PPHB

ENERGY INVESTMENT BANKING

MUSINGS FROM THE OIL PATCH

June 2, 2015

Allen Brooks
Managing Director

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

Climate Change Battle Heading For December Crescendo

Inquiring minds want to know whether this meeting will produce the elusive global treaty on carbon emissions or will it be a repeat of the Copenhagen summit fiasco?

If you have opened any newspaper or tuned in a national news show recently, you know that we are firmly entrenched in the build-up to the United Nations global climate conference scheduled for later this year. Inquiring minds want to know whether this meeting will produce the elusive global treaty on carbon emissions or will it be a repeat of the Copenhagen summit fiasco? It is hard to remember that the Copenhagen conference in December 2009 failed despite all the expectations that after 17 years of negotiating, the 192 nations assembled would rally around an agreement to restrict carbon emissions and cement the principles of the 1992 United Nations Framework Convention on Climate Change in a binding global agreement. The failure was doubly-difficult for environmentalists who had counted on new United States President Barack Obama to employ his magic to heal the planet's environment while dropping in on the Copenhagen conference after collecting his Nobel Peace Prize in Oslo, Norway.

The objective of the conference is to achieve a legally binding and universal agreement on limiting carbon emissions in an attempt to prevent the forecasted climate disaster from an overheated planet

We laughed when we read of the details of the upcoming conference as they reminded us of Russian and Chinese high-profile party gatherings that often sport multiple designations. The United Nations Climate Change Conference, COP21 or CMP11, will be held in Paris, France between November 30 and December 11, 2015. This will be the 21st yearly meeting of the Conference of the Parties (COP 21) to the 1992 United Nations Framework Convention on Climate Change (UNFCCC) and the 11th session of the Meeting of the Parties (CMP 11) to the 1997 Kyoto Protocol. The objective of the conference is to achieve a legally binding and universal agreement on limiting carbon emissions in an attempt to prevent the forecasted climate disaster from an overheated planet.

"You don't sit back; you take steps to protect your ship. Anything less is a dereliction of duty. The same is true for climate change."

Last week, President Obama delivered a commencement address to 218 newly-commissioned officers at the U.S. Coast Guard Academy in which he declared climate change to be a grave threat to the nation's security. As President Obama put it, "You don't sit back; you take steps to protect your ship. Anything less is a dereliction of duty. The same is true for climate change." This speech drew significant commentary as it occurred at the same time Iraqi troops defending Ramadi, the capital city of Anbar Province in Iraq, were being routed by military members of the Islamic State of Iraq and Syria (ISIS). The speech raised serious questions about the effort and role of the U.S. in helping Iraq fight this terrorist organization. The Ramadi victory added to the growing territorial claims of ISIS and provides it with greater access to other key military and civilian control points in the region.

Fear is a powerful emotion and it can be used in many ways to drive public perceptions in a desired direction

Are President Obama's claims that "climate change constitutes a serious threat to global security, an immediate risk to our national security" realistic? He went on to say "… we need to act— and we need to act now." Really? The science of climate change is not clear, or at least not clear to people who have embraced the movement for financial and moral reasons. For those of us who have spent considerable time attempting to understand the science of climate change, the global climate data reported and the computer models driving the scary scenarios predicted to dominate our future, there is no easy answer. Fear is a powerful emotion and it can be used in many ways to drive public perceptions in a desired direction. Moreover, fear can be used to drive agendas that often benefit their promoters to the detriment of mankind's greater good. Fear of the unknown or unknowable is often what promotes people to turn to religion as the teachings comfort and guide them in how to live in the uncertain world.

For many, the issue of climate change has become a religion

For many, the issue of climate change has become a religion. That was confirmed earlier this year when the chairman of the United Nations Intergovernmental Panel on Climate Change (IPCC), Rajendra Kumar Pachauri, resigned his post due to allegations of sexual assault, stalking, harassment, and uttering threats targeting a 29-year-old female research assistant at The Energy and Resources Institute (TERI) in Delhi, India. In his two page resignation letter he wrote, "For me the protection of Planet Earth, the survival of all species and sustainability of our ecosystems is more than a mission. It is my religion and my *dharma*." What we have learned from this letter is that the IPCC was guided by religious fervor rather than scientific inquiry into the elements of climate change.

Dr. Pachauri's conduct amounted to misuse of his position and violation of the organization's policy on sexual harassment

Dr. Pachauri has been the director of TERI, a climate research institute. Last week, the Internal Complaints Committee of TERI filed a report on the harassment complaint and found that Dr. Pachauri's conduct amounted to misuse of his position and violation of the organization's policy on sexual harassment. The complaints panel recommended that the institute initiate a disciplinary action

against Dr. Pachauri and that he should pay compensation to the complainant for the emotional distress his actions have caused.

The one-day meeting is viewed as laying the groundwork for a papal encyclical on the environment that's expected in the summer

If Dr. Pachauri viewed his role as chairman of the IPCC as a religious leader for the climate change movement, we can expect to see religion becoming more intimately involved. Pope Francis, who was initially educated and worked as a chemist before entering a Jesuit seminary and carries the name of the unofficial patron saint of the environment, St. Francis of Assisi, convened a conference on climate change at the Vatican late last month. The title of the Vatican conference was Protect the Earth, Dignify Humanity: The Moral Dimensions of Climate Change and Sustainable Development. The one-day meeting is viewed as laying the groundwork for a papal encyclical on the environment that's expected in the summer. It is anticipated this document will form the substance of Pope Francis' speech to the United Nations in September and a similar one to a joint session of Congress in Washington, D.C. It is hoped these speeches will help increase the pressure on the leaders of nations who will be heading to the UN climate change conference in Paris a couple of months later.

He is probably happy that the meeting is not scheduled for Copenhagen given his two high-profile failures in that city to convince audiences to do his bidding

One wonders whether President Obama will make a cameo appearance in Paris in an attempt to further burnish his resume of achievements during his presidency. He is probably happy that the meeting is not scheduled for Copenhagen given his two high-profile failures in that city to convince audiences to do his bidding. Not only did he fail to orchestrate the IPCC climate agreement in December 2009, but in an earlier visit that year he failed to convince the International Olympic Committee to pick his home city of Chicago to host the 2016 Olympics.

We now know that these global warming cheerleaders will attempt to shame climate change skeptics and doubters by claiming the moral high ground for their environmental movement as suggested by the title of the Vatican conference

For the next six months the world will be inundated with articles about the impending weather disasters if carbon emissions are not restricted so that global temperatures only rise by 2^{o} Celsius. Along with these dire warnings will be pleas by politicians, scientists and religious leaders for nations to commit to the terms of the proposed United Nations climate treaty, whatever they turn out to be and with disregard for their social and economic impacts. We now know that these global warming cheerleaders will attempt to shame climate change skeptics and doubters by claiming the moral high ground for their environmental movement as suggested by the title of the Vatican conference.

The Moral Case for Fossil Fuels, written by philosopher Alex Epstein that makes a forceful case that fossil fuel use should be embraced on the basis of their societal benefits

For those still in the doubter camp, there is a book, The Moral Case for Fossil Fuels, written by philosopher Alex Epstein that makes a forceful case that fossil fuel use should be embraced on the basis of their societal benefits. We had the opportunity to hear Mr. Epstein speak this spring and we have read his book. The moral case for fossil fuels is simple – all the good fossil fuels have contributed to lifting billions of people out of barely subsistence living conditions and improving their life expectancies far outweigh the potential harm

from possibly warmer temperatures. Unfortunately, there are still approximately 1.3 billion people in developing economies who still lack access to electricity according to the International Energy Agency (IEA), the first and most important power source on the ladder of assistance for improving living conditions.

This improvement has come despite the world adding 1.9 billion people over the past quarter century

We recently read an article discussing the latest annual hunger report published by the UN's Food and Agricultural Organization, the International Fund for Agricultural Development and the World Food Programme. The report indicates that the number of hungry people in the world has dropped to 795 million, some 216 million fewer than were counted in 1990-92. This improvement has come despite the world adding 1.9 billion people over the past quarter century. Although the percentage of the world's population that is undernourished, defined as people unable to consume enough food for an active and healthy life, has fallen from 23.3% to 12.9% since 1990-1992, the UN remains hopeful of ultimately eradicating hunger entirely – an admirable goal.

