
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

Oil Market Focus Short-term; Long-term Is More Important

Daily oil price fluctuations create immediate life or death scenarios for the future of the oil business

The oil market operates with a Jekyll and Hyde personality – on the one hand, daily oil price fluctuations create immediate life or death scenarios for the future of the oil business, a future that often seems not to extend much beyond the next week. Industry executives and investment analysts are often mesmerized by these fluctuations and whether the oil price is moving in the right direction – the one they had most recently predicted. If the price move is contrary, hands immediately become poised over Panic buttons waiting to see if the price move over the next 24 hours counters the prior day trend or if it confirms the move. Remember, it only takes two points to make a line, or a new forecast for that matter.

You should be looking at long-term trends that will either drive the need for fossil fuels or signal its future decline

If you are a newly minted college graduate pondering whether to join the oil industry or not, you would be forgiven if you questioned the rationale for your career decision being based on daily oil price fluctuations. Instead, you should be looking at long-term trends that will either drive the need for fossil fuels or signal its future decline. But just how good are long-term forecasts in the energy business? In most cases, not very good, especially since they are traditionally geared to predicting oil prices at some point in the future. Those forecasts are often made without providing meaningful economic and/or geopolitical assumptions or context, enabling readers to compare the assumptions against their own views.

While it is difficult to attribute much predictive value to daily oil price fluctuations other than to refer to them as “noise,” the barrage of media interpretations seems to assign them much greater importance. Who is not familiar with headlines such as “Oil Price Closes at Month Low” or “Oil Extends Six Day Losing Streak”? Are those observations helpful in understanding where oil prices will be next year or five years from now, or even next week? More

Do these fluctuations merely signal that companies should be monitoring trends to determine if they need to adjust strategies and operations?

important, how helpful are these comments on understanding what near-term oil price fluctuations mean to oil company business strategies. Does the daily volatility provide any insight into which companies might benefit due to their corporate strategy, or do these fluctuations merely signal that companies should be monitoring trends to determine if they need to adjust strategies and operations? In early 2015, everyone seemed to understand Robert Dudley's, CEO of BP plc (BP-NYSE), message when he said that the energy industry should prepare to live in a world dictated by "lower for longer." It was a signal that oil and oilfield service companies would be using axes rather than scalpels to reshape their companies.

Mr. Friedman lays out how his firm goes about making its forecasts, which challenges conventional views about geopolitical forecasting

For years, we have been reading George Friedman's forecasts and insights about the future of our geopolitical and economic world. We were introduced to him in the late 1990s when he founded a small geopolitical forecasting firm based in Austin, Texas, producing commentary and writing books explaining the broad trends that were shaping our world for next week, next month, next year, the next decade and even the next century. At some point his firm, *Stratfor*, became an important source of commentary about daily world events, as investors searched for insight into the significance of political events on future stock prices. Mr. Friedman and his wife, left *Stratfor* two years ago and formed *Geopolitical Futures (GPF)*, where he continues analyzing global economic and political developments and trends, putting them into context within his forecasts. On the *GPF* website, Mr. Friedman lays out how his firm goes about making its forecasts, which challenges conventional views about geopolitical forecasting. He writes:

"*Geopolitical Futures* is a publication dedicated to predicting the future course of the international system. In doing so, *Geopolitical Futures* challenges two assumptions. First, that political leaders decide what they will do and individual actions can't be predicted. Second, that there is no methodology for predicting non-quantitative events.

"Leaders come to conclusions based on the various pressures that are placed on them by the international system, as well as by internal political considerations"

"The fact is that political leaders' decisions are not individual decisions made independent of external factors or domestic circumstances. Leaders come to conclusions based on the various pressures that are placed on them by the international system, as well as by internal political considerations. Having been shaped by their struggle to attain power, they follow a rational course of action when in power and, therefore, their decisions are predictable.

"The second assumption, that non-quantitative forecasting is impossible, is untrue. Human beings make successful decisions daily based on non-quantitative models. The models are informal. *Geopolitical Futures* uses a formal methodology known as "Geopolitics," along with other methods, to model how the international system is working and will evolve over time."

This is the essence of separating “noise” from “trends”

At the heart of geopolitical forecasting is the ability to separate those events that truly matter in understanding the future from those that don't. This is the essence of separating “noise” from “trends.” In the oil market, it is the equivalent of divorcing daily price fluctuations from meaningful long-term developments. With this in mind, we recently reviewed Mr. Friedman's forecast for the world in 2040 along with his views about what we might expect in 2017. The former forecast offered interesting insights into the trends that he sees shaping the 2040 geopolitical and economic world. Unfortunately, these trends do not create a particularly favorable outlook for oil prices.

With that background, who would have predicted that 15 years later, in 1990, it would be our Cold War foe Russia whose country was collapsing while the United States economy was booming?

His 2040 forecast began with a recap of his perception of the future of the United States from the perspective starting in 1975. That year's searing photo image for our future was the picture of the last helicopter loaded with refugees lifting off the roof of the U.S. embassy in Saigon. The perception created by that photo was one of America's vulnerability and decline. That event occurred less than two years after the Arab oil embargo had wreaked havoc on the American economy, which subsequently had to deal with 9% annual inflation, an 8.5% unemployment rate, and 30-year home mortgages of 9% or more. This was also roughly a decade after the assassinations of John F. Kennedy, Martin Luther King and Robert Kennedy, which had prompted riots throughout the United States. It was also less than a year after Richard Nixon resigned the U.S. presidency in disgrace. With that background, who would have predicted that 15 years later, in 1990, it would be our Cold War foe Russia whose country was collapsing while the United States economy was booming?

How quickly all of those givens turned out to be wrong

The point, Mr. Friedman wrote, was: “Things that seem defining, even for a decade, can turn out to be ephemeral. However, most forecasting is linear. It assumes that what has happened for a decade will happen for another decade. Thus, it was expected that the Soviet lead in the space race would cause them to dominate in space; that Japan would overtake the United States economically; that the U.S. learned its lesson and would never again fight another war like Vietnam. And so on.” How quickly all of those givens turned out to be wrong. For investors and companies that based their strategies on those givens, much was lost.

