

## MUSINGS FROM THE OIL PATCH

February 10, 2015

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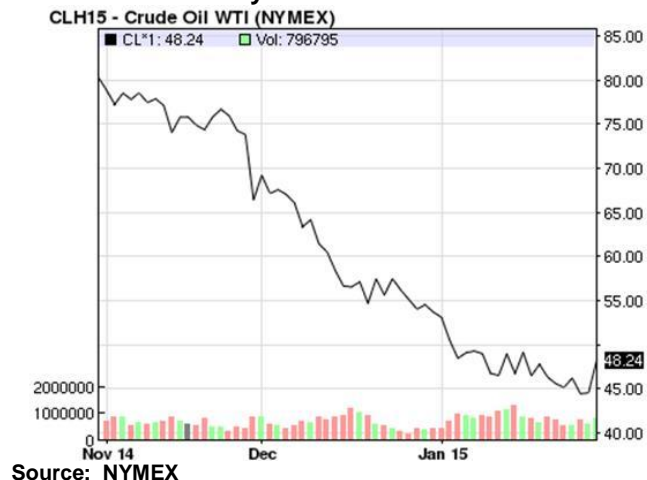
**Note:** *Musings from the Oil Patch* reflects an eclectic collection of stories and analyses dealing with issues and developments within the energy industry that I feel have potentially significant implications for executives operating and planning for the future. The newsletter is published every two weeks, but periodically events and travel may alter that schedule. As always, I welcome your comments and observations. Allen Brooks

### Does The Oil Price Bounce Signal A Bottom?

**Optimism is growing that the bottom for oil prices has been reached after the past week's market action**

Investors and industry participants are eagerly searching for the bottom in the global oil price decline that began last June and then accelerated at year-end and continued into early January. Optimism is growing that the bottom for oil prices has been reached after the past week's market action. In hindsight, we may look at the price action of Friday afternoon, January 30, as the turning point. Oil prices jumped as speculators and investors seized on the largest weekly decline in the Baker Hughes rig count, a fall of 94 oil-directed rigs, since the company began reporting detailed data in 1987. The 25-rig decline in the Permian Basin added further ammunition to the view that oil output growth would soon stop. Canada also experienced a meaningful rig count drop that week, a loss of 38 rigs or 9.5 % of the active rig count, further supporting the view of slowing North American oil output growth.

#### Exhibit 1. Has Rally Marked End Of Oil Price Collapse?



**In the stock market, oil and oilfield service stocks have all rallied in association with the rise in oil prices and the shift in attitudes about the direction for oil prices**

When the rig count drop was announced about 1 pm EST on January 30, crude oil futures prices jumped in response to high trading volumes. Until the jump, oil prices had been trading slightly higher. The price move and the volume increase can be seen in the top two charts within Exhibit 2. Last week, oil prices continued to rally and the rig count fell another 87 with oil rigs down by 85. Investors assume that the fall in the oil rig count is in direct response to oil company cuts to their 2015 capital spending plans. By drilling fewer new wells, oil output growth will stop climbing and soon start declining. In the stock market, oil and oilfield service stocks have all rallied in association with the rise in oil prices and the shift in attitudes about the direction for oil prices. Was this move in futures prices justified? Does the price spike truly reflect that a bottom has been reached in the relentless oil price decline?

**Exhibit 2. Oil Futures Jump On Rig Count Drop**



Source: NYMEX

**The month of January is thought by many to be named for Janus, the Roman god of beginnings and transitions**

The month of January is thought by many to be named for Janus, the Roman god of beginnings and transitions, but according to ancient Roman farmers' almanacs, the month is actually named for Juno, a Roman goddess - the protector and special counselor of the state. Juno was an important goddess. She was the daughter of Saturn and the sister, and also the wife, of Jupiter, along with being the mother of Mars and Vulcan.

The traditional representation of Janus has one face looking backward while another looks forward. That's a pretty good representation of how the stock market and commodity trading pits

**Exhibit 3. Statue Of Janus In Vatican Museum**

Source: Loudon Dodd

**Based on past patterns, the oil price spike suggests a market transition may have begun**

**The question is whether this view is sustained by near-term fundamental industry data**

**The short-covering traders likely outweighed the optimistic ones**

work. Both look to the past for trends and trading tendencies from historical data and then apply those patterns to project future price actions. Just as mutual funds are required to warn, past performance is not a guarantee of future performance. Based on past patterns, the oil price spike suggests a market transition may have begun. This transition is driven by a linkage between rig count declines and lower oil output. For the energy bulls, slowing oil supply growth will soon restore the balance between supply and demand, sending oil prices higher.

Whether or not one believes oil prices are heading back to the lofty heights of recent years, buying oil futures and the shares of companies that benefit from an eventual upturn in drilling and production becomes a reasonable bet – and that bet was fully embraced that Friday afternoon. The question is whether this view is sustained by near-term fundamental industry data.

What we cannot ignore is that the initial oil price spike was driven by the calendar. Friday, January 30, was the last trading day of the month, meaning that traders who wanted to lock in profits on their trades for the month needed to close them out. The huge volume of oil futures trades that afternoon likely reflected traders who had earlier bet on lower oil prices wanted to cover their short positions out of fear that the rig count drop would accelerate the end of oil supply growth. There also were some optimistic traders who wanted to speculate on a continued rise in oil futures prices. The short-covering traders likely outweighed the optimistic ones. Our conclusion comes from the fact that the oil futures contract spiked to a higher closing price and then fell back in after-market trading. (Exhibit 2.) The light volumes in after-market trading suggest the

**One of the most telling indicators about the industry’s health is oil inventory levels**

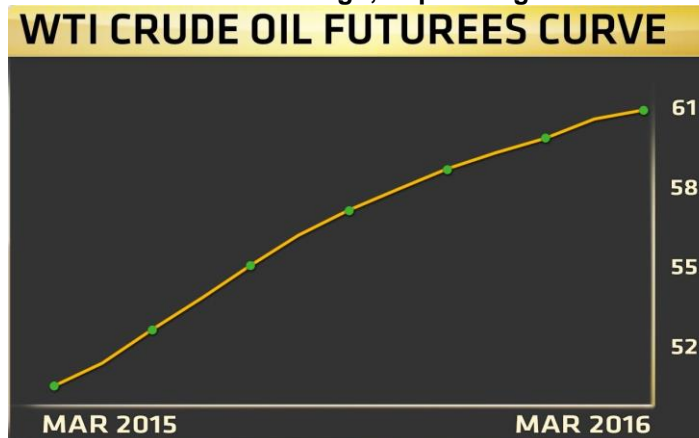
**The market is saying that it doesn’t want those volumes now and will actually pay you the higher price to cover the cost of storage**

optimists were not loading up on oil futures because they expected sharply higher prices in the immediate future, although it happened.

Have industry fundamentals changed sufficiently to support higher oil prices, or is the move just a rally in a bear market? To try to answer that question, we need to examine industry fundamentals. One of the most telling indicators about the industry’s health is oil inventory levels. If demand is sufficiently strong to push oil prices higher, refiners buy more oil. Their appetite is reflected in higher refinery throughputs and purchasing additional oil to put in storage for refining later. On the other hand, if demand is weak, they reduce their refinery utilization rates and buy only minimal oil volumes. Oil producers who mistime refiner needs are often forced to put their extra production into storage or try to sell it at a lower price to oil traders who are speculating on future price movements.

Speculators are motivated to buy those oil volumes when they can lock in a profit. They do that by agreeing to sell the oil at a future time and storing it until then. Their calculation becomes whether the price of oil in the future minus the price of oil today and the cost to store it provides sufficient profit to undertake the trade. When the futures price is higher than the current price, the market is saying that it doesn’t want those volumes now and will actually pay you the higher price to cover the cost of storage. The chart in Exhibit 4 as of the middle of last week demonstrates this phenomenon, which is referred to as contango.