Of the 129 countries monitored by the UN, 72 have achieved the Millennium Development Goal (MDG) target of reducing the prevalence of undernourishment by 50% by 2015. Twenty-nine countries have met the more ambitious goal established at the World Food Summit in 1996 when governments committed to cutting the absolute number of undernourished people in half by 2015.

Sub-Saharan Africa has the highest rate of undernourishment at 23.2%, or nearly one in every four inhabitants

Sub-Saharan Africa has the highest rate of undernourishment at 23.2%, or nearly one in every four inhabitants. However, African nations that invested more in improving agricultural productivity and basic infrastructure did achieve their MDG hunger target, most notably in West Africa. Yet Africa is still hampered by a lack of electricity. Two satellite photos of Africa demonstrate that over the past 15 years there have been gains in the portion of the continent where power is available, but these gains still leave large areas and hundreds of millions of inhabitants without access to electricity, important for improving their standard of living. The first photo (Exhibit 1) shows 1996 nighttime Africa, while the second (Exhibit 2) shows it in 2012.

Exhibit 1. Lack Of Electricity Makes Africa Dark Continent

Source: www.darksky.org

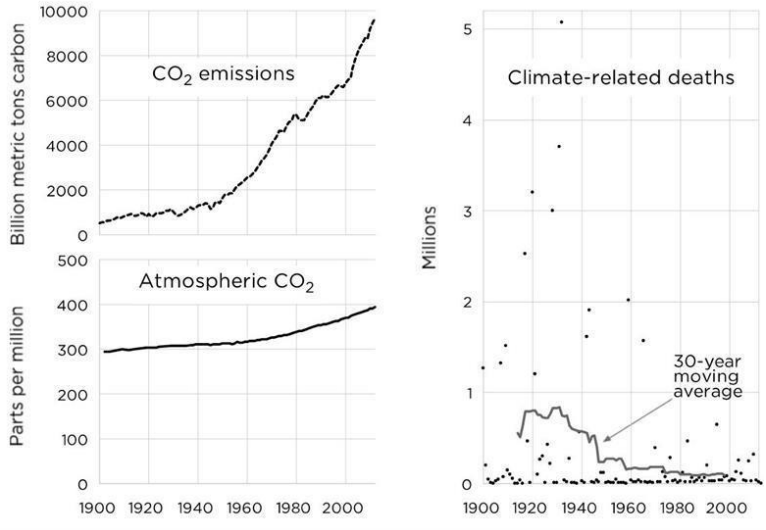
Exhibit 2. Africa Gains Access To More Electricity

Source: NASA

The keys to improving agricultural productivity are increased mechanization of farming and the use of chemical fertilizers and pesticides

As pointed out by the UN report, a key to reducing the number of undernourished people comes from increasing the productivity of the agricultural sector. The keys to improving agricultural productivity are increased mechanization of farming and the use of chemical fertilizers and pesticides. Both factors are dependent on fossil fuels, yet one never sees credit for this improvement from the climate change activists. This improvement is central to Mr. Epstein's moral case for fossil fuels. He actually expands his argument to demonstrate how the danger to humanity from climate change has declined over the past century. He uses one chart we find compelling to make his argument. The chart is based on data collected and reported by global trends researcher Indur Goklany. Exhibit 3 shows the relationship between carbon emissions growth and the decline in climate-related deaths.

Exhibit 3. Climate Deaths Have Fallen As CO2 Rises



Source: Alex Epstein

Over the past 80 years, despite rising carbon emissions, both the absolute and the 30-year moving average of the data show that climate-related deaths have declined

As the Exhibit 3 shows, over the past 80 years, despite rising carbon emissions, both the absolute and the 30-year moving average of the data show that climate-related deaths have declined. Over that period, deaths fell by 98%! While the mainstream media would have one believe that deaths associated with every weather incident or storm are increasing and driving us toward catastrophic outcomes, the data shows otherwise. Importantly, as Mr. Epstein points out, the collection of data today is much better and more accurate than in the past, suggesting that the reduction in climate-related deaths may be even greater than these statistics show.

One side is whispering while the other is yelling

What we know about this debate over climate change and fossil fuels is that one side is whispering while the other is yelling. The yellers demand that the world should turn its back on fossil fuels and embrace powering the world's economy with renewable fuels. The mechanics for doing that in the transportation sector are essentially

non-existent. Yes, trains are often electrically powered, but electric cars that can only travel 50 miles on a charge and then require extensive charging time are not realistic alternatives to vehicles powered by internal combustion engines. The airline industry has experimented with ethanol-based jet fuel and solar power, but these technologies, assuming they work, are decades away from meaningful use. Liquefied natural gas is about the only alternative for ocean-going ships, but it is an expensive alternative and not readily available globally where ships visit.

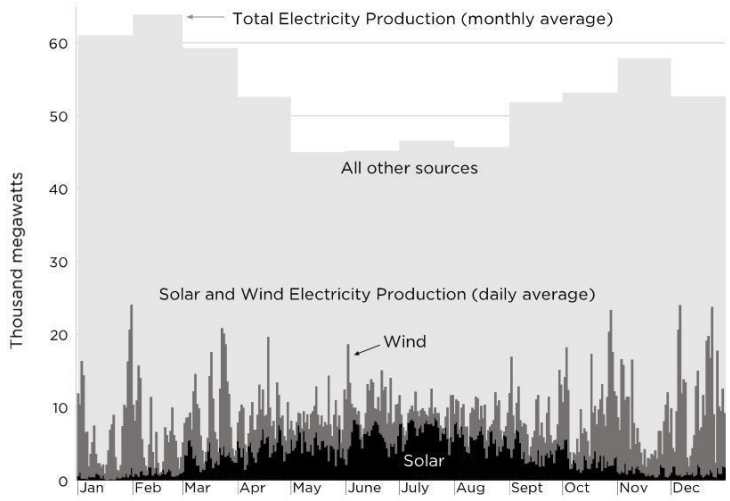
What we now have is a significant experiment underway in Europe, which has elected to abandon fossil fuels and nuclear power in favor of renewable fuels

The primary use of renewable fuels will be in generating electricity. What we now have is a significant experiment underway in Europe, which has elected to abandon fossil fuels and nuclear power in favor of renewable fuels. The experiment began in 2000 when the European Climate Change Program was established by the European Community (EC). The goal was for Europe to cut its greenhouse gas emissions to levels consistent with the targets of the 1997 Kyoto Protocol. The program was based on two assumptions – national energy systems had to change in order to fight global warming and coal, natural gas and oil would become more expensive over time allowing more expensive renewables to compete. This latter assumption was also supported by the belief that growing demand for renewables would translate into technological and volume-related reductions in their cost.

This reworking of the power supply hierarchy means that rather than market signals driving power supply decisions, weather variations do

Given those assumptions, countries within the EC began promoting programs to build demand for renewables through subsidies, while restricting fossil fuel and nuclear power via mandates and regulations limiting how and when they could be used. The net result is that renewable fuel-generated power is given priority over fossil fuel-generated power in national grids. This has made fossil fuel-generated power more expensive and the power supply less stable due to the intermittent nature of renewable power. For some utilities, fossil fuel power plants are uneconomic and are being shut down. This reworking of the power supply hierarchy means that rather than market signals driving power supply decisions, weather variations do.

Exhibit 4. Wind And Solar Provide Low Levels Of Power

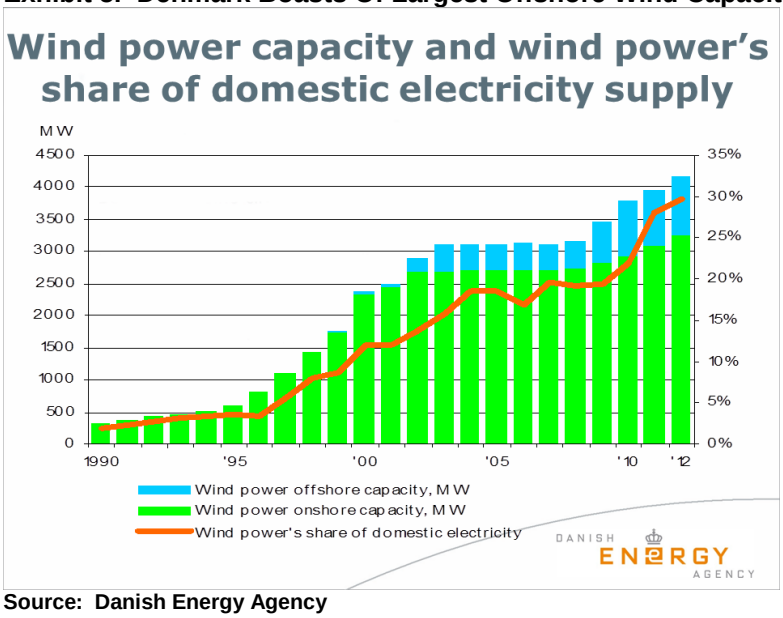


Source: Alex Epstein

As a result, Germans pay almost the highest European electricity rates

Subsidies for renewable energy have resulted in Germany having over a million roof-top solar installations in a country located at the same latitude as Calgary, Canada. According to one study, German solar installations generate electricity at less than 10% of their rated output while only providing 6% of the nation's electricity and about 1% of its total energy needs. A record of the performance of wind and solar versus all other sources of electricity generation for 2013 is shown in Exhibit 4, confirming their low output. As a result, Germans pay the second highest residential European electric rates.

