
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

Economy On The Upswing But Risks Are Emerging

Possibly one of the most important economic trends is the apparent stabilization and now resumption of Chinese growth

If you remove the volatility associated with the fear of a military strike against Syria's government due to its use of chemical weapons against its citizens, this year's stock market performance points to growing optimism for a recovery in the U.S. and global economies. Investors point to a strengthening housing sector, steadily rising vehicle sales, job growth and consumer spending increases as signs of a better economic outlook. Recent data from Europe shows that a number of Eurozone economies are showing growth, albeit slow, plus Japan appears to be making progress in shifting its economic trajectory from contraction toward growth. Possibly one of the most important economic trends is the apparent stabilization and now resumption of Chinese growth. All is good, right?

We were reminded last Friday that this past weekend was a significant anniversary, which explains why so many people are re-examining the current state of financial and economic fundamentals. The anniversaries were Hurricane Ike that devastated Galveston, Texas and the Lehman Brothers bankruptcy that ushered in the financial crisis hurricane. Two hurricanes in one weekend – five years ago – and continuing fallouts!

A slowing or absolute retreat in energy demand has serious consequences for commodity prices

Focusing on the current health and trajectory of global economies is especially important for energy players as this is the single most important driver for the health of the business. As we have seen throughout history, a slowing or absolute retreat in energy demand has serious consequences for commodity prices and, in turn, energy profitability that leads to reductions in capital investment for new output. Downturns in economic activity start the cyclical waves that have run through the history of the industry and will continue to drive them in the future.

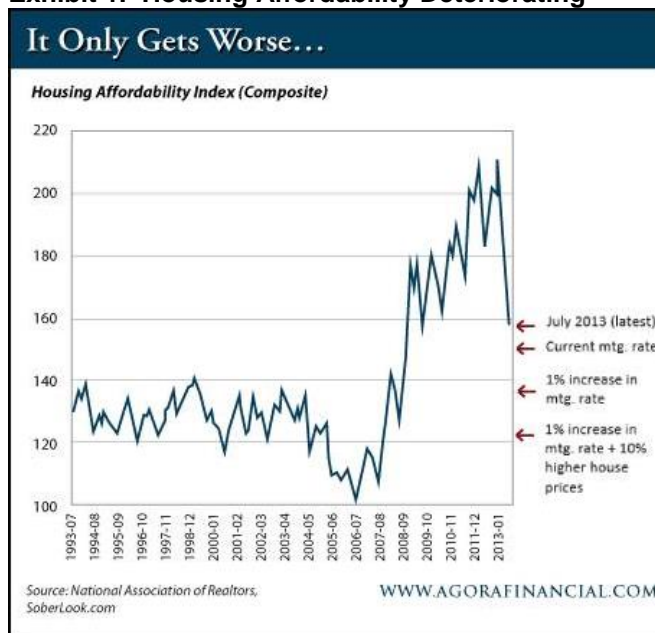
The upward tilting shape of the yield curve is its natural state, as investors who are willing to lend money long term expect to be rewarded with higher returns

Amidst the euphoria of an improving economy are signs that changes are underway in key sectors and dynamics that can meaningfully alter the projected future course of both the U.S. and global economies. For example, interest rates are rising in anticipation that the monetary ease fostered by the U.S. Federal Reserve Bank's \$85 billion a month bond purchasing program will be ending. Since the Federal Reserve has been monetizing the U.S. government's debt issuance to support its deficit-spending, the Bank has been able to keep interest rates at essentially zero. The impact of the Federal Reserve's Quantitative Easing programs has been to create a flat yield curve from short to long maturities. Now that the financial markets are beginning to price in the bond-buying tapering, the entire yield curve has shifted upward, but more importantly, the tilting rewards long-term debt buyers with higher returns as opposed to short-term debt buyers. The upward tilting shape of the yield curve is its natural state, as investors who are willing to lend money long term expect to be rewarded with higher returns for risking their money for longer time periods.

Since rates began rising, the media has reported on the slowdown in housing purchases and mortgage applications despite strong increases in house prices

One of the negatives of rising interest rates is its impact on the housing sector. Since rates began rising, the media has reported on the slowdown in housing purchases and mortgage applications despite strong increases in house prices as reflected by the latest Case-Schiller house price index. The chart on housing affordability shows the trajectory for potential future purchases based on current mortgage rates and where they are likely to go as the Federal Reserve's taper program is enacted. As shown in Exhibit 1, an additional one percentage point increase in mortgage rates and a

Exhibit 1. Housing Affordability Deteriorating



Source: *Agora Financial*

Leases accounted for 16-20% of new vehicle sales during the boom days before 2008 when new car sales averaged 20 million units annually

further 10% increase in house prices will put consumers back at housing affordability levels that existed before and during the financial crisis. Low interest rates, consumer balance sheet deleveraging, and an improving job and income outlook, coupled with low house prices, boosted the housing affordability index to record high levels. A return to 2007 housing affordability levels would diminish one of the drivers for stronger economic activity.

Another important economic driver has been new vehicle sales. From the low of 10.4 million unit sales in 2009, the automobile industry now is running at a 16.1 million unit sales rate. Part of the growth has been achieved by switching buyers onto low-cost leases. Leases accounted for 16-20% of new vehicle sales during the boom days before 2008 when new car sales averaged 20 million units annually. They are now accounting for 26% and are likely to go higher, as car dealers are now targeting middle-income buyers as opposed to exclusively concentrating on wealthy people buying luxury vehicles. This, combined with demographic trends, is why Toyota Motors (TM-NYSE) is now predicting that auto sales have reached a plateau. Another troubling underlying trend for future car sales is the rising delinquency rate for car loans. According to TransUnion's proprietary *Industry Insights Report*, the national auto loan delinquency rate (the percentage of accounts 60 or more days past due) increased slightly year over year from 0.82% in Q1 2012 to 0.88% in Q1 2013. The increase was primarily driven by a rise in delinquencies for subprime borrowers (from 5.09% in Q1 2012 to 5.50% in Q1 2013). While subprime borrowers cover a wide range of individuals, some with solid credit ratings but who have suffered from some reversal of fortune, weakness in this sector can be a precursor of deteriorating future auto demand.

