ENERGY INVESTMENT BANKING

MUSINGS FROM THE OIL PATCH

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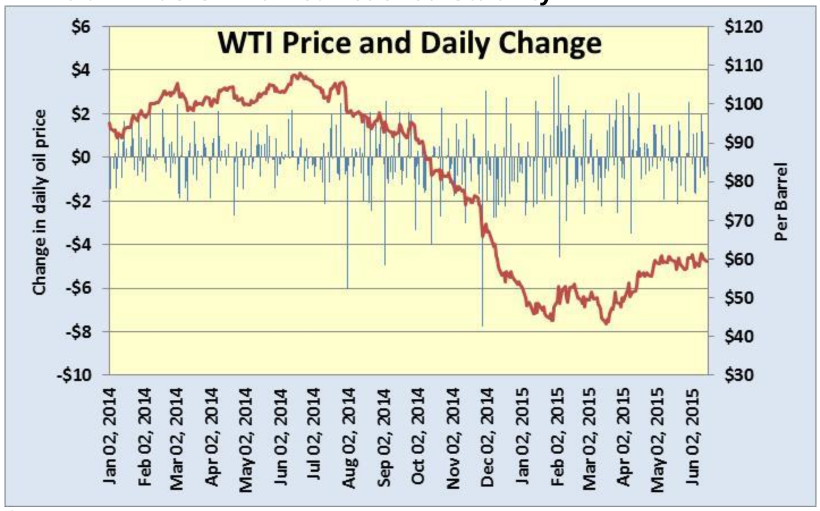
Note: *Musings from the Oil Patch reflects an eclectic collection of stories and analyses dealing with issues and developments within the energy industry that I feel have potentially significant implications for executives operating and planning for the future. The newsletter is published every two weeks,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

Has Saudi Arabia Already Won The Oil Price War?

Is there sufficient evidence to proclaim oil price stability at the $60 per barrel level?

Based on the dramatic fall in active drilling rigs and now the emerging fall in weekly oil production estimates, many in the industry and on Wall Street are feeling that oil prices are at a bottom and that we have experienced the worst of the market correction. Of course, many of these optimists were among the community of believers that Saudi Arabia would orchestrate a global oil production cut to support prices last November. We suspect many of the optimists were also among those most shocked by the speed of the drilling rig decline and the quick reaction by oil company managers to cut their capital spending. But now, these same optimists are heartened by the trading pattern of oil prices. In fact, one columnist pointed out recently that in the 41 trading sessions between April 1st and June 1st, WTI had risen 23 times and declined 18. The average daily increase was 30 cents, with 12 sessions posting an increase of over $1 against four posting a decline of over $1. He cited this trading pattern as confirming that the oil market has stabilized. To check that conclusion, we plotted in Exhibit 1 (next page) the daily change in WTI spot prices since January 1, 2014 to June 16, 2015. We also plotted the price of WTI. When one examines the chart, the visual picture of daily price changes on the far right looks more subdued than the period of time when WTI was falling and then bouncing off its low before retesting the low. That increased daily price volatility is not surprising given the turmoil the industry and oil markets were in due to the unanticipated actions of Saudi Arabia and OPEC. What is interesting, however, is to examine the stability of oil prices during the first half of 2014 as reflected by the daily price change. That low volatility period was marked with oil prices rising from the high $80s to $107 a barrel, the peak price in 2014 and for this cycle. Is there sufficient evidence to proclaim oil price stability at the $60 per barrel level? We don't know. We could make that argument, but then again we have no vested interest in making oil price calls.

Exhibit 1. Has Oil Market Reached Stability?



Source: EIA, PPHB

We thought the goal was twofold – restart global oil demand and shutdown new long-term oil supplies – most particularly Canada's oil sands and deepwater exploration

The important question for the oil industry is whether a $60 a barrel oil price is low enough to accomplish Saudi Arabia's objective of reclaiming market share. At the time of the OPEC announcement, while most analysts assumed that Saudi Arabia was targeting North America's shale producers, or possibly that their decision was designed to hurt the economies of Iran and their supporter Russia, we thought the goal was twofold – restart global oil demand and shutdown new long-term oil supplies – most particularly Canada's oil sands and deepwater exploration. We think the current evidence suggests that Saudi Arabia is accomplishing these goals.

We won't dwell much on the offshore drilling business, electing to revisit that market in a future article. However, there is clear evidence that offshore drilling activity is falling as offshore and deepwater drilling projects are being cancelled or delayed. There are reports that 200 offshore projects have been either delayed or cancelled so far this year.

Alberta has moved to double its carbon tax over two years, raising the carbon tax from $15 a ton now to $20 a ton in 2016 and $30 a ton in 2017

As far as Canada's oil sands are concerned, the evidence of capital spending cutbacks and their long-term impact on future oil output is becoming clearer. Saudi Arabia surprisingly has received some help in its efforts to derail oil sands output growth with the recent election of a new Alberta premier. The National Democratic Party (NDP) platform called for a review (hike) in royalties being collected by the province from its natural resource industries, primarily oil and gas. Additionally, the platform calls for a re-examination of the regulations on greenhouse gas emissions from the oil sands and other fossil fuel activities. Already, Alberta has moved to double its carbon tax over two years, raising the carbon tax from $15 a ton now to $20 a ton in 2016 and $30 a ton in 2017. Additionally, the amount of large-emitters carbon emissions reduction against a baseline will rise from 12% to 15% next year and 20% in 2017.

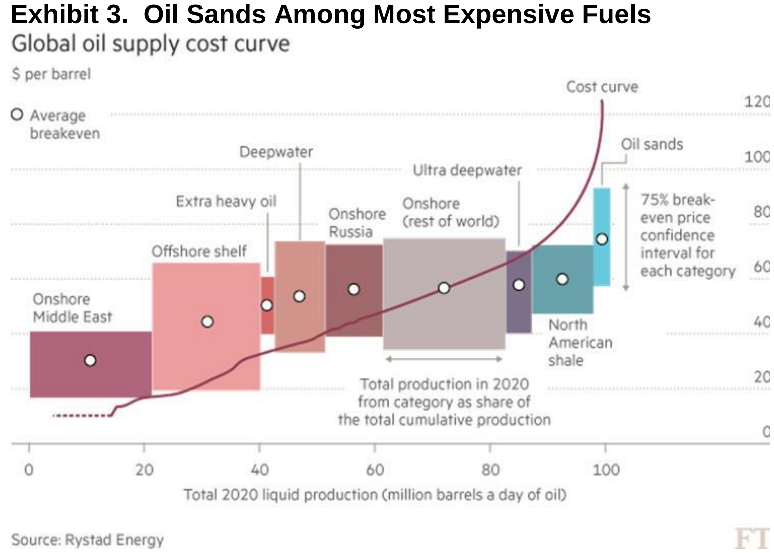
Exhibit 2. Where Oil Sands Are Found

Source: ***FT.com***

According to oil industry consultant Rystad Energy, new oil sands projects require a price of $100 a barrel in order to breakeven

The significance of the oil sands on global oil supply cannot be ignored. Over the past five years, oil sands output has grown by 1.1 mmb/d, fully one-fifth of the total oil production growth for North America. The impact of lower oil prices on the oil sands cannot be missed. Early in 2014, Western Canada Select, a heavy oil price market, was selling at $86 a barrel. By the end of March, that marker was trading below $30 a barrel. This is when, according to oil industry consultant Rystad Energy, new oil sands projects require a price of $100 a barrel in order to breakeven. What's been the impact of the price decline on the Canadian oil industry?

Exhibit 3. Oil Sands Among Most Expensive Fuels



Source: ***FT.com***

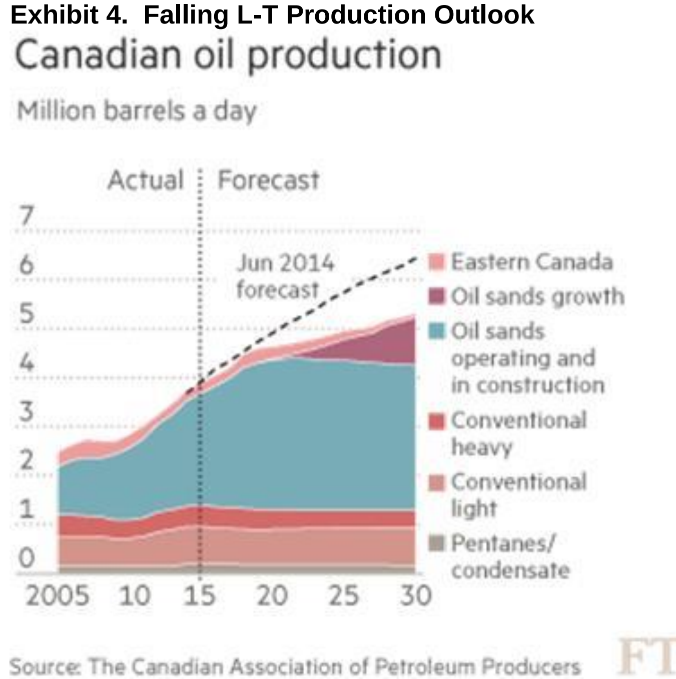
In February, Royal Dutch Shell withdrew its application to build a new 200,000 barrels per day (b/d) mine

In February, Royal Dutch Shell (RDS.A-NYSE) withdrew its application to build a new 200,000 barrels per day (b/d) mine at Pierre River, north of Fort McMurray. In May, the company announced it would delay for several years a new 80,000 b/d in situ oil sands project at Carmon Creek near Peace River. The significance of these projects is highlighted when one realizes that Shell currently operates 225,000 b/d of oil sands production. Other projects are being delayed as companies plan to bring much smaller in situ projects into production at a delayed pace in order to manage their cash flow and capital investment requirements.

A June 16th report from Ernst & Young LLP projects a 30% decline in Canadian oil sands spending

A June 16th report from Ernst & Young LLP projects a 30% decline in Canadian oil sands spending, bringing this year's investment to $23 billion, down from an expected $33 billion. The result of this spending decline and the announcements by several producers to stop or delay new oil sands mines and in situ projects means total oil production will be 17% lower by 2030 compared to the target output in the 2014 forecast provided by the Canadian Association of Petroleum Producers (CAPP).