**Exhibit 4. Oil Is In Contango, Depressing Oil Prices**



Source: CNBC

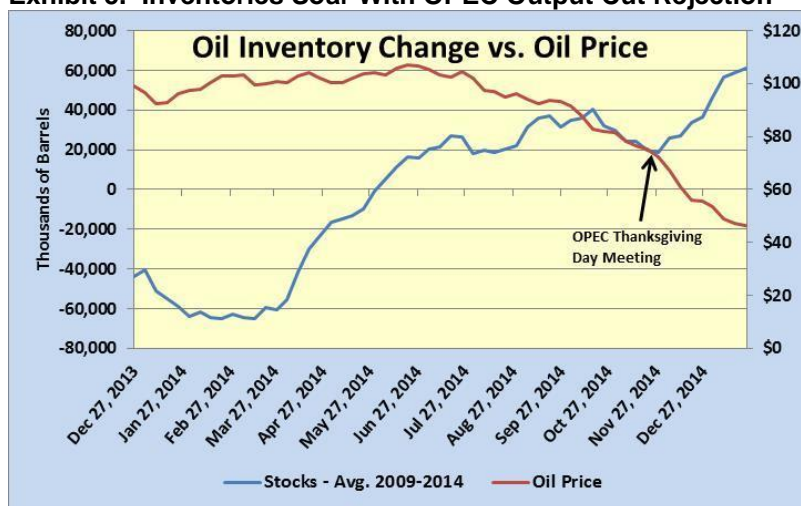
**Right now we are coming out of winter and preparing for summer**

A factor influencing the shape of the futures curve is where oil demand is seasonally with respect to demand. That will determine refinery utilization as their owners work to maximize output during strong demand periods such as summer, while minimizing it when demand is weak, such as during the winter. Right now we are coming out of winter and preparing for summer, which means that refiners must reconfigure their facilities to produce more

**Unless oil production drops sharply soon, inventories will grow, putting pressure on prices as available storage capacity shrinks**

gasoline for the summer driving season when demand is greater. During the turnaround times, refiners stop buying crude oil, which is what is happening right now. Thus, it is likely that crude oil inventories will continue growing as refinery utilization rates fall. Unless oil production drops sharply soon, inventories will grow, putting pressure on prices as available storage capacity shrinks. Oil prices need to drop to increase the spread between future and current prices in order to cover the cost of storage. Two charts demonstrate this situation.

**Exhibit 5. Inventories Soar With OPEC Output Cut Rejection**



Source: EIA, PPHB

**We assume part of the reason for oil inventories climbing at that time was refiners understanding that the trajectory for oil prices was down**

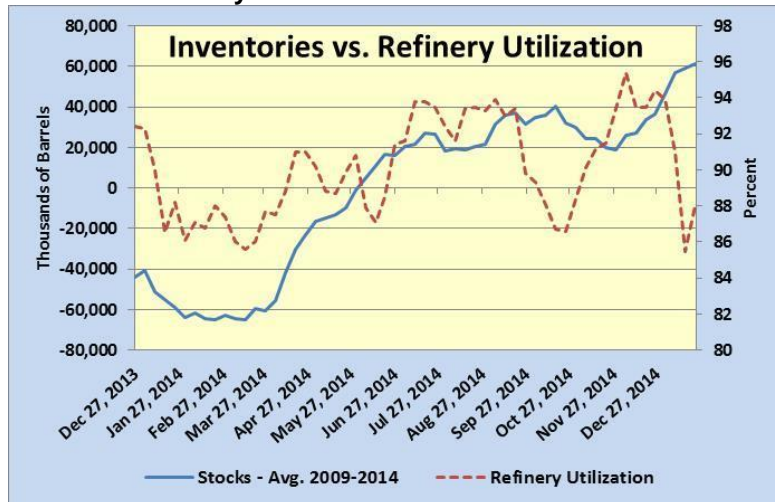
If we examine the change in domestic oil inventory volumes during 2014 and early January 2015 compared to the trend in oil prices, one can see a strong association between rising inventories and falling oil prices. (Exhibit 5.) We have calculated the weekly change in oil inventory levels by comparing them against the average of the five-years 2009-2014. Inventories grew unseasonably during last summer, but then the pace of growth slowed in the early weeks of fall until OPEC met on Thanksgiving Day and Saudi Arabia rejected the idea of a cut in its output to bolster oil prices. We assume part of the reason for oil inventories climbing at that time was refiners understanding that the trajectory for oil prices was down so they wanted to minimize the amount of high-cost oil they accumulated.

Another reason for the climb in oil inventories late last year and this January has been the seasonal decline in refinery utilization. With refinery turnarounds beginning, refiners stop buying crude oil ahead of turnaround start so they don't have to pay for the oil's storage. Shortly before the refinery restarts they begin buying crude oil to refill their supply chain and provide the initial volumes needed for restarting the refinery, meaning that initially their purchases are much larger than the refinery's output volume. Due to this seasonal pattern, over the next few weeks we anticipate oil inventories

**We've seen gasoline pump prices jump by 5-10 cents a gallon in the past week in Houston**

building before they start declining. Whether the upcoming upturn in refinery crude oil buying proves significant will depend on expected oil use, which given the recent sharp decline in oil prices should boost demand. What will the recent jump in oil prices do for the optimism of a demand rebound? We've seen gasoline pump prices jump by 5-10 cents a gallon in the past week in Houston.

**Exhibit 6. Refinery Utilization Has A Distinct Seasonal Pattern**



Source: EIA, PPHB

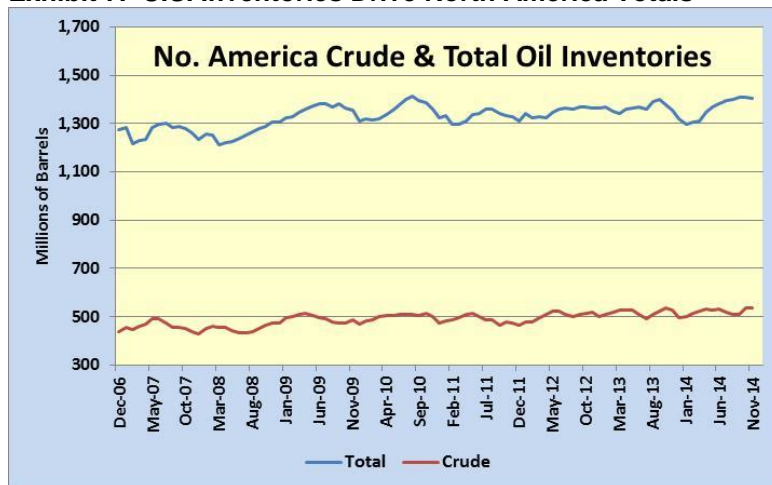
**Reportedly, oil traders have contracted 15 VLCCs to store crude oil offshore**

A problem for oil prices is that the tanks at major storage centers in the U.S. are filling up. Oil traders are already contracting tankers for storing oil offshore. While this is not happening in North America, the fact it is happening at all suggests that the international oil supply/demand balance is worsening, which will push global oil prices down and put increased downward pressure on America's West Texas Intermediate (WTI) oil price. Reportedly, oil traders have contracted 15 Very Large Crude Carriers (VLCCs) to store crude oil offshore. That number is considerably fewer than the 110 tankers contracted at the depth of the 2008-9 industry downturn.

**The Americas data represents a major component of OECD data**

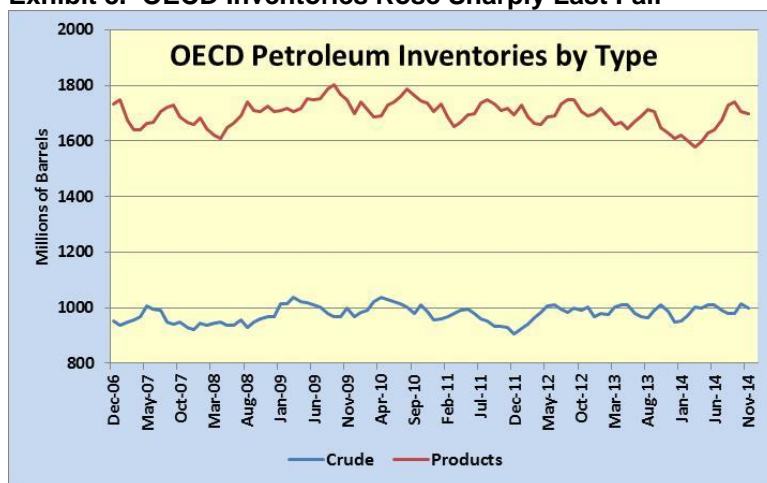
While tanker storage options are primarily international, it sent us looking at the trend in global oil inventories. We focused on the oil stocks data reported monthly by the International Energy Agency (IEA). Because of the magnitude of the data collection challenge, the IEA reports oil stocks and monthly changes by broad regions – the Americas, Europe and Pacific. It also reports data for the group of developed economies comprising the Organization for Economic Cooperation and Development (OECD). In order to understand inventory trends, we compared the Americas data to U.S. inventory data, confirming that it is the primary source of the storage volumes counted. The Americas data represents a major component of OECD data as shown by comparing the charts in Exhibit 7 and 8. What stands out is the similarity of the ups and downs between the two regions showing their inter-related nature.

