
MUSINGS FROM THE OIL PATCH

May 13, 2014

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

Keystone XL Pipeline: The Job Killer Or Is It Dead?

Mr. Girling said that TransCanada would “ramp down” its efforts to begin constructing the Keystone XL pipeline

Russ Girling, president and CEO of TransCanada (TRP-NYSE), spoke to some journalists following his company’s annual shareholders’ meeting at the end of April. In his comments as reported in the Canadian press, Mr. Girling said that TransCanada would “ramp down” its efforts to begin constructing the Keystone XL pipeline following the decision by the Obama administration’s State Department to extend indefinitely the inter-agency review of the project due to concern about the time necessary to deal with 2.5 million public comments and concern about the pipeline’s route through Nebraska following a county judge’s ruling that the Nebraska governor’s approval of the pipeline project was unconstitutional. Mr. Girling pointed out that TransCanada had been preparing to start construction this summer when the April 20th delay was announced.

Mr. Girling told the reporters that there are hundreds of TransCanada and contractor employees dedicated to the project whose jobs are now at risk

According to Mr. Girling, the route of the pipeline is lawful until a court rules otherwise. Therefore, in his view, the State Department should have concluded the inter-agency review process as it stated it was going to do the week before it suddenly reversed its position. As a result, he believes there is a “low probability” a decision will be rendered in time to save the summer construction season. TransCanada is “retooling” its arrangements and looking to cut costs, including preparing to let employees and contractors go. So far, the pipeline project has been subject to over 2,000 days of government review compared to more conventional pipeline projects where reviews have lasted 500 days. Mr. Girling told the reporters that there are hundreds of TransCanada and contractor employees dedicated to the project whose jobs are now at risk. For the 9,000 construction workers who would have been hired beginning with this summer’s construction season and next, there will be no work. Mr. Girling was quoted as saying, “There will be

The company is considering bringing a challenge to the U.S. government's right to deny or delay indefinitely under provisions of NAFTA

some disappointed folks who aren't going to work this summer and some other disappointed folks that are on the payroll in various forms or fashions that we are not going to need."

So far, TransCanada has invested \$2.3 billion in the project, against a total estimated cost of \$5.4 billion. The total cost estimate will be revised if and when the pipeline project goes forward. The company is considering bringing a challenge to the U.S. government's right to deny or delay indefinitely under provisions of the North American Free Trade Act (NAFTA). The NAFTA treaty guarantees unfettered access for Canadian oil to enter and cross the United States in return for the U.S. having unfettered supplies of Canadian oil. While a company can make a claim under NAFTA, Canada's Natural Resource Minister Greg Rickford ruled out a challenge led by the Canadian government. Given the selective enforcement of laws by the Obama administration, we suspect any victory by TransCanada in its possible NAFTA claim would be muted by the U.S. government ignoring the ruling.

There is little doubt that TransCanada is signaling possibly throwing in the towel on Keystone XL

There is little doubt that TransCanada is signaling possibly throwing in the towel on Keystone XL. If it happens, it will be a huge victory for the environmental movement, although the movement will quickly lose its prime fundraising prop. Dropping the application will likely accelerate TransCanada's move to build its Energy East oil pipeline project - the 4,600 kilometer (2,858 mile) pipeline anticipated to move 1.1 million barrels a day of oil from Alberta's oil sands and Saskatchewan to the Irving refinery and shipping terminal in Saint John, New Brunswick. If Keystone is killed, it means the environmental movement will need to turn its anti-fossil fuel fight to another project. Executives in the energy business need to be thinking about what that target might be and girding for the next battle.

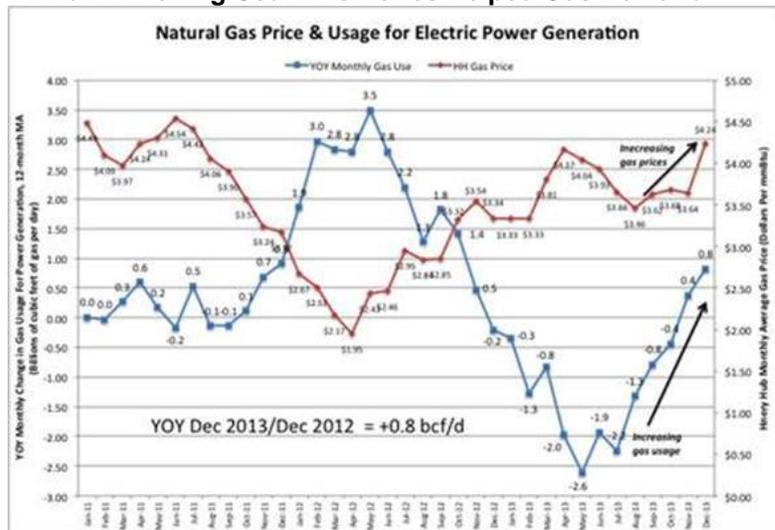
Understanding The Energy Options For The Power Market

Cheap natural gas has enabled gas to gain an increasing share of the power generation market up until last year when cheap coal began clawing back some of its lost market share

A few weeks ago we received a graph from our friend Art Berman showing the historical use of natural gas in the power sector compared to natural gas prices. His point was that during last fall, natural gas consumption by electric generating plants increased despite rising natural gas prices. This correlation was in contrast to the pattern that had existed for several years before where changes in natural gas consumption in the power sector were more dependent on that fuel's relative cost compared to the price for coal. Cheap natural gas has enabled gas to gain an increasing share of the power generation market up until last year when cheap coal began clawing back some of its lost market share. That was until last fall and throughout the winter as the severe winter weather limited coal production and shipments, especially as the volume of crude oil moving by rail into the eastern portion of the U.S. has displaced coal volumes. As a result, power generators with dual-fuel

capacity were switching back to natural gas because of depleting coal inventories.

Exhibit 1. Falling Coal Inventories Helped Gas Demand



Source: EIA courtesy of Art Berman

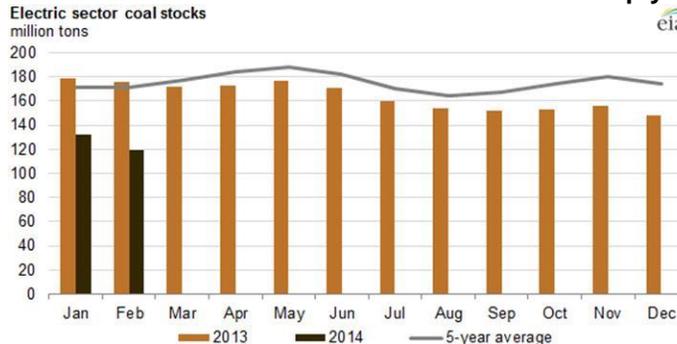
The year-over-year increase in natural gas usage went from 3.5 Bcf/d when gas prices were in the \$1.90/MMBtu range during April 2012 to a negative 2.6 Bcf/d as gas prices hit a high of \$4.24 in May 2013

As Mr. Berman pointed out in his email to us about the significance of the slide, during the course of 2013, power generation fuel-switching from coal to natural gas contributed to a 0.8 billion cubic feet per day (Bcf/d) increase in gas use, despite Henry Hub natural gas prices rising from \$3.46 to \$4.24 per million British thermal units (MMBtus) in the August to December 2013 period. In contrast, the year-over-year increase in natural gas usage went from 3.5 Bcf/d when gas prices were in the \$1.90/MMBtu range during April 2012 to a negative 2.6 Bcf/d as gas prices hit a high of \$4.24 in May 2013. His point was that the increase in coal to natural gas for power generation occurred despite rising gas prices last fall suggesting other factors were at play in the market. Most likely it was due to lower coal shipments and depleted inventories. We have also been led to believe that in the Northeast, the lack of gas pipeline capacity to ship the growing supply of Marcellus gas to market may have contributed to some discounting of gas prices in local power markets. We have not seen an estimate of the potential gas volumes that were involved due to price discounting, but we suspect it happened.

