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ENERGY INVESTMENT BANKING

MUSINGS FROM THE OIL PATCH

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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

Fed Official: Energy CEOs Don't Worry About Interest Rates

Quite possibly Mr. Kaplan doesn't understand the importance low interest rates have been for the energy industry

Dallas Federal Reserve President and Chief Executive Officer Robert Kaplan, spoke at a recent meeting at the University of Houston. He declared that oil industry chief executive officers (CEOs) have bigger worries than national monetary policy. Quite possibly Mr. Kaplan doesn't understand the importance low interest rates have been for the energy industry and how adjusting those rates may impact the outlook for the business. Mr. Kaplan was quoted in the *Houston Chronicle* saying, "If I'm in the energy industry, there are a lot of things that I'm agonizing about right now and staying awake at night about right now. I don't think Fed monetary policy should be one of them."

They often forget that abnormally low interest rates were used earlier to offset the recessionary effects following the dot.com stock market bust of 2000-2001

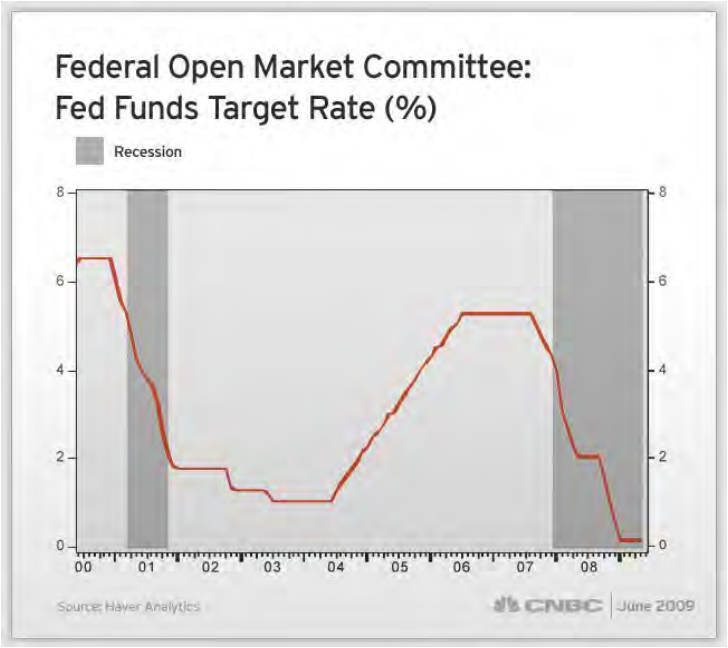
For virtually all of this year, Federal Reserve board members and chair Janet Yellen have wrestled with when is the right time to abandon their zero interest rate experiment that has dominated the nation's monetary policy for most of this century. While most people focus on the zero rate policy created in response to the 2008 financial crisis, they often forget that abnormally low interest rates were used earlier to offset the recessionary effects following the dot.com stock market bust of 2000-2001, which was later followed by the after-effects of the 9/11 terrorist attacks. While the Federal Reserve under then Chairman Alan Greenspan did not drive short-term interest rates to zero, it did drive them to 1% in an attempt to take away the incentive for Americans to put their money into savings accounts and instead encourage them to spend it and boost economic activity.

The low interest rate environment of the early 2000s was credited with contributing to the great housing bubble that was initiated by the expanded government incentives under President Bill Clinton promoting universal homeownership. The housing boom that

The housing bubble's growth coincided with the early successes of the American oil and gas shale revolution

ensued contributed to the belief that the American economy was doing well and would continue to grow after the terrorist attacks in September 2001. The housing bubble's growth coincided with the early successes of the American oil and gas shale revolution and the explosion in global oil consumption in 2004. All of these forces combined to create the "perfect storm" for fiscal, monetary and energy policies that were the seeds of the 2008 global financial crisis.

Exhibit 1. Short-term Interest Rates in 2000s



Source: ***CNBC***

While the drop in the federal funds rate was dramatic from late in 2000 to the end of 2001, the sluggish response of the American economy was thought to need further stimulus from the Federal Reserve who took short-term rates down to 1% by mid-2003. It kept rates at this level for a year, before slowly lifting them as the housing bubble expanded, without government and Federal Reserve officials ever conceding that a bubble existed.

The question of bubbles and Federal Reserve monetary policy has been an issue for several decades now

The question of bubbles and Federal Reserve monetary policy has been an issue for several decades now. In the 1990s when investors fell in love with technology stocks seeing the companies as the key to the "new" world economic order, people began to question whether an investing bubble was developing.

The most famous event during that period, which signaled that at least some people were beginning to recognize the dot.com bubble, was Federal Reserve Chairman Alan Greenspan's famous "irrational exuberance" speech in December 1996. In that speech, Chairman

It took three additional years of a rising stock market before the dot.com bubble burst and the first recession of the 21st Century commenced

Greenspan stated: “Clearly, sustained low inflation implies less uncertainty about the future, and lower risk premiums imply higher prices of stocks and other earning assets. We can see that in the inverse relationship exhibited by price/earnings ratios and the rate of inflation in the past. But how do we know when irrational exuberance has unduly escalated asset values, which then become subject to unexpected and prolonged contractions as they have in Japan over the past decade? And how do we factor that assessment into monetary policy? We as central bankers need not be concerned if a collapsing financial asset bubble does not threaten to impair the real economy, its production, jobs, and price stability. Indeed, the sharp stock market break of 1987 had few negative consequences for the economy. But we should not underestimate or become complacent about the complexity of the interactions of asset markets and the economy. Thus, evaluating shifts in balance sheets generally, and in asset prices particularly, must be an integral part of the development of monetary policy.” It took three additional years of a rising stock market before the dot.com bubble burst and the first recession of the 21st Century commenced.

Mr. Bernanke’s view was consistent with that of Chairman Greenspan who was telling the world that he saw no bubble in home prices

Later, as the housing bubble grew, former Federal Reserve Board member Ben Bernanke, then Chairman of the President’s Council of Economic Advisors, testified in 2005 that "house prices are unlikely to continue rising at current rates." But he added, "A moderate cooling in the housing market, should one occur, would not be inconsistent with the economy continuing to grow at or near its potential next year." Mr. Bernanke’s view was consistent with that of Chairman Greenspan who was telling the world that he saw no bubble in home prices, but rather "froth" in some local markets. He also cautioned that house prices might fall in some areas and that some borrowers and lenders might suffer "significant losses" if cooling house prices made it difficult to repay the new, riskier types of home loans such as interest-only adjustable-rate mortgages.

“Instead, the Fed should stand ready to mop up the economic aftermath of a bubble.”

Mr. Bernanke’s testimony came only days before he was nominated by President George W. Bush to succeed Mr. Greenspan as chairman of the Federal Reserve Board. So while the Federal Reserve was slow to raise rates to tame the growing housing bubble since it failed to see it forming, it was quick to lend its muscle in stopping the carnage from the financial crisis and to provide as much economic stimulus as possible to help drive a recovery in the U.S. and world economies. According to an article in the *Washington Post* about Mr. Bernanke, following the announcement of his appointment to lead the Fed, “He [Greenspan] and Bernanke have both said it is unrealistic to expect the Fed to identify a bubble in stock or real estate prices as it is inflating, or to be able to pop it without hurting the economy. Instead, the Fed should stand ready to mop up the economic aftermath of a bubble.”

