

MUSINGS FROM THE OIL PATCH

February 6, 2007

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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

Is Saudi Arabia Locked into a Repeat of the 1980s?

Crude oil prices started the week at \$55.42, but climbed during the ensuing five days to close at \$59.03

After this production cut the country's oil output would stand at 8.5 million barrels per day (b/d), a reduction of one million b/d since last summer

Last week, Saudi Arabia announced it was cutting its production by another 158,000 b/d. Media reports suggest it may be considering further cuts. When this latest cut is in place, Saudi will have doubled the production cut it pledged during OPEC negotiations over production quota reductions in October and December. The OPEC production cuts were an attempt to deal with weak oil prices caused by the continuing global glut of petroleum stocks. Wall Street and the traders in the commodity pits greeted the news with great enthusiasm. The announced production cut coincided with a wave of very cold winter weather and forecasts for even colder weather this week. Crude oil prices started the week at \$55.42, but climbed during the ensuing five days to close at \$59.03 – highest for 2007.

Wall Street and commodity traders looked at the Saudi production cut announcement as a strong statement in support of the efforts by the cartel to shore up oil prices. That effort seemed to work last week. However, we found other information surrounding the Saudi statement as potentially more significant. A Saudi Arabian official indicated that after this production cut the country's oil output would stand at 8.5 million barrels per day (b/d), a reduction of one million b/d since last summer. That was when front-month oil futures reached their peak price of \$77.03. So output from Saudi Arabia is off one million b/d in addition to production cuts from other OPEC members, although there has clearly been some cheating by some members. In addition, there has been new oil supply coming to the market from non-OPEC countries, but the world continues to fight the decline in production caused by depletion of older fields.

It seems to us that maybe we are seeing a repeat of the mid 1980s

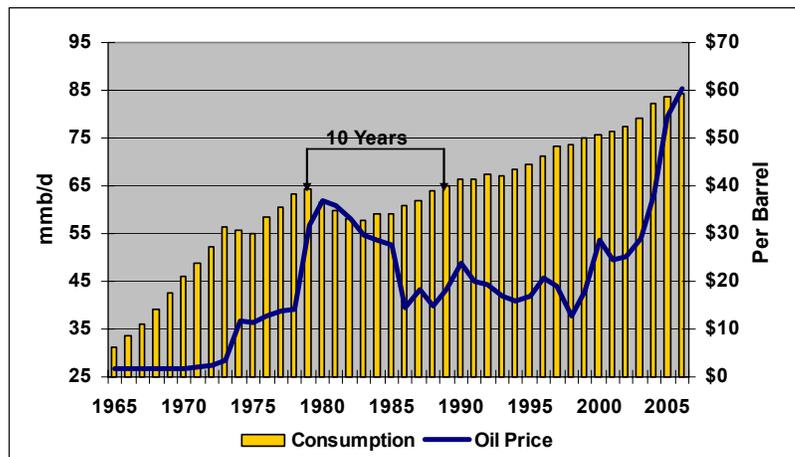
As a result of the even higher oil prices and the more efficient use of energy, global energy demand fell during the next four years

struggle that Saudi Arabia and OPEC went through, which ultimately led to the collapse in world oil prices in 1986. For those who don't remember, or need a brief refresher course on oil industry history in the late 1970s and 1980s, the rapid climb in world oil prices began in the mid 1970s driven by the Arab oil embargo of western countries that supported Israel in the Six Days' War. After several years with oil prices barely budging, they jumped again in 1979 following the Iranian seizure of American hostages at the U.S. Embassy in Tehran and ceasing to export their oil. The subsequent explosion in oil prices carried the world price to around \$40 per barrel and forced consumers to adapt and cut their energy consumption.

There had been a significant economic recession following the initial quadrupling in world oil prices that reduced industrial energy consumption, however it was relatively short-lived. A wave of more efficient automobiles and appliances plus energy-saving life-style changes began to arrive in 1979 just as the Iranian crisis boosted oil prices again. As a result of the even higher oil prices and the more efficient use of energy, global energy demand fell during the next four years before bottoming out in 1983.

While oil demand was falling, new oil production began arriving in response to the stepped up exploration and development efforts coming in response to higher oil prices. As prices started to weaken in 1983 in response to falling demand, Saudi Arabia tried valiantly to support OPEC's posted oil price by cutting production. When other OPEC members failed to heed the Saudi plea for more oil production cuts and global oil demand continued falling, the kingdom decided it was in its self-interest to reduce oil prices to ensure that the world did not give up its petroleum habit. Possessing the world's largest oil resources and being totally financially dependent on the industrialized world's oil consumption, Saudi Arabia correctly feared the possibility of a future world marked by low demand growth, or even worse, a world with significant non-oil energy alternatives.