Last week, the new chief of the World Trade Organization, Roberto Azevêdo, offered his inaugural address to the organization's general council. During his speech, he announced revised global trade forecasts for 2013 and 2014. He projected that global trade will increase by 2.5% in 2013 and 4.5% in 2014. These projections are a reduction from previous WTO forecasts of 3.3% growth in 2013 and 5% in 2014. A reduction in trade isn't a positive trend for the global markets.

So far this year, the FDIC has seized 22 failed banks, which while down from the number of failed banks in recent years, is still substantially higher than desired

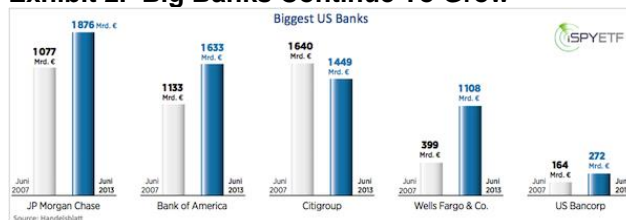
In the financial sector, last Friday the Federal Deposit Insurance Corporation (FDIC) announced it had seized and closed two more banks – one in Texas and the other in Connecticut. The assets of the Texas bank were sold to another bank while Connecticut depositors will receive checks from the FDIC, as no buyer could be found. So far this year, the FDIC has seized 22 failed banks, which while down from the number of failed banks in recent years, is still substantially higher than desired. In 2007, there were three failed banks, increasing to 25 in 2008 and 140 in 2009. The bank failure peak was 2010 when the FDIC seized 157 banks, but it only closed 92 in 2011 and 51 in 2012. The financial cost of the closed banks

His message was simple – incentives do have consequences and we are still offering a significant safety net for banks that encourages them to engage in risky financial behavior

showed that the 2008-2011 period cost the FDIC \$88 billion, but it is predicting only \$10 billion for all failed banks for 2012 through 2016. According to FDIC records, during strong economic periods it is only forced to close 4-5 banks a year. We are still quite far away from that environment.

At a breakfast meeting Friday, we heard Thomas Hoenig, the former Chairman of the Kansas Federal Reserve Bank and now vice chairman of the FDIC, speak about the lessons learned since the financial crisis five years ago. His message was simple – incentives do have consequences and we are still offering a significant safety net for banks that encourages them to engage in risky financial behavior. He handed out a chart showing the capitalization ratios for global systemically important banks both in the United States and internationally. He has made numerous speeches, written articles and provided testimony to regulators, Congress and others highlighting the impact of risk-taking by large banks because of the regulatory safety net. In a March letter to a regulatory body, he pointed out that “just prior to the last crisis, this ratio [risk-weighted assets to capital] for some large firms exceeded 40 to 1. Today, for the largest eight U.S. bank holding companies this ratio equals 17 to 1 under GAAP accounting standards and nearly 28 to 1 using international (IFRS) accounting standards. Without the safety net, historical experience tells us this ratio would be between 8 and 10 to 1.”

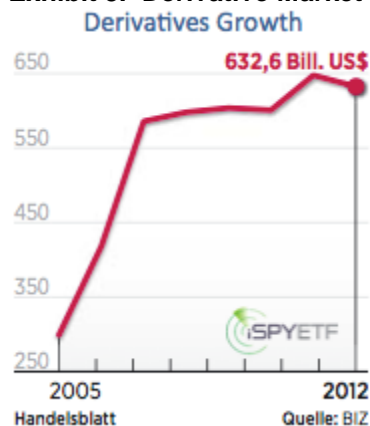
Exhibit 2. Big Banks Continue To Grow



Source: iSPYETF

These are the banks that still maintain very high leverage ratios that are currently half the peak leverage they operated at the start of the financial crisis

From an interview with Hank Paulson, former U.S. Treasury Secretary during the financial crisis, in the German newspaper *Handelsblatt*, he pointed out that the five biggest US banks now have \$8.3 trillion in assets, some \$2.5 trillion more than in 2007. The chart in Exhibit 2 shows the assets the five biggest banks held in 2007 compared to today. JPMorgan Chase (JPM-NYSE) is 74% bigger today than in 2007, Bank of America (BOA-NYSE) 44%, Wells Fargo (WFC-NYSE) 177%, and US Bancorp (USB-NYSE) 66%. Only Citigroup (C-NYSE) has shrunk. These are the banks that still maintain very high leverage ratios that are currently at half of the peak leverage they operated at the start of the financial crisis.

Exhibit 3. Derivative Market Growth

Source: iSPYETF

Note that the wording of the statement was not about how to control the sector, but rather to find out how to control it

The derivatives market, which sparked the 2007 firestorm, has grown from \$586 trillion in 2007 to almost \$633 trillion today and remains largely unregulated. This sector is a potential time-bomb. The shadow banking sector (hedge funds, private equity funds and money market funds) is not subject to capital requirements and has grown rapidly to \$67 trillion, or nearly half the size of the “regulated” banking sector. Without capital requirements, this is an attractive marketplace that is attracting players to leave the regulated marketplace. At the recent G20 summit in St. Petersburg, the members set a goal to figure out a way to control shadow banking by 2015. Note that the wording of the statement was not about how to control the sector, but rather to find out how to control it.

On the surface, all the economic signals would support ever upward growth in energy demand. That means the challenge for the industry is to assure adequate supplies of energy, and the industry knows what to do. Beneath the surface, however, we would suggest there are sufficient signs of potential weaknesses that a prudent energy manager should be guarded in his optimism and have a Plan B developed to protect against a disruptive event.

Does Syria Matter For The Future Of Crude Oil Markets?

For several weeks, Americans have been focused on the question of whether the U.S., with or without allies, would undertake military action against the Bashar al-Assad regime in Syria for his government’s use of sarin gas against his citizens who are fighting in a civil war.