Exhibit 7. U.S. Inventories Drive North America Totals



Source: IEA, PPHB

Exhibit 8. OECD Inventories Rose Sharply Last Fall

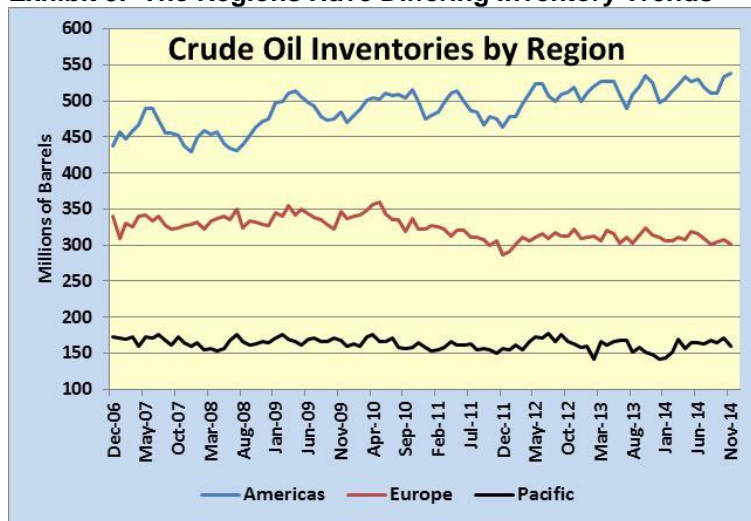


Source: IEA, PPHB

**What struck us was the level of Pacific crude oil inventories, which we assume reflects the absence of a significant refinery infrastructure**

We tracked the crude oil inventory data for the three major reporting areas. Exhibit 9 (next page) shows the increase over time for crude oil inventories in the Americas; a step down in the inventory volumes for Europe and a rise in inventories in the Pacific region. What struck us was the level of Pacific crude oil inventories, which we assume reflects the absence of a significant refinery infrastructure. Due to few refining centers in that region, substantial refined product volumes are shipped throughout the region. What is undeniable is that on a global basis crude oil inventories grew throughout last fall, which contributed to the downward pressure on global oil prices. It will be interesting seeing how the Pacific and Europe regions change when more recent data is released.

Exhibit 9. The Regions Have Differing Inventory Trends



Source: IEA, PPHB

**There is a lot about the rig decline that needs further study before we can opine on when domestic oil output growth ceases**

Returning to the U.S. market, the sharp rig count decline is tangible evidence of the realignment underway in the North American energy market. There is a lot about the rig decline that needs further study before we can opine on when domestic oil output growth ceases. Don't expect producers and oilfield service companies to quickly abandon their recently begun resizing moves. Those executives need greater clarity about the industry decline before they can focus on how it will recover. The oil price spike demonstrates just how badly people want to be optimistic. Unfortunately, the reality of growing oil inventories will weigh on the industry's near-term outlook.

## Natural Gas Market – Punxsutawney Phil To The Rescue?

**Phil said he saw his shadow, was heading back to bed and would re-appear in six weeks when spring would arrive**

February 2<sup>nd</sup> was Groundhog Day (again) and once again the leading weather prognosticator, Punxsutawney Phil, the resident groundhog, or woodchuck if you will, of Gobbler's Knob, a tiny hill in Punxsutawney, Pennsylvania, about 65 miles northeast of Pittsburgh, rendered his forecast. This year, despite rain that turned to snow and limited the crowd to about 11,000 anxious attendees, down about 4,000 from last year when there was better weather, Phil said he saw his shadow, was heading back to bed and would re-appear in six weeks when spring would arrive.

**Phil's handlers, all members of the Inner Circle, actually determine the forecast**

As noted in the photo below, Phil is not your good-looking television meteorologist, but like the TV personality, he too has a team of experts who help determine his forecast. Phil's handlers, all members of the Inner Circle, actually determine the forecast beforehand and announce it after they have pulled Phil from his comfortable lair. The members of the Inner Circle dress in formal wear, including top hats. This year, the Fair Weatherman of the Inner Circle, Jeff Lundy, read the official proclamation and published



**Exhibit 10. Your Unglamorous Weatherman**

Source: [www.zap2it.com](http://www.zap2it.com)

it on Twitter, showing just how modern this mammal has become. “Forecasts abound on the Internet, but, I, Punxsutawney Phil am still your best bet. Yes, a shadow I see, you can start to Twitter, hash tag: Six more weeks of winter!”

**The Inner Circle officials need to only draft one proclamation and establish one Twitter hash tag**

Just think how much easier the logistics are when the forecast is predetermined rather than being determined that morning as Phil is paraded around. The Inner Circle officials need to only draft one proclamation and establish one Twitter hash tag. Just think if they actually had to wait for Phil’s verdict. The Inner Circle would have to do what every sports apparel company does prior to championship or bowl games – print up two sets of tee shirts, each celebrating a different competitor.

**Not only were other groundhogs cantankerous in not agreeing with Phil, we also learned they can be dangerous to work with**

Unfortunately, this year at least, groundhog weather forecasts were not uniform. I guess they all didn’t get Phil’s memo calling for more winter weather. Not only were other groundhogs cantankerous in not agreeing with Phil, we also learned they can be dangerous to work with. Mayor Jonathan Freund of Sun Prairie, Wisconsin, where Jimmy the groundhog resides, is tasked with announcing the forecast. Jimmy is supposed to whisper it into his ear, but instead decided he was hungry after having slept so long so he took a bite of Mr. Freund’s ear. We’re not sure we ever learned Jimmy’s forecast.

In New York City, Mayor Bill de Blasio and dignitaries watched rather than held, Staten Island Chuck, who failed to see his shadow, suggesting an early spring. Last year, Mr. de Blasio had the unfortunate experience of dropping the then-Staten Island Chuck

**Exhibit 11. An Earlobe For Breakfast?**

Source: CBS TV

who died a couple of weeks later due to internal injuries, although zoo officials said he had suffered from another fall so they couldn't attribute his death to the mayor dropping him. (Sounds like a cover up to us.) So with conflicting weather forecasts, what's a natural gas man to do?

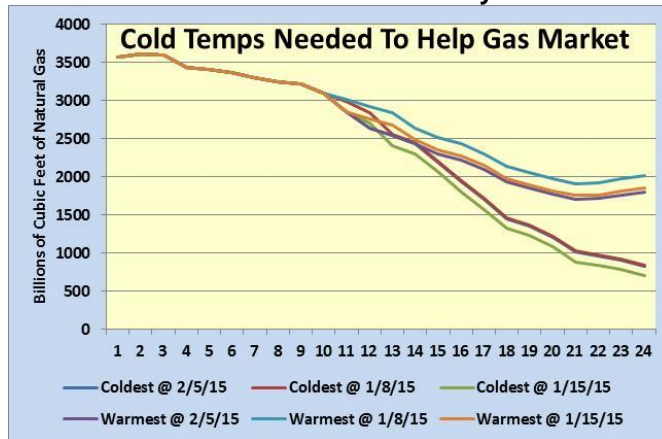
**Pray! That's what a natural gas man needs to do**

Pray! That's what a natural gas man needs to do because since the blast of Arctic cold air in mid-January, winter temperatures have failed to continue tracking the weekly cold weather experienced last winter although there have been some brief periods of cold weather. Even the current Arctic temperatures blasting the Midwest and Northeast have failed to move gas prices. Gas prices' failure to rise suggests that markets believe supplies will be adequate this winter. In Exhibit 12, we plotted two forecasts for the amount of natural gas to be left in storage at the end of winter assuming the remainder of this season mirrors one of two historical patterns for weekly withdrawals. The low forecast on the chart reflects the remainder of this winter following the withdrawal pattern of last year, which marked the coldest winter since 1994. The high forecast reflects a remaining winter withdrawal pattern similar to that experienced during the 2011 winter, which was the warmest in the past 20 years. The difference between the two forecasts is just shy of 1,000 billion cubic feet of gas (827 Bcf compared to 1,802 Bcf).