Exhibit 1. Global Oil Consumption Fell in Early 1980s



Source: EIA, PPHB

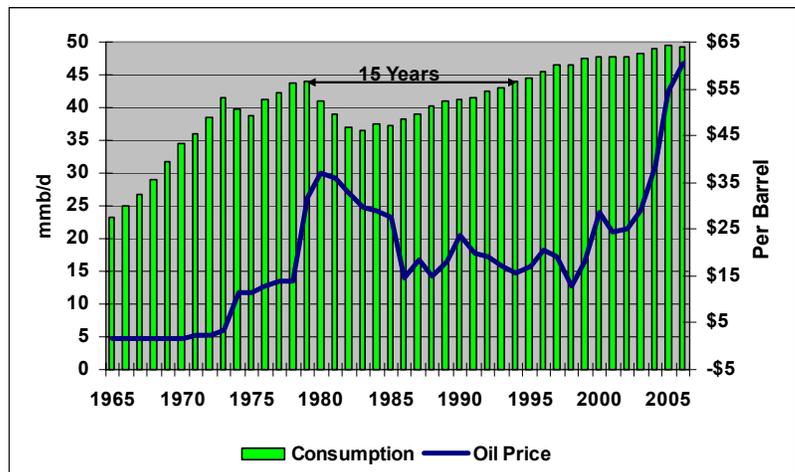
It was not until 1989, some ten years after the peak in oil consumption, that global oil demand exceeded the prior peak

The extended period of low oil prices, contributed to consumer back-sliding in their efforts to control their energy consumption

To fully understand this period, which not only contributed to the creation of radical Islam and almost totally destroyed the western world's oil patch industry, one merely needs to see how consumer life-style changes coupled with economic incentives to reduce energy consumption can impact the global energy supply/demand balance. In Exhibit 1, we show the world's oil consumption from 1965 to the present plotted against world oil prices. What you see is the steady rise in consumption in the late 1960s and early 1970s, the recession induced demand reduction in the mid 1970s, the subsequent recovery in demand and then the slow, but steady, demand growth following the bottoming of the decline in 1983. You will also notice that it was not until 1989, some ten years after the peak in oil consumption, that global oil demand exceeded the prior peak. At the same time, notice that world oil prices in 1986, measured in dollars of the day, had fallen more than in half from the peak in their climb that began with the 1973 embargo.

More telling in the analysis of this period is to look at the demand figures for the Organization for Economic Cooperation and Development (OECD), which includes almost all of the world's industrialized countries – the largest energy consumers. OECD consumption peaked in 1979. However, it took 15 years for these industrialized countries to collectively consume more oil than they did in 1979. Increased energy efficiency in automobiles, appliances, homes and manufacturing, coupled with altered life-styles, significantly changed energy consumption patterns in these countries. The extended period of low oil prices, lasting from the mid 1980s through the 1990s, both in current dollar and real dollar terms, contributed to consumer back-sliding in efforts to control their energy consumption.

Exhibit 2. OECD Demand Took 15 Years to Recover



Source: EIA, PPHB

We wonder if the Saudi Arabian situation today resembles that mid 1980s period. As we know, history seldom repeats itself, but the past often provides a path for understanding the present. In the

Saudi Arabia faces a dramatically expanded matrix of economic and geopolitical variables that may alter future consumption patterns

1980s, the petroleum industry was opening up huge new sources of oil supply and existing producing fields were still relatively young. Neither condition exists today. On the demand side, industrialized countries were little concerned about the impact of global warming, climate change, greenhouse gas emissions and energy security on their levels of energy consumption and the choices of fuels available. Today, Saudi Arabia faces a dramatically expanded matrix of economic and geopolitical variables that may alter future consumption patterns, making the Kingdom more concerned about its future given its economic dependency on crude oil.

Among some of the other changes the Saudi Arabian government needs to contemplate are the rise of Russia as an oil and gas producer and exporter – especially as it appears to be locking up the energy markets of Europe. Globally, natural gas is playing a much greater role in the world's energy supply mix. Major oil fields that have been the backbone of global supply for decades are in sharp decline and are not being replaced by new-field discoveries. The rise of radical Islam is forcing long-standing customers of Middle East oil to consider alternative suppliers and/or alternative fuels; neither option is good for oil-dependent economies.

New energy sources and increased energy efficiency arising from new technology will also alter the historic energy and economic growth equation

If societies embrace climate change concerns and restructure their economies to lower their consumption of hydrocarbons and especially petroleum products, the outlook for Middle Eastern oil and gas producing countries will change. New energy sources and increased energy efficiency arising from new technology will also alter the historic energy and economic growth equation. Which of these trends will have the greatest impact on energy markets of the future is virtually impossible to predict at the present time. The only safe assumption is that these trends will impact future energy markets. For Saudi Arabia, operating in this new energy world will be a challenge and there is no clear roadmap. Moreover, the country is in a transition phase as the older generation of rulers and technocrats pass from the scene to be replaced by younger, untested leaders.