After the stock market appreciated by 126% between 2009 and 2015, it fell by 10% at one point this year and currently sits 2.5%

Investors are worried about the impact of this rate rise on a multitude of factors that impact the fortunes of various economic sectors

below the February 2015 peak. Much of the price action this year has been attributed to the anticipation by investors that the Federal Reserve will raise interest rates for the first time since 2008. Investors are worried about the impact of this rate rise on a multitude of factors that impact the fortunes of various economic sectors, the value of the U.S. dollar and what it all means for corporate earnings and capital spending decisions. Given the stock market volatility this year due to the unclear view of what may happen once interest rates begin to rise, we were surprised by Mr. Kaplan's comments.

Many of these junk bond investors failed to understand the outsized-risk that came along with their reach for those higher returns

Mr. Kaplan seems to ignore the fact that after technology, the key driving force for domestic oil and gas output growth over the past decade has been the availability of cheap capital. It was partially responsible for the recent era of $100 a barrel oil, which provided expectations for outsized financial returns by exploration and production (E&P) companies. In a world where savers and investors have been deprived of appropriate returns for their conservative savings, people have been forced to extend themselves along the risk curve in search of more traditional investment returns. One of the easy ways the energy business found to fund its need for substantial sums of capital required upfront to develop shale resources was to tap the high yield debt market, referred to as "junk bonds." These bonds are traditionally issued by lower quality (weaker balance sheet) borrowers and as a result can carry hefty interest rates. Those high yields were the primary attraction for investors in the current low-yield environment. Of course, many of these junk bond investors failed to understand the outsized-risk that came along with their reach for those higher returns. They are now paying the price.

The firm commented that these bankruptcies have dealt with $13.1 billion of debt

According to law firm Haynes and Boone LLP, so far this year 37 North American E&P companies have filed for Chapter 11 bankruptcy, but it fully anticipates additional bankruptcies by yearend. The firm commented that these bankruptcies have dealt with $13.1 billion of debt. The most significant bankruptcy so far this year is Samson Resources Corp., the 2011 $7.2 billion buyout by a group of private equity firms headed by KKR (KKR-NYSE) that saddled the company with $4.3 billion in debt. Falling oil and gas prices, lack of significant production growth and high-priced debt forced the company into a pre-packaged bankruptcy arrangement that saw some of the company's debt holders receive only about 30 cents on the dollar of debt. That buyout eliminated roughly $950 million in debt and facilitated the addition of $1 billion of second-lien debt to the company's balance sheet. The key is that this new debt is secured while the debt it replaced was unsecured.

Further highlighting the agony in the industry is the recent $5.4 billion write-down of producing assets and continued bleeding of cash during the third quarter at Chesapeake Energy Corp. (CHK-NYSE). Its high yield bond prices collapsed (see Exhibit 2, next page) when the company signaled further asset write-downs are

coming along with the likelihood that it will borrow an additional $2 billion in second-lien debt that will outrank the $11+ billion of bonds that are unsecured debt, sharply reducing their value.

Exhibit 2. Fall in Value of Chesapeake's High Yield Debt

Source: ***Bloomberg***

A recent report from investment firm Goldman Sachs (GS-NYSE), which exerts substantial influence in the global commodities market due to its significant trading business, suggested that commodity prices, including crude oil, needed to decline further before corrective market forces will restore an appropriate supply/demand balance. The report was the subject of an article in the *Financial Times*. The newspaper quoted the following from the report's conclusion: "Supply adjustments to date are still insufficient, and demand has done too little to offset this slow adjustment. This sustains the need for lower prices for even longer, keeping us underweight commodities for the next 12 months."

The conventional wisdom says that higher U.S. interest rates will drive the value of the dollar up

So what role do interest rates play in the energy market? Besides the impact on consumer budgets from higher interest rates, possibly cutting into their discretionary spending including for new homes, automobiles and travel, there remains the question of what higher interest rates mean for the value of the U.S. dollar. As we wrote in the last *Musings*, the conventional wisdom says that higher U.S. interest rates will drive the value of the dollar up. Foreign money wishing to receive the higher interest rates here needs to sell its local currency in order to buy U.S. dollars, thus driving up the dollar's value relative to the foreign currency. A stronger dollar will make oil more expensive for foreign buyers as oil is priced in U.S. dollars globally.

On the other hand, we showed in our article that there is a growing body of research demonstrating that during the first 180 days following an initial interest rate hike, the value of the U.S. dollar declines, at least based on the record of the past five rate hikes.

Another look at the impact of rate hikes offers another counterintuitive message for commodities such as crude oil, which

Exhibit 3. Value Of U.S. Dollar Falls After Initial Rate Hike

Source: ***Business Insider***

In each case, the stock market, as reflected by the Standard & Poor's 500 Index, rose

is positive stock performance. A report we examined showed that there have been three times when interest rates were raised by the Federal Reserve over multiple quarters, which is what is envisioned for the anticipated upcoming interest rate environment. In each case, the stock market, as reflected by the Standard & Poor's 500 Index, rose.

Exhibit 4. S&P Stock Performance After Rate Hikes

Time Frame	Rate Increase	S&P Return
December 1993 - March 1995	3.00-6.00	7%
March 1999 - June 2000	4.75-6.50	12%
June 2004 - June 2006	1.00-5.25	12%

Source: ***MarketRealist.com***

One has to assume that Energy's performance was driven largely by the belief that the Federal Reserve's interest rate hike reflected concern about higher inflation, which is traditionally good for commodities

While not all market conditions are the same, the stock market performance pattern reflected in Exhibit 4 is somewhat surprising. But what may be more surprising is the examination of the performance of sectors during these periods (shown in Exhibit 5, next page). Energy topped the sector performance list. One has to assume that Energy's performance was driven largely by the belief that the Federal Reserve's interest rate hike reflected concern about higher inflation, which is traditionally good for commodities.

One should be careful assessing the 2004-2006 performance of Energy as it was partially fueled by the China/Asian energy boom. Regardless, there was positive Energy sector performance during that period. Interestingly, when looking at the data in the chart, only three of the ten market sectors showed positive performance in all

Exhibit 5. S&P Sector Performance In Interest Rate Hikes

	Performance		
Sector	04-06	99-00	93-95
Energy	70%	14%	8%
Utilities	36%	8%	-15%
Materials	21%	-10%	12%
Industrials	16%	11%	6%
Telecomm	15%	-5%	-3%
Financials	13%	-6%	5%
Consumer Staples	6%	-17%	16%
Consumer Discretionary	5%	-2%	-3%
Healthcare	0%	4%	22%
Technology	-2%	62%	33%

Source: ***MarketRealist.com***

three periods – Energy, Industrials and Healthcare, assuming zero performance is considered positive.

"You can't imagine how quickly core assets become non-core when you're going broke"

It may be that Mr. Kaplan's view of the issues confronting energy company CEOs at the present time may be too shortsighted. Maybe those CEOs should be worried about the Federal Reserves' monetary policy as it has potentially a significant impact on broader forces that may shape their company's future business environment. As Porter Trimble, president of private E&P company Fleur de Lis Energy LLC put it after commenting about how quickly the energy business can change, "You can't imagine how quickly core assets become non-core when you're going broke."

