March 2007 Investor Letter

Quarterly Review

The first quarter of 2007 was especially rough, with two large downward moves in the prices of energy commodities and precious metals during the quarter. Our projected weakness in the dollar was borne out, and yet, investors were hesitant to abandon the trend of the last nine months in which high-beta, high-P/E stocks went up in price while companies with solid fundamentals and slower but steady growth (like our energy and materials companies) had a harder time. In spite of these headwinds and dreadful short-term price action, our portfolios managed to finish close to unchanged for the quarter.

Energy prices were initially very weak in January as North American weather was initially far warmer than normal, which led to less usage, larger inventories and extremely negative sentiment. Crude oil prices plunged from the lower $60's per barrel to an intra-day low of $49.90 and natural gas prices hovered near $6.00 per MMBtu in mid-January. However, cold weather did come to the Midwest and East Coast, chilling the eastern half of the country for nearly 1 ½ months, and pushing energy demand and prices back near $60/barrel and $7.50/MMBtu for crude oil and natural gas, respectively.

Precious metals prices followed energy prices down during early January as traders believed that the disinflationary forces of lower oil prices would ease demand for metals. Prices recovered as energy prices moved back up, and gold prices were approaching $700/oz when the stock market hit an air pocket in late February, falling 416 points in a day and causing selling around the world in all asset classes. Precious metals were hit hardest, as gold and silver prices had moved up strongly since mid-January. Energy prices also fell over the period, as financial markets worried about a slowdown in the worldwide economy and whether it would lead to decreased energy usage.

March was a choppy month with equity prices jumping around but ending relatively strong, with stock indices ending just about unchanged for the 1st quarter. Precious metals prices recovered from their swoon, with gold ending up 5% for the quarter. Energy prices continued to rise, with increased usage of gasoline leading prices higher (inventories of energy products dropped during the 1st quarter showing strong demand). Crude ended the quarter up 10% (even after those two drops in price during the quarter), showing the world's continuing growth in demand for energy products. The end of the quarter was dominated by the Iran/United Kingdom standoff over the capture of British sailors in the Persian Gulf by Iran over trespassing issues. However, most disappointingly, many traders believe that energy price rises are only temporary, so prices of energy stocks did not participate in the upside move (also, at least some of the money

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coming into the stock market is petrodollars being reinvested from outside the United States, so those investments are slanted away from oil-related investments). Thus, our portfolios did not realize the benefits of the rise in energy prices as much as might have been expected.

However, while the US economy slowed slightly from its pace of last year, the mortgage markets, which had been going great guns for four years through mid-2006, started to show some cracks. Subprime companies like New Century Financial, NovaStar, Accredited Home Lenders and others disclosed large loan problems and suffered large financial losses. While unemployment statistics reported by the government have stayed strong and wage gains by US workers have started to pick up, many of these subprime mortgages were originated with extremely lax lending standards to people who had little hope of affording them. Thus, a number of these mortgages have gone into foreclosure, and while many in the market think the problems will be "contained" to subprime, we believe that lax lending standards occurred in all types of mortgage lending, and that problems will continue to grow in mortgages in general. We believe the market sell-off in late February/early March had as much to do with mortgage/finance problems in the US as declines in foreign markets, and that these finance problems in the US will lead to further pressure on the US dollar and thus price appreciation in the commodity-related parts of our portfolios.

Going Forward

Our primary investment thesis, owning positions that will benefit from a lower US dollar and attractive supply/demand characteristics, is not only intact but looking much more promising than in the past nine months.

Energy prices which were held back by a late arrival of the winter in North America and skepticism on the tightness of supply against uncertain growth in demand appear poised to rise. Continued strong demand for gasoline even in the seasonally weak early spring coupled with continued cold weather in the US have helped supply stockpiles to dwindle. We believe that continued strong usage of gasoline will help drive higher crude oil prices, and the threat of hurricane disruption of Gulf of Mexico energy supplies will help support crude and natural gas prices.

The dollar has continued to weaken versus the Euro and a number of other world currencies, and this has helped our metals and materials companies. We believe that this trend will continue and could cascade if the US Dollar Index falls below the critical 80 level that hasn't been reached since 1992. Part of the reason for the dollar's weakness is the perception that the Fed will lower short-term interest rates this year (versus tightening in most other countries in the world) as well as the diversification by foreign US dollar holders into other investments, including other (non-dollar) currencies as well as precious

metals. Global demand for base metals and many other commodities have lent more strength to the bids for these materials, further driving the bull market in commodities.

The other factors affecting our portfolios are the expected weakness in mortgage finance and technology company growth/profitability expectations. Subprime mortgages have made the headlines lately as borrowers who "bit off more than they could chew" caused a large amount of mortgage defaults. We believe that the blame for these defaults is in the lending standards of 2005-2006, not the inability of subprime borrowers to pay their mortgages, so we believe that "higher quality" mortgages in the so-called "Alt-A" category as well as prime mortgages are going to see a lot more defaults. In addition, we have see a huge run in technology company stock prices as investors perceive that there will be an upturn in technology company sales for capital investment (by companies) and continued "conspicuous" consumption (by consumers). Tech companies, from chip makers to cell phone companies to electronic retailers, have built large inventories in anticipation of demand that up-to-now has not appeared. Microsoft's Vista operating system launch in January (for consumers – the business roll-out was last fall) was supposed to spur demand for PCs, software and memory for new Vista-ready systems. Instead, the Vista launch was a non-event and actually led to reduced sales as people avoided the hassles and uncertainty of switching to Vista. In addition, the slowdown in the US economy is happening at a time when technology companies were expecting a capital spending cycle to commence, so these companies with bloated balance sheets could face a real shock when they end up having to sell their products at a discount just as materials prices are rising, squeezing profits.

We feel that our positions are appropriate to capture these trends, and we strongly believe that these trends, which are not followed by the investment mainstream, will bear fruit for our portfolios during 2007.

The Case for Oil

We have included a narrative that outlines a lot of our thoughts about the oil complex and why we are still bullish about energy prices (and thus companies) going forward. We believe that oil is headed for much higher prices, and The Case for Oil offers the reasoning behind our conclusions. We encourage you to read it. However, we also believe in the cycles of bull markets (although it is often hard to identify where we are in the cycle until later), and we have included a passage below on bull markets by Richard Russell of Dow Theory Letters that we believe sums up how bull markets often occur:

> ***The great majority of investors don't understand bull markets or the concept of the primary trend. When the primary trend of an item turns up - whether it be stocks, commodities, agriculturals, precious metals - we call that a bull market. There are small, medium and large bull markets. Once the primary trend of a category turns bullish, there's no way of knowing beforehand, how big the***

coming bull market is fated to be - nor exactly what path the bull market will take.

We do know that in major bull markets there are psychological or sentiment phases. The first phase of a bull market is the accumulation phase. This is the early phase where informed investors accumulate an item because they know the item is underpriced or that the item is underused or simply not understood.

The second phase of a bull market, usually the longest phase, sees the professionals, the funds, the big money, the smartest of the public, taking positions in the item. The second phase tends to be characterized by many reactions, corrections, adverse news events that cause the public to dump the item.

The third phase of a bull market is the speculative phase, here we see rising volume, the wholesale entrance of the public, accompanied by news and endless hype by the Wall Street "experts." People who wouldn't touch the item during the first and second phases, are now enthusiastic buyers. The third phase sees systematic distribution by the early first phase buyers. Third phase buying can easily turn to hysteria and madness. Towards the end of the third phase, we see hints of the beginning of the next primary bear market.

