

## MUSINGS FROM THE OIL PATCH

July 11, 2006

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*Note: Musings from the Oil Patch reflects an eclectic collection of stories and analyses dealing with issues and developments within the energy industry that I feel have potentially significant implications for executives operating oilfield service companies. The newsletter currently anticipates a semi-monthly publishing schedule, but periodically the event and news flow may dictate a more frequent schedule. As always, I welcome your comments and observations. Allen Brooks*

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### Consumer Saving Patterns: Trouble for Energy

**Energy intensity of large, mature economies such as the United States has been declining as they shift from energy-intensive manufacturing industries in favor of more service oriented businesses**

For more than a year we have been treated to a number of analyses of why the U.S. and global economies have not appeared to have suffered from high oil and gas prices. The common explanation is that the energy intensity of large, mature economies such as the United States has been declining as they shift from energy-intensive manufacturing industries in favor of more service oriented businesses. Other thoughts have been that in real terms, energy prices are barely back to levels they reached in the late 1970s when the U.S. experienced its last "energy crisis," and that the percentage of consumer budgets devoted to gasoline has declined to 3.7% from 7.2%, as consumer incomes have grown since the late 1970s.

**Housing ownership and the emergence of the automobile society are having a greater influence over how consumers are spending their money today**

Now there is a new study from the U.S. Department of Labor titled "100 Years of U.S. Consumer Spending" that sheds some interesting perspective on this debate. The study is based on data from the Bureau of Labor Statistics' consumer spending survey. The study presents a fascinating history of the United States and the changes that have occurred to our population and our lifestyles. Many of these changes are reflected through our spending patterns. What becomes quite evident from the trends over the 100-year period is that housing ownership and the emergence of the automobile society are having a greater influence over how consumers are spending their money today. Those spending patterns are now subjecting consumers to the growing pressures from rising commodity prices.

One factor mentioned by the authors of the report in their discussion of discretionary spending trends in 2002-3 was the fact that people had to pay Federal, State and local taxes, which did not exist for families in 1901. We are not so sure that there weren't various state and local income taxes that people had to pay back then, but they

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were probably considerably less of a financial burden than today. That's because these taxes didn't impact as many citizens as they do today. However, there was no Federal income tax back in 1901.

Between 1901 and 2002-3, family expenditures rose from \$769 to \$40,748, a 53-fold increase. In real terms, the increase would have been 2.4-fold, indicating that real spending has advanced meaningfully over the period. Importantly, of the expenditures in 1901, 79.8% of family spending was devoted to necessities – food, clothing and housing. By 2002-3, the percentage allocated to necessities dropped to 50.1%. The greatest relief came in spending for food that dropped from 42.5% of budgets to just 13.2%.

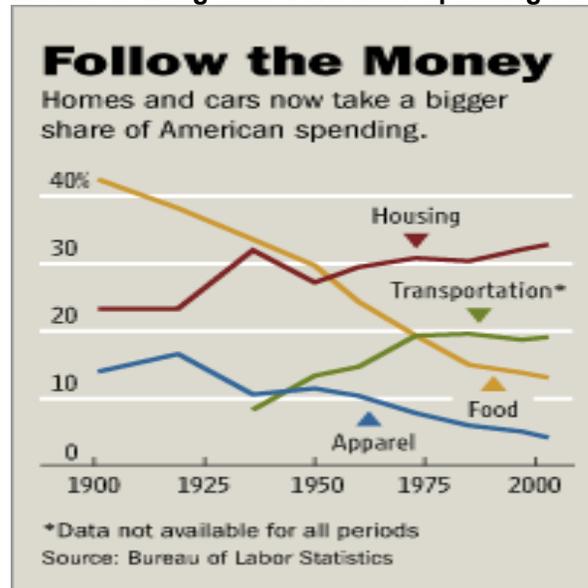
**Home ownership has undergone a significant change as only 19% of Americans owned their home in 1901, while 67% did by 2002-3**

Home ownership has undergone a significant change as only 19% of Americans owned their home in 1901, while 67% did by 2002-3. In the 1960s, family spending for housing became the most significant item in household budgets, displacing spending on food. The study pointed out that with the rise in home ownership, spending on utilities has climbed. In the 1970s, the average U.S. family allotted 4.9% of total spending for utilities, which rose to 6.7% by 2002-3.

**Spending on transportation has climbed from 14.7% of budgets in 1960 to 19.1% in 2002-3**

Apparel spending has experienced a steady decline over the study period. From 14.0% of the average family budget in 1901, apparel now only accounts for 4.2% in 2002-3. Offsetting this decline has been the rise in our automobile society. In 1934-36, 44.4% of U.S. households owned an automobile. By the 21<sup>st</sup> century, 88% of U.S. households owned at least one vehicle, with the average family owning 2.0. As a result, spending on transportation has climbed from 14.7% of budgets in 1960 to 19.1% in 2002-3. The spending allocation for transportation was higher in the 1970s and 1980s with the peak of 19.6% being reached in 1984-5.

