

MUSINGS FROM THE OIL PATCH

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

Random Thoughts While Traveling Middle Eastern Waters

Three of the four Emirates produce crude oil while the fourth, and newest, has none

This past week we have been traveling in the Middle East on a cruise that took us to three of the Emirates that comprise the United Arab Emirates (UAE) and to the country of Oman. Several of the land tours we took at various port stops resulted in us traveling into a fourth Emirate, meaning we visited more than half of the seven Emirate members of the UAE. Three of the four Emirates produce crude oil while the fourth, and newest, has none, providing an interesting perspective on how to run a country without that elector of petroleum money.

We kept hearing a couple of common traits about the region that sure were appealing: no taxes; cheap gasoline; free education; free medical care; and even housing and employment if one needed it

Throughout our trip we kept hearing a couple of common traits about the region that sure were appealing: no taxes; cheap gasoline; free education; free medical care; and even housing and employment if one needed it. The downside to this utopia is the climate and the culture. All our tour guides lamented that their jobs lasted only six months a year because between April and October the extreme heat in the region discouraged tourists from visiting. Since most of these tour guides were foreign workers and not eligible for certain jobs, financial benefits or protections, they have to leave the country during the summer to seek employment elsewhere in the world. An example of the restriction on employment opportunities is that in Oman there is no public transportation, so everyone is forced to use taxis. But only Omanis can drive taxis so foreigners lose out on that possible employment. Culturally that issue is not going to be changed, and the only real opportunity for employment is in the construction industry that has been hit hard by the recession.

We arrived in Dubai several days before our cruise commenced. Upon arrival, we were shocked at the crowds at immigration given the special lanes for Gulf country citizens and reports we had heard about the recessionary impact on the city's activity. In fact, as we

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progressed through the immigration line, we noticed that the immigration officials kept looking at the length of the lines and making comments to each other. Since we don't speak the local language we can only speculate on what they were saying, but it sure seemed to reflect surprise at how long the lines were and how long they stayed long!

Because we arrived late at night, our first visual image of the city was in the morning when we looked out our hotel room window and saw a massive downtown skyline with lots of buildings under construction and lots of construction cranes. The problem was we couldn't find the famous Dubai tower, the tallest building in the world, or the sail-shaped hotel. Thinking we were seeing just a part of Dubai, we were surprised to learn that we were staring at the skyline of Sharjah, another of the Emirates. It wasn't until we went for breakfast in the lounge located on the opposite side of our hotel floor that we saw the Dubai skyline with all the landmarks we were expecting to see.

Dubai also had a number of towers under construction each with its respective accompanying construction crane. It wasn't until later that day that we discovered that the construction on most of these high-rise office and residential towers had ceased due to the economic recession and financial crisis. In our time in Dubai, we took a tour out into the desert for some "dune bashing" where four-wheel drive SUVs race up and down across the sand dunes while the drivers do their best to scare the tourists inside. Our Indian vehicle mates were screaming appropriately to satisfy our driver that he had accomplished his mission. We then went for dinner and entertainment at a model Bedouin camp. There we had a chance to take a camel ride that convinced us we'd like a thicker saddle if we planned to use camels as our primary transportation method.

We discovered that the Chinese today are the equivalent of the Japanese of the 1980s

Based on our hotel experience, our desert tour and shopping at the souks (markets) in Dubai, coupled with conversations with various tour guides, we discovered that the Chinese today are the equivalent of the Japanese of the 1980s. They were everywhere and oblivious to non-Chinese tourists or shoppers. The tour guides were not fond of the Chinese tourists but recognize that there is little they can do about them, especially since they bring money. Our observation about the Chinese in the souks was that they were doing lots of looking but not much buying, in contrast to our prior experiences with the Japanese in the 1980s.

Our ship's captain described the area as a parking lot for tankers

During our first night on the ship we traversed the Strait of Hormuz, but it was in the middle of the night. We awoke to find ourselves traveling through a maze of idle ships. Our first count was 38 ships, but then on getting a little closer the number increased to 41 ships with at least 80% of them tankers. Our ship's captain described the area as a parking lot for tankers waiting on contracts to proceed into the Arabian Gulf to pick up oil cargos for delivery elsewhere.

Plans are to expand the refinery and pipeline, providing potentially greater supply flexibility for Abu Dhabi

We soon arrived at our first port of call, the Emirate of Fujairah, the newest Emirate, having only been officially established in 1980. Prior to that time, Fujairah had been a part of Sharjah. It is the only Emirate to look eastward onto the Arabian Sea and Indian Ocean. Because the Emirate has no oil, it has used its geographic location to become a transportation and logistics hub for the UAE. We noticed as we approached the port that there were two huge tank farms and several offshore tanker loading facilities. We later found out that there is a small refinery associated with these tank farms with the oil flowing by pipeline from Abu Dhabi. Plans are to expand the refinery and pipeline, providing potentially greater supply flexibility for Abu Dhabi so not all its oil must go by tanker through the Strait of Hormuz, the world's leading oil transportation chokepoint.