The declines for each of the first two months of 2014 put inventories some 50-55 million tons below the historical five-year average

The inventory situation is demonstrated by the chart in Exhibit 2 showing how monthly coal inventories at electric power plants declined during the second half of 2013 and fell significantly in January and February of this year. The magnitude of the declines is shown by looking at the five-year average monthly inventory levels. The declines for each of the first two months of 2014 put inventories some 50-55 million tons below the historical five-year average, a meaningful shortcoming.

Exhibit 2. Power Plant Coal Inventories Fall Sharply

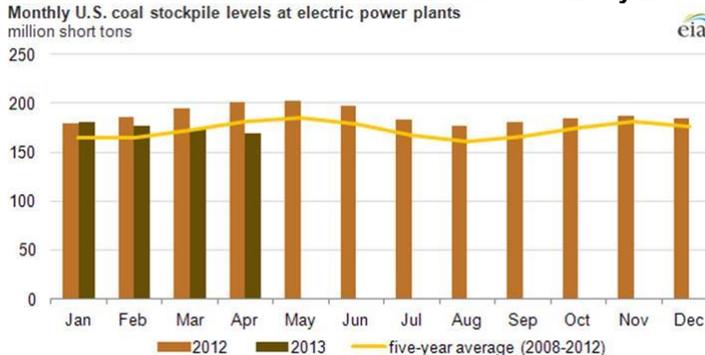


Source: EIA

It appears that coal inventories always decline by the end of winter, but the dramatic fall this winter was more meaningful – and potentially of greater concern for power generators

What is interesting as you contemplate the significance of the fall in coal inventories is to look at the same information as of the spring of 2013. It appears that coal inventories always decline by the end of winter, but the dramatic fall this winter was more meaningful – and potentially of greater concern for power generators. Last year, coal inventories declined every month during the first four months of the year, but January 2013's inventory level was higher than it was in January 2012. More importantly, the 2013 monthly declines contrasted against rising inventories during the first four months of 2012. In fact, the May 2012 coal inventories were the highest in the past 26 months, which we suspect was due to a combination of a warm 2011-12 winter and weak natural gas prices that enabled gas to gain market share in the power generation sector.

Exhibit 3. Coal Inventories Also Declined In Early 2013



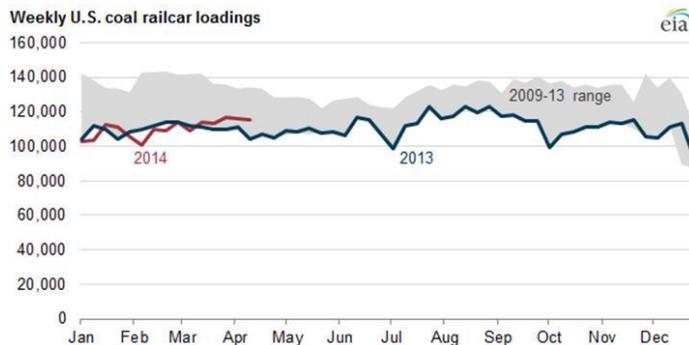
Source: EIA

One has to wonder whether the fact that in 2013 and so far this year, carloads were at the low end of the five year history is the new reality

In the near-term, it looks like the domestic coal industry is beginning to step up its deliveries to coal-fired power plants. Increased coal deliveries, however, are coming from a very low level. While it is nice to see an increase in the volume of coal being delivered to power plants, one has to wonder whether the fact that in 2013 and so far this year, carloads were at the low end of the five year history is the new reality. Do the low inventories reflect a continued struggle between coal and crude oil for railroad track space, or does it reflect a new normal as to the use of coal in the domestic power industry as

consumption contracts with the scheduled closing of coal-fired power plants due to environmental restrictions?

Exhibit 4. Power Plant Coal Inventories Should Build



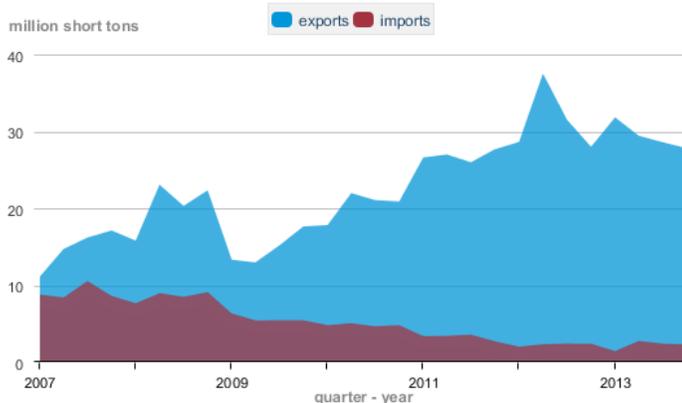
Source: EIA

According to the EIA, coal exports to Europe represented 52% of total exports for the year, while another 23% went to Asian buyers

The answer to the coal shipment question depends on the need for power, which is a question about our weather, both summer and winter. It also depends on the supply and demand for natural gas, as that will impact gas prices and the competitiveness of gas with depressed coal prices. Cheap domestic coal could also evaporate if the industry is successful in boosting its exports to European and Asian markets. As shown in Exhibit 5, U.S. coal exports were down in 2013 from 2012, but they are at the second highest level in the past seven years. According to the Energy Information Administration (EIA), coal exports to Europe represented 52% of total exports for the year, while another 23% went to Asian buyers. Collectively, those two markets accounted for 75% of U.S. coal exports last year. We have no reason to think that these buyers will be consuming less coal in 2014.

Exhibit 5. Coal Exports Off In 2013, But Near Record

U.S. coal exports and imports



Source: U.S. Energy Information Administration: "Quarterly Coal Report."