Exhibit 5. Denmark Boasts Of Largest Offshore Wind Capacity

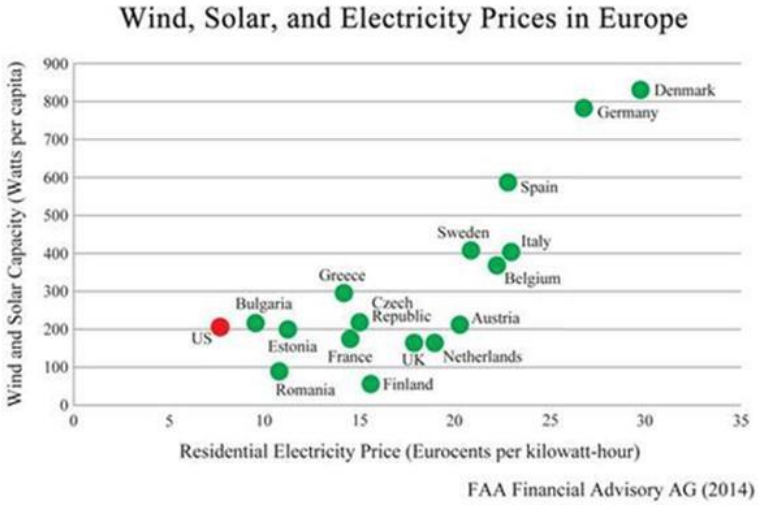


Source: Danish Energy Agency

In total, the turbines produce 1.1 gigawatts of electricity, or the equivalent of one large conventional power plant

In Denmark, the country has installed 5,252 wind turbines as of July 2014, or one for every thousand Danish citizens. In total, the turbines produce 1.1 gigawatts of electricity, or the equivalent of one large conventional power plant. These examples are repeated in other EC countries such that the countries on the continent that have installed the most solar and wind power now pay the highest electricity rates. In fact, for Denmark and Germany, their electricity costs are 3-4 times those on average in the United States.

Exhibit 6. More Solar And Wind Power = High Power Costs

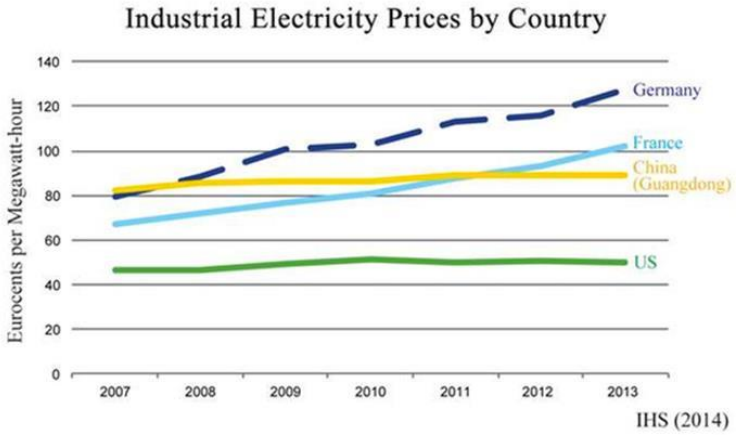


Source: Alex Epstein

Given the relationship between Germany's industrial power costs and those in the United States, it is no surprise that German manufacturers are building new plants in the U.S. rather than Germany

When we consider the impact of this renewable energy strategy on European industry, the costs are becoming a significant burden on manufacturing enterprises. Since 2007, power costs in the industrial sector have climbed significantly in Germany and France, and are now materially above those in the U.S. and China. Given the relationship between Germany's industrial power costs and those in the United States, it is no surprise that German manufacturers are building new plants in the U.S. rather than Germany. Natural gas prices in the U.S. are about a third of those in Europe. Petrochemical feedstock costs tied to natural gas in the U.S. are still meaningfully below oil-linked feedstock costs in Europe even after the significant drop in global crude oil prices, so German petrochemical companies are constructing new and expanded plants in the U.S.

Exhibit 7. European Industrial Power Costs Are High



Source: Alex Epstein

Imagine New York City with horse-drawn carriages rather than vehicles, and six feet deep in horse manure

Under the burden of these higher power costs, EC economies are struggling to grow, which is contributing to financial and social challenges in many of the member countries. The giant renewable energy experiment in Europe is demonstrating the risks of programs designed to drive economies backwards to less efficient energy sources. Imagine New York City with horse-drawn carriages rather than vehicles, and six feet deep in horse manure. This is an experiment American policy planners should examine closely before overthrowing the current structure of our nation's power supply. The full-throated climate change debate will continue with its proponents wrapping themselves in the cloak of religious piety and moral superiority. Maybe they should truly consider the moral case for fossil fuels as the measurable improvement in living standards of the world's population rather than some imagined or projected harm.

A Funny Thing Happened On The Way To The Oil Output Decline

There are a significant number of moving parts involved in the supply and demand equation setting oil prices

Domestic crude oil prices have been climbing since the end of March as commodity traders and speculators have bet on declining production and rising demand in response to the sharp fall in prices since the end of November 2014. The magnitude of the oil price increase has been limited by two considerations – the value of the U.S. dollar that continues to strengthen reducing demand for oil as a store of wealth and concern that prices are reaching a point at which producers will restart drilling to boost their profits. Intertwined in this calculation is the impact of changes in oil inventory volumes that in turn are impacted by refinery demand levels related to the start of the summer driving season and the need for increased gasoline supplies. In other words, there are a significant number of moving parts involved in the supply and demand equation setting oil prices.

Changes in inventory are viewed as measures of underlying oil demand and production. Last week's 2.8 million barrel withdrawal

The inventory decline, however, was partially the result of a nearly 7% weekly decline, or 503,000 barrels per day, in crude oil imports

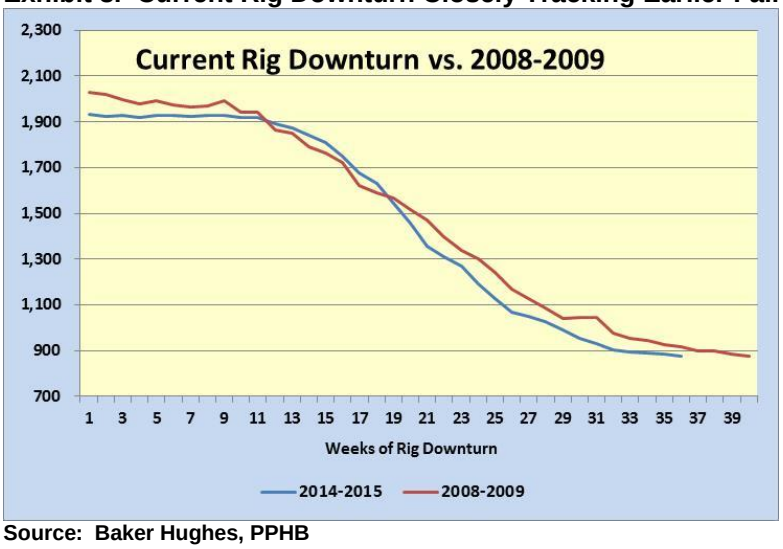
from crude oil storage marked the fourth straight week of declines following months of weekly gains. The inventory decline, however, was partially the result of a nearly 7% weekly decline, or 503,000 barrels per day, in crude oil imports. This stretch of oil inventory declines is part of why a 10-week rise in crude oil prices occurred, although it was snapped last week due to concern about the growth in the weekly oil production estimate.