The heightened security attention was due the recent hijacking by Somali pirates of an oil tanker destined for the United States

Besides handling logistics for the region as a major cargo port, Fujairah is developing a resort area to provide a location for tourists who want to enjoy water sports – swimming, fishing, snorkeling and diving – but can't in the ultra-warm waters of the Arabian Gulf. With Fujairah's location on the cooler Indian Ocean, these resorts should be welcome commercial enterprises.

The key point was that the tanker hijacking occurred about 300 nautical miles east of where we were located

As we moved down the coast to Muscat, the capital of Oman and another cargo port, our ship was greeted by several naval vessels as we approached. We learned later that the heightened security attention was due the recent hijacking by Somali pirates of an oil tanker destined for the United States. A multi-national naval fleet provides protection for shipping in the region and Muscat is a port where these naval vessels often stop for refueling and re-provisioning. Moored next to us in Muscat was a British frigate, the Cumberland, which came into port after us to restock. The following morning we noticed an Omani naval vessel or a police ship lying off the mouth of the harbor presumably checking out ships approaching.

Because of the pirate activity, Captain Henrik and Cuddy, the cruise director, prepared a video discussing the situation. The key point was that the tanker hijacking occurred about 300 nautical miles east of where we were located. The captain also talked about a failed attempt in the Gulf of Oman that was disrupted by an American naval vessel. The captain talked extensively about the techniques of the pirates and how they had evolved over time. Originally they went after ships close to the coast until the ships realized that if they moved further away from shore they were less susceptible to attack. Then the pirates created mother ships that took them further offshore and provided a platform for launching attacks out there.

Exhibit 1. Middle East Region And Our Tour



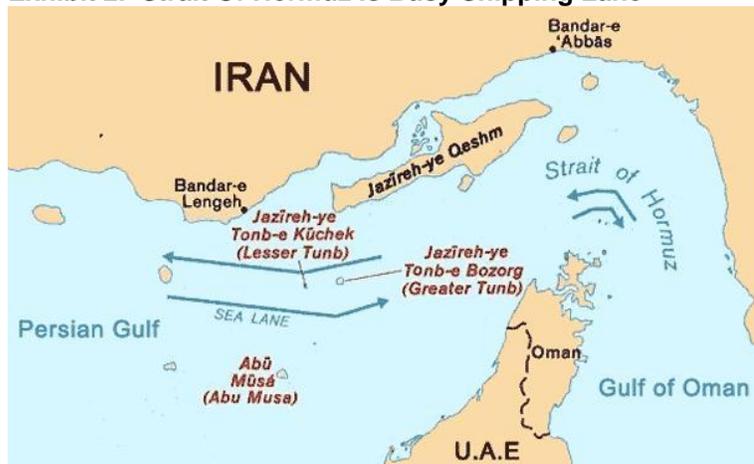
Source: Fox News

The jet was a toy of one of the royal families who don't need to concern themselves with rules and regulations when out having fun

Cruise ships have several protections – speed, water turbulence around the vessel, and the height from the waterline. Cruise ships can attain speeds that may outrun some pirate ships. If not, the water turbulence from the bow and the stern props is likely to swamp the small rubber high-speed boats the pirates use in their attacks. Lastly, once a pirate attempts to climb aboard the cruise ship, he has to scale five decks from the waterline, or maybe 50 feet, no small feat especially from a bobbing small boat. At one point in our transit we noticed four small boats racing rapidly toward the ship, but they all passed behind us. Our first thought was pirates, although the boats were not the high-speed rubber vessels usually associated with pirates. We also were buzzed by a small blue jet, which we assumed was the Omani military but couldn't confirm. We later learned from the captain that the jet was a toy of one of the royal families who don't need to concern themselves with rules and regulations when out having fun.

The shipping lane is six miles wide with a two-mile wide channel in each direction and a two-mile wide buffer zone in the middle

As we made our way toward the Strait of Hormuz, the 29 nautical mile wide water way separating Iran and Oman, we passed a number of ships, mostly tankers, moving in the opposite direction. That is not surprising because there are two organized shipping lanes that require vessels to move largely single file through the strait. According to industry research, about 40% of the Middle East's crude oil production travels through the strait, or roughly 17 million barrels per day. The shipping lane is six miles wide with a two-mile wide channel in each direction and a two-mile wide buffer zone in the middle. As we were making our way through the Strait, we did see an oil and gas producing platform offshore Iran along with a nearby jackup drilling rig with a supply vessel parked at the rig. We couldn't make out anything about the ownership of the rig or supply vessel. We later saw a number of offshore gas wellheads off Iran.

