

## THE CASE FOR INVESTING IN THE ENERGY INDUSTRY

The case for investing in energy companies, companies that explore for and produce hydrocarbons, and the companies that provide services to them, is very straightforward. Since the last major energy industry peak in 1982, world consumption of hydrocarbons has advanced about 50%, while the infrastructure of companies and equipment available to find and deliver them has shrunk substantially. This mismatch sets up a major investment opportunity, as we move into an extended period of chronic energy tightness.

The remarkable thing about energy demand is the inexorable rise over the last 15 years, despite recessions, wars, revolutions, currency crises, and all the rest of the turmoil that has swept around the world during this period. The chart below shows the steady growth in oil demand, while natural gas demand growth has been even faster.

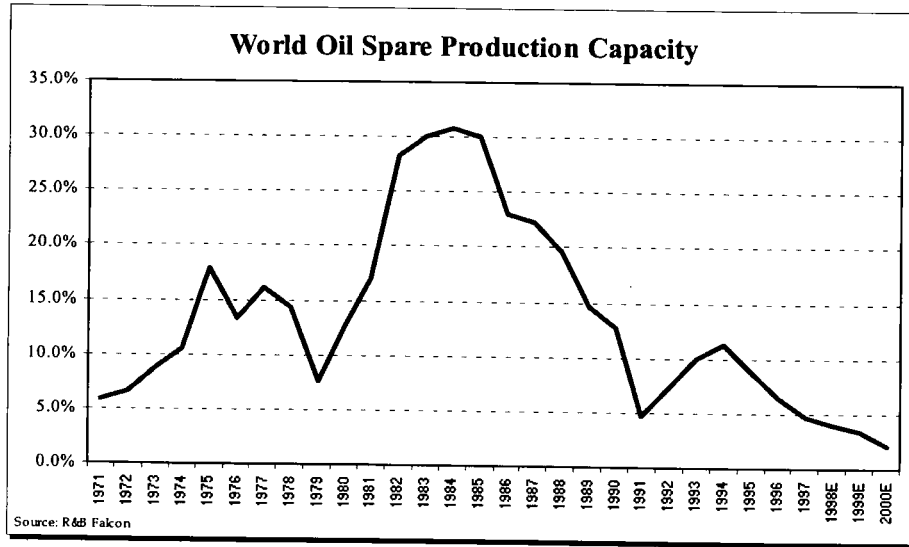


The driving force behind this demand is economic development layered on top of 1+% population growth. While the OECD uses a large share of world hydrocarbons, growth there is relatively moderate (just below 2%). The developing world is much less energy intensive, but growth in demand is two to three times as fast as the developed world. This arena represents 75% of the world's population, most of which has relatively recently been set free from the shackles of socialism or the extreme of communism, and allowed to pursue free enterprise style growth. The results are dramatic, as the accoutrements of western material lifestyles spread. Consider that the middle class in India is larger than the entire population of the United States, which gives some scale to the potential demand for energy-using appliances and vehicles. In 1998 we witnessed a hiccup in energy demand growth as Asia endured a severe recession/depression in economic activity; yet worldwide demand still grew and shows signs of reaccelerating this year. History would argue that the only thing that reverses growth of energy demand is sustained sharply higher prices, such as the quadruple of 1981/82.

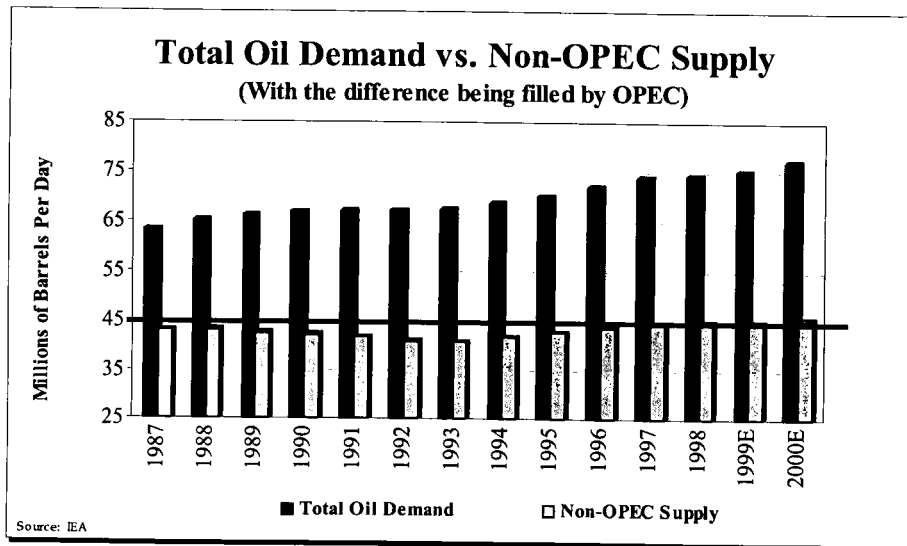
While hydrocarbon demand continues its steady climb, supply has become a major question mark. Despite apparently ample near-term oil supply and 1998, early 1999 weak oil pricing, world spare capacity is probably no more than five percent and falling. North American natural gas appears to be even tighter. Furthermore, the advent of marvelous new technologies to lower costs and enhance production have the dark side of using up our resource base much faster than before, putting us ever more at the mercy of the timing of new discovery to meet tomorrow's needs.