Unlike previous global powers, North America and the United States are to a large degree self-sufficient

To quickly summarize Mr. Friedman's view of the international system that will shape the world between now and 2040, one must understand “the continued and intensifying instability of the Eastern Hemisphere and increasing stability in the Western Hemisphere.” The U.S. has become the “center of gravity” within the international system, as it accounts for almost 25% of the world's GDP, “controls the world's oceans and uses its economic and military power to attempt to shape events around the world.” Importantly, and unlike previous global powers, North America and the United States are to a large degree self-sufficient. That means that regardless of the

As Germany's export machine is weakening due to economic, political and demographic factors, its internal economy is at risk of destabilizing

attractions of international trade, this is not a requirement for the U.S. in order for it to sustain itself and prosper. That is a key precept since international trade plays a critical role in the current and future state of the other leading world powers – Russia and China – and how it factors into the outlook for the global oil business.

With respect to Europe, Mr. Friedman sees two fundamental weaknesses – the unwillingness of nations to yield their ultimate sovereignty to a supreme national state and the free trade system. The free trade issue divides into two parts – the fact that not all parties benefit equally from free trade and that the European Union free trade zone is based on a massive exporter, Germany, at its center. As Germany's export machine is weakening due to economic, political and demographic factors, its internal economy is at risk of destabilizing. We would ask, what role is Germany's aggressive revamping of its economy's power supply structure and the associated cost having on the economy's stability?

Both together – particularly the lack of clarity on how energy demand will rise, as these are not cyclical events – indicate an extended period of low prices

Further to the discussion of the challenges Russia faces, Mr. Friedman pointed out that “We have entered a unique period in the energy market, which will have significant implications for Russia. Of the three pillars of the global system – the U.S., Europe and China – two are in severe economic distress without any clear path to recover over the next few years. On the supply side, new technology has brought a substantial amount of oil and natural gas to the market. Either of these events could lower energy prices. Both together – particularly the lack of clarity on how energy demand will rise, as these are not cyclical events – indicate an extended period of low prices. By the 2040s, new emerging economies will be taking China's place, but the structural shift in every availability will likely constrain prices for an extended period of time and severely limit Russia's revenue flow.” That is one of the critical trends that Mr. Friedman sees undermining Russia's power in the world and that underlies the nation's current militaristic actions.

Since the early 2000s, the country has transitioned from a low-wage, high growth economy to a lower-growth, higher-wage economy

When discussing the maturing of China's economy, Mr. Friedman says that the key to understanding this trend is observing how, since the early 2000s, the country has transitioned from a low-wage, high growth economy to a lower-growth, higher-wage economy. That trend has created significant regional differences in economic wealth and political power, but it has also forced the central government to become much more active in directing economic activity. To keep the country from fracturing politically and socially, significant centralization of economic and political power has been required. That effort has resulted in the government keeping bankrupt companies afloat rather than allowing natural economic transitions to work. It has also led to crackdowns on “corruption” among the business, government and political sectors.

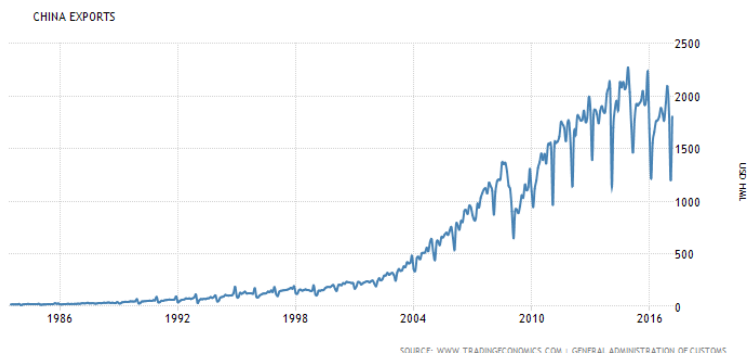
China’s economy has never fully recovered from that 2008 global crisis and has now been supplanted by other low-wage countries as the manufacturing hubs for the world

Since then, exports have moved progressively lower with each subsequent year’s peak export volume falling below the peak of the prior year

The shift in China’s economic future reached an inflection point in 2008, when China’s key trading partners were in financial crisis and the country’s global competitive wage advantage was evaporating. China’s economy has never fully recovered from that 2008 global crisis and has now been supplanted by other low-wage countries as the manufacturing hubs for the world. In fact, in a recent segment on CNBC, a Chinese student attending New York University discussed his undercover work last summer at a plant in China making iPhones for Apple (APPL-Nasdaq). According to this student, in his view, there is no way Apple could bring iPhone manufacturing back to the United States, as suggested by President Donald Trump, and remain competitive because it was structurally so much cheaper to manufacture the phones in China. In his discussion, the student pointed out that many of the tasks required to assemble the iPhone were performed by robots. His work station, which involved installing a screw into the phone’s case, for which he was paid \$450 a month for a 60-hour week, probably could just as easily be replaced by a robot, but the human labor was still cheaper for the time being. If more of the manufacturing process can be performed by robots, even with higher labor wages, China can still keep its total iPhone manufacturing cost below that of a new, highly-automated manufacturing plant in the U.S.

How does one measure the impact of this rising wage trend on the future economic health of China and its subsequent role in the international system? The impact of China’s rising wages is spelled out in one chart, but a different presentation of the similar data often causes analysts to miss the point. Exhibit 1 shows the growth of China’s export revenues since the early 1980s. After climbing sharply from the early 2000s until the 2008 financial crisis, China’s export revenues quickly rebounded after falling during the crisis and subsequent 2009 recession. Exports moved steadily higher until they peaked in 2014. Since then, exports have moved progressively lower with each subsequent year’s peak export volume falling below the peak of the prior year.