Exhibit 4. Falling L-T Production Outlook



Source: *FT.com*

Suncor Energy has said it plans to replace 800 dump truck drivers with automated trucks at its oil sands mines

In addition to cutting new investment, oil sands producers are looking at ways to cut their operating costs to help improve their breakeven prices. Suncor Energy (SU-NYSE), a significant oil sands producer, has said it plans to replace 800 dump truck drivers with automated trucks at its oil sands mines. That move, which is a huge boost for autonomous vehicle technology, is projected to save the company C$200,000 per driver.

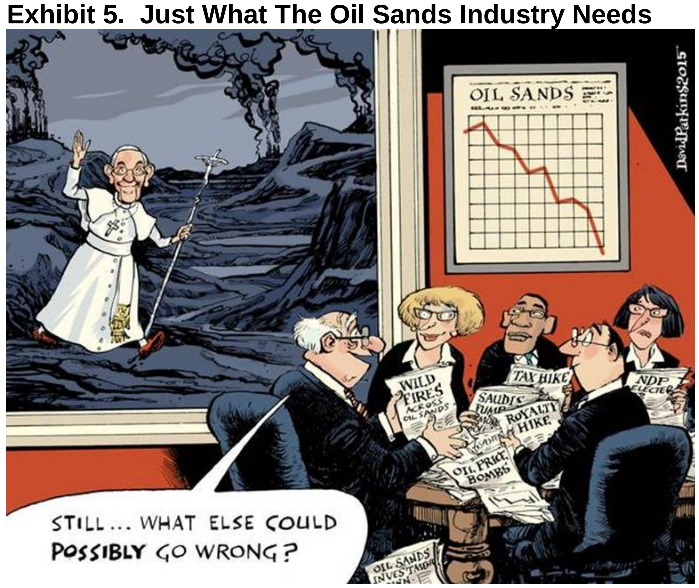
Logistical challenges will remain a problem for the industry until new export pipelines are constructed

While the economics of oil sands mines and in situ projects in light of low oil prices is a challenge for producers, it isn't the only challenge the industry faces. Besides the possibility of higher oil royalties and increased costs from more stringent greenhouse gas emissions, Canadian oil sands producers still face a challenge in getting this higher output to market. The continued delay in the approval of the Keystone XL pipeline to move more oil sands volumes to the U.S. Gulf Coast refining complex and eventually to export markets adds to producers' costs as they will have to rely more on rail for exports at higher-per-barrel costs than for pipeline transportation. Logistical challenges will remain a problem for the industry until new export pipelines are constructed.

oil sands producers face continued attacks from environmentalists

Additionally, oil sands producers face continued attacks from environmentalists who have made this oil product their rallying cry for keeping fossil fuels in the ground, i.e., stranding the assets for their owners. Now producers have to worry about the climate change battle being led by Pope Francis in advance of the Paris climate change summit in December.

Exhibit 5. Just What The Oil Sands Industry Needs



Source: David Parkins/*Globe and Mail*

The latest CAPP oil production forecast calling for considerably less oil sands output in 2030 is the first good news in Saudi Arabia's struggle to regain, and retain, lost oil market share

The favorable decision last August by the European Union panel considering whether or not to label oil sands output "dirty oil" and banning its use from the continent was hugely positive for Canadian producers. It was also a primary reason why, we believe, Saudi Arabia orchestrated the oil price decline. As a one product economy – crude oil and its refined products – Saudi Arabia needs to consider oil markets decades into the future. The latest CAPP oil production forecast calling for considerably less oil sands output in 2030 is the first good news in Saudi Arabia's struggle to regain, and retain, lost oil market share. Our belief is that we are still in the first half of the oil price war, but Saudi Arabia has scored a major victory. From here on, watch further oil sands project deferral announcements, further deepwater drilling and development postponements and falling U.S. oil production. Higher global oil demand growth projections will also help the OPEC, but the status of long-term oil production projects are the most important variable.

Natural Gas – The Rodney Dangerfield Of Commodities

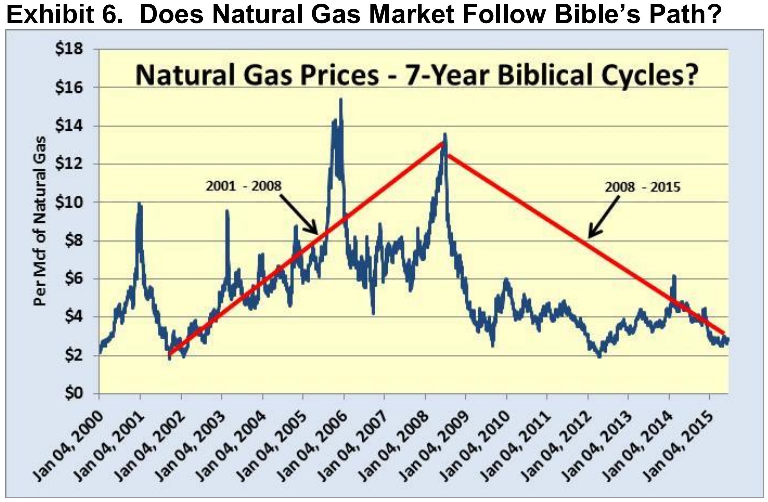
Every week drivers need to fill up their gasoline tanks so they know and understand both the level and movement of fuel prices

If we measure the importance of a commodity by column inches in newspapers and magazines or the thousands of words spoken on financial talk shows then crude oil is the hands-down winner. There are plenty of reasons for that interest – oil makes our world go round. True. Not many vehicles run on non-oil fuels. Oil is pivotal in geopolitical discussions. The daily oil price movements carry the same fascination as the Dow Jones Index, and with about the same explanatory value. However, the most important consideration is that Americans owned 252.7 million light-duty cars and trucks in 2014, according to consultant IHS, and even more vehicles today. Every week drivers need to fill up their gasoline tanks so they know and understand both the level and movement of fuel prices. Some people often equate gasoline price changes with smiley faces.

They may also identify with the lyrics to the song "I've been down so long, it looks like up"

While oil is drawing most of the media attention, the natural gas market has begun showing signs of life and possibly signaling it may be on the cusp of shifting from hugely over-supplied to more balanced, which means prices could be heading higher soon. For those active in the natural gas market, they have embraced the late comedian and actor Rodney Dangerfield's famous expression, "I don't get no respect." They may also identify with the lyrics to the song "I've been down so long, it looks like up," especially as they contemplate the latest Texas natural gas production data.

Exhibit 6. Does Natural Gas Market Follow Bible's Path?



Source: EIA, PPHB

Note that the last peak in natural gas prices was experienced in 2008, roughly seven years ago

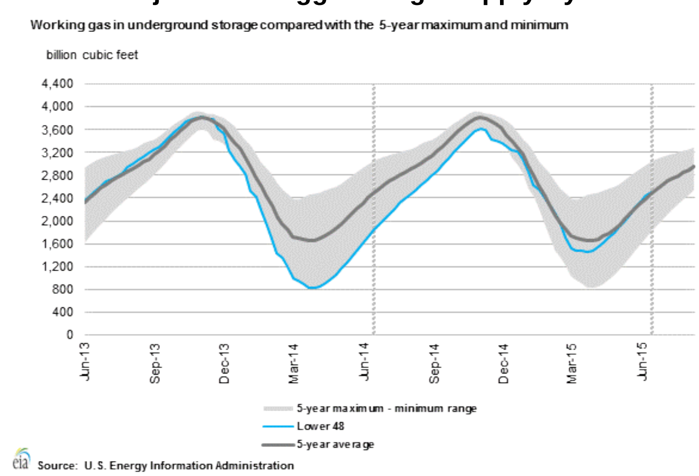
When we look at a long-term chart of daily natural gas futures prices, we wonder whether this industry has been driven by the Biblical phrase from the Book of Genesis describing Egypt's seven years of famine that would be followed by seven years of feast. Note that the last peak in natural gas prices was experienced in 2008, roughly seven years ago, and also roughly seven years after the prior low price point in the early years of this century.

While we started this year's gas storage injection season at a much higher level than 2014's season, we have averaged the highest weekly injection rate for any season since 1994, some 21 years

Last year, the greatest concern for the gas industry and energy investors was would there be enough gas injected into storage to assure gas users and buyers that adequate supply would be available during the depths of the next winter. As last year's winter was worse than the prior year's, which depleted gas storage inventory and caused prices to jump, the fact that natural gas producers were able to build storage to nearly 78% more than where they started the prior year's injection season, gave confidence to consumers. While we started this year's gas storage injection season at a much higher level than 2014's season, we have averaged the highest weekly injection rate for any season since 1994, some 21 years. This sharp growth in gas storage volumes has stimulated discussion among industry forecasters as to whether this winter's withdrawal season will start with over four trillion cubic feet (Tcf) in storage. Some forecasters believe storage volumes will be comfortably above that threshold while others believe the disparate supply sources and logistics challenges will prevent the industry from being able to store more than four Tcf of gas.

As we did last year, we have examined the current pace of the build in natural gas inventories and sought a comparable year to track how the actual storage supply growth tracks against our projection. So far, natural gas storage injections have been robust and are leading to the debate over that four Tcf threshold. Every week when the Energy Information Administration (EIA) publishes its estimate of

Exhibit 7. Injections Suggest Huge Supply By Season-end



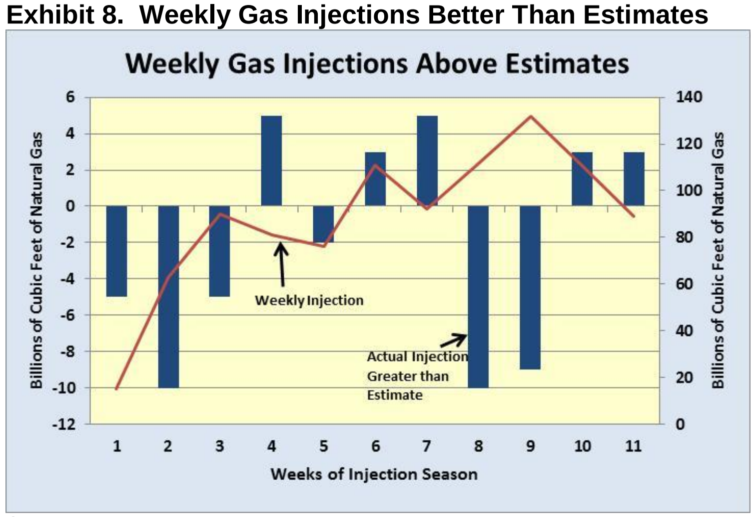
Source: EIA

the amount of gas injected into storage for the prior week, it offers a chart showing where the current gas inventory level is relative to the five-year high and low for weekly storage volumes. As shown in Exhibit 7 (prior page), current storage volumes are comfortably about at the mid-point of the five-year weekly supply inventory.

