
MUSINGS FROM THE OIL PATCH

October 15, 2013

Allen Brooks
Managing Director

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

Ol' Man Natural Gas Just Keeps Rollin' Along

The initial production estimate of Lower 48 gross gas production for July showed a 0.54 Bcf/d increase from the revised monthly figure for June

The latest Form 914 report of estimated natural gas production was released at the start of October by the Energy Information Administration (EIA). The data was for July and was consistent with the pattern of a two-month lag in reporting production figures. The initial production estimate of Lower 48 gross gas production for July showed a 0.54 billion cubic feet a day (Bcf/d) increase from the revised monthly figure for June. If we exclude the production gains from the Gulf of Mexico, 80% of the monthly increase came from onshore Lower 48 basins.

The lyrics from the opening stanza reflect some of our questions about the domestic natural gas market

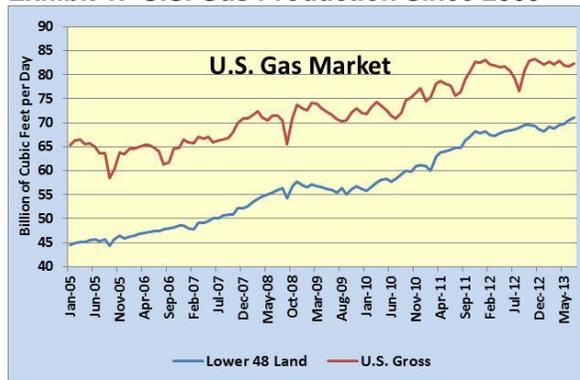
Reading about another monthly gas production increase made us think of the highlight song, Ol' Man River, (music by Jerome Kern and lyrics by Oscar Hammerstein) from the 1927 Broadway musical, *Show Boat*. The song is sung from the point of view of a black dock worker on a showboat traveling the Mississippi River. The song highlights the challenges of his life. The lyrics from the opening stanza reflect some of our questions about the domestic natural gas market.

Ol' man river,
Dat ol' man river
He mus'know sumpin'
But don't say nuthin',
He jes'keeps rollin'
He keeps on rollin' along.

If you interchange the word "gas market" for "river" you begin to get the drift. The gas market must know something, but it doesn't say anything about what is happening. The gas market just keeps rolling along boosting production, but no one is exactly sure where it is all coming from or why it keeps coming. Haven't we cut back gas

drilling? Aren't we focused on all those liquids-rich plays and oil plays, which admittedly have associated gas production? Is it really possible that all that associated gas is the reason the natural gas market lingers in the doldrums of pricing expectations?

Exhibit 1. U.S. Gas Production Since 2005

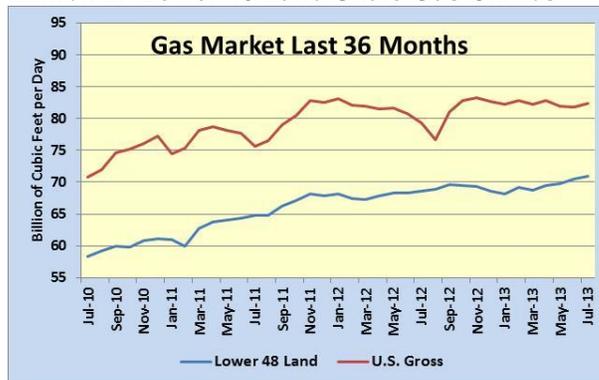


Source: EIA, PPHB

The steady upward trend in Lower 48 production reflects the impact of the American shale revolution – both the growth in dry natural gas production and the increase in associated gas output

Exhibit 1 shows the long-term history of the domestic natural gas market from the beginning of the EIA’s reporting of monthly production from its Form 914 surveys of state oil and gas regulatory agencies and estimates for those states that only report production periodically. We have presented the revised monthly data for the total U.S. natural gas market and the Lower 48 land market, but the latest data point is the initial estimate. The differences between the two data series reflect gas production from Alaska and the Gulf of Mexico. What is evident about the two lines is the narrowing that has occurred in the past several years as the Gulf of Mexico was impacted by the Macondo accident and low gas prices coupled with gas production declines in Alaska. The steady upward trend in Lower 48 production reflects the impact of the American shale revolution – both the growth in dry natural gas production and the increase in associated gas output when the revolution shifted its focus to liquids-rich gas and crude oil plays.