Exhibit 2. Strait Of Hormuz Is Busy Shipping Lane

Source: Wikipedia

We spent time each day watching the unfolding drama in Egypt on CNN, and wondering what else might transpire in this important region of the world

We still had a visit to Abu Dhabi and Dubai scheduled before completing the cruise. Those visits happened after we wrote this article. We must say that we learned much about this region that helps us to understand political and economic developments better. Of course, we spent time each day watching the unfolding drama in Egypt on CNN, and wondering what else might transpire in this important region of the world. This marks the fourth major geopolitical event in the past decade we have watched on television while traveling – 9/11, Hurricane Ike, the Bush-Gore election recount and now Egyptian President Mubarak's forced resignation from office. Each of the first three events significantly altered our world and how we had to adjust our thinking. We suspect this fourth event will do likewise, but it is probably too early to know exactly how things will change. The experiences gained from this trip will definitely help us comprehend the significance of the seismic shifts underway in the Middle East.

Business Reality Confirms Problem Of EV Strategy

The problem is that EVs are not ready for prime time, despite the media hype and the Obama administration claims

President Barack Obama reiterated his goal that under his administration's energy policy the United States will have one million electric vehicles (EV) on the nation's roads by 2015. To ensure this strategy, his government continues to hand out money to help build or convert plants to make batteries for EVs and to promote the installation of EV recharging stations around the country. The annual Detroit auto show recently concluded and was packed with new EV models and showcases highlighting the EV technology being developed to ensure that these cars become mainstream alternatives to conventionally-powered cars.

The problem is that EVs are not ready for prime time, despite the media hype and the Obama administration claims. These vehicles –

The problem with EVs is that they meet few of the driving needs of typical Americans

the few that are being delivered today – are going to a small population of elite consumers with green agendas and/or the desire to be seen as technology pioneers. Without greater driving range from a single battery charge and the lack of any recharging infrastructure, EVs will need continued huge government subsidies. The problem with EVs is that they meet few of the driving needs of typical Americans. As people find out the limitations of EVs they are less likely to be impressed with the high prices necessitated by the costly batteries needed to power the cars. Without continued and substantial government assistance, these early EVs would likely be left on showroom lots.

People who focus on the energy storage industry have been critical of the government's push for EVs as they see the technology as too expensive and not environmentally friendly. Both of these issues are ignored among all the "happy talk" about the ideals of EVs. But today's EVs do not address the true energy challenges of substituting metals for energy. If we consider the issue for saving oil to be best done by switching the American auto fleet to battery power, then not enough work has been done to examine the physical limitations of this strategy along with the considerable challenges of expanding the production capabilities of the global metals industry.

A recent article by John Petersen, a European-based lawyer focused on helping energy storage companies, highlighted the numbers behind this challenge of switching from oil-powered vehicles to battery-powered ones. He looked at the amount of production of crude oil and compared it to the same measure for a number of metals involved in the auto industry, and especially the EV sector. His data shows that for every 1,000 pounds of global oil production, the world produces ten pounds of aluminum, four pounds of copper, one pound of lead, six ounces of nickel, a half-ounce of rare earth metals and a tenth of an ounce of lithium.

The world is producing nearly 650 kilograms of oil per capita while it only produces four grams of lithium, the primary material employed in EV batteries

Mr. Petersen prepared a table showing the annual global production of oil and the various metals in metric tons and turned the production figures into per capita measures to further highlight the difference in magnitudes. As shown by his data, the world is producing nearly 650 kilograms of oil per capita while it only produces four grams of lithium, the primary material employed in EV batteries. Can the planet both find and develop, in a timely manner, the volume of metals that will be needed to meet the Obama administration's lofty goals for EV growth? In Mr. Petersen's view, "no thoughtful investor can compare per capita production of oil and essential metals and rationally conclude that we can increase metal consumption in the name of conserving oil."

Metal prices are only now receiving significant attention by investors and consumers as they have moved substantially higher in recent years during the global commodity boom that has been underway.

Exhibit 3. Current EV Metals Production Very Small

Natural Resource	Global Production (MT)	Per Capita Production
Crude oil	4,282,736,000	648.9 kg
Iron & steel	2,400,000,000	363.6 kg
Aluminum	41,400,000	6.3 kg
Copper	16,200,000	2.4 kg
Lead	4,100,000	0.7 kg
Nickel	1,550,000	0.2 kg
Rare earths	130,000	20 g
Lithium	25,300	4 g

Source: *Seeking Alpha*, PPHB

Over the past 20 years, it is clear that metals prices are just as volatile as oil and have risen to levels in recent years that make them very expensive

Many people wonder whether the rise in metal prices is merely reflective of commodity speculation activity as traders chase short-term profit opportunities in the market. That school of thought has been countered by fundamental analysts who contend that metals prices truly are reflecting increased global demand and a lack of supply expansion, or at least at a pace sufficient to keep up with that demand growth. If one examines the performance of selected metals prices compared to crude oil prices over the past 20 years, it is clear that metals prices are just as volatile as oil and have risen to levels in recent years that make them very expensive. Since the public doesn't buy metals every week as they do gasoline, the impact of rising metals prices has not been of concern. That may change in the future.