Question -- Do all bull markets progress as described above?

Answer -- Almost all major bull markets do. It's a judgment as to whether an ongoing bull market is fated to become a major bull market or not. There's no definitive answer to that question.

– Richard Russell, March 12, 2007

We at Kanos believe we are in the second phase of the great bull market in energy, and that the third phase will lead to much higher prices. Read The Case for Oil and see why.

Thoughts for the Future

Financial markets more and more seem to be correlated across regions and asset classes. Thus, we believe that our portfolios will be in for quite a bit of volatility in the future as some investments do better than others and markets adjust quickly and violently. We have tried to keep our eyes on the long run, respecting but trying not to panic when positions move against us (even violently) in the short-term, as long as our long-term analysis continues to be compelling.

We have included a narrative called "The Case For Oil" as mentioned above. Please read it if you have the time because it contains a lot of our rationale behind our energy positions.

We are trying to preserve your wealth and grow it in a way that makes sense in these sometimes confusing economic times. We very much appreciate your business and your patience. The markets continue to send all kinds of conflicting messages, and we are trying to keep your wealth in a place where it will grow with the appropriate amount of risk.

The Managers of Kanos Capital Management

The Case for Oil

Kirby Shanks
Kanos Capital Management, LLC

As your asset manager, we at Kanos are constantly looking at investment opportunities and the prospects of the investments we currently hold. We spend a lot of our time gathering and digesting information that affects our holdings, trying to determine times to either increase our holdings due to improving fundamentals or cut back (or eliminate) holdings due to deteriorating conditions and fundamentals. Energy prices have both risen sharply and dropped sharply over the last twelve months, and we thought this would be an opportune time to present our current thoughts on energy fundamentals and discuss our conclusions.

We at Kanos have extensive knowledge and experience in the energy industry, and we are currently bullish on prices of energy commodities and companies. We will attempt to summarize our thoughts on the reasons for our bullishness by laying out our thoughts about demand, supply, depletion and future development of petroleum.

Executive Summary

Energy prices have been high for three years, and one of our principal investment themes at this time is owning companies involved in a number of facets of the energy industry. While there has been a lot written on why we have high oil, gasoline and natural gas prices, I thought it would be useful to give you a succinct account of why we at Kanos still believe we can make you money by investing in energy companies.

We believe current conditions are similar to the 1970s when supply ended up being constrained after years of complacency over what was thought to be nearly endless supply from the Middle East coupled with demand rising continuously. In contrast with the 1970s, however, the 1990s were characterized by the rapid growth of businesses in Eastern Europe, the Far East (led by China) and south Asia (led by India) which has led to rising demand for nearly fifteen years. Meanwhile, extreme price volatility caused by short-term (intra-year) supply gluts drove prices below $20/bbl at times (1998, 2001), coupled with the belief that Saudi Arabia and other OPEC countries could add deliverability for under $5/bbl, led to underinvestment in long-term, higher cost investments by international oil companies. The abovementioned demand growth has used up virtually all of the world's supply cushion, pushing prices to the levels seen today.

Plenty of investor and analysts disagree with this thesis: some argue that decreased supply is the reason for high energy prices but argue that high prices will lead to

increased supplies, meaning prices should drop to historically lower prices. Some analysts blame demand for the price rise, citing rising middle classes in China, India, the Middle East and Latin America, as the reason prices are high; they argue, however, that high prices will cut down on current demand, thus driving prices down. A number of analysts are citing the 1980s price bust as the rationale for their belief that energy prices are poised to move back down to prices prevalent in the 1990s: crude oil in the $18-30/bbl range, gasoline in the $1.50-2.00/gal range and natural gas in the $2.50-4.50/MMBtu range. Their argument states that there is plenty of oil to be found, that high prices will cause increased exploration, that technology will make oil extraction cheaper and more efficient, and that when prices get "too high", demand destruction will allow prices to drop.

We believe that energy prices have risen sharply in recent years and stayed at high levels due to the confluence of continual increases in demand and faltering increases in supply. We believe that the combination of demand increases from developing nations dwarfs the effects from the developed world, and that increase standards of living will continue to power increased worldwide demand. We also believe increasing supply for the worldwide market has become a series of challenges which encompasses finding new sources, being able to extract these discoveries economically in the face of rapidly increasing material, services and labor costs (and shortages), and battling the effects of oil field depletion, as many large oil fields age and produce less each year. This combination of effects we believe will continue to support high energy prices into the future, although short-term effects will continue to introduce extreme volatility into price movements.

Demand

Energy demand throughout the world has been on an upswing, and that pickup seems to have accelerated in the past few years. Two major factors have been at work: modestly increasing energy usage in the developed world, and large increases in energy usage in the developing world.

The United States has always been the largest user of energy in the world, and we continue to use approximately 25% of all energy on a daily basis. Refined products from crude oil are used for transportation fuels (gasoline, diesel, jet fuel), heating (heating oil, residual fuel), feedstock for industrial purposes (ethane, propane, butane, ethylene – many of which are used to make plastics, PVC, etc.) and other (asphalt for roads, etc.).

The US in its boom of the 1990s (and after a shallow recession in 2001) and the 2000s has continued to raise its energy consumption while energy efficiency has flattened. Why? As Americans have grown richer, they have increased their usage of SUVs and trucks, private planes, second homes and recreational vehicles (ATVs, watercraft, RVs, etc.). While technological innovation has increased fuel efficiency in new vehicles, Americans demand for more power and speed have nullified many of the gains in

technology. In addition, the buildup of retail outlets around the US over the past twenty years has led to large increases in demand for large trucks for delivery of goods to more remote places, further increasing usage of diesel over more traditional distribution means of shipping and railroads. In the same vein, the continued rise of suburban living has led to longer drive times for commuters to work as well as to sporting events and on errands/eating at restaurants, etc.

Finally, many thought that higher priced energy would lead to large doses of conservation, as happened in the late 1970s and early 1980s. However, the US is much wealthier per capita than during this earlier time, and high prices have not cut down usage (for any appreciable time frame) as crude oil has averaged in the $60s – $70s/bbl and gasoline has exceeded $2.50 – $3.00/gal price ranges. US compound average growth rate for gasoline usage (2001 – 2006) according to Simmons and Company is 1.17%; while this does not sound like a lot, the US uses about 9.2 million bbl/day of gasoline (or 386 million gallons/day), so if this growth rate continues [and the United States Energy Information Administration (EIA) projects 1.1% growth in gasoline usage through 2030], the US will be using an additional 101,000 bbl/day every year, which is the size of a small refinery. This is still a large challenge for suppliers as the US has not built a new refinery since 1976 and incremental refinery expansions generally take at least three years to accomplish and are very expensive.

Of course, one big reason prices have risen is that demand from the developing world has increased as more large countries embrace capitalism and international commerce. In addition, rising populations of middle class in China, India, Brazil and other large populous developing countries are looking to improve their standard of living, and increasingly that means they are buying cars and cooking more extensive meals than in the past. This trends point to increasing energy usage in the future, regardless of small changes in economic activity going forward

The big story is China, as we have heard ad nauseum. However, the growth in energy usage in China is truly breathtaking. In February 2007, the General Administration of Customs in Beijing reported that China increased crude oil imports by 14.5% to 2.904 million bbl/day. In addition, China imports of refined products rose 15.7% to 0.584 million bbl/day. The US EIA has estimated Chinese total petroleum usage as 6.9 million bbl/day (2005) and nearly 7.9 million bbl/day (2006), representing a 14+% increase in energy usage. In addition, China uses coal primarily to generate both heat and electricity; coal, especially the way it has been used in China, is not environmentally friendly, and China has already realized that it must try to generate more electricity and heat from more environmentally friendly energy sources, be it natural gas, distillates or clean coal technologies. Chinese increases in usage of transportation fuels can be chalked up to two main events: 1) increased factory construction in inland China, leading to longer transportation trips for raw materials and finished products, and 2) China's frantic road construction, which allows for increased and more efficient freight hauling, as well increased usage by automobiles for business and recreation. The growing Chinese middle

class has purchases more and more cars, and they want to use them! These trends should continue to support increased petroleum usage in China over and above the usage of petroleum for transportation fuels.