**THE OIL STORY**

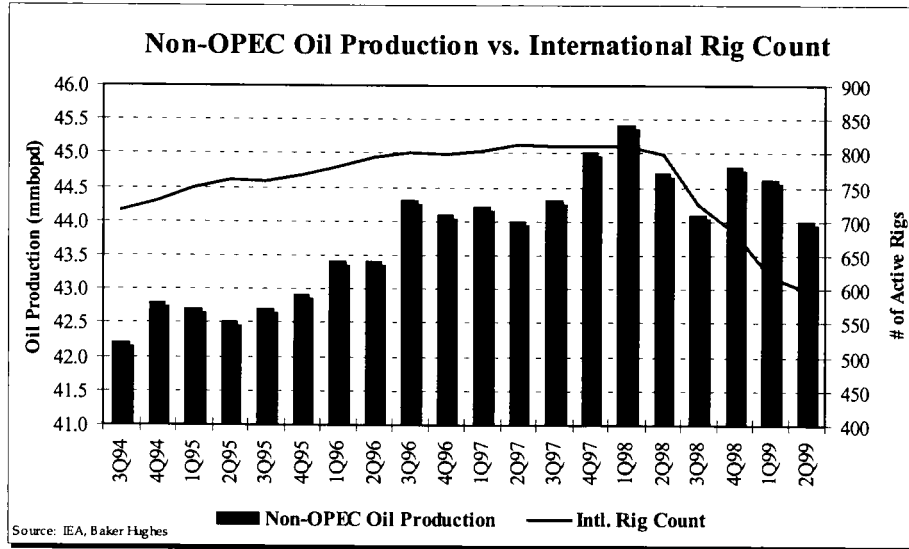
Spare capacity to produce oil exists in only a few places. Now that Iraq is back at full production, the only spare capacity is that which exists within a few members of OPEC (primarily Saudi Arabia and Kuwait), plus at most a few hundred thousand barrels per day in the North Sea and Mexico. Careful analysis of shut-in production, looking at proposed cuts in 1998 and the March agreement for another 2 million barrels per day, yields a total of about three to four million barrels per day, versus total world use of about 75 million B/D. This stands in stark contrast to the last period of extreme price weakness in the mid-1980s, when spare capacity rose to 30% of demand.



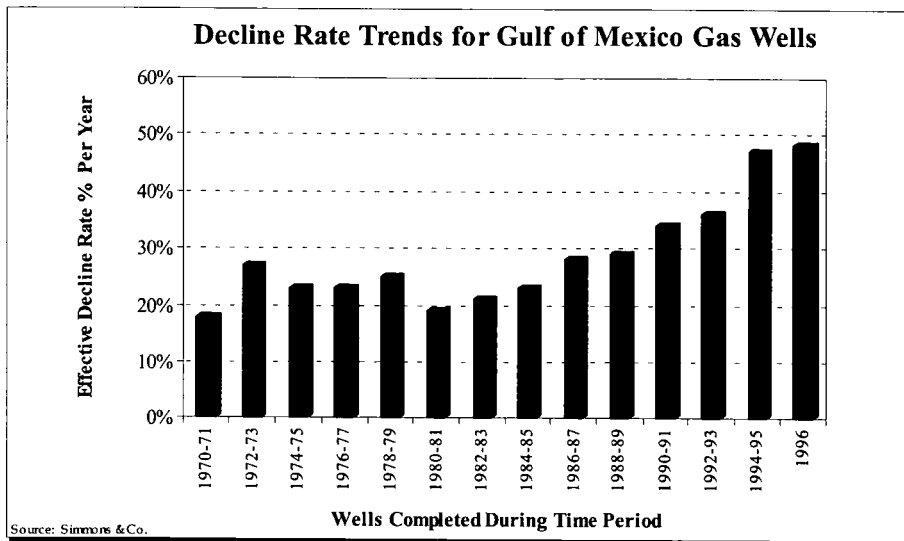
While total spare capacity is modest, the volume of non-OPEC production is stagnant at best. Despite the brief but sharp rebound in drilling during 1996 and 1997, surprisingly little additional net non-OPEC production was developed. In fact, the level of this supply is little different than a decade ago, despite nearly \$300 billion of major oil company exploration and development spending over the period.