The spread between the purchase and sale prices in those earlier trades more than offset storage costs and interest expenses for the transactions

The storage withdrawals have been helped by falling domestic production in consort with a falling drilling rig count. Additionally, speculators, who earlier in the year bought crude oil and elected to store it until they had to deliver it against futures contracts they had sold at significantly higher prices, stopped buying crude oil. The spread between the purchase and sale prices in those earlier trades more than offset storage costs and interest expenses for the transactions. The remaining spread, or profit, provided ample returns to justify significant trade volumes. Those profit opportunities have disappeared as current oil prices have increased while future prices have failed to increase.

The traders, and industry participants, actively watch weekly data releases from the Energy Information Administration (EIA) on storage volumes, refinery demand, gasoline volumes and estimates of domestic oil production. They also watch the estimates of oil storage volumes, especially at the important transit point in Cushing, Oklahoma. The final weekly data series actively monitored is the rig count data provided by Baker Hughes Corporation (BHI-NYSE).

Exhibit 8. Current Rig Downturn Closely Tracking Earlier Fall



Source: Baker Hughes, PPHB

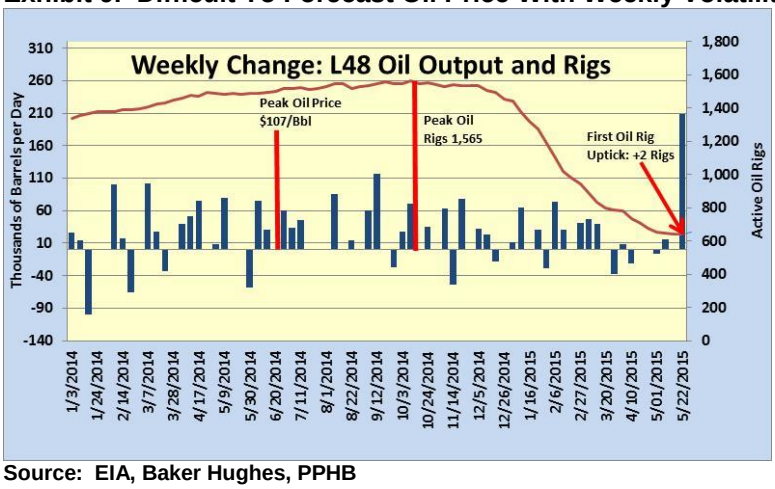
As the low oil price environment has extended beyond the time people expecting a “V-shaped” price recovery to last, their focus has now shifted to tracking the drilling rig count against the 2008-2009 correction associated with the financial crisis and resulting

recession. The current industry downturn is closely tracking that past correction, although this downturn has been steeper and quicker than the earlier one.

The problem with the weekly oil production estimates, however, is that they tend to be highly volatile due to factors having little to do with underlying fundamentals such as wet or extremely cold weather conditions that can interrupt production and/or the drilling and completion of new wells

As the decline in the rig count gave comfort to speculators that domestic oil output would at some point turn negative and demand would increase, the focus shifted to the EIA's weekly estimates of changes in oil inventories and domestic oil production. The EIA separately reports Lower 48 oil production along with Alaskan output enabling a closer focus on supply trends from shale formations, the source of significant output growth over the past several years and acknowledged as the factor that has altered the world's oil markets. The problem with the weekly oil production estimates, however, is that they tend to be highly volatile due to factors having little to do with underlying fundamentals such as wet or extremely cold weather conditions that can interrupt production and/or the drilling and completion of new wells. The volatility, marked by a number of weekly negative production estimates, is shown in Exhibit 9 below.

Exhibit 9. Difficult To Forecast Oil Price With Weekly Volatility



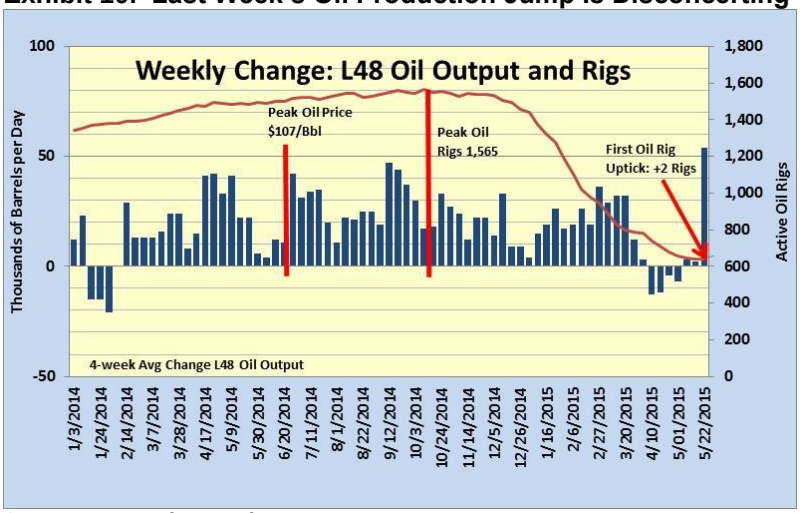
Source: EIA, Baker Hughes, PPHB

Last week's huge weekly production gain is disturbing

Due to the weekly volatility, we favor the use of the four week moving average of production that the EIA publishes. When examined in Exhibit 10 (next page), it is clear that up until early April domestic oil production was increasing, but it then turned negative for four weeks before showing small increases for the middle two weeks in May. Last week's huge weekly gain is disturbing. Does it signal that oil prices are at a level where producers can justify drilling their best (most productive) wells? Is it possible that the mid-May report of an increase in oil output for March in North Dakota's Bakken formation reflects a change in industry output dynamics? Might it be possible that oil demand growth was temporarily boosted by the restarting of refineries whose impact has now run out? Or maybe the estimate is just a mistake by the EIA. We will certainly need to monitor upcoming weekly production estimates to see if this output gain is sustained or whether it falls.

The fact that last week's drilling rig count fell again may signal either that the bad weather in Oklahoma and Texas impacted drilling or producers are becoming concerned that oil prices are headed down and drilling new wells will only result in new high-volume production being sold into a weak oil price environment.

Exhibit 10. Last Week's Oil Production Jump Is Disconcerting



Source: EIA, Baker Hughes, PPHB

All the latest weekly data has done is cloud the picture for future oil prices

All the latest weekly data has done is cloud the picture for future oil prices. This industry downturn has lasted longer than many people anticipated. We continue to believe that the downturn will last longer than people would like it to, meaning that producer and oilfield service company managers must still work to resize their businesses for the current level of activity. Hopefully, we are too pessimistic.

British Columbia LNG Deal Highlights Canada's Dilemma

It highlights the pressure the province is under to resolve issues blocking energy export projects

Nearly two weeks ago, British Columbia Premier Christy Clark signed an agreement with the Pacific Northwest LNG consortium that outlined favorable long-term royalty rates and ensures the consortium is shielded from future increases in carbon taxes and liquefied natural gas (LNG) income taxes in a bid to provide cost certainty for the proposed $36 billion project. This agreement, if ratified by the consortium and its partners, still must be approved by the B.C. government. It highlights the pressure the province is under to resolve issues blocking energy export projects. Moreover, until these export options are developed, Canada's economy will continue to suffer from low commodity prices.

The shale revolution has altered North America's role in the global energy business. The continued growth of U.S. tight oil and natural gas production is putting greater pressure on Canada's oil and gas industry as export opportunities south of the border are

Political opposition to the construction of high profile transportation projects are limiting near-term options for Canada's petroleum output

disappearing. Political opposition to the construction of high profile transportation projects such as TransCanada Corp.'s (TRP-NYSE) Keystone XL pipeline and Enbridge Corp.'s (ENB-NYSE) Northern Gateway pipeline are limiting near-term options for Canada's petroleum output. These challenges are occurring at the same time the new leadership of Alberta Province is planning to review the royalties it collects from domestic production along with tightening environmental regulations, which will add to company expenses.

The West Coast of Canada was once a hotbed for LNG terminal proposals

The West Coast of Canada was once a hotbed for LNG terminal proposals. To date, there have been 19 LNG export terminals proposed, but none have made a final decision. Malaysia's Petronas, coupled with its partners Indian Oil Corp., Japan Petroleum Exploration, Petroleum Brunei and Sinopec of China, appears to be the furthest along, but a recent decision by the Lax Kw'alaams, a First Nations band, to turn down a $1 billion compensation offer over 40 years from Pacific Northwest indicates how difficult it remains to get projects over the finish line.