**The first few weeks of this winter's withdrawal season saw natural gas futures prices trading in excess of \$4/Mcf**

The first few weeks of this winter's withdrawal season saw natural gas futures prices trading in excess of \$4 per thousand cubic feet (Mcf) as optimism reigned that we would have a cold winter. However, the lack of early cold temperatures contributed to minimal weekly withdrawals convincing gas traders that there would be more than enough gas in storage to meet future cold snaps. As a result, gas prices slid steadily lower as the market awaited a serious cold wave to boost gas withdrawals. By the week ending January 9th, natural gas prices, as reported by the NYMEX, reached a then-

Exhibit 12. Coldest Forecast Probably Not Attainable

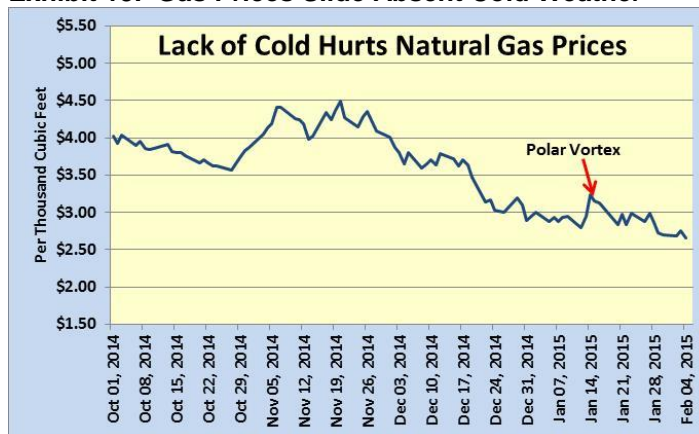


Source: EIA, PPHB

**When the cold temperatures moderated, gas prices quickly retreated, erasing all of the gains due to the cold weather and driving them down to \$2.64/Mcf**

season-low of \$2.95/Mcf. The following week an Arctic Vortex swept through the eastern half of the U.S. sending gas consumption soaring and producing a significant supply withdrawal. Correspondingly, natural gas futures prices jumped by 14-cents per Mcf, week to week, lifting them up to \$3.09/Mcf, although prices went considerably higher in the interim. When the cold temperatures moderated, gas prices quickly retreated, erasing all of the gains due to the cold weather and driving them down to \$2.64/Mcf.

Exhibit 13. Gas Prices Slide Absent Cold Weather



Source: EIA, PPHB

**For the first eight weeks of 2014, there were five weeks when gas withdrawals exceeded 200 billion cubic feet Bcf**

What is impressive in the price chart in Exhibit 13 is the jump in prices due to the Polar Vortex. Since then prices have steadily declined. The gas market's problem is that the pattern of cold weather experienced last February doesn't look likely to repeat this year. For the first eight weeks of 2014, there were five weeks when gas withdrawals exceeded 200 billion cubic feet (Bcf). During the first four weeks of this year, there were only two weeks with

**A more bearish forecast made recently by Bentek, an oil and gas consulting firm, calls for summer gas prices averaging about 30-cents/Mcf below the NYMEX strip prices, or at \$2.55-2.60/Mcf**

withdrawals greater than 200 Bcf. Therefore, we believe the likelihood gas storage volumes reach the lows predicted by our Coldest Forecast @ 2/5/15 is low. (Exhibit 12, prior page.) It is more likely that gas storage volumes end this winter much closer to our Warmest Forecast @ 2/5/15, or about 1700 Bcf of gas.

With winter storage levels targeted to finish the season at a high level and gas output continuing to grow, as demonstrated by the Energy Information Administration's Form 914 monthly surveys, available storage for next winter should fill quickly this summer limiting gas prices from rising appreciably. The 12-month forward strip of gas futures prices on the NYMEX as of February 3<sup>rd</sup> shows traders and investors anticipating gas prices during July-September to be in the \$2.85-2.90/Mcf range. A more bearish forecast made recently by Bentek, an oil and gas consulting firm, calls for summer gas prices averaging about 30-cents/Mcf below the NYMEX strip prices, or at \$2.55-2.60/Mcf. Where natural gas prices actually trade depends on temperatures during the balance of this winter, the pace of gas output growth over the next six months, increases in gas demand driven by higher industrial activity, higher gas consumption for generating electricity, and summer temperatures. Given all those variables, you just might want to head to Las Vegas to determine your gas price forecast.

## **We Hate Fossil Fuels, But We Love Wind, Like Germany**

**On the other hand, the Obama administration has played an important role with respect to wind and solar, albeit with a cost to the economy and for power users**

In President Obama's State of the Union address on January 20<sup>th</sup>, he said the following about energy: "We believed we could reduce our dependence on foreign oil and protect our planet at the same time. And today, America is number one in oil and gas. America is number one in wind power. Every three weeks, we bring as much solar power online as we did in all of 2008." The Obama administration did little to help the oil and gas industry reach number one. In fact, it was achieved in spite of the Obama administration's actions. On the other hand, the Obama administration has played an important role with respect to wind and solar, albeit with a cost to the economy and for power users. In energy, America seems to be treading the same path Germany has already traveled. We just hope the journey leads to a better outcome.

**With respect to the claim that America is number one in wind, it depends on whether the standard is wind generating capacity or electricity generated from wind**

Since the government has yet to release the monthly electricity data for last December, comparisons between 2014 and prior years requires using incomplete data or making adjustments to the comparisons. With respect to the claim that America is number one in wind, it depends on whether the standard is wind generating capacity or electricity generated from wind. In the case of the former measure, between 2008 and September 2014, the United States increased its wind generating capacity from 25,410 megawatts (MW) to 62,300 MW. This growth was driven by the federal production tax credit even though it expired at the end of 2014 for projects not under construction by then. The existence of wind farms under

**China had the capacity to generate 91,412 MW of wind power**

construction at year-end 2014 means the nation's total wind generating capacity will continue growing, but not at the same growth rate when it was driven by the tax incentive. Globally as of 2013, according to The Global Wind Energy Council, China had the capacity to generate 91,412 MW of wind power. Since then, China has outpaced the United States with respect to new wind-power generating capacity additions, meaning that the gap between the two countries has likely widened.

**The amount of electricity produced from wind turbines was currently greater in the United States than in China**

America can claim the number one ranking in wind power if the measurement is the amount of electricity produced from the nation's wind turbines. A January 15, 2015, report from the American Wind Energy Association stated that the amount of electricity produced from wind turbines was currently greater in the United States than in China and that has been the case since 2008. According to the report, in 2013, the United States generated 167 billion kilowatt-hours of electricity from wind while China only generated 138 billion kilowatt-hours.

**U.S. electricity production reached a peak in 2007**

U.S. electricity production reached a peak in 2007 when the nation's power plants generated 4,156,745 million kilowatt-hours (kWh) of power. Every year since then the nation's electricity generation has been lower, with the lowest point in recent years being experienced in 2009 during the economic recession as a result of the 2008 financial crisis. Electricity generation data is only available through November, however, on a year-to-date basis, power generation in 2014 is 1.2% higher than in 2013. Using a rolling 12-month comparison, 2014's gain is about 1.5%. For the past three months – September to November – electricity generation was only up in November, and then by only 1.1%. The other two months showed year-over-year declines. In order for all of 2014's electricity generation to match 2013's total, December's kilowatt-hours generated would need to increase more than 16% over last year.

**Wind-generated electricity grew from 34,450 million kWh in 2007 to 167,665 million kWh in 2013, an increase of 133,215 million kWh, or a 258% increase**

When we consider the amount of power generated by specific fuels, the achievements of wind and solar generation look impressive. Wind-generated electricity grew from 34,450 million kWh in 2007 to 167,665 million kWh in 2013, an increase of 133,215 million kWh, or a 258% increase. Looked at on the basis of year-to-date generation, 2014's wind power generation has increased by 13,480 kWh over 2013, or a gain of 8.8%. The comparison on a rolling 12-month basis shows an almost identical increase as in the year-to-date measure; a gain of 13,056 kWh or a 7.8% increase. It is difficult to know what might have happened last December as in 2013 the month's output declined compared to the prior month, while in 2013 it actually increased by a healthy amount.

