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## MUSINGS FROM THE OIL PATCH

October 1, 2013

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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

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### Shale, Shale And More Shale – The Good, Bad And Ugly

**Low natural gas prices also undercut the economics of renewable fuels – wind, solar and hydro – to the dismay of environmentalists and politicians determined to radically change the U.S. energy market**

Beyond Syria, the debt ceiling and the war on coal, shale is in the middle of a fierce debate involving various industrial sectors, environmentalists and regulators. We've left out the public as they are almost always the innocent bystanders whose future will be dictated by the outcome of the debate. The Obama administration's "nonexistent" war on coal has been helped by the gas shale revolution that began some half-dozen years ago and produced such an abundance of natural gas that it crashed gas prices and undercut demand for coal in the electric power sector. This "war" has positively contributed to reduced carbon emissions. On the other hand, low natural gas prices also undercut the economics of renewable fuels – wind, solar and hydro – to the dismay of environmentalists and politicians determined to radically change the U.S. energy market by curbing the use of fossil fuels on global warming grounds. For those who may have forgotten, natural gas was the preferred transition fuel from fossil fuels to the age of renewables. That was true until the gas shale revolution uncovered hundreds of years of potential gas supply at projected low prices.

**This targeting led to attacks on the evils unleashed by hydraulic fracturing of gas shales**

As the shale revolution gained traction, it became the target of environmentalists who saw natural gas as the enemy rather than the tolerable transition fuel. This targeting led to attacks on the evils unleashed by hydraulic fracturing of gas shales. Using all its scientific, literary and creative powers, natural gas from shale formations was attacked ruthlessly. Whether it was *Gasland I* or *Gasland II* by Josh Fox or *The Promised Land* by Matt Damon, both anti-shale supporters, Hollywood weighed in with intellectually corrupt films of the horrors of fracking. University professors chimed in with academic studies claiming gas contamination of drinking water wells and charges of incorrect measurements of methane emission volumes by regulators, most of which have been proven

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**And who can ignore the wild claims that increased carbon emissions are contributing to super storms, droughts, forest fires and even increased violence**

fallacious. Other studies claim that fracturing activity or the disposal of the waste water from these wells is contributing to increased earthquake activity. And who can ignore the wild claims that increased carbon emissions are contributing to super storms, droughts, forest fires and even increased violence. If we listen to the proponents of these views, all the sins of American life and our weather are the result of the extraction and use of fossil fuels while a shift to an economy powered exclusively by wind, solar and hydro power would eliminate them all.

**Methane emissions at a representative sampling of gas wells across America was consistent with the data reported by the EPA**

A new study conducted by a team of researchers from the University of Texas at Austin's Cockrell School of Engineering and environmental testing firms URS and Aerodyne Research concluded that the methane emissions at a representative sampling of gas wells across America was consistent with the data reported by the Environmental Protection Administration (EPA) that was attacked for being too low by environmental groups and academic groups opposed to gas shale development. A major study released two years ago by a group of professors at Cornell University headed by Robert Howarth said gas wells leaked like a sieve releasing as much as 7-8% of production into the atmosphere. (Full disclosure, the author received his M.S. degree from Cornell and is on the board of directors of a fracturing company.) The study was immediately challenged by industry and other academic researchers, but the Cornell study called into question the EPA's data and set in motion the UT study.

One challenge to the Cornell study was the expertise of the team, especially its leader, Professor Robert Howarth who is a leading anti-fracking proponent in upstate New York, a high-stakes battleground over gas shale development. Prof. Howarth's academic profile, presented on the Cornell University web site, states:

"Professor, Ecology and Evolutionary Biology (EEB), College of Agriculture and Life Sciences (CALS)"

"I am a biogeochemist and ecosystem scientist, an active research scientist who also enjoys teaching and is deeply involved in the environmental management and policy communities in the State, nationally, and internationally. My training was in oceanography, and much of my research still focuses on coastal marine ecosystems. However, I also work on freshwater systems (both rivers and lakes) and on large river basins."

Clearly, Professor Howarth has no petroleum engineering training, raising questions about his credentials for the Cornell study. As a columnist on the *Forbes* magazine web site put it, "As renowned Cornell geologist Lawrence Cathles convincingly argued, Howarth appeared to have deliberately used 2007 data in his study, a century ago by shale gas technology standards, which bumped his

**This support, coupled with the fact that two of the researchers worked in the petroleum industry before starting their academic careers, has provided ammunition for anti-fracking enthusiasts to attack the report's conclusions**

**The UT-A study actually underwent more extensive peer-review than a normal study**

estimates by 10-20 times—at least. US Energy Department, University of Maryland, Massachusetts Institute of Technology, a Sierra Club-backed Carnegie Mellon University study and the Worldwatch Institute each reviewed the methane leakage issue and rejected Howarth's findings as vastly inflated." But that didn't end the debate, so the UT study was commenced with the support of nine oil and gas companies (Anadarko Petroleum (APC-NYSE); BG Group (BRGYY-OTC); Chevron (CVX-NYSE); Encana (ECA-NYSE); Talisman (TLM-NYSE); ExxonMobil (XOM-NYSE); Southwestern Energy (SWN-NYSE); Shell Oil (RDS-A-NYSE); and Pioneer Natural Resources (PXD-NYSE) and led by the Environmental Defense Fund (EDF). This support, coupled with the fact that two of the researchers worked in the petroleum industry before starting their academic careers, has provided ammunition for anti-fracking enthusiasts to attack the report's conclusions.

Besides the attack on the sponsors and the intellectual honesty of the researchers, the key claim is that the report "cherry picked" the wells it sampled in order to get the low emissions data. According to the anti-frackers, the study specifically excluded wells emitting more methane and the researchers excluded smaller producers who "typically" have worse environmental procedures and completions. The UT study actually underwent more extensive peer-review than a normal study in order to protect the validity of its conclusions from the anticipated attack by anti-fracking parties.

