

MUSINGS FROM THE OIL PATCH

February 19, 2008

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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

It's The Economy Stupid: Oil Demand Cut Again

Both the International Energy Agency (IEA) and the Organization of Petroleum Exporting Countries (OPEC) have recently reduced their estimates of the amount of crude oil that will be used in 2008. We have focused in the past on the inability of the IEA, among others, to get its oil demand forecast right during this decade. The IEA's forecast was either too low as in the early years that was manifest in the 2004 surge in global oil demand, up 2.9 million barrels per day or 3.6%. Or after being too low for those years, the IEA then began overestimating demand and has had to ratchet down its initial projections as each year unfolded.

Much has been made by the business media of the most recent demand reduction, but they paid little attention to the IEA's earlier demand cuts

As crude oil prices have jumped to nearly \$100 per barrel, the importance of the world oil demand forecast has grown as an indicator of where future oil prices might head. What we have found most interesting and a little disconcerting, is that much has been made by the business media of the most recent demand reduction, but they paid little attention to the IEA's earlier demand cuts. In Exhibit 1, we show the annual increase in crude oil demand since 1989 along with the initial IEA demand forecasts for 2005, 2006 and 2007 along with actual demand for those years. In every case, actual demand proved lower than the forecasts.

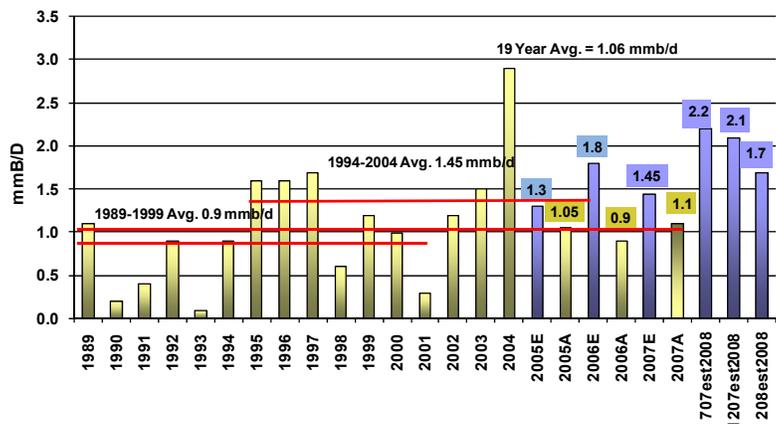
So far, the IEA's 2008 oil demand forecast has been reduced by half a million barrels per day

On that chart we also plotted the 2008 estimated oil demand increase forecasts issued in July 2007, December 2007 and February 2008. So far, the IEA's 2008 oil demand forecast has been reduced by half a million barrels per day (mmb/d), from 2.2 mmb/d to 1.7 mmb/d. The most recent ratcheting down of the demand estimate was prefaced by commentary from the IEA about the recent reduction of world economic growth projections by the

Early this year, the IMF lowered its world economic growth forecast by 0.3% to 4.1%

International Monetary Fund (IMF). The 2008 growth estimate had initially been projected in October to be lower than the world's performance in 2007 (+4.9%). But early this year, the IMF lowered its world economic growth forecast by 0.3% to 4.1% after it assessed the impact of credit market problems in the United States during the fourth quarter of 2007.

Exhibit 1. Recent IEA's Oil Demand Forecasts Have Been High



Source: IEA, PPHB

Another way of looking at the challenge the IEA has in trying to forecast oil demand is to look at the pattern of oil demand growth over historic periods. As displayed on the chart in Exhibit 1, over the ten years of 1989-1999, the average annual growth in oil consumption was 0.9 mmb/d. On the other hand, if you take a different ten-year period, 1994-2004, which includes the huge demand growth year of 2004, the annual average increase was 1.45 mmb/d.

One might conclude that the demand growth experienced in 1994-1997 and in 2004, all of which was attributed to strong economic growth in Asia and/or China, was more an aberration than the norm

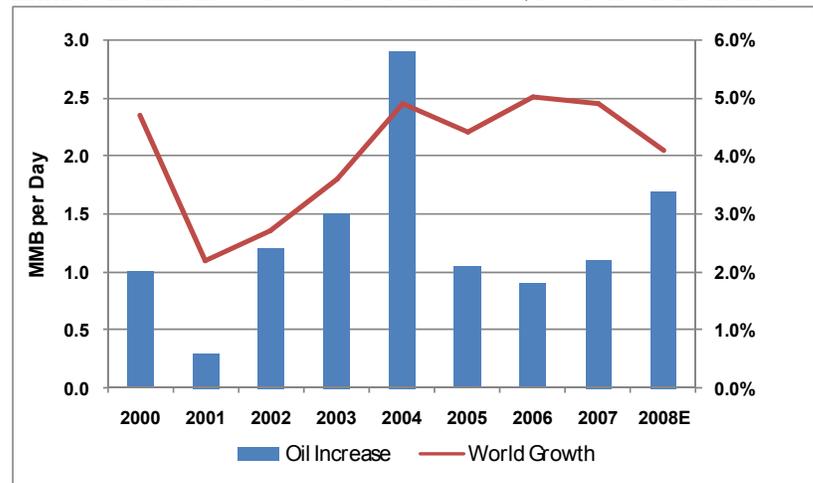
The actual demand increase experienced in 2005 was 1.05 mmb/d. In 2006 it was 0.9 mmb/d. Last year the growth was 1.1 mmb/d. That three-year record suggests the world's oil demand growth was closer to the average oil demand experienced during 1989-1999. In all three years, the IEA started the year with a substantially higher demand growth forecast. What one might conclude is that the demand growth experienced in 1994-1997 and in 2004, all of which was attributed to strong economic growth in Asia and/or China, was more an aberration than the norm.