India, while not as extensive in energy usage or consumption growth, is still expected to increase its energy usage 4.2+% for the next couple of years, which amounts to adding 100,000 bbl/day to its approximately 2.63 million bbl/day current usage. Like China, they have embarked on a large highway building program, analogous to the US building the interstate roadway system in the 1950s, adding efficiency and attractiveness car travel and truck transportation to India.

Other countries are adding to the increase in demand. One country growing its energy usage after years of energy use shrinkage is Japan which is growing their usage approximately 100,000 bbl/day each year, with usage currently estimated at 5.5 million bbl/day. Interestingly, "slow-growth" Europe has been increasing usage of petroleum at an approximate 1.3% clip (2006E from EIA), about the current worldwide average. Other countries with large increases in petroleum demand are: Russia (up over 3% in both 2004 and 2005 usage to 2.85 million bbl/day), Saudi Arabia (up over 4.5% in both 2005 and 2006 to 2.1 million bbl/day), Iran (up over 5% since 2003 to 1.6 million bbl/day in 2005E) and Venezuela (up over 3.5% to 600,000 bbl/day in 2005 and 2006). Overall, worldwide petroleum usage has been growing at a five-year compound annual growth rate of 1.3% or 1.1 million more barrels per day, which emphasizes the continued challenge of usage growth.

One other factor that we cannot ignore: petroleum products (and most commodities in general) are priced in US dollars. As the dollar drops in value versus other currencies (which it has been doing for a couple of years now, approaching lows not seen since the 1990s), oil grows cheaper to others throughout the world. Being cheaper means being more attractive, thus further stimulating demand, all other things being equal. So the falling level of the dollar against other currencies may give us more confidence in the oil story, if the dollar continues to weaken (as we expect it to do).

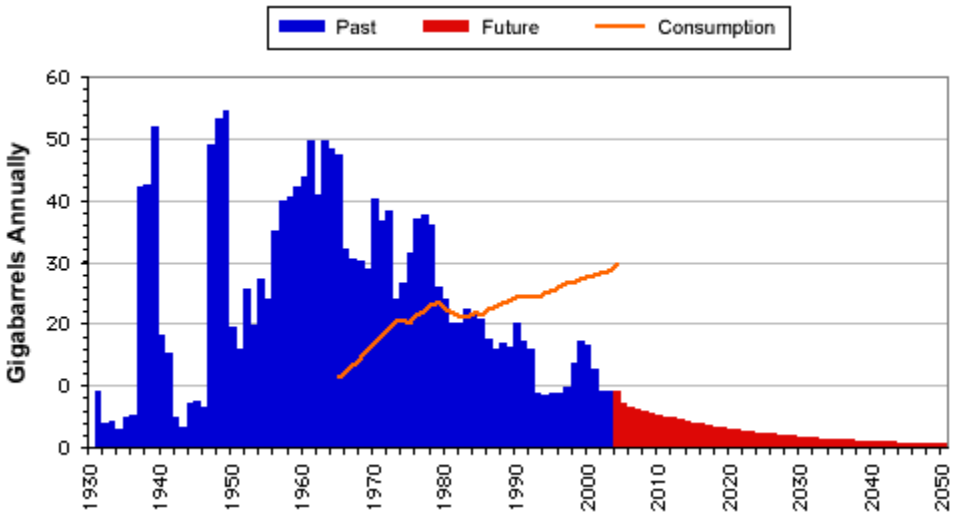
Supply

While the first oil well was drilled in Pennsylvania in 1859, the center of the petroleum world during the latter part of the 19th century was Baku in the Caspian region of Russia. Oil and gas had seeped up in the area for millennia, and oil was first dug out of the ground and later drilled, making Baku the source for more than half of the world's petroleum by 1900. The discovery at Spindletop in Texas in 1901 really set off the oil rush, and oil was discovered around the world during the early part of the 20th century. However, in spite of large discoveries in the Middle East and Latin America, the United States was the world leader in petroleum production throughout the first two-thirds of the century. As oil became harder to find in the US, oil companies looked around the world for similar geologies and evidence of surface petroleum "shows" to order to find large

discoveries around the world. However, by the 1970's large field discoveries started to taper off – the "easy" oil had been found.

Figure 1

Oil Discovery (3 year average - past and projected) 1930-2050



(1 gigabarrel = 1 billion barrels)
Source: ASPO

The worldwide petroleum industry embraced new technologies as it sought to find more reserves in harder-to-operate locations, and technological advances led to more (albeit smaller) discoveries: the use of three-dimensional seismic and improved well logging to find the petroleum; improved offshore drilling techniques and equipment to capture heretofore unrecoverable deep offshore oil and gas; horizontal / directional drilling that led to increased drilling and infrastructure productivity and improved processes and catalysts to improve refining yield for high value products, especially gasoline. In addition, new ways of recovering already discovered oil led to increased yields from old and existing fields, further boosting production levels and adding to recoverable reserve amounts.

However, a lot of recently-found oil and gas is extremely expensive to recover when on e considers the absolute cost of the entire project. Billions of dollars are spent on new platforms, pipelines, processing plants and tankers to bring this petroleum to market, and the volatility of sales prices have led the oil industry to be conservative on developing new projects to try to make sure they make a reasonable return on their capital invested. As oil prices dropped precipitously in the early 1980s and gyrated between $9 and $30 for the next twenty years, the oil industry underinvested, especially in the past ten years, as uncertainty of prices and marginal investment returns in some projects led to higher

risk (read: cost) projects being shelved (for example, refining was a very poor business during the period between 1985 – 2002).

And general world consensus from the 1980s through today has been that OPEC countries, especially Middle Eastern countries such as Saudi Arabia, Kuwait, Iraq and Iran, have such vast reserves that new production could be brought on for less than $5/bbl when prices got "too high". This appears to have been optimistic, because as prices have risen higher and higher, OPEC countries have not been able to raise their daily production at will. While many OPEC countries (Nigeria, Algeria, etc.) partnered with major oil companies and continued to drill new wells and build infrastructure during the 1990s, most large Middle East oil producers felt they only needed to regulate the production from existing wells; new wells and production were thought to be able to be brought on from undeveloped discoveries in a relatively short period of time. The last supermajor field discovered in Saudi Arabia was in 1968 (!), but Saudi Arabia has historically developed their fields on an "as needed" basis, so developmental drilling of existing fields has continued over the last forty years. In the past, Saudi Arabia has tried to bring into production undeveloped parts of its large discoveries as they saw production might be needed in the near future. As prices rose past $50 in the past couple of years, Saudi Arabia has said they would provide more oil to stabilize prices, as they have as the world's swing producer over the past thirty-five years. But a funny thing happened this time – the Saudis never produced more than about 9.5 million bbl/day! We will examine the implications of this in the next section entitled "Depletion / Leveling Production?" below.