Stock Market's January Effect Works for Oil, Too

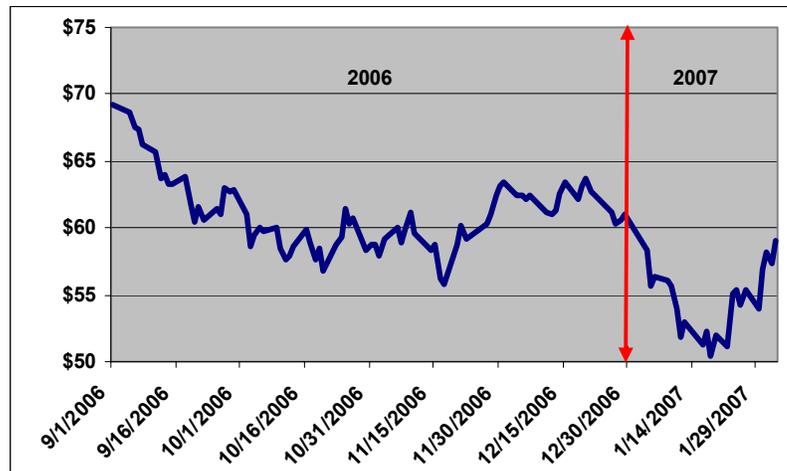
In the stock market, the January effect is the belief among investors that trading in the first month of the year sets the tone for the full year. That means if the stock market moves higher over the course of January, then the full year should see a market advance compared to the closing stock price of the prior year. Likewise, if prices move down in January, then investors can expect a down year for the major stock indices. According to the oil editor for the Dow Jones Newswire, this January effect also holds for crude oil futures traded on the NYMEX.

Dow Jones looked at the price direction of the front-month crude oil futures in January compared to the prior December and found that in 18 of the past 22 years, its movement signaled the trend in annual

With an 82% success record for this indicator, it would seem that global oil prices will remain flattish or decline for the balance of 2007

price moves. With an 82% success record for this indicator, it would seem that global oil prices will remain flattish or decline for the balance of 2007. While prices would be down from the \$66.22 per barrel record of 2006, crude oil prices around current levels (\$55-\$59) still should remain attractive for stimulating oil industry economic activity this year.

Exhibit 3. After Diving in January, Futures Have Rallied



Source: NYMEX, EIA, PPHB

Until Friday's closing front-month futures price of \$59.02 broke that prior high, we were at risk of possibly establishing a new pattern

The fall in oil prices in January created some interesting analysis. The NYMEX closing futures price on the first trading day of January was \$58.32. According to Dow Jones, never in the history of the NYMEX has the settlement price on the first day of the year been the high price for the entire year. Until Friday's closing front-month futures price of \$59.02 broke that prior high, we were at risk of possibly establishing a new pattern. Now that we have broken the old high, the question becomes whether the current high price might be the high for the year, or will oil futures trade above \$60 this year? Depending upon political events, they could trade substantially higher, but then again economic conditions could send them lower.

January 2007 was the first time since May 2005 that oil futures did not close above \$60 on any day of the month. The front-month crude oil futures price averaged \$54.35 for January. Reportedly, after dumping oil and other commodity investments, hedge funds and pension investors have begun to accumulate these investments once again, contributing to the sharp uptrend over recent days. As long as cold weather continues, we probably can expect continued investor interest in oil futures. Will that hold when cold weather yields to a warm spring?

CEOs Concerns – Global Warming is Only One

PricewaterhouseCoopers released a study at the World Economic Forum in Davos, Switzerland of the attitudes of corporate chief

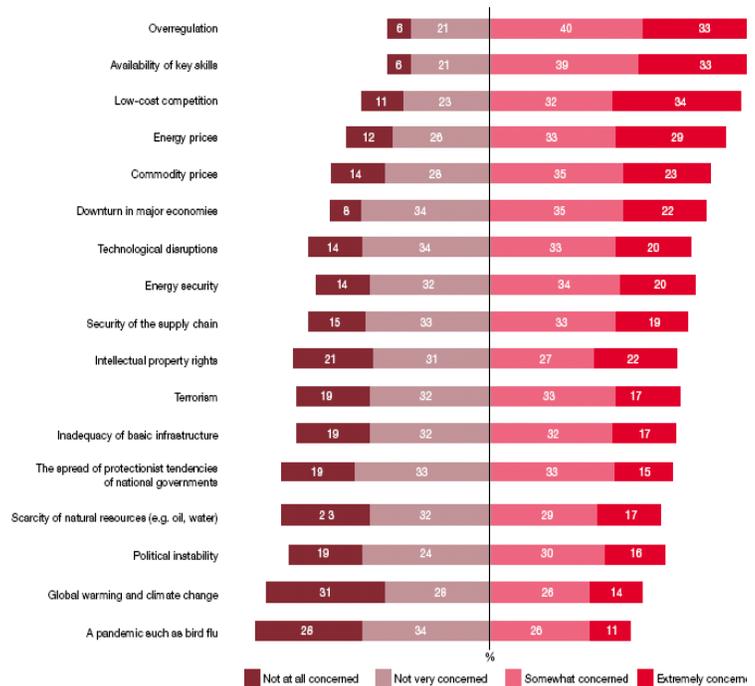
In the United States, CEOs are less concerned about global warming than the average of all executives surveyed

executive officers from around the world toward various business threats and concerns. One of the findings was that in the United States, CEOs are less concerned about global warming than the average of all executives surveyed. The CEOs most worried about the threat of global warming appear to be Asian-based.

