PPHB

ENERGY INVESTMENT BANKING

MUSINGS FROM THE OIL PATCH

December 2, 2014

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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

OPEC Is A Band-Aid; Lack Of Global Demand Is The Wound

The key to the decision was understood to be how Saudi Arabia would respond to the pressure to cut

For the past month, all eyes in the energy business were focused on the outcome of last Thursday's Organization of Petroleum Exporting Countries (OPEC) meeting in Vienna, Austria. A survey conducted by *Bloomberg* of 20 energy industry analysts just a few days before the meeting was evenly split over whether OPEC, in response to pleas from member countries with large populations who are heavily dependent on high oil prices to support their governments, would cut production. The key to the decision was understood to be how Saudi Arabia would respond to the pressure to cut, especially after Iran indicated it would press for a cut, non-OPEC member Mexico indicated its willingness to contribute to reducing surplus supply, and Russia indicated it, too, would be willing to reduce its production in 2015.

It is estimated that 1.5 to 2.0 million barrels a day of oil needs to be cut from OPEC's current production

One of the challenges cited by energy investment analysts and crude oil traders interviewed in various media stories speculating on an OPEC production cut is determining the volume of oil needing to be removed from the market to support global oil prices at higher levels. It is estimated that 1.5 to 2.0 million barrels a day of oil needs to be cut from OPEC's current production of 30.25 million barrels a day, as reported in the November *OPEC Oil Monthly Report,* to balance supply and demand. How that volume reduction would be shared among the 11 nations that make up OPEC, and any other producers willing to contribute, is difficult to ascertain. Moreover, there is already an estimated 2.0 million barrels a day of output already on the sidelines due to chaos and violence in the Middle East and Africa.

Prior to the meeting, it was our assessment that if OPEC merely cut production to try to bring global oil supply in line with current and near-term projected consumption levels it would only lead to a short-

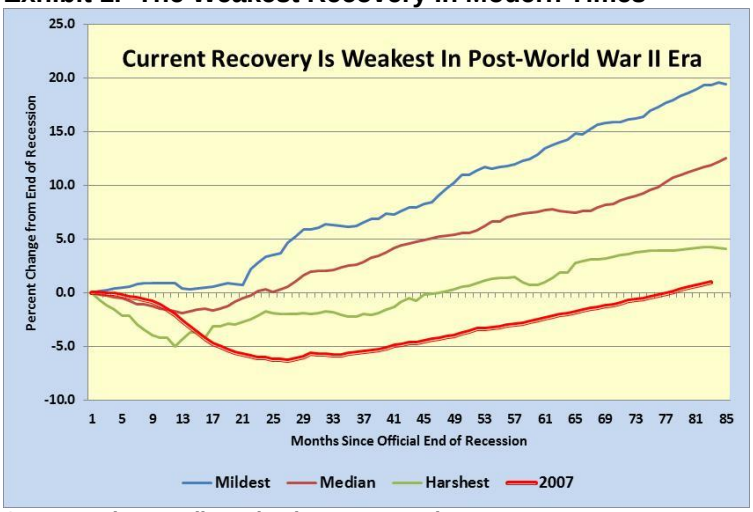
The length of time the world lived with high oil prices – both before and after the 2008 financial crisis – has impacted the operation of world economies

term price fix. The ongoing issue is that the world appears to have slipped into an era of lower oil demand as a result of weak economic activity. The length of time the world lived with high oil prices – both before and after the 2008 financial crisis – has impacted the operation of world economies, which in turn has undercut oil demand. At the same time, this extended period of high oil prices worked its magic to increase supply, i.e., new deepwater discoveries, maintenance of mature conventional production and growth in shale output.

The issue is that demand in the Eurozone has failed to recover and actually remains more than 4% below its pre-crisis level

A recent column by *Financial Times* economic columnist Martin Wolf summed up the global economic challenge. He called it: "The curse of weak global demand" – what he termed "chronic demand deficiency syndrome." Mr. Wolf focused on a speech by U.S. Treasury Secretary Jack Lew given as he was heading to the recent G-20 meeting in China. Sec. Lew pointed out that gross domestic product (GDP) in the U.S. is now 6% higher than it was before the financial crisis and that both Japan and the UK are about 2% higher. The issue is that demand in the Eurozone has failed to recover and actually remains more than 4% below its pre-crisis level. Despite the U.S. recovery, it remains the weakest on record since 1948 as shown in Exhibit 1. The chart shows that while the 2007 recession officially ended in June 2009, the recovery has trailed the best, the median and the weakest of the 10 prior recession recoveries. We suspect that a chart of all other country and regional recoveries would show a similar pattern.

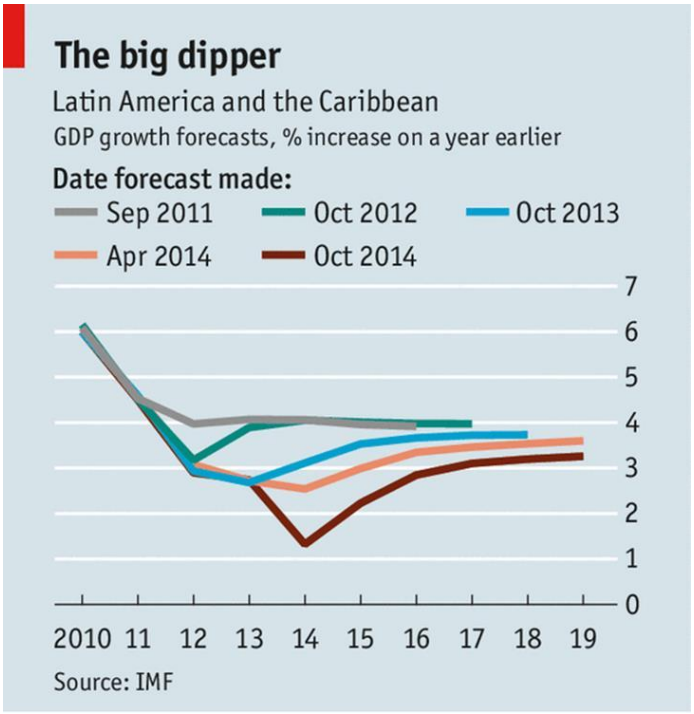
Exhibit 1. The Weakest Recovery In Modern Times



Source: Minneapolis Federal Reserve Bank, PPHB

The anemic recovery has forced economic forecasters and non-government financial organizations such as the World Bank and International Monetary Fund to continually reduce their forecasts for the world and individual countries. Exhibit 2 shows how this trend has impacted IMF forecasts for Latin America and the Caribbean.

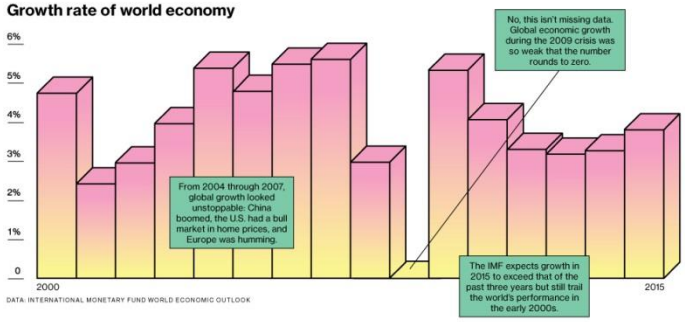
Exhibit 2. How Economic Forecasts Have Fallen



Source: ***The Economist***

The contrast between the strength of the global economy in the early years of the 2000s compared to the weakness in the years since the 2008 financial crisis, including projections for 2014 and 2015, utilizing IMF data, is shown in Exhibit 3.

Exhibit 3. Recent Economic Growth Below Earlier Years'



Source: IMF

The impact of these policies is that all the primary nations' central banks have increased their balance sheets significantly

Mr. Wolf criticized Sec. Lew for ignoring that the recoveries, at whatever pace experienced, have come "despite the most aggressive monetary policies in history." The impact of these policies is that all the primary nations' central banks have increased their balance sheets significantly. While the balance sheets of the central banks in the U.S. and UK have stabilized, the Eurozone's bank is now expanding its balance sheet after having contracted it

since 2011, while the Bank of Japan's balance sheet has exploded to 80% of the nation's GDP and continues to grow.