Recent Studies Question Economics Of Renewable Energy

The economics of their favored solution to the perceived problem is being questioned by recent studies

As 50,000 participants, including 25,000 registered attendees, descend on Paris for the start of the UN's climate change conference, the economics of their favored solution to the perceived problem is being questioned by recent studies. The latest report, 'Journey to grid parity - Three converging forces provide a tailwind for US renewable power," was authored by the Deloitte Center for Energy Solutions. The other report, "The deep de-carbonization of electricity grids," is the annual energy paper of J.P Morgan Asset Management that is prepared under the guidance of distinguished Professor Emeritus in the Faculty of Environment at the University of Manitoba in Winnipeg and a Fellow of the Royal Society of Canada Vaclav Smil.

The authors of the J.P. Morgan report asked Dr. Smil for his thoughts about the issue of de-carbonizing the electricity grid, i.e., fueling it with renewables. He offered one of the most reasoned statements about the challenge, while measuring it against the cost of undertaking such a transition. Dr. Smil wrote: ""Underlying all of the recent moves toward renewable energy is the conviction that

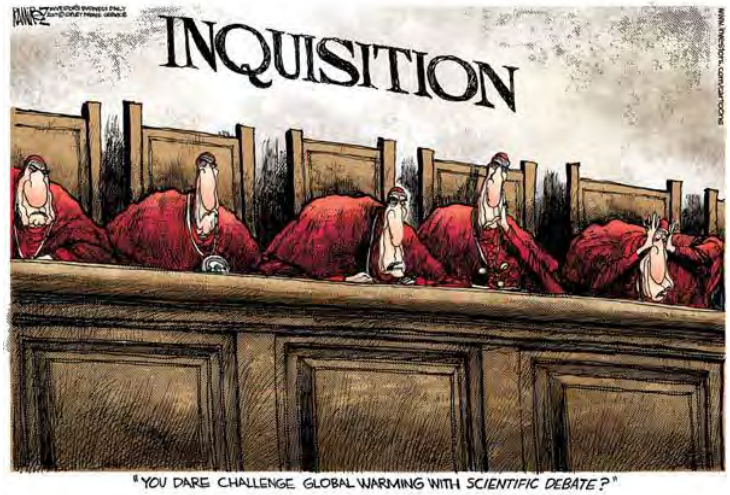
"We know that energy transitions are inherently protracted affairs and hence, acting as risk minimizers, we should proceed with the de-carbonization of our overwhelmingly carbon-based electricity supply – but we must also appraise the real costs of this shift"

As the passage of time and new research studies point to the fallacies in the predictions of these models, activists should not be surprised that the public fails to fall in-line behind them

such a transition should be accelerated in order to avoid some of the worst consequences of rapid anthropogenic global warming. Combustion of fossil fuels is the single largest contributor to man-made emissions of CO2 which, in turn, is the most important greenhouse gas released by human activities. While our computer models are not good enough to offer reliable predictions of many possible environmental, health, economic and political effects of global warming by 2050 (and even less so by 2100), we know that energy transitions are inherently protracted affairs and hence, acting as risk minimizers, we should proceed with the de-carbonization of our overwhelmingly carbon-based electricity supply – but we must also appraise the real costs of this shift."

If we think about the agenda of environmental activists, it is clear that they fully embrace Dr. Smil's belief about the importance of CO2 emissions, although some might suggest that methane is a more significant issue even though it receives less attention. Contrary to Dr. Smil, the activists believe their computer models are accurate to the nth decimal point in predicting the globe's climate and temperature in 2100. As the passage of time and new research studies point to the fallacies in the predictions of these models, activists should not be surprised that the public fails to fall in-line behind them. Branding the public and those climate skeptics who point out these fallacies as deniers and demanding that they be silenced and/or prosecuted under the Racketeer Influenced and Corrupt Organizations (RICO) law, as proposed by Senator Sheldon Whitehead (D-RI), is a sign of the climate change activists' frustration and desperation at their lack of success in quieting the doubters.

Exhibit 6. Do Climate Believers Have Open Mind?



Source: Image Source

The idea that we can immediately redo the world's energy infrastructure to abandon fossil fuels and nuclear power in favor of

less carbon-intense and predictable power sources (wind and solar) is unrealistic, but the sentiment is much easier to express on a bumper sticker. The key problem is that the proposed shift needs to be examined from a financial cost/benefit perspective to see whether the idea is feasible. Here too, the activists disagree with Dr. Smil's reasoned position. It is hard to see that much progress in this debate will come from the Paris conference, especially when studies such as those mentioned above arrive at conclusions questioning the economics of renewables, unless believers only talk to believers. The Deloitte study concluded "it is unlikely that some parts of the US can reach grid parity without federal or state incentives within the next 10-15 years." One certainly must ask whether the study's time frame conclusion is realistic or merely typical of the many studies predicting positive outcomes well-beyond the reasonable range of forecasting capability – what we refer to as "over the horizon" forecasts. In those forecasts, it is always blue skies beyond the dismal known or what can be reasonably predicted outcomes.

It is hard to see that much progress in this debate will come from the Paris conference, especially when studies such as those mentioned above arrive at conclusions questioning the economics of renewables

The Deloitte study had two more optimistic conclusions that address the timing issue of their principle conclusion, and support our over the horizon view. The study's authors wrote: "Three trends are converging, which are collectively pushing renewable energy development forward: forecasted rising natural gas prices, wholesale power market rebalancing, and ongoing improvements in renewable technology. Whether or not these trends continue and to what degree will affect the timing of grid parity." They went on further to conclude that "the pace of innovation across technology, processes, and financing is the big wild card. While it is difficult to include in an economic modeling exercise such as this [Deloitte MarketPoint], innovation should be acknowledged as a factor that could shorten the journey to grid parity to a great extent." Yes, technology is always the "ace in the hole" for studies where the economics fail to lead to a positive outcome.

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The conclusions of the J.P. Morgan study may actually be of greater significance as they come from an in-depth analysis of the positives and negatives of electric power system shifts mandated in Germany (wind) and California (solar and wind). Many of us are familiar with the German term *Energiewende*, the name adopted for the country's power plan to shut down all of its nuclear power plants, which was adopted following the Fukushima, Japan nuclear power plant accident, and replacing that power source with wind energy. The J.P. Morgan study's key conclusion, [presented in bold text in the report] was that "**A critical part of any analysis of high-renewable systems is the cost of backup thermal power and/or storage needed to meet demand during periods of low renewable generation. These costs are substantial; as a result, levelized costs of wind and solar are not the right tools to use in assessing the total cost of a high-renewable system."** That is a very important point about the analyses being presented today by renewables proponents.

"A critical part of any analysis of high-renewable systems is the cost of backup thermal power and/or storage needed to meet demand during periods of low renewable generation"

In many of our *Musings* articles reviewing renewable fuel economic studies proclaiming their cost-competitiveness with electricity produced from fossil fuels, the cost of backup power, along with the shorter economic lives of wind turbines and solar panels, is never considered. Our favorite question about these studies is: "What's the cost of wind power when the wind isn't blowing, or solar power at 2 am in the morning?" Theoretically, the cost should be zero because they aren't producing any power. However, if you needed the power at those times, their cost is indeterminate.