As the prospect of a retaliatory strike against Syria increased, global crude oil prices jumped

As the prospect of a retaliatory strike against Syria increased and fears that such an attack might spark a wider Middle East conflict, global crude oil prices jumped. Even though Syria is not a significant oil producer, it’s location in the Middle East automatically boosts the potential for a wider conflict resulting in reduced oil

production and shipments, especially shipments through the Suez Canal and the SUMED pipeline through Egypt. Scenarios were offered that a wider conflict might move Iran, a sponsor of the Assad regime, to mine the Straits of Hormuz where 35% of the world's seaborne oil passes daily. Any of these scenarios would impact oil's availability and its price. Since August 21st, the date of the gas attack in Syria, West Texas Independent and Brent crude oil, the two global oil price markers, rose from \$103.93 and \$110.82 a barrel to \$110.30 and \$115.90 a barrel on September 6th, respective increases of 6.1% and 4.6%. As of September 13th, the respective prices were \$108.21 and \$111.70, declines from September 6th but higher than August 21st. This price action reflects continued investor concern about the Syrian civil war expanding with greater regional economic and political risks.

It is hard to remember that at the peak of the financial crisis in 2008, the Middle East was a relatively stable region even though there were two wars underway

We think it is important to look at the longer term perspective for the Middle East and crude oil prices. An interesting set of maps shows the political stability of Middle East countries five years ago compared to today. It is hard to remember that at the peak of the financial crisis in 2008, the Middle East was a relatively stable region even though there were two wars underway – Iraq and Afghanistan. Of the Middle East countries, only Iran was viewed as unstable at that time. That is not the case today (Exhibit 5, next page.).

Exhibit 4. Middle East Was Relatively Stable 5 Years Ago
Middle East 5 Years ago: 2 Wars in Mostly Stable Region



Source: Money and Markets

One has to wonder how much the financial crisis and related recession contributed to the instability of the Middle East

One has to wonder how much the financial crisis and related recession contributed to the instability of the Middle East. From the petroleum industry's perspective, this dramatic shift from a mostly stable region to one marked almost totally by chaos has altered their risk tolerance. A recent example of that shift was Apache's (APC-NYSE) decision to sell a third of its Egyptian operations to China's Sinopec (SHI-NYSE) for \$3.1 billion, and invest the money

According to World Bank data, foreign firms made \$11 billion in long-term investments in Egypt in 2007, but in 2011, they pulled half a billion dollars out of the country

elsewhere. Since it entered Egypt in 1994, Apache accumulated 10 million acres for exploration and production and was the country's largest American investor. Importantly, the location of its petroleum operation is well removed from the centers of political violence. But the turmoil in Egypt has taken its toll on U.S. and foreign investment there. Chevron (CVX-NYSE) has sold its network of Egyptian gasoline and fuel stations, again opting to reduce its risk exposure. According to World Bank data, foreign firms made \$11 billion in long-term investments in Egypt in 2007, but in 2011, they pulled half a billion dollars out of the country. Given the continuing chaos, it is difficult to see any meaningful new international investment in Egypt for the foreseeable future.

Exhibit 5. The Middle East Is In Chaos Today
Middle East Today: Instability, Chaos and More Wars



Source: Money and Markets

The conflicts between the two sects have contributed to the civil wars and other battles and they continue to be the primary source of the region's instability

As a quick refresher, Exhibit 6 shows a chart of the Middle East countries and leading political organizations dominated by one of the two primary religious sects in the region. The conflicts between the two sects have contributed to the civil wars and other battles and they continue to be the primary source of the region's instability as the sects struggle over how various countries will be governed – legally, economically and more importantly, socially.

Exhibit 6. Two Religious Sects Are Source Of Conflict

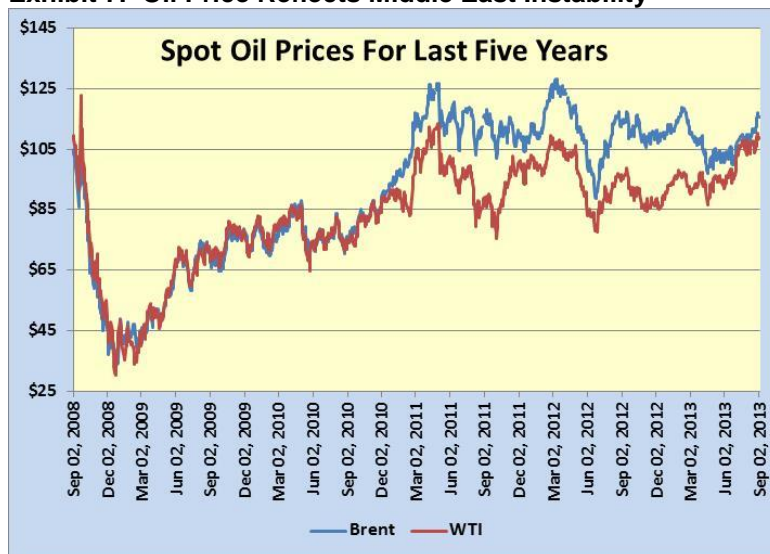
	Shia	Sunni
Regimes of Major Nations	Iran Iraq Syria	Saudi Arabia Egypt Turkey
Some Major Organizations	Hezbollah (Lebanon) Mahdi Army (Iraq)	Al Qaeda & affiliates Muslim Brotherhood

Source: Money and Markets

By the end of 2009, even with sharply reduced oil consumption, global oil prices had more than doubled from 12 months earlier

Given the remarkable political transformation the Middle East has undergone during the past five years, it is interesting to note the impact the region’s instability has had on the price of its primary output – crude oil. We plotted in Exhibit 7 the spot price of West Texas Intermediate (WTI) and Brent oil from September 2008 to the start of September 2013. The early months of the period captured the peak in oil prices driven by the boom leading up to the 2008 financial crisis. Oil prices collapsed from well over \$100 a barrel to about 30% of that price at the low during late 2008 and early 2009. Prices snapped back quickly during the first half of 2009 even as the recessionary fallout from the financial crisis took hold. By the end of 2009, even with sharply reduced oil consumption, global oil prices had more than doubled from 12 months earlier. What is more notable was the jump in world oil prices as the Arab Spring commenced in late 2010 and early 2011. At about the exact same time, the correlation between WTI and Brent broke down as the logistical challenges for American oil drove WTI prices well below world (Brent) prices. It has only been in the past few months that this correlation seems to have been re-established. If we look only at Brent oil prices, with the start of the Arab Spring they jumped above \$105 a barrel and have largely stayed there.