The survey of 1,084 CEOs was conducted by Samuel A. DiPiazza, chief executive of PricewaterhouseCoopers, either in face-to-face meetings or by telephone during the period of last September to December. The survey queried the CEOs about their level of concern for 17 major business threats. The focus was on macro economic, political or societal issues that would, or could, impact the business the CEO is managing. The survey results for these 17 issues are presented in Exhibit 4, and show that overregulation is of greatest concern to these executives. Of least concern was the threat of a pandemic such as bird flu.

Exhibit 4. Global Issues that Worry Business Leaders

Serious concerns about business and macro threats indicate CEO optimism is not unbridled



Q: How concerned is your company about each of the following potential business threats? (Base 1,084)

Source: PricewaterhouseCoopers Global CEO Survey

Source: PricewaterhouseCoopers

Energy prices and energy security ranked much higher in executive concern than climate change

In reviewing the issues and the CEOs' level of concern, we were struck by the fact that energy prices and energy security ranked much higher in executive concern than climate change, which mirrors the results of some recent surveys of global social concerns. These results are intriguing given the recent move by a group of top U.S. CEOs to join with several environmental groups in pushing for

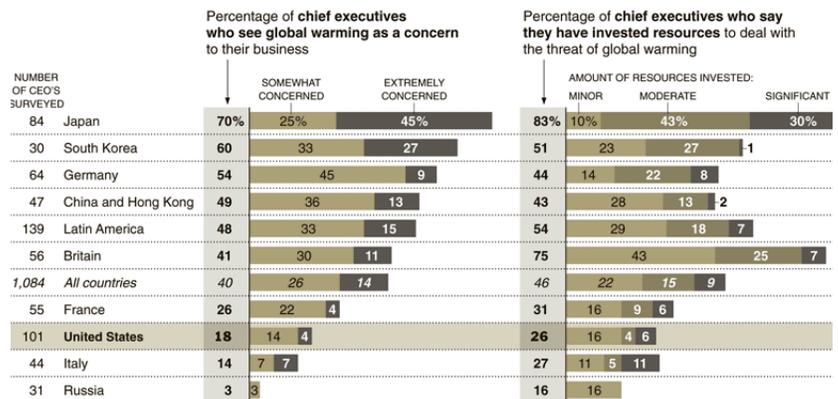
The energy and oilfield service companies are concerned with all three of the top ranked concerns in the survey

the federal government to move forward in creating a cap-and-trade system for carbon emissions. Maybe those executives are starting a bandwagon of support in hopes that they will be able to influence the shape and mechanics of the cap-and-trade system to the financial benefit of their respective companies. If true, then they are doing what good executives should be doing – positioning their company to maximize its future revenues and profits.

In reviewing the survey results, it was interesting to note that the second and third highest ranked issues of executive concern were availability of key skills (labor shortages) and low-cost competition (abundant and cheap labor). The energy and oilfield service companies are concerned with all three of the top ranked concerns in the survey.

Energy is considered so important to our economy and society that we place a substantial number of regulations on its production and use. The energy business, due to its highly cyclical and volatile nature, has lost significant skilled workers over the years. Now that the needs of the industry have increased the demand for skilled workers, they are no longer available, or are extremely costly to either attract back to the industry or to train new workers. Even though the energy business has survived by using its wits and intelligence, the skilled worker shortage may hinder the pace at which the industry can grow in the future.

Exhibit 5. CEOs Not Concerned About Global Warming In America, Global Warming Does Not Register



Source: PricewaterhouseCoopers

Source: PricewaterhouseCoopers, *The New York Times*

The New York

On the issue of global warming and climate change, 40% of the surveyed CEOs were either concerned or extremely concerned

On the issue of global warming and climate change, 40% of the surveyed CEOs were either concerned or extremely concerned. In the United States, only 18% of the CEOs felt that way. In *The New York Times* article discussing the survey's results, Mr. DiPiazza was quoted as saying, in response to the low concern ranking of U.S. CEOs on the global warming issue, "Maybe the North American C.E.O.'s will notice there is a lot more green outside than snow." Mr. DiPiazza was speaking from Davos and right before a large snowstorm arrived. But one might conclude that these executives

American CEOs were hesitant to say they were extremely concerned about any of the 17 business risks about which they were surveyed

are less concerned about global warming because they believe warm is better than cold and snow.

The article also pointed out that American CEOs were hesitant to say they were extremely concerned about any of the 17 business risks about which they were surveyed. The writer speculated that they took this position because otherwise they would demonstrate that they were not on top of the topic. We wonder if it was more to do with Sarbanes-Oxley. If he expresses extreme concern about a particular risk and it isn't clearly listed as a potential business risk in the company's SEC filings, the executive could be in big trouble. On the other hand, the survey showed that a majority of Japanese executives were extremely concerned about almost all of the issues. Quite possibly this reflects their more conservative nature.

It is becoming increasingly clear that the tipping point among the public on climate change happened during 2006

The results of the survey suggest that those proponents of the global warming and climate change issues and the need to immediately address them have a lot of work to do within the corporate world. It is becoming increasingly clear that the tipping point among the public on climate change and the future problems it may cause happened during 2006, or possibly after hurricanes Katrina and Rita in the fall of 2005. Regardless of when the tipping point was reached, or whether one believes in climate change or not, as an executive leading a corporation, to ignore this issue is a high risk business strategy.