Exhibit 2. Lower 48 Land Shale Gas Climbs



Source: EIA, PPHB

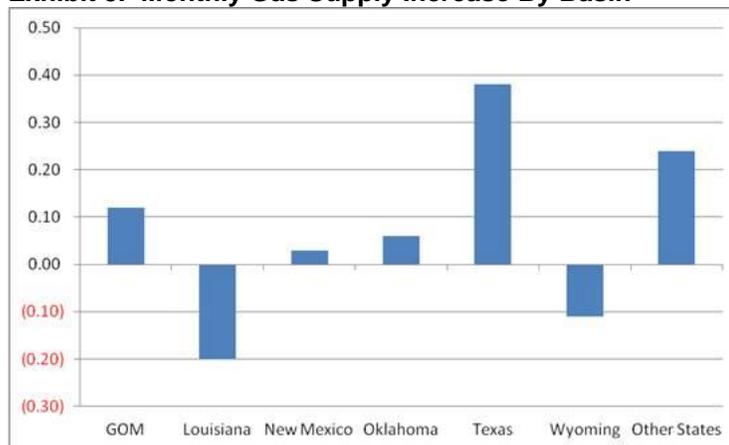
Between November 2012 and July 2013, Lower 48 land gas production increased by a tad over 1.0 Bcf/d

If we focus on the development of the natural gas market over the past 36 months, we can see even more clearly the narrowing between total U.S. gas production and the output coming just from the Lower 48 land market. If we look at the data for total U.S. gas production, while it increased in the most recent month, output remains below the record level attained in November 2012. Over that period, total gas output fell by 0.9 Bcf/d. In contrast, between November 2012 and July 2013, Lower 48 land gas production increased by a tad over 1.0 Bcf/d. The Lower 48 land gas market has experienced four consecutive monthly increases, bringing gas output above the prior peak achieved last fall. It is this continuing relentless increase in natural gas production that is holding back any meaningful increase in gas prices, and in turn improved profitability for exploration and production companies.

The production gains in July came primarily from Texas and the Other States category, which is largely Marcellus output from Pennsylvania

So just where is all this gas coming from? An examination of the EIA's Form 914 data shows that the production gains in July came primarily from Texas and the Other States category, which is largely Marcellus output from Pennsylvania. The source of most of the gains in Texas production is the Eagle Ford shale formation in South Texas where substantial associated gas is being produced. The strength of output from these two basins overcame meaningful production declines in Louisiana and Wyoming.

Exhibit 3. Monthly Gas Supply Increase By Basin

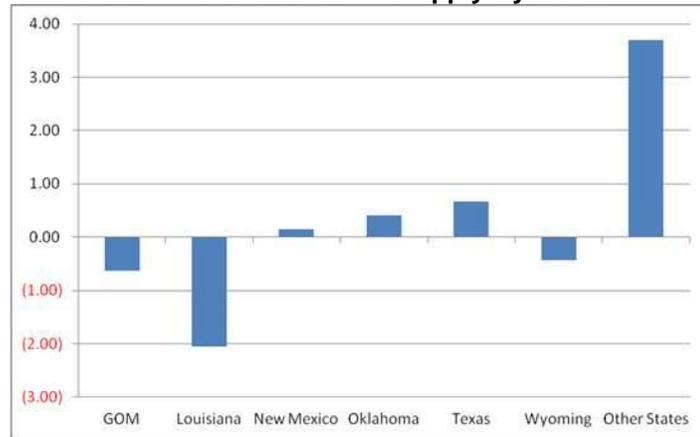


Source: Simmons & Co.