Exhibit 7. Oil Price Reflects Middle East Instability

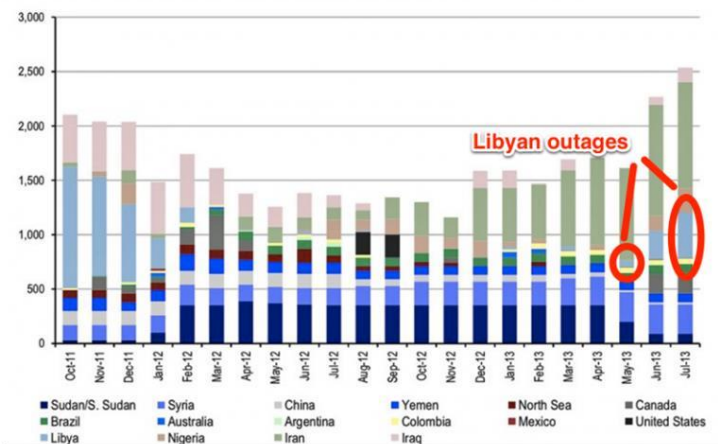


Source: EIA, PPHB

But world oil prices have also been held up by the decline in world oil supplies as reflected in the amount of oil production shut in

While the high oil price has impacted consumption, the continuing weak economic recovery in developed economies around the world has also limited the recovery in petroleum demand. But world oil prices have also been held up by the decline in world oil supplies as reflected in the amount of oil production shut in. The recent jump in oil prices that have coincided with the Syrian situation have been further supported by the sharp cuts in Libyan output due to violence in that country.

Exhibit 8. Oil Prices Being Supported By Higher Outages
Chart 1: Global Supply Outages (kb/d)



Source: *Business Insider*

After sustaining historically high oil production in 2011 and 2012 in order to prevent oil price spikes from production outages due to the Arab Spring, Saudi Arabia reduced its output during the latter part of 2012

As Exhibit 8 shows, Libyan oil output was sharply curtailed during the civil war there that led to the overthrow and killing of Co. Omar Gadhafi. The increase in Libyan oil curtailments has been significant, but there are a number of other oil production outputs. The economic sanctions against Iran have contributed to the largest amount of global output cuts. These sanctions have been offset by increased Saudi Arabian production. After sustaining historically high oil production in 2011 and 2012 in order to prevent oil price spikes from production outages due to the Arab Spring, Saudi Arabia reduced its output during the latter part of 2012. The cutback came in response to the drop in global oil prices as the Arab Spring failed to interrupt oil supplies as much as feared. (See Exhibit 7, page 8, for oil prices during the second half of 2012.) With global oil inventories growing, oil prices dropped, so Saudi Arabia responded by cutting its production, i.e., oil exports, by roughly a million barrels a day. When the sanctions were instituted against Iran by the West in response to that country's failure to curtail its nuclear power development, Saudi Arabia stepped up oil production and exports to offset the lost Iranian output.

Oil prices substantially above the \$100 a barrel level that Saudi Arabia has suggested is reasonable for the world's economy will negatively impact global economic activity and oil consumption

What we know is that if oil production outages increase, Saudi Arabia, the country with the greatest amount of possible additional oil capacity, will be asked to step up its output to prevent an oil price spike. Oil prices substantially above the \$100 a barrel level that Saudi Arabia has suggested is reasonable for the world's economy will negatively impact global economic activity and oil consumption. That is not a favorable scenario for Saudi Arabia, although it might appeal to some of its production-constrained fellow members of the Organization of Oil Exporting Countries (OPEC).

Exhibit 9. Saudi Uses Output To Influence Prices

Saudi Arabian Oil Production at Record High

Millions of Barrels per Day



Source: EIA, OPEC, Barclays Research, U.S. Global Investors

Source: U.S. Global Investors

At some point in the future we may look back on this period as a turning point in the evolution of the global oil industry, and the future course of the global energy business, too

Saudi Arabia has two strong reasons to see that the Syrian civil war, and its government’s use of poison gas, is confined and punished. Neither a victory by Shia-dominated Syria, with the support of Shia-dominated Iran, nor a wider Middle Eastern conflict that removes oil output from the market is an attractive scenario for Saudi Arabia. And neither scenario is good for the world. At some point in the future we may look back on this period as a turning point in the evolution of the global oil industry, and the future course of the global energy business, too. How it evolves will depend on Middle East political developments and other geopolitical trends, the sustainability of Saudi Arabia’s high oil output, any change in oil and gas supplies due to the global shale revolution and all of these considerations must be balanced against energy consumption trends, increased energy efficiency measures and the growing role for energy renewables. Given the dynamics of each of these factors, any predictions about the future of the oil industry and oil price should be taken with a grain of salt. Therefore, we caution readers to be wary of all those long-term forecasts of peak oil or peak demand, and even those calling for U.S. and/or North American energy independence. No one knows the future.