So as older fields around the world have started to mature, they start to deplete and daily production levels drop. As the oil industry, both national oil companies (like Saudi Aramco, PDVSA in Venezuela, Pemex in Mexico, etc.) and international oil companies (like ExxonMobil, BP, Shell, Anadarko, Occidental, etc.) began to ramp up new production plans during the last ten years, they discovered something: the prices of people, materials and contractors had gone up – and were continuing to do so. Why? As the Cold War waned, formerly communist countries in Asia and Eastern Europe joined the world business community and were busy using large amount of concrete, steel, copper and other materials to build factories, roads, housing complexes, bridges, etc. around the world. The oil industry had been able to use the large amount of spare capacity in its support industries very cheaply during the 1980s and early 1990s when there was excess. Now it is difficult to find new people to expand the industry, it is expensive to buy materials to fabricate new facilities, and many support firms are at capacity so that lead times and costs to build plants have doubled (or more)!

Thus, demand is booming and supply has been underdeveloped and is expensive and time-consuming to bring on. Older wells are depleting (more on that topic below). What has this caused? Let's look at some recent news stories on oil and gas production: 1) UK Offshore Operators' Association reported in February 2007 that the UK's oil and gas production was down 9 percent in 2006 to 2.9 million oil-equivalent bbl/day, the lowest

level since 1992 and far below the peak of 4.5 million in 1999; 2) the Paris-based International Energy Agency reported in February 2007 that Venezuelan oil output fell 5.5% in 2006 to only 2.56 million bbl/day; 3) On February 7, 2007, the Norwegian Petroleum Directorate reported that Norway's oil and gas production dropped 3.3% to 2.83 million of oil equivalent bbl/day during 2006 – crude oil production dropped 7.8% while natural gas production rose 3.1%; 4) In a Wall Street Journal front page article in February 2007 it was reported that one of the largest oil fields in the world, Cantarell which is offshore Mexico, is going into steep decline. In August 2006, Pemex had announced that Cantarell would average 1.86 million bbl/day, down from 2.03 million bbl/day in 2005. By the end of 2006, Cantarell is shockingly down to 1.6 million bbl/day, a 20% decline in just one year! Mexico had upped the field's output in the late 1990s from 1 million bbl/day to over 2 million bbl/day with massive nitrogen injection and increased horizontal drilling, but this appears to have hastened Cantarell's decline; 5) Russia, which many see as a source of future production gains, saw its oil production fall 2.4% in 2006 as reported by the Russian Federal Customs Service on February 13, 2007.

How about major public oil companies? The majors have also had limited success in offsetting the natural depletion of their oil and gas wells. ExxonMobil reported 2006 production rose 4.2% to 4.23 million oil-equivalent bbl/day, after production had dropped 4.0% in 2005. Chevron report 2006 production oil and gas production volumes were flat with 2005 at 2.66 million bbl/day (oil-equivalent). Royal Dutch Shell reported production increased 4.2% in 2006 but forecast production gains of only 1-2% through 2010. BP reported that 2006 production volumes dropped 2% from 2005 volumes to 3.93 million oil-equivalent bbl/day, and forecast 2007 volumes would drop an additional 2% to 3.85 million oil-equivalent bbl/day.

What about new projects? Recent projections of future oil prices have proclaimed that production from new projects, especially non-OPEC projects, will continue to add to available oil production. However, some recent newspaper articles show how hard it is to bring on production within cost guidelines, expected time frames and with the projected reserves: 1) On January 22, 2007, Indonesian energy contractor BPMIGAS announced that it expects oil from the Cepu discovery in Indonesia (jointly owned by ExxonMobil and Pertamina, the Indonesian national oil company) to be delayed from its originally scheduled 4Q 2008 start to 2010 due to infrastructure delays. Cepu is estimated to have 600 million barrels of oil reserves, 6.7% of Indonesia's total reserves, and is expected to produce 180,000 bbl/day at its peak. 2) On February 12, 2007, BPMIGAS Indonesia announced after further testing that Chevron's Sadewa block in East Kalimantan is expected to contain 80-90% lower than the 500-600 million barrels originally announced; and 3) Kazakhstan's Energy Ministry announced on February 16, 2007 that the huge Kashagan oil field development would be pushed back to 2011-2012. The field is the largest discovered in the last 30 years, is estimated to hold up to 10 billion barrels of oil, and was originally thought to be producing oil by 2005 with $10 billion needed for development. The field will eventually produce up to 1.5 million bbl/day, but the "complex geology of the high-pressure reservoirs and the dangers posed by the high

concentrations of deadly hydrogen sulfide gas they contain" has caused at least five years of delays and cost overruns of at least $5 billion (so far). These three examples illustrate that with the world currently at approximately 85 million bbl/day of daily supply and demand starting to exceed 84 million bbl/day (on average), shortfalls in expected production increases will have more and more effect on oil inventory dynamics.

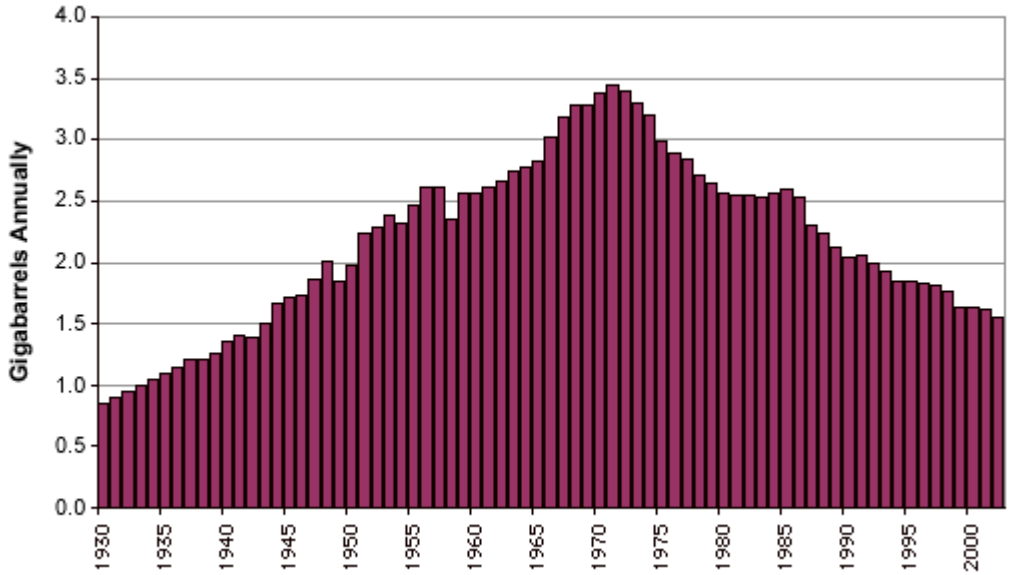
Depletion / Leveling Production?

The real problem around petroleum production currently is the amount of depletion (or the fall in production rates) of the world's major oil fields which were mostly discovered decades ago. As we said above, the easiest and cheapest oil was exploited first, and humans have been working their way to the harder and more expensive reserves ever since.