As a result of examining this performance record, we have been skeptical of the IEA's forecast for 2008. The actual growth in oil consumption in 2005, 2006 and 2007 turned out to be much closer to the earlier ten-year average as well as the average experienced over the entire 19-year period, 1989 to 2007. World economic growth during 2005, 2006 and 2007 was very healthy at 4.4%, 5.0% and 4.9%, respectively. With weaker demand forecast and probably much lower oil demand growth, should one conclude that high crude

Oil demand growth in recent years has not reflected the health of world economies

oil prices have had some impact on consumption? To examine that question, we plotted world economic growth as reported by the IMF for each year of this decade, including the most recent estimate for 2008, against the annual increase in crude oil consumption. When one looks at the graph, it appears that oil demand growth in recent years has not reflected the health of world economies. That being the case, with world economic growth in 2008 projected to be lower than at any time other than 2001, 2002 and 2003, it is difficult to believe 2008's oil consumption will be more than 15% higher than in 2003.

Exhibit 2. IMF 2008 Forecast Calls Into Question Oil Demand



Source: IEA, IMF, PPHB

Even though the IMF has lowered its economic growth forecast for 2008, that forecast is still at risk of being too high. There are growing signs that the credit market problems and their economic fallout in the United States is beginning to be experienced in Europe. If those problems undercut European economic growth, the focus will turn to what linkage there may be between U.S. and European economic activity and that of Asia and China. In turn, economic activity will influence oil demand. If 2008's economic growth fails to meet the current forecast than we would expect even greater downward pressure on oil demand and crude oil prices.

Gasoline stocks at February 8 are the highest they have been since February 19, 1999

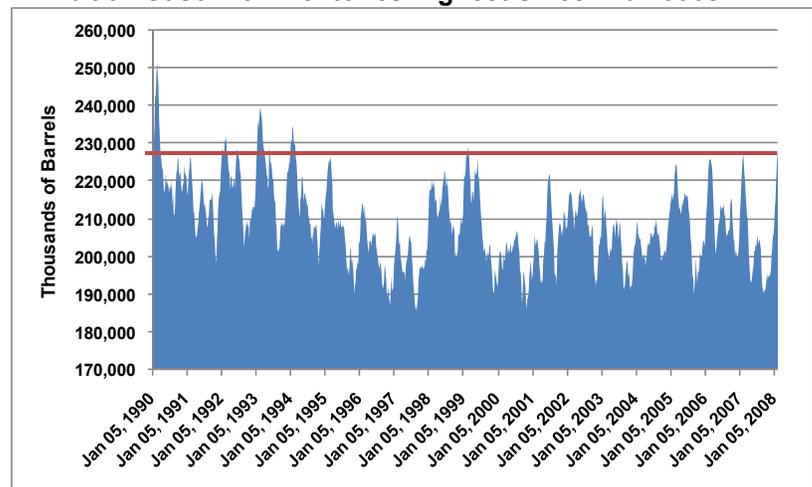
Another oil demand factor to be considered when discussing the question of the impact of high petroleum prices on consumption is what is happening in the domestic gasoline market. For the week of February 8, the U.S. Energy Information Administration (EIA) reported gasoline stocks of 229,236,000 barrels. This is the highest inventory since the 229,300,000 barrels reported for the week of February 19, 1999. Moreover, that one weekly high number had not been seen since the months of January and February of 1994 – fourteen years ago.

It is equally significant to note that gasoline inventories have risen steadily since the week of October 26, 2007. During the first six

The evidence of global oil demand being impacted by high oil prices and weakening economic activity is growing

weeks of 2008, gasoline inventories have risen at an average rate of 3,566,000 barrels per week. If this pattern of gasoline inventories, especially in the face of huge vehicle fleet growth over the past nine or 14 years, doesn't suggest that something is going on with demand, we are not sure what would. Again, let us caution that we are not predicting a collapse in global crude oil prices. However, we do believe that the evidence of global oil demand being impacted by high oil prices and weakening economic activity is growing. At some point, and we can't forecast when that point is, crude oil prices will drop – or there will be a huge revival of economic growth to support current prices. We have a hard time betting that world economic growth will accelerate soon given the still uncertain condition of global credit markets.

Exhibit 3. Gasoline Inventories Highest Since Mid 1990s



Source: EIA, PPHB

Consultant Challenged to Back Up Forecast With Cash

We now have a Texas-sized challenge to the advice of one strategy firm regarding the future of global energy resources

One of the traditional criticisms about consultants is that they provide strategic advice to management and recommend actions to be taken but are seldom held accountable for the success or failure of their plans. We now have a Texas-sized challenge to the advice of one strategy firm regarding the future of global energy resources. The challengers believe the consultant's advice is wrong and that relying on it could create serious economic and geopolitical consequences. The timing of this challenge came just as the consultants were convening their annual industry conference in Houston.

In June 2007, Cambridge Energy Research Associates (CERA) published a forecast that world oil production capacity will reach 112 million barrels per day (mmb/d) in 2017, which suggests that actual production will be 107 mmb/d, up from about 87 million barrels today. Many in the petroleum industry have been skeptical of that forecast (and many of those issued by the IEA and the EIA as well)

If global oil production does not exceed CERA's forecast of 107 million b/d in 2017, the group of individuals will donate their winnings to an energy-focused non-profit organization

believing that production cannot grow to anything close to that target due to the large number of producing countries that have reached or passed their peak oil production capacity. The critics have been questioning the decline rates of producing fields, in particular those of the world-class oil fields that account for a substantial amount of the global oil supply.