Lastly, the weak recovery may be tied to a "slowdown in potential growth" as a result of demographic changes, weak capital investment and a significant slowing in the pace of productivity growth in the key regions

There are three possible explanations for the weak demand according to Mr. Wolf. First is that the "overhang of private debt and the damage to confidence caused by the sudden disintegration of the financial system" is what has impeded the pace of recovery. The second explanation is that "the pre-crisis demand was unsustainable because it relied on huge accumulations of private and public debt" and that the "inability to generate credit-driven demand on the pre-crisis level" was why the recovery remains weak. Lastly, the weak recovery may be tied to a "slowdown in potential growth" as a result of demographic changes, weak capital investment and a significant slowing in the pace of productivity growth in the key regions. The explanation for the weak recoveries, according to Mr. Wolf, is that each country has a different combination of ailments making it much more difficult for global growth to be reestablished as each government works on its own plan to boost its economy. While all three explanations are reasonable, the third is tougher to change.

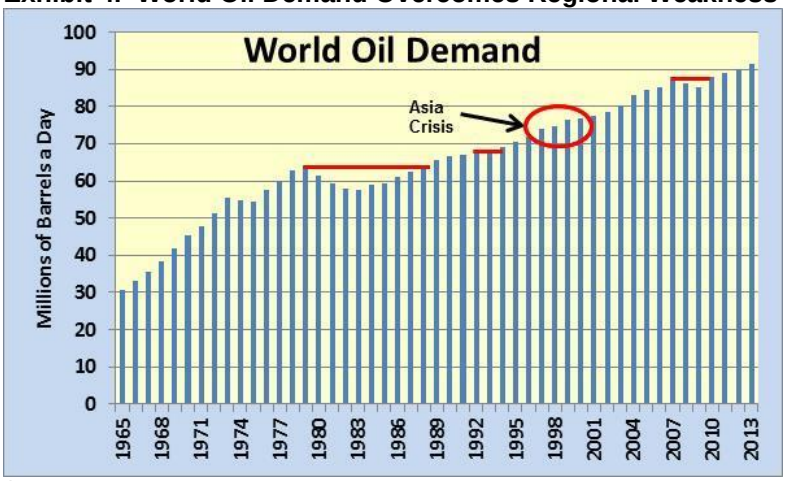
Aggressive monetary policy can impact the value of the U.S. dollar that plays a role in the price of oil

What is the impact of Mr. Wolf's observations for the oil market? Slow economic activity translates into weak oil demand, which in turn will hurt oil prices if supply expands faster than demand grows. On the other hand, aggressive monetary policy can impact the value of the U.S. dollar that plays a role in the price of oil since the commodity is priced in dollars. In the remainder of this article we examine the impact of each factor on the future of global oil prices.

We have circled the years of the Asian currency crisis, but surprisingly global oil demand did not fall, although demand did fall in Asia and global oil prices fell with the low price environment needing nearly 14 months to recover

Energy demand and oil demand in particular, grows in concert with the fact that there are more people on the planet and they demand food, clothing, housing and jobs – all of which cause an increase in energy consumption. This relationship is supposed to support greater economic growth. In the case of oil, Exhibit 4 shows world oil demand since 1965 through 2013 based on statistics from BP Ltd. (BP-NYSE). In the chart we have highlighted several global economic events impacting oil demand: the decline from the 1979 demand peak following the Iranian revolution and the removal of that country's oil from the world market; the small decline in the early 1990s associated with an economic contraction; and the larger demand drop following the 2008 financial crisis. We have circled the years of the Asian currency crisis, but surprisingly global oil demand did not fall, although demand did fall in Asia and global oil prices fell with the low price environment needing nearly 14 months to recover. Two points of interest about the demand declines – the length of time it took for global oil demand to return to its 1979 level and the fact that demand did not fall during the Asian crisis despite the fall in global oil prices. The latter event contributed to significant disarray within OPEC due to its misreading of Asian demand growth, and restoring oil price stability required an agreement between OPEC, Russia and Mexico to reduce supply.

Exhibit 4. World Oil Demand Overcomes Regional Weakness

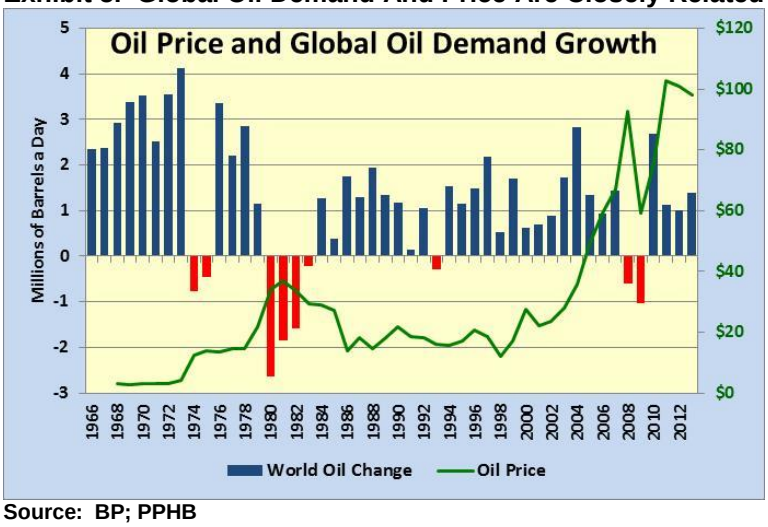


Source: BP; PPHB

The relationship between global oil demand and oil prices does not always appear to be direct

The relationship between global oil demand and oil prices does not always appear to be direct. In some cases, oil price movements reflect demand shifts, either global or regional, caused by non-petroleum related economic shocks or in response to extended periods of extraordinarily high oil prices such as recently experienced. Sometimes, the change in demand has led to shifts in oil prices. What is often not seen is the reduction in projected demand growth from the initial estimates to the actual results. Exhibit 5 shows the record of annual global oil demand change, again based on the BP statistics, plotted against the price of oil, using the annual average price for imported oil purchased by U.S. refiners. What stands out for us in the chart are the demand drops in the 1970s due to the oil price shocks and that of the financial crisis of 2008 due to the petroleum industry's loss of access to

Exhibit 5. Global Oil Demand And Price Are Closely Related



Source: BP; PPHB

capital. It is noteworthy to focus on the relative duration of the demand contractions. In the 1980s, the demand contraction reflected significant adjustments in oil consumption by individuals and businesses made in response to the sharp oil price rise during the 1970s. In contrast, other periods of demand declines were of much shorter duration. When we examine periods when oil demand declined by specific geographic regions the story changes.

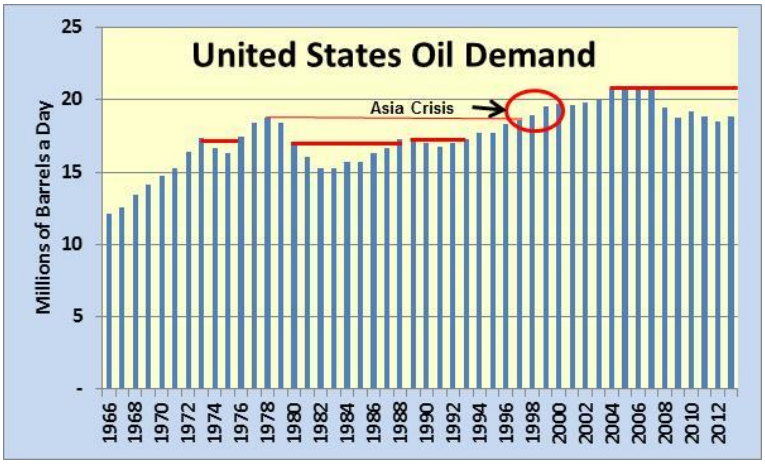
The demand drop after the 1973 oil price shock was relatively short in duration and magnitude, which was somewhat surprising given the size of the oil price hike and its shock to the global economy

U.S. oil demand has had an interesting history. The demand drop after the 1973 oil price shock was relatively short in duration and magnitude, which was somewhat surprising given the size of the oil price hike and its shock to the global economy. It was followed by several years of demand growth until the Iranian oil crisis drove oil prices much higher and produced a severe recession that was followed by an extended period of a meaningful reduction in the use of oil that lasted throughout the 1980s. In past analyses we focused primarily on the nearly decade-long decline in demand and subsequent recovery, but that period appears to have been only part of a much longer period of weak demand that extended from the late 1970s to the late 1990s. Many analysts looking at this period focus on the years of demand growth following the 1983 demand trough.