The J.P. Morgan study's conclusions are presented below:

The cost of backup thermal capacity and storage is an inextricable part of any analysis of a high renewable system

"Intermittency greatly reduces the importance of wind and solar levelized cost when assessing high-renewable grids. The **cost of backup thermal capacity and storage** is an inextricable part of any analysis of a high renewable system. Academic and industry research has reached similar conclusions. A 2015 paper from the Potsdam Institute for Climate Impact Research notes that integration costs in systems with high levels of renewable energy can be up to **50%** of generation costs, and that the **largest single factor is the additional cost of backup thermal power**.

"Energy **storage** reduces CO_2 emissions but its cost, utilization rate and energy loss must be accounted for. Even when assuming continued learning curves, storage adds to net system cost.

"It may be aggressive to extrapolate the spectacular decline in photovoltaic panel costs across other energy technologies

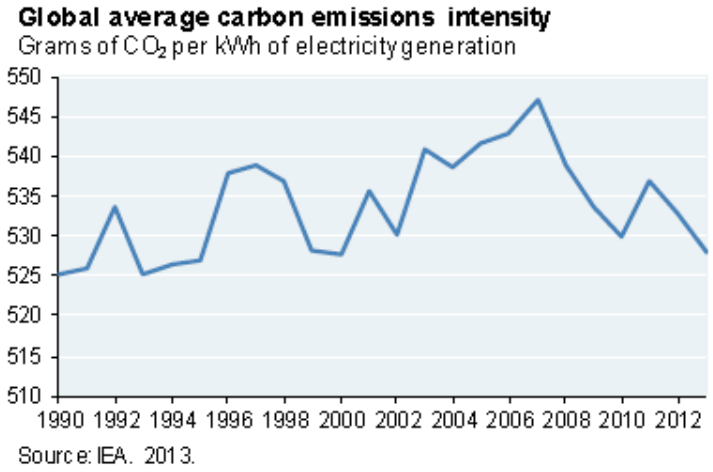
"The cost of a high-renewable system reflects ***potential*** renewable resources, *and* the **efficiency** with which these resources are harnessed. In Germany, even assuming future cost declines, it will be an expensive journey. In California, the economics of a high-renewable system are better given higher wind and solar capacity factors. However, it may be aggressive to extrapolate the spectacular decline in photovoltaic panel costs across other energy technologies.

"The **CO_2 intensity** of global electricity generation has declined over the last few years, but is simply back at the level it was at in 1995. A combination of a global recession which reduced peak energy demand, a shift in some jurisdictions away from coal towards natural gas and increased installation of wind and solar power explain the decline since 2007."

One of the more interesting aspects of the J.P. Morgan study was its examination of many of the "what-if" proposals by renewables optimists to address their favored fuels' shortcomings. The summary of conclusions about these proposals include:

"Could cross-border integration of high-renewable grids reduce the need for backup power and its corresponding cost? That's the next wave of renewable energy research. It would cost money to build these interconnections, but in theory, if wind and solar patterns

Exhibit 7. Carbon Emissions Progress May Be Temporary



Source: J.P. Morgan Asset Management

are more divergent the larger the geographic area covered, the problem of renewable intermittency could simply be diversified away. Unfortunately, **new research on wind suggests that this theory has major limitations**. This remains a premise best proven empirically rather than by assumption.

"The problem is that incremental solar, wind and energy storage costs would dwarf foregone costs of backup thermal power"

"What about over-building renewable energy and storage so that the **need for and cost of backup power is eliminated**? The good news: it's an emission-less system. The problem is that incremental solar, wind and energy storage costs would dwarf foregone costs of backup thermal power. Our models determined that a system in California with enough wind, solar and storage to eliminate backup power entirely would cost $280-$600 per MWh, which is 2.5x – 5.0x more expensive than *Caliwende* [study's name for California's renewable energy scenario] (depending on assumed storage system properties and costs). Bottom line: **a renewable energy storage version of the Temple Granaries looks to be prohibitively expensive**.

"Why not draw on electricity stored in electric car batteries ("**car-to-grid**") to reduce storage costs? Another theoretical possibility that's only worth discussing when we can determine the penetration rate of plug-in vehicles, the participation rate of drivers willing to share their battery with the grid and how much of it they would share, the cost of interconnections, and the cost of incentives required by drivers to have their expensive car batteries cycled more frequently.

"Demand management is meant to deal with intraday supply-demand issues, not intermittency issues which span weeks and months"

"What about "**demand management**"? If demand could (somehow) be reconfigured to match up with variable renewable generation, unused surpluses and demand gaps would be smaller and system costs could decline. However, demand management is meant to deal with intraday supply-demand issues, not intermittency issues which span weeks and months."

The study's authors appear to agree with the views of many scientists, academics and environmentalists who actually envision a substantial role for nuclear power in our energy future

The ultimate conclusion of the study is that it is possible to conduct a deep de-carbonization of the electricity grid by employing renewable energy and without using nuclear power, but it is foolish to not underestimate either the cost or the speed of doing so in many parts of the world. Interestingly, the study postulated that the efforts to solve the nuclear cost-safety challenge might yield particularly large benefits in a post-carbon world. The study's authors appear to agree with the views of many scientists, academics and environmentalists who actually envision a substantial role for nuclear power in our energy future. That is an interesting conclusion because it promotes an emissions-less fuel source that is certainly within the realm of possibility both technologically and the time-frame needed for a significant fuel transition. Nuclear power could provide the bridge to our next global fuel transition such as lean energy nuclear reaction (LENR) that is making technological progress but still remains decades away from being proven, assuming it ever does.

Energy In Houston And Canada Face Holiday With No Cheer

Instead, they quickly assigned the greatest downturn odds to the scenario calling for a short, sharp drop in oil prices to be quickly followed by a steep reversal – a "V-shaped" pattern – that would return the industry to its heydays of the prior four years

Last week was the one-year anniversary of the famous Organization of Petroleum Exporting Countries (OPEC) meeting at which all expectations for a continuation of the boom for the global energy business were shattered. This week will witness the next major OPEC gathering at which oil market policies will be discussed and any changes adopted. Last year, by agreeing to sustain the organization's oil output flow, thus shifting price determination to market forces, global oil prices immediately dropped by 7%, beginning the worst industry downturn since the 1980s. Of course that was not the immediate expectation of energy forecasters and company executives. Instead, they quickly assigned the greatest downturn odds to the scenario calling for a short, sharp drop in oil prices to be quickly followed by a steep reversal – a "V-shaped" pattern – that would return the industry to its heydays of the prior four years.

Two thousand and fifteen would not be a fun year for the oil patch, but based on the limited damage inflicted during the 2008-2009 V-shaped oil price correction, the pain in 2015 was expected to be tolerable

December 2014 was a blur for most of those in the energy business as energy company management teams frantically reworked their just recently approved 2015 capital spending plans. The new equation was simple: lower oil prices equals less cash flow which means lower spending and fewer wells and discoveries. Those on the frontline of drilling and completion activity – the oilfield service companies - began calculating how many fewer workers would be needed in the months ahead given a reduced spending outlook along with trying to figure out what other cost cuts could be made. Two thousand and fifteen would not be a fun year for the oil patch, but based on the limited damage inflicted during the 2008-2009 V-shaped oil price correction, the pain in 2015 was expected to be tolerable.