Oil and gas fields hold a finite amount of oil and/or gas, and the amount of that resource that can actually be withdrawn is dependent on the field's geology, the makeup of the petroleum and the location/conditions of the field and recovery equipment. The United States has been exploiting its petroleum resources continuously since a number of large fields were found following Spindletop in 1901. Graphing from 1930 forward, we can see in Figure 2 below that US production generally followed a bell curve-shaped path, peaking in 1971 (with Alaska, total US production didn't peak until the mid-1970s). This was actually predicted in 1956 by a Shell geoscientist named King Hubbert. He did a number of calculations and figured that US production would peak in late 1969 – he was off by less than 18 months. Since that time, the bell curve shape of the curve below has become known as "Hubbert's Peak", and it has given rise to a concept called Peak Oil. Peak Oil is the idea that the combined production of oil from around the world will reach a daily production level (the "peak") that will never be exceeded because production from new wells will be more than offset by depletion of old wells. Peak Oil does not mean we have used up all of the world's oil, but it does mean that the world cannot produce more oil than the peak on a daily basis. We will discuss more about Peak Oil later in this paper.

Figure 2

Oil Production (USA lower-48) 1930-2002

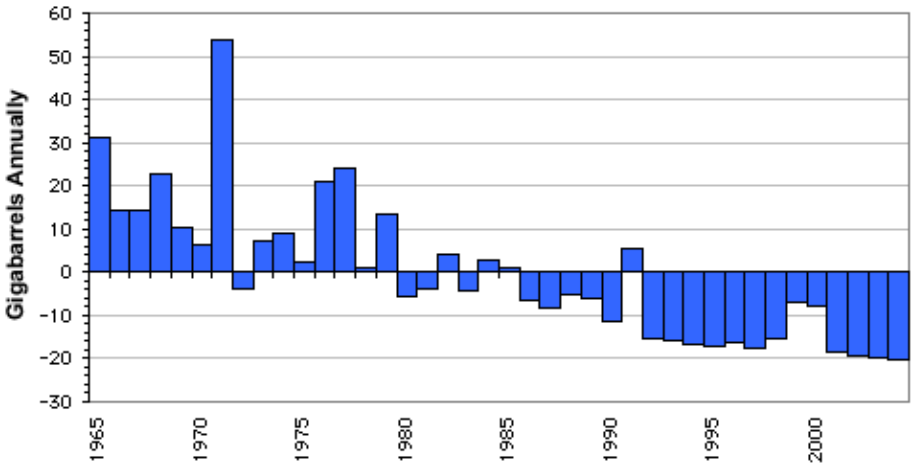


(1 gigabarrel = 1 billion barrels)
Source: ASPO

As discussed above, both national oil companies and investor-owned oil companies have had trouble keeping their production volumes up. As we saw above in Figure 1, discoveries of oil peaked in the 1960s and 1970s, and discoveries of new oil have dropped dramatically since that time. Meanwhile, demand for petroleum has increased steadily, to a current 85 million barrels/day. This means at some point (it happened during the mid-1980s), yearly consumption outpaced yearly oil discoveries, and this gap has continued to grow (see Figure 3 below). The table illustrates how large the 1960s/70s discoveries were and how we have gradually been using more and more of the oil from these discoveries in the ensuing years.

Figure 3

Oil Discovery minus Consumption (world)

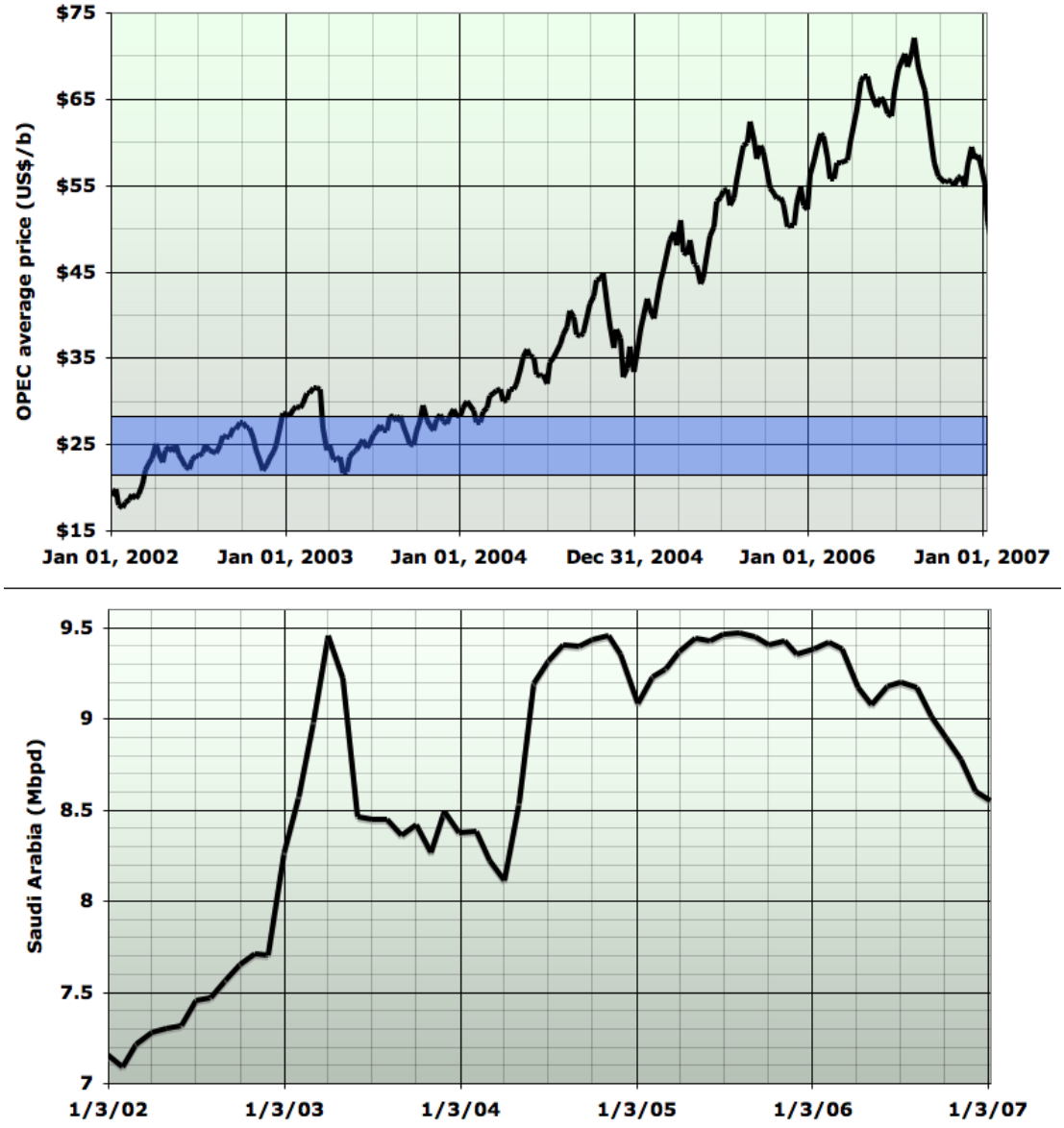


(1 gigabarrel = 1 billion barrels)
Source: ASPO

So, why don't the Middle Eastern OPEC countries just drill some more wells and produce enough oil to drive oil prices back down? The West has believed for years that the Saudis had spare capacity to produce at a level they thought would not harm demand – as the Saudis themselves have claimed to this day. Since Saudi Arabia and Russia are the two largest producers in the world and Russia produces every barrel it can each day, the Saudis are still thought of as the producer who can most affect oil prices both up and down. The Saudis have recently produced up to 9.5 million bbl/day, and they claim that they will be raising this productive capacity to 12 million bbl/day by 2010. However, (see Figure 4 below) since mid-2005, when Saudi Arabia last produced 9.5 million bbl/day as prices rose above OPEC's target price band (indicated in purple), the Saudis have not produced enough to bring oil prices back down anywhere near the price band. In fact, as prices continued to rise (a condition that has caused the Saudis much angst in the past because they have always believed high oil prices will kill demand for the only thing which funds their economy and monarchy), Saudi production could not keep up and actually dropped as prices remained well above the price band. The Saudis have always, in their role as swing producer (starting in the 1970s), increased production when prices got "too high" and reduced production as prices fell. OPEC set up the price band because they thought prices in excess of $28/barrel would cause demand destruction for oil (in the short-term and if not, certainly in the long-term). Even when short-term effects drove prices down 25% at the end of 2006/early 2007, prices were still almost twice as high as the upper bound of OPEC's price band.