The UT study abstract is posted on the web site of the National Academy of Sciences, which published the study in its *Proceedings*, and describes the details of the study and its conclusions. The Abstract states: "Engineering estimates of methane emissions from natural gas production have led to varied projections of national emissions. This work reports direct measurements of methane emissions at 190 onshore natural gas sites in the United States (150 production sites, 27 well completion flowbacks, 9 well unloadings, and 4 workovers). For well completion flowbacks, which clear fractured wells of liquid to allow gas production, methane emissions ranged from 0.01 Mg [Mega grams] to 17 Mg (mean = 1.7 Mg; 95% confidence bounds of 0.67–3.3 Mg), compared with an average of 81 Mg per event in the 2011 EPA national emission inventory from April 2013. Emission factors for pneumatic pumps and controllers as well as equipment leaks were both comparable to and higher than estimates in the national inventory. Overall, if emission factors from this work for completion flowbacks, equipment leaks, and pneumatic pumps and controllers are assumed to be representative of national populations and are used to estimate national emissions, total annual emissions from these source categories are calculated to be 957 Gg [Giga grams] of methane (with sampling and measurement uncertainties estimated at  $\pm 200$  Gg). The estimate for comparable source categories in the EPA national inventory is  $\sim 1,200$  Gg. Additional measurements of unloadings and workovers are needed to produce national emission estimates for these source

### **The Environmental Defense Fund was surprised by the study's findings**

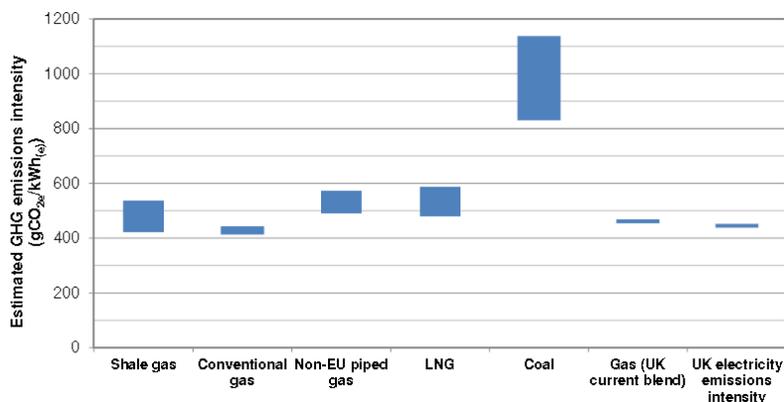
**“Depending on who has read the report and on which side of the fracking fence they fall, the methane study tells us either that fracking isn't as bad as we thought for the environment, or that this is the definitive evidence we need to catapult us into the anti-fracking club.”**

categories. The 957 Gg in emissions for completion flowbacks, pneumatics, and equipment leaks, coupled with EPA national inventory estimates for other categories, leads to an estimated 2,300 Gg of methane emissions from natural gas production (0.42% of gross gas production).”

The EDF coordinated the study. Steven Hamburg, EDF's chief scientist, defended the robustness of the study and its state-of-the-art techniques. “It was totally independent,” said Mr. Hamburg. He also said the EDF was surprised by the study's findings. The nine petroleum companies provided the researchers access to their well sites but were not involved in the data collection or the analysis. According to Mr. Hamburg, “The study team requested of specific companies a list of all completions being done within a specific time frame—not too far in the future—for a specific geography. They selected the completion they would measure; once on site they requested a list of all wells within a specific distance; they then selected from the list what wells they measured. All the companies have positively stated they gave the team all sites that met the study team criteria. The sample was an unbiased sample of the wells of the nine participating companies, which collectively drilled roughly half of all natural gas wells in 2011.” The study's process was designed to ward off anticipated claims of “cherry-picking” the data from a small sample size.

The attacks on the UT study have not let up and probably won't until either more studies are done, or people tire of the arguments. A recent British government study, [Potential Greenhouse Gas Emissions Associated with Shale Gas Extraction and Use](#) reaches similar conclusions as the UT-A study. The attacks, as mentioned earlier, have gone after the researchers, the supporters and now even those supporting the EDF financially, including Tom Steyer, the billionaire hedge fund operator who has been funding the environmental campaign against the approval of the Keystone pipeline. But as one UK publication put it in commenting on both the UK and UT studies, “Depending on who has read the report and on which side of the fracking fence they fall, the methane study tells us either that fracking isn't as bad as we thought for the environment, or that this is the definitive evidence we need to catapult us into the anti-fracking club.” In their view, the positive case is that fracking will unleash more natural gas that can displace coal (obviously the near-term objective of the EPA's new carbon emissions rules) that has already led to a reduction in national carbon emissions. The negative is that even with lower methane leakage rates, as we move to drill and fracture more wells, total overall methane emissions will overwhelm those from coal. Pick your poison.

**Exhibit 1. Electricity GHG Life-Cycle Emission By Fuel**



Source: McKay and Stone report

**A new study by consulting firm IHS says that commercially recoverable reserves of tight oil in the rest of the world could be double or more those reserves of North America**

The importance of this debate should not be lost on people. Shale deposits are becoming ubiquitous globally. A new study by consulting firm IHS says that commercially recoverable reserves of tight oil in the rest of the world could be double or more those reserves of North America. The geology of the 23 best areas are estimated to have 175 billion barrels of technically recoverable reserves out of the total estimated 300 billion barrels total outside North America. Commercially recoverable resources in North America are estimated at only 43 billion barrels. All of these reserves will depend upon fracturing for their production so their development could be at risk from any restrictions on fracturing.

Another aspect of the shale gas revolution, particularly as a result of the success of the Marcellus and Utica shales, was pointed out by a German energy blog. It pointed out that the trendline for the futures market on the German-Austrian power exchange has fallen from around €63 (\$85.22) a megawatt-hour (MWh) at the beginning of 2010 to around €43 (\$58.17) per MWh now. The trendline for NEPOOL, the power exchange in New England that is heavily dependent on natural gas and has benefitted from cheap gas prices, also fell from about €63 (\$85.22)/MWh to just below €40 (\$54.11)/MWh between 2008 and mid-2013. The blog pointed out that the only real difference between the performances of the two power exchanges is the occasional sharp spikes in New England.

**A big question is whether the battle over fracturing will diminish the market opportunity of fossil fuels to the benefit of renewable energy**

The battle over fracturing is not over. Neither is the battle between natural gas and coal, now that EPA regulators appear to have tilted the table in favor of gas. A big question is whether the battle over fracturing will diminish the market opportunity of fossil fuels to the benefit of renewable energy. Also, what role does the fracking debate play in the discussion about approving more LNG export terminals and the fate of the American manufacturing/petrochemical industry revival? We have just approved the fourth LNG export terminal, which if all shipped at their maximum volumes will consume 6.6 billion cubic feet a day, or just under 10% of current

**Americans may also ask what a restriction of fracturing means for their electricity costs, especially if cheap coal is no longer an option and legacy nuclear power plants are retired**

domestic gas production. If we curtail gas production growth by restricting fracturing activity, how rapidly and how high might natural gas prices go in response to slowing or falling future supplies, especially if more gas is being exported? What does that mean for America's industrial base and our competitive position in the global economy? Americans may also ask what a restriction on fracturing means for their electricity costs, especially if cheap coal is no longer an option and legacy nuclear power plants are retired. These are all topics we look forward to exploring in future *Musings*. But in the meantime, the U.S. Energy Information Administration (EIA) doesn't believe that fracturing will be restricted, but like every other agency in Washington, D.C., it can only forecast based on the rules and policies in place – not what they think those rules and policies might be in the future. That virtually guarantees that the EIA forecasts will be wrong – it becomes a question of when, and in which direction the forecasts will err? Altering the energy future of the United States has been, and remains, a primary goal of President Barack Obama. His vision for America's energy future doesn't include a prosperous fossil fuel industry. Remember, even if you are successful, you didn't build it!