**Exhibit 1. Long-term Consumer Spending Trends**



Source: USDL, Dow Jones

The bottom line of this study is that housing, with its utility expenditure component, and transportation expenditures are now accounting for the largest share of consumer spending. That makes consumer budgets more susceptible to inflationary pressures from rising oil, gas and utility prices. If family incomes don't continue to rise, and there is growing evidence they are not, then higher energy costs will squeeze spending and potentially cause consumption shifts that could alter the long-term demand for oil and gas.

## Florida Fights Offshore Rigs; What about Windmills?

**The oil industry is still suffering from the 1980s Valdez spill, although that spill came from shipping not drilling**

Floridians, led by their politicians and especially Governor Jeb Bush, are adamantly opposed to any oil and gas drilling off their coast. Even if that drilling were more than a hundred miles offshore, they object because of the potential impact on tourism. Implicit in their objections is concern about visual and environmental pollution. The fact that last year the Gulf of Mexico oil and gas industry went through its worst hurricane season ever, losing 113 offshore producing platforms and suffering damage to hundreds of underwater pipelines, without a single drop of oil being spilled does little to alter citizens' views that oil spills from drilling are a risk. The oil industry is still suffering from the 1980s Valdez spill, although that spill came from shipping not drilling. The last major U.S. spill associated with drilling was offshore Santa Barbara in 1969. Texans, however, are more familiar with the Ixtoc blowout offshore Mexico that eventually landed oil globules on South Texas beaches in 1979.

What Floridians seem not to understand is that today's drilling technology is extremely safe. Moreover, offshore drilling does not have to lead to offshore platforms as all the producing equipment can be located on the seafloor and underwater pipelines used to move the oil and gas to production facilities located onshore and away from the coast. But now, in step with the growing frenzy to develop alternative energy sources, Florida is considering the potential for offshore wind farms.

**Can you imagine the battle over offshore wind farms in Florida?**

The Minerals Management Service held a public meeting recently to discuss the potential for offshore wind farm projects. Wow! Here we have the potential for hundreds of offshore towers with spinning propellers driving turbines mounted on the towers generating electricity that would move through cables laid on the ocean floor to shore. Can you imagine the battle over offshore wind farms in Florida? It could make the political battle over the approval of the Cape Wind project offshore Cape Cod look like a mere disagreement. Instead of temporary offshore structures possibly on the horizon, we could be looking at a forest of structures that would never leave. As *The Boston Globe* suggested while following the Cape Wind debate, think how much energy we could have if only we could harness the hot air from the hypocrisy of clean energy supporters?

## Oil Becoming Increasingly Dear Versus Stocks

One of our favorite financial columnists, Scott Burns of *The Dallas Morning News*, is retiring and has recently begun writing about his and his wife's new lifestyle as dedicated Recreational Vehicle persons. In a recent column, he discussed the lifestyle decisions of his daughter and her family and some other young friends, each of whom is driving a Chevrolet Suburban. Known as gas-hogs, Burns analyzed the operating costs for these vehicles and put the couples' decision about their vehicle selection in the context of financial decision-making.

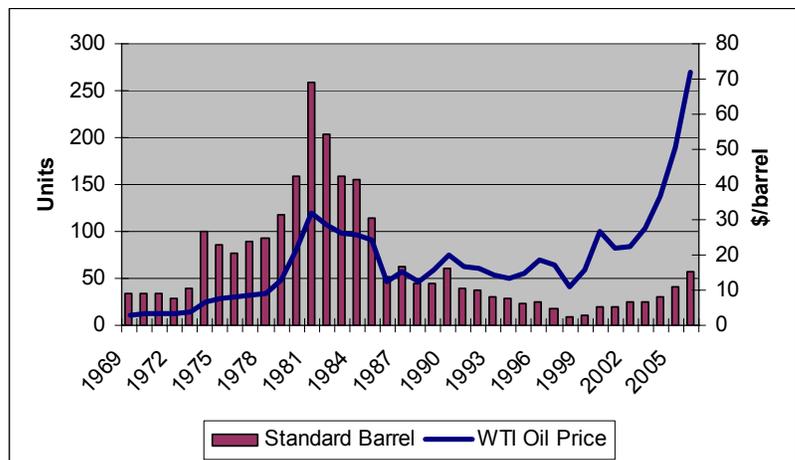
**The cost of gasoline remains a small part of the total annual cost of vehicle ownership**

According to Burns, it now costs about \$120 to fill up the 42-gallon gas tank on these behemoths. While owners of these types of vehicles grimace at the gas pump, the cost of gasoline remains a small part of the total annual cost of vehicle ownership. Depreciation is the largest expense by far, followed by either gasoline or insurance, depending upon driver specifics such as miles driven, one's driving record and credit record. Today, consumers are spending more of their incomes on transportation than they did 35 years ago, but much of that increase is related to discretionary spending on more expensive vehicles.

**It takes more S&P 500 units to buy that oil today than it did in 1995, or certainly in 1998, but we are still better off than in most past periods**

To determine how consumers are doing in the face of rising oil prices, Burns looks to the performance of the Barrel Standard, or the ratio of how many units of the Standard & Poor's 500 index is needed to buy 1,000 barrels of oil. Based on historical numbers, it takes more S&P 500 units to buy that oil today than it did in 1995, or certainly in 1998, but we are still better off than in most past periods.