As the downturn has lengthened the expected pendulum swing from pain to benefit has yet to truly manifest itself

One of the underlying questions about the oil price downturn was how economies would fare. Lower oil prices puts more money into the pockets of consumers who are expected to spend it on other goods and services. Therefore, the initial expectation was for the global economy is that it would receive a shot-in-the-arm that would boost growth and in turn lift demand for the now cheap oil. However, the result so far this year has been a mixed bag with the negative spending results from those industries hurt by the oil price decline largely offsetting the consumer and industry sector benefits from lower oil prices. While conventional economic theory would suggest that the benefits of falling oil prices are often displayed further in the future than the economic pain from spending cuts and worker layoffs, as the downturn has lengthened the expected pendulum swing from pain to benefit has yet to truly manifest itself. That is one reason why the oil price recovery is progressing more slowly than anticipated.

Vehicle miles traveled (VMT) grew to 260 billion in September, an all-time record for the month and up 4.3% versus last year

Global oil demand growth is now expected to reach 1.8 million barrels a day (mmb/d), a five-year high, and even more growth than the pre-OPEC meeting optimistic demand growth forecast. The pace of the oil demand recovery may now be starting to accelerate. Evidence of that gain has shown up in data such as that of America's driving patterns. Vehicle miles traveled (VMT) grew to 260 billion in September, an all-time record for the month and up 4.3% versus last year. Year-to-date, VMT growth is running at a 3.5% rate, which puts it on track for the biggest yearly growth in at least the past 10 years. With gasoline pump prices remaining low and the unemployment rate continuing to fall, consumers are buying new vehicles at a record pace suggesting 2015 sales may total 17.4 million units, topping 2001's record of 17.35 million units sold.

For all of 2015, gasoline demand is 300,000 barrels a day higher

What has this meant for oil? U.S gasoline demand for the four weeks ended November 13th, averaged 9.24 mmb/d, the highest level since 2007. That's up from 9.06 mmb/d last year. For all of 2015, gasoline demand is 300,000 barrels a day higher. However, despite the stronger oil demand now being experienced, U.S. supply, along with that of the rest of the world, has grown faster putting further downward pressure on world oil prices.

The steps these management teams are now embracing are beginning to alter the color of the Houston economic outlook from gray to black, although there are certainly many shades of both colors at play

When one factors into this growing oil demand picture the prospect of continued high output from OPEC and other exporters such as Russia and Mexico, and 2016 economic growth forecasts calling for weaker activity and less oil consumption growth, the picture for energy companies is not pretty. These forces are pressuring energy company management teams to reassess their outlooks and to fundamentally re-order their organizations to better compete in a "lower for longer" oil price environment. The steps these management teams are now embracing are beginning to alter the color of the Houston economic outlook from gray to black, although there are certainly many shades of both colors at play. While the pain in Houston is growing, it has yet to catch up with the high

economic pain level felt in Calgary, the other North American energy hub.

The December figure was better than economists were expecting, which may have been impacted by misjudging the pace with which oil price reductions would hurt retail sales

The oil price drop began at the end of June 2014, and accelerated following the OPEC meeting in late November. Highlighting the problem this created for the North American economies, retail sales in Canada for December 2014 fell 20% to C$42.1 billion. That was the largest decline since April 2010. Clearly, a portion of that decline was attributable to lower gasoline and other oil product prices. In the U.S., December 2014 retail sales increased 0.2% from November's level, which was revised down from a positive 0.7% to 0.4%. The December figure was better than economists were expecting, which may have been impacted by misjudging the pace with which oil price reductions would hurt retail sales.

He characterized the 2015 outlook as "clouds gathering over Houston" but that they would only bring some light showers and not a storm

Despite the weak retail sales figures, regional economic forecasters were suggesting that Houston's growth would merely slow in 2015 and 2016. A KHOU television news story on December 26, 2014, carried the headline: "Some economists believe in 2015, Texas could be headed for trouble." Yet, a story just 45 days later in the *Houston Chronicle* reported that in a presentation by Robert Gilmer, director of the Institute for Regional Forecasting at the Bauer College of Business at the University of Houston and a former economist and bank official at the Federal Reserve Bank branch in Houston, to the West Houston Chamber of Commerce, he characterized the 2015 outlook as "clouds gathering over Houston" but that they would only bring some light showers and not a storm.

He did highlight that the job growth would shift from the west side of Houston to the east side as there were $35 billion in new refinery and petrochemical plant upgrades, expansions and greenfield projects underway

We heard Dr. Gilmer speak twice last spring and every time he presented a cogent case for why this oil industry downturn would not bring the same cataclysmic results for the Houston economy as was experienced in the 1980s downturn when one in seven Houstonians lost his or her job. In the presentations, he forecast that job growth in Houston would shrink by more than 50%, from 120,000 new jobs added in 2014 to only 40,000 to 45,000 in 2015 and 2016. While this view might have sounded bad, Dr. Gilmer referred to it being a "breather" for the Houston economy that had been on a very fast-paced growth trajectory. He did highlight that the job growth would shift from the west side of Houston to the east side as there were $35 billion in new refinery and petrochemical plant upgrades, expansions and greenfield projects underway. (That figure is now closer to $50 billion.) The impact of that spending meant that lower socio-economic class workers would be employed during the several year construction period needed to complete these plants, but at the expense of white collar workers who were likely to lose their jobs in the headquarters of energy and oilfield service companies.

Recently, Dr. Gilmer presented the Institute's regional forecast for the balance of 2015 and 2016. The *Houston Chronicle's* business columnist wrote about the presentation and made the following observation: "For the past two years, Gilmer has been consistently

more upbeat about Houston's economy than I have, so when he starts getting gloomy, it's time to pay attention." It is all about energy job growth and the indirect impact on employment. About 50% of Houston jobs are indirectly tied to the revenues of the oil and gas companies. So when they stop making money, there will be a problem as the companies are forced to cut employees. As he characterized the problem, "As soon as the price of oil falls, all of the sudden, the job growth machine is broken." Currently, the Federal Reserve Bank of Dallas is forecasting that Houston will create close to zero net jobs in 2015. While there isn't any forecast for job growth in 2016 yet, the outlook suggests that the Houston economy will be slower than in 2015, so any job growth is likely to be modest.

So when they stop making money, there will be a problem as the companies are forced to cut employees

In Calgary, the Canadian oil industry is suffering equally tough conditions, or maybe worse than the U.S. energy business. Cash flows for Canadian oil and gas producers are expected to fall by C$50 (US$37) billion to C$60 (US$45) billion, or back to levels below those experienced in 2000. The direct impact from lower cash flows is lower capital investment, layoffs, reduced repatriated wages of migrant workers from eastern Canada and the knock-on effects in related industries. All of this combined with the impact from the current depression in the Canadian mining industry means that governmental revenues will fall. The outlook among energy executives in Calgary is further impacted by the change in the provincial and now the federal government to regimes with leaders who are more environmentally-friendly, less supportive of the fossil fuel industry and more interested in gaining greater revenues from energy companies to help less-fortunate citizens across the nation.

The outlook among energy executives in Calgary is further impacted by the change in the provincial and now the federal government

From the perspective of a frequent traveler to Calgary, we are witnessing the impact of reduced oilfield activity – planes, hotels and restaurants less full, airfares declining, fear of an office space glut growing as companies downsize and seek to sublet surplus space. Meanwhile, at least four new office towers are under construction, and concern about long-term damage to the energy industry from the downturn and possibly restrictive government policies such as Alberta's just-announced climate change policy continue to grow.