Over the past year, it has been the Marcellus (Pennsylvania), Texas and Oklahoma volume increases that have offset the declines in Louisiana and Wyoming

If we look at the sources of incremental natural gas production over the past year, we see that it has been the Marcellus (Pennsylvania), Texas and Oklahoma volume increases that have offset the declines in Louisiana and Wyoming. An examination of the sources of both the monthly and yearly changes in gas production highlights the importance of the Marcellus, Eagle Ford and Permian/Granite Wash plays for the industry. We cannot ignore the reality that the high production decline rates for gas shale wells means that even those basins exhibiting stable output must continue active drilling programs in order to sustain output levels.

Exhibit 4. Year Over Year Gas Supply By Basin

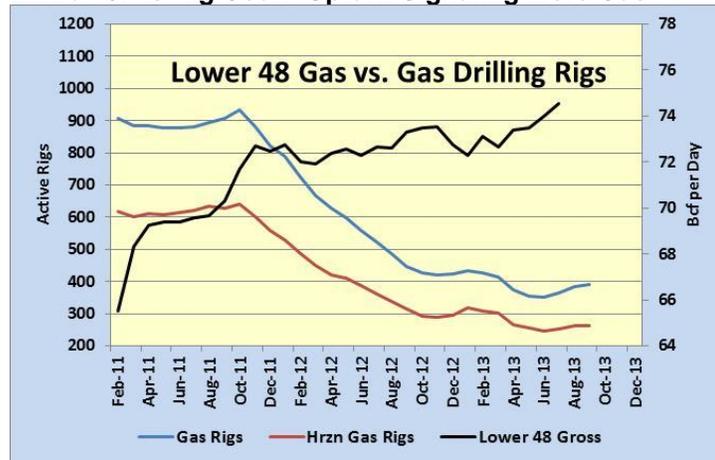


Source: Simmons & Co.

The continuing rise in natural gas production has been driven by increased drilling productivity and well efficiency

With the decline in gas-oriented drilling over the past few years in response to low gas prices and high crude oil prices, the continuing rise in natural gas production has been driven by increased drilling productivity and well efficiency. The harnessing of these technologies can be clearly observed in Exhibit 5 where we have plotted Lower 48 gross gas production against the count of total gas-oriented drilling rigs and horizontal gas-oriented rigs. The data for the horizontal gas rigs is only available since February 2011, but the trend in active rigs between then and now is clear.

Exhibit 5. Is Rig Count Upturn Signaling More Gas?



Source: EIA, Baker Hughes, PPHB

The rig counts bottomed out in June and have increased in each subsequent month

The trend in active drilling rigs may have some significant implications for future Lower 48 gas output. The gas production data is only through July while the two rig data series go through September. The rig counts bottomed out in June and have increased in each subsequent month (the horizontal rig count was flat in September with August) suggesting that the recent rise in gas

An early and severe winter would ease the downward pressure on gas prices next spring as substantial storage volumes would need to be replaced

production may become a new trend. If the increase in the rig count is foreshadowing greater future gas production, we need to focus on whether natural gas demand will rise to absorb the increased output or if the industry is headed toward lower gas prices once winter is over? In the intermediate term, the onset of winter weather in the western states and predictions of an early and cold winter will provide near-term support for gas prices. The latest gas data shows that the volume in storage is 55 billion cubic feet (Bcf) above the 5-year average for the first week in October, but 138 Bcf below last year's volume. An early and severe winter would ease the downward pressure on gas prices next spring as substantial storage volumes would need to be replaced.

That all changed in 2013 as natural gas prices are closer to \$0.75 per thousand cubic feet (Mcf) higher than last year and electricity demand growth has slowed from its normal 1-2% per year rate to just 0.5%

The EIA estimates that the domestic natural gas market has grown from 23 trillion cubic feet (Tcf) in 2002 to 25.5 Tcf in 2012. They project the market to grow to 26.5 Tcf by 2022, which appears to be out of step with the views of most industry participants. The EIA is tying its outlook for the domestic gas market to price increases for natural gas, especially compared to cheap coal, which could erode the gas market's share. In early September, the EIA projected that due to cheap coal and rising natural gas prices the amount of gas used by the electric power sector would fall from 25 Bcf/d in 2012 to 22.1 Bcf/d in 2013 and further decline to 21.6 Bcf/d in 2014. This outlook comes after natural gas used to generate electricity in 2012 climbed 20% higher than in 2011. But that was because natural gas prices were below the cost for coal. That all changed in 2013 as natural gas prices are closer to \$0.75 per thousand cubic feet (Mcf) higher than last year and electricity demand growth has slowed from its normal 1-2% per year rate to just 0.5%. This squeeze on natural gas is also coming from growth in renewable fuels that are gaining increased share of the power generation market.