Source: EIA

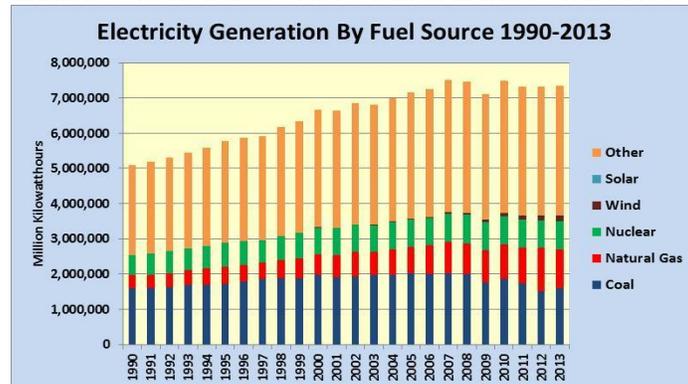
The 1950's world of economic, financial and regulatory stability for utilities no longer exists

The future of the coal industry is changing as its future within the electric power business changes. There was a joke back before the turn of the century that any CEO when asked if he believed in reincarnation, was also asked what would he like to come back as. The answer was: a utility company CEO in the 1950s. Why? His fundamental growth was 3-5% a year and all he had to do was make sure the regulators were well looked after in order to ensure approval of periodic rate increases that would keep his dividend growing and give him plenty of time to play golf. The 1950's world of economic, financial and regulatory stability for utilities no longer exists. In fact, the entire utility business model is under attack, and a portion of the industry will need a total reworking. The most recent event that is shaking up the utility world with particular ramifications in energy markets was the decision two weeks ago by the U.S. Supreme Court to uphold the power of the Environmental Protection Agency (EPA) to regulate the downwind emissions of coal-fired power plants. The 6-2 decision acknowledging the right of downwind states to sue utilities producing electricity using coal for damages caused by their plants' emissions upwind, even hundreds of miles away, puts these plants at risk of being closed to minimize the legal risk to the owners.

From 2008, when the financial crisis hit, to now, electricity generation has fluctuated but is generally lower

The regulation of air quality for new power plants, and now existing ones, raises the question of how electric utilities will be able to supply power in their service areas if they must shut down these plants. Add to that challenge the issue of state renewable energy mandates. We can see the impact of these two trends in the data on electricity generated by fuel source and additions and retirements of generating capacity by fuel source. When we examine the history of electricity generation by fuel source for the past 23 years (Exhibit 6), we see that from 1990 through 2007, overall consumption grew steadily with the exception of years when economic dislocations occurred. From 2008, when the financial crisis hit, to now, electricity generation has fluctuated but is generally lower. The fluctuations reflect weather, slow economic growth and the increased output from renewable energy sources.

Exhibit 6 Renewables Have Taken Market Share Recently



Source: EIA, PPHB

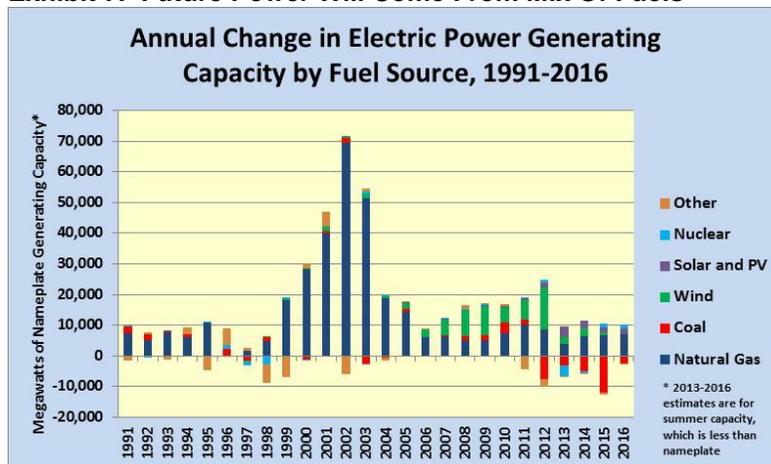
Many of the tax subsidies for renewable fuels were cancelled at the end of 2013, which might improve the competitive situation for coal and gas

Natural gas and wind have been the primary beneficiaries as coal has lost market share as plants are retired

The impact of renewables shows most clearly during the past several years as mandates and subsidies for these fuels have benefitted from the Obama administration’s war on fossil fuels. That war has resulted in the shutting down of coal-generating power plants. When combined with the struggle between cheap natural gas and cheap coal for fossil fuel market share, the loss of coal plants has led to a modest decline in the percentage of output from fossil-fuel-powered plants. Many of the tax subsidies for renewable fuels were cancelled at the end of 2013, which might improve the competitive situation for coal and gas, however, Congress is now working to restore some or all of the tax breaks in order to resuscitate the renewable fuel industry.

The EPA restriction against the burning of coal to generate electricity has resulted in little new coal-burning generating capacity being built in this country. Since the middle of the last decade, the mix of new power generating capacity by fuel source built shows a remarkable mixture of fuels. Natural gas and wind have been the primary beneficiaries as coal has lost market share as plants are retired. These trends are not going to change, except if renewables lose their subsidies permanently. The chart in Exhibit 7 shows the annual change in power generating nameplate capacity by fuel source from 1991 through 2013 with forecasts for 2014 through 2016.

Exhibit 7. Future Power Will Come From Mix Of Fuels

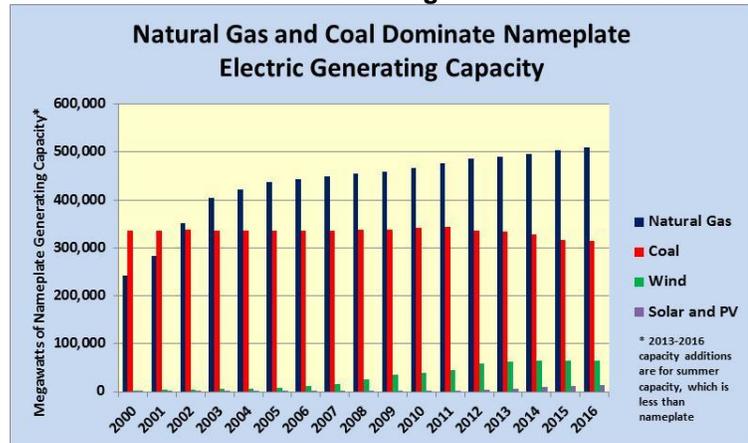


Source: EIA, PPHB

Even with the forced retirements of coal-burning power plants, the electricity sector is dominated by coal and natural gas

Even with the forced retirements of coal-burning power plants, the electricity sector is dominated by coal and natural gas with wind and solar beginning to claim a growing share of the market starting in 2005. Remember that nameplate capacity does not necessarily correlate with output as many of the natural gas plants are used only in peak demand periods and as backup for wind and solar installations in order to supply power whenever these highly variable sources of clean energy fail to meet demand.

Exhibit 8. Wind And Solar Making Their Presence Felt

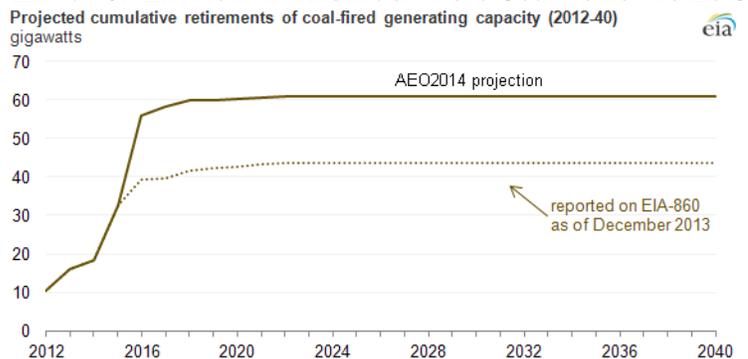


Source: EIA, PPHB

The EIA points out that the 60 GW's of capacity that is due to be retired by 2020 represents approximately 20% of the nation's total coal-fired electricity generating capacity

The outlook for coal-generated power is so bleak that the EIA has updated its latest long-term energy outlook (AEO2014) with a scenario showing the impact of a higher than previously projected retirement rate. The result is that rather than a retirement of 40 gigawatts (GW) of coal-fired generating capacity by 2016, we could be looking at closer to 55-60 GW. If that higher rate becomes the new trajectory for retirements, then the power industry needs to start aggressively building new generating capacity. The EIA points out that the 60 GW's of capacity that is due to be retired by 2020 represents approximately 20% of the nation's total coal-fired electricity generating capacity. The higher retirements will be good for natural gas as it is the best positioned fuel at the present time to take up that slack, however, we expect wind and solar will reap their share of the building boom, too, especially given the push for increased green-energy power.