According to StatsCan, Alberta's unemployment rate for October was 6.6%, triple the 2.2% rate in October 2014. The 58,000 Albertans who filed unemployment claims in September was the highest number since January 2010. Employment agencies in Alberta are reporting 50% increases in the number of job seekers they are seeing. The unemployment fallout impacts other provinces such as Newfoundland and Labrador (up 2.2%) and Nova Scotia (up 2.1%), as these are traditional sources of oilfield workers who are now forced to return home due to the loss of their jobs. Other signs of economic stress in the province are increases in food bank demand, which increased by more than 23% compared to last year, versus only a 1.3% increase nationwide according to HungerCount. The province is also experiencing a crime increase as well as higher

The 58,000 Albertans who filed unemployment claims in September was the highest number since January 2010

death tolls from drug overdoses. Homes sales in Alberta are falling by double-digits and real estate sales people are abandoning Fort McMurray due to the dismal outlook for home sales in the heart of oil sands country.

Houston was surprised last week by news that the 23rd largest law firm in the city, an energy-focused firm, was closing due to the loss of business

The current economic news in Texas and Alberta is not good, and concern over whether oil prices will improve significantly in the near-term will deter any material improvement. Houston was surprised last week by news that the 23rd largest law firm in the city, an energy-focused firm, was closing due to the loss of business. That goes to show how widespread the pain from low oil prices is impacting the local economy. October home sales in the region fell by double digits, another indication of a changing environment.

The negative backdrop overhanging the holiday season will likely carry on into 2016. We expect the upcoming economic outlooks for both Houston and Alberta to be pessimistic. However, by the time the 2016 forecasts are presented, we may have signs of changes in the global oil market that might signal when its recovery may start. Unfortunately, we don't expect the pace of the recovery to be robust, although we could be surprised. The initial pain from oil's price drop is now spreading more widely throughout the regions sucking the joy out of the upcoming holiday season. Let's hope for a better outlook during 2016.

COP21 Started Yesterday But Its Success Is Uncertain

The planned climate change marches, always a good thing for activists, have been cancelled as Parisian authorities are concerned about them becoming a target for further acts of terrorism

The throngs of climate activists, government officials and media have descended on Paris, the City of Light, which struggles to recover from the terrorist attacks of two weeks ago. The planned climate change marches, always a good thing for activists, have been cancelled as Parisian authorities are concerned about them becoming a target for further acts of terrorism. One wonders just how focused European leaders, who are dealing with the Syrian refugee movement, the recent shooting down of a Russian fighter jet over Turkey, the attack on hotel guests in former French colony Mali, and defections from the supposed climate change agreements leading up to the conference, will be about policies and costs to address a possible condition 85 years in the future? Right now, most leaders are more concerned about the ISIS terror threat, dealing with the quagmire of Syria, determining how to ease the ongoing tensions with Russia over its Crimea expansion, and the political future of certain key political leaders of Europe's principle governments than with climate change issues.

Recent media stories about the state of the pre-conference negotiations over the language of the draft agreement to be considered at COP21 have highlighted the surprising last-minute disagreements over details of the plan that conference organizers believed had been previously agreed to. For example, the agreement is supposed to be legally binding. That means it will

have to be presented to the U.S Congress as a treaty (a legal agreement between nations) and will require the approval of the Senate.

Sec. Kerry said, "It's definitely not going to be a treaty…They're not going to be legally binding reduction targets like Kyoto or something."

Article II, Section 2, Clause 2 of the U.S. Constitution stipulates: "He (the President) shall have power by and with the advice and consent of the Senate, to make treaties, provided two thirds of the Senators present concur." Given the present split between Republicans and Democrats in the Senate, there is little chance a climate change treaty that binds the U.S. to the terms and costs of the agreement will be approved by the requisite number of Senators. In recognition of this hurdle, Secretary of State John Kerry told the *Financial Times* on November 11th, "It's definitely not going to be a treaty…They're not going to be legally binding reduction targets like Kyoto or something."

A spokesperson for the European Union Climate Commission, Miquel Arias Cañete, said, "The Paris agreement must be an international legally binding agreement"

This statement set off sharply critical responses including from French President Hollande who admonished Sec. Kerry that "If the agreement is not legally binding, there will be no agreement." His foreign minister Laurent Fabius commented that it was obvious that any agreement in Paris would contain legally binding elements, and suggested that Sec. Kerry was "confused" about that point. A spokesperson for the European Union Climate Commission, Miquel Arias Cañete, said, "The Paris agreement must be an international legally binding agreement." Mr. Cañete has also been fighting the pushback from India and Saudi Arabia who at the G-20 meeting the weekend before last in Turkey blocked any reference in the final draft agreement language to the supposedly agreed-to regular review process to be held every five years. If a review of the nations' compliance with the agreement's terms demonstrated that the goal of limiting temperature's rise to 2-degree Celsius was not projected to be attained, then the governments would draw up new emission targets that would facilitate its achievement.

This raises the question of whether any agreement of value can come from COP21

The ability of the UN to get all 195 countries at the COP21 meeting to agree to the terms of a climate change plan, and to fund their financial commitments for helping developing economies buy the technologies needed to reduce their emissions and adapt to climate change is questionable. For some of the key players, this raises the question of whether any agreement of value can come from COP21. Quoting Mr. Cañete, "Just to sign an agreement for the sake of having a piece of paper on the table is not useful." Is it possible that the optimism leading into COP21 ultimately dissipates as happened in Copenhagen in 2009?

Is Alberta's Climate Change Policy A Sign Of The Future?

On a Sunday afternoon two weeks ago, the new center-left New Democratic Party government of Alberta unveiled its long-awaited climate change policy, which will cause residents in the province to pay more for their energy and utilities in the name of cutting future

Big questions remain as to whether the carbon emissions goal of the plan will be achieved and whether the cost to the economy will be too great

carbon emissions. What the employment impact will be from this policy remains to be seen, but the new climate change policy is being embraced by the leading oil sands producers who are probably breathing a sigh of relief that the plan wasn't worse for them. Big questions remain as to whether the carbon emissions goal of the plan will be achieved and whether the cost to the economy will be too great. If the latter, the plan has no provision for relief, which may be a future serious problem. An underlying motive of the plan is to boost the provincial government's revenue. That was probably the most important consideration and climate change became a convenient excuse.

Canada ranked fourth in the world based on per capita carbon emissions of 15.7 tons per person

Our cynicism probably won't be appreciated but Canada is not as significant of a carbon emitter as at least nine other countries in the world despite the country's relatively high per capita emissions figure. According to data from the 2013 EDGAR database, created by the European Commission and the Netherlands Environmental Assessment Agency, Canada ranked fourth in the world based on per capita carbon emissions of 15.7 tons per person. Canada trailed Australia, which was in first place with 16.9 tons per capita and Saudi Arabia and the United States who were tied for second place at 16.6 tons per capita. The per capita ranking reflects the carbon intensity of three countries possessing small populations – Australia, Canada and Saudi Arabia. Only the United States has a major population base, but its economy represents nearly a quarter of the world's gross domestic production.

