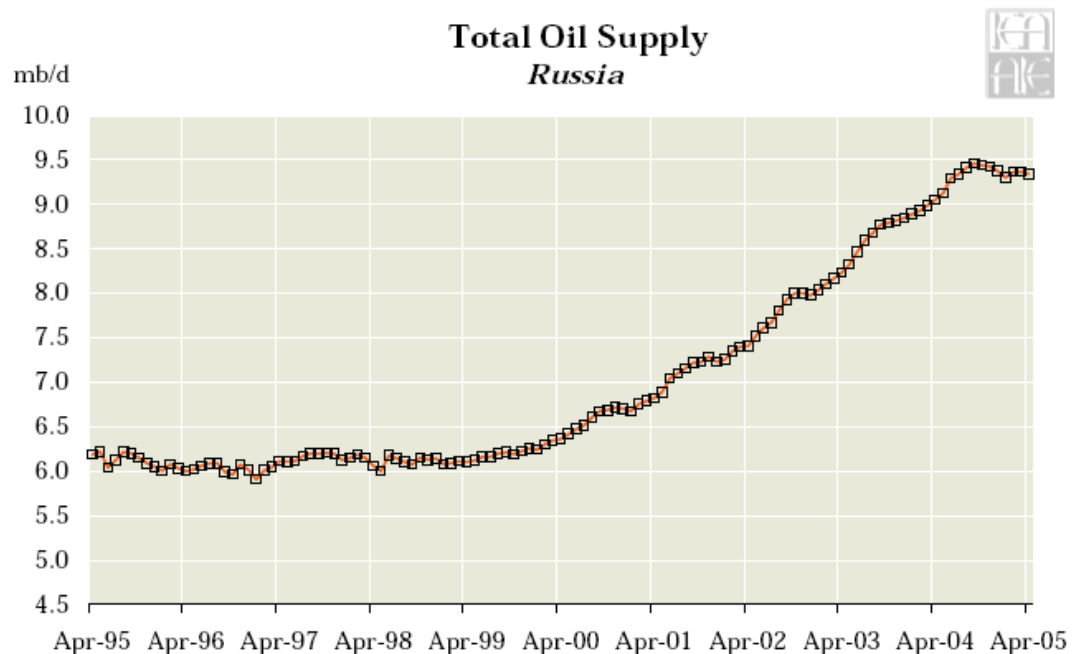
As a side note, the decline rates being experienced in the natural gas industry are even more onerous. First Energy revealed that Canadian natural gas production is expected to rise by a measly 0.1% this year, even though exploration and development costs are up 25%. So 25% more money has to be spent in order to find 0.1% more natural gas. As one can see, the supply side of the natural gas market is having problems of its own.

So far this year the supply side of the oil equation has been anything but encouraging to those who believe that plentiful oil will be with us for decades to come. On the contrary, with each passing day we are becoming increasingly convinced that a “supply shock” is just on the horizon, and it will likely manifest itself before the year is out. **This year, 2005, may well turn out to be the peak year for global oil production.** In the seasonally strong fourth quarter, demand is expected to be 86.5 million barrels per day – that's 4 million barrels per day higher than current demand in the second quarter. Where this extra production is supposed to come from is leaving many of us scratching our heads. Be that as it may, the moment of reckoning is quickly approaching.

So why are things looking so bleak for oil supply? For one thing, it is becoming increasingly apparent that North Sea oil production is now falling off a cliff. In a report released this week, it was revealed that Britain had the steepest decline in oil production of any oil-producing nation last year, falling by 10% or 230,000 barrels per day. Norway (the other major North Sea oil producer) in the first four months of the year saw its oil production similarly fall 10% compared to last year. Even more disturbingly, the month of May alone saw a drop of 40,000 barrels per day versus April. If such a month-over-month rate of decline continues then Norway will lose at least 400,000 barrels per day of production this year alone. The heyday of North Sea oil production is clearly a thing of the past. It is worth noting that at its peak in 1999, the North Sea accounted for 9% of world oil production. Since that time it has lost one million barrels per day of oil production, with the most precipitous declines occurring in the last 12 months.

The news coming out of Mexico isn't helping matters either. Until recently, Mexico has been a bright spot on the oil scene, having achieved consistent production increases over the past decade from 2.6 million barrels per day in 1995 to 3.4 million barrels per day last year. However, production figures coming in for this year show that Mexico may already have peaked. Production so far this year is coming in slightly down year-over-year, after only a marginal increase (12,000 barrels per day) last year. Mexico's largest oilfield is Cantarell, a giant that produces 2 million barrels per day and accounts for over half of Mexican production. Late last year, the CEO of Mexico's state-owned oil company warned that Cantarell may start to go into decline as early as the middle of this year, and once it does the decline rate will be **10%-15% per year!** That amounts to another 200,000-300,000 barrels per day of oil production **per year** falling by the wayside.

Meanwhile, the Russian Economy Minister said this week that Russian oil production will only grow 3.5% this year – half the average growth rate experienced in the last five years. Even 3.5% seems optimistic to us given that in the first five months production was up only 3.2%, and that was an easy compare (Russian production was still ramping up at the start of last year). However, if one were to look at the monthly chart of Russian oil production it is definitely starting to look “peakish”.