One can question how much the compensation offer rejection was based on true environmental concerns versus posturing for a better future offer

The Lax Kw'alaams band is located near the project's proposed site on Lelu Island and expressed its concern about the terminal's impact on salmon fish habitats in its decision to turn down the compensation offer. Pacific Northwest LNG's CEO was quoted saying that he believes many of the Lax Kw'alaams' concerns are addressed in the company's latest filing with the Canadian Environmental Assessment Agency, which is reviewing the project and is expected to make a ruling next year. One can question how much the compensation offer rejection was based on true environmental concerns versus posturing for a better future offer.

Today, it looks like Pacific Northwest LNG may be the only one of the more likely projects to be built that will be in operation by 2020

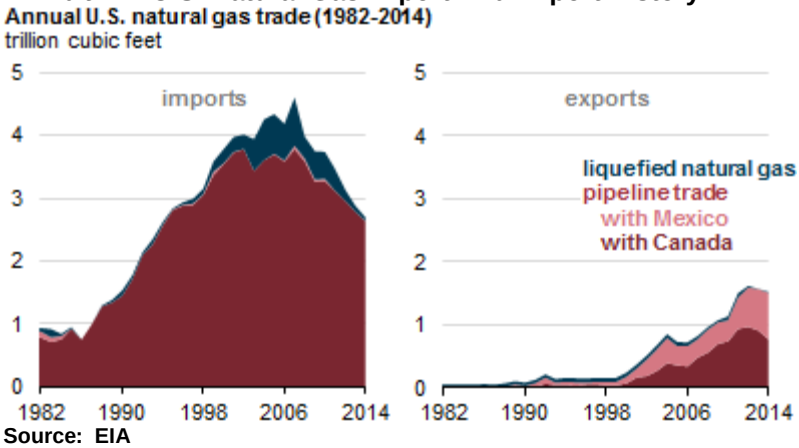
When Premier Clark won re-election in 2013, she campaigned on a promise to eliminate B.C.'s debt with the royalties and income taxes from an expanded LNG industry. At that time, the government was planning for five LNG terminals along the coast with the first one to be in operation in 2016 and three more by 2020. Today, it looks like Pacific Northwest LNG may be the only one of the more likely projects to be built that will be in operation by 2020. Therein is part of the problem Canada and its western oil and gas producing provinces are having in boosting their energy industries. Developing energy export options for Canada's East Coast and further expanding the existing export routes to the United States and its Gulf Coast shipping facilities are becoming more pressing issues.

The magnitude of the pressure on Canada's natural gas industry was highlighted by two charts recently published by the U.S. Energy Information Administration (EIA) on its web site. The charts show U.S. natural gas trade over 1982-2014. One chart shows natural gas imports separated by volumes arriving via pipeline and those coming by sea as LNG. The other chart shows the history of exports between LNG and pipeline, with the latter volumes split between those going north to Canada and those heading south to Mexico.

U.S. export volumes to Mexico may expand

Since about 2000, U.S. natural gas exports to Mexico and Canada have grown, although they reached a peak a couple of years ago. The sliver of LNG volumes represents the Alaskan terminal that has been sending Cook Inlet natural gas to Japan for most of the 30 year period. U.S. export volumes to Mexico may expand as there are a number of proposed pipeline projects to ship more natural gas there.

Exhibit 11. U.S. Natural Gas Import And Export History



Source: EIA

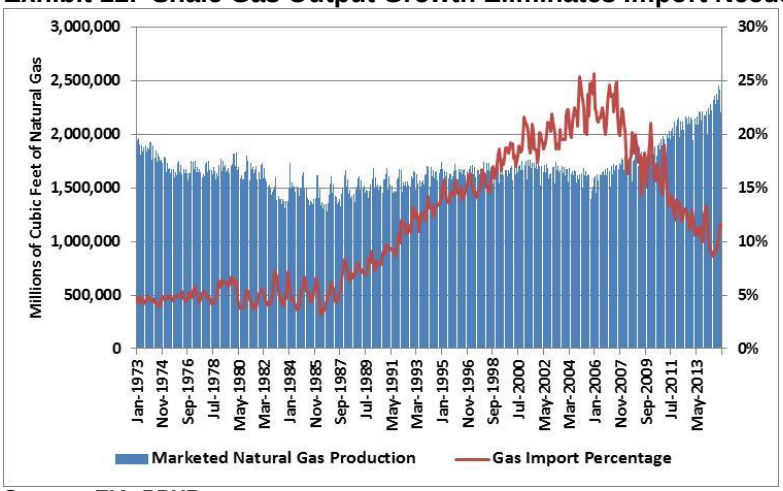
The more recent LNG volumes have come from projects in Trinidad-Tobago and sporadic shipments from terminals in Africa and the Middle East

On the import side, LNG volumes in the early 1980s came from long-term contracts that pipeline companies had entered into with Algeria in the 1970s. The more recent LNG volumes have come from projects in Trinidad-Tobago and sporadic shipments from terminals in Africa and the Middle East used to help maintain the operating condition of LNG import terminals. The chart shows that pipeline import volumes reached a peak in 1999, which remained fairly stable until 2007 before beginning an extended slide. That slide prompted us to examine the impact of the changing U.S. natural gas market on Canada's export opportunities.

Once the American shale gas revolution began and output started climbing, it displaced much of the natural gas import volumes the U.S. had been relying on

In Exhibit 12, we show marketed natural gas in the United States from 1973 to early this year. From the early 1970s through the mid-1980s, U.S. natural gas consumption declined while the percentage of gas imports was fairly stable. Beginning in the mid-1980s both natural gas consumption and the percentage of gas consumption represented by imported gas rose. After peaking around 2000, gas consumption slumped, but the percentage of gas supply represented by imports climbed, eventually hitting 25% of the nation's consumption. Once the American shale gas revolution began and output started climbing, it displaced much of the natural gas import volumes the U.S. had been relying on.

Exhibit 12. Shale Gas Output Growth Eliminates Import Needs

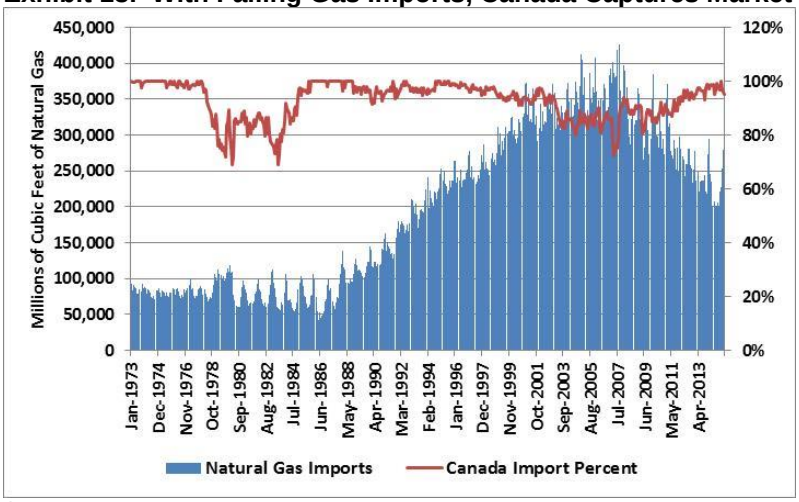


Source: EIA, PPHB

In recent months, LNG and other gas supply sources declined, leaving Canadian pipeline gas as our sole import volumes

More importantly, when we look at total natural gas import volumes and the percentage originating from Canada, we can see (Exhibit 13) how important imports and Canada's share were until total imports peaked in the winter of 2007-2008 and began to slide. As gas import volumes peaked, the Canadian share declined and other supply sources expanded, in particular LNG volumes from the Caribbean. In recent months, LNG and other gas supply sources declined, leaving Canadian pipeline gas as our sole import volumes.

Exhibit 13. With Falling Gas Imports, Canada Captures Market



Source: EIA, PPHB

This is a reason why Canadian politicians need to work harder to open other export opportunities

The dilemma for Canada is that without either more rapid growth in U.S. natural gas consumption or a decline in U.S. gas output, Canada's ability to ship more of its gas production to the U.S. will be capped, or possibly worse shrink. This is a reason why Canadian politicians need to work harder to open other export opportunities for

its natural gas and oil output. Without them, Canada's petroleum industry will face an extended period of depressed activity as it is highly likely that Canadian natural gas prices will remain depressed and volumes shipped out will show no growth, not a good outlook for either Canada's economy or its petroleum industry.