After much debate and criticism of the CERA report, a group of 11 people active in the broadly defined energy business decided to challenge the forecast by putting up a \$100,000 bet. If CERA elects to call the bet, it must post a \$100,000 letter of credit from the same bank the challengers are using. If global oil production does not exceed CERA's forecast of 107 million b/d in 2017, the group of individuals will donate their winnings to an energy-focused non-profit organization.

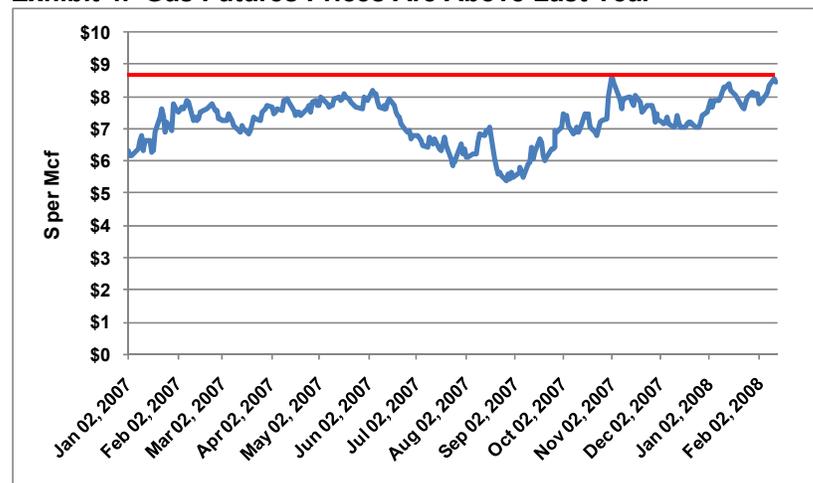
Given how rapidly the world changes, we suspect the answer to the bet will be known well before the ten-year time period. What seems evident to us is that what happens in 2017 will be akin to opening a time capsule buried in a building's cornerstone, but with a little less fun associated with the occasion. At that time, we will know the answer and there won't be any historical items to ooh and ah over. We normally don't do much with old, incorrect forecasts except discard them and ignore them. We are not sure the bet over the forecast will gain much greater respect even though there is \$100,000 riding on the outcome.

Natural Gas Prices Rise – It's All About Supply

Natural gas futures prices are trading about \$1 more than last year at this time

The near month contract for natural gas futures prices have traded in the range of the high \$7 dollars to mid \$8 dollars per thousand cubic feet of gas for all of 2008, which is about a dollar higher than experienced last year. Yes, this winter has been slightly colder than last year, although not appreciably. According to the most recent

Exhibit 4. Gas Futures Prices Are Above Last Year

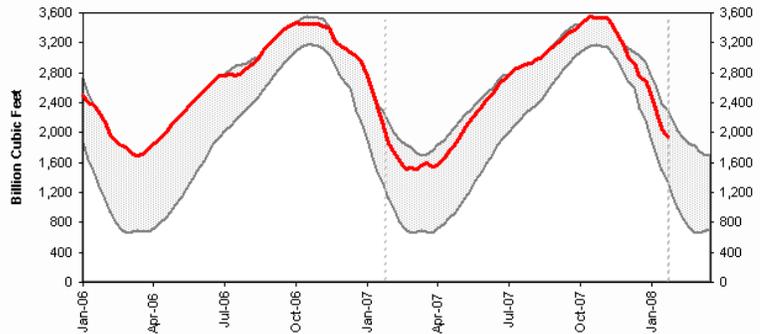


Source: EIA, NYMEX, PPHB

Natural gas in storage has declined significantly and is almost back to the mid-point of the 5-year average range

data from the National Oceanic and Atmospheric Administration (NOAA), this year (July 2007 through January 2008) the nation has experienced 2,455 heating degree days. That is 92% of the normal for the country for this time period based on the 1971 through 2000 data, or 2,656 days. Last year, at the similar time period, the country was at 90% of normal, or 2,390 heating degree days. Yet when we look at the most recent weekly natural gas inventory report for the week ending February 8, gas in storage has declined significantly and is almost back to the mid-point of the 5-year average range.

Exhibit 5. Gas Storage Volumes Are Dropping Rapidly

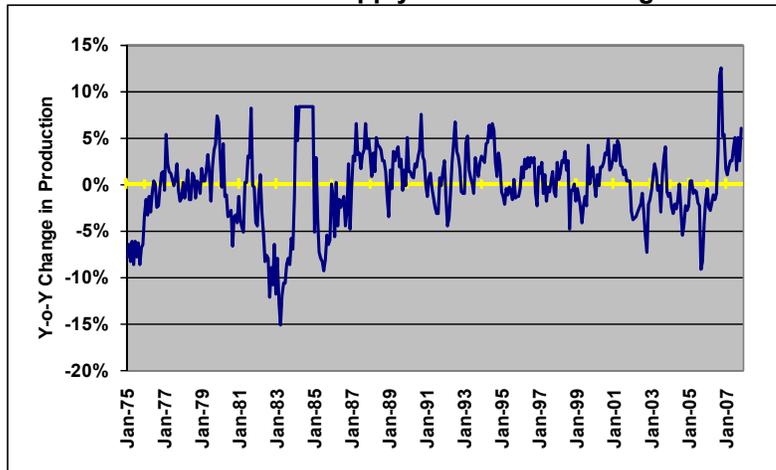


Source: EIA

The United States has been experiencing a rise in domestic gas production largely due to the success of the Barnett Shale

The arctic winter temperatures that dipped into the Midwest and moved across the country several weeks ago contributed to record gas withdrawals from storage. That has clearly contributed to the inventory reductions. But at the same time, the United States has been experiencing a rise in domestic gas production largely due to the success of the Barnett Shale formation in north central Texas as well as other emerging gas shale plays. Since domestic gas drilling continues to remain strong, and various natural gas shales are only now starting to emerge as significant supply contributors, we believe it is likely that domestic gas production will remain strong.