Exhibit 4. 20 Year Price Record For Oil And Metals



Source: *Seeking Alpha*

In Mr. Petersen's view, "any energy policy or business model that

The “ethanol folly” foisted onto the backs of American consumers in the name of cleaning up our greenhouse gas emissions has been shown to have been little more than a farm subsidy bill

increases metal consumption in an effort to conserve oil must fail.” He points to the highly questionable economic value proposition of food for ethanol. The “ethanol folly” foisted onto the backs of American consumers in the name of cleaning up our greenhouse gas emissions has been shown to have been little more than a farm subsidy bill. Even early ethanol supporter former vice-president Al Gore, who is now a major clean energy private equity investor, confessed that his support of ethanol was a mistake. Despite his new-found honesty, we find it interesting that he hasn’t been leading a movement to repeal or correct his “mistake.”

By reducing the vehicle’s weight through reduced use of metals, energy efficiency of conventional engines would leap ahead of current EV performance

It seems that the only EV energy strategy that will work is one that uses tiny amounts of metal to reduce large amounts of oil. This means that electric two-wheeled or four-wheeled vehicles work only so long as the empty vehicle weight is less than twice the passenger weight. This fits with the vision for future autos expounded by a former R&D executive with General Motors (GM-NYSE) who said that the most successful clean-energy vehicles will only come with the adoption of anti-crash GPS technology. That development would enable cars to be built with considerably less metal because they do not need all the metal for protection since they won’t crash. By reducing the vehicle’s weight through reduced use of metals, energy efficiency of conventional engines would leap ahead of current EV performance.

The Prius HEVs are marginal if their primary components are not easily recycled

Absent that technological breakthrough, start-stop idle elimination at the low end and Prius class hybrid EVs at the high end represent the range of technologies that stand a chance of meeting the energy/metal exchange requirement. Even then, the Prius HEVs are marginal if their primary components are not easily recycled. According to Mr. Petersen, when you put a plug into the vehicle, the resource balance “goes to hell in a handbag.” What is amazing is that President Obama has made EVs the center point of his “green energy” strategy while claiming that science lies behind his policy actions (the reason he appointed Nobel laureate Stephen Chu as Secretary of Energy). However, he has failed to comprehend the basic physics and the critical economics of a metals-for-oil tradeoff. President Obama’s shortsightedness may cost the American consumers substantially in the long-run.

Groundhog Day Storm Drives Debate Over Climate Change

It furthered a debate that has been underway for months about the cold and snowy winter and global warming

The blizzard that kicked off the month of February stretched from Oklahoma to New England and impacted the daily lives and travel plans of tens of millions of people. That storm is now a distant memory, but it furthered a debate that has been underway for months about the cold and snowy winter and global warming. During the recent storm, Chicago was caught in the middle and was buried under 20.2-inches of snow, making it the third greatest storm in the city’s history. The magnitude of this winter storm was unusual. As Meteorologist Thomas Spriggs of the National Weather

Once again, the record cold and heavy snows have people questioning the global warming fears of scientists, politicians and environmentalists

Service put it, “A storm that produces a swath of 20-inch snow is really something we’d see once every 50 years – maybe.”

Once again, the record cold and heavy snows have people questioning the global warming fears of scientists, politicians and environmentalists. Even former vice president and Nobel laureate Al Gore was forced to come to the defense of the global warming proponents, although his credibility has been diminished after he admitted that his support of ethanol as the solution to reduce carbon emissions from autos was misguided. But Mr. Gore and his supporters must have been heartened by the pronouncement by Punxsutawney Phil from his haunt at Gobbler’s Knob in Punxsutawney, Pennsylvania, that there will be an early spring this year. The fact that Phil didn’t see his shadow on February 2nd, in contrast to his having seen it 98 times before since 1887 means he is really going out on a limb with his prognostication. Or is he?

Exhibit 5. The Fearless Prognosticator Phil



Source: *Associated Press*

Groundhog Day is rooted in the old Christian religion known as the Presentation of Jesus at the Temple, which falls on February 2nd each year

Groundhog Day is rooted in the old Christian religion known as the Presentation of Jesus at the Temple, which falls on February 2nd each year. In the Eastern Orthodox Church, the ceremony is one of the twelve Great Feasts. The celebration goes by other names such as Candlemas, the Feast of the Purification of the Virgin, and the Meeting of the Lord. The event is described in the Gospel of Luke (Luke 2:22-40). According to the gospel, Mary and Joseph took the baby Jesus to the Temple in Jerusalem forty days after his birth to complete Mary’s ritual purification following childbirth in accordance with Jewish tradition, and to perform the redemption of the firstborn, in obedience to the Law of Moses. Upon bringing Jesus into the temple, his parents encountered Simeon the Righteous. The Gospel records that Simeon had been promised that “he should not see death before he had seen the Lord’s Christ.” Simeon then prayed the prayer that prophesized the redemption of the world by Jesus.