### Exhibit 2. The Standard Barrel Is Still Favorable



Source: EIA, PPHB

In 1970, the price of a barrel of oil was \$3.18 while the S&P 500 index stood at 92.15. This indicates an exchange rate of 34.5 units of S&P 500 per thousand barrels of oil. As of this June, the exchange ratio had climbed to 56.7. After the first jump in global oil

**From 1998 to this June, a seven and a half year period, the ratio is up 6.4 times compared to the 11-year period of 1970 to 1981, when the ratio climbed 7.5 times**

**We have been creating wealth at an annualized rate of 8.1%**

prices following the Arab oil embargo in 1973 and the subsequent recession and stock market collapse, the exchange ratio rose to 100.2. For the balance of the 1970s, it traded from a low of 76.2 to a high of 117.1. As oil prices climbed in the early part of the 1980s and the stock market was flat to slightly lower, the exchange ratio rose to a peak of 259.2.

The low for the Barrel Standard occurred in 1998 as the dot-com stock market boom compared to a depression price for crude oil, pushing the exchange ratio to 8.8. What has happened since the 1998 oil price low is that we have witnessed the exchange ratio climbing faster than it did during the decade of the 1970s. From 1998 to this June, a seven and a half year period, the ratio is up 6.4 times compared to the 11-year period of 1970 to 1981, when the ratio climbed 7.5 times. The rate of gain in the 1970s was slightly over an annual average of 68% versus the recent period when the advance was at an average annual rate of 85.6%, or 25% faster. Despite this acceleration, we still have a more favorable exchange ratio than we had in 1990.

To put this oil price to stock market value in perspective, Burns points to the Federal Reserve Flow of Funds data showing that the net worth of households and nonprofit institutions in America was \$3.4 trillion in 1970. At the end of 2005, that value had climbed to \$52.4 trillion. As a result, we have been creating wealth at an annualized rate of 8.1%. While this is an enviable record, which reflects the long-term growth of the American economy as reflected in the bull market for stocks and housing, we still must worry about how much a weakening housing sector and possible stock market correction could erode these gains, especially in the face of a peak oil scenario that could send oil prices sharply higher in future years.

## Saudi Arabia Rig Count Climbs

**Saudi Arabia announced that it expected to end 2006 with 121 rigs in operation**

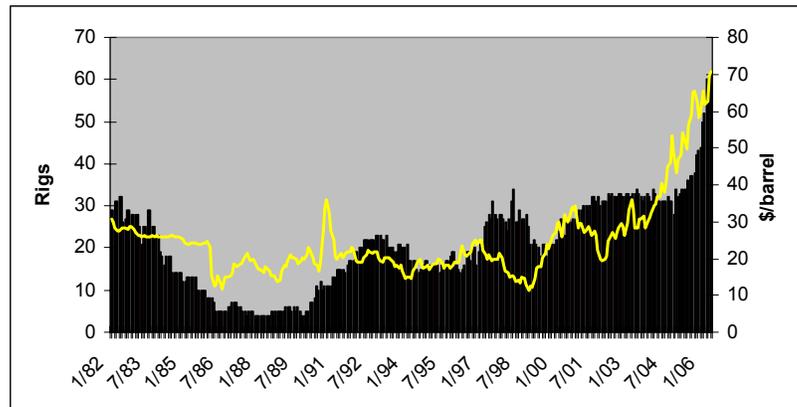
**Until recently, Saudi's active rig count was about where it was in the early 1980s**

Saudi Arabia announced that its active rig count had reached a record 100 rigs. The kingdom also announced that it expected to end 2006 with 121 rigs in operation, and that is before some of the recently contracted rigs arrive early next year. The surge in drilling activity in Saudi Arabia is part of the kingdom's plan to ramp up its production capacity from a maximum of 11.3 million barrels per day (b/d) currently to 12.5 million b/d by 2009. The government is considering the possibility of further boosting its capacity to 15 million b/d, but no time period has been suggested.

We thought it would be interesting to see what Saudi Arabia's drilling rig count looked like over time and in relation to crude oil prices. Using the Baker Hughes rig count figures, which focuses only on rigs actually drilling rather than merely working or under contract, we see that until recently, Saudi's active rig count was about where it was in the early 1980s. That high historical record coincided with high global oil prices and an environment of perceived rapid demand growth and a tight global supply/demand relationship.

The reality, however, was that global crude oil supplies were growing rapidly as non-OPEC production expanded due to oil companies and resource-rich countries responding to high oil prices by stepping up exploration and development activity. At the same time, energy conservation steps and slowing economies in Europe and the United States were undercutting global oil demand growth.

### Exhibit 3. Saudi Drilling Reflects New Challenges



Source: Baker Hughes, PPHB

**Today's surge in Saudi Arabian drilling activity reflects more challenging drilling conditions**

Today's surge in Saudi Arabian drilling activity reflects the more challenging drilling conditions that must be overcome in order to increase the country's production capacity. Part of the challenge is due to the areas within existing producing fields that are now being exploited. Because the geology within these areas is not as productive as the older producing regions, wells drilled often need to be horizontal in order to expose more of the reservoir to the wellbore to increase drainage and thus establish higher production rates. These types of wells are more oilfield service intensive resulting in them taking longer to drill and costing more than the simple wells drilled in the past. Additionally, explorers are being forced to enter more remote areas of Saudi Arabia to seek new fields. These remote areas require greater infrastructure before establishing new drilling and production sites, adding to the time necessary to boost production capacity. There are few signs that any of these trends will be reversed in the near future.