How Many Legislators Does it Take to Change a Lightbulb Act

California last year became the first state to mandate cuts in greenhouse gas emissions

California Assemblyman Lloyd Levine (D-Van Nuys) was expected to introduce the "How Many Legislators Does it Take to Change a Lightbulb Act" last week, which would ban incandescent light bulbs in the state by 2012 in favor of compact fluorescent light bulbs (CFLs). The proposed legislation would further the state's pioneering environmental efforts to reduce greenhouse gas emissions. California, led by Republican Governor Arnold Schwarzenegger, last year became the first state to mandate cuts in greenhouse gas emissions, targeting a 25% reduction in total emissions by 2020.

CFLs use about 25% of the energy of conventional light bulbs

Assemblyman Levine commented that the light bulb was developed about 125 years ago and has undergone no major modifications since. As a result, these bulbs remain incredibly inefficient by only converting about 5% of the energy they receive into light. In contrast, CFLs use about 25% of the energy of conventional light bulbs. Furthermore, CFLs generate 70% less heat than incandescent lights.

About a fifth of the average U.S. home's electricity costs pays for lighting according to a spokeswoman from the U.S. Environmental Protection Agency (EPA), which recommends CFLs. A 20-watt CFL gives off as much light as a 75-watt incandescent bulb and lasts 13 times as long, according to the Rocky Mountain Institute, which

In 2005, about 100 million CFLs were sold in the United States, or about 5% of the 2-billion-lightbulb market

studies energy issues. California Energy Commission member Arthur Rosenfeld said an average home in California will save \$40 to \$50 per year if it replaces all incandescent bulbs with CFLs. This is not likely to happen quickly given the initial cost of CFLs. Many people remain convinced that the light given off by CFLs is not as good as that from incandescent bulbs and, given the significant cost differential between the two bulbs, they are reluctant to switch.

In California, Southern California Edison (SCE), one of the state's biggest utilities, runs a program that cuts the cost of a CFL by \$1 to \$2.50 per standard bulb. In the past year, the SCE program has helped consumers buy 6 million CFLs. In 2005, about 100 million CFLs were sold in the United States, or about 5% of the 2-billion-lightbulb market, according to the EPA. That number might double this year as Wal-Mart (WMT-NYSE) embarked on a sales promotion effort in November to sell 100 million CFLs at its stores.

The more remarkable thing about Wal-Mart is not just that it has embraced CFLs as the wave of the future, but to learn of the company's energy saving programs in managing its business. We recently heard Charles Zimmerman, Vice-President, Prototype & New Format Development for Wal-Mart speak about its corporate strategy in designing new stores and revamping older ones in order to cut energy consumption and greenhouse gas emissions. The presentation was, in our opinion, one of the most remarkable we have seen in quite some time. Mr. Zimmerman had given the same presentation a week earlier to the Department of Defense, the largest government consumer of power.

Wal-Mart is the largest single buyer of electricity in the world and alone consumes 1% of all the electricity produced in the United States

Wal-Mart is the largest single buyer of electricity in the world and alone consumes 1% of all the electricity produced in the United States. The company has been engaged in energy use management for over 20 years. It is attributed to the vision of Sam Walton, the company founder. He became convinced that store managers shouldn't be worrying about lights, heating and air conditioning and refrigeration operation, therefore, all these functions are controlled from the company's headquarters in Bentonville, Arkansas. This centralized control also forces management to focus on energy use and its cost. As Mr. Zimmerman put it: Wal-Mart's everyday low costs are what make its everyday low price guarantee work.

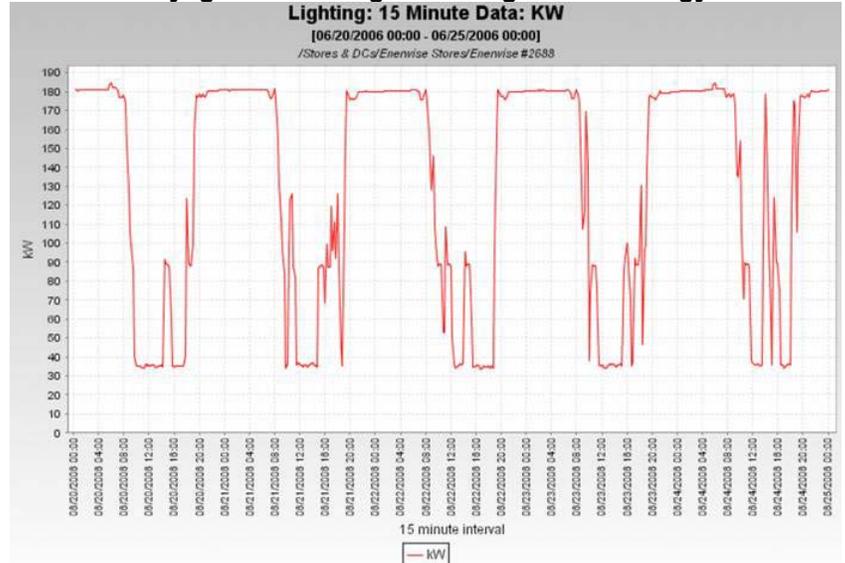
The company controls its energy use (and its cost) by constructing stores that are energy efficient

The company controls its energy use (and its cost) by constructing stores that are energy efficient. That means it uses techniques such as daylight harvesting to control lights, "cool" roofing to reduce heat buildup, heat reclamation to produce hot water and boost the temperature of outside air brought in for heating, high efficiency HVAC units, active de-humidification programs to enable stores to operate in the summer with temperatures two degrees higher than competitors, and exterior LED (light emitting diode) signage.