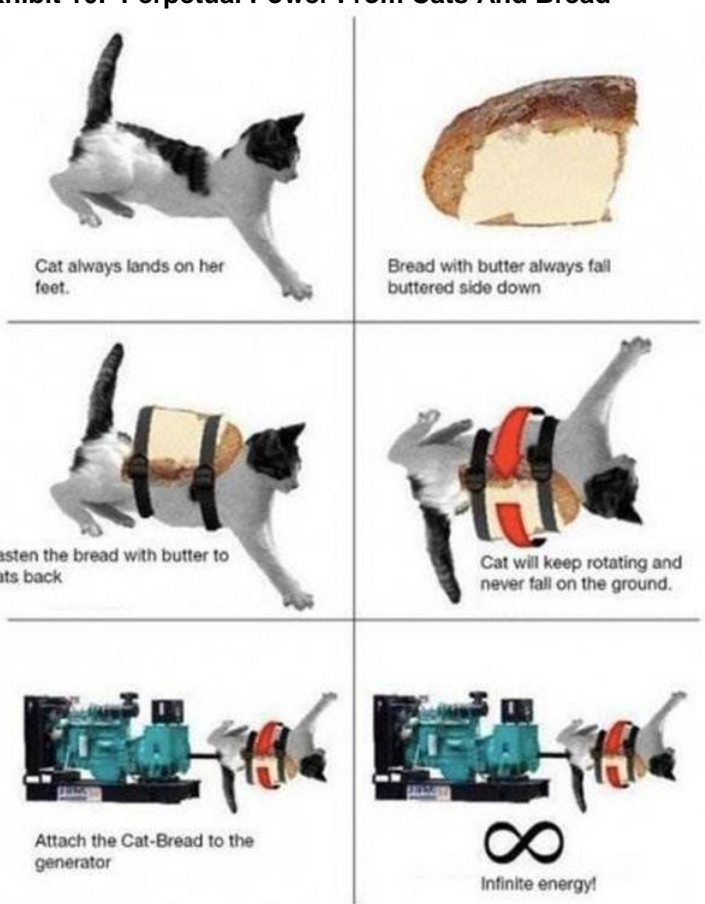
We Found The World’s Next Alternative Energy Source

The cat is the most popular pet in the world

According to *Scientific American* magazine, the cat is the most popular pet in the world. Attempting to estimate how many domestic cats there are is virtually impossible. We have seen estimates of 500 million to two billion in the world. A census conducted in the United Kingdom several years ago estimated that there were 10.6 million cats in that country alone. Another estimate suggests there

could be 85 million domestic cats in North America, which based on the estimated number of households and multiple cat homes seems reasonable. As a cat lover, we were intrigued by their involvement in the latest and, based on the rationale, most promising new alternative energy source.

Exhibit 10. Perpetual Power From Cats And Bread



Source: Power Line

We’ve never seen a cat not land on its feet, or a slice of buttered bread land unbuttered-side down

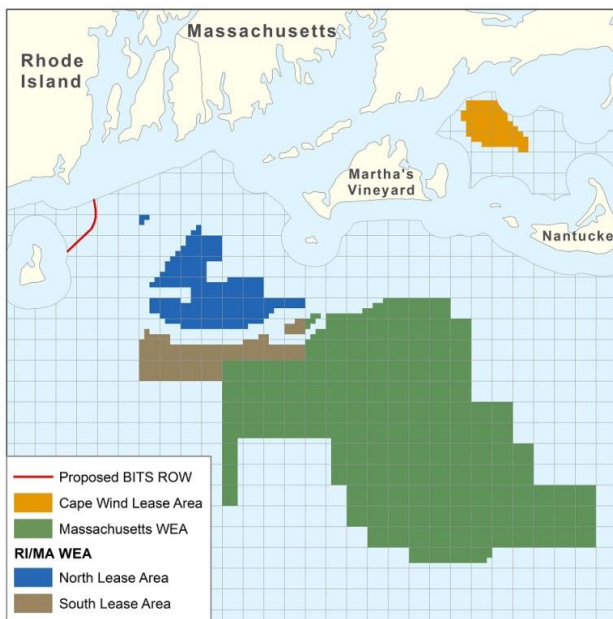
If a cat always lands on its feet and buttered bread always upside down, one has to admit, the logic of this latest perpetual energy source appears sound. Personally, we’ve never seen a cat not land on its feet, or a slice of buttered bread land unbuttered-side down. We just need to make sure that a cat-hater is not in charge of setting our national energy policy.

Wind Energy Is Clearly Politically Correct In Rhode Island

The *Providence Journal* newspaper, the only statewide paper, maintains a feature called Politifact Rhode Island, in which reporters and editorial writers evaluate claims, mostly boasts made by

politicians. This feature exists in many papers and is visible primarily during political campaigns, as the newspapers try to evaluate and correct any campaign misstatements. Our attention to the column a few weeks ago was due to the subject matter and Politifact’s decision.

Exhibit 11. Deepwater Wind’s New Offshore Leases



Source: BOEM

Deepwater Wind is currently developing a five-wind turbine demonstration project off the coast of Block Island in Rhode Island state waters

In the July 31st auction of offshore wind energy leases off the coast of Massachusetts and Rhode Island by the Bureau of Ocean Energy Management (BOEM), Deepwater Wind won rights to a 257-square mile tract with a bid of \$3.8 million. The company is currently developing a five-wind turbine demonstration project off the coast of Block Island in Rhode Island state waters. It has plans to develop the new site with a massive 100-200 wind turbine farm and sell the power to utilities on Long Island and Rhode Island.

Exhibit 12. Block Island Has Wind



Source: Wikipedia

Was offshore wind actually cheaper than solar?

Following the sale, WJAR TV's public affairs show, "10 News Conference," hosted Deepwater Wind's chief executive officer, Jeffrey R. Grybowski, on August 4, 2013. During the interview, the show's host, Bill Rappleye, asked Mr. Grybowski how much the electricity generated by the wind turbines would cost consumers. He answered, "Yes, 13- to 14-cent power [offshore wind energy per kilowatt hour] is probably what we're talking about, significantly lower than the cost of what we've seen for offshore wind to date." He went on to say, "Also, by the way, significantly less expensive than solar energy." It was this claim that aroused curiosity among the Politifact editors. Was offshore wind actually cheaper than solar?

We will only hit the high points of the extensive due diligence Politifact went through to reach its decision. They interviewed Mr. Grybowski to understand his claim. He noted that the five-wind turbine project is actually Phase I, while the larger turbine project is Phase II. He said his cost claim was based on the Phase II project, and his expectation that his company would be able to offer a wholesale price for this output at 13-14 cents per kilowatt-hour (kWh) with escalations.