Exhibit 6. Domestic Gas Supply Has Been Growing

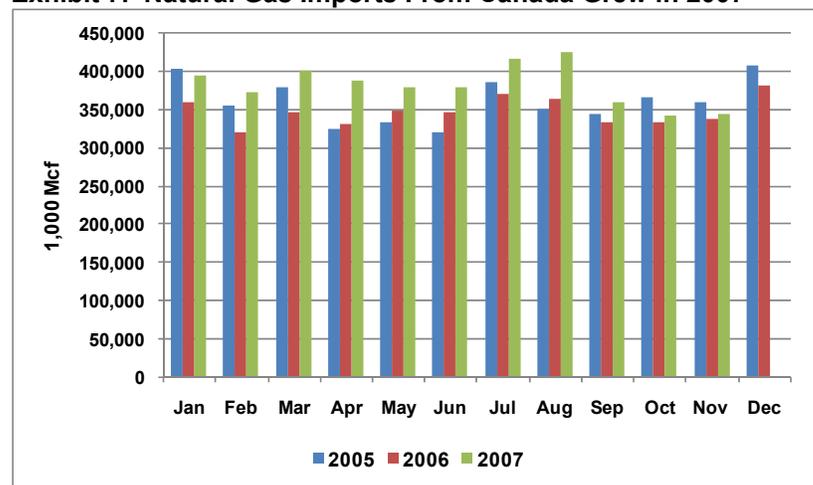


Source: EIA, PPHB

We have seen a rise in the volume of natural gas that is being imported from Canada

At the same time, we have seen a rise in the volume of natural gas that is being imported from Canada. This improvement may not last as the increase has been partly supported by strong drilling in 2005 and 2006 that was curtailed in 2007 and remains curtailed due to the change in Alberta's royalty scheme along with the federal government's earlier change in the taxation of income trusts. Additionally, some of the Canadian natural gas that is flowing south of the border was destined to be consumed in the new, expanded oil sands projects that have been delayed. Again, we would not be surprised to see gas imports from Canada begin to fall as we enter the second half of 2008, but in recent months and currently, the U.S. market is the beneficiary of additional Canadian gas supply.

Exhibit 7. Natural Gas Imports From Canada Grew in 2007

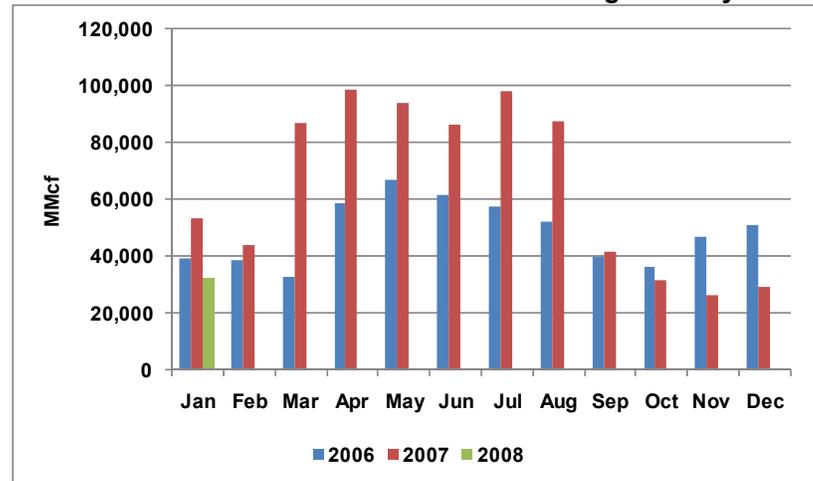


Source: EIA, PPHB

LNG import volumes surged in the early and mid part of 2007 but then fell off sharply in the second half of 2007

The big supply story has been the sharp reduction in the volume of natural gas entering the United States in the form of liquefied natural gas (LNG). As shown by Exhibit 8, LNG import volumes surged in the early and mid part of 2007 but then fell off sharply in the second half of 2007. They are way off in January. As we have written about before, the fact that the U.S. has a large gas storage capacity and multiple LNG re-gasification facilities that are not being fully utilized, LNG supplies will tend to come to the U.S. to be stored for consumption in the winter. But to obtain those LNG supplies, natural gas prices have to be competitive with European markets, and more recently the Pacific basin.

The strong demand for LNG in Japan due to its largest nuclear power plant being out of service due to damage from last year's earthquake and Korea's increased appetite because it has had several major LNG storage tanks out of service have boosted prices those two countries are willing to pay for gas supplies. The European market has also drawn LNG supplies from the Atlantic basin market as it too has been willing to pay higher prices than offered in the United States. These forces have combined to significantly reduce the volume of LNG flowing to the United States.

Exhibit 8. LNG Volumes To U.S. Have Fallen Significantly

Source: EIA, Pan Eurasian, PPHB

Conditions in the LNG market may be setting up the U.S. for a significant further strengthening of domestic natural gas prices

According to the latest LNG import data, the amount of gas coming into the U.S. during the October 2007 through January 2008 period was the lowest for those months in a long time. Forward LNG pricing indications suggest that demand in other geographic markets will be strong and draw LNG supplies away from the United States. Thus conditions may be setting up for a significant further strengthening of domestic natural gas prices. If that happens, it will revive domestic oilfield activity and generate an increase in gas drilling. A pickup in activity will help to absorb what appears to be an oversupply of oilfield equipment, which eventually would support firmer oilfield service prices. As this scenario unfolds, we would expect Wall Street to begin looking at the potential for upward earnings revisions. That dynamic is important to understand. Oilfield service stocks will return to investor favor when they can see the potential for positive earnings surprises from oilfield service companies that will help to boost share valuations.