The beginning of February also coincides with a time in Europe when various animals would awaken from their winter hibernation and check to see how the world was doing

The point of the prior discussion isn't to deliver a lesson on religion but rather to point out that Groundhog Day is really tied to a day of celebration. The celebration may come from religion or even pagan traditions, but it is a day to party and not work. The beginning of February also coincides with a time in Europe when various animals would awaken from their winter hibernation and check to see how the world was doing – and whether there was anything to eat! The thought was that if these hibernating animals – bears, badgers, hedgehogs, or wolves – were blinded by the winter conditions they would retreat to await warmer weather. On the other hand, if it was cloudy there was a good chance temperatures were warming so the prospect of finding food was improved.

The idea of watching how these hibernating animals reacted to the weather upon emerging from hibernation soon evolved into a form of weather forecasting. The tradition crossed the Atlantic to America. The tradition provided another reason to have a party in the middle of winter, which was about the time everyone was ready for a break in the bleak times associated with cold and snow. That fact should not be lost on people when they consider Phil's fearless forecast. Groundhog Day falls almost exactly between the winter solstice and the vernal equinox, both dates tied to the rotation of the earth and its tilt on its axis.

Between Groundhog Day and the vernal equinox, there is approximately six weeks of time

The winter solstice marks the shortest day and longest night of the year and usually occurs about December 20th or the 21st. The vernal equinox is when the length of the day and night are exactly equal and that is usually about March 20th or 21st. When you count the time between these two events, it is almost exactly 90 days. Half of that period would be 45 days, which just happens to coincide with the February 2nd date. But what it also means is that between Groundhog Day and the vernal equinox, there is approximately six weeks of time. So when Punxsutawney Phil sees his shadow and predicts another six weeks of winter he is just as accurate as when he doesn't see his shadow and calls for an early spring within the next six weeks. Is this really a case of having it both ways? Lots of forecaster work hard to be that infallible.

Phil's and his predecessors' record of forecasting the winter's end, however, is reportedly only 39% accurate since 1988

Phil's and his predecessors' record of forecasting the winter's end, however, is reportedly only 39% accurate since 1988 according to the National Climate Data Center. As Bernie Rayno, senior meteorologist with *AccuWeather.com* put it, "He [Phil] has the easiest job in the world. He hibernates during the winter, pops his head up on one day and makes a prediction." On the supposed lack of forecasting prowess, Mr. Rayno commented, "If I was only right 39 percent of the time, I think I'd lose the rest of my hair and probably my job." In fairness to Phil, we'd point out that if he were a major league baseball player he would be paid in the millions to be a .390 hitter, especially after what some .220 hitters recently received in long-term contract renewals.

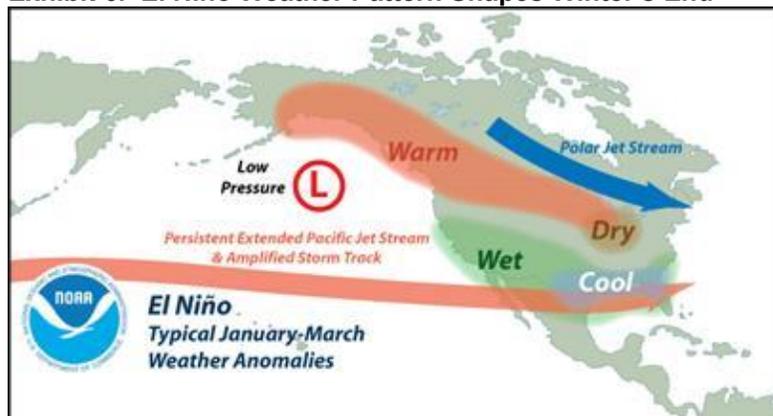
PETA asked that Phil be moved to a sanctuary and replaced with an animatronic groundhog replica

Punxsutawney Phil's forecast is actually prepared by a committee that meets and predetermines the outcome before he ever comes out of his cave. Talk about the fix being in! But for playing along with this charade, Phil is taken care of by the Punxsutawney Groundhog Club, which recently came under attack from the People for the Ethical Treatment of Animals (PETA) for its handling of the groundhog. PETA protested the Groundhog Club's continued reliance on Punxsutawney Phil as a weather prognosticator/tourist attraction. They asked that he be moved to a sanctuary and replaced with an animatronic groundhog replica. Groundhog Club President William Deeley said in response that Phil was "treated better than the average child in Pennsylvania" and is subject to an annual inspection by the Pennsylvania agricultural department to ensure his well-being. We're not sure what Mr. Deeley's comment says about family life in Pennsylvania.