Exhibit 9. EIA Now Thinks Much More Coal Power To Be Shut



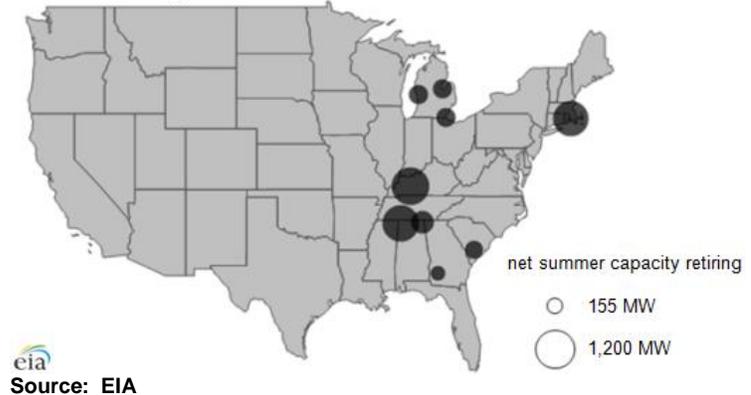
Source: EIA

Just in the past few months, there has been 5.4 GW of coal-fired generating capacity retired. Over half of it was due to decisions by the Tennessee Valley Authority (TVA) to close many of their power

plants. Nearly 1.1 GW of coal-fired generating capacity was closed in Massachusetts with the balance coming from plants closed across Mississippi, South Carolina and Georgia.

Exhibit 10. Coal-Powered Plants Are Shutting Down

Coal-fired electric generator retirements—announcements since November 2013



There will be a geographic impact as the coal-fired power plants targeted to close are clustered in and around the primary coal deposits of America

When we examine the remaining coal-fired power plants scheduled to be closed by 2016, it is evident that certain regions of the nation will be looking at significant new power sources. What will replace these plants, and how the selection will impact consumer electricity bills remains unknown. What we do know, however, is that there will be a geographic impact as the coal-fired power plants targeted to close are clustered in and around the primary coal deposits of America, in particular those in Ohio, Pennsylvania and West Virginia. There will be economic repercussions, but how extensive they may be is unclear.

Exhibit 11. Coal Plant Shutdowns Impact Central Region

Reported Coal-fired generator retirements, 2012 - 2016

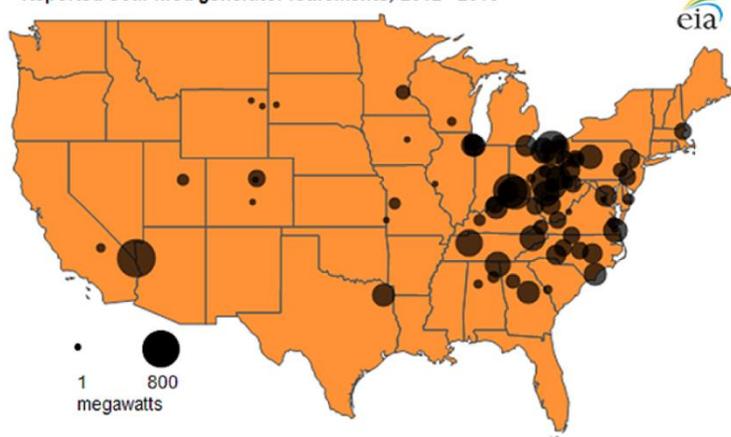
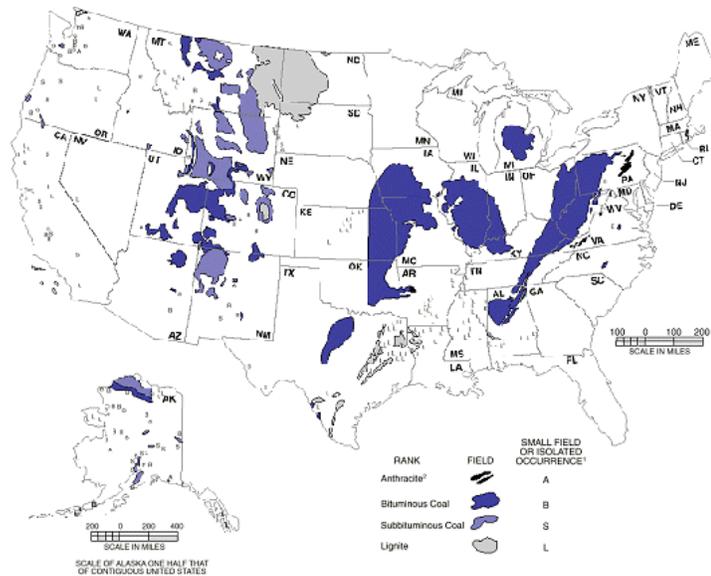


Exhibit 12. Coal Producing Regions Most Impacted By Policy

Figure 1. Coal-Bearing Areas of the United States



Source: *BusinessWeek.com*

Without an extensive effort to integrate and better manage the highly variable, but desirable, renewable power output, America’s citizens may find that their life-style options may be restricted in the future

The future mix of energy for generating America’s electricity is changing and will never resemble the past. Without an extensive effort to integrate and better manage the highly variable, but desirable, renewable power output, America’s citizens may find that their life-style options may be restricted in the future. People will likely face significantly higher electric bills that will put a squeeze on consumer incomes and spending. Few people have given much thought to what happens to our economy and social structure when cheap power goes away. There will be unimagined and unintended economic, political and social consequences.

If More Violent Weather, Why Is Hurricane Forecast Benign?

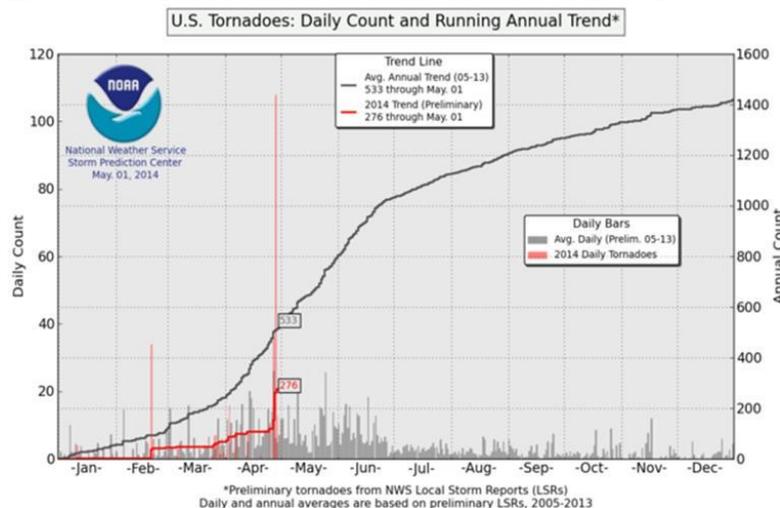
They are also signaling that we should experience stronger, if not more, hurricanes

One of the principle claims by proponents of climate change is that the weather outside is terrible and it is destined to become worse, meaning more people and assets will be at risk. Their contention suggests that we should be seeing more destructive weather such as strong thunderstorms, floods and tornadoes. They are also signaling that we should experience stronger, if not more, hurricanes. Despite the recent rash of tornadoes when a massive cold front moved through the continental United States and clashed with warm, moist air moving up from the Gulf of Mexico, the tornado count is well below “normal” as it continues a calm pattern begun in recent years. Additionally, the leading hurricane forecasting team at Colorado State University (CSU) is projecting a very benign upcoming hurricane season.