His firm's contract with Rhode Island electricity provider National Grid for the excess power from Phase I, however, is for 24.4 cents per kWh, escalating to 46.9 cents in the last year of the 20-year contract

Since there have not been any offshore wind farms built, Mr. Grybowski pointed to a formal offer his firm made in 2012 to sell power from Phase II to Long Island for 10-cents per kWh as justification for his claim. His firm's contract with Rhode Island electricity provider National Grid (NGG-NYSE) for the excess power from Phase I, however, is for 24.4 cents per kWh, escalating to 46.9 cents in the last year of the 20-year contract. The price for Cape Wind's turbine farm in Nantucket Sound output sold to National Grid, subject to contingency adjustments, is 18.7 cents per kWh for the first year.

Due to different government subsidies it is difficult to make accurate cost comparisons

Politifact dug into the cost of solar by turning to the Rhode Island Office of Energy Resources, which plays a role in the pricing for renewable energy projects. By law in Rhode Island, solar projects enter into contracts with National Grid at a fixed price for 15 years and offshore wind at a price with annual escalators for 20 years. According to Christopher Kearns, chief of program development for the Office of Energy Resources, "This stuff is extremely complicated." By that he meant that due to different government subsidies it is difficult to make accurate cost comparisons. He then suggested that "The rule of thumb is the larger the renewable project, the lower the price will be." Mr. Kearns suggested, "We have seen a gradual decline in the price of solar" for larger projects.

The Office of Energy Resources provided Politifact a list of 18 solar projects that have entered into contracts with National Grid since December 2011. The wholesale power prices ranged from 18.5 cents per kWh to 33 cents, with the largest projects having the lowest prices, consistent with Mr. Kearns observation. Deepwater Wind also provided Politifact a similar list compiled from National

Given the expected 3% per year escalation, by year 11, the wind power price would equal solar, and by year 15 the wind price would be equal to 20 cents to 22 cents, or two to four cents more per kWh than for power generated from solar

Mr. Grybowski claims that for large-scale offshore wind projects, the 29.5-cent estimate is inaccurate because it is based on faulty methodology

They found that the initial Deepwater Wind Phase II power price would be cheaper than all the solar contract prices

Grid data, showing 21 Rhode Island solar projects, with prices ranging from 18.5 cents to 33 cents per kWh.

The lowest cost solar project under contract is for 18 cents per kWh and is planned by Next Sun Energy for an industrial site on Great Road, in North Smithfield, Rhode Island. This project beats Deepwater Wind's Phase I power cost and the gap widens over time. Assuming Mr. Grybowski's estimate of 13-14 cents per kWh for Phase II is correct, it will be cheaper than the solar contract. But given the expected 3% per year escalation, by year 11, the wind power price would equal solar, and by year 15 the wind price would be equal to 20 cents to 22 cents, or two to four cents more per kWh than for power generated from solar.

To further evaluate the Mr. Grybowski's statement, Politifact went to the U.S. Energy Information Administration's (EIA) web site to see what it estimates costs for these power sources to be. On a national basis, the EIA says that the "levelized cost" of the most widespread kind of solar power, photovoltaic, is 22.4 cents per kWh, compared to offshore wind at 29.5 cents. Levelized cost is a measure of overall competitiveness of different electricity generating technologies explains the EIA. Interestingly, Mr. Grybowski claims that for large-scale offshore wind projects, the 29.5-cent estimate is inaccurate because it is based on faulty methodology.

After their extensive analysis, which they listed with their article that included both interviews and email exchanges with various sources and examinations of government filings, Politifact concluded Mr. Grybowski's claim that offshore wind was "significantly cheaper than solar energy" was "False."

The Politifact article was published on August 28th. We were surprised to open the paper three days later to see the same article headline. Was the *Providence Journal* merely rerunning the earlier story, we wondered. Once we looked, it turned out that Politifact was now judging Mr. Grybowski's statement as "Mostly True," although they suggested it needed some additional information. So what caused Politifact to make a U-turn in their ruling?

They began their re-examination by comparing the Phase II power cost to the costs on the list of 21 solar contracts provided by Deepwater Wind. They found that the initial Deepwater Wind Phase II power price would be cheaper than all the solar contract prices. At year 12, the Deepwater Wind price would surpass the cheapest solar project's price, but after 20 years, Deepwater Wind's price would be about 23 cents and thus cheaper than 19 of the 21 solar projects.

Politifact suggested that comparisons of solar and offshore wind prices in Rhode Island are tricky due to their scale. As they pointed out, there isn't much room in tiny Rhode Island for the sort of large-

Certain units built for the demonstration project of Phase I will help in both the construction of Phase II and its operation, but we assume that those costs were not included in the analysis

What we found more interesting was that Politifact was comparing actual contracted prices for solar energy projects against a hypothetical large offshore wind farm

scale solar projects that exist in the Southwest. The largest solar project that appeared on Deepwater Wind's list is planned for the former Forbes Street Landfill, in East Providence and would have a capacity of 3.7 megawatts. Fifteen of the 21 solar projects are for less than one megawatt of power compared with the 1,000 megawatts planned for Deepwater Wind's Phase II.

While Deepwater Wind's Phase I project would be more expensive over time than all of the Rhode Island solar projects the company cited, if Mr. Grybowski's Phase II estimated electricity price holds true, its price would ultimately be cheaper than 19 of the 21 solar projects. One point not mentioned by Mr. Grybowski is that certain units built for the demonstration project of Phase I will help in both the construction of Phase II and its operation, but we assume that those costs were not included in the analysis. The price gap favoring wind energy would be a few cents for the larger solar projects and up to 10 cents for the smallest.

The comments on the *Provident Journal* web site were fascinating. Many commentators wondered who had gotten to the paper. People pointed out that Politifact didn't provide any different data sources than with the earlier article to change their ruling. But what we found more interesting was that Politifact was comparing actual contracted prices for solar energy projects against a hypothetical large offshore wind farm. We also found it interesting that the cost estimate from Phase II is now 30%-40% higher than Deepwater Wind contractually offered to a utility last year, but that point was never investigated. We also don't know if the escalator will be 3% a year. What if it is 4% a year, or possibly higher?