Mr. Zimmerman showed the audience a chart of the electricity consumption of one of Wal-Mart's stores in Tyler, Texas over a five

day span with usage readings every 15 minutes. As shown in Exhibit 6, the maximum power consumption occurs during evening hours as would be expected when the lights are fully on. However, if one looks closely at the top line, shortly before the power use drops, there is a small drop, which he explained was when the parking lot lights go off. When the power use is low, the sharp increases, and then fallbacks reflect summer thunderstorms that darkened the area and required an increase in lighting use.

Exhibit 6. Daylight Harvesting Saves Significant Energy



Source: Zimmerman presentation, Jan. 18, 2007, Wal-Mart

Cool roofs have been shown to save the store significant power consumption by repelling light and heat and enabling the company to save on electricity consumption. Wal-Mart also has found that the

Exhibit 7. White Cool Roofs Are a Wal-Mart Trademark



Source: Zimmerman presentation, Jan. 18, 2007, Wal-Mart

Mr. Zimmerman is very high on the future for LEDs

LEDs used in the store's signs outlast the effective life of the signs, meaning that the signs will be replaced before light bulbs need to be replaced. Mr. Zimmerman is very high on the future for LEDs. He commented on Wal-Mart's commitment to get consumers to buy CFL bulbs to save energy. He also talked about the amount of energy savings that come from the use of LEDs and how he expects not only that Wal-Mart will incorporate more of them in their stores in the future, but that customers will find more use for them in their homes.

Wal-Mart will begin testing this year to see whether adding doors to meat and dairy counters impacts customer buying decisions

The chairman of Wal-Mart has committed to 20% energy and greenhouse gas emission reduction in existing stores within seven years and a 25-30% reduction for new prototype stores within four years. By further improving the efficiency of some of its existing technologies, and adopting new techniques such as putting doors on all meat and dairy counters and using LED lights in them, the most recent prototype store opened last week in Oklahoma cut its energy use by 22%. Wal-Mart will begin testing this year to see whether adding doors to meat and dairy counters impacts customer buying decisions, something that the company does not have any feel for, yet. We expect that if their tests show a fall in sales due to the requirement to open a door on a meat or dairy counter, Wal-Mart will begin a major marketing effort to educate people about the impact the doors have on energy savings and the environment.

Wal-Mart's new carbon recycling program, to be initiated in all the company's stores, will ultimately offset the entire carbon footprint of its truck fleet, the world's largest

Wal-Mart has also been experimenting with varying the composition of the cement utilized in its newly constructed stores. Cement is one of the most energy intensive building materials used. By adding more fly ash to the mixture, thus reducing the volume of cement, less energy is required in the material needed to cover the same area as before. Wal-Mart has a testing facility where it lays sections of concrete floors using the different cement and fly-ash compositions to see how they perform over time.

Mr. Zimmerman was quite confident he would meet the new corporate energy-saving goals and well within the target time frames. He also was confident that Wal-Mart's new carbon recycling program to be initiated in all the company's stores will ultimately offset the entire carbon footprint of its truck fleet, the world's largest. Wal-Mart's truck fleet of 7,200 tractors and 14,000 trailers drives 900 million miles a year, so Mr. Zimmerman's statement reflects huge environmental savings.

As the climate change movement evolves, we expect to see more legislative initiatives such as the California light bulb act along with more energy and greenhouse gas emission programs undertaken by corporations. While these actions will all be good for the environment, most of them will slow energy demand growth, and even possibly reduce our total energy consumption. No one can predict the timing of these changes, but they are underway and are being driven by profit-hungry businessmen. Wal-Mart's dedication to these programs and demonstrating their profit impact, other companies will follow along. In fact, Wal-Mart shares all its energy-

saving techniques with the new store builders of its competitors, although the 5 am pour for the concrete floor test was skipped by everyone invited as it turned out to be too early. With efforts such as Wall-Mart's, we can look toward to a world with a different energy use profile from the past.

Pennsylvania Weather Forecaster's Fearless Forecast

Last Friday, Punxsutawney Phil, the famous weather forecasting Pennsylvania groundhog, was rudely pulled from his stump at Gobbler's Knob where he was hibernating for the winter to answer that burning question: When will winter end? Until recently, for most people involved in the energy industry, the question was: When would winter arrive?