The difference between the two counts was approximately 300 storms, meaning this is a very quiet year

When the cold front moved across the United States at the end of April, there were over 110 tornado sightings on one day alone. But surprisingly, the cumulative total of tornadoes for the year as of May 1st was 276. That total trailed the trend line of average annual storms as of that date for 2005-2013 by 257 tornadoes. Moreover, about half of the 2014 YTD tornadoes were counted from two days – one in February and the other at the end of April. If one examines the 2014 tornado count and the average annual count as of the day prior to the 110 tornadoes, the difference between the two counts was approximately 300 storms, meaning this is a very quiet year.

Exhibit 13. 2014 Tornadoes Trails Record Of 2005-2013



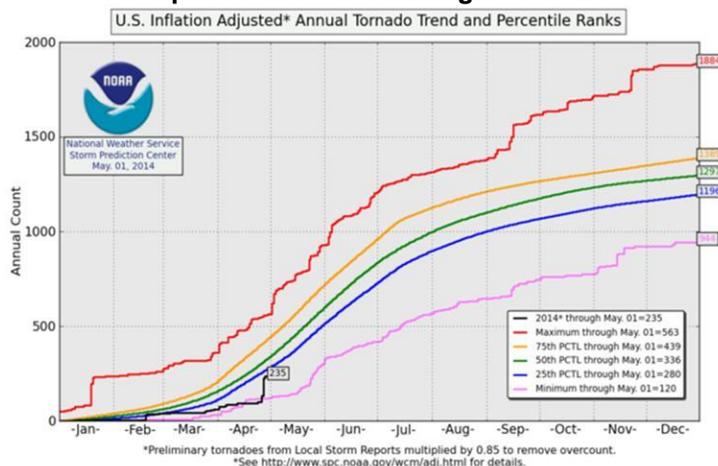
Source: NOAA

Until the late April tornado outbreak, the 2014 tornado season was on track to match the historical minimum number of tornadoes recorded

The Storm Prediction Center of the National Weather Service calculates an adjusted measure of the number of tornadoes recorded in order to eliminate potential duplicate sightings recorded in the daily local storm reports. The Center also plots the minimum and maximum number of tornadoes observed given this methodology along with determining the 25th, 50th and 75th percentile counts. Until the late April tornado outbreak, the 2014 tornado season was on track to match the historical minimum number of tornadoes recorded. Even after that April 110 tornado day, the entire 2014 tornado season is only now tracking the 25th percentile rank. While we still have the balance of May and the month of June for peak tornado activity, it remains highly likely that 2014's tornado season will be on the low end of historical storm seasons.

The rather benign tornado season looks like a precursor for the upcoming hurricane season that starts June 1st. The leading hurricane forecasting team of Phil Kloutzbach and Bill Gray of the Department of Atmospheric Science at CSU at Fort Collins, Colorado, issued their projection for storm activity during the upcoming season along with their probability for storms making landfall along the U.S. coastline and in the Caribbean.

Exhibit 14. April Tornado Total Brings Us To 25th Percentile



Source: NOAA

A significant contributor to their below-average projection is their belief that an El Niño of at least moderate strength will develop this summer and fall

The 2013 hurricane season was the first since 1968 without a storm reaching at least a Category 2 status

Their view is that this storm season “will have below-average activity compared with the 1981-2010 climatology.” A significant contributor to their below-average projection is their belief that an El Niño of at least moderate strength will develop this summer and fall. The CSU professors also “anticipate a below-average probability for major hurricanes making landfall along the U.S. coastline and in the Caribbean.”

The CSU hurricane forecast seems to be a continuation of the below-average trend that began last year, which surprised virtually all forecasters. That year was predicted to be quite active with the CSU forecasters calling for 14 named storms, including eight hurricanes and three major hurricanes. Instead, the 2013 hurricane season was the first since 1968 without a storm reaching at least a Category 2 status, let alone a Category 3, 4 or 5. Moreover, only two hurricanes were recorded during the season, the lowest total since 1982.

Exhibit 15. Hurricane Forecast Reflects Calm Period

Forecast Parameter and 1950-2010 Climatology (in parentheses)	2014F	2013	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003
Named Storms (12)	9	10	19	19	19	9	16	15	10	26	14	14
Named Storm Days (60.1)	35.0	32.3	99.5	89.8	88.3	30.0	84.8	34.5	50.0	116.0	90.0	71.0
Hurricanes (6.5)	3	2	10	7	12	3	8	6	5	14	9	7
Hurricane Days (21.3)	12.0	3.3	26.0	26.0	37.5	12.0	29.5	11.3	20.0	48.0	46.0	32.0
Intense Hurricanes (2.0)	1	0	1	4	5	2	5	2	2	7	6	3
Intense Hurricane Days (3.9)	2.0	0.0	0.3	4.5	11.0	3.5	8.5	5.8	3.0	16.8	22.0	17.0

Source: CSU, PPHB

The CSU forecast for 2014 calls for nine named storms, including three hurricanes and one major hurricane, defined as a storm rated as a Category 3, 4 or 5. With respect to at least one major hurricane

The forecasters estimate a 35% probability for landfall along entire U.S. coastline versus an average for the last century of 52%.

making landfall, the forecasters estimate a 35% probability for the entire U.S. coastline versus an average for the last century of 52%. The probability for a landing along the entire U.S. East Coast, including the Florida peninsula, is put at just 20% versus the historical average of 31%. Along the Gulf Coast from South Texas to the Florida Panhandle, the probability of landfall is estimated at 19% compared to 30% for the last century. This reduced probability for the Gulf Coast suggests that the forecasters do not expect major hurricanes to develop close to shore as has happened in the past. We expect the reduced probability is due to their observation that waters in the Gulf of Mexico are cooler than normal, which retards the development of localized, close-to-shore hurricanes.

Impact Weather, a Houston-based weather forecasting service, released its estimates for the upcoming hurricane season. Their forecast is remarkably similar to that of CSU, with nine named storms, including four hurricanes and one intense (major) hurricane. The Impact Weather forecasters also estimate that the measure of accumulated cyclone energy (ACE) for the season will be 60% of normal. CSU, on the other hand, estimates ACE will be 55%.

These two forecasting groups base their projections for a benign hurricane season on both the development of a moderate to strong El Niño, which acts to create greater wind shear in the deep tropics that can sap developing hurricanes of their strength, and other meteorological conditions that create a less hospitable set of conditions conducive to the formation of hurricanes. While only a very strong El Niño will actually impact a hurricane, the degree of strength anticipated should create sufficient wind shear force to mitigate the strengthening of hurricanes.