Exhibit 1. China Exports Are Now In Down Trend

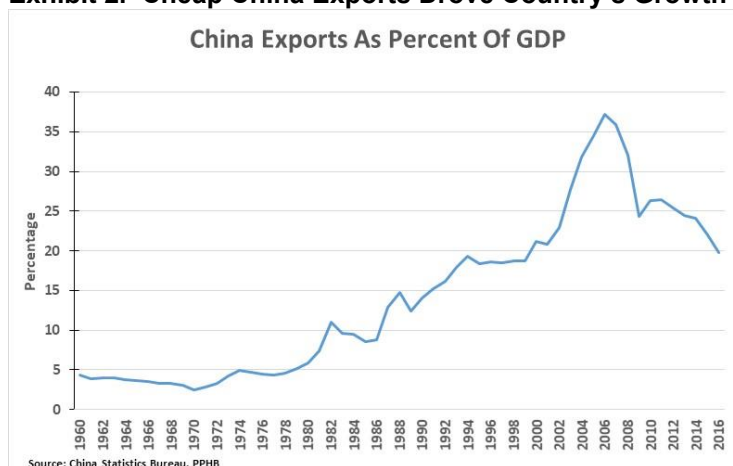


Source: *Trading Economics*

Mr. Friedman cites the impact of the 2008 global financial crisis for changing the course of China's economy and the country's role in the future international system

Although exports have slid, many analysts continue to focus on their high level relative to history. What is more telling in analyzing the role of exports in China's economic development is to consider its share of total GDP (Exhibit 2). Mr. Friedman cites the impact of the 2008 global financial crisis for changing the course of China's economy and the country's role in the future international system. He stated that this change came at the same time oil was reaching its 2008 peak. However, when the oil price is plotted against China's export percentage (Exhibit 3, next page), the oil price peak came slightly later than the peak export share of China's economy. One reason for the difference in timing is our use of annual oil price data.

Exhibit 2. Cheap China Exports Drove Country's Growth

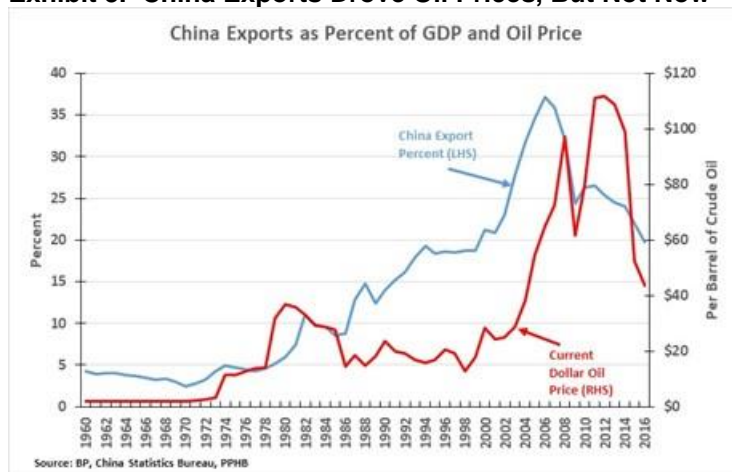


Source: China Statistics Bureau, PPHB

The export share decline has yet to bottom

Even though there was a lag between the peaking of the export percentage and the peak in oil prices (Exhibit 3, next page), the drop in the export share of the economy bottomed at about the same time oil prices did. As exports rose slightly after the 2009 recession, so did oil prices. However, oil prices continued soaring higher as China's export share peaked and started down. The export share decline has yet to bottom, but oil prices eventually peaked in 2014 and fell for the next two years before beginning to stabilize. Mr. Friedman suggests that the soaring oil prices were due to investors anticipating that China's export share would fully recover, returning to its previous peak before going higher.

Exhibit 3. China Exports Drove Oil Prices, But Not Now

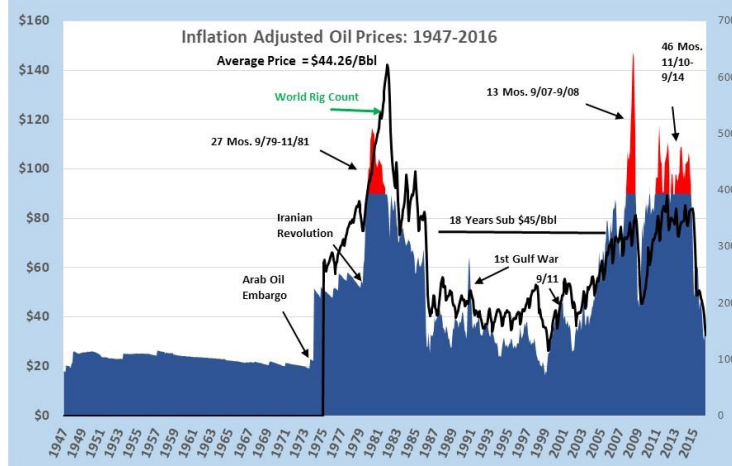


Source: BP, China Statistics Bureau, PPHB

What people failed to appreciate was how China’s economy was changing, from the low-wage driven one to an economy surviving on considerably higher wage-rates

Mr. Friedman’s explanation for why oil prices reached the \$100 a barrel level and returned there following the 2008 financial crisis and 2009 recession, was that people expected China’s export share percentage to rebound. What people failed to appreciate was how China’s economy was changing, from the low-wage driven one to an economy surviving on considerably higher wage-rates that spawned increased corruption, poverty and regionalism. Analysts were confusing the increases in absolute export volumes with a restoration of their importance in China’s economic growth and health.

Exhibit 4. Oil Embarking On Another Period Of Flat Pricing?



Source: Dow Jones, BLS, Baker Hughes, PPHB

After reading the full 26 pages of Mr. Friedman’s forecast and re-reading his conclusions about oil, we are reminded of the history of real oil prices and oilfield activity following the 1970s boom. That was the first time the world’s economy had experienced extremely

Does Mr. Friedman's geopolitically-driven forecast suggest we are entering the first phase of another extended period of low oil prices?

high oil prices (\$40 in current dollar terms, \$90-\$100 in real terms) such as we endured during the early 2000s and again in the 2010s. In between those two boom periods, we experienced an 18-year span of oil prices below \$45 a barrel, except for the brief events of the start of the 1st Gulf War and 9/11. For many months, oil prices failed to average above \$40 a barrel. Does Mr. Friedman's geopolitically-driven forecast suggest we are entering the first phase of another extended period of low oil prices, or at least oil prices well below those experienced during 2007-2014? It is this scenario that haunts us as we consider the future that energy executives and their companies must navigate. Do they understand this possibility? Can they navigate it? If so, what steps will they need to take to help their companies be successful?

Barack Obama, The Environmental President, Said What?