**One could project that the kingdom may surpass the Gulf of Mexico in terms of active drilling rigs by early 2007**

As a result, Saudi Arabia is rapidly becoming a major oilfield service market. Currently, Saudi Arabia has 62 rigs drilling according to Baker Hughes (BHI-NYSE), some 25 fewer than are working in the Gulf of Mexico, but the Saudi active drilling rig count is trailing the growth in its rig population. Based on Saudi's statement about its rig fleet growth and the recently negotiated drilling rig contracts with Global Santa Fe (GSF-NYSE), one could project that the kingdom may surpass the Gulf of Mexico in terms of active drilling rigs by early 2007. The Gulf of Mexico has historically been one of the world's premier regional drilling markets. Understanding that this market's drilling activity potentially may be surpassed by Saudi Arabia in 2007 re-enforces the view that seismic changes are

underway in the global energy and oilfield service industries.

## Gasoline Prices, Energy Taxes and the French Experiment

Gasoline prices continue to climb due to refinery problems, surging demand and escalating crude oil prices. According to the AAA Automobile Club, gasoline prices are averaging about \$2.94 per gallon for regular fuel, up 80 cents from a year ago. Projections are that the average price may reach or exceed \$3 per gallon by this week. An oil spill at a CITGO Petroleum Corp. refinery in Louisiana, near Lake Charles, caused the Calcasieu Ship Channel to be shut to vessel traffic that included crude oil tankers and inland refined product barges. As a result of this accident, with its yet undetermined cause, all refinery operations in the area were impacted. Two refineries grew short of crude oil and asked to borrow 750,000 barrels from the Strategic Petroleum Reserve in order to continue to operate and produce refined product.

**Gasoline demand increased by 105,000 b/d to 9.65 million b/d, the second highest weekly demand ever**

Last week's petroleum inventory statistics produced a surprising increase in gasoline inventories that at first blush caused oil and product prices to fall. However, once traders learned that gasoline demand increased by 105,000 b/d to 9.65 million b/d, the second highest weekly demand ever, petroleum futures prices recovered from their earlier sell-off. The gasoline inventory and demand figures reflect consumer purchases for the week leading into the four-day Fourth of July weekend. The strength of gasoline demand in the face of rising gasoline pump prices reflects adjustments consumers have made to high commodity prices. Whether consumers will continue to drive as much in the face of even higher near-term prices remains to be seen. If they do, then gasoline supply will remain precariously balanced given the potential of disruptions due to refinery operational issues and/or raw material availability or output constraints due to hurricanes.

**The politicians used the festival to gain attention for their effort to mobilize a group of protestors to challenge BP over high gasoline prices, a lack of minority representation among management and vendors and safety issues**

The weekend before last, the New Orleans-based Essence Music Festival was held in Houston. The festival attracted many notable black politicians including Rev. Jesse Jackson, Rev. Al Sharpton and Louis Farrakhan. These politicians used the festival to gain attention for their effort to mobilize a group of protestors to challenge BP plc (BP-NYSE) over high gasoline prices, a lack of minority representation among management and vendors and safety issues following a deadly explosion at BP's Texas City, Texas refinery. The refinery explosion last year killed 15 BP and contractor employees and injured 170 others. BP has announced that it is taking a \$500 million charge to earnings for the cost of the accident.

Rev. Jackson explained his motives for leading the protest. "We are going to engage in direct action against BP to change their behavior. They need to stop energy exploitation, stop manipulating prices and undercutting the American people." A few days before the protest, a group of black leaders led by Jackson and Sharpton announced the boycott of BP primarily because none of its upper-level executives

are black and there are no black owners among its hundreds of U.S. distributors. The company challenged these statements with specifics on black employees in management and arrangements it has made with minority distributors.

While the issue of safety at the Texas City refinery is important, the prime motivating factor for the protest was to express unhappiness over gasoline prices. Rev. Jackson said, "If you're white, black or brown, we are all victims of the energy monopolization, price gouging and greed. The American public has been too silent. We must fight back to drive down the price of gas." Clearly, Rev. Jackson hasn't read the latest government reports on gasoline price gouging that found that after Hurricane Katrina, there were only a few minor incidents that could be considered price gouging.

**The problem with finding price gouging is that it is an undefined concept**

The problem with finding price gouging is that it is an undefined concept. Unlike pornography, which has a legally mandated requirement for a jury to first establish community standards on pornography before applying them to the subject material, the only community standard for gasoline is a low price. In this case it is hard to accept the 1964 pornography view expressed by Supreme Court Justice Potter Stewart that "I'll know it when I see it" because with gasoline we are biased to - lower is always better. Having served on a jury in a pornography case, I appreciate the challenge of determining community standards for pornography and then applying them. I believe that is a much greater challenge than determining price gouging, but I'm sure there are many who might dispute that belief.