So, if Phil were really wandering around in the relatively mild mid-winter period, which experienced enough sunlight for him to see his shadow, he would call for more winter

While we may make light of the traditions surrounding Phil and his forecasts, there is some science behind the effort. The science is tied to the El Niño weather phenomenon in the Pacific Ocean. El Niño is associated with a warming of the waters of the Pacific Ocean, which alters global wind and weather patterns. In North America, it starts with a warming of the West Coast and then expands eastward. By mid-winter the warmth of a normal El Niño reaches the Great Lakes and Midwest. Then, as the El Niño weakens normal winter weather returns to the East. Thus, the winter weather pattern is for a cool early winter that then shifts to warmer mid-winter weather only to be followed by a cooler late winter. So, if Phil were really wandering around in the relatively mild mid-winter period, which experienced enough sunlight for him to see his shadow, he would call for more winter. By then, El Niño would have faded and winter would literally return, sometimes with a real vengeance.

Exhibit 6. El Niño Weather Pattern Shapes Winter's End



Source: NOAA

As was pointed out by one climate expert, the groundhog tradition was fostered during the 1700s and 1800s, during the last vestiges of

With today's weather being driven by La Niña rather than El Niño, weather patterns of the past may all change

the "Little Ice Age." So what worked during those years may not work now, and may partially explain why Punxsutawney Phil's forecasting record has fallen dramatically in recent years. With today's weather being driven by La Niña rather than El Niño, weather patterns of the past may all change, something that was the subject of our article in the last issue of the *Musings*. That article focused on a video Joe Bastardi, *AccuWeather.com's* extreme weather forecaster, prepared to help explain why his forecast for this winter had proven so wrong. But he was not alone in believing that this winter would be more moderate than recent winters.

If winter were to end today, it is clear that only a few forecasters could claim the prize for most accurate winter forecast. That honor would likely have to go to the *Famers' Almanac*, with the *Old Farmers' Almanac* coming in a close second. These two rival publications prepare their own weather forecasts based on methodologies developed over decades of study. In fact, the *Famers' Almanac* has used a You Tube commercial to hype its old time forecasting methodology. The commercial uses the existing editor of the almanac who pulls out the box that contains the forecasting methodology, which she intends to share with the television audience. Unfortunately after much effort, it becomes evident she will not be able to open the box, so she tells the audience they will have to buy the *Famers' Almanac* to read the forecast.

The primary difference from conventional weather forecasters is their reliance on sun spot research

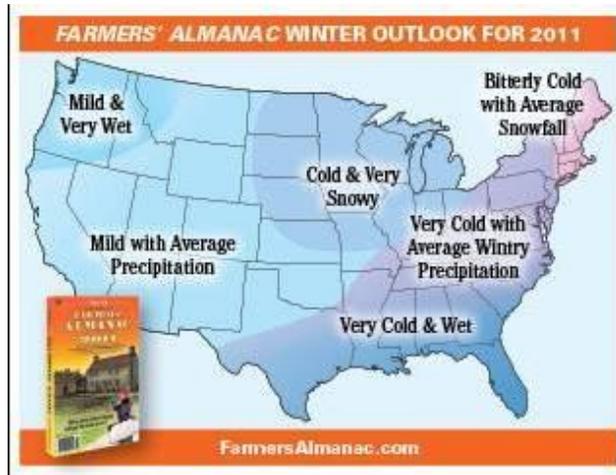
Both the *Famers' Almanac* and the *Old Farmers' Almanac* rely on climatology and meteorology for preparing their long range weather forecasts, but the primary difference from conventional weather forecasters is their reliance on sun spot research. But even here, there are differences between the methodologies of the two long standing almanacs as demonstrated by their forecasts for this winter.

Exhibit 7. *Old Farmers' Almanac* Winter Forecast



Source: *Old Farmers' Almanac*

Exhibit 8. Famers' Almanac Winter Forecast



Source: *Farmers' Almanac*

While we can argue about the minor differences between the two forecasts, it is clear that they have come much closer to the actual winter weather

As can be seen from the two graphic illustrations of the respective almanac's forecasts, the *Farmers' Almanac* seems to have come closer to the actual weather patterns experienced so far this winter. For example, it has the weather in Maine being bitterly cold with average snowfall. In contrast, the *Old Farmers' Almanac* had Maine being mild and dry. While we can argue about the minor differences between the two forecasts, it is clear that they have come much closer to the actual winter weather. That should be a strong marketing point for them later this year when they unveil their winter 2011-2012 forecasts.

The almanac forecasts were better than those issued by *AccuWeather.com* and the National Oceanic and Atmospheric Administration (NOAA) that did not integrate sun spot activity forecasts into their predictions.