He then jumped into an SUV and headed to his hotel in a 14-vehicle caravan

Barack Obama, former President of the United States and an avowed environmentalist when he was in office, has recently returned to the public stage with several speeches. His most recent speech was at the third annual Seed & Chips Global Food Innovation Summit in Milan, Italy, which focused on how food innovation can save humanity from climate change. Mr. Obama flew in a private jet to Milan, where he was met by former Italian Prime Minister Matteo Renzi. He then jumped into an SUV and headed to his hotel in a 14-vehicle caravan. He attended a dinner that night hosted by the Institute for International Political Studies.

“For all the challenges we face, this is the one that will define the contours of this century more dramatically perhaps than any other”

At the conference the next day, Mr. Obama hosted a panel with the former Obama White House chef Sam Kass, along with also delivering a keynote speech that must have scared environmentalists more than they expected. In his opening remarks, Mr. Obama made the following claim about the significance of climate change. “For all the challenges we face, this is the one that will define the contours of this century more dramatically perhaps than any other,” he said. He then went on to blame climate change for everything from weather conditions in America, “where states are seeing floods on sunny days, where wildfire seasons are longer and more dangerous,” to the European Union's influx of migrants, which he claimed was caused not only by the conflict in Syria, but also by “food shortages that will get far worse as climate change continues.” He followed up this point later in his speech by stating that the impact of climate refugees on the European Union's political system is “just the beginning.” So far, his statements were consistent with the climate change theology.

What must be concerning to environmentalists was other statements Mr. Obama made about climate change and its impact. In fact, some of his comments are perfectly in alignment with climate skeptics' positions. Oh my!

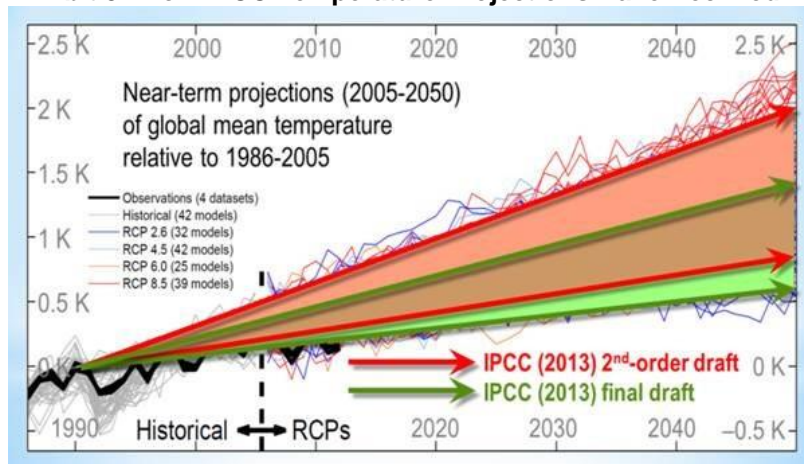
The 97% figure represents 7-tenths of 1% of all the scientists surveyed

Mr. Obama claimed that “Ninety-nine percent of scientists who study climate change carefully...will tell you that it is indisputable that the planet is getting warmer and the only real controversy is how much warmer will it get.” The initial part of his claim inflated the orthodoxy of global warmists and the statement prominently displayed on the climate change page of the National Aeronautical and Space Administration (NASA) web site stating: “Multiple studies published in peer-reviewed scientific journals show that 97 percent or more of actively publishing climate scientists agree: Climate-warming trends over the past century are extremely likely due to human activities.” The climate scientist number is derived from responses of scientists in a 2009 survey. The online survey was directed to 10,257 scientists, of which only 77 responded. Of those responses, 75 were in agreement with the “consensus” view that humans contribute to climate change. The ratio of 75/77 produced the 97% figure. The 97% figure represents 7-tenths of 1% of all the scientists surveyed.

Is Mr. Obama suggesting that these climate models may not be right?

The more scary point for environmentalists was Mr. Obama’s statement that “the only real controversy is how much warmer will it get.” This counters the climate change models that universally predict rapidly rising global temperatures due to the increase in carbon dioxide (CO₂) in the atmosphere. Is Mr. Obama suggesting that these climate models may not be right? Or possibly he has picked up on the modification of the potential range in global temperature changes by the scientific community that has lowered the future range.

Exhibit 5. How IPCC Temperature Projections Have Declined



Source: *Watts Up With That?*

In a column by climate skeptic Christopher Monckton of Benchley following the January 2014 release of the second draft of the Fifth Assessment Report by the International Panel on Climate Change (IPCC), he wrote: “Unnoticed, the IPCC has slashed its global-warming predictions, implicitly rejecting the models on which it once

Now we are talking about the temperature rise being just over 20% of Dr. Hanson's earlier prediction

so heavily and imprudently relied. In the second draft of the Fifth Assessment Report it had broadly agreed with the models that the world will warm by 0.4 to 1.0 C° from 2016-2035 against 1986-2005. But in the final draft it quietly cut the 30-year projection to 0.3-0.7 C°, saying the warming is more likely to be at the lower end of the range [equivalent to about 0.4 C° over 30 years]. If that rate continued till 2100, global warming this century could be as little as 1.3 C°." This was a significant change as it reflected one more ratcheting down of the projected temperature rise over the balance of this century. In June 1998, when Dr. James Hanson, then with the Goddard Institute for Space Studies, spoke to the U.S. Congress, he predicted that global temperatures would rise by 1 C° every 20 years till 2050, implying 6 C° rise by 2100. Now we are talking about the temperature rise being just over 20% of Dr. Hanson's earlier prediction.

High food prices, scarcity, and hunger are almost always the result of failed government and economic systems, not due to the methane emissions of cows.

There were some other facts about climate change that Mr. Obama got wrong in his talk. He blamed man-made climate change for making food production more difficult. "We've already seen shrinking yields and spiking food prices that in some cases are leading to political instability." However, outside of a handful of countries, including Venezuela and North Korea, this is not the case. Crop yields across all major crops worldwide continue to rise. High food prices, scarcity, and hunger are almost always the result of failed government and economic systems, not due to the methane emissions of cows.