Californians Hit By 1970s Energy Legislation

California has promoted all the alternative energy technologies with a particular focus on solar and wind power

The state of California is known for its aggressive stance on energy consumption and the environment. It's known for a number of other things, too, but they don't have anything to do with the energy business. California has led the charge against the Bush Administration's Environmental Protection Agency (EPA) over the state's right to mandate tougher vehicle emissions standards and higher fuel efficiency ratings. As part of the state's efforts, it has promoted all the alternative energy technologies with a particular focus on solar and wind power.

In 2006, California ranked second in terms of installed wind power generating capacity with 2,361 MW, or slightly over 20% of the nation's installed capacity. But it is in the area of solar power that California is taking a real lead. In January 2006 the California Public

The California Solar Initiative allocated over \$3 billion to provide financial incentives to residential and non-residential customers to install photovoltaics and solar water heaters on their homes and businesses

Utilities Commission approved the California Solar Initiative (CSI) that allocated over \$3 billion to provide financial incentives to residential and non-residential customers to install photovoltaics and solar water heaters on their homes and businesses. In August 2006, California Gov. Arnold Schwarzenegger signed into law Senate Bill 1, called the 'Million Solar Roofs' initiative. The goal of this legislation was to complement the CSI and to generate the installation of one million new solar rooftop systems over the next ten years. Provisions of the legislation include: raising the cap on net metering from 0.5% to 2.5% of utilities load (enabling them to buy surplus power generated by homes with solar roof systems); mandating that state municipal utilities start a rebate program of \$800 million for consumers who install solar power units; and mandating that solar panels become a standard option for new homebuyers with a requirement that this option eventually become the standard and non-optional for new home construction.

The objective of these solar initiatives is to drive the use of solar power in the state. As of 2005, according to the Energy Information Administration (EIA), 0.9 billion KWH of electricity, or less than 0.01% of the nation's electricity, was generated by solar power. The projection for 2030 is that solar power will grow to 7 billion KWH, or between 2% - 3% of all power produced in the country.

One Sunnyvale couple was surprised to find that they were the target of a lawsuit over solar power due to the redwood trees in their backyard

With California aggressively pursuing solar as an environmentally-friendly and energy-efficient power source, it was not a total surprise that officials would begin to enforce the solar laws already on the books. However, one Sunnyvale couple was surprised to find that they were the target of a lawsuit over solar power due to the redwood trees in their backyard. At issue is the shade these trees cast on a neighbor's 10-kilowatt solar system that he installed in 2001 to power his home. The couple found that they were charged with violation of the Solar Shade Control Act. If they did not "abate the violation" within 30 days, they were liable for fines of up to \$1,000 a day.

Prosecutors say the Sunnyvale couple is breaking the law because their trees are shading their neighbor's solar system

The law, signed by then-Governor and now Oakland Mayor Jerry Brown in 1978, has been rarely used. Prosecutors say the Sunnyvale couple is breaking the law because their trees are shading their neighbor's solar system. With the huge push under the new solar initiatives, it is expected that other citizens may be prosecuted and/or threatened with prosecution under the shade control law in order to foster increased use of residential solar power systems.

As with most legislation, the devil is in the details. We recently read a paper prepared by the Energy Policy Initiatives Center at the University of San Diego's School of Law detailing the content and application of California's solar laws. It also examined the few court cases involving the law and similar laws in other states. In order to understand the potential impact of the shade control law, it is necessary to understand the myriad definitions of active and passive solar systems and nature of the vegetation and the degree of

The judge ruled that six of the trees can stay but the two casting the greatest shadow had to be removed

shading and time of day parameters. We will spare you the details, but suffice it to say that not all things are obvious. In addition, you can fall into violation of the law merely over time as your trees or other vegetation grows. The law requires homeowners to remain vigilant with respect to their trees and their growth.

In the end, the Sunnyvale couple was judged to have violated the law. The judge ruled that six of the trees can stay but the two casting the greatest shadow had to be removed. However, he waived the fines. So the couple, whose attorney can find no other conviction under the shade control law, is appealing the ruling because they are worried it may set a precedent, especially given the state's solar initiatives. But the battle lines are being drawn between solar power promoters and tree huggers. As Kurt Newick, who sells solar systems for a San Jose company but is also the chairman of the global warming committee of the Loma Prieta Chapter of the Sierra Club was quoted as saying, "On average a tree only sequesters 14 pounds of carbon dioxide a year and a solar electric system offsets that every two or three days."

"We are the first citizens in the state of California to be convicted of a crime for growing redwood trees"

However, Frank Schiavo, a retired San Jose State University environmental studies lecturer, said the law needs to be fixed before it turns into a nightmare for more homeowners. As one of the Sunnyvale defendants put it, "We are the first citizens in the state of California to be convicted of a crime for growing redwood trees." And we thought Californians worshiped redwood trees.

Kuwait, LNG and Future Oil Exports

Replacing the oil with natural gas will not only be more fuel efficient, but more importantly it would allow Kuwait to export an additional 100,000 barrels of oil providing \$8.5 - \$9.0 million a day in additional income

Early in February, Kuwait Petroleum Corp. (KPC) CEO Saad al-Shuwaib announced that his country is constructing a facility to allow it to import LNG. The country's target is to begin importing supplies from Qatar sometime in 2009. While the fifth largest oil producer within the Organization of Petroleum Exporting Countries (OPEC), the country produces an insignificant volume of natural gas. Like most other Middle East countries, the climate dictates that air conditioning play a significant role in everyday life. Moreover, because domestic energy costs are highly subsidized by the government, demand is growing rapidly. Generating the electricity to power the air conditioning and other modern conveniences used in the country requires roughly 100,000 barrels of fuel oil per day. Replacing the oil with natural gas will not only be more fuel efficient, but more importantly it would allow Kuwait to export an additional 100,000 barrels of oil providing \$8.5 - \$9.0 million a day in additional income.