## **Germany's Clean Energy Problems Gaining Visibility In U.S.**

**The new energy policy's goal is to shift Germany entirely to wind and solar power by 2050, but it comes with an estimated \$735 billion price tag, equal to 20% of its 2012 GDP**

We have written about the challenge Germany is facing in implementing its *Energiewende*, or energy turn as it translates. What it means is a revolution in the country's power sources. The revolution, driven by Chancellor Angela Merkel and her green party supporters, evolved out of the Fukushima nuclear power plant disaster in Japan two and a half years ago. Germany had been on track to increase its nuclear power generating capacity while at the same time shutting down coal-fired plants. Due to fear of the possibility of similar nuclear disasters as experienced in Japan, the government, with the support of the people, elected an energy policy U-turn and began shutting down all its nuclear plants and replacing them with wind and solar power. The possibility of a tsunami or earthquake damaging Germany's nuclear plants is virtually non-existent, but that meant nothing in the debate over the strategy reversal. The new energy policy's goal is to shift Germany entirely to wind and solar power by 2050, but it comes with an estimated \$735 billion price tag, equal to 20% of its 2012 GDP. While the country is early in this power transition, many of its unknowns are materializing, inflicting significant costs on government, major companies and consumers. Recently, newspapers such as the *Financial Times* and *The New York Times* have written articles highlighting Germany's technical problems from its *Energiewende* policy and how the costs are being borne by consumers, especially the poor. As many observers are acknowledging, Germany's energy revolution is rapidly making electricity a luxury good that a growing portion of the population cannot afford. Could it happen here?

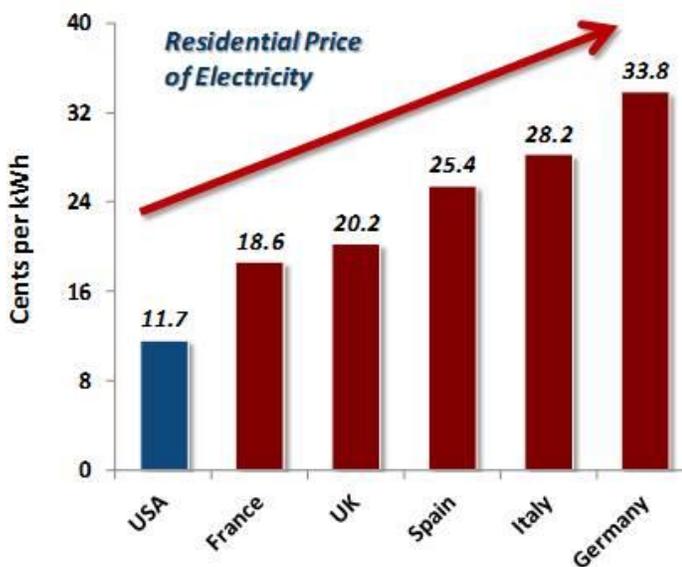
**Natural gas-fired electricity generation was the big loser, dropping to only 9% of total output, but coal’s market share rose by three percentage points to 52%**

**Reportedly, there are 4,000 different subsidies in place to encourage renewable fuel production, but the primary financial tool of the German government, worried over the impact rising electricity costs are having on its manufacturing industries, is to shield companies from the higher cost**

In 2012, nuclear power plants generated 16% of Germany’s electricity while renewables – wind, solar and hydro – accounted for 22%. Natural gas-fired power plants produced 11% of the country’s electricity while coal-fired plants generated 45%. According to preliminary data for the first half of 2013, Germany’s nine nuclear power plants produced 18% of electricity output while combined wind, solar and hydro accounted for 18%. Natural gas-fired electricity generation was the big loser, dropping to only 9% of total output, but coal’s market share rose by three percentage points to 52%. The shift in fortunes for coal and natural gas reflect the falling price of coal. Even the most modern combined cycle gas turbine plants remain seriously underutilized as they are needed only during winter when wind and solar are less productive.

In order to encourage the investment in renewable energy plants envisioned by German’s energy revolution, many incentives were put in place. Germany’s subsidies amounted to \$22.7 billion in 2012 and are projected to potentially reach \$40.5 billion by 2020. Reportedly, there are 4,000 different subsidies in place to encourage renewable fuel production, but the primary financial tool of the German government, worried over the impact rising electricity costs are having on its manufacturing industries, is to shield companies from the higher cost. We are unsure how many companies have received this protection; it is either 700 companies as cited by *The New York Times*, or 2,300 according to *Der Spiegel*. Even with this protection, however, German manufacturing companies face the highest electricity costs in Europe, which is cited as a reason for a lack of investment in industry.

**Exhibit 2. Germany Has Highest Power Cost**



Source: Energy-Facts.com

**A three-person household is estimated to spend €90 (\$121.74) per month for electricity, essentially double what it cost in 2000**

**The government estimates the cost to expand German's electricity grid will be €20 billion (\$27.1 billion), which doesn't include the cost for additional ocean cables for the offshore wind farms**

Estimates are that German power costs will climb to 40 cents per kilowatt-hour by 2020, a 20% increase from the current average cost of about 33 cents per kilowatt-hour. The recent bad news for German electricity consumers is that the energy surcharge added to every bill will increase from 5.3 cents today to between 6.2 and 6.5 cents per kilowatt-hour next year, a 20% increase.

The social impact of these high electricity costs is that many families can no longer keep up with their bills. A three-person household is estimated to spend €90 (\$121.74) per month for electricity, essentially double what it cost in 2000. Having one's power shut off is extremely costly as it can take several months to be restored after negotiating a payment plan and paying a reconnection fee of up to €100 (\$135.24). *Der Spiegel* reported that based on discussions with various charity groups, more than 300,000 households are having their power shut off for lack of payment. *The New York Times* reported that according to an employee of an agency in Berlin that deals with consumer power bill issues he had intervened in more than 350 cases to prevent the local utility from cutting off the electricity of customers. He said that in the first six months of 2013, 1,800 people had sought the agency's help or 200 more people than sought help for all of 2012. That suggests rising electricity costs and stagnant incomes are creating a growing social problem. This problem will only get worse as the costs of debottlenecking the new power business rise.