So far this season, weekly storage injections have largely exceeded the estimates of analysts

So far this season, weekly storage injections have largely exceeded the estimates of analysts. That signifies that natural gas consumption has fallen short of the demand component in analyst forecast models. If there has been a shortfall, it becomes interesting attempting to assess whether the shortfall is due to cooler temperatures reducing electricity demand for air conditioning or warmer temperatures that eliminate gas used for heating. Gas demand can also fall short of expectations due to reduced industrial use, something tied closely to economic activity, which presumably was lower than expected. For the first one-third of this injection season, the natural gas industry is averaging 88 billion cubic feet (Bcf) per week being injected into storage, a greater volume than was averaged during the early portion of last year's injection season.

Exhibit 8. Weekly Gas Injections Better Than Estimates

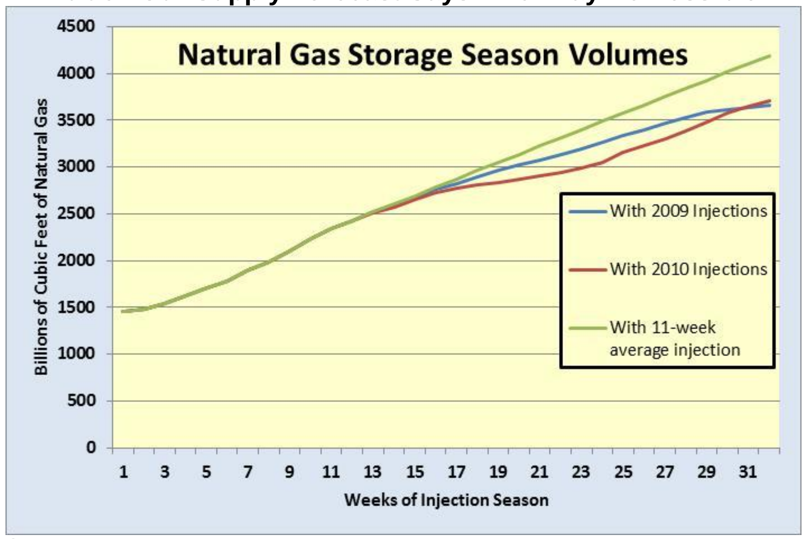


Source: EIA, PPHB

So far this year, the industry has injected 972 Bcf into storage, a volume that is unmatched at this point by any of the past 21 years of injection data

In order to determine which injection season(s) to use for projecting season-ending storage volumes, we began by looking for those years when initial volumes were relatively close to this year's starting volume. We found eight such years, all of them since 1999. We then examined the latest weekly storage level (week ending June 12, 2015, or the 11th week of the natural gas injection season). So far this year, the industry has injected 972 Bcf into storage, a volume that is unmatched at this point by any of the past 21 years of injection data. We found two years when the industry was able to inject more than 900 Bcf into storage – 2009 with 903 Bcf and 2010 with 905 Bcf. To develop another projection, we decided to use the 2015 weekly average injection volume. The three forecasts are presented in Exhibit 9 (next page).

Exhibit 9. Our Supply Forecast Says 4 Tcf May Be Possible



Source: EIA, PPHB

The forecast based on a continuation of 88 Bcf weekly injections leads to nearly 4,200 Bcf of gas in storage at the end of the season

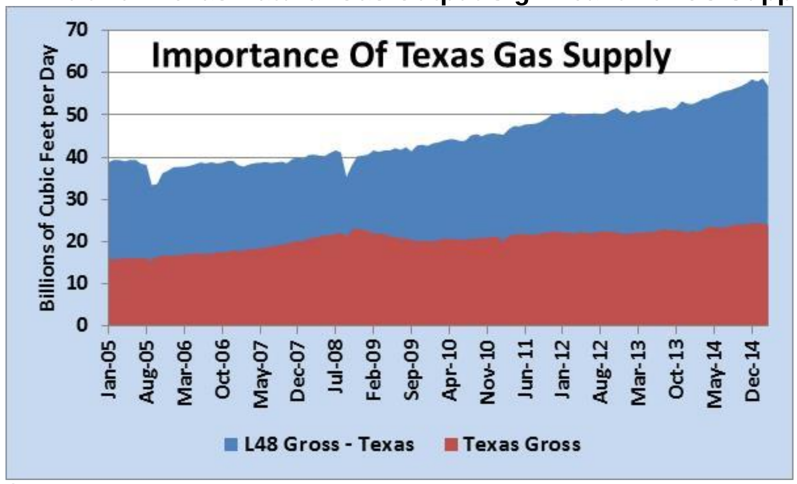
What this analytical exercise shows is that if from June 12th forward, the 2015 injection season follows the weekly injection patterns of 2009 and 2010, we will end up with 3,664 Bcf, 3,711 Bcf, or 4,193 Bcf of natural gas in storage at the start of the withdrawal season. As pointed out earlier, both the 2009 and 2010 injection seasons saw almost the exact same volume injected into storage, so where our forecasts wind up and the volume of gas injected over the season are nearly identical. The forecast based on a continuation of 88 Bcf weekly injections leads to nearly 4,200 Bcf of gas in storage at the end of the season, after injecting slightly over 2,700 Bcf of gas during the season.

The latest monthly data available (March 2015) shows that Other States output has almost flipped and is now 137% of Texas's gas production

Historically, natural gas supply was tied to output from a handful of states – principally Texas with important contributions from Oklahoma and Louisiana. Other meaningful sources of gas supply included Wyoming, New Mexico and the Gulf of Mexico. In January 2005, when the EIA began reporting the monthly gas output data collected on Form 914, Texas represented 150% of the natural gas volumes reported by all other gas producing states other than those named above. Included in the Other States category were Pennsylvania, Ohio and West Virginia, to name several states whose fortunes have been significantly changed with the industry's success in exploiting their Marcellus and Utica shale formations. The latest monthly data available (March 2015) shows that Other States' output has almost flipped and is now 137% of Texas's gas production. Still, Texas' output is significant for the nation's gas supply, so what happens in Texas remains important.

What the following series of charts demonstrate is how significantly Texas' natural gas production has fallen in recent months

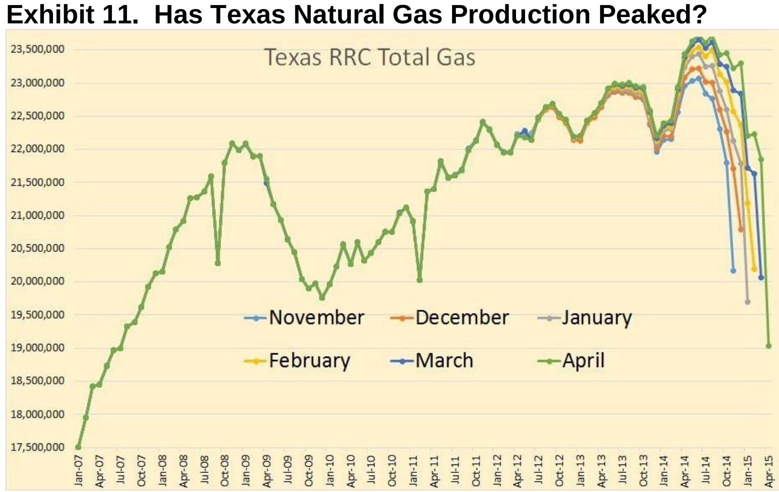
Exhibit 10. Texas Natural Gas Output Significant For US Supply



Source: EIA, PPHB

The Texas Railroad Commission recently reported preliminary production data through April. As usual, the preliminary data is incomplete and will be revised in later monthly releases. The impact of those revisions is that the initial production lines will rise. That trend is reflected in the following charts that cover a series of monthly releases since November 2014. What the following series of charts demonstrate is how significantly Texas' natural gas production has fallen in recent months, and even with upward revisions of the data, the growth in gas supply may be about to reverse, which will send gas prices higher.

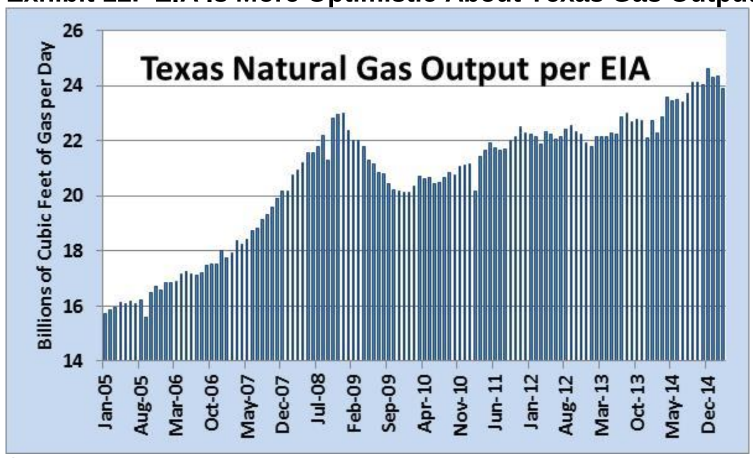
Exhibit 11. Has Texas Natural Gas Production Peaked?



Source: Dean Fantazzini, *OilPrice.com*

As we look at the state data, the original November 2014 natural gas output was estimated at slightly above 20 Bcf per day. By the latest release for April 2015's data, the November 2014 output had increased to an estimate of 22.25 Bcf per day. When compared to the EIA's Form 914's latest report of Texas gross gas production through March 2015, it shows November 2014's output at 24.04 Bcf per day, some 1.8 Bcf per day, or 8% greater, than the most recent Texas production estimate.