For solar, the other principle beneficiary of power mandates and tax subsidies, its electricity generation results grew from 612 million kWh in 2007 to 9,252 kWh in 2013, or by a multiple of 15 times. Year-to-date in 2014, solar-generated electricity reached 17,361

**Between 2007 and 2013, coal-generated electricity declined by 430,458 million kWh, or 21.3%**

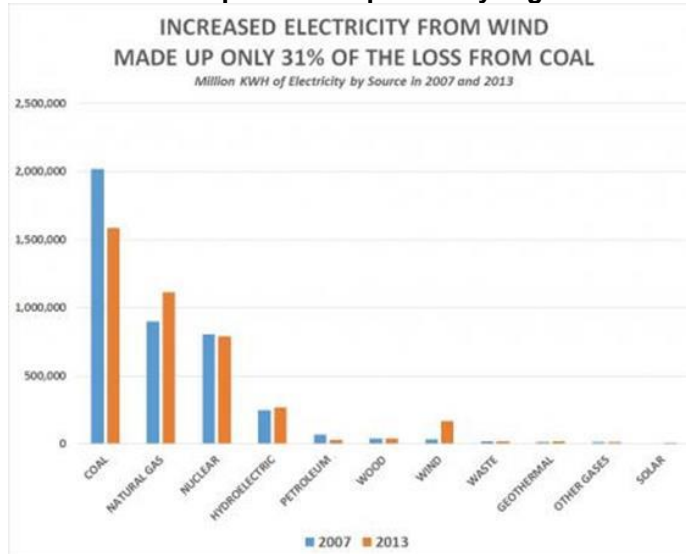
**The 133,215 million kWh of additional wind-generated electricity in 2013 made up for only about 31% of the lost coal-generated electricity**

kWh. Despite the spectacular growth of solar-generated electricity between 2007 and 2013, in the most recent year solar power only accounted for 0.23% of the nation's total electricity!

One of the more interesting comparisons, given the Obama administration's efforts to shut down coal-fired power plants, is to examine how well the nation is doing with its policy of substituting renewable-generated electricity for coal-generated power. Between 2007 and 2013, coal-generated electricity dropped from 2,016,456 million kWh to 1,585,998 million kWh, or a decline of 430,458 million kWh, or 21.3%.

As we pointed out above, wind-generated electricity increased 258% between 2007 and 2013. The 133,215 million kWh of additional wind-generated electricity in 2013 made up for only about 31% of the 430,458 million kWh in lost coal-generated electricity. (Exhibit 14.) If we look at the gain in solar-generated electricity between 2007 and 2013, the additional 8,640 million kWh accounted for only about 1/50<sup>th</sup> of the loss in coal-generated electricity.

**Exhibit 14. Cheap Power Replaced By High-Cost Power**



Source: CNS News

**One region receiving a high-level of attention is offshore the East Coast**

In furtherance of the wind power push, the administration has been working to expand wind-favorable regions for development. One region receiving a high-level of attention is offshore the East Coast. Despite the push to develop offshore wind power as a way to reduce greenhouse gas emissions, in the early 2000's, the governors of several of the East Coast states made it an objective as they foresaw the opportunity to build a new industry that would employ thousands of the residents. Rhode Island and Massachusetts led the way, but other states such as Maryland, New Jersey and even Virginia were angling for a piece of the action. To date, there are no

**The power companies should be happy to be free of 15-year power purchase agreements with a starting price of 18.7 cents/kWh and a guaranteed 3.5% annual increase**

U.S. offshore wind farms in operation, or even under construction, although one to be located near Block Island in Rhode Island state waters is preparing to start construction this spring having received all its local, state and federal permits and secured financing for the project. The next most likely project to move forward could be the Cape Wind farm to be located in Nantucket Sound south of Cape Cod and between Nantucket Island and Martha's Vineyard. Its problem is that it failed to secure financing for the project before year-end so the two utilities who had agreed to purchase the power canceled their contracts. Cape Wind still believes its leases are valid and its project's economics are solid, but the power companies should be happy to be free of 15-year power purchase agreements with a starting price of 18.7 cents/kWh and a guaranteed 3.5% annual increase. The starting price is nearly twice the nationwide cost of electric power. There are potentially three other offshore projects in various stages of development in Texas, Oregon and Hawaii.

#### **Exhibit 15. Cape Wind Lies Between Islands And Cape Cod**

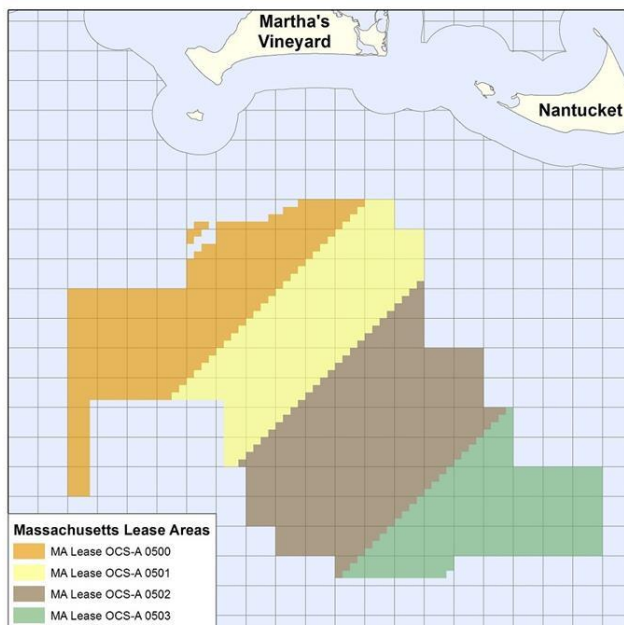


Source: *Wikipedia*

**To demonstrate the challenge offshore wind is having, 12 companies qualified to bid but only two submitted bids**

In late January, the Bureau of Ocean Energy and Management (BOEM) held the fourth federal offshore lease sale for renewable energy. The sale targeted acreage in federal waters off the coast of Massachusetts. To demonstrate the challenge offshore wind is having, 12 companies qualified to bid but only two submitted bids. Although the four leases were in the heart of some of the windiest areas of the U.S., they are further south of Martha's Vineyard and Nantucket Island and in deeper water than the Cape Wind project located to the north of the islands, meaning that development and operating costs will be considerably greater. Two of the leases attracted no interest and of the remaining leases, each bidder purchased one lease. The total of the high bids accepted was \$448,171.

**Exhibit 16. Massachusetts Offshore Wind Leases**



Source: BOEM

**Positive spin from the government: “We are working hard to set up an offshore wind industry in the United States, and so I am very encouraged by the fact that two experienced wind developers have chosen to bid.”**

**Wind power, along with solar and other forms of renewable energy, is heavily subsidized through tax credits**

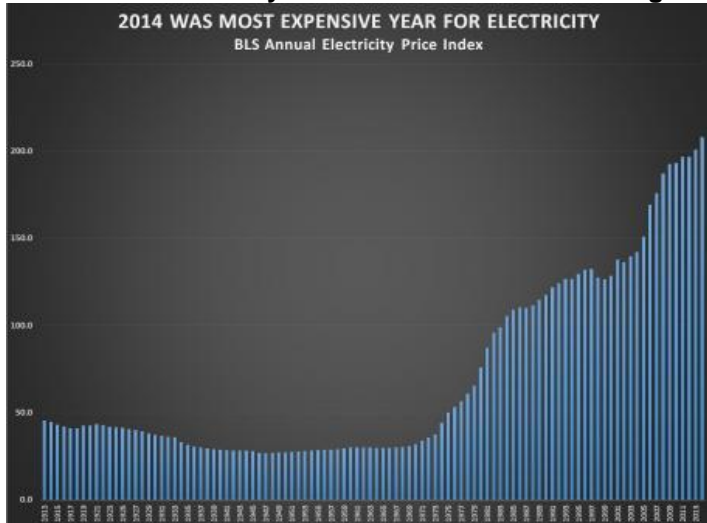
Including the recent sale, the government has raised a total of \$14.5 million in high bids for more than 700,000 acres leased for renewable power projects. In the Gulf of Mexico, individual oil and gas leases often received high bids in excess of the entire renewable leases won at auction yet for less than 1% of the amount of wind acreage leased. What was interesting about the Massachusetts lease sale was the positive spin put on the results by the federal government. According to Abigail Ross Hopper, director of the Bureau of Ocean Energy Management, in a conference call with reporters following the sale, “We are happy with the results of this auction. We are working hard to set up an offshore wind industry in the United States, and so I am very encouraged by the fact that two experienced wind developers have chosen to bid.” Of course one wonders where were the rest of the developers? Most of them were pursuing onshore wind farm projects.