The Missing Gasoline Tax Cut Stimulus Boosting Demand

Last Friday, first quarter GDP was revised to show a 0.7% contraction

A few weeks ago, the U.S. Census Bureau released its estimates for the nation's overall and core retail sales figures for April showing both to be flat compared to upwardly revised March results. This report was a disappointment to forecasters who had expected April's overall retail sales to rise by 0.2% from March's figures, while core retail sales, excluding automobiles, gasoline, building materials and food services, were expected to be 0.5% higher. Analysts' commentary was that the retail sales results were not unexpected given the meager 0.2% increase in 2015's first quarter gross domestic product (GDP), which was well below forecasts. Last Friday, first quarter GDP was revised to show a 0.7% contraction.

The critics of the seasonal adjustment mechanism have not stated that the annual GDP figures are wrong; they just question the seasonal pattern

The most recent controversy over the weak GDP figures is to seek to overhaul the calculations. The belief is that there are serious issues with the seasonal adjustment mechanism that has caused the first quarter GDP estimate to be consistently too low while subsequent quarterly growth rates are too high. The critics of the seasonal adjustment mechanism have not stated that the annual GDP figures are wrong; they just question the seasonal pattern. They claim that this pattern has been wrong for 30 years, but no one has yet to offer an explanation as to why, all of a sudden, the seasonal adjustment pattern changed. More importantly, why was it only in response to the most recent quarter's preliminary estimate that analysts began questioning the seasonal adjustment mechanism? Their claim is that it was due to the strength of other data series, in particular the employment data, during the quarter. We monitor the output from John Williams' Shadow Government Statistics web site, which recalculates many of the federal government statistical releases based on historical formulas. Mr. Williams consistently shows higher unemployment and consumer prices on the older calculations than the latest government figures.

According to Mr. Rosenberg, the spending spree, as he called it, hasn't happened yet, but it will

One frustration for economists looking at the health of the U.S. economic recovery is the lack of a significant increase in retail sales in response to the implied consumer tax cut due to the dramatic fall in oil prices late last year and early this year. A recent column in the Canadian newspaper *The Globe and Mail* authored by David Rosenberg, chief economist with Toronto-based money manager Gluskin Sheff + Associates Inc., discussed why cheaper gasoline prices haven't translated into greater consumer spending. According to Mr. Rosenberg, the spending spree, as he called it, hasn't happened yet, but it will. Like all good forecasters, he gave a definitive forecast but without attaching a specific timeframe.

He points to the culprit being that the personal savings rate has increased from 4.4% last November to 5.3% in April

In Mr. Rosenberg's assessment, there are three reasons why consumer real disposable income has risen at a 4.5% annual rate since November. Those reasons include: gains in employment; increases in wages; and energy price relief. This is the good news. The troubling news is that consumer spending has advanced during this period by only 1.5% annualized. He points to the culprit being that the personal savings rate has increased from 4.4% last November to 5.3% in April. According to Mr. Rosenberg's analysis, if the personal savings rate had not increased, consumer spending would have expanded at a 4.5% annual rate. Had that happened, all the handwringing over the lack of economic strength would never have gained traction.

Mr. Rosenberg says that the flow of savings over the four-month period increased by $120 billion, or approximately by 20%

During the November to April period, the reduction in energy costs has provided consumers with more income, but they have elected to put most of it into their savings accounts or possibly to repay debt – improving their balance sheets. Mr. Rosenberg says that the flow of savings over the four-month period increased by $120 billion, or approximately by 20%. While the savings increase is not surprising given the normal response of individuals to tax cuts, Mr. Rosenberg believes we have reached a point where consumers should become comfortable spending more of their energy cost savings.

Consumers typically respond to an energy price shock by waiting until they can assess whether the change is transitory or more permanent

Consumers typically respond to an energy price shock by waiting until they can assess whether the change is transitory or more permanent. Consumers are attuned to the fact that gasoline prices rise and fall seasonally during the year while gasoline prices will rise and/or fall relative to prior years' results based on overall energy industry dynamics. Personal savings rates, according to Mr. Rosenberg, are not likely to fluctuate much during a year in which gasoline prices move up or down based on seasonal factors. Mr. Rosenberg examined the mid-1980s relationship between changes in the personal savings rate and gasoline prices to establish his view that consumers are primed for a spending explosion. In his analysis, "households were initially skeptical of the 70-per-cent plunge in oil prices." They were not sure whether the oil price drop was sustainable or transitory. As he put it, "when the shock proved to be more durable, the initial savings run-up then became dry powder for future spending growth."

"As the U.S. gasoline windfall that initially went into the piggy bank gets spent in the real economy during the second half of the year, watch for this consumer cyclical outperformance to widen out even further."

Mr. Rosenberg drew the following conclusion about the impact on consumer spending from the recent price drop. "As the U.S. gasoline windfall that initially went into the piggy bank gets spent in the real economy during the second half of the year, watch for this consumer cyclical outperformance to widen out even further." He was referencing to the fact that the stocks of companies selling discretionary items – automobiles, appliances, and other large-ticket items – to consumers have outperformed the stocks of those companies selling to consumers products necessary for everyday life – food, beverages, tobacco and household goods – for which demand doesn't fluctuate depending on the health of the economy.

We would suggest that one aspect of Mr. Rosenberg's analysis that could become a problem is his expectation that consumer spending will go into overdrive in the second half of 2015. That could lead to an increase in energy demand pushing up crude oil prices and ultimately gasoline prices, erasing a portion of the current benefit bestowed on consumers from the earlier fall in oil prices. When that happens, consumers may be reluctant to spend on discretionary items and willing to put more of their gasoline cost savings into their piggy banks to pay for higher gasoline prices down the road.

We found patterns that question the automatic assumption that gasoline price cuts wind up stimulating spending after initially boosting savings

Over the past six month, having heard about the beneficial impact that the drop in global oil prices would produce, the absence of signs of any impact caused us to look at this relationship between the cost of gasoline and the personal spending rate. We found patterns that question the automatic assumption that gasoline price cuts wind up stimulating spending after initially boosting savings.

While we can analyze the conditions of each decade, the visual from this chart is the long steady decline in the savings rate

Exhibit 14 shows the history of the personal savings rate compared to the consumer price index (CPI) for all urban consumers for gasoline over 1959-2015. This extended history provides an interesting perspective. We exited the decade of the 1950s with a saving rate at about 11% of consumer incomes. The rate rose steadily to nearly 14% before spiking sharply to 17% coinciding with the 1973 oil embargo that tripled oil prices and drove the western world into a recession. While we can analyze the conditions of each decade, the visual from this chart is the long steady decline in the savings rate. Other than for brief upturns, the rate fell from near 14% to 2% by 2005. Gasoline prices, as reflected in the CPI, showed an orderly oil market from 1959 to 2000. So far in the 21st Century, gasoline prices have been highly variable reflecting the greater volatility in crude oil prices and world economies.