Exhibit 12. EIA Is More Optimistic About Texas Gas Output

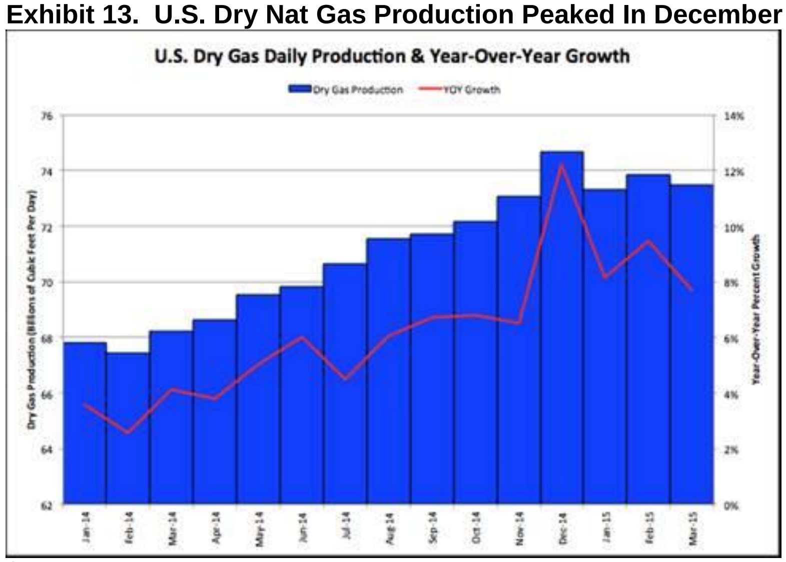


Source: EIA, PPHB

The most recent data from the EIA's Monthly Energy Report shows that U.S. dry natural gas production peaked in December

The EIA estimate for Texas natural gas production shows that output fell in March 2015 from the prior three months. The EIA reports that Texas gas output peaked in December at 24.60 Bcf per day and then fell in subsequent months to 24.31 Bcf, 24.33 Bcf and 23.91 Bcf per day, respectively. Is it possible that Texas will continue to be revised higher and eventually reach the EIA's estimates, or will the EIA be forced to revise its output estimates lower? The most recent data from the EIA's Monthly Energy Report shows that U.S. dry natural gas production peaked in December.

Exhibit 13. U.S. Dry Nat Gas Production Peaked In December

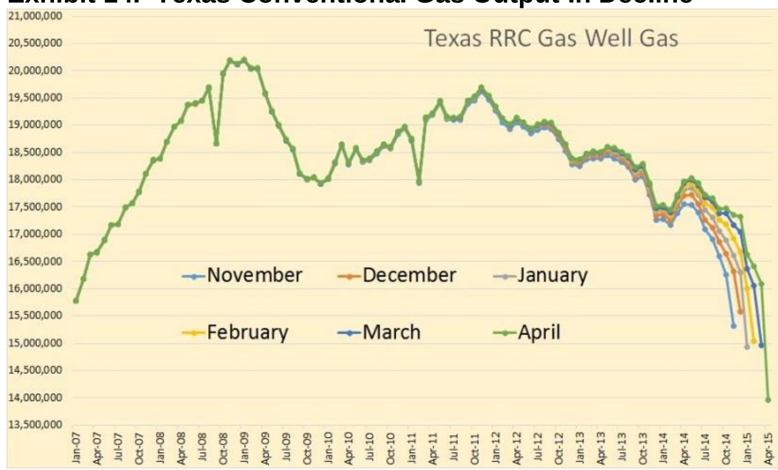


Source: EIA, Art Berman

The decline in the state's gas production has come largely from conventional wells

What is interesting when examining the Texas Railroad Commission data is to see that the decline in the state's gas production has come largely from conventional wells, especially as producing wells grow older. The data also shows the significance of associated gas output from oil wells, a phenomenon of the shale revolution, especially in the Eagle Ford formation.

Exhibit 14. Texas Conventional Gas Output In Decline

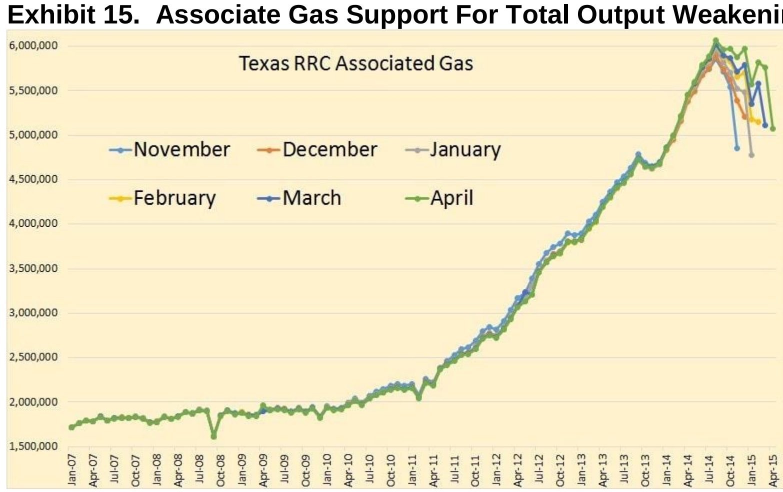


Source: Dean Fantazzini, *OilPrice.com*

The April production data shows that conventional gas well output peaked in the summer of 2008

The April production data shows that conventional gas well output peaked in the summer of 2008. It declined most likely in response to sharp capital spending cutbacks associated with the financial crisis and recession, but then slowly rebuilt output until it peaked in the fall of 2011. Since then, conventional gas output has steadily declined with brief rebounds before resuming the long-term decline.

Exhibit 15. Associate Gas Support For Total Output Weakening



Source: Dean Fantazzini, *OilPrice.com*

On the other hand, associated natural gas produced from oil wells has continued to grow since 2007 until it briefly peaked in the summer of 2013, but then continued growing until the most recent peak in April 2014. With the reduction in oil well drilling in the state due to the decline in oil prices, it is likely that associated gas output will continue to fall in the future.

If Texas' natural gas output is actually falling, it is hard to imagine that every other state's output is rising

If Texas' natural gas output is actually falling, it is hard to imagine that every other state's output is rising. That suggests that United States national gas output will soon begin declining, which will be reflected in higher natural gas prices. The higher price will be necessary to stimulate greater drilling for natural gas, something that hasn't happened for many years, especially since the success of gas shale drilling produced huge new supplies that overwhelmed the gas market and drove prices from double-digit levels down to the $2-3 per thousand cubic feet price range. If the Bible is a good forecaster, then stay tuned for a significantly different natural gas market than many currently anticipate.

The American Shale Revolution's Successes And Challenges

J.P Morgan Chase economists are predicting that the oil industry spending cutback will cost 2015 GDP 0.3% of its forecasted growth rate

The success of the American shale revolution is well acknowledged. It has proven to be one of the most disruptive forces for the energy industry. Somewhat less understood is that the shale revolution also has had a meaningful impact on overall economic activity. The downturn in petroleum industry spending this year is being cited as contributing to the weak first quarter gross domestic production of the United States, which fell by 0.2% based on the final revision to that estimate. J.P Morgan Chase (JPM-NYSE) economists are predicting that the oil industry spending cutback will cost 2015 GDP 0.3% of its forecasted growth rate. Offsetting that decline is their estimate that the lower oil prices will boost GDP by 1%. Those projections were made in early March before it became evident that oil industry spending would fall more than originally thought and that American consumers would save more of their gasoline price savings, limiting the boost to GDP growth. We continue learning about these disparate impacts from the shale output explosion, and we will likely continue to learn of other un-intended consequences.

In 2014, the growth in U.S. oil production alone exceeded the total increase in global oil demand, meaning that U.S. producers gained market share from all the other oil producers in the world

Most oil analysts attribute the decline in global oil prices to an orchestrated effort of members of the Organization of Petroleum Exporting Countries (OPEC), led by Saudi Arabia, to recapture market share lost to non-OPEC oil supply growth. A principal target has been U.S. shale producers who have dramatically lifted U.S. oil production, having increased output since 2011 from 5.5 million barrels a day (mmb/d) to the latest 9.6 mmb/d estimate. In 2014, the growth in U.S. oil production alone exceeded the total increase in global oil demand, meaning that U.S. producers gained market share from all the other oil producers in the world.

With crude oil prices hanging in the $100 per barrel range throughout much of 2014, Saudi Arabia was faced with the prospect of fighting further U.S. shale oil output at the same time global

Three times before, since 1973, when OPEC became the controlling force for setting global oil prices, Saudi Arabia led efforts to stem dramatic oil price declines

consumption remained constrained by the weight of high oil prices on global economic growth. Three times before, since 1973, when OPEC became the controlling force for setting global oil prices, Saudi Arabia led efforts to stem dramatic oil price declines. All three of those events were confluences of too much supply driven by the profit potential from high oil prices coupled with what turned out to be too little demand related to the economic stress caused by these high oil prices.

In 1998, following OPEC's decision to boost output in response to the perceived ramping up of demand in Asia rapidly turned into a glut when Thailand's real estate bubble burst taking the value of its currency with it and causing oil prices to collapse. In 2008, in response to the global financial crisis and recession, oil supply quickly swamped demand creating another oil price collapse. In both of those cases, Saudi Arabia was able to corral several other of the world's large oil producers – Russia and Mexico – in a concerted effort to reduce their oil exports in order to rapidly bring supply and demand back into balance thereby stabilizing oil markets and eventually leading to higher oil prices.

The one time that Saudi Arabia engaged in seeking a market solution to weak oil prices was in the mid-1980s

The one time that Saudi Arabia engaged in seeking a market solution to weak oil prices was in the mid-1980s. In 1985, after having fought to support global oil prices in the face of collapsing demand due to the 1981 recession and the long-lasting oil consumption impact from the 1970s' explosion in oil prices, Saudi Arabia altered its market-supporting tactics. From 10 mmb/d of output in 1981, Saudi Arabia had seen its oil production by 1985 fall to 3 mmb/d even though global oil prices had steadily declined. In 1981, foreign oil coming into the U.S. was priced in the mid-$30 a barrel (nominal dollars). As the oil oversupply grew, prices weakened into the high-$20s a barrel during 1983. Prices continued steadily drifting lower into the mid-$20s a barrel by 1985 before crashing to $10 a barrel in early 1986 after Saudi Arabia announced it would no longer play the role of OPEC's swing producer. Instead, Saudi Arabia boosted its output back toward the 10 mmb/d level it had been at in 1981. By the end of 1986, the other members of OPEC capitulated and agreed to cut their output, along with Saudi Arabia, in order to lift oil prices from the $10 a barrel level.