Figure 4

Oil Prices (Top Graph) vs. Saudi Oil Production (Bottom Graph)



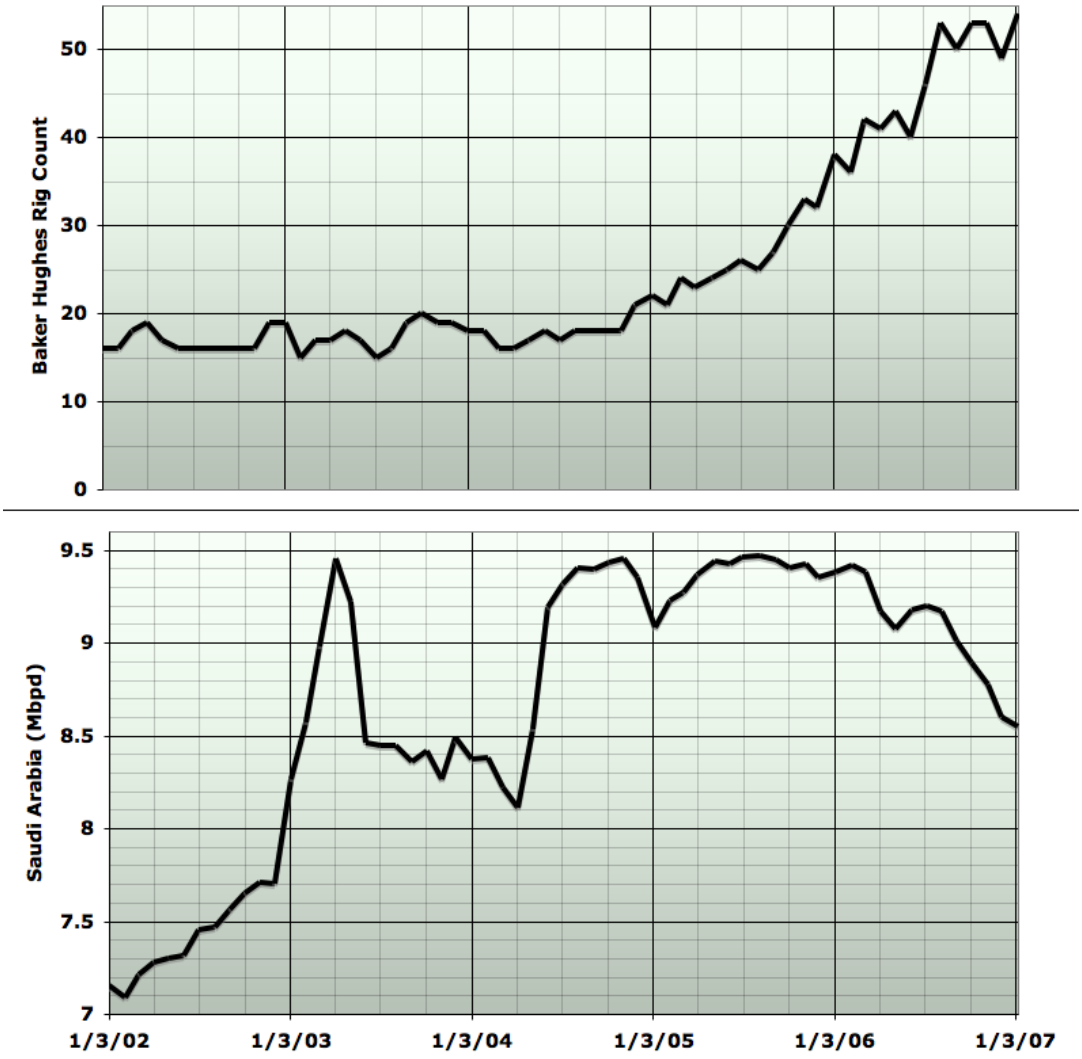
Source: Stuart Standiford, "A Nosedive Into The Desert", published on The Oil Drum.com from EIA and other production sources

Why would the Saudis not raise production with prices high and going up? It has been postulated that Saudi Aramco cannot produce more oil now because their largest field (and the largest field in world history) Ghawar has peaked and it is producing less oil,

forcing the Saudis to try to get production from other smaller fields. Are the Saudis worried about this? Well, we are not privy to the thoughts of Saudi Aramco management of the Saudi royal family, but we can gauge some of their behavior by looking at their increased use of third-party drilling contractors over time (see Figure 5 below).

Figure 5

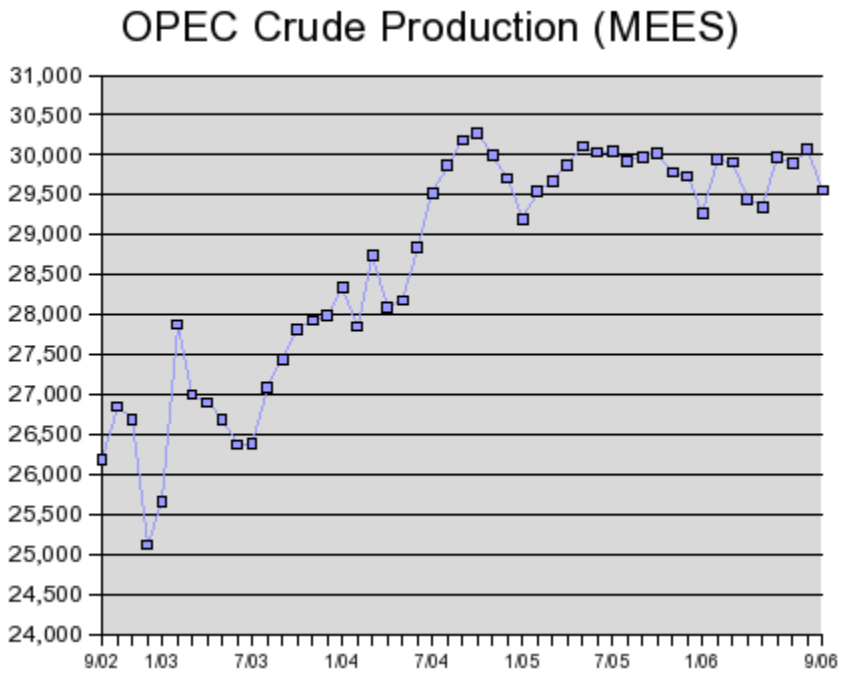
Drilling Rigs At Work in Saudi Arabia (Top Graph)
vs. Saudi Oil Production (Bottom Graph)



Source: Stuart Standiford, "A Nosedive Into The Desert", published on The Oil Drum.com from EIA and other production sources

As you can see, the rig count of drilling rigs looking for oil in Saudi Arabia (exclusively the province of Saudi Aramco – so the Saudis are the only ones making these hiring decisions) has tripled since prices started to rise and Saudi production couldn't exceed 9.5 million bbl/day! It looks to me like they are worried indeed. But what about the rest of OPEC? Why can't Kuwait or Iran or Algeria increase production? As shown in Figure 6 below, OPEC as a whole does not appear to be able to increase production over 30 million bbl/day, in spite of high and rising prices through mid-2006.