Kuwait, along with its neighbor Saudi Arabia, has been one of the few OPEC member countries that have been able to lift their production in recent years. However, in the past year, more and more questions have been raised about the productive capability of Kuwait's major field - Burgan. The field, the world's second largest behind Saudi Arabia's Ghawar, was discovered in 1938 and began

The recent rise in domestic oil consumption growth among OPEC member countries has raised concerns about the ability of the organization to meet global oil demand needs

For whatever reasons, Saudi Aramco has been unsuccessful in tapping the country's gas resources, estimated to be the fourth largest in the world behind, Russia, Iran and Qatar

producing in 1946. The field's peak production was 3 million barrels per day (mmb/d), but has declined in recent years to about 1.7 mmb/d. KPC believes that something around this production level can be sustained for the remainder of the field's producing life, estimated to be another 30 to 40 years.

By switching to LNG to fuel the country's power plants, Kuwait should be able to forestall a possible decline in its oil exports that could come from either a decline in output or a rise in domestic oil consumption. The recent rise in domestic oil consumption growth among OPEC member countries – especially those in the Middle East – has raised concerns among some petroleum industry forecasters about the ability of the organization to meet global oil demand needs. As the surplus productive capacity of OPEC has shrunk, the possibility of its complete erosion has analysts concerned.

We have voiced concern about this issue for a number of years and believed that the natural gas exploration initiatives begun in the late 1990s in Saudi Arabia were designed to eventually position that country to do exactly what Kuwait appears to be doing. However, the strategy begun about a decade ago to develop natural gas fields in Saudi Arabia has been slow to produce results. For whatever reasons, Saudi Aramco, the country's national oil company, has been unsuccessful in tapping the country's gas resources, estimated to be the fourth largest in the world behind, Russia, Iran and Qatar. As a result, King Abdullah of Saudi Arabia switched course in 2006 and ordered the kingdom's power plants to be fueled by crude oil. Natural gas was to be reserved for the petrochemical industry under the government's new economic development plan.

Exhibit 9. Future Oil Export Volumes Could Fall Substantially

Table 1
Traditional Suppliers Export Capacity Will Decline (mn bbl/day)

		1995	2000	2006	2008(f)	2010 (f)
OPEC	Oil Production	27.7	31.5	34.2	34.4	34.8
	Own Consumption	5.2	5.9	7.5	8.2	9.0
	Oil Exports	22.5	25.6	26.7	26.2	25.8
Mexico	Oil Production	3.1	3.5	3.7	3.0	2.4
	Own Consumption	1.7	1.9	2.0	2.1	2.2
	Oil Exports	1.4	1.5	1.7	0.9	0.2
Russia	Oil Production	6.3	6.5	9.8	10.2	10.2
	Own Consumption	3.0	2.6	2.7	3.0	3.2
	Oil Exports	3.3	4.0	7.0	7.2	7.0
Total	Oil Production	37.0	41.5	47.7	47.6	47.3
	Own Consumption	9.9	10.4	12.2	13.2	14.3
	Oil Exports	27.1	31.1	35.5	34.4	33.0

Source: 2006 and prior years, BP Statistical Review of World Energy; more recent data are CIBC WMI estimates/forecasts

Source: CIBC

Russia, Mexico and the 13 members of OPEC account for almost 58% of global oil production

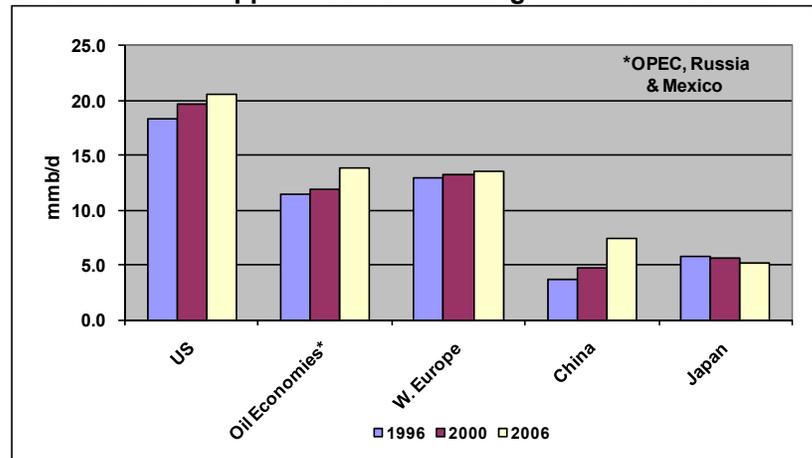
The situation in Kuwait is a microcosm of a bigger issue with potentially significant implications for the future of the global oil industry. That issue is the rapid growth of domestic oil consumption of the world's major oil producing and exporting countries. Today, Russia, Mexico and the 13 members of OPEC account for almost 58% of global oil production, or roughly 48 million barrels per day

Oil consumption growth in the mature, industrialized economies of the United States, Western Europe and Japan is growing much slower than in the developing countries

(mmb/d) and export approximately 36 million barrels. However, due to growing domestic demand in the member countries it is possible that exports might fall by 2.5 mmb/d by the end of the decade. Unless global oil production grows faster than forecast, satisfying worldwide oil demand will be problematical. In that scenario, it is difficult to see the producing countries sacrificing their economies and citizens' living standards to meet the western world's petroleum needs.