The growth in wind power has been dramatic, largely due to the subsidies provided and the government's emphasis on supporting a growing wind turbine manufacturing industry. As the onshore wind power business reaches saturation in many regions of Germany, more offshore wind farms are being constructed. The problem is that these turbines are located in sparsely populated coastal locations, well away from the regions that require the power. This means new power transmission lines must be built. The government estimates the cost to expand German's electricity grid will be €20 billion (\$27.1 billion), which doesn't include the cost for additional ocean cables for the offshore wind farms. This expense will further add to the cost of electricity for consumers in Germany. *The New York Times* carried an interview with Irina Lucke who is responsible for the construction of a 30-turbine wind farm offshore the island of Borkum in the North Sea. The wind farm was supposed to be operating in August, but workers must still sweep the ocean floor for any abandoned World War II ordnance before a cable can be installed to bring the power ashore. She estimates this will delay the start-up of the project until next year and add \$27 million to the \$608 million cost of the wind farm, or a 5% increase.

Besides the need for upgrading the German power grid, utility companies are struggling to figure out how to integrate more of the inconsistent renewable power supplies being developed. The cost of energy storage is making developing more capacity questionable.

**The key to the coal/natural gas economic struggle is European Union carbon allowances**

**Lignite and thermal coal dominate the power generation market with nuclear a strong third contributor**

One strategy to handle the power variability is to keep nuclear and coal-fired plants on line. Older coal-fired power plants are being restarted and new, legacy plants under construction have come on line, which has worked against Germany's goal for reducing carbon emissions. Coal prices, according to Platts' data, have fallen by about a third over the past two years, hitting a three-year low of \$85 per metric ton (mt) in late June. Natural gas prices have remained essentially flat for the past two years. The key to the coal/natural gas economic struggle is European Union carbon allowances. Carbon prices set a record low earlier this year and continue to trade at just above €4/mt (\$5.41/mt). Industry sources suggest that carbon allowances need to rise above €40/mt (\$54.11/mt) to prompt utilities to profitably switch to natural gas from coal.

If we look at the power market in Germany, we see some interesting developments, which are interpreted differently by observers depending on their allegiance to renewable power. [Pardon our use of charts in German, but the publishers have the best data.] The distribution of power generation for the first half of 2013 is shown in Exhibit 3. The fuel captions, reading left to right, are nuclear, lignite coal, thermal coal, natural gas, wind, solar and hydro. Lignite and thermal coal dominate the power generation market with nuclear a strong third contributor.

**Exhibit 3. German Power By Fuel For 1H2013  
Nettostromerzeugung in den ersten acht Monaten 2013**



Source: Fraunhofer-Institut Für Solare Energiesysteme ISE

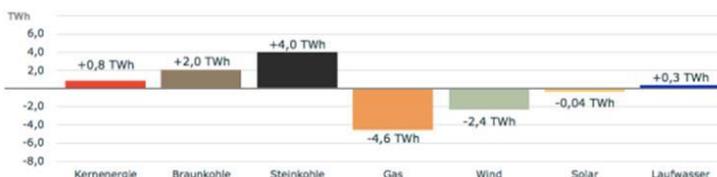
**The decline in wind may be a function of Europe experiencing a quiet wind year so far this year, as it is heavily subsidized to encourage its production**

When we look at what has changed among these fuels for the first half of 2013 (Exhibit 4 on the next page), we see that lignite was up 2.0 terawatt-hours (TWh) while thermal coal increased 4.0 TWh. In contrast, natural gas was down 4.6 TWh and wind was off 2.4 TWh. The shift in power supplies reflects the economics of carbon costs and the pricing of coal and natural gas in Germany. The decline in wind may be a function of Europe experiencing a quiet wind year so far this year, as it is heavily subsidized to encourage its production. Solar increased marginally as Europe had an early sunny summer.

One analyst pointed out that between 2010 and 2012, 40 TWh of nuclear energy output capacity (from 140.6 TWh in 2010 to 99 TWh in 2012) was shut down in response to the Fukushima accident. He

**Exhibit 4. Change In German Power In 1H2013****Veränderung der Stromerzeugung: erstes Halbjahr 2013 gegenüber erstes Halbjahr 2012**

Veränderung der Stromerzeugung: erstes Halbjahr 2013 gegenüber erstes Halbjahr 2012



Source: Fraunhofer-Institut Für Solare Energiesysteme ISE

**The greater story might be the decline in electricity demand, which is likely due to consumers being forced to cut back their power use due to higher electricity prices, although it could be greater efficiency**

**The impoverishment of German families due to higher electricity costs – the antithesis of what we expect from our power policies – should be of concern in this country**

suggests that this demand was replaced by 32 TWh of renewable electricity and a 16.9 TWh decline in electricity consumption. That estimate suggests that about 6.9 TWh of decline was experienced by coal and natural gas. While that may have been the outcome through 2012, the change in the power market so far in 2013 implies that renewables have lost market share to other more dependable and cheaper energy fuels. The greater story might be the decline in electricity demand, which is likely due to consumers being forced to cut back their power use due to higher electricity prices, although it could be greater efficiency. All the articles we have read about Germany's electricity market this year have highlighted how families are surviving with one or two light bulbs of low wattage, i.e., almost living in the dark, unless more light is absolutely needed. Many charity groups are distributing more expensive compact fluorescent light bulbs as a way to help families reduce their power bills.

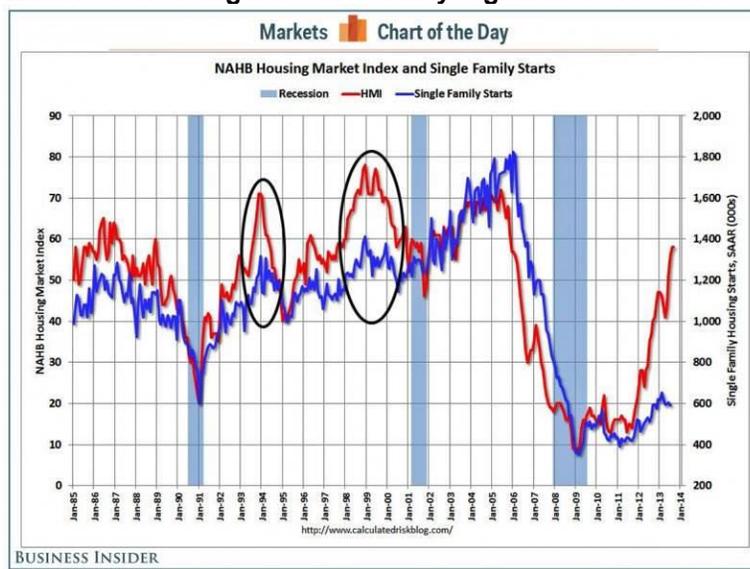
We hope the increased domestic media coverage of the problems in Germany with its radical plan to revamp its electricity market is not being lost on American politicians and regulators contemplating renewable fuel standards changes and power subsidies. The impoverishment of German families due to higher electricity costs – the antithesis of what we expect from our power policies – should be of concern in this country. The logical conclusion of a totally renewable-energy-based economy is evident in Germany, and it still benefits from substantial low-cost power sources. Will Germany still be the most powerful country in the Eurozone in 35 years, or will that mantle belong to France with its low nuclear power costs? Now there's a Black Swan to contemplate.