It will be interesting to see how the environmentalists explain the logic of Mr. Obama's conflicting positions

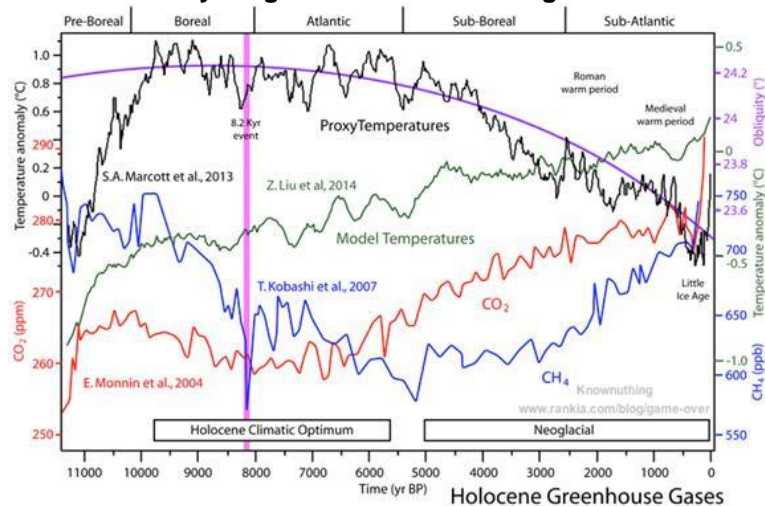
At the same time, Mr. Obama also appeared unsure of his own message. While claiming climate change is making producing food difficult, he also stated that producing food is also a major cause of climate change. He said, "Food production is the second-leading driver of GHG [greenhouse gas] emissions . . . and if we don't change course, the World Bank predicts that by 2050, agriculture and land use change may account for as much as 70 percent of global GHG emissions." It's difficult to rationalize why we aren't raising enough food due to climate change while at the same time making all this food is causing climate change. It will be interesting to see how the environmentalists explain the logic of Mr. Obama's conflicting positions.

Given Mr. Obama's comments, one has to wonder whether he has actually been a closet climate denier

Mr. Obama also shocked his environmental supporters when he acknowledged that if global temperatures only rise by a degree or two, "we can manage." What? That observation flies in the face of climate change theology that preaches that even a few degrees rise in global temperatures over the next 80 years will lead to the planet's demise. Given Mr. Obama's comments, one has to wonder whether he has actually been a closet climate denier. The points in his speech are consistent with what respected climate change skeptics have been saying for years, while being derided and attacked for holding these views that we now know seem to align with those of the Environmental President.

Andy May, a writer for the climate web site *Watts Up With That*, presented a chart showing global temperature proxies, climate change model temperature forecasts, and the key factors driving climate change prepared by Javier in an extensive report on the site. The chart (Exhibit 6) shows global temperatures inferred from various proxies such as tree rings and other recognized measures, carbon dioxide and methane concentrations measured from ice cores, and temperatures predicted by climate alarmists' models covering the Holocene period, 11,500 years since the Ice Age.

Exhibit 6. Everything About Climate Change In One Chart



Source: *Watts Up With That?*

“for the Holocene, neither CO2 nor the computer models are predictive of temperature”

According to Mr. May, “For the Neoglacial Period, temperatures go down, but the computer model temperatures go up, so does the carbon dioxide level. Quite obviously, for the Holocene, neither CO2 nor the computer models are predictive of temperature.” This chart, with the track of rising climate change drivers yet falling temperatures, is referred to as the Holocene Conundrum. Will Mr. Obama no longer be lauded as the Environmental President, or does he just need a ‘re-education’ session?

Houston To Rhode Island – Our Fastest Trip Ever!

At 6:15 am we were sailing on I-10 at 65 miles per hour heading into downtown Houston

A week ago Friday dawned bright and sunny in Houston. In fact, we were blinded for much of the morning by the lack of clouds and the bright sun as we drove eastward towards New Orleans. Besides being a beautiful day, it must have been one of those Friday’s when oil companies and others give their employees the day off. Why did we think that? Maybe because at 6:15 am we were sailing on I-10 at 65 miles per hour heading into downtown Houston. There was no significant morning rush traffic, but maybe we were experiencing normal traffic following the oil industry downturn since we don’t work downtown anymore, so have no basis to measure against.

As we headed north in Mississippi, the clouds were ahead of us and then over us

Weather and traffic dominated our trip. On the weather front, readers may remember that the prior couple of days had seen heavy rain move through the Houston area heading east. Traffic, on the other hand, was generally light, which may have accentuated our view of the volume of truck traffic we encountered, heading in both directions. More about the truck traffic later, but the weather proved interesting.

All the way to Slidell, Louisiana and our turn north on I-59, the sun was shining and temperatures warmed as the morning went on. As we headed north in Mississippi, the clouds were ahead of us and then over us. Temperatures dropped and the wind picked up buffeting us around. At various points in Mississippi, Alabama and Tennessee we were caught in rain. Fortunately, most of the rain showers were not heavy, just bad enough to make driving less fun but fortunately not dangerous. We did feel out of place when we were filling up the car and stopping to eat while wearing shorts and a short-sleeve shirt. We elected not to dive into our luggage given we spent most of the time in our comfortable vehicle.

There were no busses or travel trailers visible, so we concluded that the crowd was mostly locals along with some travelers

Speaking of eating, we had to wait 20 minutes for a table at the Cracker Barrel in Fort Payne, Alabama. There were no busses or travel trailers visible, so we concluded that the crowd was mostly locals along with some travelers. What we couldn't tell was whether there was a shortage of help that forced the rationing of tables, as there were a number of people shopping in the restaurant and sitting outside waiting when we arrived. Upon being seated, we noticed a number of unoccupied tables. As we were leaving the restaurant, we heard calls for a party of 12 and another for a party of eight confirming our view of the preponderance of local dinners, especially since it was a Friday evening.

Food items we often order at McDonald's were nowhere to be seen

As many of our loyal readers know, we usually stop at McDonald's for lunch because it is quick, the food is consistent and the restaurants are conveniently close to the highway. McDonald's recently has introduced a new menu called Custom Burgers where you select the meat, toppings and bun. This is obviously in response to the increased competition from proliferating premium hamburger chains. We had been introduced to this new menu at two McDonald's we recently visited in Houston. In those restaurants, we were still able to order items off their extensive menu options. At the two McDonald's we visited on our trip – one in Hattiesburg, Mississippi and the other in Lexington, Virginia – the new menu choices seem to have led to a shrinking of the rest of the menu. Food items we often order at McDonald's were nowhere to be seen. We don't know if this is deliberate or whether it was the choice of those particular McDonald's. Since we had stopped at one of them last year, we don't remember the menu having fewer than the normal menu choices. Is this McDonald's answer to hamburger competition?