As shown in Exhibit 10, all markets except Japan have shown growth in domestic oil consumption. In 1996 and 2000, the domestic consumption of the Oil Economies (Russia, Mexico and OPEC) lagged behind Western Europe, but by 2006 they had surpassed it. What this chart shows clearly is that oil consumption growth in the mature, industrialized economies of the United States, Western Europe and Japan is growing much slower than in the developing countries such as China and the oil exporting countries.

Exhibit 10. Oil Suppliers Are Consuming Greater Production

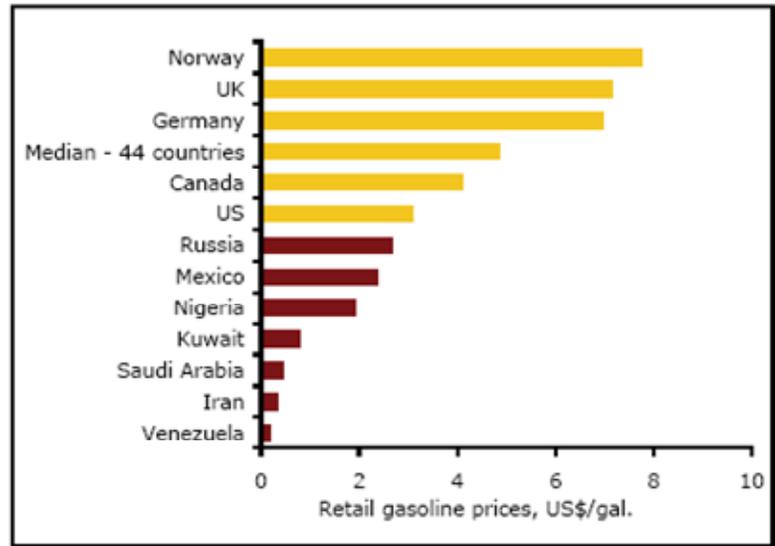


Source: BP, IEA, PPHB

Part of the explanation for the faster growth in oil consumption is the high level of fuel subsidies developing economies are providing to their citizens. That is demonstrated by Exhibit 12. Until these countries elect to reduce their fuel subsidies, they will face above average consumption growth that will force them to scramble to secure new and additional sources of global oil supplies.

The decision by Kuwait to utilize LNG rather than piped-gas is another step in building the global LNG trade

Kuwait may be deciding that switching to natural gas for its power plants is a desirable option to free up more oil for export. In addition, the decision by Kuwait to utilize LNG rather than piped-gas is another step in building the global LNG trade. A larger global LNG market can lead to reduced costs in the future, a favorable consideration. LNG also gives Kuwait greater supply flexibility, which means its neighbors Iran and Saudi Arabia will have less political leverage over the country through threats to cut off natural gas supplies.

Exhibit 11. Developing Countries Highly Subsidize Fuel Use**Chart 4
Gasoline Prices Around the World**

Source: CIBC

Changing oil and gas markets may apply greater pressure on oil importing economies to alter their consumption patterns

We will watch this development closely as it may signal the start of a trend with significant long-range implications for both the global oil and natural gas markets. But possibly more important, the changing oil and gas markets may apply greater pressure on oil importing economies to alter their consumption patterns. How they adjust, and what steps governments attempt to help changes along could have interesting and significant implications on the use of sovereign wealth funds and energy consumption mandates. There could also be social upheavals as a result.

Rising Oil Prices Impact State and Local Governments

One of the less visible results of the rise in global crude oil prices is their impact on state and local government budgets. In turn, those pinched budgets will come back to haunt citizens through either reduced municipal services or higher taxes, or both. One of the more prominent impacts of higher petroleum prices has been on the cost of operating local police forces and school transportation systems.

A less visible, but equally challenging issue for state and local governments is the cost of asphalt for paving roads

A less visible, but equally challenging issue for state and local governments is the cost of asphalt for paving roads. We were alerted to this issue by an email that directed us to the State of California's Department of Transportation web site. On that web site is a monthly index maintained by the department to be used for adjustments to compensation for paving asphalt in those road construction projects that have a provision in their contract for

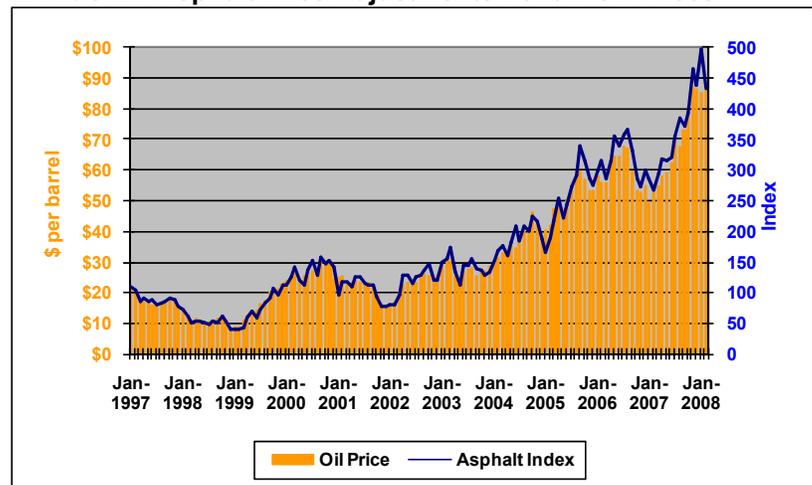
Given the impact from the oil price rise, there likely will be a shortage of asphalt that will hurt state and local governmental efforts to maintain their transportation infrastructures

compensation adjustments. The price index is determined by the department using the median of posted prices in effect on the first business day of the month posted by Chevron (CVX-NYSE), ExxonMobil (XOM-NYSE) and Union 76 for the Buena Vista, Huntington Beach and Midway Sunset oil fields.