**More Data Reflects Concern About Health Of U.S. Economy**

In our last issue of the *Musings* we wrote about various troubling economic data being ignored in the thinking of economic forecasters, which is then being factored into 2014 energy demand forecasts. We recently found this chart (Exhibit 5 on the next page) showing the National Association of Home Builders Market Index

(HMI) since 1985 compared to the monthly single-family home starts statistics. Admittedly, single-family homes are only part of the home building industry, as there is also the multi-family (apartments/condos) sector, but individual homes are economically more significant. The NAHB Market Index tracks the sentiment of home builders, who construct the nation's single-family homes, about the current and future health of the industry.

#### Exhibit 5. Housing Disconnect May Signal More Weakness



Source: *Business Insider*

**If we are about to experience another correction in the HMI, it would signal that the housing market is weakening in response to rising interest rates, a lack of improvement in family financial fortunes – jobs, income and debt – and the deterioration of home affordability**

As the chart shows, we are experiencing a significant divergence between the NAHB HMI and single-family housing starts. While the HMI has essentially tracked the single-family starts statistics for most of the 28-year period, there have been two other times – 1994 and 1999 – when the index significantly deviated from the starts data. In both cases, the divergence reflected an overly optimistic view of the future trajectory of single-family housing starts that almost immediately fell at the peak in the sentiment index. In both cases, the HMI quickly turned down and eventually came back into sync with the housing starts data. If we are about to experience another correction in the HMI, it would signal that the housing market is weakening in response to rising interest rates, a lack of improvement in family financial fortunes – jobs, income and debt – and the deterioration of home affordability. The recent surprise decision by the Federal Reserve to continue its quantitative easing policy by continuing to buy \$85 billion of bonds each month boosted the stock market. Housing sales data released the next day following the Federal Reserve's monetary policy decision was supportive of the homebuilders' view. While the Federal Reserve's decision was made to dampen the recent rise in interest rates, we doubt it will have a material impact on the slowing underway in the housing market as reflected in the single-family housing starts data.

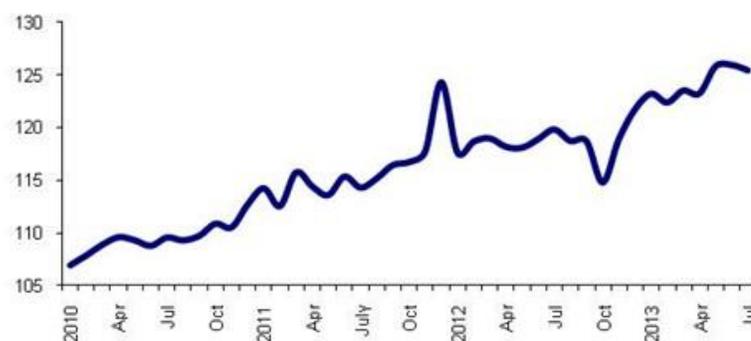
**The latest reading of the American Trucking Association's index of trucking tonnage for July fell 0.4% after rising marginally (+0.1%) in June**

Investors, bankers and consumers know that at some point monetary easing will end, which will send interest rates higher, especially for long-term rates as mortgage lenders, concerned about future inflation eroding their returns, will demand higher rates.

Another measure of economic activity, and one we follow closely, especially from personal observations made during our drives between Houston and our summer home in Rhode Island, is truck traffic on the highways. The latest reading of the American Trucking Association's (ATA) index of trucking tonnage for July fell 0.4% after rising marginally (+0.1%) in June. On a seasonally-adjusted basis, truck tonnage is up 4.7% in July, the same percentage increase on a year-to-date basis for 2013. The Bureau of Labor Statistics also reported that employment in the trucking industry rose by 0.4%, but this data should be used with caution as current month labor data is notoriously subject to revision.

**Exhibit 6. Weak Trucking Overstates Economy Strength**

**ATA's Truck Tonnage Index  
(Seasonally Adjusted; 2000 = 100)**

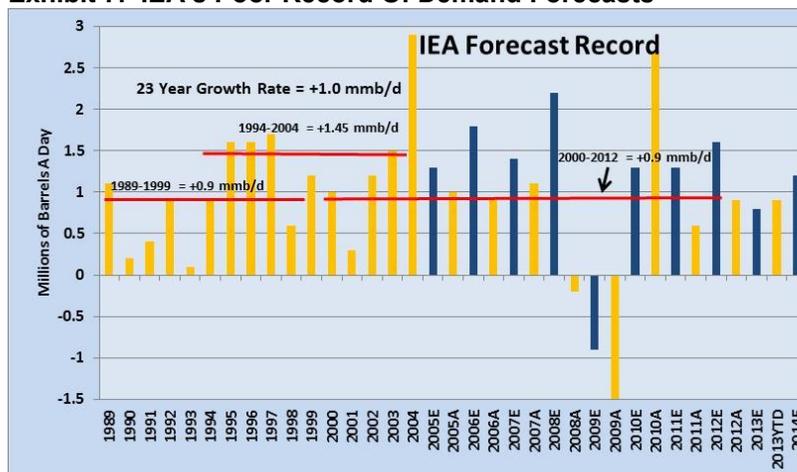


Source: *Econintersect*

**“Tonnage gains in the second half of the year are likely to overstate the strength in the economy as these heavy freight sectors continue to outperform the economy overall.”**

We noted comments from the ATA's chief economist about the underlying trends in trucking tonnage and what the outlook is for the second half of 2013. We suggest people should pay attention to his comments about the housing sector and its impact on trucking tonnage. ATA Chief Economist Bob Costello said, “Despite the small reprieve in July, we expect solid tonnage numbers during the second half of the year as sectors that generate heavy freight, like oil and gas and autos, continue with robust growth. He went on to say, “Home construction generates a significant amount of tonnage, but as mortgage rates and home prices rise, growth in housing starts will decelerate slightly in the second half of the year, but still be a positive for truck freight volumes. Tonnage gains in the second half of the year are likely to overstate the strength in the economy as these heavy freight sectors continue to outperform the economy overall.” This is an interesting warning about the potential for a misreading of the ATA data.

Exhibit 7. IEA's Poor Record Of Demand Forecasts



Source: IEA, PPHB

**We would warn people to be alert for any downward adjustments to the 2014 energy demand growth estimates**

A slowing of, or an absolute decline in the housing market will undercut energy demand growth in this country, as the industry consumes many materials that utilize large amounts of energy – glass, carpets, aluminum, shingles, etc., and, as a result, there will be less tonnage hauled by the trucking industry. We would warn people to be alert for any downward adjustments to the 2014 energy demand growth estimates. Unfortunately, that has been the norm for the forecasts from the International Energy Agency (IEA) since the mid 2000s as shown in the accompanying chart. The chart shows a long history of yearly global oil demand increases, but starting in 2005 we show the difference between the initial forecast by the IEA and the subsequent actual yearly increase. Note how few times the estimates and the actual volumes were similar. Forecasting is a dangerous occupation.