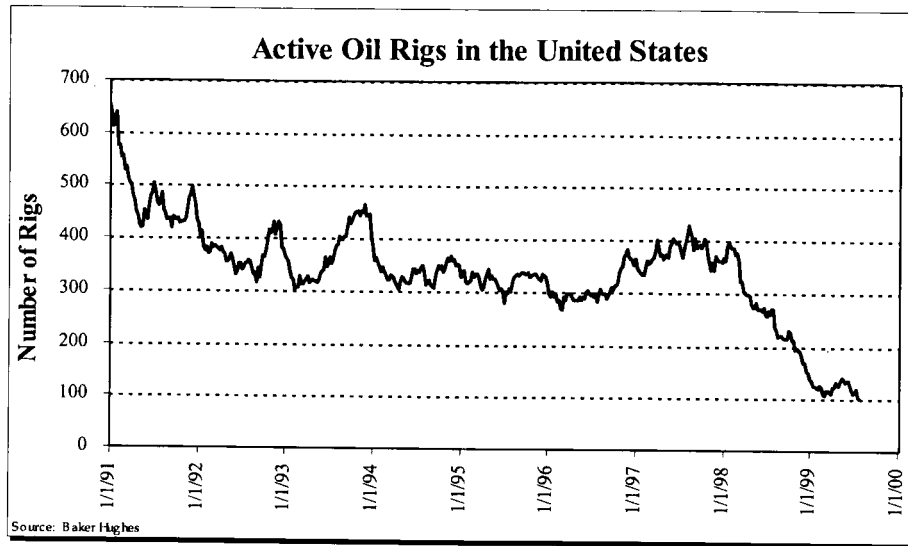
Perhaps nowhere is the effect of reduced drilling on non-OPEC production more apparent than in the U.S. The Department of Energy in its weekly report now shows production of crude and natural gas liquids down about 900,000 barrels per day over the last twelve months. Since drilling continues to languish near the lowest levels since before WWII, more declines are inevitable. The world situation looks just as threatening, as the toll of normal depletion outruns what new oil can be produced with such low drilling levels.



The best way to understand this phenomenon is to step back and consider what has happened to energy technology over the last ten years. The advent of 3D seismic, horizontal or steerable drilling, underbalanced drilling, and lateral completions have all been very successful at getting oil and gas out of the ground faster. Since the economics of hydrocarbon production are very time sensitive, technologies that bring cash realizations forward dramatically enhance profitability at any given commodity price level. The upshot of this dynamic is that these new technologies have been applied aggressively. The decline rates (how fast output falls because the reservoir is used up) for production have therefore skyrocketed in the U.S. as the Gulf of Mexico gas well chart below shows so clearly and dramatically.