The forecasters also foresee less rainfall in the Caribbean region this summer, which further reduces the potential for hurricanes to gather more energy as they move into and through the region

Atlantic basin surface waters are warm, but are cooling to below normal temperatures. In addition, these waters are receiving more cold water from the North Atlantic, which will act to accelerate the overall cooling of the Atlantic basin waters. The eastern Indian Ocean is also cooler than normal. This body of water generates energy conditions that lead to the formation of tropical waves in Somalia that cross the African continent and enter the Atlantic Basin as tropical storm waves that eventually gather sufficient energy and moisture as they move toward the Caribbean waters. The forecasters also foresee less rainfall in the Caribbean region this summer, which further reduces the potential for hurricanes to gather more energy as they move into and through the region.

As these storm forecasters develop their mathematical models based on various conditions and outlooks for the meteorological conditions described above, they also use data from analog years to modify their forecasts. The two teams each selected five analog years. Given the similarity of the two forecasts, it was not surprising that the analog years selected were similar in that they both selected 1957, 1963 and 1965. It was the remaining two years where the

In 1957, it was Hurricane Audrey, a Category 4 storm that took 416 lives, largely in Cameron Parish, Louisiana, and caused \$147 million (1957 dollars) in damages

David Dilley, CEO of GWO, is forecasting 17 named storms, including eight hurricanes and three major hurricanes

selections differed. CSU selected 1997 and 2002 versus Impact Weather's selection of 1972 and 1982. It was interesting to compare the average storm data from the two analog year selections. In terms of the named storms, hurricanes, major hurricanes and ACE, the CSU selection produced the following averages: 8.6; 4.2; 1.6; and 79. In contrast, Impact Weather came up with the following averages: 7.2; 3.8; 1.2; and 68.6. Despite these differences, the two forecasters arrived at almost exactly similar forecasts.

In commenting on their benign storm forecast in a webinar, Impact Weather's forecasters pointed out that in each of two analog years there was one storm that did tremendous damage. In 1957, it was Hurricane Audrey, a Category 4 storm that took 416 lives, largely in Cameron Parish, Louisiana, and caused \$147 million (1957 dollars) in damages. Category 4 Hurricane Betsy in 1965 claimed 81 lives and inflicted \$11 billion (current dollars) in damages out of a total of \$23 billion for the entire storm season. They also pointed to the rather benign hurricane season of 1992 when Hurricane Andrew, a Category 5 hurricane, took 26 lives and inflicted \$45.5 billion in damage as it roared through the Caribbean and across the Florida peninsula. Their point in presenting this data was that it only takes one hurricane to create extensive damage and inflict a significant human toll. This is a point the CSU forecasters always make in their discussion about landfall probabilities.

There still remain a number of high-profile weather forecasters who have yet to release their forecasts for the upcoming hurricane season. However, we were intrigued by the forecast from Global Weather Oscillations Inc. (GWO). David Dilley, CEO of GWO, says that the upcoming season will be stronger and more dangerous than last year. He is forecasting 17 named storms, including eight hurricanes and three major hurricanes. This forecast calls for nearly twice as many named storms, with nearly three times as many hurricanes and major hurricanes as the earlier forecasters. GWO's press release of its forecast trumpets that it was the "only" weather forecaster who correctly predicted the weak 2013 hurricane season. While that may be true (we haven't attempted to verify the claim), we wonder whether GWO might also be a one-hit wonder, although it claims to have predicted Hurricanes Ike and Irene and super storm Sandy. Mr. Dilley says that his firm's research into weather cycles has isolated the fact that each of the Atlantic and Gulf coastal zones they have identified possess varying weather cycles and that within each cycle, there exists smaller weather cycles making each zone unique. By using these cycles, GWO claims to have been nearly 90% accurate since 2006 in predicting which coastal zones would be "hot spots" that would be targets of storms. Mr. Dilley says in the press release that while the last major hurricane to hit the U.S. coast was Hurricane Wilma in 2005 that record could fall during the upcoming season.

He disputes the notion that hurricanes occur randomly and are impossible to predict

Mr. Dilley also believes that most climate changes are primarily attributable to weather cycles. Therefore, he disputes the notion that hurricanes occur randomly and are impossible to predict. As he says, "There are no random hurricanes, everything occurs in cycles." We basically agree with Mr. Dilley that there are many cycles in nature, but we are not sure how much some of these cycles can be impacted by carbon, let alone the clash between various meteorological forces. If Mr. Dilley is correct, then he should be able to give us three-year weather and violent storm projections enabling the population to adequately prepare for these storms. In deference to Mr. Dilley, we hope the CSU and Impact Weather forecasts for the upcoming hurricane season prove more correct.

Obama And IPCC Wage Climate Change War For Green Fuels

The White House report follows lockstep behind the fifth assessment report by the United Nations Intergovernmental Panel on Climate Change

The Obama administration released its National Climate Assessment report declaring that the nation is being impacted by human-caused global warming that is contributing to a worsening of our weather, including more devastating storms, droughts and heat waves, and that our coastlines are threatened by rising sea levels. The White House report follows lockstep behind the fifth assessment report by the United Nations Intergovernmental Panel on Climate Change, which declared our planet's environment at significant risk of devastation due to climate change.

Today, fossil fuels supply about 82% of our energy and even in 2035 they are projected to supply 80% of a greater amount of energy consumption

These studies begin with a preconceived conclusion – the need to stop burning fossil fuels. We must also restrict the growth of the world's population as well as repowering our economy with renewable (green) fuels. To examine the cost/benefits embedded in this thesis, Bjørn Lomborg, the president of The Copenhagen Consensus Center and author of [The Skeptical Environmentalist](#), authored an article for *Forbes* magazine. As he points out, "we don't burn fossil fuels to annoy environmentalists but because these fuels power almost everything we like about modern life: They feed us, warm us, transport us and keep the lights on while powering industry and the Internet." He further points out that today, fossil fuels supply about 82% of our energy and even in 2035 they are projected to supply 80% of a greater amount of energy consumption.

"Cheap power is an amazing way to improve living standards"

In his article, Mr. Lomborg makes a powerful statement: "Cheap power is an amazing way to improve living standards." He points to the hundreds of millions of Chinese who have been lifted out of poverty, not with inefficient wind turbines but with lots of cheap, albeit polluting, coal. We are often reminded of the billions of people in Africa who live their entire lives without electricity and as a result, are consigned to burning wood or dung in order to keep warm and to prepare their food.

The greatest challenges for renewable fuels are their lack of profitability, their intermittent nature and the limited amount of energy output per unit of power they deliver. Mr. Lomborg cites

The IEA projects these subsidies will more than double to \$220 billion per year by 2035

Over the past 12 years, however, investment returns from renewable energy stocks have dramatically trailed those of traditional oil and gas companies

These conglomerates have recently made a series of acquisitions to enhance their traditional energy industry exposure

statistics from the International Energy Agency (IEA) showing that society spent \$101 billion in 2012 subsidizing the cost of renewable energy. The IEA projects these subsidies will more than double to \$220 billion per year by 2035. Given the continuing inability of renewable fuels to achieve sustained profitability, Mr. Lomborg questions why world leaders are pushing for divestment by pension funds and endowments of their fossil fuel stocks and to reinvest those funds in “green assets” for the sake of both society and future pension holders.