Between 2002 and 2012, natural gas in the power generation sector increased from 18.6% to 34% of gas demand, respectively

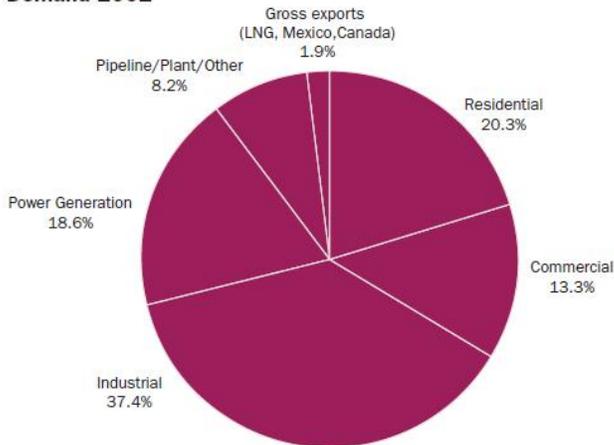
The impact of natural gas's growing role in the power generation business is evident when one looks at the charts in Exhibit 6 and 7 on the next page presented by *Platts*. The two exhibits show pie charts of the distribution of natural gas in various sectors. Between 2002 and 2012, natural gas in the power generation sector increased from 18.6% to 34% of gas demand, respectively. The dramatic growth in the share of power generation sector came at the expense of market share in residential, commercial and industrial. The residential market share decline may reflect weather impacts that are transitory, but the sharp fall in the industrial and commercial sectors reflect economic conditions.

There are many forecasts calling for natural gas prices to remain low (below \$5/Mcf) for years into the future

When it comes to figuring out where the natural gas market might go, we are reminded of the quotation by Danish Physicist Niels Bohr who said, "it is exceedingly difficult to make predictions, particularly about the future." If one looks around, there are many forecasts calling for natural gas prices to remain low (below \$5/Mcf) for years into the future. The reference case from the Annual Energy Review 2013 issued by the EIA this spring projected that Henry Hub spot

Exhibit 6. The Normal U.S. Gas Market Demand

Demand 2002

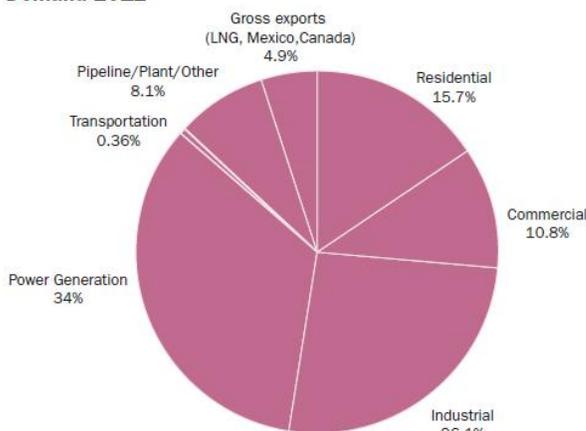


Sources include: EIA, Bentek, NGSA, AGA, industry officials and consultants

Source: **Platts**

Exhibit 7. The Current U.S. Gas Market Demand

Demand 2012



Sources include: EIA, Bentek, NGSA, AGA, industry officials and consultants

Source: **Platts**

In constant 2011 dollars, the price doesn't reach \$5/Mcf until 2026 when the nominal gas price would be \$6.44/Mcf

prices would just reach \$5/Mcf in nominal terms in 2021. In constant 2011 dollars, the price doesn't reach \$5/Mcf until 2026 when the nominal gas price would be \$6.44/Mcf. When these projections were made, the EIA had to use long-term economic projections and known regulatory conditions. Since then we have had the pronouncement by the Environmental Protection Agency (EPA) of rules governing carbon emissions from newly built coal-fired power plants. These rules are being cited as a reason why the electric power industry will no longer consider building coal-fired power plants. If so, there is hope for increased natural gas use in the power generation sector. Just how much, however, remains a