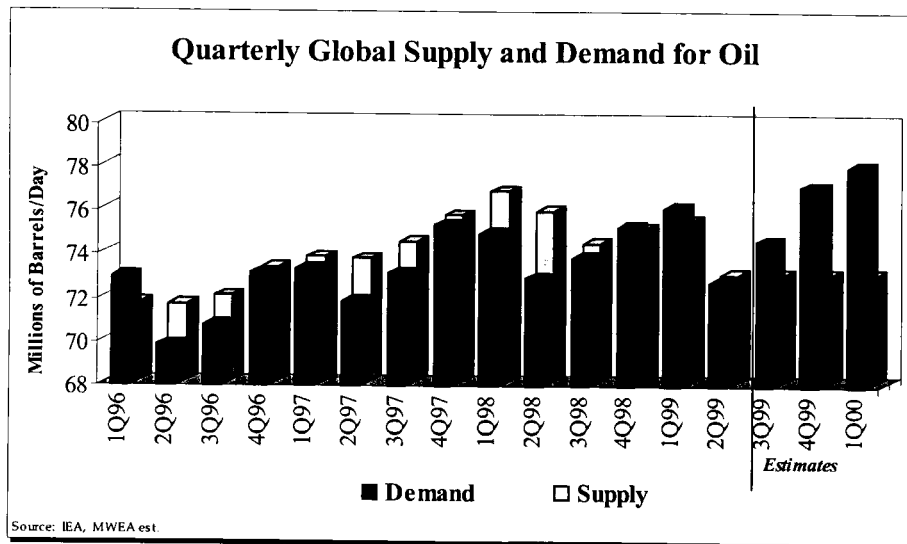


The financial results were great for exploration companies in the short run, but put them on a very fast production replacement treadmill. Then, during the recent period of commodity price weakness, old non-economic (mostly stripper well) production was shut, and then production decline curves began to take their toll. Since there has been very little sign of a turn in drilling, the declines in production can only intensify.



Non-OPEC oil production will probably fall by well more than one million barrels per day this year, and another 400,000 barrels per day in 2000. With scant spare capacity, and demand continuing to rise, the probability of a major price move is high. The seasonal pattern to oil demand points to a fall/winter price move, as peak demand coincides with the worst of the depletion driven production declines.

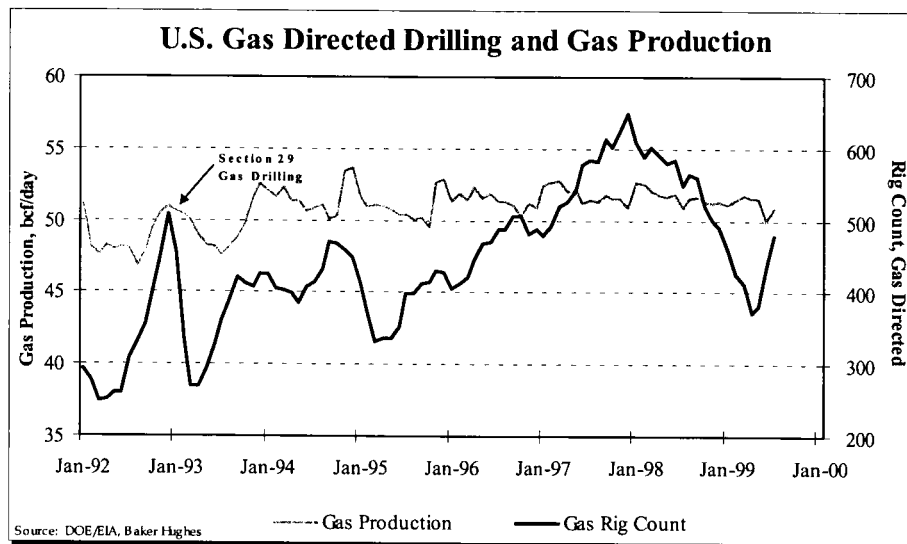
While oil figures lack precision because of the way it sloshes around the world looking for the best price, the International Energy Agency does make very detailed estimates of world supply and demand based on comprehensive review of virtually every non-OPEC field, plus macro economic developments around the world. The quarterly chart below summarizes their latest numbers with the last three quarters estimated to reflect an OPEC success at production restraint at 90% of the March targets. The chart shows the seasonal pattern of demand and clearly shows the excess production of 1997 and early 1998, which resulted from the temporary interruption of demand by El Niño and the Asian economic meltdown. It also shows the rebalancing in late 1998 and looming shortage in late 1999 and early 2000.