So while America has the number one position in terms of electric power generated from wind, the question is at what cost? Wind power, along with solar and other forms of renewable energy, is heavily subsidized through tax credits and payments while states mandate increased use of this expensive power as a way to minimize the damage to the nation’s air quality and economy from climate change caused by increased greenhouse gas emissions released from the burning of fossil fuels.

The efforts to mandate increased use of renewable fuels for generating electricity while at the same time pushing to shut down



**Exhibit 17. Electricity Prices Continue To Climb Higher**



Source: CNS News

low-cost power sources such as coal-fired and nuclear power plants have led to electricity prices soaring to all-time highs. The Bureau of Labor Statistics, that publishes the Consumer Price Index, reported that the annual electricity price index for 2014 reached a record high of 208.020, up from 200.750 in 2013. The seasonally-adjusted December electricity price index reached 210.151, setting an all-time record for the index. The previous record was March 2014 when the index was 209.341. The December 2013 index was 203.740.

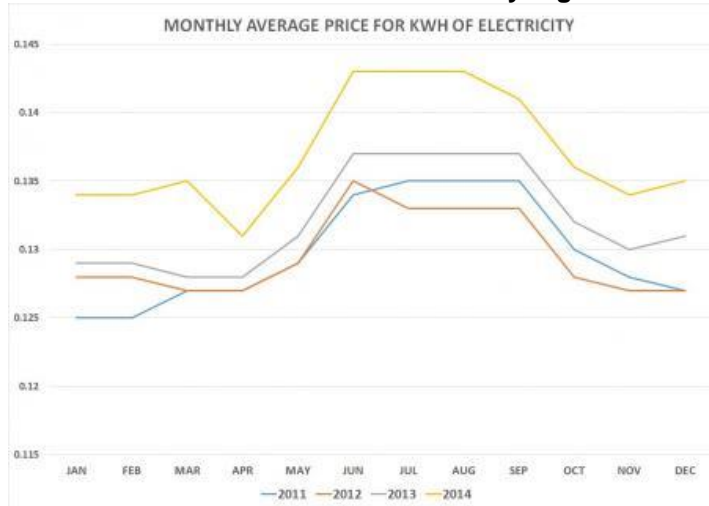
**The average price of a kWh of electricity in June, July and August was 14.3 cents, which set an all-time high for any of those months on record**

In December, the average price for a kWh of electricity in the United States was 13.5 cents. That is the highest average price for a kWh of electricity in the month of December since the BLS began recording monthly price data in 1978. In December 2013, the average price for a kWh was 13.1 cents. Typically, electricity prices peak during summer months and bottom in the winter. According to the BLS data, each month of 2014 recorded a record high for that particular month. The average price of a kWh of electricity in June, July and August was 14.3 cents, which set an all-time high for any of those months on record.

**Given commodity price trends, one must assume the major culprit in the rise in electric power prices is the cost of power generated by renewable energy**

The rise in electricity costs comes at a time when oil prices are falling, natural gas prices remain depressed and low-priced coal is fighting low natural gas prices in an attempt to gain increased market share in the electric power generation market. Given commodity price trends, one must assume the major culprit in the rise in electric power prices is the cost of power generated by renewable energy. This should not be a surprise to students of energy markets, and especially the power sector, as conditions in Germany provide a road map for this cost explosion.

**Exhibit 18. 2014 Had Numerous Monthly Highs For Power**



Source: CNS News

**That law created the legal framework for rapid growth such that by 2011, 21% of the country’s electricity generation came from renewable sources, including hydroelectric, onshore wind, biomass and solar power**

**The lack of flexibility in the system allowed smart developers to seize opportunities to build new projects whether they were economic or not**

Briefly, the growth in renewable power in Germany is rooted in the post-World War II environment when it was thought that the next war, like the prior two, would be fought in Germany. There was a deep mistrust of nuclear power that was further fueled by the 1986 Chernobyl disaster that dusted areas of the German countryside with nuclear material. In response, the Green Party emerged and through various coalitions in state and federal governments steadily gained power, all the while lobbying against nuclear power. Its rise led to the passage of the German Renewable Energy Act of 2000. That law created the legal framework for rapid growth such that by 2011, 21% of the country’s electricity generation came from renewable sources, including hydroelectric, onshore wind, biomass and solar power. In 2011, when Japan’s Fukushima nuclear disaster hit, German Chancellor Angela Merkel moved quickly to close down the country’s eight oldest nuclear power plants of the 17 in Germany and pledged to be nuclear-free by 2020. The state also promised to support the renewables industry until it was profitable.

The commitment to growing renewable power further aggravated problems that had begun to emerge as a result of the 2000 Act. That law established feed-in tariffs for renewable power while electing to ignore market forces. It established financial support that guaranteed profits for renewable projects. The lack of flexibility in the system allowed smart developers to seize opportunities to build new projects whether they were economic or not. As a result, Germany saw its solar generating capacity rising from 2,000 MW in 2008, about equal to the nation’s wind-generating capacity, to 7,000 MW in 2010 while wind capacity remained static. For the Sahara this policy would be sensible, but for sun-challenged Germany it has led to significant inefficiencies and high costs in the power market.

**The consumer has been hit with a levy escalating from about 2 cents/kWh in 2010 to nearly 7 cents/kWh last year**

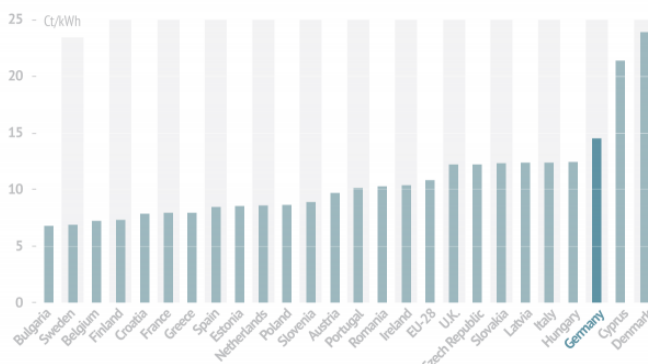
**If you are not on this list of protected industries, you are facing the third highest power cost in Europe behind Denmark and Cyprus**

The cost of the feed-in tariff to date is estimated at about \$400 billion with estimates that it may ultimately double by 2020. The structure of the tariff calls for the consumer to bear the brunt of its cost. The tariff subsidy has steadily risen as renewable production has grown, meaning that the consumer has been hit with a levy escalating from about 2 cents/kWh in 2010 to nearly 7 cents/kWh last year.

The tariff is structured to protect many of Germany's heavy industries such as the paper, aluminum, steel and cement sectors, which comprise about 40% of total energy consumption. If you are not on this list of protected industries, you are facing the third highest power cost in Europe behind Denmark and Cyprus. A German government-commissioned study in 2014 found that a typical medium-sized company in Germany pays about 10.5 cents/kWh while an equivalent company in Texas pays about half that amount. Is it any wonder why more German companies are moving operations to the United States in search of more affordable costs and stronger business conditions?