Saudi Arabia officials announced it was prepared to continue pumping its maximum output while letting the market establish the oil price

In 2014, Saudi Arabia elected early on not to play the swing producer role, a somewhat disconcerting decision for its fellow oil producers who had grown use to $100 a barrel oil prices that poured cash into their treasuries. As the shale oil producers were working their magic in the U.S. to boost output and drive down the country's crude oil import needs, the owners of the least costly oil in the world – Middle East producers – found it increasingly more difficult to sell their oil at high prices as demand slumped. Saudi Arabia officials announced it was prepared to continue pumping its maximum output while letting the market establish the oil price. Importantly, Saudi Arabia also announced it was prepared to live with "low" oil prices for up to two years, a duration sufficiently-long enough to impact both the economics and mindset of global oil producers.

Cheap capital, born from the easy money policy of the U.S Federal Reserve, became a force in reshaping the domestic energy business by encouraging rapid exploitation of shale formations throughout the United States

The shale revolution was born from the successful marriage of two technologies – horizontal drilling and hydraulic fracturing. These technologies had existed independently in the oil patch for many years. After being harnessed together by George Mitchell and his cohorts at Mitchell Energy, these technologies proved critical for economically tapping the toughest hydrocarbon bearing formations the industry was seeking to exploit. As important as these technologies were, it has been less appreciated the role "cheap" capital has played in the shale revolution's success. Cheap capital, born from the easy money policy of the U.S Federal Reserve, became a force in reshaping the domestic energy business by encouraging rapid exploitation of shale formations throughout the United States.

The success of these technologies produced huge initial well flows that in the case of natural gas overwhelmed demand causing prices to fall

Shale developments require substantial capital investment upfront in order for exploration and development companies to acquire the acreage over these large shale formations and drilling and completing wells. The nature of shale formations meant many wells were needed in the shale formations. These wells were expensive, often costing in the range of $10-15 million apiece. A large portion of the well cost was for hydraulically fracturing the wells to unlock the trapped hydrocarbon resources. The success of these technologies produced huge initial well flows that in the case of natural gas overwhelmed demand causing prices to fall. Crude oil and condensate had a better outlook since the U.S. was importing millions of barrels of oil that could be displaced with increased domestic output.

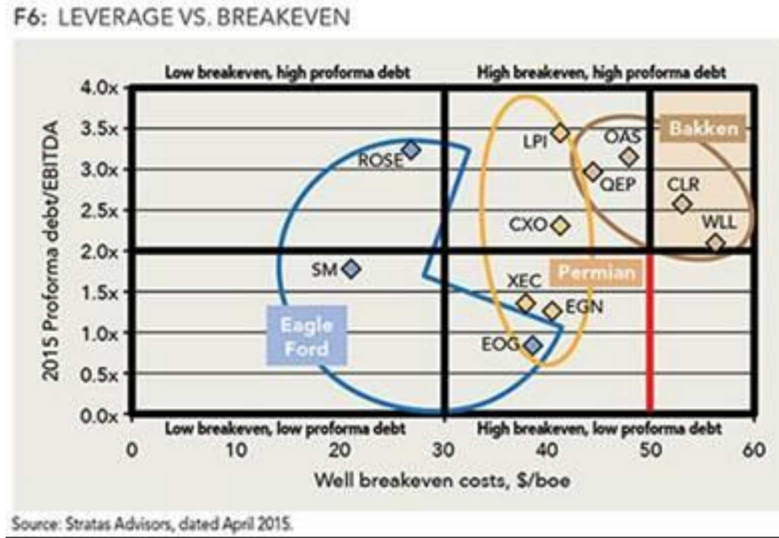
Shale was perceived as a "game changer" due to its ability to exploit challenging formations and because they appeared to be 100% productive – no dry holes

Shale was perceived as a "game changer" due to its ability to exploit challenging formations and because they appeared to be 100% productive – no dry holes – thus enabling producers to report huge resource/reserve growth boosting the value of companies. Despite the huge upfront capital investment, the prospect for building significant production and substantial asset values proved a magnet for attracting investment.

Initially, the capital flowed from Wall Street in the form of equity and debt

Initially, the capital flowed from Wall Street in the form of equity and debt. Independent producers with large shale acreage positions also attracted interest from large international oil companies (IOCs) and national oil companies (NOCs) who were willing to form joint ventures to exploit large swaths of shale acreage. These joint ventures usually involved significant upfront cash payments to compensate the E&P companies for its acreage investment and cost to develop the technology to exploit shale formations. The IOCs/NOCs also committed to fund part of the new well drilling costs. More cheap capital flowed in.

Exhibit 16. Different Shale Basins Have Different Economics



Source: ***OilPrice.com***

It was always about the huge future profits once the wave of initial investment in new wells slowed, so piling on more debt was considered prudent in pursuit of long-term profitability

About the same time the IOCs/NOCs arrived, private equity, always interested in creating new, rapidly growing companies, waded into the energy sector backing existing management teams at existing shale-focused E&P companies and seeking new management teams for start-ups. Money was no object despite the lack of profitability. It was always about the huge future profits once the wave of initial investment in new wells slowed, so piling on more debt was considered prudent in pursuit of long-term profitability.

"The companies in the Bloomberg index spent $4.15 for every dollar earned selling oil and gas in the first quarter, up from $2.25 a year earlier"

Unfortunately, profitability failed to arrive before global oil prices fell. The question now is what happens with all the debt the E&P industry has loaded on its balance sheets. According to Thomas Watters, an oil and gas credit analyst with Standard & Poor's, "The debt that fueled the US shale boom now threatens to be its undoing. Drillers' debt ballooned to $235 billion at the end of the first quarter, a 16 percent increase in the past year, even as revenue shrank. The problem for shale drillers is that they've consistently spent money faster than they've made it, even when oil was $100 a barrel. The companies in the Bloomberg index spent $4.15 for every dollar earned selling oil and gas in the first quarter, up from $2.25 a year earlier, while pushing U.S. oil production to the highest in more than 30 years. He went on to say, "The question is, how long do they have that they can get away with this?" He also pointed out that the companies with the lowest credit ratings "are in survival mode."

Exhibit 17. Shale E&P Companies Are Not Profitable

Tight Oil & Shale Gas Plays Are Not Profitable for Most Companies

Oil-Weighted	2014 FCF	2013 FCF	FCF Change	CF/CE	Debt/Equity	2014 DEBT	2013 DEBT	Debt Change
OXY	$451	$3,247	-$2,796	1.04	0.20	$6,838	$6,939	-$101
EOG	$402	$269	$134	1.05	0.33	$5,910	$5,913	-$3
MRO	$327	$504	-$177	1.03	0.30	$6,391	$6,597	-$206
WTI	-$46	$8	-$54	0.92	2.67	$1,360	$1,205	$155
SFY	-$80	-$229	$149	1.53	1.35	$1,075	$1,142	-$68
COP	-$350	$550	-$900	0.98	0.43	$22,565	$21,662	$903
CRZO	-$360	-$421	$61	0.58	1.22	$1,351	$900	$451
PDCE	-$392	-$236	-$156	0.38	0.58	$665	$605	$60
PVA	-$491	-$243	-$249	0.37	1.64	$1,110	$1,281	-$171
OAS	-$528	-$1,756	$1,228	0.62	1.44	$2,700	$2,536	$164
MUR	-$570	$48	-$618	0.85	0.35	$3,002	$2,963	$39
ROSE	-$570	-$1,237	$667	0.53	1.20	$2,000	$1,500	$500
MHR	-$581	-$520	-$61	0.03	1.78	$949	$880	$69
NFX	-$741	-$650	-$91	0.65	0.74	$2,892	$3,694	-$802
HES	-$810	-$970	$160	0.85	0.27	$5,987	$5,798	$189
WLL	-$1,153	-$650	-$503	0.61	0.99	$5,629	$2,654	$2,975
PXD	-$1,210	-$731	-$479	0.66	0.31	$2,665	$2,653	$12
CLR	-$1,361	-$1,176	-$185	0.71	1.21	$5,998	$4,716	$1,282
APA	-$2,419	-$1,385	-$1,034	0.78	0.43	$11,245	$9,725	$1,520
TOTALS	-$10,482	-$5,577	-$4,904	0.75	0.92	$90,331	$83,363	$6,968

Gas Weighted	2014 FCF	2013 FCF	FCF Change	CF/CE	Debt/Equity	2014 DEBT	2013 DEBT	Debt Change
ECA	$141	-$423	$564	1.06	0.98	$7,813	$7,668	$145
UPL	$100	$96	$4	1.16	-19.73	$3,378	$2,470	$908
PQ	$3	-$241	$243	1.02	3.53	$425	$425	$0
XCO	-$30	$30	-$60	0.92	3.81	$1,447	$1,891	-$444
KWK	-$116	-$153	$37	0.04	-1.85	$2,038	$1,989	$49
GDP	-$201	-$180	-$21	0.38	1.79	$569	$486	$83
CRK	-$234	-$262	$28	0.63	1.03	$1,070	$799	$272
TLM	-$242	-$696	$454	0.89	0.71	$5,274	$5,540	-$266
COG	-$243	-$170	-$73	0.84	0.50	$1,752	$1,147	$605
BBG	-$323	-$182	-$140	0.45	1.15	$829	$984	-$155
RRC	-$470	-$554	$84	0.67	0.94	$3,073	$3,141	-$68
XEC	-$489	-$248	-$241	0.77	0.35	$1,500	$924	$576
SGY	-$536	-$76	-$460	0.43	0.85	$1,041	$1,027	$14
AR	-$611	-$521	-$90	0.62	0.96	$4,363	$2,079	$2,284
CHK	-$673	-$1,962	$1,289	0.87	0.71	$11,555	$12,904	-$1,349
SD	-$951	-$645	-$305	0.40	1.95	$3,195	$3,195	$1
DVN	-$1,007	-$1,322	$315	0.86	0.58	$11,262	$12,022	-$760
APC	-$1,042	$1,167	-$2,209	0.89	0.69	$15,092	$13,565	$1,527
SM	-$1,063	-$277	-$786	0.58	0.92	$2,366	$1,600	$766
QEP	-$1,184	-$411	-$773	0.57	1.18	$2,273	$3,107	-$834
NBL	-$1,365	-$1,010	-$355	0.72	0.55	$6,241	$4,887	$1,354
SWN	-$5,006	-$344	-$4,662	0.32	0.45	$6,967	$1,950	$5,017
TOTALS	-$15,541	-$8,383	-$7,159	0.68	-0.01	$93,522	$83,798	$9,724