**We should look to the real estate price controlling action of the Communist mayor of Saint-Ouen as an example of heavy-handed social action**

What politicians such as Rev. Jackson wish for is a lower gasoline price. Helping their constituents is always the motivating factor. Maybe we should look to the real estate price controlling action of the Communist mayor of Saint-Ouen, a working class suburb north of Paris, as an example of heavy-handed social action. She was so fed up with complaints that property prices had soared out of reach of local citizen's budgets that she devised a plan to keep them down.

**While the town hall has been successful in keeping prices down, there remains a way around the ceiling – basically an under-the-table deal**

The plan calls for the mayor to block property sales if she feels that the price the seller is asking for the property is too high. Real estate developers are only granted a permit to build if they promise to sell the new properties at a pre-agreed price. So how high is too high? The town is trying to keep prices below 3,500 euros (\$4,400) a square meter. So far it seems to be working according to real estate agents who report that the average price per square meter in Saint-Ouen is about 3,000 euros compared with about 4,000 euros in neighboring Clichy-sous-Bois. While the town hall has been successful in keeping prices down, there remains a way around the ceiling – basically an under-the-table deal. Interestingly, official government policy is causing citizens to engage in illegal activities in order to complete transactions at market-clearing prices.

So how would price controls work in the gasoline market if we adopted the mayor of Saint-Ouen's plan? In a world of \$3 per gallon

**Does anyone remember the drinking glass give-a-ways or S&H trading stamps that supplemented the gasoline price wars of the 1950s and 1960s?**

prices, we could mandate that gasoline can only sell for \$2.50 per gallon. The biggest problem is that we quickly would drain the gasoline tanks at stations under these price controls. Since gasoline is used to power mobile vehicles, the issue of location, location and location, the rule for real estate, has no power. Cheap gasoline prices would do a lot for boosting gasoline demand, creating greater environmental problems from emissions. For stations not under price control, would they have to give price concessions to attract business? Does anyone remember the drinking glass give-a-ways or S&H trading stamps that supplemented the gasoline price wars of the 1950s and 1960s?

The second highest weekly gasoline demand ever at the same time that Rev. Jackson is leading a protest over high gasoline prices suggests consumers haven't reached the breaking point on consumption. Recently reported weak retail sales figures may indicate that consumers are directing their discretionary dollars where they believe they are getting the greatest satisfaction. That pattern doesn't suggest impending problems for petroleum companies, but it could signal bad news for consumer-oriented companies.

## **Will LNG Bail Out Our Natural Gas Supply Problems?**

Domestic natural gas prices are weak. Gas inventories continue to build. The market is worried about the possibility of shut-in gas this summer or fall as gas storage facilities in the U.S. bulge with supply. Low gas prices have the potential to lead to a self-correcting market as potential gas consumers find gas a cheaper alternative to their existing fuel supplies. With declining gas production in the U.S., and the potential for declining supplies from Canada, natural gas consumers are looking at increased liquefied natural gas (LNG) supplies to meet growing domestic demand.

**CERA's forecast that the LNG industry will grow to 2012 by the same amount as in the first 40 years of its history may prove conservative**

Cambridge Energy Research Analysis (CERA) has issued a new report on the outlook for LNG. The study proclaims that their forecast that the LNG industry will grow to 2012 by the same amount as in the first 40 years of its history may prove conservative. Their conclusion is based on estimates that LNG supply is building strongly. They believe the market will double in six or seven years compared to volumes shipped in 2004. CERA estimates that the industry will grow to more than a \$65 billion dollar annual market and meet 15% of the world's natural gas demand by 2012. A key to the forecast is the assumption that technology and cost implications will not raise LNG costs out of the \$4 per million Btu envelope, which could make it uneconomic against other gas supplies.

According to the author of the CERA report, Michael Stoppard, more than 25 million tons (mt) of new liquefaction capacity has been commissioned since October of last year, adding about 18% to global capacity. Further, Stoppard estimates that even under the most conservative scenario, LNG trade should grow by 12% to 159

**Without stronger gas demand, we are not likely to need as much LNG as projected for this year**

mt between 2005 and 2006, with U.S. imports growing by almost 25%. That forecast, however, depends on normal weather this summer, fall and winter. Because we had a warmer than normal winter last year and a warm or cool spring, depending upon where you live, domestic natural gas inventories are near record levels. As a result, we are using our current LNG import terminals at less than 50% of their rated capacity. Without stronger gas demand, we are not likely to need as much LNG as projected for this year. But a shortfall this year does not undercut the long-term gas supply/demand fundamentals in the United States that are driving our need to secure additional supplies.

**Forecasts call for LNG to surpass petroleum as the world's main fuel source by 2025, making up 20%-25% of the total gas demand in the United States**

The biggest problem for the U.S. is its capacity to import LNG. Opposition to building new LNG re-gasification terminals may limit the importation of greater volumes. There is strong opposition to sitting these terminals along the East Coast and in particular in the Northeast region of the country, which will soon be short of natural gas to power existing and planned electricity plants. At the present time, there are about 40 receiving terminals either planned or that have received permission to be built from the federal regulators. The global LNG market cannot support all these terminals.