**Exhibit 19. Germany Is Third Most Expensive Country**

**EUROPEAN INDUSTRY POWER PRICE  
(CONSUMPTION OF 70-150 GIGAWATT HOURS) IN 2013**



Source: Eurostat

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Source: Stratfor

**A partial explanation for Germany's economic struggles is the country's energy policy that has created an explosion in electricity costs in recent years**

While Mr. Obama can claim America is number one in wind power, the achievement is coming with a high price tag. Mr. Obama and his policymakers should examine Germany, who has recently slipped into deflation, a condition they have not experienced since 2009. Part of the country's problems stem from the sharp fall in oil prices, but overall Germany's core inflation has remained low largely due to the weak economies of its European trading partners that account for 55% of Germany's trade. A partial explanation for Germany's economic struggles is the country's energy policy that has created an explosion in electricity costs in recent years. The cost of its energy policy has also limited Germany's government from aggressively stimulating its economy. The German situation should be closely examined by the Obama administration as our rising power costs are driven by an aggressive environmental regime and

the burdens it levies on our low-cost energy supplies. Fortunately, the U.S. has many economic and natural resource strengths, but rapidly rising power costs could be our undoing just as they are in Germany.

## Falling Rig Count Gives Hope For Oil Industry Recovery

**The speed with which the rig count is dropping has encouraged forecasters to translate the decline into an immediate fall in oil output**

**The angle of this oil rig decline is sharper than occurred in the 2008-2009**

Another week and another huge drop in the Baker Hughes oil-directed drilling rig count. The speed with which the rig count is dropping has encouraged forecasters to translate the decline into an immediate fall in oil output. The focus of analysts has been on the oil rig decline since the world is absorbed with determining when either Saudi Arabia cuts its production to boost global oil prices from current levels or the American shale industry cuts back drilling sufficiently that the natural decline rate of shale wells eliminates the existing oil surplus.

The chart of the count of active oil drilling rigs since the turn of the century shows an almost vertical decline in recent weeks. The angle of this oil rig decline is sharper than occurred in the 2008-2009. On the surface, this picture would support the view of a rapid decline in new oil production. Below the surface there may be some variances in the pace of decline of the various drilling rig types that could moderate the optimism of a quick production reaction.

**Exhibit 20. Oil Rig Count Decline Sharper Than 2008**



Source: *Business Insider*

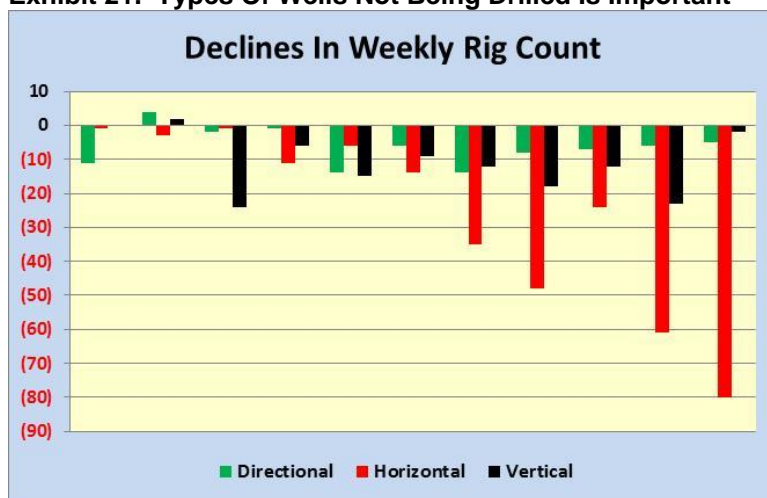
In Exhibit 21 we plotted the change in the weekly rig count since Thanksgiving by whether the rigs were drilling directional, horizontal or vertical wells. In the first couple of weeks, there seemed to be little or no reaction to the start of the collapse of oil prices following the Thanksgiving Day meeting of the Organization of Petroleum Exporting Countries (OPEC) at which the members agreed to

**Finally, the rigs drilling horizontal wells started falling rapidly**

sustain the organization’s 30-million-barrel a day production level. The announcement of that decision caused one of the largest one-day drops in global oil prices and started the industry on the slide into its current recession.

When the rig count started to reflect decisions by producers in response to the fall in oil prices, we see all types of rigs shutting down, although directional wells seemed to be leading the pace. Slowly the pace of decline of rigs drilling vertical wells accelerated. Finally, the rigs drilling horizontal wells started falling rapidly, although there were certainly more of them at work initially.

**Exhibit 21. Types Of Wells Not Being Drilled Is Important**



Source: Baker Hughes, PPHB

**Between November 26, 2014, and last week, the industry lost rigs drilling 59 directional wells, 283 horizontal wells and 119 vertical wells**

Between November 26, 2014, and last week, the industry lost rigs drilling 59 directional wells, 283 horizontal wells and 119 vertical wells. On a percentage basis, the declines were 30.4%, 20.6% and 33.8%, respectively. What we take away from these figures is that we are on the cusp of the decline in oil production growth. Vertical rigs are often used to deep the top section of horizontal wells with the main portion drilled by larger rigs (horizontal). Efforts to improve drilling efficiencies and lower well costs have led to this rig specialization. The recent pattern in the rig declines suggests that pad drilling is only beginning to be impacted, which is good news for the optimists who believe this will be a short industry downturn.

**Oil rigs will continue to fall until the industry has shut down enough rigs to truly impact oil production growth, and unfortunately that may take a while**

So far, the industry has laid down 461 rigs since Thanksgiving Day week. Oil rigs will continue to fall until the industry has shut down enough rigs to truly impact oil production growth, and unfortunately that may take a while. We would not be surprised to see another 300+ rigs shut down before production starts to slow. We will continue to watch the nature of the wells being drilled. We also need to examine where the rigs are falling to further gauge how fast oil production may fall and oil prices respond.

## ***Financial Post* Article: “EPA Report Gives Obama KXL Cover”**

**The arrival of the EPA’s letter was about as dramatic as the extra point try in the National Football League**

Waiting to the last minute, the Environmental Protection Agency (EPA) weighed in with its comments on the Department of State’s final Supplemental Environmental Impact Statement (SEIS) for the Keystone XL pipeline permit application. The DOS had given the eight governmental agencies that had any review rights in the determination of whether the pipeline is in the “national interest,” which is the determination of whether or not to approve the permit to construct the pipeline, until February 2<sup>nd</sup> to offer their comments. The arrival of the EPA’s letter was about as dramatic as the extra point try in the National Football League.

**There was no drama to its arrival, but we were amused by the contents of the letter**

The headline on the front page of the *Financial Post* business section of Canada’s *National Post* newspaper last Wednesday summed up the impact of the EPA’s letter: “EPA report gives Obama KXL cover.” There was no drama to its arrival, but we were amused by the contents of the letter written by Cynthia Giles, the EPA’s Assistant Administrator for Enforcement and Compliance Assurance. Ms. Giles stated upfront that the agency was making its comments on the Final SEIS now rather than when it was published “because of the possibility that a decision of the Nebraska courts would have led to changes to the Final SEIS.”

**She also pointed out that “The analysis of climate change issues has also improved from the Draft SEIS.”**

She also went on at great length to complement the comprehensive nature of the Final SEIS and how it had addressed the EPA’s April 2013 comments on the Draft SEIS. She talked about how much they appreciated “the usefulness of the new compilation of all of the proposed mitigation measures,” which was contained in an appendix. She also expressed pleasure at how the DOS “strengthened the analysis of oil spill prevention preparedness, response and mitigation and has committed to requiring numerous mitigation measures regarding leak prevention and detection, as well as spill cleanup measures.” She also pointed out that “The analysis of climate change issues has also improved from the Draft SEIS.” But here was where she began to weigh in with the EPA’s objections to the Final SEIS, and where the arguments became convoluted.

**She utilized the maximum estimate of potential carbon dioxide emissions and equated the volume to the annual emissions from 5.7 million passenger vehicles, or 7.8 coal-fired power plants**

After pointing out that the incremental greenhouse gas emissions that would come from the extraction, transport, refining and use of the 830,000 barrels per day of oil sands crude would result in an additional 1.3 to 27.4 million metric tons of carbon dioxide compared to the reference crudes, she utilized the maximum estimate of potential carbon dioxide emissions and equated the volume to the annual emissions from 5.7 million passenger vehicles, or 7.8 coal-fired power plants. Here is the key sentence in the letter: “Until ongoing efforts to reduce greenhouse gas emissions associated with the production of oil sands are more successful and widespread, the Final SEIS makes clear that, compared to reference crudes, development of oil sands crude represents a significant increase in greenhouse gas emissions.” Remember, President Obama’s criteria

**Instead of 5.7 million passenger vehicles, we would be talking about 268,000 vehicles**

for approving the Keystone pipeline is that it will not lead to an increase in greenhouse gas emissions. So now the EPA has weighed in and said that building Keystone will increase emissions, especially in light of the downturn in global oil prices. But is this a contrived rationale?