## Continuing To Receive Mixed Signals About Keystone

**Media reports oscillate back and forth between “imminent approval” to “outright rejection.”**

We can't decide whether TransCanada's (TRP-NYSE) Keystone XL pipeline construction permit approval saga should be made into a soap opera, a quiz game or a forensic melodrama for our entertainment enjoyment. What we do know, however, is those of us who follow closely the twists and turns governing the presidential permit decision for building the northern leg of the pipeline crossing the Canada/US border sometimes suffer from whiplash as media reports oscillate back and forth between “imminent approval” to “outright rejection.” At one point last spring, we thought the decision was a “given” for mid-summer, but at the point we reached that conclusion, we learned that the pace of release by the State Department of the one million public comments filed during the open review period for the draft Supplemental Environmental Impact Statement (SEIS) meant the decision couldn't possibly happen before late 2013. Then we learned of an investigation of a potential

**Our conclusion was that the Keystone decision wouldn't happen before the end of 2014's first quarter at the earliest**

conflict of interest by, or at least a question about the voracity of the Department of State's process for hiring, the environmental consultant who prepared the SEIS that wouldn't be completed before early in 2014. How could the State Department recommend any decision about the permit before it knew whether the SEIS might be compromised? The permit decision's timing was further upset by disclosure of a letter sent by the Department of the Interior that raised questions about certain conclusions in the draft SEIS. These concerns were similar to ones raised about the original Environmental Impact Statement (EIS) in 2011. Our conclusion was that the Keystone decision wouldn't happen before the end of 2014's first quarter at the earliest. We still hold to that conclusion. Our fallback position is that even if the pipeline is approved, it would face years of legal battles from environmental groups who have made stopping the development of additional "dirty" Canadian oil sands production a "red line" that cannot be breached. As Keystone plays a critical role in Canada's plans for higher oil sands output, environmentalists cannot allow it to be built.

**Exhibit 8. Revised Keystone XL Pipeline Route**



Source: *The Washington Post*

We have now learned of more conflicting opinions about the pipeline's fate from people supposedly "in the know," or from those who stand to benefit from the pipeline's construction. In some cases, we wonder whether the news stories based on the views of

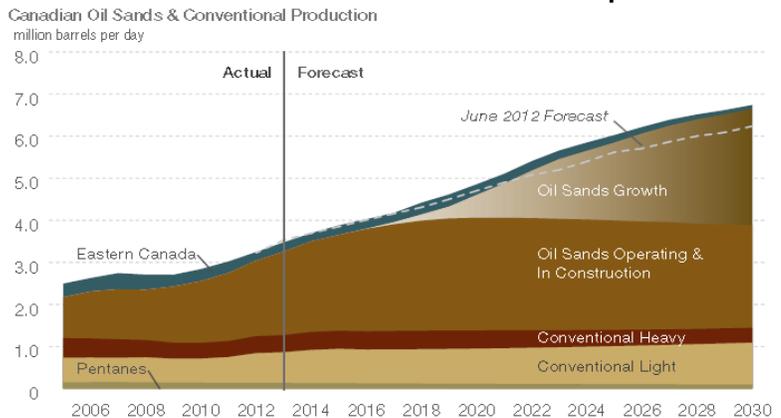
**“They just waited too long. The industry is very innovative, and it finds other ways of doing it and other routes.”**

**He is planning a new pipeline called the Double H Pipeline, which could be built with the capacity to transport up to 100,000 barrels of Bakken oil per day**

these people weren't actually written merely to keep the Keystone debate in the news since there appears little else is going on. The first sensational claim came from an interview with CEO Harold Hamm, the billionaire oilman behind the successful Bakken-focused Continental Resources (CLR-NYSE), who said Keystone is no longer needed. Mr. Hamm became a Keystone booster once TransCanada announced an up-ramp feeder line to haul Bakken shale oil from Montana and North Dakota into the main pipeline. "It's not critical any longer," Mr. Hamm told the *National Journal Daily*. He went on to say, "They just waited too long. The industry is very innovative, and it finds other ways of doing it and other routes." He was referring primarily to the rapid expansion of rail transportation options, but he failed to mention his own plans to build a pipeline to move Bakken oil.

Continental Resources has committed to shipping 35,000 barrels a day (b/d) of its Bakken output on the Keystone line. That volume represents about a third of the 100,000 b/d of Bakken crude expected to be moved on the Keystone pipeline to Gulf Coast refineries along with 730,000 b/d of oil sands output from Canada. The volume Continental Resources planned to ship is less than half of the 88,000 b/d of its then-Bakken output, so the expansion of rail operations and other pipelines probably provides sufficient outlets to move all of Mr. Hamm's oil. Another consideration is that Mr. Hamm owns a pipeline company, Hiland Partners. He is planning a new pipeline called the Double H Pipeline, which could be built with the capacity to transport up to 100,000 barrels of Bakken oil per day. That just happens to be the exact amount of Bakken oil that Keystone XL would transport, and more than Continental Resources is producing today, but maybe not what it will be producing in the foreseeable future. Thus, Mr. Hamm's statement may reflect his view that not only could Continental Resources survive without the Keystone pipeline, but he may eventually be in competition with the Canadian-owned pipeline.

**Exhibit 9. Canada Plans For More Oil Sands Output**



**Based on planned investments in new loading terminals in Alberta coupled with the delivery of specially designed tank cars that can keep the bitumen fluid, an incremental 425,000 barrels a day of heavy oil will be able to be moved to market by rail**

Shortly after Mr. Hamm's comments, a report was issued by Phil Skolnick, managing director and senior oil and gas analyst at Cannacord Genuity that concluded the northern leg of Keystone was no longer necessary as oil sands producers were developing sufficient rail capacity to move the planned volumes targeting the pipeline. According to Mr. Skolnick, moving oil sands output in tank cars used to be a temporary fix, but now it has become more of an economic proposition. Canaccord's analysis estimates that about 130,000 barrels a day of Canadian heavy oil is now moving in rail cars. According to the American Association of Railroads, nearly 200,000 rail cars in Canada carried crude oil or fuel during the first seven months of 2013, up 20% from a year ago. Based on planned investments in new loading terminals in Alberta coupled with the delivery of specially designed tank cars that can keep the bitumen fluid, an incremental 425,000 barrels a day of heavy oil will be able to be moved to market by rail. This volume is comparable to the approximately 465,000 barrels a day of raw bitumen (without the diluting agents) that Keystone is designed to transport. In Mr. Skolnick's view, "If Keystone does not get approved, the rail capacity is going to be there."