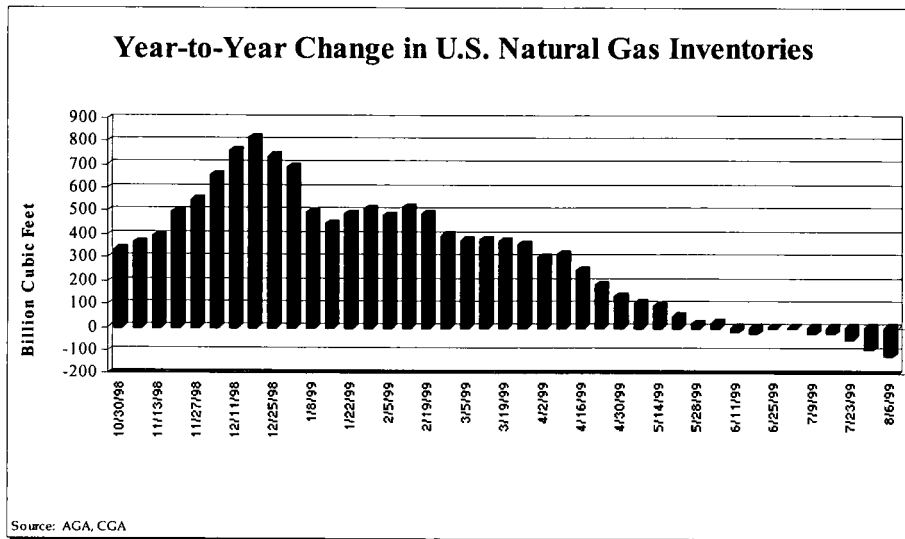
Even more intriguing is a simple extrapolation of International Energy Agency demand estimates for full year 2000 and beyond, relative to current potential supply. Short of a huge new drilling boom, it is hard to see how the demand can be met. IEA projections call for upcoming winter usage to approach 77 million B/D, as pictured. Current production, with Iraq at full bore, is about 73 million B/D with supposedly four million B/D shut in. Clearly, winter will be a tight period even if everyone produces at full capacity. Going forward, year 2000 demand in aggregate should be just above 77 million B/D with a spring trough, then autumn rebound. World production capacity could well be still in decline, with the obvious outcome of severe supply constraint. That arithmetic seems to demand higher oil prices to fund the needed investment spending.

### THE NATURAL GAS STORY

Natural gas lends itself to fairly precise estimates of the balance between supply and demand, because of the lack of imports from offshore and the relative precision of supply and storage data for North America. In the past, gas production reacted to drilling swings with about six months delay. The chart below shows the relationship over the last decade, and the production responses in 1992 and 1995 are readily apparent. The difference in 1999 is that the drilling decline is much larger, 40%, and, again, spare capacity in the U.S. and Canada much less. A forecast of spot shortages is reasonable, and chronic tightness for at least several years almost unavoidable, considering the pictured drilling decline and the depletion rates for Gulf of Mexico gas shown previously.



The red flag that signals the speed and severity of the oncoming natural gas supply/demand crunch is to be found in inventory numbers, or gas storage, for North America. As recently as mid-December, 1998, the continent was awash with 800 billion cubic feet (BCF) of excess gas in storage as measured by the increase from the previous year. Since then moderate growth in demand combined with falling production has eliminated that surplus. We have been losing ground to 1998 storage replenishment rates practically every week. If this continues, we will reach next heating season with substantially less gas than needed. Much higher prices are bound to be the result, regardless of the weather.



**CONCLUSION**

The investment implications of this set of fundamentals are profound. Like a race car that has been lapped, energy investment spending has been much too slow and will have to accelerate enough to at least match current demand growth (the leading car) and, beyond that level, enough more to close the rapidly developing supply/demand gap. Realistically, we must create at least a little slack. Portfolios in place before this oil and gas crunch period should be in line for substantial appreciation if past experience is any guide. The last brief cycle of tightness generated the results below for the period 1995-97 for a variety of companies.

Mid Cap Service Companies	Average +700%
Offshore Drillers	Average +800%
Small Cap Expl. and Dev.	Average +400%

The last full cycle of 1970-1982 generated far larger returns than even these attractive results. A Securities Research Company index of energy service companies rose 1800% by the stock peak in 1981. In many ways the current situation points to an even more powerful cycle this time. The level of global demand is up 50%, and growing faster in more places. Major productive regions like the U.S. are in serious decline, leaving far fewer places to search for or expand production. The depletion factor is faster worldwide because of new technology. The people and equipment resources are severely constrained, and capital is scarce. The rewards to capital will be substantial, as is always the case when it is a constraining factor.

Construction of a portfolio today should reflect three important considerations of industry fundamentals and analysis of past market behavior. First, small and mid-cap companies, on a selected basis, will significantly outperform large caps during the mid and late phases of the investment cycle so consequently should be emphasized. We would tilt 65% toward selected small cap, 35% toward selected mid cap. Second, natural gas has the most certainty through winter 2000 and should be overweighted relative to oil. And third, as the only North American gas province still showing the ability to grow meaningfully, we would have exposure to selected companies in Canada. Relative values currently favor E&P companies over service companies; however, the latter should provide the biggest ultimate returns if past cycle behavior is a reliable guide, so portfolios should be balanced between them.

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