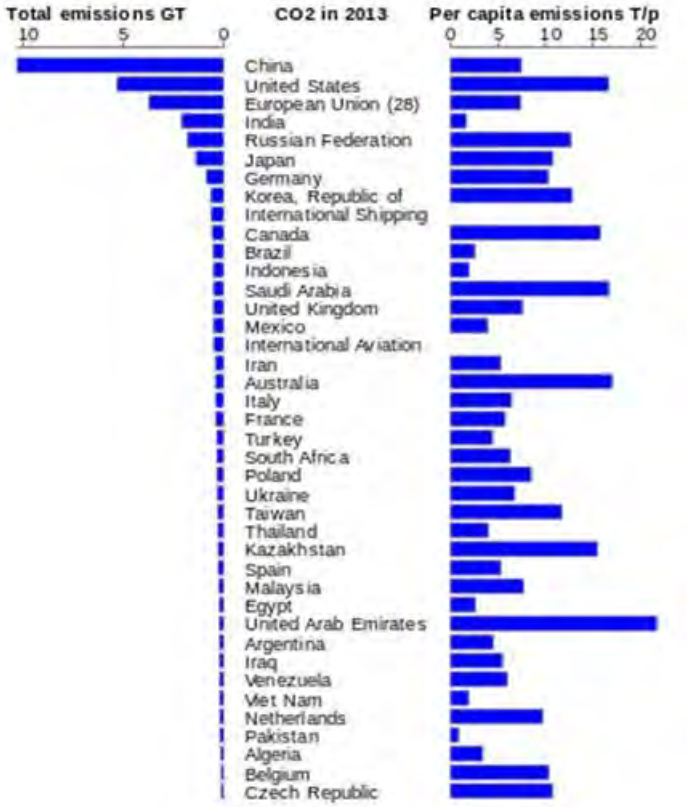
The key point of the new Alberta policy is to make all citizens pay for these climate change measures rather than only the large emitters as has been the existing policy

Based on Canada's total carbon emissions of 550 million tons of carbon emissions in 2013, the country ranked 10th in the world as a polluter. The top ten countries in 2013 collectively produced 27.69 billion tons of carbon emissions, or 78.5% of the world's total. The goals of the Alberta climate change policy (we have yet to see the environmental policy plan from Canada's new environmentally-friendly government of Prime Minister Justin Trudeau) are to put a cap on carbon emissions from the oil sands output, replace two-thirds of the coal-fired power generation in the province with renewable energy and the rest with natural gas by 2030, and raise the price of gasoline and home heating natural gas in order to force conservation. The key point of the new Alberta policy is to make all citizens pay for these climate change measures rather than only the large emitters as has been the existing policy.

Annual carbon emissions from the oil sands have quadrupled in the past 25 years to reach the 70 MT figure

With respect to the oil sands, the plan will put a cap on carbon emissions of 100 megatons (MT) per year compared to the industry's current emissions of 70 MT per year as well as taxing them at C$20 (US$14.93) per ton in 2017, increasing to C$30 (US$22.40) per ton in 2018. Thereafter, the plan is for the tax to increase in real terms until 2030. Annual carbon emissions from the oil sands have quadrupled in the past 25 years to reach the 70 MT figure, which is what has bothered environmentalists and regulators. The emissions cap is designed to provide room for the industry to

Exhibit 8. Ranking Of Countries By Carbon Emissions



Source: ***Wikipedia***

We have to believe they are appreciative of the freedom to try their own solutions to the emissions growth challenge rather than having the Alberta government proscribe the allowed solutions

continue growing its output while at the same time encouraging the use of new technology to limit future carbon emissions. Whether that technology involves carbon capture and storage, the use of solvents mixed with steam to melt the bitumen, which reduces the amount of steam needed by as much as 25%, or injecting carbon dioxide into a tailings pond, storing the gas and accelerating the clean-up of the toxic water, the industry will be allowed to find its own ways to slow the growth of carbon emissions. Although we have seen many chief executive officers of oil sands producers supporting the climate change plan, we have to believe they are appreciative of the freedom to try their own solutions to the emissions growth challenge rather than having the Alberta government proscribe the allowed solutions.

Consumers will probably be the most shocked by the new Alberta policy. It means they will pay C5 (US3.7) cents per liter more for gasoline in 2016, which will rise to C7 (US5.2) cents per liter in 2018. For homeowners, it means an additional C$1.12 (US$0.84) per gigajoule of energy in 2017 for the natural gas they burn in their home furnaces, which will rise to C$1.62 (US$1.21) per gigajoule in 2018. The government presented an estimate that the average

resident in the province who uses gasoline, natural gas and electricity will pay an additional C$320 (US$239) in 2017 and C$470 (US$351) in 2018.

Plans are to use some of the money to fund renewable energy projects and to ease the pain of the carbon taxes for low-income earners, with the balance to fund other government priorities

When all is said and done, this climate change plan will raise an additional C$3 (US$2.24) billion in carbon tax income by 2018 for Alberta at a time when the government is running a roughly C$6 (US$4.48) billion deficit. The plan is projected to increase carbon tax revenues to C$5 (US$3.73) billion by 2030. These revenue estimates are net of the foregone corporate taxes and royalties. Plans are to use some of the money to fund renewable energy projects and to ease the pain of the carbon taxes for low-income earners, with the balance to fund other government priorities.

As one commentator put it, this plan's projected carbon emissions savings are overwhelmed by the number of new coal-fired power plants China built in just the past four months

Currently, there is no mechanism for adjusting this plan if it turns out to hurt the economy more than presently anticipated. Regardless, Alberta will probably still be negatively impacted by whatever federal government climate change plan is instituted. As a result, many people are concerned that this new climate change plan will negatively impact the very factors - oil, natural gas and coal - that have driven the province's economic success. As one commentator put it, this plan's projected carbon emissions savings are overwhelmed by the number of new coal-fired power plants China built in just the past four months. Having laid out this climate change plan to cap oil sands carbon emissions and demonstrated that the major oil sands producers are supportive, and vowing to end coal-fired electricity generation, which will be replaced with wind and natural-gas powered plants, and getting citizens to pay for their own carbon emissions, Alberta Premier Rachel Notley is now primed to fly to Paris to claim her "green" badge of honor. Unfortunately, her plan isn't totally embraced by environmentalists as 350.org still says the oil sands need to remain in the ground.

Comments On Current Energy Issues

Ruckelshaus Blasts Climate Skeptics Over Science

"The atmosphere today is completely different to the 1970s. Republicans' arguments [against climate change] are all partisan driven, they aren't based on any legitimate analysis of science"

Prior to being awarded the Presidential Medal of Freedom by President Barack Obama last week as a prelude to the Paris climate change conference, William Ruckelshaus, the first-ever Environmental Protection Agency (EPA) chief under President Nixon and chief environmental regulator during President Reagan's second term, bashed Republicans saying, "The atmosphere today is completely different to the 1970s. Republicans' arguments [against climate change] are all partisan driven, they aren't based on any legitimate analysis of science." This is laughable coming from a man who rejected the supporting science of DDT to ban the pesticide that has recently led to serious malaria outbreaks in different parts of the world.

DDT's ban was helped by "scientific studies" later to be shown to be fraudulent

We highlighted the issue in our November 3, 2015, *Musings* when we discussed the scientific method and politics. To review briefly, after being ordered by a federal court, in response to a 1971 lawsuit by the Environmental Defense Fund, to begin the de-registration procedure for the pesticide DDT, Mr. Ruckelshaus rejected the move following a six-month review of the EPA's scientific evidence. The environmental uproar prompted the EPA to hold seven months of hearings involving 125 witnesses on both sides of the issue who generated 9,362 pages of testimony about the risks of DDT. EPA judge Edmund Sweeney subsequently ruled "DDT is not a carcinogenic hazard to man" and rejected the de-registration request. Ignoring the scientific studies, Mr. Ruckelshaus overruled the judge saying, "The ultimate judgment [on DDT] remains political. Decisions by the government involving the use of toxic substances are political with a small 'p'." There are fewer "scientific facts" about climate change today than existed with DDT, but there are lots of models with projections about the deleterious outcomes of not acting now to ban the burning of fossil fuels. DDT's ban was helped by "scientific studies" later to be shown to be fraudulent. So much for science or the scientific method.