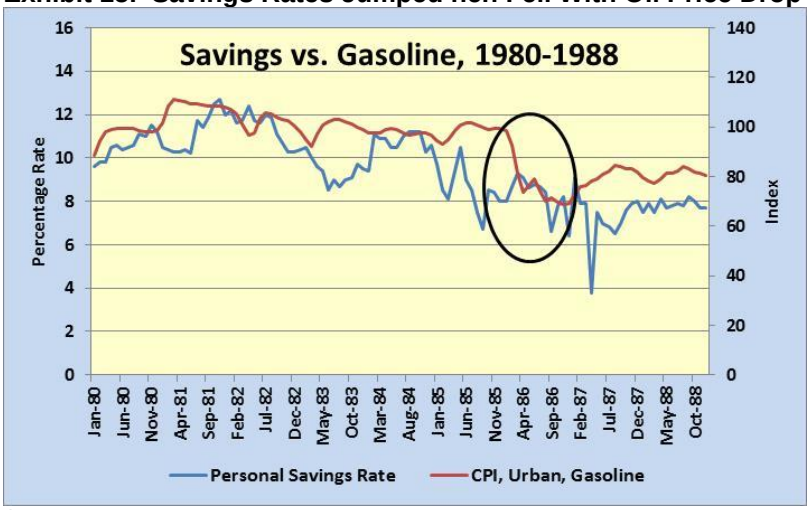
Exhibit 14. Much Of Our History Has Seen Falling Savings Rate

Source: EIA, PPHB

In late 1982, the savings rate increased but then fell as gasoline prices climbed suggesting savings were used to offset higher gasoline prices

In light of Mr. Rosenberg's comments about the impact on savings from the fall in oil prices, we took a closer look at the relationship between the savings rate and gasoline prices during the 1980s. Exhibit 15 shows that relationship for 1980-1988. We have circled the period when oil prices fell in 1985 sending gasoline prices down in late 1985 and early 1986. What we see is that at the time of the oil price drop, the savings rate bounced up from 8% to a little over 9%, but then immediately resumed its long-term decline. The decline in the savings rate needed almost an entire year to return to the 8% level. Maybe this did help consumer spending, but notice that after the initial fall in gasoline prices they continued to fall for more than a year. Importantly, gasoline prices by 1989 still had not returned to their pre-1985 level. There were earlier periods when gasoline prices fell and the savings rate spiked higher. For example, one can look at mid-1981 when the saving rate stayed elevated despite falling gasoline prices. In late 1982, the savings rate increased but then fell as gasoline prices climbed suggesting savings were used to offset higher gasoline prices. Could we be looking at a similar pattern emerging now?

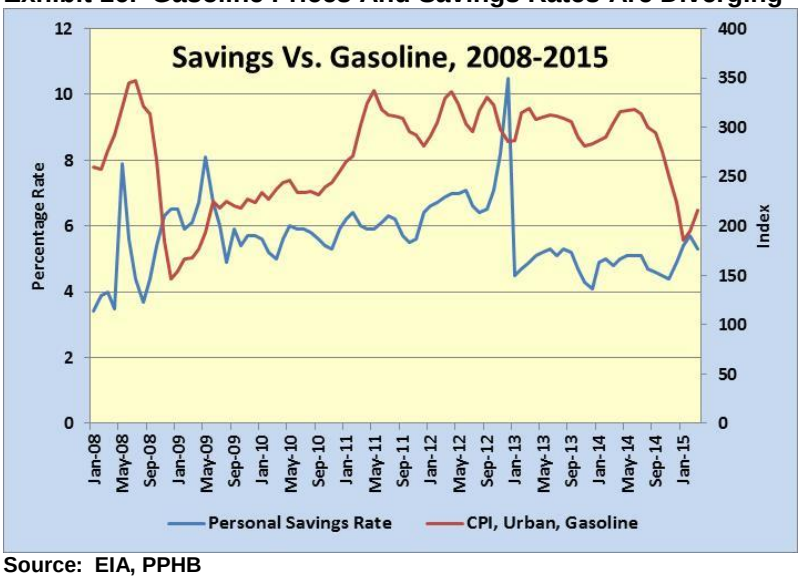
Exhibit 15. Savings Rates Jumped hen Fell With Oil Price Drop



Source: EIA, PPHB

When we examine 2008-2015 (Exhibit 16, next page) for the relationship between the personal savings rate and gasoline prices, there were a number of times when oil prices bounced down and the savings rate rose slightly. But during most of the first portion of this period, consumers were recovering from the impact of the 2008 financial crisis and the 2009 recession. As a result, the personal savings rate demonstrated a steady upward trend from 4% to 7%. During that time, there doesn't appear to be a relationship between declines in gasoline prices and rises in the savings rate.

Exhibit 16. Gasoline Prices And Savings Rates Are Diverging



Source: EIA, PPHB

In examining the recent savings rate data we believe the spike above 10% is a mistake. We don't know why that data point emerged from the St. Louis Federal Reserve's database, but it is totally inconsistent with the rates immediately before and after. We also wonder how much of the sharply lower savings rate reported since 2013 reflects consumers dipping into their savings to support their lifestyles during the current extended era of low interest rates.

Does this mean we have seen the full impact on spending from the earlier drop in gasoline prices?

The most interesting development is the most recent monthly patterns of gasoline prices and the savings rate. The savings rate has been falling while gasoline prices are rising. Does this mean we have seen the full impact on spending from the earlier drop in gasoline prices? That would counter Mr. Rosenberg's optimistic view of a future consumer spending spree. Survey evidence suggests consumers are spending their gasoline savings on other inflated expenses such as higher health care costs? Despite federal government claims about low consumer price inflation, analyses by Shadow Government Statistics suggest consumer price increases are substantially higher than reported. If gasoline prices continue to follow global crude oil prices higher, will this undercut hopes for more robust consumer spending, and thus help extend the weak recovery from the 2008 financial crisis?

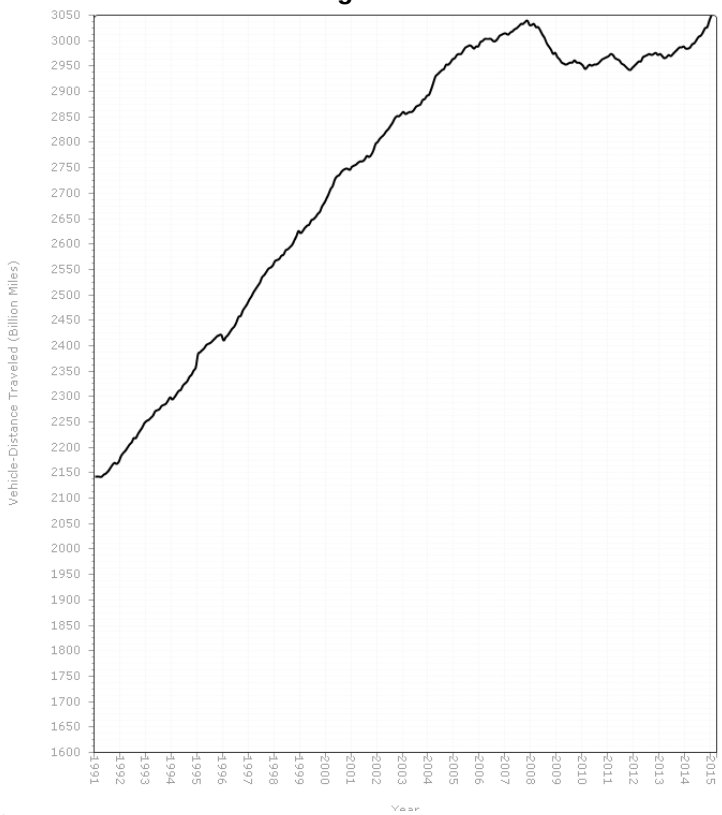
VMT Are Rising But Gasoline Volumes Are Lagging

Much is being made about the recent increase in vehicle miles traveled (VMT), which is interpreted as signaling further growth in oil demand. VMT had been a major source of oil demand for decades as America's love-affair with the car blossomed and people enjoyed the individual freedom cars provided. The Federal Highway

VMT rose and fell during this period but at the start of 2014 it began rising again

Administration (FHWA) within the Department of Transportation publishes a monthly report of the number of miles vehicles in the United States travel and on which types of roads. One of the exhibits in the report is a rolling 12-month total of VMT, which we show in Exhibit 17. As the chart shows, beginning in 1991, the number of VMT steadily climbed until it peaked in late 2007 as the financial crisis was emerging. VMT fell for over a year, before beginning to trend sideways for the next few years. VMT rose and fell during this period but at the start of 2014 it began rising again.

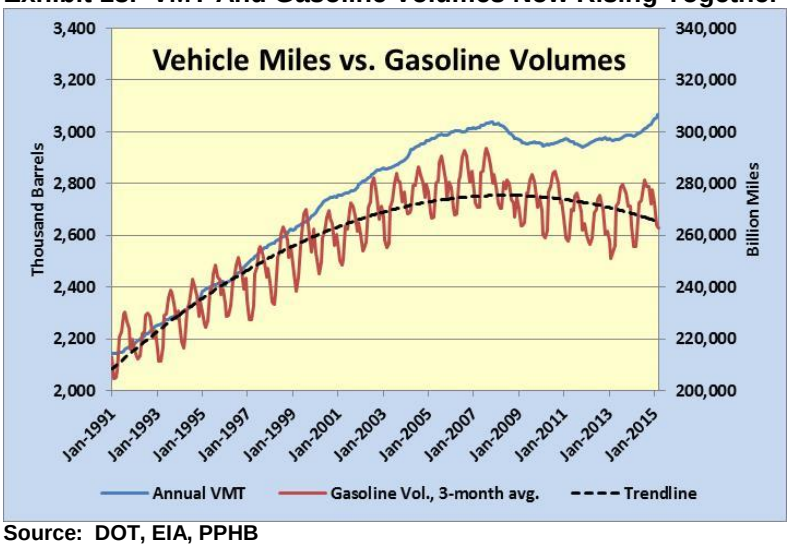
Exhibit 17. VMT Now Rising After Years Of Weak Demand



Source: FHWA

The March data showed that the year-over-year increase was 3.9%. Actually, the January year-over-year increase was 4.9%, but then it fell in February to only a 2.8% increase. For some reason, the rebound in March has been heralded as signaling a new future with rising oil demand. But is that really going to be happen?