Figure 6



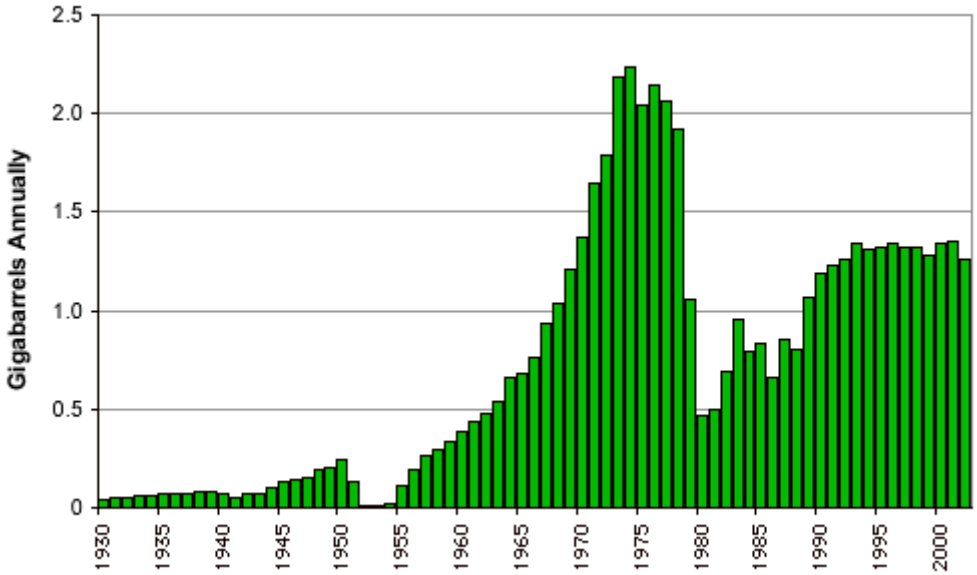
(in thousands of barrels per day)

Source: Middle East Economic Survey

Virtually all OPEC countries besides Saudi Arabia have produced every barrel they could for much of their productive lives due to the political goals of the ruling regimes (paying for social programs with oil revenue) or the greed/vanity of the rulers (living extravagantly, buying expensive, complicated weapons for defense purposes, etc.). Thus, most OPEC countries cannot increase production to any significant degree (if production cuts have not been implemented first). Iran is a prime example of this – see Figure 7 below. While Iran's oil production was following a typical production profile through the mid-1970s, revolutions (1979) and wars (1980-88) hit output. But notice that production levels in Iran have not increased in spite of increasing political uses for oil revenue since the Iranian Revolution in 1979/80.

Figure 7

Oil Production in Iran (1930 - 2002)



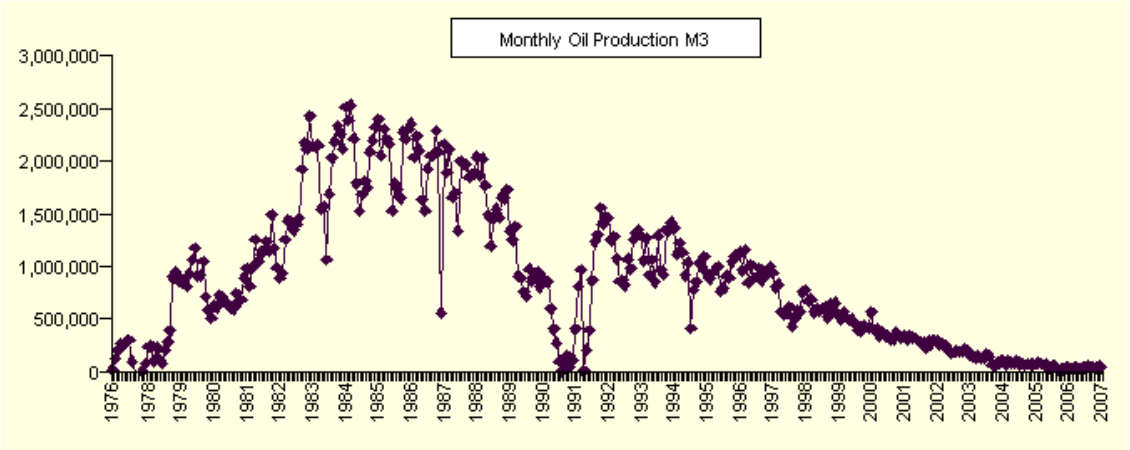
(1 gigabarrel = 1 billion barrels)
Source: ASPO

Obviously, like the example of the US production curve shown above, all oil fields and oil regions are subject to the inevitable decline of production after production has removed the majority of the recoverable oil. Some of the fields for which we have the best data are the fields of the North Sea. Displayed below are some curves of some of the largest (and earliest developed) North Sea fields and how their production has dropped off over the years. One overriding concern illustrated in these charts is their relatively short lives – the North Sea has only been producing since the 1970s and it is in irreversible decline as the charts of Figure 8 below show:

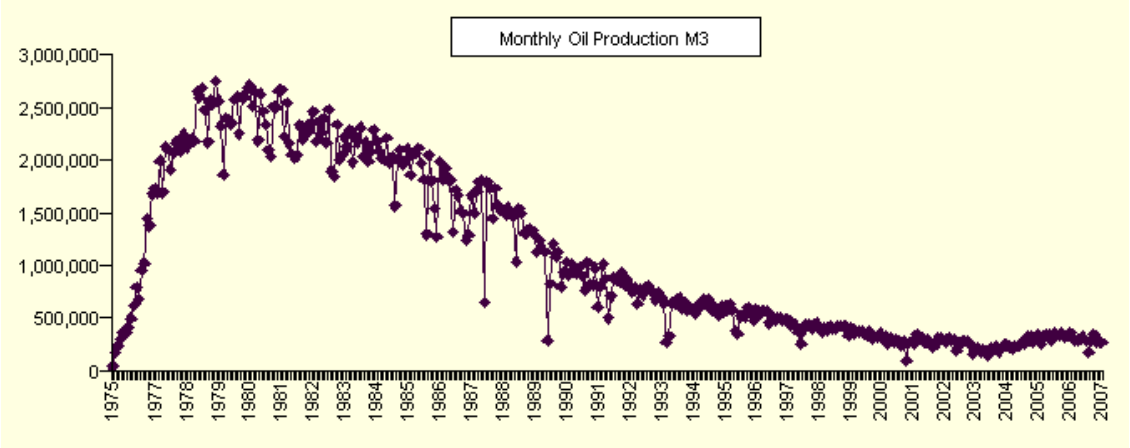
Figure 8

North Sea Oil Field Production Levels

Oil field: BRENT



Oil field: FORTIES



(in barrels per day, monthly average)
Source: UK Department of Trade and Industry

Conclusions

So the big question: Is Peak Oil here? In our opinion, the strictest definition of Peak Oil is that the worldwide oil industry cannot produce enough oil to satisfy current demand, and prices must go up to "ration" consumption. We do not believe that we are approaching Peak Oil. However, relatively tight supply and increasing demand makes it "feel" as though we might be. We do believe that the world's oil industry will have trouble increasing worldwide production capacity for a number of reasons. They include:

1) National governments, especially those with politics left of center, have taken on more control of current petroleum production and future development in their countries. Many are using large amounts of current oil revenue for political purposes. Much of this revenue should be reinvested by the national oil companies to at least maintain production levels (not to mention increasing them), but most are being starved of reinvestment capital. Few national oil companies have the political will to change their countries' attitudes to even maintain net production or the expertise to use ultramodern technologies to maximize production from existing wells. Oil prices have risen sharply over the past couple of years, and the increase in revenue to producing countries has led to increased social programs and subsidizing the rising costs of consumer goods and staples. Examples abound: a) Venezuela is due to nationalize a number of their Orinoco oil projects (which are the only Venezuelan ventures currently majority-owned by international oil companies) in order to capture more oil revenue to fund Venezuela's political/social agenda; b) Iran subsidizes their growing gasoline appetite so that gasoline costs less than $0.50/gallon; c) Russia has seized a number of oil company assets and sold them to firms that are majority-owned by the Russian government itself in order to reestablish political control and keep further revenue for the government; d) Bolivia president has nationalized all of its natural gas industry and is threatening to move on the oil and/or mining industries having "pledged" all revenue from petroleum extract to the people of Bolivia; e) Peru has seized fields developed by international oil companies and auctioned them off to other companies without compensation to the original owners; and f) Mexico controls all petroleum exploration and production through wholly-owned Pemex, which does not have the capital or expertise to replace the production its aging giant Cantarell field. The control of so much of the world's production and potential development by politicians who don't understand the business of oil exploration and production and who are further starving their national oil companies of the capital and expertise needed to continue (much less to expand) their petroleum production seems to put a cap on daily oil production capacity from these countries in the future. If these countries were to hire profit-oriented oil and gas exploration firms to inject capital and find petroleum, selling it to make requisite profits, then production could be ramped up over time. However, experts estimate that the technology-rich international oil companies are excluded from at least 80% of the world's undeveloped oil reserves – the national oil companies reserving the ability to explore for, produce and sell these expected discoveries.

2) Similar to Reason #1, greed and repression in a number of countries with less developed petroleum resources precludes large scale development of these oil riches because the uncertainty of recovering one's investment over time due to the political instability of these countries. A large number of sub-Saharan African countries do or may have large petroleum reserves, but the greed of current politicians tends to exclude the people who must suffer through oil development (Nigeria is a prime example of this) from sharing in the riches created. Other countries, like Chad or the Democratic Republic of the Congo, have a small number of projects, but these projects are under constant threat of nationalization, damage or local protests due to the lack of sharing of

oil revenue by the governments with the poor people of the country. Even Iran, with the second largest estimated oil reserves in the world, has scared off investment not only from international oil companies (like Shell and Italy's ENI – US oil companies are prohibited from working in Iran by law) but also national oil companies from Japan and Europe who are desperate to lock up oil supplies but exasperated by poor terms, lack of real negotiations and long delays by Iran in potential development projects.

3) The environmental forces around the world have cordoned off a number of areas where large amounts of hydrocarbons may reside, thus crimping the ability to use new discoveries of petroleum in these areas to offset the decline of current production. Obviously the United States is the main culprit here, disallowing drilling and production off virtually all of the West Coast, all of the East Coast, and half of the prolific Gulf of Mexico. In addition, the Alaskan National Wildlife Refuge is believed to hold a large amount of hydrocarbons. A lot of Alaska and large swaths of federal land in the United States are currently limited in companies' ability to search for petroleum, although many areas could be explored with minimal upset to these pristine lands. Opposition to development extends to the building of non-production petroleum installations around much of the developed world: the ability to build oil refineries, processing plants and liquefied natural gas (LNG) receiving terminals is severely limited and takes many years to get regulatory clearance due to the strength of the "not-in-my-back-yard" or NIMBY mentality/ political efforts. Thus, the ability to site facilities where they are the cheapest or the most efficient from a logistics standpoint is often compromised due to NIMBY efforts, costing time, money and efficiency for the world's petroleum systems.

4) Even large-scale discoveries that do have the possibility of increasing worldwide production levels are generally in such hostile climates that developing and operating these facilities will be much more expensive and challenging than current facilities. New discoveries in the Russian and Canadian Arctic regions, large gas discoveries offshore in the Arctic and ultra-deepwater discoveries off the North American, South American, African and Asian coasts will need new techniques, even more rugged equipment than is currently used and huge amounts of capital to develop. These types of projects will take at least a decade to bring on to full production, and they will need large numbers of experienced people and service companies to start these projects operating. While the oil industry has adapted to these types of "quantum leaps" before (by improving technology and hiring the best and the brightest), it generally has happened after large sustained price increases (offshore Gulf of Mexico after post-WWII industrialization and North Sea / deepwater Gulf of Mexico after Arab oil embargoes).

5) The "golden age" of the oil business was in the late 1950s through the 1970s. The industry grew extraordinarily, and oil was discovered in new places all over the world. Lots of people and new technologies were needed to delineate the discoveries, build and site equipment to recover the oil, build infrastructure for transportation and deliver the oil to market. It included geoscientists, engineers of all types and tradesmen to build, transport and operate all of the facilities and equipment needed. When prices crashed

under $10/bbl in the mid-1980s, it marked the low point of the "oil bust" after this golden age. In hindsight, the damage done during the bust was immense: very little new drilling equipment has been built since the early 1980s and, more importantly, a generation of oil company and oil services company workers were lost when they were either driven out of the business or never entered. Now there is a growing shortage of expertise in the exploration & production and oil service companies around the world as the veteran workers with much of the experience retire. The ability to exploit smaller, more remote energy deposits around the world with a workforce that is shrinking in numbers and expertise due to attrition and retirement is another large challenge facing the world as it attempts to grow energy production in the future. In addition, as mentioned above, the price and availability of material and equipment has increased substantially in the past few years, making all projects far more expensive than similar projects developed even in the recent past.

We believe these political and economic factors, all of which appear to be getting more prevalent lately, will retard the growth of production worldwide in the future. The oil industry will gradually go to greater and greater lengths to produce this petroleum, but we think the world is getting to a point where much of the cheap oil, certainly oil found in the largest concentrations, has been found already and that depletion will make worldwide production levels hard to maintain going forward. If the oil industry worldwide succeeds in solving at least some of the challenges enumerated above, the world can continue on cheap oil for awhile longer, and we will adjust our investment outlook accordingly. We believe that it will be very hard to accomplish.

Thus, we project that over the next ten years, oil prices will be much higher than they have been over the last ten years (when they averaged under $30/ bbl). We believe that while we may see times when economic growth in the world retrenches and growth in energy usage slows down, temporarily depressing prices, we believe that the next ten years will have average oil prices in the $60–90 per barrel, as we humans adjust to conserving our primary source of transportation fuel.

A note about ethanol: while ethanol is useful as a blending stock to raise octane levels in gasoline, ethanol is a very poor substitute for gasoline itself for the following reasons: 1) ethanol requires almost as much petroleum to produce as the ethanol itself generates: the fuel needed to plant and harvest the corn, the natural gas needed to make the fertilizer, and the trucks needed to transport the manufactured ethanol requires about as much fuel as ethanol provides; 2) corn-based ethanol is government-subsidized, and if it weren't, the amount of ethanol produced would be a tiny fraction of what is currently being produced; 3) ethanol is corrosive, so it cannot be transported by pipeline (by far the most *efficient transportation method for liquid fuels) and it ultimately damages the engine of your car; and 4) ethanol provides less power for your car than gasoline, so it is not as efficient a fuel for vehicles. Thus, my thought is that ethanol will be used to blend with*

gasoline for some octane benefits, but the usage of ethanol to power our cars will not happen without some major changes to some of the factors mentioned above.