Since the pre-financial crisis years of 2007-2009, oil demand remains down although it appears to be growing, suggesting it may take years before our demand returns to the level experienced at the past peak

We have circled the Asian currency crisis years to show that U.S. demand was not impacted by that event, although oil prices fell during those years. The last point about U.S. oil demand we would point out is that since the pre-financial crisis years of 2007-2009, oil demand remains down although it appears to be growing, suggesting it may take years before our demand returns to the level experienced at the past peak. The demand peak coincided with the peak in vehicle miles driven and our love affair with automobiles.

Exhibit 6. U.S. In Midst Of Oil Demand Downturn



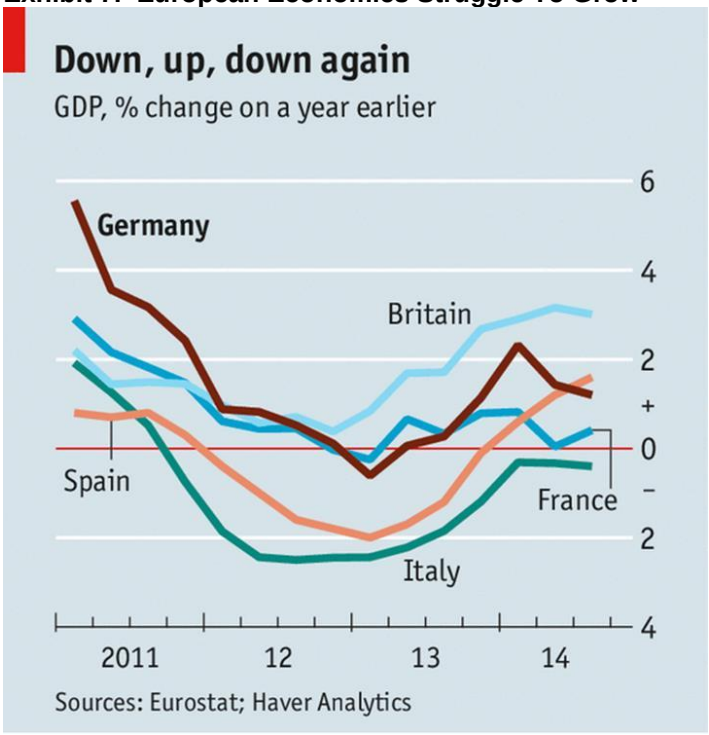
Source: BP; PPHB

Europe and Eurasian oil demand has an even worse record with respect to demand destruction since the late 1970s. Just as in the

Recent economic statistics show several of the countries have slipped back into recession and the German powerhouse economy has barely escaped recession

U.S. and worldwide, oil demand in the region fell in the mid-1970s and again in the 1980s. What is disturbing is to look at demand since the early 1990s. That performance suggests that the countries that compose the region have experienced fundamental and structural issues that have combined to erode oil demand. Recent economic statistics show several of the countries have slipped back into recession and the German powerhouse economy has barely escaped recession. Now, inflation in the Eurozone is near zero causing the central bank to worry about deflation that would send energy demand down.

Exhibit 7. European Economies Struggle To Grow



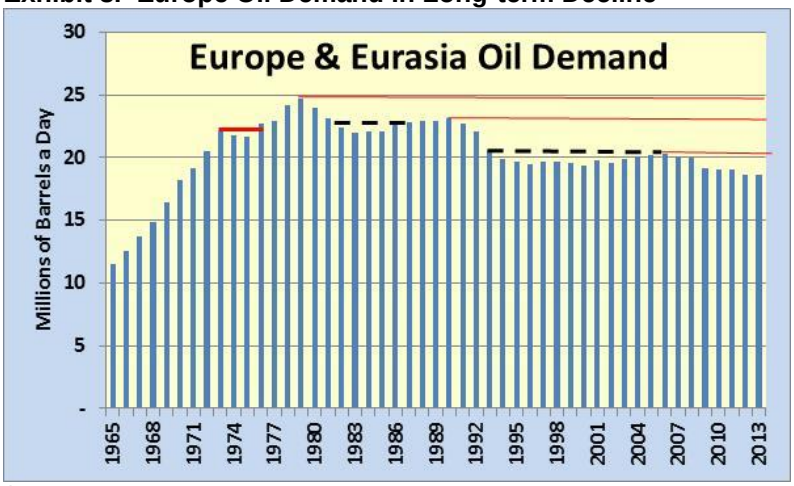
Source: ***The Economist***

The countries in the European and Eurasian region are all suffering from economic problems largely related to demographic challenges and in some cases, absolute population declines

The countries in the European and Eurasian region are all suffering from economic problems largely related to demographic challenges and in some cases, absolute population declines. Some of the countries have resorted to opening their countries up to increased immigration. While this has helped boost the growth of those economies somewhat, often social unrest has become a major problem, as immigrants assume a greater role in the economy and take jobs away from native-born residents. The tension over the flood of immigrants into Europe is creating economic and political challenges not easily resolved.

The demographic challenge for many of the wealthy western economies that tend to be large oil consumers is that a number of them are actually experiencing declining populations. As we pointed

Exhibit 8. Europe Oil Demand In Long-term Decline

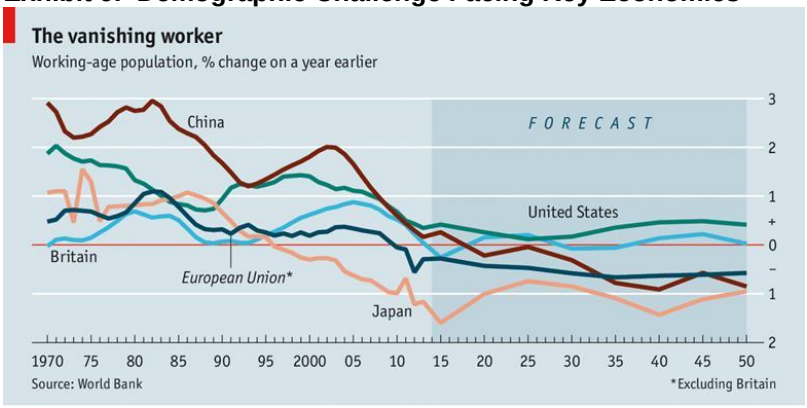


Source: BP; PPHB

Over the next 35 years only Britain and the United States are projected to experience growth in this key population segment

out earlier, the growth of populations, along with rising living standards, is the primary driver for energy use and crude oil consumption. As shown by World Bank data in Exhibit 9, at the present time only two countries – the United States and China – are experiencing positive growth in their working-age populations. As the data shows for the countries in Exhibit 9, over the next 35 years only Britain and the United States are projected to experience growth in this key population segment. Of those two countries that are expected to still have growing labor forces in 2050, Britain will have barely shown positive growth over the entire 35-year period while the U.S. is projected to show meaningful growth. This is a key tenant underlying many of the long-term forecasts that suggest the United States is the best-positioned country economically for the next 50 years.