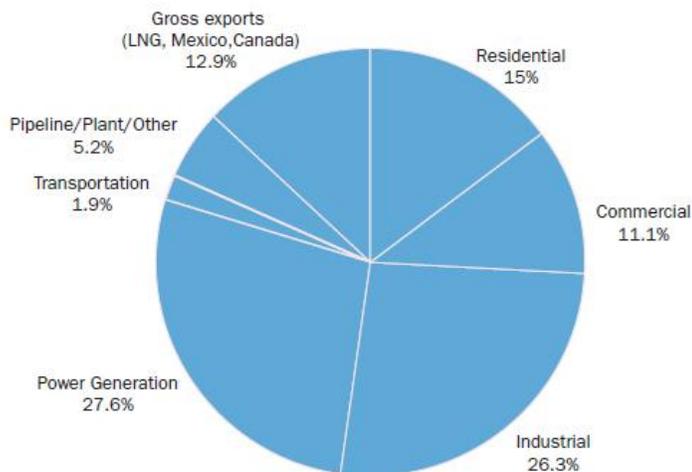
Natural gas has been a fuel looking for a market for quite some time

question since there is still a major governmental and environmental effort to increase the share of power generation fueled by renewables.

Natural gas has been a fuel looking for a market for quite some time. The industry is counting on exports of gas in the form of liquefied natural gas (LNG) to European and Asian markets as a significant source of new demand. Gas producers are also pushing for increased use of gas in the transportation sector and for fueling drilling rigs and well completion equipment. All of these markets are taking a while to develop because they entail building new infrastructure – LNG liquefying plants and export terminals and gas refueling stations across the country. As these facilities come on stream, the outlook for gas demand will improve and become evident by increased gas exports and more gas used in the transportation sector. Unfortunately, the gains in these sectors will not be accompanied with gains in the power and industrial sectors, according to some long-term forecasts.

Exhibit 8. An Optimistic View Of Future Gas Market

Demand 2022



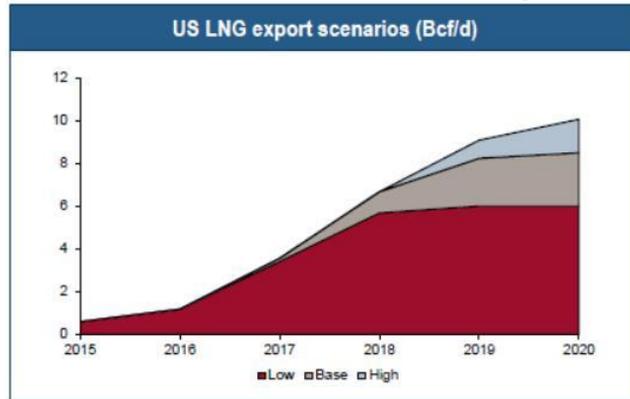
Sources include: EIA, Bentek, NGSA, AGA, industry officials and consultants

Source: *Platts*

Analysts with Black & Veatch have suggested that LNG export demand will be 8 Bcf/d in 2019, which is the equivalent of 11% of current monthly natural gas production

Predicting future demand for natural gas is an important consideration. We already know that the volume of natural gas that might be exported as LNG has increased with the approval of four export projects, and it may increase further given that there are additional export terminal applications pending approval. Analysts with Black & Veatch have suggested that LNG export demand will be 8 Bcf/d in 2019, which is the equivalent of 11% of current monthly natural gas production. Other forecasts call for even greater LNG export volumes and sooner such as *Platts Bentek*.

Exhibit 9. What Is Most Realistic LNG Export Volumes?