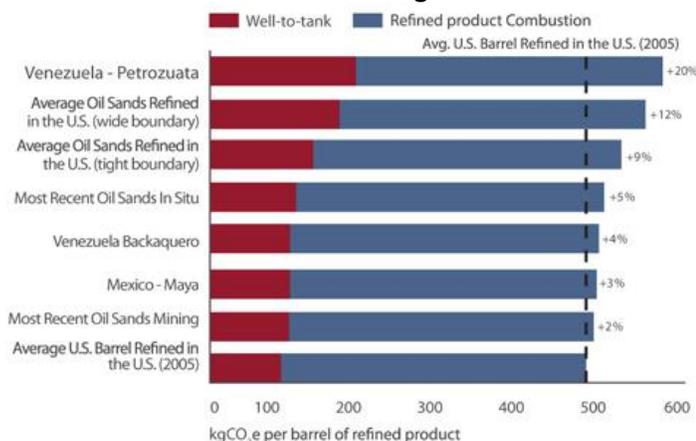
**Valero said Keystone was no longer critical to its business**

After the media concluded that producers were no longer dependent on the construction of Keystone, they turned to the refiners for their opinion. Various articles questioned how necessary it was for the pipeline to be built for the users to get the oil supply. Although none of the refiners said they were abandoning Keystone, they almost all said they were developing alternative ways to secure the oil they need. Valero (VLO-NYSE) said Keystone was no longer critical to its business. It is expanding rail terminals at its refineries in Benicia, Calif.; St. James, La.; and Quebec to receive more crude oil shipments, including Canadian heavy oil. Valero spokesman Bill Day stated, "If we just sat around and waited for Washington, we'd never get anything done."

**The media is reporting the potential for an emissions reduction agreement by Canada with the United States in exchange for approving the Keystone pipeline**

The latest stories around Keystone relate to what the Canadians are prepared to do to gain President Barack Obama's approval. Initially, following the termination of the first pipeline approval process in 2012, Canada's Prime Minister Stephen Harper reportedly told his staff that he needed to make developing alternative oil export opportunities for Canada his highest priority. Last June, following President Obama's climate change speech, Mr. Harper supposedly wrote to the president that he would like to work with the United States to "reduce emissions from the oil and gas sector," in an effort to get the pipeline approved. Mr. Harper reportedly discussed this offer with President Obama at the recent G20 meeting in St. Petersburg and the media is reporting the potential for an emissions reduction agreement by Canada with the United States in exchange for approving the Keystone pipeline.

**Exhibit 10. Oil Sands Less Polluting Than Venezuela**



Source: IHS, CAPP

**At a recent *Bloomberg News* event, former White House climate czar Carol Browner, now a senior fellow at the liberal Center for American Progress, said, “I think it is conceivable that Canada will offer an offset for the emissions, which will change the debate.”**

**In our view, President Obama is concerned about his legacy, which is to be the “transformational” president**

Recently, Canada’s Natural Resources Minister Joe Oliver, on a trip to the U.S., was interviewed and said he couldn’t handicap the odds of the pipeline decision being made this year or even what those odds were for the pipeline to be approved. What he did offer was his opinion that the pipeline should be approved if all the facts are taken into consideration. But the question remains, will Canada offer greenhouse gas emission control tradeoffs to win the pipeline’s approval? At a recent *Bloomberg News* event, former White House climate czar Carol Browner, now a senior fellow at the liberal Center for American Progress, said, “I think it is conceivable that Canada will offer an offset for the emissions, which will change the debate.” She also offered her opinion on why the Keystone pipeline is such an emotional flashpoint for environmental groups. “I do think for a lot of the people who are objecting to it, it is the amount of greenhouse gases, the amount of energy it takes to get the tar sands up out of the ground, and if [Prime Minister] Harper can say ‘Mr. President, that’s X amount of greenhouse gases and I’m prepared to reduce greenhouse over here,’ then I think that drops the temperature on some of the arguments.”

Interestingly, it seems as if the political calculus now is tipping in favor of Keystone’s approval by President Obama, while at the same time, the industry is backing off its view of the critical need for it. If domestic crude oil production continues to grow at the pace of its recent increase into early next year and if the Canadians haven’t conceded on climate change concessions, then in our view President Obama will reject the permit. If the opposite has happened, then the odds favor Keystone’s approval and leaving it to the environmental groups to fight the pipeline’s construction. In the end, in our view, President Obama is concerned about his legacy, which is to be the “transformational” president. He is building that legacy through ObamaCare, his isolationist foreign policy, ending the War on Terror and trying to alter America’s eating habits and gun

ownership creed. Changing America's energy future – away from fossil fuels and toward renewables – could be another major achievement. Mr. Obama is a young man, and I suspect he would love for his obituary to cite these social and economic achievements as his legacy. Don't forget that a climate change victory over Canada would be another notch in his victory belt.

## Hurricane Season Confounds Forecasters And Warmists

**Most experienced weather forecasters were in agreement with the large number of total named storms and hurricanes**

In late spring, the various hurricane trackers released their forecasts for the 2013 season. Uniformly, they were calling for an active season. In fact, the National Ocean and Atmospheric Administration (NOAA) said it expected the 2013 season to be “extremely active” and forecasted there would be 20 named storms, 11 hurricanes and six of those would become major hurricanes, meaning they would attain Category 3, 4 or 5 status at some time during their life. Most experienced weather forecasters were in agreement with the large number of total named storms and hurricanes. The forecasts were released during May in anticipation of the June 1<sup>st</sup> start to the storm season and at the time the media was filled with stories about the high level of storm activity anticipated, the risk of coastal U.S. cities for damage from storms making landfall and how much the increased storm activity and storm strength was due to global warming. One must also remember that the Mid-Atlantic region was still recovering from the devastation caused by Super Storm Sandy last fall, which colored some of the media focus. Sandy was a Category 1 hurricane when it brushed the Carolinas as it traveled up the East Coast, but it was only a tropical storm when it made landfall on the upper New Jersey coast, but its timing coincided with an extremely high tide.

**As we moved into September with the tropics quiet, forecasters were forced to acknowledge that something wasn't working with their forecasting models**

As a quiet June moved into July without any storm activity, people began questioning what was going on. What we know, however, is that the hurricane season doesn't peak until September. In fact, three times as many hurricanes form during the months of September, October and November as during the three months of June, July and August. So the fact that we slid into August without any hurricane activity was not too bothersome. As we moved into September with the tropics quiet, forecasters were forced to acknowledge that something wasn't working with their forecasting models. As a result, forecasters revised their projections. In the case of NOAA, it revised its forecast for named storms modestly to 13-19 with 6-9 hurricanes and 3-5 major hurricanes.