Exhibit 9. Demographic Challenge Facing Key Economies



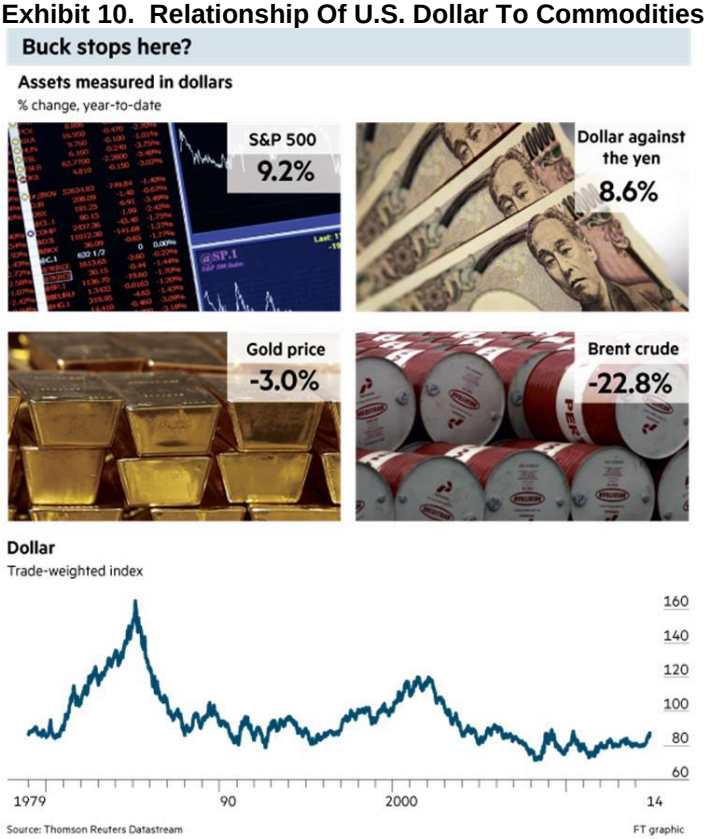
Source: *The Economist*

The relative strength of the U.S. economy is explained by stronger current growth and better long-term growth prospects due to the

The strengthening dollar has been driven by the flood of money unleashed by central banks around the world just as the U.S. Federal Reserve has ended its bond buying spree known as Quantitative Easing

pace of the economic recovery along with a more positive demographic outlook than many other countries in the world. Important for the near-term growth outlook for the U.S. is the strengthening value of the U.S. dollar relative to most other world currencies. U.S. dollar strength impacts oil boosting the value for sellers, meaning that they can accept a lower price since the dollars they receive will buy more than they would have been able to purchase with oil at a higher price but a weaker U.S. dollar. The strengthening dollar has been driven by the flood of money unleashed by central banks around the world just as the U.S. Federal Reserve has ended its bond buying spree known as Quantitative Easing (QE). The Federal Reserve's bond buying exercise injected substantial funds into the U.S. economy that led to low interest rates and a weakening of the value of the U.S. dollar. The strategy of QE was to boost economic growth through more money and low interest rates while also weakening the U.S. dollar. The latter feature contributed to higher oil prices as oil sellers raised prices to try to offset the weak dollar. Exhibit 10 shows the long-term trend in the value of the dollar. The chart also shows the impact of the money created by QE this year on the stock market, the value of the U.S. dollar to the Japanese yen, along with the price impact on gold and oil, commodities whose value is influenced by

Exhibit 10. Relationship Of U.S. Dollar To Commodities



Source: ***Business Investment***

The strong performance of the stock market reflects the fact that it was about the only place where investors could hope to earn positive returns on their money

the value of the U.S. dollar. The strong performance of the stock market reflects the fact that it was about the only place where investors could hope to earn positive returns on their money since short-term interest rates were held to nearly zero and longer term rates were also held down. The performance of the four investments reflects the increase in the value of the dollar during 2014 as shown in the chart at the bottom of Exhibit 10 (prior page).

It is important to understand that the value of the dollar is not the sole driver in establishing oil prices

To further demonstrate the relationship between the value of the U.S. dollar and the global price of oil, we have prepared two charts (Exhibits 11 and 12). Exhibit 11 shows the relationship between world oil prices as reflected by the price of Brent oil and the U.S. dollar over the past 25 years. It is important to understand that the value of the dollar is not the sole driver in establishing oil prices, but it is an important factor. If you examine the long-term trend in the dollar's value, one can see how its decline over much of the period contributed to the rise in oil prices.

Exhibit 11. Long-term Dollar Weakness Helped Lift Oil Price

Source: St. Louis Fed; PPHB

The relationship between the value of the dollar and the global oil price is more clearly shown in Exhibit 12 (next page) that covers the past five years. If one examines the rise in the dollar's value that started during this past summer, it becomes clear how important it has been to the decline in the global price of oil.

A strong dollar is additive to the downward demand pressures from weak economic activity, demographic challenges, changes in attitudes toward the use of oil and inroads from renewables

Given the monetary policies recently adopted the central banks in the European Union, Japan and now China, one has to assume that the U.S. dollar's value will continue to strengthen putting increased downward pressure on global oil prices. A strong dollar is additive to the downward demand pressures from weak economic activity, demographic challenges, changes in attitudes toward the use of oil and inroads from renewables. The combination of these forces is likely to keep annual oil consumption growth to one million barrels a day or less for the next few years. It is quite possible that we could

Exhibit 12. Dollar Strength Contributes To Oil Price Fall

Source: St. Louis Fed; PPHB

be living in a world where more than a million barrels a day growth in consumption represents a boom rather than the norm.

Demand growth is what OPEC needs for its long-term future

In that environment, the question becomes what will substantially lower prices – as a result of the OPEC meeting decision of last week – mean for global economic growth in the short-term? In our view, the Saudi Arabia and OPEC game plans are less about targeting Russian, Iranian and U.S. shale production, although those are beneficial outcomes, but more about restarting European and Chinese economic activity. Demand growth is what OPEC needs for its long-term future. Low oil prices will also help Saudi and OPEC limit the growth of new long-term oil supplies such as Canadian oil sands and deepwater output that should also help improve the relative attractiveness of Middle Eastern oil. Unfortunately, restarting demand may take longer to accomplish than many anticipate. Therefore, the pain petroleum companies are just beginning to experience will need to be endured for some period before the industry fundamentals change sufficiently to restore the good times we have recently enjoyed.

Failure To Cut Production Puts Pressure On E&P Operations

"We're not sending any signal to anybody" - OPEC

According to comments from OPEC Secretary General Abdallah Salem al-Badri during a press conference following completion of the organization's meeting, "We're not sending any signal to anybody...We have to wait and see how the market will settle. As I've said many times, don't panic." He further commented that "the ministers are happy."

It is hard to believe that all 11 oil ministers representing the members of the Organization of Petroleum Exporting Countries are

What they can take comfort in is that they have made 7.15 billion people living on the planet happy since the cost of energy will be lower

happy with the outcome of their 166th meeting since several ministers – Venezuela and Nigeria in particular – had argued vehemently prior to the meeting for a cut in the group's production in an effort to shore up global oil prices. What they can take comfort in is that they have made 7.15 billion people living on the planet happy since the cost of energy will be lower in the future, which should help the living standards of those people.

For those who operate in the energy business, the task for the past few weeks has been to try to predict both what OPEC would do at the meeting and whether the group would change the recent trajectory of oil prices. If so, then everyone's business strategy would remain largely in place – plan on more shale drilling, expect large oil companies to resume their long-term offshore and Arctic drilling plans and energy-consuming companies would continue to build new manufacturing plants in relatively low-cost energy markets such as the emerging United States.

How much would oil and gas companies plan on cutting their capital spending plans for 2015?

On the other hand, if that oil price trajectory continued, managements needed to begin dusting off their game plans from prior downturns to determine the series of steps they needed to start executing. They needed to anticipate where their customers would focus spending reductions in their drilling programs – shale, deepwater or Arctic regions? How much would oil and gas companies plan on cutting their capital spending plans for 2015? How many service company employees would need to be eliminated in order to match company capacity with the anticipated business activity going forward?

Since the late 1970s, the oilfield service industry has become more proficient managers of industry downturns

Since the late 1970s, the oilfield service industry has become more proficient managers of industry downturns. It seems to be the industry growth phases they have a more difficult time managing, maybe because they haven't had as much time to learn or they tend to be swept up in the euphoria of the era.