Exhibit 8. Punxsutawney Phil Reading the Tea Leaves



Source: Accuweather.com

According to historians, Groundhog Day was a pagan observance, marking the mid-point between the winter and spring solstices

According to German folklore, when the groundhog emerges from hibernation if he sees his shadow there will be another six weeks of winter. On the other hand, if Phil doesn't see his shadow, spring will arrive sooner. According to historians, Groundhog Day was a pagan observance, marking the mid-point between the winter and spring solstices. At some point the observance merged with the Christian holiday of Candlemas that falls on February 2. With the merger with the holiday, the groundhog's hibernation role fit with the old Candlemas proverb: "If Candlemas be fair and bright, winter will have another fight. If Candlemas brings cloud and rain, winter won't come again."

On this Groundhog Day, a crowd of 15,000 visitors helped swell the 6,100 permanent population of Punxsutawney, Pennsylvania, 65 miles northeast of Pittsburgh, and with snow showers raining down old Phil failed to see his shadow. Phil's forecast signals energy markets that they may be confronting substantial oil and gas storage

Phil may not have been able to see his shadow last Friday because of the pall cast by the summary report of the Intergovernmental Panel on Climate Change of the United Nations

volumes by the end of winter. Groundhog Day turned out to be one of the coldest days experienced so far this winter season in the eastern United States. The wave of severe cold weather spread from the East Coast into the mid-Continent, Southeast and Southwest regions of the country. Current weather forecasts for this week call for even colder temperatures to descend on much of the United States, so some people are wondering how Phil can make the outrageous forecast that spring is just around the corner. Quite possibly Phil has been reading the long-term weather forecasts issued by WSI Corporation that calls for mild temperatures in the northwestern quarter of the U.S. for the February through April period.

The groundhog club that cares for Phil claims that since 1886 he, and his earlier cohorts, has seen his shadow 96 times, has not seen it 15 times and there are no records for nine years. Up until this Friday, Phil had seen his shadow for the prior six winters.

Phil may not have been able to see his shadow last Friday because of the pall cast by the release of the summary report of the Intergovernmental Panel on Climate Change of the United Nations that morning in Paris, France. The report claims that there is a 90% certainty that humans are the cause of the planet's global warming that is evident in the various studies reviewed by the committee. The authors of the report believe the time for debate over global warming is over and the time for immediate action has arrived. The committee believes that governments, and in particular the United States, must act to protect the global environment from the long-term ecological problems caused by increasing volumes of greenhouse gasses being emitted into the atmosphere from the burning of hydrocarbons.

As the debate over the global warming phenomenon has developed, some people even have noticed that Phil's forecasts are being influenced by the increased news coverage of the issue. Here is Phil's forecast for the balance of this winter.

"El Nino has caused high winds, heavy snow, ice and freezing temperatures in the west. Here in the East with much mild winter weather we have been blessed.

"Global warming has caused a great debate. This mild winter makes it seem just great.

"On this Groundhog Day we think of one thing. Will we have winter or will we have spring?

"On Gobbler's Knob I see no shadow today. I predict that early spring is on the way."

We have not had time yet to read the U.N. panel's summary report, so we will reserve comment and analysis until a future issue of

Musings. The only thing we are confident about is that the global warming and climate change debate will rage on, most likely increasing in intensity in the months ahead, and the pressure will grow for governments and businesses to act. What actions these institutions will take is unclear, but the actions taken will impact our future energy consumption, both the amount of energy and the mix of fuels producing it.

2007 will mark a year of increased uncertainty about all forecasts for the future

If you are not paying attention to the global warming and climate change movement, you are at risk of being blindsided by market changes. We are confident 2007 will mark a year of increased uncertainty about all forecasts for the future making it that much more difficult to plan for that future.

Clean Energy Investments More Than Double in 2006

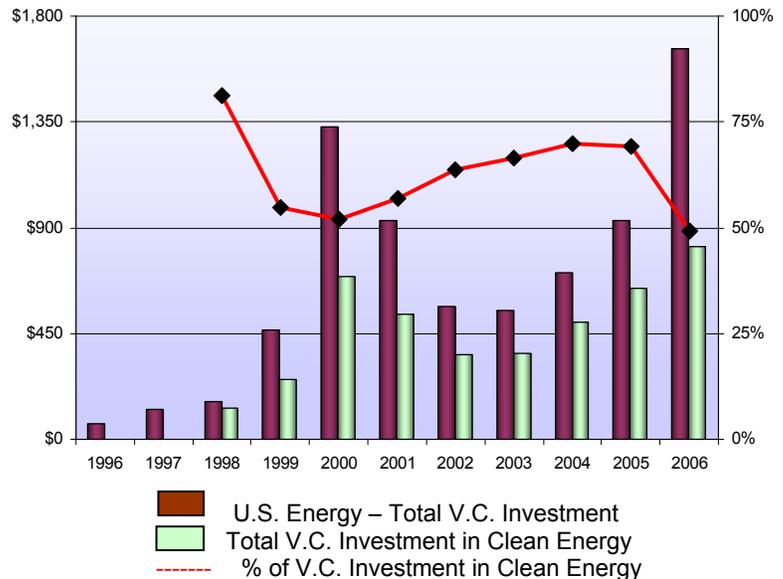
Clean energy investments increased from \$2.7 billion in 2005 to \$7.1 billion in 2006

Clean energy investments made by venture capital and private equity investors increased by 163% in 2006, according to an analysis conducted by New Energy Finance Limited. Clean energy investments increased from \$2.7 billion in 2005 to \$7.1 billion in 2006. The increase in investments was due to a surge in biofuel investments, which more than quadrupled, from \$647 million in 2005 to \$2.8 billion in 2006. Investments in solar energy more than tripled, while wind power investments more than doubled. Investments in other clean energy technologies – including energy efficiency, fuel cells, hydrogen, smart power distribution and carbon markets – grew by 74%.