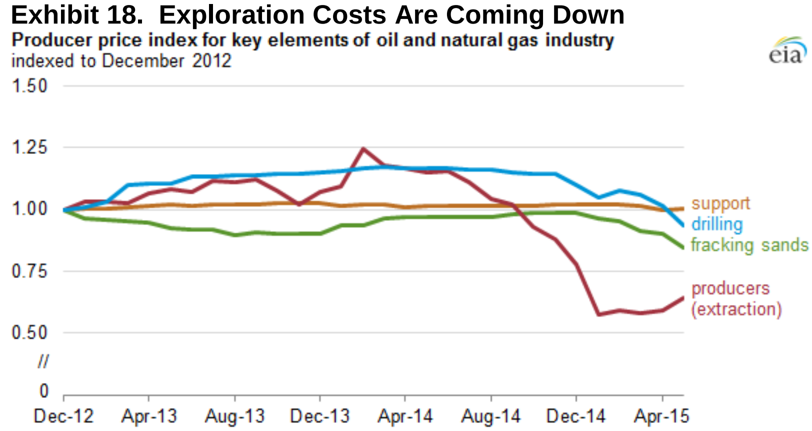
Source: Company 2014 10-K Filings and Labyrinth Consulting Services, Inc.

Source: Art Berman

We expect some cost indices will continue showing weakness through the end of 2015 as lower costs for long-lead-time items impact the data

With oil prices down, the need for E&P cost reductions quickly became evident and the pressure has become relentless. The impact of that pressure is shown by the latest producer price data from the U.S. Bureau of Labor Statistics for drilling components used by E&P companies in exploiting shale resources. We expect some cost indices will continue showing weakness through the end of 2015 as lower costs for long-lead-time items impact the data.

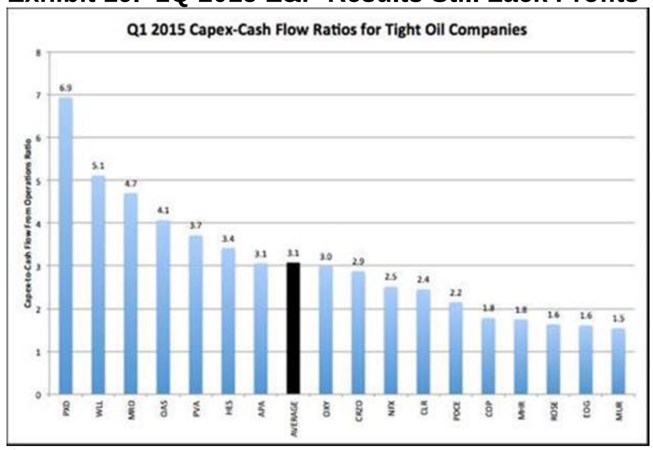
Exhibit 18. Exploration Costs Are Coming Down



Source: EIA

However, the success of cost cuts and drilling decline have yet to show meaningful improvement in the financial returns of tight oil producers according to 2015's first quarter reports.

Exhibit 19. 1Q 2015 E&P Results Still Lack Profits

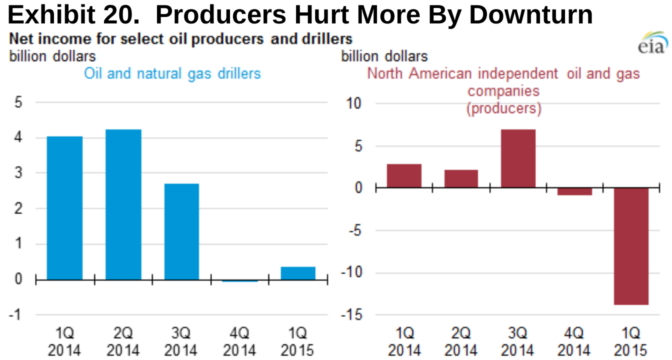


Source: Art Berman

Independent producers saw their profitability fall into negative territory for the past two quarters

The impact of this changed energy industry environment is shown in Exhibit 20. Profitability of drillers fell dramatically in the last quarter of 2014 and first quarter of 2015. Independent producers saw their profitability fall into negative territory for the past two quarters.

Exhibit 20. Producers Hurt More By Downturn

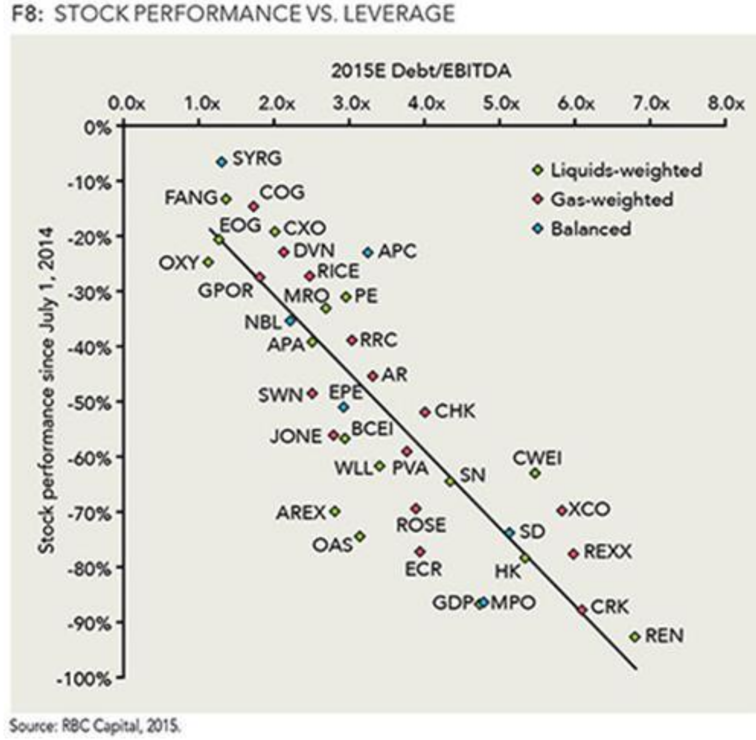


Source: EIA

The financial toll on both E&P and oilfield service companies has been significant

The financial toll on both E&P and oilfield service companies has been significant. Numerous companies have been forced to renegotiate lender agreements and/or have been forced into bankruptcy protection. Some highly-leveraged companies have been able to raise additional equity in an effort to reduce their heavy debt loads or provide them cash to continue operating.

Exhibit 21. Leverage Is Not Good For E&P Companies



Source: Opportune

That total was more than all the funds raised in 2014 and close to 2013's record of $11.4 billion

Despite the poor financial performance of shale producers and the oilfield service companies that support them, the industry's ability to continue attracting capital remains strong based on the amount of money raised. In the public arena, according to Liam Denning of *The Wall Street Journal*, as of June 19th, the E&P sector has raised $10.9 billion as reported by Dealogic. That total was more than all the funds raised in 2014 and close to 2013's record of $11.4 billion. Mr. Denning reported that the funds represented 31 stock issues this year and that those E&P issues on U.S. stock exchanges have outperformed the sector as a whole. A portfolio of these stocks, weighted by market capitalization, has produced a 4.3% return so far this year. Only 10 of the issues have underperformed the sector when measured by the issues' return since their equity was sold, relative to the E&P sector. They beat the E&P sector on a weighted-average basis by 5.5%.

Stock price outperformance shouldn't happen as selling shares is a dilutive action and can indicate balance sheet stress or profligate spending

As Mr. Denning pointed out, this outperformance shouldn't happen. Selling shares is a dilutive action and can indicate balance sheet stress or profligate spending on the part of the companies. He pointed to two equity raises by Diamondback Energy (FANG-Nasdaq) as an example of the outperformance. The company sold $106 million worth of new shares in January in order to raise funds to repay debt. In May, the company sold shares worth $342 million to help finance an acquisition. Both issues have outperformed the

E&P sector by double-digit performance. That record suggests that investors remain enamored with the long-term profit potential for shale producers.

Since 2009, there have been a total of 83 private equity energy funds closed and $103.2 billion raised

An additional consideration about the investment attractiveness of shale producers and oilfield service companies is the amount of capital held by energy-focused private equity investors. The latest data from Preqin, a chronicler of private equity and hedge fund investors, shows that in the first quarter of 2015, natural resources buyout private equity funds targeting North American oil and gas closed four investment funds and raised $17.6 billion. Since 2009, there have been a total of 83 funds closed and $103.2 billion raised.