Everyone wants to know exactly what oil price makes new shale wells uneconomic

The investment community, along with the business press, has turned the recent decline in global crude oil prices into a search for absolutes about the energy business. Everyone wants to know exactly what oil price makes new shale wells uneconomic – assuming that all oil and gas company managements are true capitalists who will only do something with the assurance that it is economically profitable. The challenge is that not every oil and gas company is alike. Major integrated oil companies (IOCs) such as Exxon Mobil Corp. (XOM-NYSE) and Chevron (CVX-NYSE), to name a couple, operate with a mandate to ensure future oil supplies for their refineries well into the future, which means they make decisions today on projects that may not begin producing oil and gas for up to a decade in the future. Who is willing to put a price estimate on crude oil in November 2024? Probably only an idiot would. Those of us who have spent our business careers making forecasts understand that every forecast will be wrong – we just

don't know exactly how it will be wrong. What we hope is that our forecast puts us in the ballpark in which the actual price lands. That means we need to focus on possible future industry dynamics and how those dynamics might be influenced by geopolitical, economic and demographic trends and events.

The shale revolution is responsible for making the U.S. into a global energy powerhouse capable of making the country energy self-sufficient if one believes the optimists

One area that has been receiving an immense amount of interest is the profitability of the shale plays in the United States. The interest is due to the fact that these plays have changed the nature of the domestic oil and gas business from one of inexorable decline into rapid growth. The shale revolution is responsible for making the U.S. into a global energy powerhouse capable of making the country energy self-sufficient if one believes the optimists. Since the shale plays emerged a decade ago as the new industry driver, E&P producers have been proclaiming how profitable they are. Existing producers, and all the new companies being established by private equity investors, have claimed that they needed to pour all their cash flows into the shale projects in order to capture the future profits to be earned from the plays. The challenge has been that for most of this period, producers have failed to generate meaningful free cash flows. This has meant that the producers had to rely on outside capital to fund their exploration and development activities. That dependence could become a significant drag on future profitability of these companies given the oil price decline, and for those companies with highly-leveraged balance sheets, it could result in their eventual demise.

What the data shows is that oil-weighted companies continue to demonstrate greater negative cash returns from their businesses while the gas-weighted companies have begun to show improvement in their free cash flow generation

The lack of profitability and balance sheet challenges is demonstrated by the data in Exhibit 13 that shows the free cash flow generated in the third quarter of this year annualized compared to the companies' 2013 free cash flow, along with their debt levels for both periods. What the data shows is that oil-weighted companies continue to demonstrate greater negative cash returns from their businesses while the gas-weighted companies have begun to show improvement in their free cash flow generation. The two groups of companies continue to show increased debt levels. All the data demonstrates that the profitability of the shale plays remains elusive and with lower oil prices and lower natural gas liquids prices, profitability for the companies will experience greater financial pressure. Short of a quick rebound in global oil prices (not likely), the industry will need to adjust its activity levels, some of which will occur as capital availability collapses.

Exhibit 13. Negative FCF And High Debt Reflect Shale Woes

SAMPLED E&P FREE CASH FLOW & DEBT COMPARISON (2014 FCF ANNUALIZED)

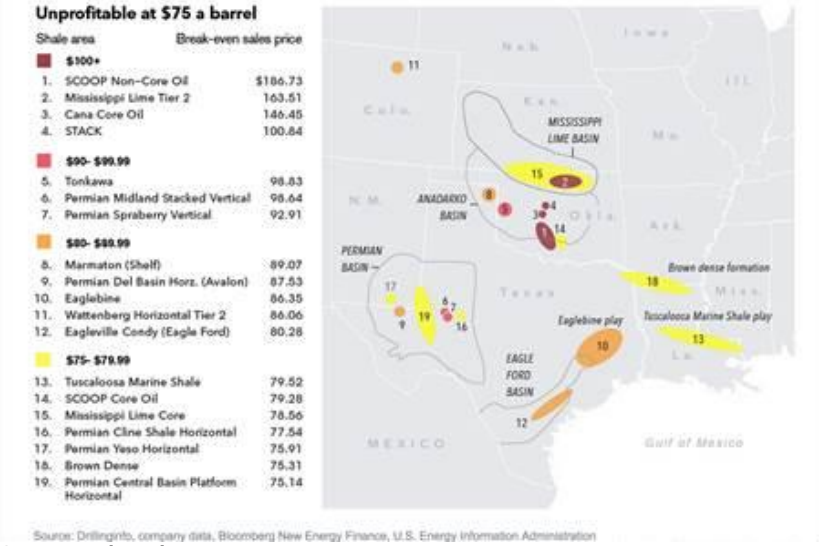
	2014 FCF	2013 FCF	FCF DIFFERENCE	2014 DEBT	2013 DEBT	DEBT DIFFERENCE
GAS-WEIGHTED	-6,637	-7,901	1,264	84,748	81,403	3,345
OIL-WEIGHTED	-7,619	-5,621	-1,999	87,786	83,407	4,378
ALL	-14,257	-13,522	-735	172,534	164,810	7,724

Source: Company reports; Art Berman

The *Bloomberg* analysis suggests that none of the shales they studied were profitable at current prices

Bloomberg prepared a report about two weeks ago attempting to determine at which price the various shale plays broke even. Exhibit 14 shows the table of shale plays with *Bloomberg's* estimates, based on data from numerous expert sources, of their respective breakeven prices. Besides presenting the data in tabular form, it showed those producing areas of the shale formations and what those breakeven points are. As we write this on the day after the OPEC meeting, the West Texas Intermediate oil price closed at $66.15 a barrel, a low last seen in mid-September 2009 during the recovery from the 2008 financial crisis and recession. If prices stay at this level, the *Bloomberg* analysis suggests that none of the shales they studied were profitable at current prices. *Bloomberg* did not examine the Bakken or the liquids-rich Marcellus and Utica shale plays. If the *Bloomberg* analysis is anywhere near correct, then the Louisiana, Texas, New Mexico, Oklahoma and Kansas oilfields are most likely looking at lower activity levels ahead.

Exhibit 14. The Profitability Profile Of Domestic Shale Plays



Source: *Bloomberg*

As he also pointed out, during the last big price drop – 2008-2009 – prices went from $143 to $40 a barrel, a 72% drop

Last Friday, following OPEC's decision to retain the organization's 30 million barrel a day production quota, oil prices dropped with WTI falling by 10%. Commodity trader Denis Gartman told CNBC that there have been two times in history when oil prices fell by 95% from peak to trough. As he also pointed out, during the last big price drop – 2008-2009 – prices went from $143 to $40 a barrel, a 72% drop. As a result, he predicted that oil prices this cycle still have further to fall. Just how low they go is the big question. In an interview with the *Sydney Morning Herald*, Citi Research analyst Eric Lee responded to a question about how low prices needed to fall by answering, "To bring US shale production growth to zero… might need prices ranging from $US40-60 per barrel." If right, then oil prices do need to fall further. Commenting on the oil price question,

We anticipate writing articles for future *Musings* about the restructuring of the energy business as a result of this new era of low oil prices

Scott Sheffield, chief executive officer of Pioneer Natural Resources (PNR-NYSE), indicated that there would be "some cutback" at $80 a barrel, but there would be a significant cutback in drilling if WTI fell below $70 a barrel, something that has just happened. Given this new pricing environment, we anticipate writing articles for future *Musings* about the restructuring of the energy business as a result of this new era of low oil prices.

HAL/BHI Deal – Transformational Or Just Shifting Deckchairs?

It is certainly a significant deal for the two companies, and was driven by Halliburton's perceived need to gain increased global scale

The recent agreement for Halliburton Companies (HAL-NYSE) to acquire Baker Hughes Corp. (BHI-NYSE), in what was reported at the time of the announcement of the deal as a $36 billion cash and stock transaction, sparked industry speculation as to the significance of the purchase for the global oilfield service industry. It is certainly a significant deal for the two companies, and was driven by Halliburton's perceived need to gain increased global scale, as well as to fill out product lines in which the company was weak and needed greater heft to better fulfill the needs of its global customers, and potentially be better positioned to weather industry cycles. According to data from oilfield market research firm, Spears and Associates, the two companies have meaningful overlaps in at least 10 product lines. These overlaps create a challenge for Halliburton's management in securing approval of the transaction from regulators both in the U.S. and other foreign jurisdictions where the companies operate. Besides seeking regulatory approvals, Halliburton still needs to convince its customers that: bigger will be better.