The person writing the email wanted to make two points. First was the impact of rising oil prices on the cost of asphalt, and to demonstrate that point he selected several monthly index figures to show the sharp cost increase. In particular he selected January 1999 when the index was 40.2, January 2007 when it was 287.1 and December 2007 when it had climbed to 439.3. This trend shows clearly the impact of rising crude oil prices on the cost of asphalt. His other point was that given this impact from the oil price rise, which he attributes to the growing pressure from peak oil conditions limiting oil supplies, there likely will be a shortage of asphalt that will hurt state and local governmental efforts to maintain their transportation infrastructures.

On his first point, we decided to look at the performance of the index over the entire time period for which we could obtain data. The index value on the web site is first reported for January 1997 at slightly over 100, so we assume the index was started about that time. As one might think, since the index is based on the posted price for three significant oil fields in southern California, the index should track the general trend in oil prices. The chart of the index and the wellhead price for oil in the United States in Exhibit 12 shows a very close correlation.

Exhibit 12. Asphalt Price Adjustments Follow Oil Prices



Source: EIA, California Dept. of Transportation, PPHB

On the issue of asphalt availability in the future, we find several interesting, and possibly conflicting, trends. Asphalt is a product made from the bottom (heavier) part of the barrel of refined crude oil. As the world's crude quality continues to get heavier, the challenge for the petroleum industry is how to extract more light refined

If peak oil produces a significant reduction in future oil supply, then not only will crude oil prices rise, but there will be even greater pressure to produce more valuable light products, in particular transportation fuels, further pressuring the available supply of asphalt

products from the heavier crude oil. More energy is required during the refining process to achieve this goal. But with prospects for even heavier crude oil streams in the future, the petroleum industry will need to upgrade refineries to make more light refined products from the barrel, thereby reducing the likely volume of heavy bottoms available to be processed into asphalt. If peak oil produces a significant reduction in future oil supply, then not only will crude oil prices rise, but there will be even greater pressure to produce more valuable light products, in particular transportation fuels, further pressuring the available supply of asphalt. Higher prices and less supply is not a winning recipe for state and local government highway maintenance departments. Asphalt may be one more unintended victim of high crude oil prices and reduced petroleum supplies. For consumers this could be a double whammy – higher taxes and increased vehicle maintenance expenses due to deteriorating roads. We wonder what renewable materials might make better road surfaces.

Tidbits That Might Impact Energy Markets

Rhode Island has a colorful history as it was the first colony to declare independence from Britain and the last state to ratify the United States Constitution

Rhode Island Has Good Environmental Record

Rhode Island ranks as the 50th state in the United States in terms of areal extent with only 1,214 square miles. The amount of land is even smaller, as one-tenth of the state's area is under water. However, the state probably has the longest official name of any state: The State of Rhode Island and Providence Plantations. The state had an estimated population in 2007 of 1,057,832 people. Rhode Island has a colorful history as it was the first colony to declare independence from Britain and the last state to ratify the United States Constitution.

There are 39 towns in Rhode Island and 29 school districts compared to 23 school districts in Harris County

To put the state into a perspective many of our readers may understand, Harris County, which includes the city of Houston, covers 1,778 square miles (1,729 of land and 49 of water). Rhode Island's total areal extent is barely 68% the size of Harris County, and if we compare the two on the basis of solid earth, the ratio falls to only 63% as large. The estimated 2006 population for Harris County was 3,886,207, or more than three and a half times the Rhode Island population. Clearly, the density of population in Rhode Island is much lower than in Harris County. But the two are somewhat similar on another measure – there are 39 towns in Rhode Island and 29 school districts compared to 23 school districts in Harris County. Those figures help explain why Rhode Island has budgetary problems – the teachers' union almost totally runs the state and insures its members have good salaries, but even better retirement plans.

The policy staff of the state Senate for Rhode Island issued a mixed report on the state's environmental record pointing out several areas where it fell short of standards for waste recycling. But the report did cite several positives dealing with the state's energy consumption.

The quality of the fuel used in Rhode Island must be relatively dirtier than in other states since its carbon emissions per capita was two less than its energy per capita ranking

These positives, several of which we were surprised about especially since we spend a meaningful amount of time in the state, got us to thinking.

According to this report, Rhode Island has the lowest per capita energy consumption of any state in the country. That's pretty significant even though the state is the smallest in the country. On the other hand, Rhode Island ranked 48th in per capita carbon emission. So the quality of the fuel used in Rhode Island must be relatively dirtier than in other states since its carbon emissions per capita was two less than its energy per capita ranking.

Rhode Island is one of the few states that require statewide use of gasoline blended with ethanol. But then again, all of Harris County requires ethanol because of the area's air quality. We were also surprised that an achievement was that Rhode Island has established a goal of generating at least 16% of its electricity through renewable resources by 2019. Given the attitudes of the citizens toward wind turbines and solar power systems, we are wondering how they are going to achieve that goal. Then again, the state has a growing record of making promises it can't or won't keep.

India and China Raising Fuel Prices

Raising subsidized fuel prices in Asian countries will be needed to help slow the world's growing thirst for oil

Last week India raised retail prices of auto fuels for the first time in 20 months. Earlier this year, China raised diesel fuel prices in an attempt to encourage refiners to increase production. Because the government capped diesel prices while crude oil prices were exploding during the second half of 2007, refiners elected to reduce production rather than sell fuel at a loss. That condition contributed to the fuel shortage that impacted the country's ability to generate power during the winter. (The diesel fuel demand for running portable generators was part of the exceptionally strong oil demand experienced by China in 2004.) Raising subsidized fuel prices in Asian countries will be needed to help slow the world's growing thirst for oil.

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