Exhibit 9. Early Winter Forecast Proved Wrong



Source: *AccuWeather.com*

Exhibit 10. NOAA's Early Winter Forecast



Source: NOAA

Exhibit 11. NOAA's Winter Forecast Too Warm



Source: NOAA

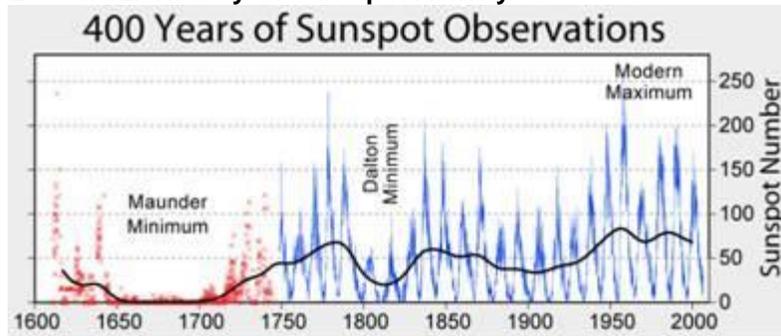
He did not expect as much of the winter to include extreme cold and ice and snow in the southern tier of the country

As Mr. Bastardi suggested, it was clear that by not focusing on sun spot activity his winter forecast was way off. The main miss was in not understanding that the heaviest snow and bitter cold would cover a much greater area of the United States. Also, he did not expect as much of the winter to include extreme cold and ice and snow in the southern tier of the country. But to Mr. Bastardi's credit, he is now looking much closer at sun spots and their impact on weather

Maybe we should be prepared for a number of years of colder and snowier winters in the Northern Hemisphere

patterns. Most importantly, he recognizes how historical weather patterns established during years with much more active sun spots may not work in periods of low sun spot activity. If we are firmly in the grasp of an 11-14 year period of low sun spot activity, then maybe we should be prepared for a number of years of colder and snowier winters in the Northern Hemisphere than we have had in many decades.

Exhibit 12. History Of Sun Spot Activity



Source: Robert A. Rohde, Global Warming Art, Wikimedia Commons

If we are headed into another ice age then one has to be concerned about some of the energy and climate change moves being forced by governments around the world

As we know, sun spot activity in the 24th cycle is at a very low level. In fact, it has been so low recently as to be almost non-existent. The last major period when sun spot activity was this low was in the Maunder Minimum period (1645-1710), which is known in climate circles as the "Little Ice Age." If we are headed into another ice age then one has to be concerned about some of the energy and climate change moves being forced by governments around the world. One of those moves is to push electric vehicles into the fleet mix without clearly establishing that these cars offer transportation solutions for only niche applications.

Test drivers of electric vehicles have established range loss of upwards of 30% during periods of cold weather

In the periods of bitter cold temperatures, electric vehicles may not be able to start because their batteries are compromised by the cold. There were numerous reports of electric vehicles in Midwest cities not able to be started during the most recent bout of bitter cold weather. If one could get his electric vehicle started, then he would find that the battery charge has been denigrated by the cold so that the vehicle cannot travel as far as it would in warmer weather. Test drivers of electric vehicles have established range loss of upwards of 30% during periods of cold weather. Now we must add cold-weather anxiety to the list of other driver concerns with electric vehicles.

Exhibit 13. Bikes Don't Offer Travel Solution In Winter Storms



Source: Associated Press

What should the owner of an electric vehicle living in areas of the United States socked by this winter's bad weather and cold temperatures do? He should consider switching to pedal power. Oops! They didn't help much in the latest winter storm.

Exhibit 14. Might Prayer Be Part Of Weather Forecasting?



Source: Associated Press

Maybe the minister who posted the above message on his church's sign has the best, and possibly the only hope for certain areas of the country

Maybe the minister who posted the above message on his church's sign has the best, and possibly the only hope for certain areas of the country. The fear people living in these areas have is that the historic weather patterns are changing and cold and snow will become the "new" norm after years of warmer and drier winters. What this winter is showing is that even by relocating south in the

United States people may not be able to avoid bitter cold and snowy weather. An interesting thought is what impact on our energy consumption patterns will come with an expanded change in winter weather patterns in the country.

China's Energy Shopping Spree Stops In Canada Again

PetroChina will buy a 50% interest in EnCana's assets located in the Montney area in western Canada for C\$5.4 billion

Last week EnCana Corp. (ECA-NYSE) announced a blockbuster deal with PetroChina Company Ltd. (PTR-NYSE) that will increase China's activity in the tight gas and gas shale region of western Canada. PetroChina will buy a 50% interest in EnCana's assets located in the Montney area in western Canada for C\$5.4 billion. The transaction involves EnCana's 635,000 acres in an area spanning the Alberta and British Columbia border, which contains approximately 255 million cubic feet a day of natural gas production (representing roughly 7.5% of EnCana's production) and an estimated one trillion cubic feet of proven natural gas reserves. The price to be paid by PetroChina was substantially above the equivalent value assigned by the stock market based upon EnCana's share price when the deal was announced. This suggests that EnCana's assets were being undervalued by investors and analysts. Some investment analysts are suggesting that this transaction may lead to an increase in the value investors place on other Canadian oil and gas assets, especially given that this transaction is happening when natural gas prices are at very low levels relative to long-term views about the appropriate economic value of these assets once they are developed.