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According to correspondence released by Baker Hughes as the negotiations were underway, the transaction was first proposed by Halliburton on October 13th, after both companies had released their third quarter 2014 financial results. Both managements commented to the investment community about their financial results and their respective views of future business activity in light of the then-recent fall in global oil prices. Halliburton's Chairman and CEO Dave Lesar spoke optimistically about the downturn being of short duration, while Baker Hughes Chairman and CEO Martin Craighead was more guarded saying that the industry correction would last longer and provide greater business challenges. After the *Dow Jones Newswire* broke the story of the discussions in the early afternoon of Thursday, November 13th, Halliburton declined to comment while Baker Hughes acknowledged the talks but said it would have no further comment. Surprisingly, the price of the companies' shares rose immediately after the news report and then continued to climb the following day, signifying that Wall Street believed the combination would be positive for both companies, although there had been no hint of the potential terms of the deal, which would impact the value of the deal for each company.

As the negotiations between the two managements and their advisors progressed on Friday, November 14th, the media was

The prospect of a protracted proxy fight seemed clear unless an agreement was reached

franticly sampling the views of Wall Street energy analysts and antitrust lawyers about the possible terms of a deal, whether the transaction made business sense, and the regulatory hurdles that it might have to overcome. About the time the ink was dry on these articles, news broke that the discussions had broken down over the purchase price (it appeared from the Baker Hughes letters and emails exchanged with Halliburton) and the terms of divestments. Almost immediately Halliburton notified Baker Hughes it was prepared to nominate a slate of directors to oppose the current Baker Hughes board of directors at the 2015 annual meeting. Prospects of a protracted proxy fight seemed clear absent a deal.

The transaction announcement also disclosed that Halliburton had identified businesses generating $7.5 billion in revenues that would be sold

In the early morning hours of Monday, November 17th, came the announcement of the deal in which Halliburton would offer 1.12 shares and $19 in cash for each share of Baker Hughes, valuing the company at $78.62 a share, more than a 40% premium over where the stock had been trading. The transaction announcement also disclosed that Halliburton had identified businesses generating $7.5 billion in revenues that would be sold, and that the company and its advisors had already identified candidates to buy these businesses. Due to the antitrust hurdle and the perceived harm that would be done to Baker Hughes if the deal had to be abandoned, Halliburton agreed to pay Baker Hughes $3.5 billion. It subsequently was disclosed that Baker Hughes would pay Halliburton $1 billion if the deal failed to close due to various conditions. The transaction should close during the second half of 2015 after all regulatory approvals are secured.

We were reminded of a similar management hardball negotiating episode during the creation of Baker Hughes

As we pondered over the weekend following the announcement of the talks the prospect of a proxy fight in the spring, we were reminded of a similar management hardball negotiating episode during the creation of Baker Hughes. In early 1987, the energy business was still reeling from the first half of 1986's oil price collapse engineered by Saudi Arabia. By the spring (May 18th) of 1987, the domestic active drilling rig count stood at 744 rigs after having fallen by 84% from the industry's 1981 peak of 4,530 active rigs. Not only was demand for oilfield service at a low, but pricing discipline in the industry had been destroyed by the desperate actions of smaller, financially-weak competitors who were willing to discount their services and products merely to generate cash.

Justice demanded that Baker sell Reed Tool, its tri-cone drill bit manufacturing business, and Baker Lift, its manufacturer of downhole electric submersible pumps

In the fall of 1986, Baker Oil Tools, as the company was then known, had approached the Hughes Tool Company with an offer to merge. A deal was struck. The problem was that the Reagan Justice Department announced it would sue to block the merger on antitrust grounds unless two divisions of Baker were sold. Justice demanded that Baker sell Reed Tool, its tri-cone drill bit manufacturing business, and Baker Lift, its manufacturer of downhole electric submersible pumps. Both businesses competed with Hughes, and the government believed that their combination would significantly reduce competition in the oilfield service industry.

Hughes demanded that the consent decree agreed to between Baker and the Justice Department be changed to provide for the government's prior approval of the sale of the domestic operations of Baker Lift to Trico Industries and the sale of Reed Tool, before Hughes shareholders would vote on the merger

The board and management of Hughes became concerned that if it voted to approve the merger before these businesses were sold, it would potentially be exposed to having to financially support these businesses during a long sale process. Hughes was also concerned that the sales might obligate it to license the buyers with Hughes technology, probably the greater concern. Both conditions were estimated to impact the value Hughes shareholders would have following the merger. Therefore, Hughes demanded that the consent decree agreed to between Baker and the Justice Department be changed to provide for the government's prior approval of the sale of the domestic operations of Baker Lift to Trico Industries and the sale of Reed Tool, before Hughes shareholders would vote on the merger. Baker claimed it had numerous inquiries from parties interested in buying Reed Tool, but it had not agreed to final terms. In early March 1987, Hughes said that if the Justice Department merger conditions were changed by April 22nd, the last date the merger agreement remained valid, the merger could still be completed within the agreement's proscribed time limit.

As Hughes became increasingly reluctant to complete the transaction, Jim Woods, Chairman and CEO of Baker called Jim Lesch, the Chairman and CEO of Hughes Tool, to arrange a private meeting between the two men

When Hughes' objections to the Baker and Justice agreement became public and Hughes was forced to delay its shareholder vote at least three times, relations between the two companies grew testy. As Hughes became increasingly reluctant to complete the transaction, Jim Woods, Chairman and CEO of Baker called Jim Lesch, the Chairman and CEO of Hughes Tool, to arrange a private meeting between the two men. The meeting was scheduled for the board room at Hughes' headquarters in the Texas Commerce Building in downtown Houston, as the company had recently relocated its executive management team from its Polk Avenue plant, the historical home of the company. Baker was headquartered in Southern California, although it had an executive office in Houston. As part of the merger agreement, the headquarters of the merged company would be located in Houston.

The gentleman accompanying Mr. Woods was famous Houston lawyer Joe Jamail

That afternoon, Mr. Lesch was surprised when his boardroom door opened and Mr. Woods walked in accompanied by another gentleman. Mr. Lesch knew immediately that Mr. Woods, a notoriously tough executive, was here to play hardball. The gentleman accompanying Mr. Woods was famous Houston lawyer Joe Jamail. For those unfamiliar with that name, Mr. Jamail was the attorney who represented the Liedtke brothers, long-time friends, and one of their companies, Pennzoil, in a suit against Texaco for tortuous interference in their agreement to buy Getty Oil Company. Mr. Jamail, a tough-nosed and aggressive Texas personal injury lawyer, known as the "King of Torts," had outmaneuvered a team of high-priced New York City and prominent Houston lawyers and secured a $10.53 billion judgment against Texaco that ultimately forced the company to file for bankruptcy because it could not pay the judgment. The presence of Mr. Jamail convinced Mr. Lesch that Hughes had little choice but to complete the deal on Baker's terms. Immediately after the merger was completed, the two targeted

businesses were sold. Baker Lift was sold to Trico and Reed Tool to Camco, Inc.

Each of these gentlemen built successful companies and trained talented executives who took the respective companies on expansion and acquisition routes that ultimately led to them becoming the second and third largest global oilfield service companies

One or two of the news stories about the Halliburton and Baker Hughes deal mentioned the founders of each company – R.C. Baker of Los Angeles, California and Earl Halliburton of Duncan, Oklahoma. One was an engineer/inventor of downhole oil tools while the other was an oilfield entrepreneur and problem-solver. Each of these gentlemen built successful companies and trained talented executives who took the respective companies on expansion and acquisition routes that ultimately led to them becoming the second and third largest global oilfield service companies. Each company has had an eventful and colorful history, marked by numerous acquisitions – some of which were equally as strategically important in the evolution of each firm as the current transaction is in creating a strong competitor to industry leader, Schlumberger Ltd. (SLB-NSYE).