Forecasts call for LNG to surpass petroleum as the world's main fuel source by 2025, making up 20%-25% of the total gas demand in the United States. LNG currently accounts for about three percent of U.S. gas usage. Many international markets also are focusing on their need to secure additional LNG supplies, especially in locations such as Europe and Japan. In Europe, the increasingly heavy reliance on Russia as its primary gas supplier is generating increased political concern following the Russian government's decision last January to shut off the gas flow to Ukraine in a dispute over gas prices that caused a knock-on supply impact in Western Europe.

**Exhibit 4. LNG Plays A Major Role In U.S. Energy Supply**

*Figure 85. Net U.S. imports of natural gas, 1970-2025 (trillion cubic feet)*



Source: EIA

**The buyers believe pipeline-delivered natural gas will be more expensive, and that belief is the primary reason why ExxonMobil is having a difficult time selling its gas**

In Japan, Tokyo Electric Power and other buyers of natural gas are lobbying ExxonMobil (XOM-NYSE) to link up with Royal Dutch Shell (RDS.A-NYSE) to maximize the amount of LNG that could come from Russia and thus reduce the cost. These gas buyers want ExxonMobil to drop its plan to ship by pipeline to Japan natural gas produced at Sakhalin-1, and instead combine their gas with Shell's at its Sakhalin-2 LNG project. The buyers believe pipeline-delivered natural gas will be more expensive, and that belief is the primary reason why ExxonMobil is having a difficult time selling its gas. According to Hiroyasu Murakashi, in charge of buying gas for Tokyo Electric, "Gas from Sakhalin is cheaper than from Indonesia, Malaysia, or Australia. If Exxon and Shell cooperate and use the same facilities, production costs will go down and benefit all of us." Whether this idea will carry any weight with the sellers is uncertain, but probably not likely.

**Bodman believes that if the Alaska pipeline does not move forward soon, the resources and capital currently dedicated to that pipeline will be shifted to other projects**

At the same time petroleum industry executives are positive about the outlook for LNG, there is a push for developing Alaskan natural gas via a pipeline through Canada. Recently, U.S. Energy Secretary Samuel Bodman, in a letter to Alaska Gov. Frank Murkowski, urged that state to move forward quickly with the legislative and contractual work necessary to begin the Alaska Natural Gas Transportation Project before Lower 48 markets are overtaken by LNG. Bodman believes that if the Alaska pipeline does not move forward soon, the resources and capital currently dedicated to that pipeline will be shifted to other projects – some of which are likely to be LNG.

**Opposition to new LNG terminals is building**

The greatest restriction on growth of the U.S. LNG market is the lack of capacity to import greater volumes. While this constraint may appear immaterial at the present time due to the large volume of natural gas in storage, weak domestic gas prices and LNG receiving terminals operating currently at less than 50% of capacity, long term planning dictates that we add import capacity. Current market conditions can, and likely will, change quickly. Adding terminal capacity cannot move as rapidly as markets can change.

Opposition to new LNG terminals is building, especially in the Northeast and along the East Coast. Much of the opposition is related to safety concerns. Those concerns were raised following the publication of a report by four experts at the Sandia National Laboratories in New Mexico earlier this year, which said that an accident from a 300,000 cubic-meter class storage and re-gasification vessel would create a pool of fire that would burn skin up to 1.6 miles away as well as melt steel up to a half mile away. If a vapor cloud were to form, people within a four-mile radius would feel the effects.

Motivated by this report, local opposition to locating LNG terminals anywhere close to population centers has grown. As shown by the FERC map of proposed terminal locations, one can expect that most, if not all, of those proposed terminals situated on the East Coast will likely not be built. We suspect that terminals on the

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**Recent analyses show that the pipeline industry will need to spend upwards of \$61 billion in new infrastructure over the next 12 years**

**While logistics would argue that sitting some LNG terminals close to consuming markets makes sense, local opposition will make it difficult for them to be built**

West Coast will also suffer from local opposition, although some are needed if the U.S. is to be able to access Southeast Asia, Australia and eventually Russian LNG.

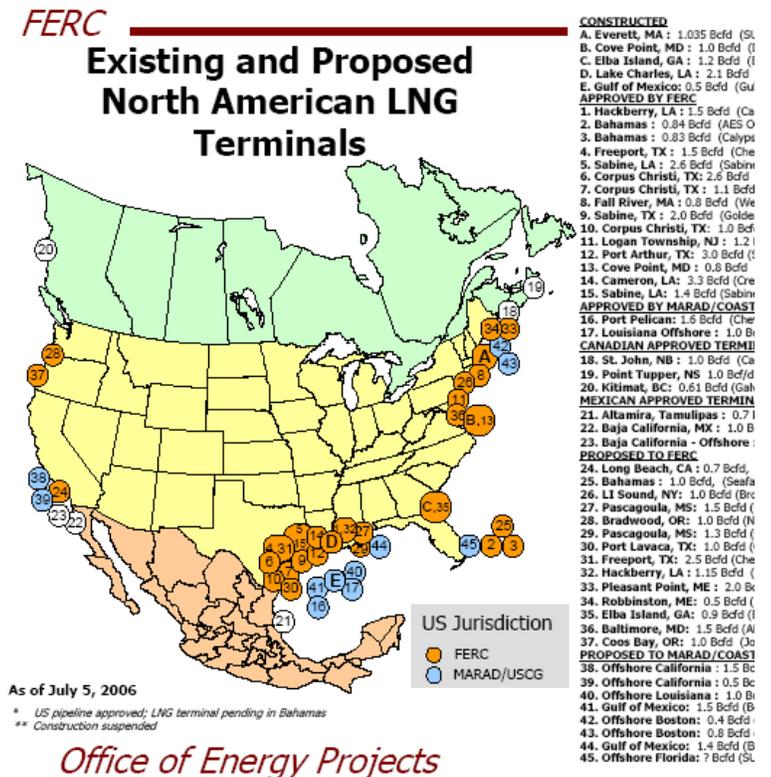
Some of the proposed LNG terminals on the Gulf Coast are already under construction and more are likely to be approved. While there have been several terminal projects in the gulf rejected for technical reasons, at least one is being revisited using different re-gasification technology. From the start of the push for more LNG entry points, logic pointed to the Gulf Coast as the most appropriate venue. The primary reason is that our national gas pipeline grid is designed to move gas from this region and the Gulf of Mexico to the large consuming markets in the Northeast, Midwest and Mid-Atlantic regions of the country. The pipelines telegraph down from large to small diameters as they head north from the Gulf Coast, making it difficult to inject large volumes of LNG into smaller pipelines.