Exhibit 13. Federal Subsidies By Energy Source – FY2010

	Direct Expenditures	Tax Expenditures	Research & Development	Federal & RUS Electricity Support	Loan Guarantee	Total	Share of Total Subsidies and Support
Coal	37	486	575	91	0	1,189	10.0%
Natural Gas and Petroleum Liquids	1	583	15	56	0	654	5.5%
Nuclear	0	908	1,169	157	265	2,499	21.0%
Renewables	4,178	1,347	632	133	269	6,560	55.3%
Biomass	6	54	55	0	0	114	1.0%
Geothermal	115	1	72	0	12	200	1.7%
Hydropower	17	17	51	130	0	215	1.8%
Solar	409	99	287	0	173	968	8.2%
Wind	3,556	1,178	166	1	85	4,986	42.0%
Unallocated							
Renewables	75	0	0	0	0	75	0.6%
Transmission and Distribution	461	58	222	211	20	971	8.2%
Total	4,677	3,382	2,613	648	555	11,873	100%

Notes: Estimates of federal electricity program support are based on the most recent audited annual reports for federally-owned utilities which conform to federal fiscal year convention.

Totals may not equal sum of components due to independent rounding.

The values provided in this table represent the average of the low and high values of more detailed estimates provided in the body of the report.

Sources: Office of Management and Budget, *Analytical Perspectives*, Budget of the United States Government, Fiscal Year s 2012 and 2009.

Joint Committee on Taxation, Estimates of Federal Tax Expenditures for Fiscal Years 2010-2014, JCS-3-10 (Washington, DC, December 2010), Table 1, and budget documents from the Departments of Energy, Agriculture, Transportation, Treasury, Health and Human Services, Housing and Urban Development, the Environmental Protection Agency and the General Services Administration.

Note: Figures in 2010 \$ millions Source: EIA

Wind receives 42% of all subsidies, five times the percentage awarded to solar

The report pointed out that in several western states, the most productive locations have already been exploited

Most interesting was reviewing the study by the EIA showing government subsidies for fuels used in generating electricity. Wind receives 42% of all subsidies, five times the percentage awarded to solar. Given that disparity, it is surprising that the wind price isn't even more competitive with solar. This is all very interesting when we realize that there was another offshore wind lease sale on September 4th won by Dominion Virginia Power with a \$1.6 million bid for 113,000 acres. There were only two bidders, but the auction lasted for three hours.

As we were writing this article, a new study was released by the National Renewable Energy Laboratory suggesting that by 2025, wind and solar electric generation could be cost-competitive without federal subsidies with natural gas in the Western United States. The qualifier was that renewable energy development occurs in the most productive locations, of which there are many in these states, even after considering the cost of transmission and integration costs. The study's conclusion is that if all the various energy sources cost about the same on a per-kilowatt-hour-basis, then the value for customers becomes a matter of finding the right power supply mix. But interestingly, the report pointed out that in several western states, the most productive locations have already been exploited. If true, then these states will be looking at the marginal cost of their power supply rising, not declining as predicted by those suggesting renewable fuels are a low-cost power alternative.

Exhibit 14. DOE Oil Price Forecasts Way Off The Mark

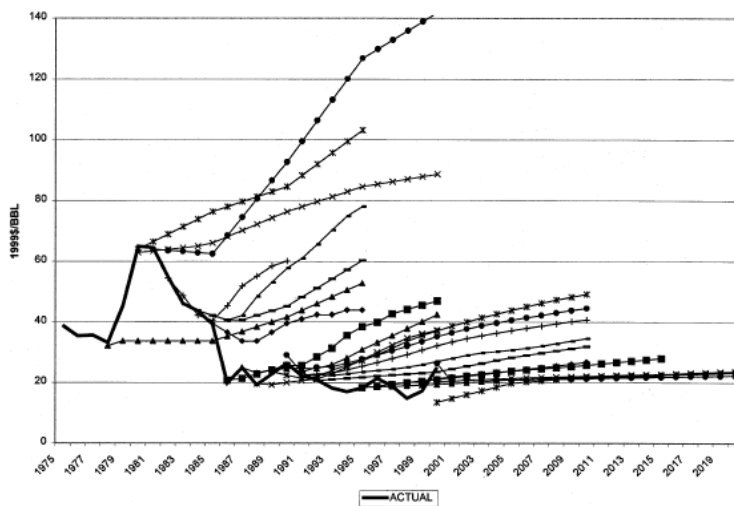


Fig 1. The evolution of DOE oil price forecasts.

Source: Michael Lynch

Most of the studies about the future of renewable fuels, including Mr. Grybowski's wind energy cost projections, remind us of the history of oil price forecasts during the 1970s and 1980s. Virtually all of them turned out to have been constructed on assumptions of trends that

were little more than an extrapolation of then-current trajectories. The predictions bore little resemblance to actual price history beyond the first 6-12 months of the forecast. Projections and predictions remind us of “wishing and hoping,” a concept one of our bosses once said “isn’t a business strategy,” and shouldn’t be the basis for our national energy strategy.

Americans Continue To Drive Less; Will That Ever Change?

The data for June, the latest month available, showed miles driven dropped by 900 million, or 0.4%, to an estimated 258.1 billion

Recent data from the Federal Highway Administration shows that Americans continue to drive fewer miles despite the sharp rebound in U.S. new-vehicle sales, an improving economy and modest job growth. The data for June, the latest month available, showed miles driven dropped by 900 million, or 0.4%, to an estimated 258.1 billion. Collectively for the first half of 2013, miles driven in the United States declined by 1.4 billion, or 0.1%, to an estimated 1.46 trillion. This extends the declines that have been happening since driving mileage peaked in 2007.