Exhibit 22. Energy Private Equity Funds Growing

Natural Resources, Buyout Private Equity Funds for North America Oil and Gas*

Year	# of funds closed	Aggregate capital raised, billion $
2009	8	18.8
2010	10	6.5
2011	8	6.2
2012	16	16.8
2013	18	22.9
2014	19	14.5
2015 1Q	4	17.6
Total	83	103.2

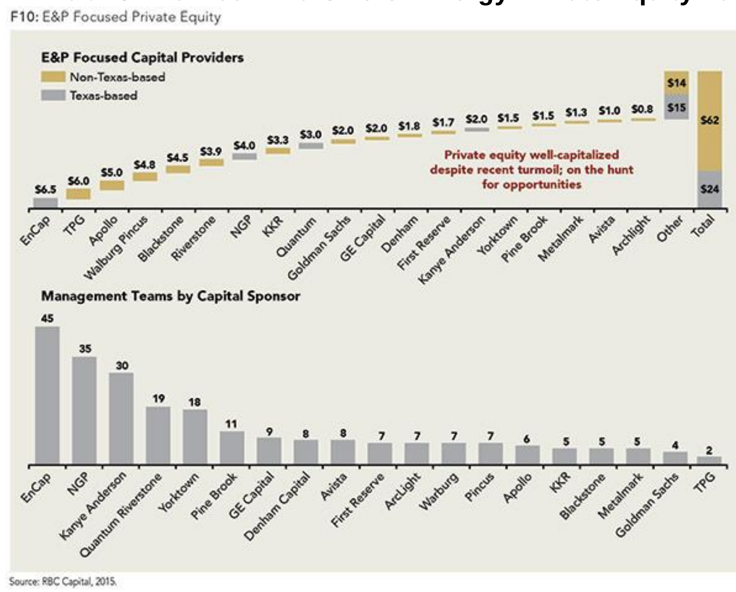
* The two main types of private equity funds investing in up-stream oil and gas are buyout and natural resources funds. The funds in this table predominately target oil and gas although some natural resources funds target other energy.
Source: Preqin

Source: *O&G Financial Journal*

The 19 identified private equity funds have backed 238 management teams in the E&P sector

Another compilation of private equity investors targeting the E&P industry earlier this year shows 19 leading private equity funds with a total of $57 billion of money. There is an additional $29 billion held by an undefined number of E&P private equity funds. The interesting point is that the 19 identified private equity funds have backed 238 management teams in the E&P sector.

Exhibit 23. Number And Size Of Energy Private Equity Funds



Source: Opportune

If Saudi Arabia is really targeting the American shale oil industry, it is difficult to imagine it has missed this capital sitting on the sidelines

What this vast pool of private equity capital targeting the E&P sector suggests is that despite sharply lower oil prices than last year, a stabilizing oil price at $60 a barrel coupled with lower drilling and production costs are lifting more shale plays into profitability. That prospect will whet the appetite of private equity investors. Shale producers' proclivity to spend all their cash flows plus any additional capital they can lay their hands on means domestic tight oil supply will continue growing and will eventually depress oil prices unless current conventional oil production falls or demand jumps. If Saudi Arabia is really targeting the American shale oil industry, it is difficult to imagine it has missed this capital sitting on the sidelines. Is it possible we will see more oil being pumped from the Middle East in order to depress oil prices?

Does Capex Spending Survey Reflect Exploration Optimism?

The earlier survey targeted a 4.8% reduction in 2015 global capital spending compared to actual spending in 2014, which has now increased to an estimated 20.2% cut

A recent mid-year survey of oil and gas company capital spending plans for 2015 and future years reflects a materially worse outlook for this year than Evercore ISI found in its prior survey conducted at the end of last year. The earlier survey targeted a 4.8% reduction in 2015 global capital spending compared to actual spending in 2014, which has now increased to an estimated 20.2% cut. As shown in the table in Exhibit 24 (next page), there are many important regional spending trends.

Exhibit 24. 2015 Capex Spending Cuts Have Grown

Figure 5. 2015 Global E&P Capital Spending by Company Type/Region – Comparison Vs. January Outlook ($B)

Regions	(June 2015) 2014A	(June 2015) 2015E	$+/-	%	(Jan 2015) % Chg	June vs Jan % Difference
U.S. Spending	181,283.6	119,270.3	-62,013.3	-34.2%	-8.4%	-25.8%
Canada Spending	53,092.8	34,894.1	-18,198.7	-34.3%	-20.0%	-14.3%
NAM Spending	$234,376.4	$154,164.4	-$80,212.0	-34.2%	-11.0%	-23.2%
Middle East	49,601.0	49,684.0	83.0	0.2%	15.3%	-15.1%
Latin America	70,311.6	60,596.0	-9,715.6	-13.8%	-3.5%	-10.3%
Russia/FSU	46,557.0	39,466.0	-7,091.0	-15.2%	-3.3%	-11.9%
Europe	41,144.6	36,240.1	-4,904.5	-11.9%	-5.4%	-6.5%
India, Asia & Australia	88,608.0	80,916.0	-7,692.0	-8.7%	-2.7%	-6.0%
Majors (Int'l Spending)	110,251.5	93,075.9	-17,175.6	-15.6%	-4.7%	-10.9%
Africa	23,779.0	21,552.0	-2,227.0	-9.4%	6.0%	-15.4%
NAM Independents (Int'l Spending)	20,226.4	13,092.9	-7,133.5	-35.3%	-6.8%	-28.5%
Other	56,700.4	42,793.2	-13,907.2	-24.5%	-2.9%	-21.6%
Int'l Spending	$507,179.5	$437,416.1	-$69,763.5	-13.8%	-2.1%	-11.7%
Worldwide Spending	$741,556.0	$591,580.5	-$149,975.5	-20.2%	-4.8%	-15.4%

Source: Company data, Evercore ISI Research

Source: Evercore ISS

Even though Middle East spending should increase, the rate of growth has fallen by 15.1 percentage points from last year's survey

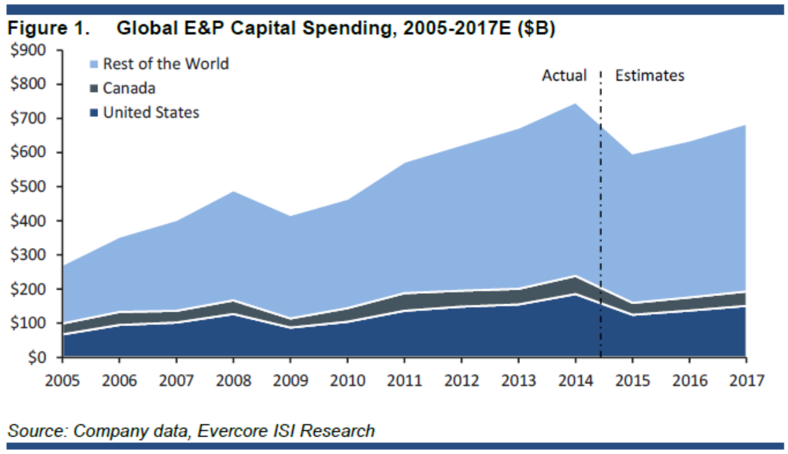
While the overall spending reduction is 15.4 percentage points higher in the recent survey versus the December 2014 survey, the U.S. spending reduction has increased by nearly 26 percentage points to a 34.2% cut. Capex spending in Canada is expected to decline by 34.3% according to the mid-year survey, a 14.3 percentage point increase from December. Interestingly, the Middle East, despite reduced capex spending, is still projected to post an increase in outlays in 2015, although up by only 0.2%. Even though Middle East spending should increase, the rate of growth has fallen by 15.1 percentage points from last year's survey. The two regions showing the smallest spending cuts are India, Asia & Australia, off 8.7%, and Africa, down 9.4%. The former region saw its spending projection fall by 6.0 percentage points, while that of Africa went from a positive 6.0% spending estimate for 2015 to a contraction of 9.4%, or a swing of 15.4 percentage points. The bottom line is that 2015 will be an extremely difficult year for the oil and gas industry and especially for those service companies that provide equipment and services.

2016's business recovery should kick-off a multi-year capital spending cycle

What was interesting about the survey, which focused extensively on the relationship between industry capital spending and its impact on the stock market performance of oilfield service companies, was the optimism about the pace of the industry recovery. A rebound in global oil prices coupled with upward projections for global oil consumption is viewed by both Evercore ISS analysts and exploration and production companies as driving capex outlays higher in 2016. Assuming that comes to pass, 2016's business recovery should kick-off a multi-year capital spending cycle.

A key statement in the report demonstrates the optimism of the industry as reflected in the survey results and Evercore ISS's oil price forecast. The report stated, "If history repeats itself, as we believe it will, Brent bottomed in January and prices will move methodically higher, averaging $70/bbl and $80/bbl in 2015 and 2016." The assumption is that since these forecasts reflect annual averages, year-end prices will be higher than prices at the start of

Exhibit 25. Future Capital Spending Is Projected Higher



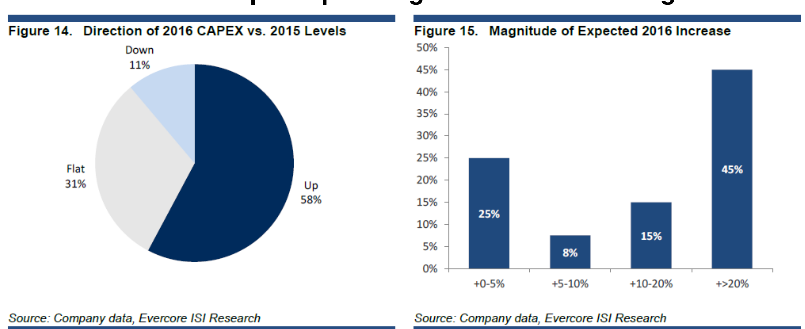
Source: Evercore ISS

the year. Therefore, the end of 2016 should see an oil price above $80 barrel, which would stimulate higher capex spending in 2017.

Some 60% of the companies expect to increase their outlays by more than double-digits

The significance of higher spending for oilfield service companies is shown in the chart in Exhibit 26 showing that 89% of respondents expect their 2016 spending to be flat or higher than what they anticipate spending during 2015. Of that percentage of companies leaning towards spending the same or more in 2016, some 60% of the companies expect to increase their outlays by more than double-digits, which is a very hefty growth rate.