With additional LNG terminals along the Gulf Coast, the pipeline industry will need to ramp up its investment in new infrastructure. Recent analyses show that the pipeline industry will need to spend upwards of \$61 billion in new infrastructure over the next 12 years, including 45,000 miles of new pipelines and 10 LNG terminals.

We found it interesting that one LNG project targeted for offshore Alabama is being blocked by the state's governor over the re-gasification technology to be used. In response to the objection, the terminal is being dropped. ConocoPhillips (COP-NYSE) said that it would not spend an additional \$800 million to employ the more costly technology to satisfy the governor's objection. Shortly after reaching that decision, Conoco purchased a 25% interest in the Rockies Express Pipeline being proposed by Kinder Morgan (KMI-NYSE) and Sempra (SRE-NYSE) to move gas from the Rocky Mountains to the East Coast. Clearly, Conoco sees the long-term need to have greater involvement in the gas infrastructure of the United States.

What is becoming increasingly evident is that North America will need substantially more pipeline capacity to satisfy the growing demand for natural gas. As Canada, our primary gas import source, struggles to meet its natural gas needs and sustain exports to the United States, we will be forced to rely more on LNG. The U.S. will become increasingly more dependent upon foreign sources for our energy. While logistics would argue that sitting some LNG terminals close to consuming markets makes sense, local opposition will make it difficult for them to be built. We will resort to building more of our gas importing infrastructure in the Gulf of Mexico, and make it susceptible to hurricanes. One wonders if we will ever learn the lessons of hurricanes Katrina and Rita?

Exhibit 5. East Coast Terminals Will Likely Not Be Built



Source: FERC

**Gulf of Mexico: Destined for a Drilling Wasteland?**

**The Gulf of Mexico is rapidly become little more than a regional drilling market**

The contract recently announced by Global Santa Fe to move four large jackup drilling rigs to Saudi Arabia was one more nail in the coffin of the Gulf of Mexico drilling market. Once the only offshore drilling market and for many years the major offshore drilling market, the Gulf of Mexico is rapidly become little more than a regional drilling market. This trend does not denigrate the importance of the Gulf of Mexico to U.S. oil and gas supplies, but the nature of this market – short-term contracts with substantial competition from older, less efficient drilling rigs that depress overall dayrates is making international markets that pay higher rates and offer longer work terms more attractive.

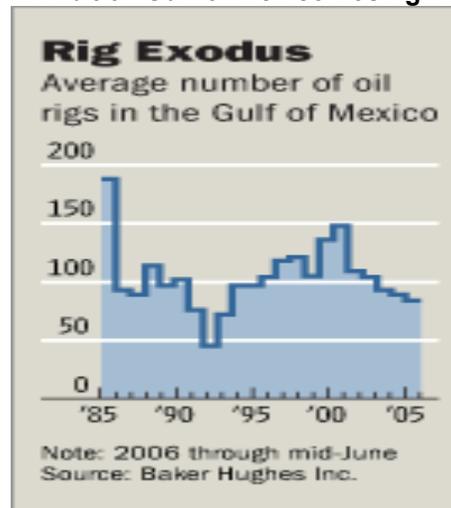
The latest factors impacting drilling contractor views of the Gulf of Mexico market are the fallout from last year’s hurricanes. The extent of the damage done to the offshore oil and gas infrastructure by hurricanes Katrina and Rita has made insurers less willing to provide coverage at reasonable cost. Due to the risk of storm damage and increased operating costs for wells drilled during hurricane season – having to shut down, secure drilling operations and evacuate

**Since the early 1980s, the Gulf of Mexico drilling market has shrunk**

workers every time a storm comes along – has made operators hesitant to contract rigs during this season. Operators who elect to drill are often forcing contractors to accept a lower day rate to help offset the possible downtime costs. Given these conditions, longer term contracts and higher day rates in international markets look even more enticing to drilling contractors.