The peak month for driving was experienced in August 2007 when Americans drove 269.3 billion miles before diving in response to the 2008 financial crisis and follow-on recession

Last year, American drivers drove an estimated 2.94 trillion miles, down from 2.96 trillion in 2011. The peak month for driving was experienced in August 2007 when Americans drove 269.3 billion miles before diving in response to the 2008 financial crisis and follow-on recession. The jump in unemployment and other financial woes curtailed the impulse, and the need, for Americans to jump in their cars. There are some optimists who believe the trend in driving will soon reverse. According to Michael Sivak, a researcher at the University of Michigan’s Transportation Research Institute, “With the improving economy and the expected increase in the U.S. population, it is highly likely that from a long-term perspective, the absolute number of vehicles has not yet peaked.” That suggests total vehicle miles driven should slowly increase, mirroring the growth in economic activity. But the latest prediction from Toyota Motors (TM-NYSE) questions that view.

Toyota's forecasts do not see new car sales in the United States hitting 17 million by 2018

According to Robert Carter, senior vice president of automotive operations for Toyota Motor Sales U.S.A., Toyota's forecasts do not see new car sales in the United States hitting 17 million by 2018, as some analysts have projected. He expects the auto industry's seasonally-adjusted annualized selling rate to remain in the high-15 million to mid-16 million unit range for most of the decade. The latest monthly sales rate was an annualized 16.1 million vehicles, which marked a strong comeback from the 10.4 million cars sold in 2009 during the Great Recession.

The recovery in new vehicle sales over the past four years was driven by an aging vehicle population as the average age rose to 11.5 years. Equally important is that even after the healthy recovery in new car sales over the past few years coupled with a sharp increase in the rate of car scrapping, a quarter of the auto population is 16 or more years old. Clearly there is room for healthy sales for

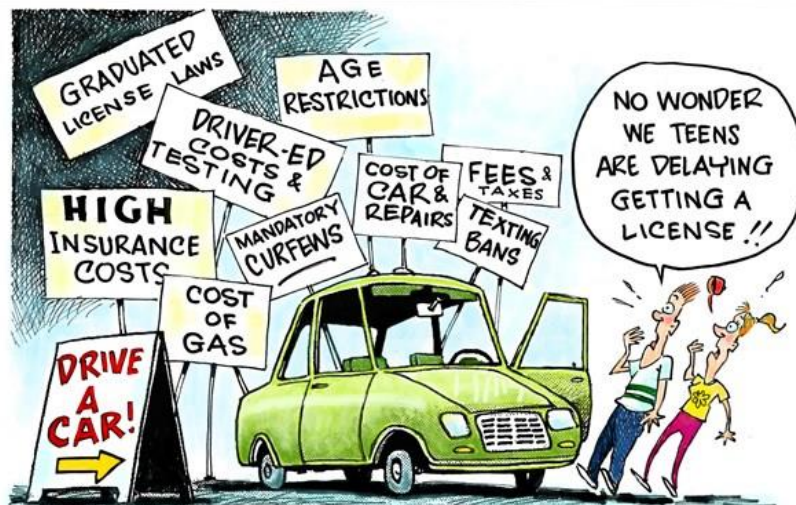
The key to boosting sales has been by reducing car costs by expanding leasing activity

We have and will continue to have more aging people every day in this country and this demographic segment drives less each year as retirement reduces work-related driving, the miles associated with raising children is cut and infirmities prevent older citizens from driving at all

the next few years, assuming the economy continues to grow and citizens find work and incomes rise. But as we have seen in the auto sales data for 2013, the key to boosting sales has been by reducing car costs by expanding leasing activity. According to industry data, so far this year, 26% of car sales have been via leases. This compares to 16% to 20% during the boom years leading up to the 2008 financial crisis. This year, in contrast to the past, leasing has been extended to medium range vehicles in addition to high-end ones that traditionally dominated the leasing activity. Leasing high-end vehicles was popular as a way of lowering the cost of luxury cars and, in turn, increasing their sales rate when leases end. By extending car leases to medium range vehicles, the auto industry is attempting to re-create the demand pattern of the high-end market, while making cars more financially attractive to more middle-income buyers.

The real key to a recovery in automobile driving, however, will depend on changes to the social trends that have undercut Americans' use of vehicles. It is difficult to see how the demographics of America's population can be altered meaningfully in the next few years. We have and will continue to have more aging people every day in this country and this demographic segment drives less each year as retirement reduces work-related driving, the miles associated with raising children is cut and infirmities prevent older citizens from driving at all. Unless we get a surge in younger drivers, which is not supported by the population models and the sheer numbers of young adults already here, it is difficult to see how this segment can offset the negative trends of aging drivers.

Exhibit 15. Why Our Teens Are Non-Drivers



DAVE GRANLUND © www.davegranlund.com

Source: Power Line

We believe that U.S. social and demographic trends impacting the amount of driving will prove stronger than auto forecasters who believe we will return to historic auto-buying patterns

We have discussed in many previous articles the reasons why social trends are undercutting vehicle miles driven – the growing use of the Internet for working and for shopping, the preference for social contact through electronic medium rather than personal contact for our teenagers and youth, and housing and work patterns that favor the use of alternative modes of transportation over personal vehicles. The cartoon below addresses why America’s teenagers are not getting their driver’s licenses. It is hard to see many of these factors changing soon.

We remain convinced that Toyota’s view of future new car sales in the U.S. will prove more accurate than the forecasts calling for an ever upward sales projection. In the early 2000s, before the financial crisis, when yearly car sales were in 19-20 million units a year range, the market was in a bubble supported by the housing bubble and the use of home equity loans to finance all sorts of consumer spending including new vehicles. We believe that U.S. social and demographic trends impacting the amount of driving will prove stronger than auto forecasters who believe we will return to historic auto-buying patterns. None of these beliefs are overly negative for the outlook for the auto industry or those businesses closely associated with new car sales, however, increased vehicle fuel-efficiency mandates will take a toll on the volume of gasoline sales meaning a challenging future for the petroleum industry. That outlook needs to be assessed in light of the other trends at work in the U.S. and North American energy market, all of which could result in the U.S. reassessing its prohibition against crude oil exports.

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