The truck traffic was the heaviest we have seen in recent trips between Houston and Rhode Island

In contrast to previous trips, there was more of a police presence this time. Most of them were either attending to accidents, writing traffic tickets or policing highway construction areas. In 1,900 miles we only saw two police cars sitting and monitoring vehicle speeds.

The truck traffic was the heaviest we have seen in recent trips between Houston and Rhode Island. We wondered whether what we saw on that Friday was merely a reflection of the end of the week and truck drivers rushing to get home for the weekend. When Saturday's truck traffic continued to be heavy, although not as heavy as Friday's, it was evident there was more economic activity behind the trucks we saw on the road. Another truck observation from Friday was a number of caravans of empty car-hauling trucks heading west toward Houston. Our first thought was that they were heading to the Houston port to pick up new cars to deliver along the Gulf Coast. Later we thought they might have been heading to Houston to pick up rental cars to be returned to outlets elsewhere that were borrowed for the Offshore Technology Conference that had just finished in Houston. We know that used to be the case that rental car companies imported additional vehicles during the show, but then again we saw where attendance was only 65,000 people, marking a third consecutive yearly decline. We thought about the rental car angle after passing a number of car-carriers hauling cars north. All the cars had license plates from southern states, so they might be rental cars heading north, following the Snow Bird migration just now beginning. It is also possible that the trucks were hauling cars north for people who didn't want to drive them as they took trains or planes to their destinations.

Amazingly, it looked like the truck stop was holding a sale on fuel as every one of the 18 fuel pump islands had a truck at it and there was a nearly full row of trucks behind waiting to get to the pumps

With the heavy truck traffic, we wondered whether they were all working for Amazon Prime. Don't know whether you have paid attention but job growth within the transportation sector is at a high level. What we did find interesting about truck traffic was the several road signs on I-75 in Tennessee providing truck parking information. The signs had an electronic portion designed to show the number of empty spaces at overnight truck parking locations at miles 23 and 45 on the highway. None of the signs were working! But when we passed the truck parking locations between 9:30 pm and 10 pm, they were not full. In fact, we didn't see any trucks parked on the entrance or exit ramps at rest areas or at highway exits that evening. The next morning, we passed a truck stop outside of Knoxville, Tennessee where there was an absolute sea of parked trucks. Amazingly, it looked like the truck stop was holding a sale on fuel as every one of the 18 fuel pump islands had a truck at it and there was a nearly full row of trucks behind waiting to get to the pumps. Later, we observed that most of the truck stops and rest areas we passed were heavily populated with parked tractor trailers. All of this truck traffic suggests that the economy is healthy, which in some ways contradicts certain government economic statistics, but also confirms other data.

I'd like to think that it had more do to the lack of construction and congestion delays than driving fast

In Virginia, there were highway signs saying, "Above 80 mph is reckless driving; Fines higher." Although the official highway speed is 70 miles per hour along I-81, the sign seems to ok driving up to 80 mph, at least that's what others believed. It wasn't until Sunday after we were at our home that I told my wife that sometimes when we were caught up the train of traffic in the speed lanes on I-81 or I-75, we were hitting 90 mph, a speed at which I was uncomfortable so I would move out of the line. That may have explained why this drive was the quickest ever. I'd like to think that it had more do to the lack of construction and congestion delays than driving fast. Fortunately, all the construction and accident delays we saw were on the other side of the highway. In this trip we seldom slowed down except for our scheduled stops. Based on what we observed, the U.S. economy appears to be following a similar pattern, much better than experienced in recent years.

How And Why Did 5-handle On WTI Oil Prices Disappear?

The CME trading day began with the June 17 Oil Futures Contract at \$47.82 and closed at \$45.52, down only 4.8%, after having fallen to the trading day's low price of \$45.29 a barrel, a decline of 5.3%

It happened with breath-taking speed. From above \$50 a barrel, West Texas Intermediate (WTI) oil prices seemed to collapse in a matter of days, although it actually took a couple of weeks, into the mid-\$40s a barrel range. On Thursday, May 4th, nearly two weeks ago, oil futures dropped by slightly over 5% to \$45.52 a barrel. However, it was as oil prices were dropping like a rock in the early afternoon that people were shaken. What was going on? The chart of the trading of oil futures (Exhibit 7, next page) during that Thursday demonstrates how the price collapsed – in downward steps. It is important to understand that most analysts focus on the futures trading during the hours the Chicago Mercantile Exchange (CME-Nasdaq) is open for business. The CME trading day began with the June 17 Oil Futures Contract at \$47.82 and closed at \$45.52, down only 4.8%, after having fallen to the trading day's low price of \$45.29 a barrel, a decline of 5.3%. That trading action is shown within the red circle.

When the oil price broke through the \$45.50 a barrel price, which had been identified as a technical support level, oil prices dropped precipitously, falling nearly straight down to \$43.76 a barrel before rebounding

Because oil is a global commodity, it trades all day both on and off exchanges around the world. After the CME trading session, the track of oil futures trading prices during the remainder of May 4th and the early morning hours of May 5th is shown within the blue circle on the chart. It shows that when the oil price broke through the \$45.50 a barrel price, which had been identified as a technical support level, oil prices dropped precipitously, falling nearly straight down to \$43.76 a barrel before rebounding. By the time the CME opened for trading on May 5th, the price had climbed above the May 4th close and then, after retesting lower price levels, the futures contract price rose to close the May 5th CME trading session at \$46.22 a barrel. The price action for the futures during that May 4-5 overnight trading session reflected serious concerns among oil traders about the health of the oil market. Some of that concern was related to technical trading patterns, which were triggered by the violation of the \$45.50 price support level, leading traders to expect oil prices to

eventually drop to the next technical support level of \$42 a barrel. Optimism among oil traders returned to the market, causing the price reversal from the overnight low. But as trading on May 5th demonstrated, not everyone was convinced that oil prices might not drop into the low \$40s before a new trading pattern was established.