Since the early 1980s, the Gulf of Mexico drilling market has shrunk in general terms. There have been periods of time when the drilling rig count has climbed, but never back to levels seen in 1985 or before. The reason 1985 marked a peak in activity was that it was immediately after the delivery of almost all of the drilling rigs constructed in the late 1970s and early 1980s in response to escalating global oil prices. While OPEC was fighting to keep oil prices up at that time in the face of growing non-OPEC production and shrinking demand due to conservation measures, the 1970s mindset that oil prices had only one way to go – up – drove drilling activity higher. More drilling produced new oil production that undercut OPEC's ability to defend high oil prices.

**Exhibit 6. Gulf of Mexico Losing Rigs**



Source: Baker Hughes, Wall Street Journal

**In very early 1985, the Baker Hughes Gulf of Mexico rig count peaked at over 220 rigs**

In very early 1985, the Baker Hughes Gulf of Mexico rig count that measures only those rigs actually drilling peaked at over 220 rigs. From that peak the count headed slowly down, until oil prices collapsed in 1986 and the rig count plummeted.

An article in *The Wall Street Journal* pointed out that in 2001 the Gulf of Mexico rig count averaged 148 rigs. The count that year went from the 160s at the start of the year down into the 115 range late in the year. The peak weekly count that year was 171 while the low was 108, each an outlier from the averages. Last week, the active Gulf of Mexico drilling rig count was 91 compared to 154 in 2001, but only down slightly from the 96 rigs working last year. Because of the Baker Hughes rig count methodology, it is safe to

**The Gulf of Mexico may become the 2000s graveyard of old rigs as the Southeast market was in earlier times**

assume that there were more offshore drilling rigs under contract – an important measure of the health of the market – than the drilling rig count showed.

Unless operators are prepared to pay higher day rates and/or offer long-term contracts, the exodus of drilling rigs from the Gulf of Mexico will likely continue. Old, shallow water jackups have limited opportunities to find work outside of the gulf. Second generation semisubmersibles are also candidates for graveyard duty in the gulf. High quality and newer rigs are all likely destined for international markets unless, and until, producer attitudes about contract terms in the Gulf of Mexico change. If they don't change, the Gulf of Mexico may become the 2000s graveyard of old rigs, just as the Southeast market was in earlier times.

## Is the Light Bulb Destined for the Museum?

**The new light bulb would be 10 times more efficient than the ordinary light bulb and twice as good as a fluorescent light**

The U.S. Department of Energy is working with academic and private industry researchers to develop light bulbs with “solid state lighting” devices that attain 50% efficiency. If achieved, the new light bulb would be 10 times more efficient than the ordinary light bulb and twice as good as a fluorescent light. The light bulb, invented by Thomas Alva Edison in 1879, revolutionized modern life.

The greatest problem for the ordinary light bulb is its lack of energy efficiency. The incandescent bulb turns only 5% of the electricity it consumes into light. The rest is wasted as heat. A fluorescent light is much more efficient, but it only puts out 25% of its energy as light. The future will depend on perfecting lighting systems consisting of light emitting diodes (LEDs), such as those found in digital clocks and phones, car taillights and dashboard indicators, traffic lights, stadium displays and other niche applications.

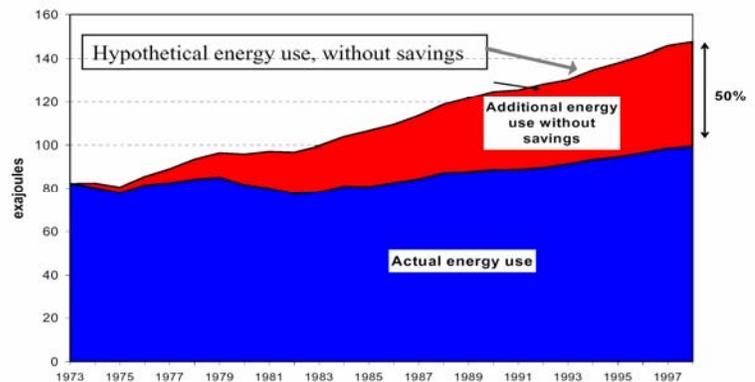
**According to the Energy Department, the LED could cut the amount of electricity Americans use for lighting in half by 2025, saving upwards of \$30 billion a year**

The LED is made of semiconductors, such as those used in computer chips. The LED produces little heat and uses no hazardous materials like mercury in fluorescent tubes. Moreover, the LED lasts for thousands of hours and even for years. The advantage of the LED is, according to the Energy Information Administration (EIA), that it could cut the amount of electricity Americans use for lighting in half by 2025, saving upwards of \$30 billion a year.

**The study showed that the savings by 1998 amounted to almost one-third of what energy consumption would otherwise have been**

To put the savings into perspective, we should look at history. The EIA prepared an analysis showing what U.S. energy consumption would have been had the energy conservation and technology changes not occurred after 1973. The study showed that the savings by 1998 amounted to almost one-third of what energy consumption would otherwise have been. The energy technology step-change the new light bulb represents could significantly impact the amount of power generation capacity needing to be built in the future, possibly giving domestic utilities greater flexibility in their fuel choices with implications for U.S. energy supply and demand.

**Exhibit 7. Conservation Savings Can Be Significant**



***Without energy savings achieved since 1973, energy demand in 1998 would have been 50% higher***

Source: EIA

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