Energy Stocks, A Bull Market Call And Dividends

A bull market is determined after a stock or stock market sector has risen by 20% after having previously declined by at least 20%

In our last *Musings* we wrote about the investment call by the Bespoke Investment Group that energy stocks, as reflected by the price action of the ETF XLE, had entered a new bull market phase. As we stated, a bull market is determined after a stock or stock market sector has risen by 20% after having previously declined by at least 20%. In the case of the XLE, from its peak in late June 2014, it had fallen by 41% to its late August 2015 low. From that point, the ETF rose by slightly more than 20% as of November 3rd, breaking the long-term bear market downtrend, and precipitated Bespoke's bull market call.

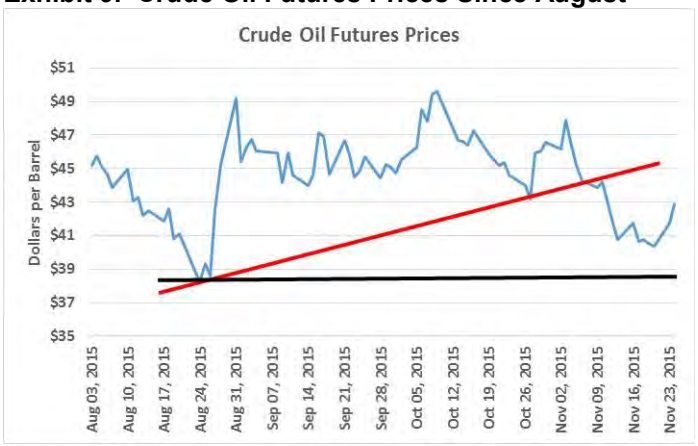
Oil prices, however, never closed below $40 a barrel

Since the time of that call, crude oil futures prices have fallen from around $48 a barrel in early November to below $40 on an interim day basis. Oil prices, however, never closed below $40 a barrel, even though the price did fall below the support line drawn between the August and the October low prices. It is important to understand that technical analysis (support and resistance lines) employs both short- and long-term trendlines. The lines, however, are not absolute as there are times when actual trading violates those lines but does not truly alter the trend underway, such as now.

We had numerous comments about the article suggesting that if we had we waited a week or more, our charts would have been different and possibly would have led to a contrary conclusion. That view was shaped by the sudden and sharp decline in oil prices and the resulting volatility in energy share prices. Yes, the oil price chart would have been different (see Exhibit 9, next page), but the important point is that oil futures never closed below $40 a barrel.

On the other hand, as shown below, the oil futures price did drop below the August to October low oil price support line we had drawn on the chart produced in the earlier *Musings* and reproduced here. On this chart, we drew a support line extending from the low August oil price, which, in this environment, is important for determining whether there has been a breakdown in industry fundamentals.

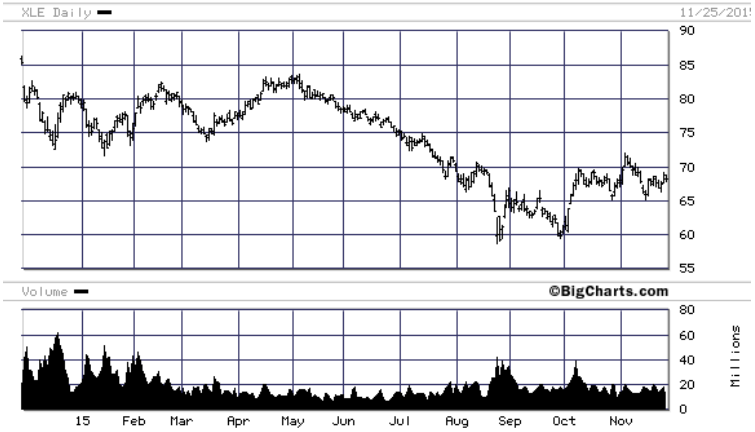
Exhibit 9. Crude Oil Futures Prices Since August



Source: EIA, PPHB

From the perspective of the XLE, at November 25th, it closed at 68.26, up 15.2% from the starting point of the bull market call, but down 4.4% from the November 3rd high price of 71.40. Since bull markets are defined by 20% stock price moves, the current bull market call is not at risk of being reversed despite the current price action of energy stocks and the XLE.

Exhibit 10. XLE Trading Pattern For Past Two Years



Source: Big Charts

Another point raised by the XLE call was that it was focused on the major oil companies and possibly the exploration and production companies, but not all the other sectors. The XLE ETF is made up

of a portfolio of energy stocks representing all industry sectors. The current portfolio's sector weightings are: Oil & Gas Refining – 44.25%; O&G Exploration – 28.28%; Oil related service companies – 16.76%; O&G Transportation – 8.63%; and O&G Drilling – 1.36%.

This list is certainly representative of the industry's breadth

The top ten holdings in the XLE as of November 25 include: ExxonMobil Corp (XOM-NYSE); Chevron Corp. (CVX-NYSE); EOG Resources (EOG-NYSE); Occidental Petroleum (OXY-NYSE); ConocoPhillips (COP-NYSE); Pioneer Natural Resources (PXD-NYSE); Phillips 66 (-NYSE); Valero Energy Corp. (VLO-NYSE); Tesoro Corp. (TSO-NYSE) and Schlumberger Ltd. (SLB-NYSE). This list is certainly representative of the industry's breadth.

Maybe it is better to develop a steady, albeit low, production growth profile while using the surplus cash flow to maintain, and potentially increase, the dividend to shareholders

A final batch of questions focused on how important major oil company dividends were to holding up their share prices? We believe it is an important consideration, but the question of dividends and the major oil companies may actually foreshadow a discussion of their future business models. If a company is stuck in a low-growth industry, which oil certainly is, then spending inordinate sums of money to lift the growth rate may not be worth it. For oil companies, the cost for finding and developing new oil production to boost a company's output growth rate from 2% to 3% to say 5% to 6%, without the company having any control over the price it receives for the product, should raise questions about their long-term business strategy. Maybe it is better to develop a steady, albeit low, production growth profile while using the surplus cash flow to maintain, and potentially increase, the dividend to shareholders. That might be a way to sustain a company's stock market valuation and secure stable shareholder support. This strategy implies that capital spending would always be at risk in low commodity price environments, but the strategy could lead to stable employment, which is critical for securing and sustaining the technical talent required in the petroleum business. This strategy, however, wouldn't work for smaller E&P companies needing capital to grow as their ability to tap the capital markets likely requires that they demonstrate rapid production growth. As we are learning, that strategy can be deadly in a period of low commodity prices. So if major oil companies were to adopt slow-growth production goals while defending and increasing their dividends, their share prices might not decline.

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PPHB is an independent investment banking firm providing financial advisory services, including merger and acquisition and capital raising assistance, exclusively to clients in the energy service industry.