We see this deal as a natural response to the new demands on the oilfield service industry as a result of the shale revolution and the migration of the search for oil and gas into more remote and hostile corners of the world

As someone who lived through much of the evolution of Halliburton and Baker Hughes into major oilfield service companies due to their acquisitions since 1970, we see this deal as a natural response to the new demands on the oilfield service industry as a result of the shale revolution and the migration of the search for oil and gas into more remote and hostile corners of the world. The nature of the service industry's customers is changing and the demands of their exploration and development efforts are different from only a few years ago. As many of the exploration and production companies are one-dimensional – shale, shallow water, deepwater, one-well international plays – their needs have become unique and more intense. On the other hand, the behemoths of the industry – the Independent Oil Companies and National Oil Companies - are increasingly developing barbell-shaped E&P strategies. They will marry long-term, high return projects - deepwater or arctic E&P - with short-term output and cash flow generating efforts such as the shale plays. One strategy gives managements the opportunity to grow production quickly and to generate cash returns faster, helping to satisfy the demands of investors, while the other end of the barbell offers the prospect of finding and developing large reserve deposits providing high returns on investment but that require years of heavy investment before first oil, and cash returns are generated. While each E&P strategy will be different, they are similar in that each requires greater operational coordination and performance along with increased technology than the oilfield has traditionally delivered, putting more demands on oilfield service companies. The Halliburton-Baker Hughes transaction likely signals the first stage of the next transition of the oilfield service business. These industry demands justify the hardball negotiating tactics engaged in by Halliburton just as they did for Baker Hughes in 1987. As experienced in almost every transition phase, it coincides with a new and lower oil and gas price environment. We anticipate that as we look back at the oilfield service industry from the perspective of

being on the other side of the valley the industry is descending into, the structure of the industry will look meaningfully different than it does today.

Buffalo Walloped By Snow; Rhode Island By National Grid!

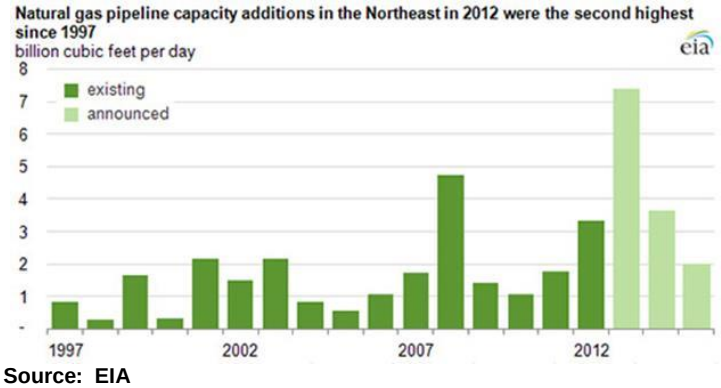
Since Rhode Island's winter electric rates do not go into effect until January 1st, customers were in the dark longer than their northern neighbors before learning of the 23.6% hike

"Wallop" has become a popular term to describe the aftereffects of events – the Democrats' mid-term election results, Buffalo after a lake-effect snow storm, and Rhode Island electricity customers after National Grid's (NGG-NYSE) winter rate increase. Electricity customers in the state had been forewarned by the utility to expect a big rate hike when the company leveed its 37% rate increase on Massachusetts' customers effective December 1st. Since Rhode Island's winter electric rates do not go into effect until January 1st, customers were in the dark longer than their northern neighbors before learning of the 23.6% hike. According to National Grid, this rate increase will take the typical electricity consumer's bill from $88 a month to $109 - Merry Christmas!

Between 2000 and 2013, natural gas used in generating electricity in the region has increased from 15% to 46% of the fuel supply

As we have written about in the past, the New England power market has transitioned from dirtier fossil fuels – coal and oil – in favor of the cleaner natural gas. In fact, between 2000 and 2013, natural gas used in generating electricity in the region has increased from 15% to 46% of the fuel supply. That shift will continue as several large coal-fired power plants in Massachusetts (Salem Harbor's 585 megawatt (MW) and Mt. Tom Station's 150 MW plants) and the Vermont Yankee nuclear plant (615 MW) have closed or will close by year-end. Add to those significant plant closures the impact on the region's fuel supply mix from the closure of several smaller oil-fired power plants in Connecticut plus the need for back-up power to support wind and solar projects in the region and the new offshore wind projects in Rhode Island and Massachusetts scheduled to come on stream in the next two years. While the increase in natural gas demand is a boost for gas producers, it creates serious problems for the transporters and, in turn, their utility company customers.

Exhibit 15. Past Capacity Expansion Has Yet To Occur

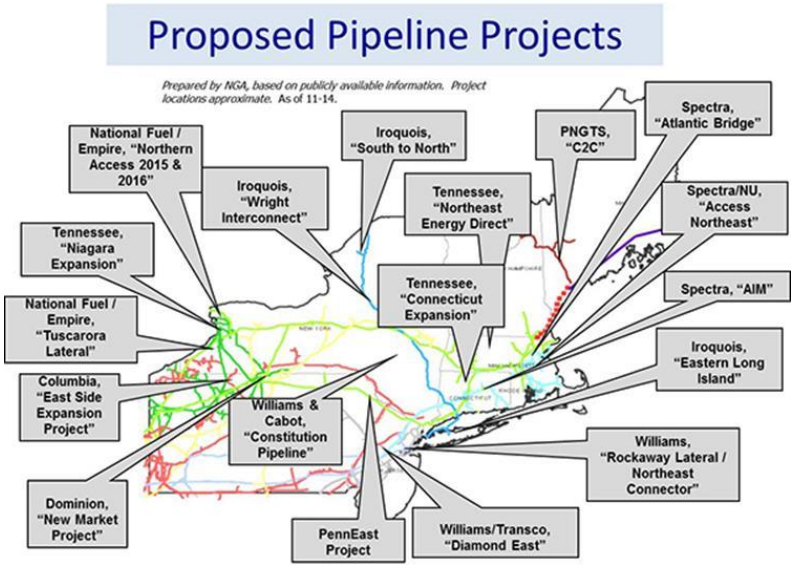


Source: EIA

Both pipeline systems have projects to expand their delivery capacities but they are being fought by environmentalists

There are two primary pipelines that bring natural gas into New England – the Texas Eastern and the Tennessee Natural Gas systems, owned by Spectra Energy (SE-NYSE) and Kinder Morgan (KM-NYSE), respectively. Algonquin Gas Transmission, an affiliate of Texas Eastern, moves gas supplies from the New York City area north through Connecticut and Rhode Island and into the Boston, Massachusetts region. The Tennessee Natural Gas system brings gas into western Massachusetts via New York State and then sends some of it north into New Hampshire. Both pipeline systems have projects to expand their delivery capacities but they are being fought by environmentalists.

Exhibit 16. New England Gas Capacity Should Be Expanded



Source: NortheastGas.org

During severe winter weather events spot gas prices can soar to $100/million BTUs, as they did last winter

The challenge for the electricity utilities that are increasingly relying on natural gas to power their generators is that their access to gas supplies is usually tied to interruptible supply contracts, which makes the gas purchases subject to spot prices and volumes, meaning that the utilities stand last in line for gas supply. As natural gas prices tend to rise during the winter, often to ten times the price at Henry Hub ($40/million BTUs versus $4/thousand cubic feet of gas, which are roughly equivalent energy values), during severe winter weather events spot gas prices can soar to $100/million BTUs, as they did last winter. At the present time, natural gas for January 2015 delivery in New England costs roughly $19/million BTUs. This is slightly more expensive than the cost of delivered liquefied natural gas in Japan that currently costs $18/million BTUs.

Natural gas prices first spiked during the winter of 2010-11, but then eased the following winter. Prices were higher during the winter of 2012-13 and higher still last winter due to the extreme cold associated with the polar vortex. According to National Grid, it spent

The ironic point about the New England energy market is that as electricity prices are driven up by natural gas prices, the cost of heating a home with gas in the region is going down by 1-3% in Massachusetts and 8.3% in Rhode Island

$5 billion on gas supplies in New England last winter, whereas it spent $5.2 billion on gas for all of calendar 2012. The Independent Supply Operator New England (ISO New England) estimates that natural gas prices this winter will be essentially flat with those of last winter, assuming this winter is more normal. ISO New England estimates that a normal winter's temperature will be 7^{o} F on average, resulting in a peak power demand of 21,085 MW. A cold winter will see temperatures average 2^{o} F with a peak power demand of 21,705 MW. The ironic point about the New England energy market is that as electricity prices are driven up by natural gas prices, the cost of heating a home with gas in the region is going down by 1-3% in Massachusetts and 8.3% in Rhode Island.