Exhibit 26. 2016 Capex Spending Could Be Much Higher

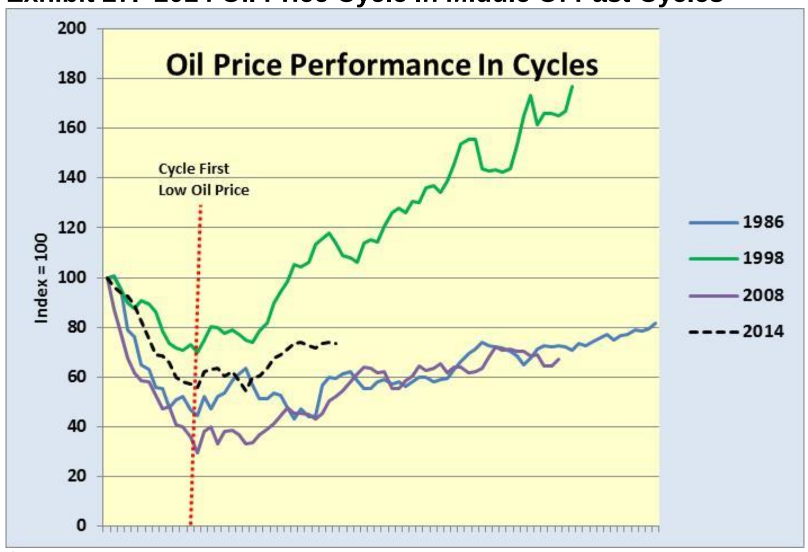


Source: Evercore ISS

They found that there was an R2 of 0.92 for the comparison of the current price cycle against the other V-shaped price recoveries

It appears that the Evercore ISS oil price projections are based on comparing the oil price decline and current rebound versus an average of the prior major industry down-cycles of 1986, 1998 and 2008. They found that there was an R^2 of 0.92 for the comparison of the current price cycle against the other V-shaped price recoveries. Based on that average price (indexed to 100 at 13 weeks before the low price of the cycles) a year from the low point will be 130 percent of the of the starting oil price when the downward cycle began. We thought that was an interesting analysis, but questioned the inclusion of 1986 as a "V-shaped" recovery. We understand how most analysts who were not involved in the business at that time, believe the 1986 "price war" waged by Saudi Arabia against its fellow Organization of Petroleum Exporting Countries (OPEC) members was a brief period in a more normal industry cycle.

Exhibit 27. 2014 Oil Price Cycle In Middle Of Past Cycles



Source: EIA, PPHB

The 1986 cycle was actually a part of a much longer industry downturn with the peak oil price being reached at the beginning of 1981 and not, as often assumed, in 1986

We decided to look at the weekly data indexed to the price a full quarter ahead of the cycle's first lowest price. We then extended the price plot for one year following the low. One condition that may create a difference between our analysis and that of Evercore ISS is how we treated the low point in the 1986 price cycle. The 1986 cycle was actually a part of a much longer industry downturn with the peak oil price being reached at the beginning of 1981 and not, as often assumed, in 1986. The 1986 price decline bottomed the week of April 4, 1986, and then began to rally. However, 13 weeks later, the oil price fell to a new low. Since we decided to plot the price action for the various cycles for one full year after the low price was established, we had a problem with 1986. Therefore, we elected to plot the year after the later low price to allow for the full effect of the recovery to play out. We also plotted each cycle independently rather than to average the other cycles as Evercore ISS did.

We also found it instructive to note the shape of the initial weeks in the recovery for all four cycles

With respect to the current price decline, it reached its low point with a smaller decline than experienced in either the 1986 or 2008 cycles. The 1998 cycle low was even higher than the low point for the 2014 cycle. We also found it instructive to note the shape of the initial weeks in the recovery for all four cycles. They appear to follow similar patterns, at least for the first few weeks. The 1986 pattern failed to rollover following its first few weeks of gains, but rather continued higher. It peaked at about the same point the other three cycles' declines bottomed and their prices began to rise.

We believe it is important to note that the global and the U.S. economy in 1998 were considerably different from today's economy, and even different from those of 2008 and 1986

We believe it is important to note that the global and the U.S. economy in 1998 were considerably different from today's economy, and even different from those of 2008 and 1986. The pattern of the 2014 cycle seems to be more comparable to that of the 2008 cycle, at least in its early phase, than to the 1998 cycle. If, as we believe, today's economic environment is more similar to those experienced in 2008 and 1986, then possibly the pattern for oil prices over the next 12 months of the 2014 cycle will more closely resemble the patterns of those cycles rather than the sharp upward price trend of the 1998 cycle.

If the 2014 oil price cycle follows the 1986 and 2008 patterns, then it is possible we won't reach that high-$60s a barrel price until sometime in 2016, meaning any spending rebound will be muted

This does not mean that oil prices cannot move higher in the future, but it is likely that any future oil price gains will be moderate. Will those increases be sufficient to drive substantially higher capex spending? Most of those E&P executives surveyed signaled that the higher spending increases in 2016 will require oil prices in the $60-69 a barrel range, with a sustained price of $65 a barrel or above. If the 2014 oil price cycle follows the 1986 and 2008 patterns, then it is possible we won't reach that high-$60s a barrel price until sometime in 2016, meaning any spending rebound will be muted.

Over-The-Road Trucks To Go On Fuel Diet

It is projected that for heavy-duty trucks to achieve the carbon emissions reduction, they will need to boost their fuel rating to close to 9 mpg

The Obama administration's Environmental Protection Administration (EPA) has proposed regulations to reduce greenhouse gas emissions from heavy-duty trucks, requiring that their fuel economy increase up to 40% by 2027 compared to levels of 2010. This is the next step in heavy-duty vehicle fuel economy efforts begun in 2011. Based on 2013 preliminary data, the latest available from the Energy Information Administration (EIA), tractor-trailers averaged 6.4 miles per gallon (mpg). It is projected that for heavy-duty trucks to achieve the carbon emissions reduction, they will need to boost their fuel rating to close to nine mpg.

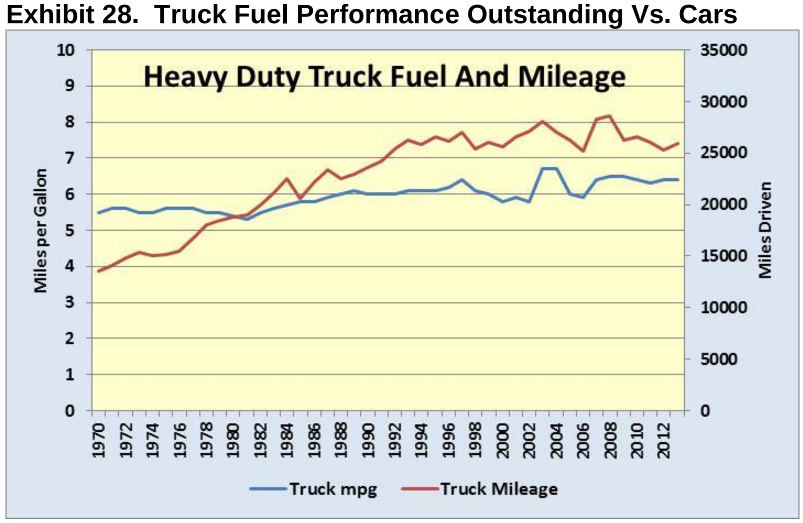
Estimates are that the fuel-economy push will add $12,000 to $14,000 to the manufacturing cost of a new tractor-trailer

Heavy-duty trucks have become a target of the EPA, environmentalists and the Obama administration because they are estimated now to account for a quarter of all greenhouse gas emissions from vehicles in the United States, even though they reportedly only represent 4% of traffic. This greenhouse gas emissions reduction effort is part of the Obama administration's goal of being credible on climate change when the Paris conference opens at the end of November. A big question is how this target, assuming it becomes a part of the final rule, can be achieved and what will be the cost of the effort. Estimates are that the fuel-economy push will add $12,000 to $14,000 to the manufacturing cost of a new tractor-trailer. New tractors can cost $130,000 to $180,000 while the trailer can cost anywhere from $30,000 to $80,000. That means new tractor-trailer units can cost $160,000 to $260,000, or more. If we assume the cost of the new technologies for boosting mpg ratings is assigned to the tractor, it means cost increases of anywhere from 8% to 9%.

That means the efforts will more likely have to address the tractor engine and transmission, suggesting that the final cost estimates may be understated

Many of the suggested fuel-saving steps have already been adopted by major trucking operators and truck manufacturers. Those include low-resistance tires, wind deflectors, wind skirts and engine governors. That means the efforts will more likely have to address the tractor engine and transmission, suggesting that the final cost estimates may be understated. As expected, the EPA claims that the increased vehicle costs will be recouped over the first 18 months by fuel savings.

Exhibit 28. Truck Fuel Performance Outstanding Vs. Cars



Source: EIA, PPHB

Between 1970 and 2013, heavy-duty trucks increased their fuel performance by 16%, increasing it from 5.5 mpg to 6.4 mpg

Between 1970 and 2013, heavy-duty trucks increased their fuel performance by 16%, increasing it from 5.5 mpg to 6.4 mpg. This improvement has come as the average mileage driven by these trucks has increased by 139% from 10,851 miles to 25,952 miles per year. At the same time, light-duty vehicles (cars and SUVs) have improved their fuel efficiency from 13.5 mpg to 23.4 mpg, or a 73% improvement. However, average annual vehicle-miles-driven by light-duty vehicles have only increased by 13%, going from 9,989 to 11,244 miles. On the surface, one would argue that it is time for trucks to increase their fuel performance and to reduce their carbon emissions. The greatest gains in truck emissions reductions have come in the area of nitrous-oxide and particulate (soot) emissions where the reductions have been over 98%. No longer do you see those trucks belching clouds of black smoke on the highways.

That is the same weight today as that truck hauled in 1970

Can truck fuel-efficiency be increased as much as being proposed? The improvement in light-duty vehicle fuel-use has been achieved by reducing the weight of cars. Trucks may not offer such an opportunity. Additionally, cars carry on average two passengers, so a vehicle weighing 3,000 pounds is hauling 350 pounds of “cargo.” On the other hand, a fully-loaded 80,000 pound tractor-trailer will be hauling 50,000 pounds of cargo. That is the same weight today as that truck hauled in 1970. From a fuel-efficiency point, trucks deliver over 140 times the cargo as a car, but they do that while only burning about 3.5 times the amount of fuel. That would appear to be a notable achievement.

The increased fuel economy performance by the trucking industry was achieved on its own in response to efforts to improve operating results

The increased fuel economy performance by the trucking industry was achieved on its own in response to efforts to improve operating results. The trucking industry is already harnessed with the increased operating costs from new highway safety rules reducing the number of hours drivers can work each day and in a week. Increased capital investment costs will further squeeze trucking company profitability, causing freight rates to rise and harming the economy. Don't hold your breath for any relief on these proposed rules – just prepare for higher costs of all those products you purchase.

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