Exhibit 7. Oil Futures Trading During Price Crash



Source: CME, PPHB

With U.S. oil production rebounding to a new high of 9.3 mmb/d, and with forecasts for further gains in 2018, the weight of market sentiment began shifting against a meaningful recovery in oil prices

Saudi Arabia's energy minister, Khalid Al-Falih, speaking at an energy conference, stated that his country and his OPEC fellow members would do "whatever it takes" to rebalance the oil market

So what should we make of the health of the oil market? To listen to the analysts who are explaining what happened on May 4th and since, they see the market suffering from a cold. Analysts are pointing to the fact that OPEC and its non-OPEC supporters have failed to cure the oil market oversupply as rapidly as was expected. With U.S. oil production rebounding to a new high of 9.3 million barrels a day (mmb/d), and with forecasts for further gains in 2018, the weight of market sentiment began shifting against a meaningful recovery in oil prices. U.S. and other non-OPEC oil production growth is blunting the market's gain from the OPEC/non-OPEC production cut of 1.8 mmb/d. Just when might the global oil market reach supply and demand balance?

One explanation for the May 4th oil price drop was the comments from various OPEC producers who said that they would not increase their 2016 agreed-to production cut volumes for 2017 when the organization meets on May 25th. Confusing the market were the statements by these same OPEC members that they were amenable to extending the cut to the end of 2017, and possibly into 2018. Saudi Arabia's energy minister, Khalid Al-Falih, speaking at an energy conference, stated that his country and his OPEC fellow members would do "whatever it takes" to rebalance the oil market. In the last few days, the monthly OPEC Bulletin reported further production cuts helping restore a degree of optimism about the market's rebalancing.

What analysts should have concluded by now is that attempting to read the body language of people dressed in robes is impossible to do with any degree of success

All the focus on commentary from OPEC oil ministers and the weekly inventory, supply and demand data was overwhelmed by the highlights from an interview with Saudi Arabia Deputy Crown Prince Mohammed bin Salman (MBS) and five reporters from Bloomberg

The headlines also helped explain King Salman's willingness earlier to reverse the salary and benefit cuts for ministers and to grant salary bumps for the military and air force pilots

While most analysts continue monitoring production volumes within and without OPEC and how much oil is being consumed daily, they are also trying to read the body language of OPEC oil ministers about what they may do with the production cut agreement when they meet in late May. What analysts should have concluded by now is that attempting to read the body language of people dressed in robes is impossible to do with any degree of success. That's why they all missed the 2014 price support abandonment decision by Saudi Arabia, as well as missing the forecast for a production cut decision to be reached in early 2016. After going zero for two, they then missed Saudi Arabia's decision to reverse its market share strategy that had led to the country boosting output to all-time highs in 2015 and 2016.

One of the more interesting explanations for what happened to oil prices during the week of May 1st, when they declined 6.3%, was how traders, analysts and trading algorithms viewed the causes of the sharp drops during different days of that week. All the focus on commentary from OPEC oil ministers and the weekly inventory, supply and demand data was overwhelmed by the highlights from an interview with Saudi Arabia Deputy Crown Prince Mohammed bin Salman (MBS) and five reporters from *Bloomberg*. The interview was scheduled to be shown on local television on Tuesday evening, which was Tuesday afternoon in the United States. Those highlights drove oil prices lower during the afternoon of May 2nd, but they also established a negative backdrop that colored oil trading for the rest of the week.

The headlines included:

- SAUDI PRINCE: SAUDI BUDGET DEFICIT NARROWED MORE THAN EXPECTED
- SAUDI PRINCE: SAUDI ECONOMY AVOIDED RECESSION
- SAUDI PRINCE: NON-OIL REVENUE IN 1Q EXCEEDED EXPECTATIONS
- SAUDI PRINCE: DEBT WON'T EXCEED 30% OF GDP
- SAUDI PRINCE: RAISING DEBT ALLOWS GOVERNMENT TO SPEND

The analysts' takeaways were that the Saudi Arabian economy was healthier than many thought, thus pressure for the country to lead the OPEC charge to substantially higher oil prices was soon dissipated. The headlines also helped explain King Salman's willingness earlier to reverse the salary and benefit cuts for ministers and to grant salary bumps for the military and air force pilots. With the shrinking budget deficit and the ability of the kingdom to tap global debt markets twice in the last six months, the government felt comfortable it could increase spending without necessarily needing higher oil prices. Further comfort in its spending decision was provided by the point about non-oil revenue in the first quarter

The shifting economic condition in Saudi Arabia is a long-term dynamic at work within the global oil market

exceeding the government's expectation. That latter point is important and helps explain why MBS says that Saudi Arabia's debt will not exceed 30% of GDP. This is in contrast to many countries where total government debt equals or exceeds the country's GDP. The shifting economic condition in Saudi Arabia is a long-term dynamic at work within the global oil market, and requires that analysts reassess their view of the kingdom's strategy toward higher oil prices in the future. The last pillar supporting the significantly higher oil price forecast is the requirement for a favorable oil price backdrop in order to launch the initial public offering of Saudi Aramco, the state oil company.

A key driver over the next few weeks will be people trying to guess the outcome from the May 25th OPEC meeting, but the outcome seems preordained

Crude oil prices are likely to remain highly volatile in the near-term as the shoulder months for oil demand and the restarting of refineries from the heating oil to gasoline turnarounds is creating inventory fluctuations. Many of these inventory fluctuations are not being accurately captured in the average analysts' weekly inventory change forecasts, setting the oil market up for weekly surprises between the data and estimates. A key driver over the next few weeks will be people trying to guess the outcome from the May 25th OPEC meeting, but the outcome seems preordained. A negative surprise will be if the OPEC members fail to extend the production cut agreement as assumed by conventional wisdom. A positive surprise might be an increase in the production cut volumes, or an extension of the production cut agreement into 2018. Either or both of those actions will likely be viewed skeptically as greater volumes and longer time horizons create an environment that encourages increased cheating by OPEC members. If there has been a surprise from the current production cut it is the high compliance by the OPEC member countries. Is that a reflection of desperation or a true commitment to greater output discipline?