The PetroChina investment represents another deal in the energy shopping spree China has been undertaking during the past year

The agreement means that EnCana and PetroChina will jointly own and develop the resources in this acreage block. Importantly, the PetroChina investment represents another deal in the energy shopping spree China has been undertaking during the past year. Estimates are that with this investment, Chinese energy companies have now spent \$46 billion in energy acquisitions worldwide since the start of 2010 with about a quarter of the deals in Canada.

China certainly could be looking to this LNG export terminal as a source of gas supply for its economy in the future

Why the energy shopping spree? Simply because China's economy will need substantial energy and other natural resources in order to meet its projected growth trend. China has taken a keen interest in the development of the Kitimat liquefied natural gas (LNG) terminal to be located on the west coast of British Columbia. The application seeking Canadian regulatory approval for the terminal's construction and its natural gas supply infrastructure investment is in the early stages of the approval process. China certainly could be looking to this LNG export terminal as a source of gas supply for its economy in the future. That would be consistent with the recent BP (BP-NYSE) energy outlook forecast that calls for China to overtake the United States as the largest global oil consumer within the next 20 years. *The Wall Street Journal* recently reported that China has begun to stockpile rare earth metals, which are important raw materials in the production of clean energy technologies,

At the present time, China has 10.8 GW of installed nuclear power generating capacity that is expected to grow to 80 GW by 2020

The reasons China is stockpiling rare earth metals is for use in its own growth in clean energy production and because the government wants the economy to become the global supplier of clean energy equipment

Gas shales do exist in China and are projected to play an important role in the country's future energy supply mix

demonstrating further evidence of the Chinese government's concern about having available adequate energy supplies for the future.

China's current energy and metals consumption is huge and growing. For example, last December, China imported 2,999 metric tons of uranium fuel, a ten-fold increase over the volume imported in December 2009. That import volume is likely to continue to increase if China fulfills its nuclear power growth initiative. At the present time, the country has 10.8 gigawatts (GW) of installed nuclear power generating capacity that is expected to grow to 80 GW by 2020. China is also currently the world's largest coal consumer using 3.2 billion metric tons per year to fuel the country's population of coal-fired power plants.

The reasons China is stockpiling rare earth metals is for use in its own growth in clean energy production and because the government wants the economy to become the global supplier of clean energy equipment. In addition, China has been embarked on a significant clean energy building effort for its own power needs and to meet global pressures for the country to reduce its greenhouse gas emissions. At the present time, China has 44 GW of installed wind power with plans to increase that to 248 GW by 2020. It expects to increase its hydroelectric power generating capacity from the current 214 GW of installed capacity to 449 GW in 2020. The biggest clean energy growth, however, will come in the solar energy sector where the country's installed capacity is projected to climb from 625 megawatts (MW) today to 17 GW in 2020. Despite that explosive growth, solar energy will still represent only a tiny portion of China's total energy supply. In order to capitalize on all this investment in new clean energy supplies, China anticipates investing \$1.7 trillion by 2020 according to the country's electricity council.

The bottom line is that given China's population and its need to grow its economy, the supply of energy and minerals will continue to be a concern to the government. Securing supplies of these resources around the world has formed a large part of the government's political and economic plan for a number of years. While Chinese companies have successfully invested in gas shale developments in the United States, these investments are in their early stages and were more likely made to gain knowledge of the technological issues with drilling and completing wells in this complex natural resource. Gas shales do exist in China and are projected to play an important role in the country's future energy supply mix. On the other hand, the energy and mineral investments in Canada and elsewhere around the world probably reflect assets that could find their way back to China in the future, especially natural gas in the form of LNG from Western Canada.

Will this natural resource spending spree ever end? As China strives to ensure it has sufficient resources for its economy to grow

The pace of the current shopping spree may slow somewhat in 2011 because the optimum market conditions for making deals probably have peaked

without knowing exactly how much that may be, we suspect its government will continue to promote strategic energy and mineral investments for many years into the future. The pace of the current shopping spree may slow somewhat in 2011 because the optimum market conditions for making deals probably have peaked, but we still expect to see China buying resources strategically. The pace will all be determined by how China views current energy and mineral prices relative to their view of what they may be in the future. The more concerned China is about the adequacy of future global supply, the more aggressive they will be in buying sooner rather than later.

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