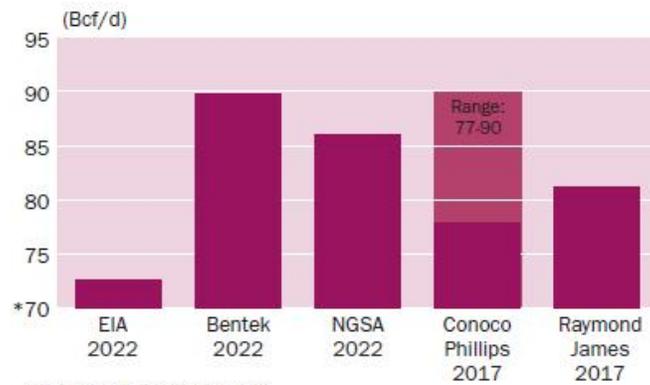
Source: *Platts Bentek*

Few people ask whether supply will be present. Instead, the assumption is made that because the EIA says there is 2,431 Tcf of technically recoverable gas resources in the U.S., the supply is there, it just needs to be drilled

Of course, there is always a question about the continued growth in natural gas output. Is there any risk that the American gas shale revolution might end? This is not the conventional wisdom, or even a scenario offered for consideration. What becomes troublesome is the assumption that demand will grow rapidly and supply will automatically arrive. Few people ask whether supply will be present. Instead, the assumption is made that because the EIA says there is 2,431 Tcf of technically recoverable gas resources in the U.S., the supply is there, it just needs to be drilled. It is this belief that underlies the statements of the United States having 100 years of gas supply. The corollary to that estimate is that the available supply will be there even with natural gas prices never exceeding \$5/Mcf. If we consider some additional projections for future natural gas demand to the EIA’s forecast, we can see how optimism for the gas market outlook is driving many E&P, processing and pipeline, and industrial consumer strategies.

Exhibit 10. Are Demand Forecasts Too Optimistic?

Sample of US demand forecasts



Sources include: EIA, Bentek, NGSA, AGA, industry officials and consultants

Source: *Platts*

What we worry about is that many industry executives are factoring out those inevitable cycles and are forecasting in a straight line

What we know about the energy business, and in many cases the domestic natural gas business, is that if you take the cycles out of the industry it becomes a boring business. What we worry about is that many industry executives are factoring out those inevitable cycles and are forecasting in a straight line. There will be surprises in the future because there will be cycles. We just don't know what will cause them or how violent they will be or even when they might happen. What we are confident about is that the future will be like Ol' Man River and that the gas market will keep on rollin' along.

The Reordering Of The Global Oil And Gas Industry

Will these changes lead to the "resource wars" that some people have worried about?

The world is fascinated by lists and rankings. In the energy world there is a keen interest in knowing who may be the world's largest producer of oil and gas as well as who might be the world's largest importer of those fuels. For a long time, those rankings haven't changed, but new leaders are emerging, signaling that meaningful changes are underway for the global energy business. Will these changes lead to the "resource wars" that some people have worried about? So far, the reality is that the global allocation of natural resources – oil, natural gas, minerals, water, etc. – has shifted without a shot being fired.

Between 2008 and now, global oil use has risen by five million barrels a day (b/d) from 87 million b/d to 92 million b/d

Last week, the U.S. Energy Information Administration (EIA) pronounced that China has officially surpassed the United States to become the world's largest net importer of crude oil. The prospect of this change has been widely anticipated given the dramatic rise in U.S. crude oil production over the past few years due to the success of the American shale and tight oil revolutions. Put into context against trends of global oil markets, the oil market change over the past five years has been nothing short of amazing. Between 2008 and now, global oil use has risen by five million barrels a day (b/d) from 87 million b/d to 92 million b/d. At the same time, OPEC's output has fallen by two million b/d while Brent oil prices have tumbled by nearly 25% despite the current Middle East political tensions.