**Tropical storm Humberto became a hurricane on September 11th, failing to establish a new record for the latest-forming first storm of the season by three hours**

The discussion in early September turned to when we would actually see a tropical storm evolve into a hurricane. In the satellite era, the record for the latest formation of the first hurricane of the season was Gustav in 2002 when it became a hurricane after 8:00 a.m. EDT on September 11<sup>th</sup>. Tropical storm Humberto became a hurricane at 5:00 a.m. EDT on September 11<sup>th</sup>, failing to establish a new record for the latest-forming first storm of the season by three hours.

Exhibit 11. Why The Hurricane Season Lags

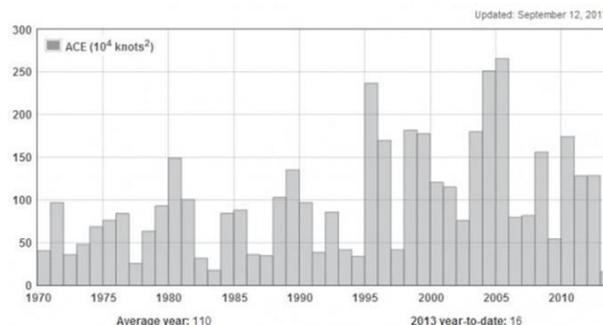


Source: *AccuWeather.com*

**These people pointed to two factors – the lower atmospheric dusty air from the Sahara Air Layer coming off the east coast of Africa and the cooler temperatures impacting the African wave formation area over Ethiopia**

We recently participated in a webinar with a weather forecasting service in which the lead meteorologist walked through the drivers for storm activity. At the time of the webinar, there had been seven named storms but no hurricanes or major hurricanes. The presenter pointed out that their forecast expectation of deep warm pockets of water in the Atlantic Basin and low pressure in the region had all occurred. In fact, pressure was low across the globe from Africa to the Gulf Coast. So with favorable storm formation conditions, why haven't there been the storms? These people pointed to two factors – the lower atmospheric dusty air from the Sahara Air Layer coming off the east coast of Africa and the cooler temperatures impacting the African wave formation area over Ethiopia. He showed photos of the dusty air in the lower atmosphere off Africa, but that phenomenon was ending, which should contribute to more favorable storm formation conditions. Dirty air remains in the mid-level atmosphere, but all the storm forecasting models have been adjusted to account for that condition. The shift in the African wave formation pattern was a big surprise and has yet to return to normal conditions. This wave formation pattern comes from the area over Ethiopia on the east coast of Africa and is heavily influenced by the temperatures in the neighboring Indian Ocean. This body of water began cooling at the start of the storm season and remains in a cool phase, contrary to normally anticipated conditions.

Exhibit 12. 2013 ACE Total At Record Low



Source: *Weather Underground*

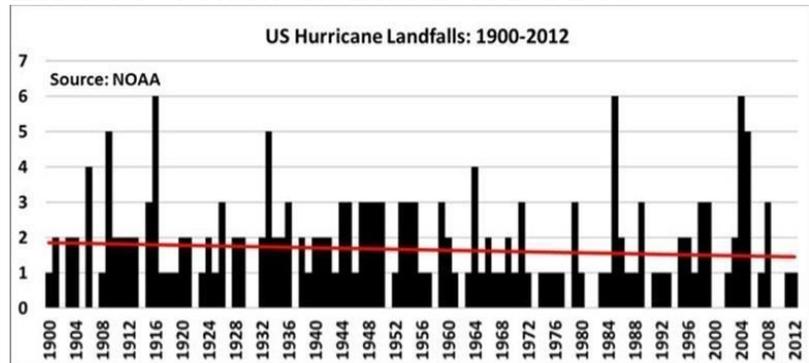
**The ACE for August was the lowest for any August since 1970**

**He also suggested that the decline in tropical cyclone energy globally could be due to the decline in the solar energy cycle, which has been one of the lowest in recent cycles**

One factor forecasters are monitoring is that the Northern Hemisphere Accumulated Cyclone Energy (ACE) measure is at the second lowest level experienced since 1970. ACE is determined by taking the square of each storm's wind speed, calculated every six hours. Added up over a whole season, an average year will see the ACE number reach about 110. So far in 2013, ACE is at 16, although expectations are that with additional storms predicted for the season, the ACE number will rise. The ACE for August was the lowest for any August since 1970. The history of ACE since 1970 through September 13<sup>th</sup> is shown in Exhibit 12 on the previous page. Weather Underground, which updates the ACE chart, believes weather conditions limiting the formation of hurricanes are temporary, as they point to a 40-year rise in ACE and suggest that increase will continue in the future. They never acknowledge the possibility that low ACE could indicate a change in meteorological conditions that contribute to the formation of tropical storms.

The meteorologist conducting the webinar suggested several other considerations about why the ACE is so low so far this year. First, he had fit a regression curve to the historic ACE data since 1970 and although the calculated 2013 point remains well above the current ACE total, he believes the remainder of the 2013 storm season will lift the 2013 ACE total to the curve's projected value, but it still is below the roughly 110 average suggested by Weather Underground. He also suggested that the decline in tropical cyclone energy globally could be due to the decline in the solar energy cycle, which has been one of the lowest in recent cycles. Expectations are that the next solar cycle will also be weaker than the current cycle, contributing to a view that the Atlantic Basin could be moving into a global cooling phase. The last Atlantic Basin cool cycle ran from 1970 to 1994, at which point it shifted into the current warm phase associated with increased tropical storm activity. The fact it was a colder than normal winter in the Southern Hemisphere and that it appears likely there will be a colder and earlier start to the U.S. winter makes these forecasters question whether the Atlantic Basin is transitioning to a cool phase with reduced tropical storm activity.

**Exhibit 13. U.S. Hurricane Landfalls At Low Level**



Source: Weather Underground

**If we look at the number of hurricanes making landfall on the U.S. coast, we see that recent years reflect a pattern more like the lows experienced during the 1970s to early 1990s with the exception of a couple of years during that period**

While weather forecasters are reluctant to make bold predictions about warming/cooling cycles in the Atlantic Basin, if such a shift is underway then we will be looking at a significant reduction in tropical storms in coming years. If we look at the number of hurricanes making landfall on the U.S. coast, we see that recent years reflect a pattern more like the lows experienced during the 1970s to early 1990s with the exception of a couple of years during that period. That was the last cool phase for the Atlantic Basin. A change in the frequency of tropical storms, or the number that might make landfall on the U.S. coast doesn't speak to either their intensity or the paths they might take. This potential shift to a cool phase for the Atlantic Basin would necessitate that those proponents of global warming/climate change driving increased hurricanes and more intense storms may need to revise their predictions.

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