We pointed out above the use of the maximum estimated carbon emissions to point out the potential harm. But that damage was equated to the emissions from millions of additional vehicles or multiple coal-fired power plants. Yet, what if the incremental emissions analysis utilized the low end of the possible range? Instead of 5.7 million passenger vehicles, we would be talking about 268,000 vehicles. Likewise, we would only be concerned with 30% of a single power plant rather than 7.8. Given the EPA's new policies on power plant emissions, just how many new coal-fired plants do we think will be built here? And last month, the auto industry sold nearly five times the low-end estimate for additional polluting vehicles. Even if we used the maximum value of incremental carbon emissions, we are talking about one-third of all the vehicles expected to be sold in the U.S. this year. So what's the concern? This is why the EPA is trying to make the issue appear more dramatic with its vehicle and power plant comparisons.

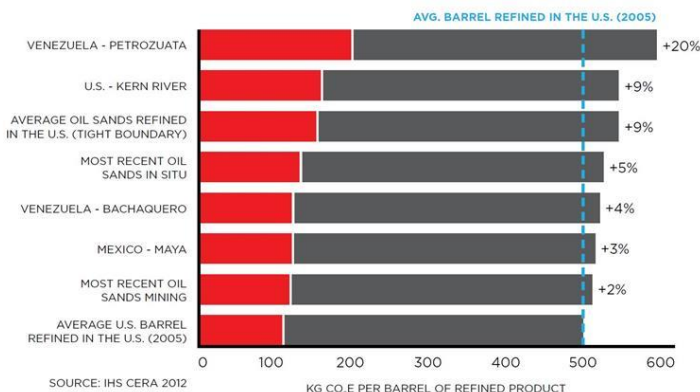
**Keystone's 830,000 barrels per day of oil sands crude would amount to less than 1% of current global oil production, and a lower percentage in the future**

To gain greater appreciation for how the EPA is distorting the oil sands crude emissions issue, one need only remember that the Final SEIS calculated the life-cycle of greenhouse gas emissions to be 17% greater than those of the average for crude oil refined in the U.S. So let's explore the significance of these emissions. According to *Environment Canada 2014*, oil sands accounted for 8.7% of Canada's greenhouse gas emissions and just over 0.13% of global greenhouse gas emissions. Keystone's 830,000 barrels per day of oil sands crude would amount to less than 1% of current global oil production and a lower percentage in the future. Canada's 2014 oil sands output was estimated at 2,106,000 barrels per day according to the Canadian Association of Petroleum Producers (CAPP). Keystone's extra oil represents a 40% increase in Canada's oil sands output, or an incremental five hundredths of a percentage point increase in global greenhouse gas emissions.

**Canadian oil sands greenhouse gas emissions are below those of the competing heavy oils**

*Environment Canada 2014* also reports that between 1990 and 2012, greenhouse gas emissions associated with every barrel of oil sands crude produced have been reduced by 28%, or slightly more than one percentage point per year. A study conducted by consultant IHS in 2012 shows how various oil sands crudes compare to the average U.S. crude oil barrel refined in 2005. More importantly, the study shows how oil sands' greenhouse gas emissions compare to those of other heavy oil refined in the U.S., such as Venezuelan oil from Petrozuata and Bachaquero and Mexico's Maya crude oil. Canadian oil sands greenhouse gas emissions are below those of the competing heavy oils, thus by merely substituting Canadian oil sands crude for these dirtier crude oils there would be a net environmental gain for the United States.

Exhibit 22. Oil Sands Emissions Below Other Heavy Oils



Source: IHS CERA

**That is an important omission because it acknowledges that the issue is about relative emissions and not a statement about the impact on the climate**

A recent *Financial Post* column by Peter Foster explored the corruption of the EPA’s greenhouse gas emissions argument by anti-fossil-fuel-loving media, in particular *The Guardian* in England and *Bloomberg News*. *The Guardian* story reported to quote from the EPA letter when it wrote “Until ongoing efforts to reduce greenhouse gas emissions associated with the production of oil sands are more successful and widespread development of oil sands crude represents a significant increase in greenhouse gas emissions.” Note that compared to the letter’s original text quoted above, this quote cuts out the section between “widespread” and “development,” which reads “the Final SEIS makes clear that, compared to reference crudes.” That is an important omission because it acknowledges that the issue is about relative emissions and not a statement about the impact on the climate.

**Bloomsberg News was more skillful in its falsification of the EPA’s conclusion by splitting the quote and leaving out those words that The Guardian had misquoted**

According to Mr. Foster, *Bloomsberg News* was more skillful in its falsification of the EPA’s conclusion by splitting the quote and leaving out those words that *The Guardian* had misquoted by merely not quoting them at all. *Bloomberg News*’ version reads as follows: “‘Until ongoing efforts to reduce greenhouse gas emissions associated with the production of oil sands are more successful and widespread,’ developing the crude ‘represents a significant increase in greenhouse gas emissions’ the EPA said...”

**The true argument is, and should be, over the relative greenhouse gas emissions of oil sands output**

What these two articles and their treatment of the EPA quote do is promote the notion that developing the oil sands is a disaster from a climate perspective, when the true argument is, and should be, over the relative greenhouse gas emissions of oil sands output. Given the progress the oil sands producers have made in reducing life-cycle greenhouse gas emissions coupled with the favorable emissions benefits from substituting this output for even dirtier fuels used in the U.S., the EPA should be applauding the Keystone pipeline as a positive environmental move by the Obama administration. Remember, part of the Keystone debate is whether pipelines are inherently safer and have lower emissions per barrel of



**Given the decline in oil prices to below \$50 a barrel, that conclusion needs to be re-examined and factored into the discussion about carbon emissions**

crude oil transported than the alternative of trains. The analysis would seem to clearly favor pipelines over trains. As an aside, Berkshire Hathaway (BRK.A-NYSE), whose chairman is Warren Buffett, a significant Democratic Party and Obama supporter, benefits from the profits its Burlington Northern rail subsidiary generates by hauling oil sands crude from Canada to the refining centers in the U.S. Could there be a political payback for rejecting Keystone? And we won't even discuss the ranting of the high priests of the anti-fossil fuel movement.

There were two additional arguments the EPA made in its letter that we will only mention in passing. One was the conclusion from the Final SEIS that the oil sands would be developed whether or not Keystone was approved. The EPA suggests that that conclusion was based on a continuation of high oil prices that would offset the higher cost of alternative transportation modes. Given the decline in oil prices to below \$50 a barrel, that conclusion needs to be re-examined and factored into the discussion about carbon emissions.

Their second argument concerned other pipeline routes. The EPA says more analysis was needed. As it wrote, "we note that eliminating alternatives from a detailed analysis based on an abbreviated estimate of environmental impacts is not the preferred approach under NEPA's requirement to take a 'hard look' at alternatives, which would provide a more detailed and comprehensive discussion of the issues associated with these route alternatives."

While the first argument is worthy of some debate, the fact that the producers are not abandoning Keystone, and they are the true economic determiners. The second argument suggests the roadmap for environmental groups to sue DOS over the failure of the Final SEIS to fulfill its obligation to consider issues raised by other environmental laws. How many years of litigation will this consume?

**The EPA letter buys the administration more time before reaching decision points and saves the environmental movement from having to start its legal actions**

What we conclude about the EPA letter is that a governmental agency closely aligned with the environmental (anti-fossil fuel) movement and the environmental views of President Barack Obama retained an arrow in its quiver in case the Nebraska court ruled in favor of the pipeline. The EPA letter buys the administration more time before reaching decision points and saves the environmental movement from having to start its legal actions. If the Congressional legislation mandating the granting of a permit for Keystone is vetoed by President Obama as advertised and then over-ridden by the Senate, then the legal battles would likely commence. We would not be surprised to see the Justice Department bringing suit for the EPA against the DOS to prevent it from granting the permit due to the final matter of the pipeline route analysis among other claims. The resolution of Keystone may be barely beyond the mid-point of its ultimate timeline, if it ever is approved.

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