From mid-July 2008 to a week ago, U.S. oil production increased from 5.0 million b/d to 7.6 million b/d

The reason world oil demand could climb without the primary providers of crude oil benefiting has been due to the dramatic rise in U.S., and to a lesser degree, Canadian production – both conventional and oil sands. From mid-July 2008 to a week ago, U.S. oil production increased from 5.0 million b/d to 7.6 million b/d, which is largely attributable to increased oil flows from the Bakken shale formation in North Dakota and Montana and from the Eagle Ford and Permian Basin increases in Texas. Over the same period, West Texas Intermediate oil prices declined from \$145 per barrel to a recent low of \$102 per barrel. Canadian total oil output has increased by roughly half a million barrels a day, for about a 15% increase between mid-2008 and now. Expectations are that North American production gains will continue well into the future on the

As developing economies have demanded increased oil and gas, prices have been pushed higher causing residents in the developed economies to drive less, use more efficient vehicles and switch to alternative fuels

Should prices drop to \$60 a barrel, producers will react and cut exploration and production spending

The natural resource policy of China has been driven by a fear that the global community might act to close off oil and gas supplies that in turn would hinder the country's economic development

The development of the Chinese navy is a manifestation of the next phase of the Chinese global energy and minerals policy

back of shale and tight oil gains in the U.S. and the shale and oil sands from Canada.

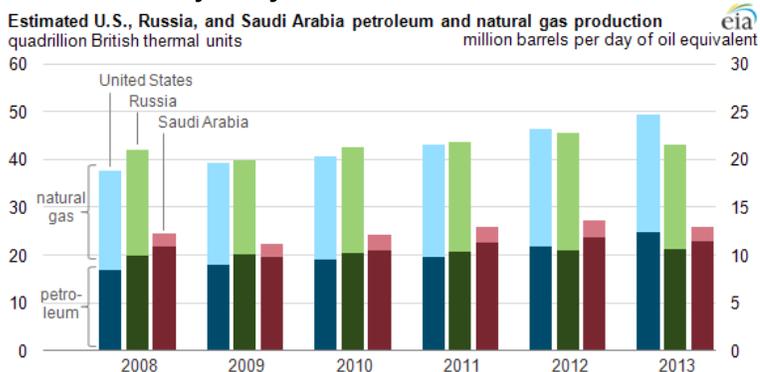
In 1970, the members of the Organization for Economic Co-operation and Development (OECD), the developed economies of the world, consumed 75% of the world's oil production. Today, that share is below 50%, and likely to fall further given the outlook for faster economic development in the developing economies of the world. This shift, rather than involving military action, has been orchestrated through the market price mechanism. As developing economies have demanded increased oil and gas, prices have been pushed higher causing residents in the developed economies to drive less, use more efficient vehicles and switch to alternative fuels. At the same time, higher oil prices have contributed to the oil shale development that has produced the incremental oil supply that has boosted America's energy self-sufficiency ratio.

Some people are concerned that with the U.S. becoming the world's largest oil producer in 2013, as shown by the chart published by the EIA (Exhibit 11 on the next page), Russia may feel pressured to strive to boost its output. When coupled with a return to market some of the oil volumes currently idled due to geopolitical issues within OPEC producers, Russia's supply could put the world in an over-supply situation causing global oil prices to fall to the \$80 a barrel level. An assessment offered by a forecaster at *Platts* Commodity Week was that there would be no industry impact if prices fell to \$80. However, should prices drop to \$60 a barrel, producers will react and cut exploration and production spending.

As China assumes the mantle of the world's largest oil importer, forecasters and political observers are concerned that the energy industry's balance could be disrupted. China's hunger for greater oil and gas supplies is pressuring the global community to ensure that market forces can accommodate China's needs. The natural resource policy of China has been driven by a fear that the global community might act to close off oil and gas supplies that in turn would hinder the country's economic development. That fear is best demonstrated by episodes such as the U.S. blocking China's purchase of Unocal in 2005 and then the U.S. barring China from retaining operating control over the Gulf of Mexico assets of Canadian oil company, Nexen Inc. that it purchased in 2013. These episodes reinforce China's belief that its strategy to control oil and gas and mineral holdings for the country's benefit around the world requires selective geographic focus.