The clean energy investment field is maturing

An important point made by New Energy Finance is that the clean energy investment field is maturing. They draw their conclusion based on the fact that more than half of the venture capital funding raised last year was third-round funding, also called “Series C” funding, compared with less than a third in 2005. This funding reflects the maturing nature of the investments because investors commit to third-round funding only in generally proven technologies that are at an advanced stage of commercialization. In addition, New Energy Finance observed that private equity investments in new assets and capacity expansions for clean energy companies more than tripled to \$3.5 billion last year. These investments generally go toward proven technologies with a solid business plan. Clean energy companies also raised \$1.9 billion through over-the-counter stock transactions and by selling their stock at a discount, known as “private investment in public equity” or PIPE.

Other data on clean energy investments confirm the trends observed by New Energy Finance. Data from Nth Power, presented at a Rice Alliance energy conference, show that after a surge in energy venture capital investing in 2000, of which more than half went into clean energy investments, the percentage of money directed to clean energy grew, even though the volume of venture capital investing declined.

Exhibit 9. Energy and Clean Energy VC Investments

Source: Nth Power, PPHB

Since the total amount of energy venture capital funding was so high in 2006, even though the clean energy percentage fell, the total dollar amount flowing into this category was at a record

Last year produced sharply different trends in both the amount of venture capital money going into energy, which surged to a new record, however, the percentage of money going into clean energy investments declined to the lowest level in a decade. Since the total amount of energy venture capital funding was so high in 2006, even though the clean energy percentage fell, the total dollar amount flowing into this category was at a record. This confirms the interest in energy by venture capital investors, but it also demonstrates how maturing clean energy technology may have diminished the attractiveness of clean energy projects for them.

However, we should expect more clean energy investments this year and in the future given the shift in the political winds. With President Bush pushing alternative energy as a partial solution to the country's energy security and "oil-addiction" problems, and the Democratic Congress rushing to "out green" the Administration, expect more federal subsidies and mandates supporting increased alternative energy development. With increasing federal support, venture and private equity investors will continue to seek out clean energy investments.

Hot Gas is Already Costing Consumers

Gasoline is often delivered to customers at substantially higher temperatures, which can have the effect of costing consumers billions of dollars a year

Amidst all the rhetoric about climate change, global warming and the warmest years on record, one thing I was not aware of was "hot gas" that is costing us money, but may have nothing to do with these concerns. The national standard temperature for delivering gasoline is 60 degrees Fahrenheit. But gasoline is often delivered to customers at substantially higher temperatures, which can have the

For every 10,000 gallons of fuel that a gasoline station sells at 90 degrees Fahrenheit, consumers are overcharged by \$432.90

effect of costing consumers billions of dollars a year.

At 60 degrees a gallon of gasoline measures 231 cubic inches and contains a certain amount of energy. But if the gallon of gasoline is heated to 90 degrees Fahrenheit, it expands to 235 cubic inches and contains a smaller amount of energy. While a less than 2% expansion in gasoline volume seems middling, for every 10,000 gallons of fuel that a gasoline station sells at 90 degrees Fahrenheit, consumers are overcharged by \$432.90 with gasoline prices in the \$2.50 per gallon range.

On the flip side, colder gas costs gasoline companies because they are delivering more energy for every gallon sold. In some cases, gasoline companies have protected themselves against this potential loss. For example, in Canada in 1990, the gasoline companies lobbied the government to pass laws to adjust for cold fuel. The U.S. military adjusts for the loss of energy due to hot gas in its fuel purchasing policies.

For U.S. consumers, the problem is that there are no laws or regulations prohibiting gasoline stations from selling hot gas as if it were at the 60-degree standard

For U.S. consumers, the problem is that there are no laws or regulations prohibiting gasoline stations from selling hot gas as if it were at the 60-degree standard. With U.S. consumers purchasing 384.7 million gallons of gasoline per day, the cost of hot gas is substantial. Unfortunately, without new regulations on gas distributors, there is little U.S. consumers can do to protect themselves. There are no federal regulations for gasoline dispensing temperature standards. Whatever interest in regulation there is has come from the states, with Hawaii in the forefront. That regulatory interest probably stems from the high cost of gasoline on the islands comprising the state.

The typical service station gasoline tank is buried about 12 feet below ground. At this depth, the temperature of the tank can remain constant for most of the year. For environmental reasons, modern underground storage tanks are double-lined to prevent leaks, but that also serves to make them underground thermoses and enables gasoline stations to keep the gasoline contained in them warmer longer. During summer months, gasoline can be delivered up to 40 degrees more than the standard. If global warming becomes a bigger issue, maybe someone will look at the issue of how hot our gasoline is becoming and what the cost is to consumers.

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