Exhibit 18. VMT And Gasoline Volumes Now Rising Together



Source: DOT, EIA, PPHB

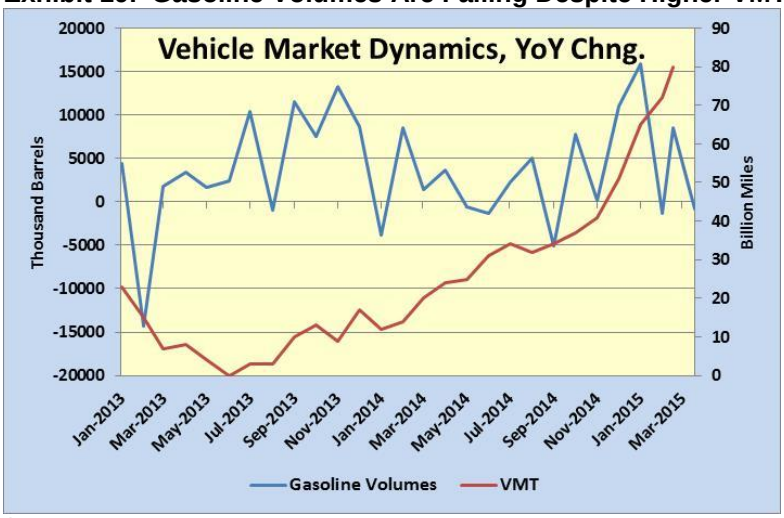
Gasoline consumption, using a three-month moving average, tracked the rise in VMT for the first half of the 1990s

We plotted VMT and gasoline consumption for 1991 through March 2015 in Exhibit 18. As shown, gasoline consumption, using a three-month moving average, tracked the rise in VMT for the first half of the 1990s. After that, gasoline consumption rose at a slower pace than VMT before both peaked in 2007. Gasoline consumption fell along with the decline in VMT, but rather than going sideways after the decline bottomed as VMT did, gasoline consumption continued falling. The decline is attributed to improved vehicle fuel-efficiency mandated by tightened environmental emission restrictions on vehicles.

Is the decline just the seasonal pattern at work?

While the polynomial trendline plotted for the gasoline consumption data tracks a further decline, it appears that during the past 24 months gasoline consumption has actually begun rising, consistent with the increase in VMT. The problem with the shape of the gasoline consumption curve is that recent months show it to be in decline despite monthly VMT rising. Is the decline just the seasonal pattern at work? We explored, in Exhibit 19 (next page), the most recent months' data for VMT and gasoline consumption in order to see if we could define a clear pattern.

Exhibit 19. Gasoline Volumes Are Falling Despite Higher VMT



Source: EIA, PPHB

The volatility in year-over-year changes in gasoline volumes during 2013-2015, negates the idea of a tight relationship with VMT

We calculated the year-over-year change in monthly gasoline consumption and VMT. Starting in June 2013, the year-over-year change in VMT turned positive and other than three monthly declines, has remained positive through March, the latest data available. By using the weekly data from the Energy Information Administration's (EIA) petroleum balance sheet, we can estimate the monthly gasoline consumption for April. We recognize that our calculation and its year-over-year comparison are estimates subject to revision when the official monthly data is reported, but it provides a starting point for analysis. The volatility in year-over-year changes in gasoline volumes during 2013-2015, negates the idea of a tight relationship with VMT. It is interesting that there were some very large monthly changes in gasoline consumption during 2013 that seemed to coincide with the ending of the VMT decline and the start of its advance. When we entered the summer of 2014, monthly gasoline volume changes moderated and actually turned negative, just as the increase in VMT slowed and even dropped one month.

In the last months of 2014 and the first few months of 2015, VMT seemed to accelerate

In the last months of 2014 and the first few months of 2015, VMT seemed to accelerate. Was that a direct result of the fall in crude oil prices that commenced in June 2014? When crude oil prices collapsed following the outcome of the November meeting of the Organization of Petroleum Exporting Countries (OPEC), VMT, as well as gasoline consumption, appeared to accelerate. Some analysts suggested that the gasoline consumption drop in February 2015 reflected the impact of the cold and snowy winter weather that hit Midwestern and Northeastern states particularly hard and occasionally belted the Southeast and Southwest states.

The most interesting question is whether our estimate for April gasoline consumption, which suggests a negative year-over-year change, means that the pattern of increases for VMT will moderate?

A trend that may negate fleet fuel-efficiency gains is the rise in purchases of sport utility vehicles (SUV) rather than less-thirsty sedans and alternative vehicles

Assuming that our estimate for April gasoline consumption is close to what the EIA eventually reports for the month, there is the possibility that we are only capturing further improvement in vehicle fleet fuel-efficiency. A trend that may negate fleet fuel-efficiency gains is the rise in purchases of sport utility vehicles (SUV) rather than less-thirsty sedans and alternative vehicles. We suspect that increased SUV purchases in the past several years due to low vehicle financing costs may be impacting monthly gasoline consumption. Unfortunately, this is difficult to demonstrate, although the University of Michigan's Transportation Research Institute, which tracks the fuel-efficiency of the vehicle fleet by monitoring the window-sticker miles-per-gallon rating of vehicles sold each month, saw a decline of 0.2 mpg from March's value to an average of 25.2 mpg in April.

Exhibit 20. Declining Fuel-Efficiency Due To More SUVs Sold

Source: U. of Michigan, Transportation Research Institute

It is interesting that since peaking at 25.8 mpg in August 2014, the monthly fuel-efficiency rating has fluctuated within a narrow range of 25.0 mpg and 25.4 mpg

When we examine the chart of monthly fuel-efficiency ratings for fleet sales, it is interesting that since peaking at 25.8 mpg in August 2014, the monthly fuel-efficiency rating has fluctuated within a narrow range of 25.0 mpg and 25.4 mpg. Clearly, this is a reflection of the mix of vehicles currently being purchased. SUVs are considered light-duty trucks and as such have a lower fuel-efficiency mandate. As more SUVs are purchased, rather than cars carrying higher fuel-efficiency ratings, the average fuel-efficiency of the nation's stock of vehicles may be falling marginally, depending on whether they are replacing vehicles with even lower fuel-efficiency ratings, which will help boost gasoline volumes necessary to power the same number of VMT.

It seems that if VMT continues increasing with no significant improvement in the fuel-efficiency rating of vehicles being sold, then gasoline consumption should continue rising. What would be the

Impact on gasoline demand if pump prices continue to climb? Demand would probably fall.

Have gasoline pump prices caught up with the recent rebound in crude oil prices, or do they have further to advance?

The American Automobile Association (AAA) reports that in Rhode Island, gasoline pump prices have increased for six consecutive weeks; increasing by four cents a gallon in the most recent weekly survey. Nationally, gasoline prices are up for five straight months. Have gasoline pump prices caught up with the recent rebound in crude oil prices, or do they have further to advance? The AAA expects gasoline prices to follow the seasonal pattern of falling in June. Of course, the direction of crude oil prices will influence gasoline price trends, as will demand. Gasoline supply is about 4% higher than last year but if demand continues increasing, that may not prove sufficient, meaning prices will have to go up along with refinery purchases of crude oil. On the other hand, everything could go in the opposite direction. All this goes to show that there are many cross-currents impacting gasoline demand and they all bear watching in order to gauge the trend for domestic oil demand.

Contact PPHB:
1900 St. James Place, Suite 125
Houston, Texas 77056
Main Tel: (713) 621-8100
Main Fax: (713) 621-8166
www.pphb.com

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