Without additional pipeline capacity, or a change in regulations allowing utilities to sign long-term gas supply contracts, consumers will face ever higher winter power bills

The challenge New England residents face is that as demand for natural gas grows due to the environmental push to reduce the use of oil and coal for generating electricity in the region and for back-up for renewables-based power sources, pipeline capacity needs to expand. These same environmentalists who have pushed for increased use of cleaner fuels are fighting those infrastructure expansion projects. Although pipeline capacity was only maxed out for 40 days in 2013, the total days of maximum throughput this year will likely to be higher, especially if we experience a cold winter as increasingly seems to be the outlook. Without additional pipeline capacity, or a change in regulations allowing utilities to sign long-term gas supply contracts, consumers will face ever higher winter power bills. New England already is experiencing population outmigration and a weak regional economy, both conditions that would worsen with higher utility bills. At some point regulators, politicians and the public need to agree that moderately priced electricity is in the best interests of the general population in the region and to achieve that goal, the proposed pipeline expansion projects should move forward.

Renewables Tax Subsidies Continue To Drive Industry Growth

Since the wind turbines will stand taller than the top of Block Island, we should be able to see them once they are installed

Deepwater Wind's 5-turbine demonstration project offshore Block Island, Rhode Island, announced it had received its final permit allowing construction to begin during the summer of 2015. If the project meets the current timetable, these wind turbines might become the first offshore wind project for the United States. Exhibit 17 shows a map of the southern coast of Rhode Island, Block Island Sound that extends from the tip of Long Island, New York, to Block Island and Block Island. The row of dots southeast of the island is where the turbines will be located. The map was associated with a visual system that allowed people to click on a number to see what the wind turbines would look like from that point. Number 11 is to the west of where our summer house is located. In fact, we are just about where the Route 1 sign is positioned. On clear days, we can see Block Island from our upstairs office. Since the wind turbines will stand taller than the top of Block Island, we should be able to see them once they are installed.

Exhibit 17. Location Of Deepwater Wind's Turbines

Source: Treehugger.com

These articles are designed to show that wind and solar energy projects are now competitive with conventionally-powered energy projects, in particular with natural gas fired combined-cycle plants, the new target of environmentalists

More and more articles are discussing the rapid improvement in the cost of renewable energy projects. These articles are designed to show that wind and solar energy projects are now competitive with conventionally-powered energy projects, in particular with natural gas fired combined-cycle plants, the new target of environmentalists. A recent article in *The New York Times* focused on how these renewable projects are starting to win contracts versus conventionally-fueled plants. The article quoted results from a study by investment banking firm Lazard showing that utility-scale solar energy projects produced energy that cost as low as 5.6 cents a kilowatt-hour (kWh) and wind power at 1.4 cents/kWh. These costs compare to natural gas ones at 6.1 cents/kWh and coal at 6.6 cents/kWh. The report acknowledges that without subsidies, solar cost climbs to 7.2 cents/kWh while wind increases to 3.7 cents/kWh.

The price competition issue remains contentious due to the failure to include the cost of the backup power

Up until now, the argument against renewable energy has been two-fold: the power is too expensive and it isn't dispatchable, meaning that because the power is produced intermittently it cannot be counted on to be available when it is needed. The price competition issue remains contentious due to the failure to include the cost of the backup power that must be maintained by a utility when it employs renewables. Until significant breakthroughs occur in battery technology enabling the storage of energy produced by renewable power projects to be delivered when current output is not available (dispatchable), renewables will remain a niche power source.

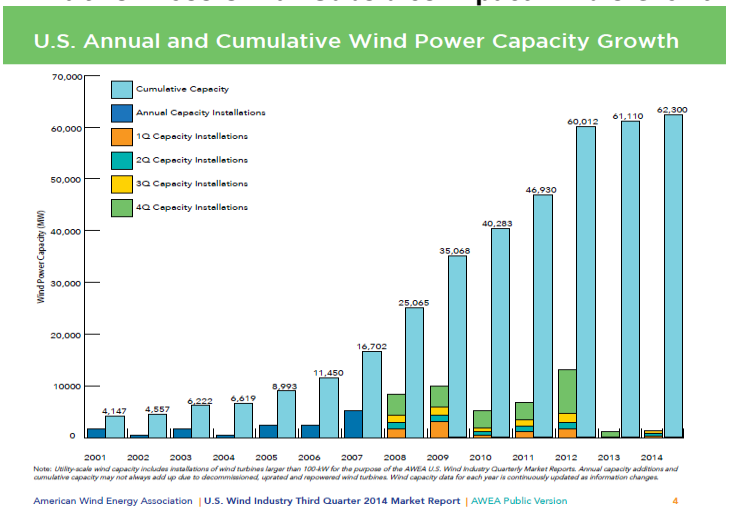
Wind energy subsidies have lapsed and solar federal tax subsidies at 30% are scheduled to fall to 10% at the end of 2016

Even though renewable fuels contend that they are competitive with conventional energy sources, state mandates for increased use of renewables and tax subsidies have driven their increased use. Wind energy subsidies have lapsed and solar federal tax subsidies at 30% are scheduled to fall to 10% at the end of 2016. Wind professionals are pushing for Congress to renew their tax credits and solar executives are pushing to extend the 30% rate. The wind tax

Without those credits, Berkshire Hathaway is no longer interested in new wind investments

subsidy has experienced several episodes of ending and then being reinstated so wind professionals are optimistic they can get it reinstated. The impact of the current tax subsidy extension is demonstrated in Exhibit 18 where the annual capacity additions in 2013 and 2014 are minimal compared to previous years. The significance of the tax credits to the wind energy business is best shown by the statement of Warren Buffett, head of Berkshire Hathaway (BRK.A-NYSE), that the only reason it has invested in wind energy projects is for the tax credits. Without those credits, Berkshire Hathaway is no longer interested in wind investments.

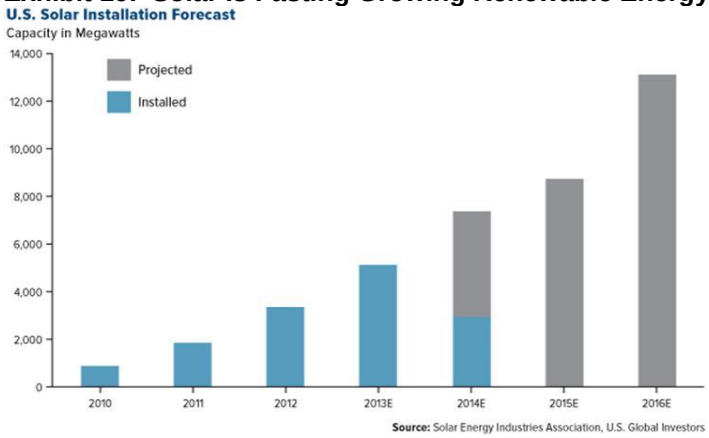
Exhibit 18. Loss Of Tax Subsidies Impact Wind's Growth



Source: AWEA

Lucrative solar tax credits along with the drop in the cost of solar panels helps to explain the rapid growth in new solar power capacity. That combination will drive the significant expansion in new solar capacity planned for the next two years.

Exhibit 19. Solar Is Fasting Growing Renewable Energy



Source: U.S. Global Investors

We are confident that renewables will remain a niche power source for decades to come, but that the niche will grow and erode the market for conventional power fuel sources

We continue to marvel at environmentalists' claims that renewables can eventually meet 100% of the planet's energy needs. These statements confirm the lack of understanding of basic energy principles and the state of energy technology, let alone the cost of renewables. We are confident that renewables will remain a niche power source for decades to come, but that the niche will grow and erode the market for conventional power fuel sources meaning less coal, gas and nuclear fuel will be needed in the future than suggested by unrestricted growth. Understanding the interaction of renewables within the global power market will be important for forecasting future energy requirements.

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