Mr. Lomborg makes clear in his article that he is not opposed to renewable fuels. He writes in his *Forbes* piece that “Instead of campaigning for unrealistic divestment from fossil fuels, we should focus on increasing public investment in green R&D to ensure the next generations of green technologies will eventually become so cheap that everyone, including China and India, will switch.” Over the past 12 years, however, investment returns from renewable energy stocks have dramatically trailed those of traditional oil and gas companies. To demonstrate his point, he compared the STOXX Global 1800 Oil & Gas Index against the RENIXX Renewable Energy Industrial Index. (See Exhibit 16.)

Exhibit 16. O&G Stocks Outperform Renewables



Source: *Forbes.com*

As shown, \$100 invested in 2002 in fossil fuels would be worth about \$252 today [early February]. That same \$100 invested in renewable fuels would only be worth about \$34. Mr. Lomborg points out that green energy proponents claim divestment of fossil fuel shares can actually increase investment returns, but they tend to pick and choose their comparison periods, or they include in their “green energy” portfolios conglomerates such as Siemens AG (SI-NYSE), Honeywell International (HON-NYSE), ABB Ltd. (ABB-NYSE) and Philips NV (PHG-NYSE). Interestingly, these conglomerates have recently made a series of acquisitions to enhance their traditional energy industry exposure.

Low fossil fuel prices have further undercut the timing for renewables to reach profitability, something that was widely believed to be imminent during the early years of this century

What is striking when examining the performance of these two indices is the dramatic difference in fortunes since the end of the financial crisis of 2008. That point marks the emergence of the shale revolution that has significantly reduced the cost of natural gas, and in turn coal prices, while global oil prices, after recovering from the crisis devastating low at the end of 2008, have remained essentially flat for the past half of a decade. Low fossil fuel prices have further undercut the timing for renewables to reach profitability, something that was widely believed to be imminent during the early years of this century. We agree with Mr. Lomborg that society should be investing in new energy technologies, but more from the perspective of trying to improve the underlying science rather than picking commercial winners and losers. In that vein, we will soon begin writing about developments surrounding our next potential energy source.

New Study Refutes Melting Greenland Glaciers Due To GHG

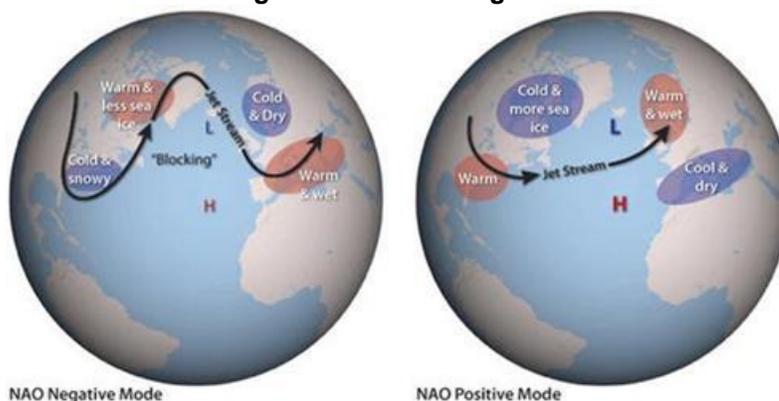
One-half of the surface-warming on Greenland, which has contributed to the shrinking of glaciers, is due to tropical temperatures in the Pacific Ocean

A new study authored by Qinghua Ding, a climate scientist at the University of Washington, and some colleagues concludes that about one-half of the surface-warming on Greenland, which has contributed to the shrinking of glaciers, is due to tropical temperatures in the Pacific Ocean and not greenhouse gas emissions. Sea surface temperatures in the Pacific Ocean are known to impact global weather patterns, with the most well know phenomenon being El Niño and its contra phenomenon, La Niña. El Niño, which is currently developing in the Pacific Ocean, is known to shift rainfall around the world, which impacts the development of regional weather patterns. As it develops, El Niño causes rain to increase in western North America while contributing to drought patterns in Australia and Central America.

Climate models fail to reproduce the rapid warming in the Arctic, something that raises questions about why so much faith is placed in the output of these models by warming proponents

Climate scientists have been puzzled for a long time as to why Greenland and the Canadian Arctic are warming more quickly than other regions of the world. This new study may help resolve the puzzle. Climate models, including those relied upon by the fifth assessment undertaken by the Intergovernmental Panel on Climate Change (IPCC) fail to reproduce the rapid warming in the Arctic, something that raises questions about why so much faith is placed in the output of these models by warming proponents. So far, climate scientists have tried to explain the warming as the result of the loss of sea ice in the Arctic Ocean.

According to Mr. Ding, tropical sea surface temperatures in the Pacific Ocean impact the North Atlantic Oscillation, a climate pattern that dominates Arctic weather. Since the 1990s, warm sea surface temperatures in the western Pacific Ocean along with cool waters in the eastern Pacific Ocean have pushed the North Atlantic Oscillation into a negative phase that allows high pressure systems to settle over Greenland and the Canadian Arctic. High pressure systems tend to lead to increased warming and less sea ice.

Exhibit 17. NAO Negative Pattern Brings Heat To Arctic

NAO Negative Mode
Source: *Live Science*

NAO Positive Mode

Tropical ocean temperatures have only been closely watched since 1979, with the advent of satellites, so scientists don't know if the Pacific temperature cycle is a short-lived pattern, or if it has settled in for decades

If the Pacific temperature phase shifts from its current pattern, warming in the Arctic region could slow in coming decades

Some of the researchers interviewed suggest that human-driven global warming is likely to outpace any natural cooling in the coming decades

The connection between the Pacific Ocean and Greenland comes from atmospheric pulses called Rossby waves. These are undulations in the high-altitude winds that race around the globe, such as the jet stream. The distribution of warm and cold air rising above the Pacific Ocean sets off a Rossby wave that eventually contributes to warmth over Greenland. Tropical ocean temperatures have only been closely watched since 1979, with the advent of satellites, so scientists don't know if the Pacific temperature cycle is a short-lived pattern, or if it has settled in for decades. As Mr. Ding told a reporter with *Live Science*, "So far our data is really quite short, so we're not sure what the real cause is." We think this is an important point to consider, especially when you realize that climate models haven't been able to replicate the warming Pacific Ocean.

The North Atlantic Oscillation is a major climate player, as it affects the extent of Arctic sea ice; the path of the jet stream; and storm routes across North America, the Atlantic and Europe. Finding a connection between the North Atlantic Oscillation and the Pacific Ocean tropics could improve forecasts for the North Atlantic Oscillation, which has defied accurate prediction. According to Mr. Ding, if the Pacific temperature phase shifts from its current pattern, warming in the Arctic region could slow in coming decades. Some evidence already hints that this is the case, such as the jet stream pattern that contributed to the polar vortex that hit the eastern portion of America with extremely cold temperatures this past winter. What we do know about polar vortexes is that they appear to have a 40-year cycle.

Virtually all the articles reporting on the study brought in comments from global warming proponents who attribute higher temperatures to human activity, in order to appear to balance their report. Some of the researchers interviewed suggest that human-driven global warming is likely to outpace any natural cooling in the coming decades. According to Juergen Bader, a climate scientist at the Max Planck Institute for Meteorology in Germany, "It is only a

Whether it is a few years or a century in duration makes a huge difference in how people and governments should react to climate change

question of time before external forcing [man-made warming] dominates regional Arctic warming. So the role of natural climate variability on certain Arctic warming patterns might be reduced in the long run." As you will note from Mr. Bader's comment, there is no science nor are there any facts cited to support his conclusions nor are his time frames defined. Whether it is a few years or a century in duration makes a huge difference in how people and governments should react to climate change.