Source: International Energy Agency

Production has been flat to slightly down since October 2004 after ramping up considerably in the five years before then. Be that as it may, even if Russia were to realize the 3.5% growth that they claim, it would amount to a mere 300,000 barrels per day over what they produced last year. To put that in perspective, that's an amount equivalent to Cantarell's (potential) decline, and is still less than half of what North Sea oil production is losing every year. In short, nowhere near enough to make up for the decline rates we mentioned earlier.

Have the OPEC countries been picking up the slack? Hardly. OPEC ministers are saying publicly that many member countries such as Iran, Venezuela, and Indonesia are failing to meet production targets. (Indonesia is now a net importer of oil... so much for the E in OPEC). The Iranian oil minister even went as far as to say, "OPEC members are already pumping at full capacity and can do nothing about prices." Recall that it is OPEC (along with Russia) that has been responsible for the majority of the world's oil production growth over the past decade. The rest of the world as a whole has remained more or less flat over that time. If OPEC and Russia are indeed running their wells flat out, then it's game over. There is no excess capacity anywhere in the world.

The problem is that we are reliant on a handful of gigantic (and aging) oilfields for the vast majority of our oil supply – oilfields that have been in production for decades and may have been "overproduced" in order to keep up with growing demand. As these fields go, so does global oil production – they are **that** large. Nothing found since can hold a candle to these goliaths. Nowhere is this more apparent than in the Middle East, especially Saudi Arabia which is the largest OPEC producer by far. 90% of the oil that Saudi Arabia has ever produced has come from **five** giant oilfields, some of which (like Ghawar) are over 50 years old. The two largest, Ghawar and Safaniya, have accounted for 75% of all Saudi oil production ever, and Ghawar today at five million barrels per day still accounts for almost 60% of Saudi production. To put the size and relevance of Ghawar in perspective, in the last 25 years the number of oilfields discovered in the world that are producing over 250,000 barrels per day can be counted on one hand.

Hot off the presses is a new book by Matt Simmons, Chairman and CEO of Simmons & Company International and a leading proponent of the Peak Oil hypothesis. The book is titled "Twilight in the Desert – The Coming Saudi Oil Shock and the World Economy." Simmons has been an oil industry analyst for over 30 years and for this book has poured over 235 technical papers written by engineers and scientists familiar with the key Saudi oilfields. He does a field by field assessment of 12 oilfields and concludes that Saudi Arabian oil production is at or very near its peak sustainable volume, and will likely go into decline in the very near future. The biggest problem is with Ghawar. This mammoth oilfield has been producing oil at prolific levels for the past 25 years, and it may have been irrevocably damaged by efforts to maintain its production through massive water injection. Simmons calls this "overproducing" – a term that is common in the oil industry and implies two things: (1) less oil being ultimately recoverable from the oilfield, and (2) a precipitous decline in production once damage from all the water injection fails to maintain pressure. Saudi Aramco (the state-owned oil company) started injecting water into Ghawar since the early 1960's, but it found itself having to inject more and more water over time to maintain production levels. The amount of water injected started in the tens of thousands of barrels per day and steadily grew to 12 million barrels per day by 1998. Today, Simmons suspects that the Saudis are injecting 15 to 18 million barrels of water per day into Ghawar – three times the quantity of oil that is being produced. Simmons believes Saudi oil production can collapse at any time. The proof will be in the pudding. If the Saudi's are unable to increase oil production, this will become most clear in the fourth quarter when OPEC is scheduled to increase production to 30.5 - 31 million barrels per day from the 28 mbpd it produces currently.

So the prospects for global oil supply look tenuous at best, but let's not forget the demand side of the equation. Many interesting data points can be found here too. Chinese car sales in the month of May were up 24% year-over-year, and are expected to be up at least 15% for the year as a whole. Similarly,

car sales in India were up 20% in the month of May. To put a historical perspective on what this means for oil demand, back in the 1950's and 60's when automobiles started to become ubiquitous in the Western world, oil demand grew from 10 million barrels per day in 1950 to 50 million barrels per day by 1970. Clearly, there won't be enough oil to go around for this kind of automobile demand in developing countries as well.

Although the world for the most part is still in denial when it comes to the pending oil crisis, the markets haven't been oblivious to these developments. Even though we are seasonally in a low demand period, the price of oil is quickly approaching \$60 as we speak – an all-time high and an increase of \$12 in the past month alone. The futures price of oil is now in contango (future price higher than spot) until 2007 and, early last week before the run-up in the spot price, was in contango all the way to December 2011 (the longest contract available). A contango in the oil market was practically unheard of as recently as the beginning of this year. However, the way events are unfolding, posterity may well show that buying a 2011 barrel of oil for \$55 today was the bargain of the century!

How high can oil go? In a crisis the sky's the limit. Even the **threat** of a shortage can send the price parabolic. Back in 1970 when US oil production unexpectedly peaked (nobody believed Hubbert back then), the price of oil shot up from \$1 per barrel in 1970 to \$12 per barrel by 1973. (This all happened **before** the Arab oil embargo.) There wasn't a *de facto* shortage of oil back then, as the Middle East was able to pick up the slack in US production. Unfortunately, there is nobody left to pick up the slack today. All the data points are confirming that we have a problem in oil, and by inference the entire energy sector. It is the biggest problem the world faces today.

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