Anti-Fossil Fuel Groups Resort To Pressure On Lenders

It worked well when the U.S. government was ruled by a sympathetic Obama administration

Protests against the construction of new long-haul pipelines to bring oil sands and other crude oils from their remote locations to the refinery centers of North America has become a well-established technique of the environmental movement. It worked well when the U.S. government was ruled by a sympathetic Obama administration. The election of Donald J. Trump as U.S. President has changed that dynamic as his administration moved quickly to issue a construction permit for the long-delayed and rejected Keystone XL Pipeline and it ordered the Corps of Engineers to issue the previously suspended permits to enable the completion of the Dakota Access Pipeline.

Now that physical protests and rallies are ineffectual in derailing pipeline projects, the anti-fossil fuel movement is being forced to resort to pressuring financial institutions to withhold loans necessary for building those hated pipelines. This is an advancement of the groups' earlier efforts to convince pension funds and endowments, especially those associated with governments and universities, to

More than 700 large investors have committed to cutting their exposure to fossil fuels in recent years

The larger issue, however, is what it will cost to transition to another fuel source as well as how much the fossil fuel divestment effort will cost the investment funds in future returns

divest any investments that depend on fossil fuels and commit to not making new investments.

According to data from 350.org, a leader in the campaign to convince institutional investors to divest their fossil fuel investments, more than 700 large investors have committed to cutting their exposure to fossil fuels in recent years. According to Tarek Soliman, senior analyst at the Carbon Disclosure Project, an organization that compiles research for institutions that collectively oversee investments of \$100 trillion, “Investors are increasingly viewing the prospect of sterner climate change policy and fast growth in clean energy deployment as material business risks for incumbent fossil fuel companies, and therefore something that needs addressing in their investment portfolios.”

The environmental movement is focused on the rapid growth in renewable energy investments along with the Paris climate agreement as signals that the age of fossil fuels is coming to a rapid end. We are not sure about the concept of a “rapid end” to fossil fuels as we are still using wood and charcoal for energy, which were the original fuels when fire was discovered. The larger issue, however, is what it will cost to transition to another fuel source as well as how much the fossil fuel divestment effort will cost the investment funds in future returns. A 2016 study by Hendrik Bessembinder, a finance professor at Arizona State University, calculated that university funds that pulled out of fossil fuels would lose about two to 12% of their endowment value over a 20-year period.

Exhibit 8. Climate Activists Protest Chase Energy Loans



Source: Sarah Bernard, *Seattle Weekly*

With a successful divestment program underway, the environmental movement is now figuring how to increase its leverage against fossil fuel projects. The effort is focused on disrupting commercial banks that lend to the infrastructure project owners. The most recent

According to an article in the *Seattle Weekly*, “the branch manager and other employees watched the scene politely for ten or fifteen minutes, their faces remarkably blank (one teller appeared bored)”

action was by a group of activists who tried to disrupt banking operations at between 10-20 branches of JP Morgan Chase (JPM-NYSE) in Seattle. The cause being protested was the bank's willingness to loan funds to TransCanada Corp. (TRP-NYSE) for building the Keystone XL Pipeline.

Previously, the anti-fossil fuel group 350.org helped organize groups (the “Keep It in the Ground” movement) to oppose bank lending for energy projects relying on or promoting the use of fossil fuels. Previously, a protest in Seattle centered on a single downtown Wells Fargo (WFC-NYSE) branch, but not targeting branches citywide. The Chase protest was the next step in the activist program. The protest began outside the branch before moving inside. According to an article in the *Seattle Weekly*, “the branch manager and other employees watched the scene politely for ten or fifteen minutes, their faces remarkably blank (one teller appeared bored).” I’m sure that was not the response the activists anticipated or desired. Maybe some people are more interested in doing their job rather than becoming activists. Given the large volume of capital available and wanting to invest in the energy sector, pressuring commercial banks may not be particularly successful in defeating new pipeline projects as there are many other sources of capital eager to earn healthy returns on these fossil fuel investments.

Where Did All That Carbon Dioxide Go? Into The Plants.

Plants are converting 31% more carbon dioxide into organic matter than they were before the Industrial Revolution

A recent report in *Nature* magazine concludes that over the last century, plants have been growing at a rate far faster than at any other time in the last 54,000 years. The report says that plants are converting 31% more carbon dioxide into organic matter than they were before the Industrial Revolution. Does this conclusion undercut the potential damage from all the carbon being injected into the atmosphere that has resulted from humans? According to the author of the study, the carbon in the extra plant growth amounts to 28 billion tons a year, or an amount estimated to be three times the volume of carbon stored in all the crops harvested worldwide every year.

As a result, the level of carbonyl sulfide in the air drops as plants grow

Dr. J. Elliott Campbell of the University of California, Merced was the leader of the study that focused on the impact of carbonyl sulfide levels worldwide. Carbonyl sulfide is a molecule made up of a carbon atom, a sulfur atom and an oxygen atom. It is present only in a few hundred parts per trillion in the atmosphere, which is about a million times lower than the concentration of carbon dioxide. However, plants draw in carbonyl sulfide along with carbon dioxide, but as soon as it enters plants, they destroy it. As a result, the level of carbonyl sulfide in the air drops as plants grow.

By studying the ice in Antarctica, it is possible to trace the global concentrations of carbonyl sulfide over time. Over the course of several thousand years after the end of the ice age, the gas dropped

Although photosynthesis increased since the end of the ice age, the current rate is 136 times as fast

as glaciers retreated and new land was uncovered allowing plants to spring up destroying the carbonyl sulfide.

According to Dr. Campbell, "The pace of change in photosynthesis is unprecedented in the 54,000-year record." He pointed out that although photosynthesis increased since the end of the ice age, the current rate is 136 times as fast. With all the extra carbon dioxide going into plants, there has been less in the air to contribute to global warming, meaning that the warming experienced so far could have been much greater without this phenomenon. Dr. Campbell and his team obviously didn't expect the outcome of their study, therefore he had to rationalize the conclusion. He stated, "I've been referring to this as a carbon bubble. You can see ecosystems storing more carbon for the next 50 years, but at some point you hit a breaking point." In other words, this is a temporary phenomenon. Maybe or maybe not. Of course, to not believe it is a bubble means you have to acknowledge how much about climate change the scientific community doesn't know.

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