Shareholder Returns - Another Aspect Of Era Of Austerity

Shareholders' faith in managements' ability to grow earnings sufficiently to lift the share price is waning

Oil and gas companies are evolving their business models in response to demands from their shareholders. These demands reflect the profitability challenges companies have encountered due to poor discovery records, high finding and development costs and low commodity prices. We have termed the intersection of these challenges as the Era of Austerity. The challenges of this new Era are causing shareholders to begin demanding a return of more of their capital, since they believe energy company managements are failing to earn satisfactory returns. Shareholders' faith in managements' ability to grow earnings sufficiently to lift the share price is waning.

The easiest way for oil and gas companies to satisfy their shareholders is to pay higher dividends and/or repurchase shares. In one case the shareholders actually receive more cash, while in the other the share price should increase in response to faster earnings growth. Both strategies should provide shareholders with greater wealth.

Corporate strategy consulting firm Fortuna Advisors that asked the question: Do share buybacks create or destroy value at individual companies?

Institutional Investor magazine recently reported on a study conducted by New York corporate strategy consulting firm Fortuna Advisors that asked the question: Do share buybacks create or destroy value at individual companies? To answer the question, the firm calculated share buyback return on investment at 269 companies that saw share repurchases reduce market capitalizations by more than four percent during 2012 and 2013. Calculating the buyback return over the last eight quarters should provide sufficient time for the investment to produce satisfactory returns. Choosing a longer time period has a tendency to make some buybacks appear better and others worse as shifting economic and stock market trends have a greater impact.

Examining the latest period's results, the Energy industry's buybacks produced a negative 1.8% return

Fortuna Advisors has prepared a buyback scoreboard on a quarterly basis and we elected to examine the results during the most recent period and in an earlier period. Examining the latest period's results, the Energy industry's buybacks produced a negative 1.8% return compared to the overall market's return of a positive 0.7%. The negative reading for Energy suggests managements would have been better off not repurchasing shares, although the return from buybacks for the entire universe of companies was barely positive.

Of the 24 industry sectors scored by Fortuna Advisors in this period, 11 produced negative returns over the prior eight quarters

Of the 24 industry sectors scored by Fortuna Advisors in this period, 11 produced negative returns over the prior eight quarters. Of this group, three industries generated slightly smaller losses than Energy – Insurance, Media and Food and Staples Retailing. For the remaining seven sectors with worse performances compared to Energy, two were quite close, those being Food, Beverage and Tobacco along with Utilities. The remaining loss generating sectors were worse than Energy by between two and seven percentage points.

“I learned you should buy low and sell high, but somehow managements and boards often do the opposite”

Interestingly, when we examined the scorecard as of the end of the first quarter of 2013, Energy buybacks generated a positive 3.5% return compared to the overall market’s return of 4.8%. There were only five sectors with negative returns out of the 24 studied. Automobiles and Components generated the best performance with a 19.1% gain. That category was the highest returning sector in the most recent period also with a 12.1% return.

The conclusion from the study was summarized by Fortuna CEO Gregory Milano when he said he wondered how many companies committed to buybacks will regret it when share prices retreat and they look foolish for having bought back so much at the peak. As he said, “I learned you should buy low and sell high, but somehow managements and boards often do the opposite.” One has to wonder whether the past couple of years will confirm Mr. Milano’s judgment. Companies spent \$126 billion on stock buybacks in 2012 and 2013, nearly a record pace. During the fourth quarter of 2013, ten companies announced intentions of spending \$52 billion on buybacks. In the first quarter of this year, company announcements indicated \$54 billion more in buybacks. Does this explain why the U.S. stock market is trading at record highs?

The Latest Attempt To Harness Higher Atmospheric Winds

As wind speed doubles, the potential supply of energy grows eight-fold

Scientists know that as you go higher in the air ground friction diminishes, leading to increasingly stronger winds. At elevations of 20,000 to 50,000 feet, you enter what’s known as the jet stream. As wind speed doubles, the potential supply of energy grows eight-fold. According to an article published recently in the journal *Energies*, “the total wind energy in the jet streams is roughly 100 times the global energy demand.”

Altaeros Energies recently announced plans to hoist an airborne wind turbine to the unprecedented height of 1,000 feet above a remote site in Alaska

To test this thesis of higher energy at elevated levels, Altaeros Energies, a private Boston-based company, recently announced plans to hoist an airborne wind turbine to the unprecedented height of 1,000 feet above a remote site in Alaska. During the 18-month test, their Buoyant Airborne Turbine (BAT) prototype will supply power to about a dozen homes off the grid. The test is being funded by a \$1.3 million grant from the Alaska Energy Authority. According to the company’s co-founder, there is no start date for the project since they are still finishing the permitting process.

From a distance, the BAT looks like a massive donut, except for it having a standard three-blade, horizontal axis turbine in the center

The BAT is capable of delivering two-to-three times the amount of power produced by conventional wind turbines

The cost of the power the BAT will generate is estimated to be 18 cents per kilowatt-hour

From a distance, the BAT looks like a massive donut, except for it having a standard three-blade, horizontal axis turbine in the center. With four protruding fins for stability, the helium-filled outer shell, made from highly-durable fabric, is attached to three high-tensile strength tethers that hold the turbine securely in place. Once the BAT is suspended, an onboard sensor system enables the turbine to operate autonomously, even changing its position to harvest more wind energy or dock whenever it detects a severe thunderstorm. Energy is transferred to a power station on the ground, where an interface then distributes the power to a micro-grid or a power grid connection.

The BAT is capable of delivering two-to-three times the amount of power produced by conventional wind turbines. The inflatable turbine is also equipped with an emergency venting system that allows gases to be released gradually should the structure have to be brought back to ground level. Monitoring of the BAT will be done remotely, with specialists only being deployed periodically to top off any lost helium.

Exhibit 18. BAT – The Inflatable Wind Turbine



Source: *Smithsonianmag.com*

The key hurdle for the BAT is its cost. The cost of the power the BAT will generate is estimated to be 18 cents per kilowatt-hour, compared to what the average consumer in most major markets in America pays, which is about 13.4 cents per kilowatt-hour. However, in remote areas where the power grid is not available and residents rely on diesel-fueled power generators, residents can pay upwards of \$1 per kilowatt-hour, making the BAT a viable option.

Besides providing a cheaper power option for remote communities, the sponsors of the BAT also point to the ease of its installation. The BAT can be transported inside small containers, making them easy to deploy in one day's time without the need for cranes and

It may also be possible to add gadgets such as wireless communications devices in order to provide Wi-Fi in these remote areas

other heavy equipment. It may also be possible to add gadgets such as wireless communications devices in order to provide Wi-Fi in these remote areas. In considering the pros and cons of the BAT, we wonder whether this wouldn't be a better option than the proposed wind farm offshore Block Island, Rhode Island, where power costs are in the \$0.65 to \$0.75 per kilowatt-hour. It would surely make the tourists and fishermen happy not to have to look at or dodge offshore wind turbines.

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