The development of the Chinese navy is a manifestation of the next phase of the Chinese global energy and minerals policy. As China becomes a larger importer of these critical commodities, it needs to ensure that its supply routes are protected, as they have become China's greatest political (economic) vulnerability. Since 1945, the global transformation of the flow of energy and minerals has been

Exhibit 11. Trajectory To World's #1 Position



A more energy-secure United States becomes the safest strategy for protecting against future political tensions and possible geopolitical accidents

accomplished without shots being fired. However, historians remember that it was the need for raw materials – either for sustaining their economy or feeding their war machines – that drove the Japanese to attack Pearl Harbor and for Nazi Germany to launch its European blitzkrieg. A more energy-secure United States becomes the safest strategy for protecting against future political tensions and possible geopolitical accidents. This goal needs to be seen in the context of a unified foreign and economic strategy and not just a popular ‘drill baby drill’ policy.

Will The British Election Be About ‘Bread and Circuses?’

The practice of buying the support of the populous by offering them free wheat for their bread and circuses for their entertainment began in 123 B.C.

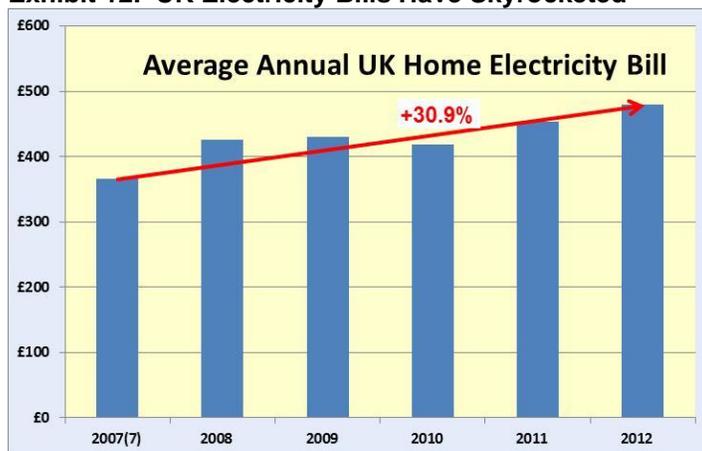
At the end of September, the Labor Party, the loyal opposition to the current Conservative British government headed by Prime Minister David Cameron, held its annual meeting at Brighton, during which party leader Ed Miliband delivered what was considered by many to be the most left-wing speech by a Labor leader in decades. In reading Mr. Miliband’s speech, we were reminded of the Latin metaphor – ‘*panem et circenses*’ written by Roman satirist and poet Juvenal sometime about 100 A.D. For those who never took Latin in school, the phrase translates into ‘bread and circuses.’ When Juvenal wrote the phrase, he was displaying his contempt for the declining heroism of his contemporary Romans. The practice of buying the support of the populous by offering them free wheat for their bread and circuses for their entertainment began in 123 B.C. when the politician Gaius Sempronius Gracchus created the ‘Annona’ (grain dole). Today, we can see how the idea of “bread and circuses” created a public more interested in handouts than work, which has corrupted our leaders and the political process.

Mr. Miliband offered his vision of what the Labor Party needs to offer British citizens in 2015 in order to gain their vote. The offer would be a freeze of natural gas and electricity prices for 20 months following the election. The Labor Party calculates this will save the typical consumer around \$190 a year. According to Mr. Miliband, the failure

Included in his list was “Gas and electric companies that put prices up and up and up”

of the current British government to improve the living standards of the public lies with its catering to wealthy, vested interests. Mr. Miliband told his audience: “In the 1990s, we committed to a dynamic market economy. Think of those words: ‘dynamic, ‘market’, ‘economy.’ And then think about this, what happens when competition fails? What happens when it just fails again and again and again? Then government has to act.” He went on to cite various industries such as payday lenders, homebuilders and train companies, among others. Included in his list was “Gas and electric companies that put prices up and up and up.”

Exhibit 12. UK Electricity Bills Have Skyrocketed



Source: UK Dept. of Energy & Climate Change, PPHB

According to data from the UK’s Department of Energy & Climate Change, over 2007-2012, the average home electricity bill increased by nearly 31%. In 2012 alone, the cost rose by 5.7%. These utility price increases (the average natural gas bill rose by 5.2% from 2011 to 2012) have come while average incomes rose at a slower pace – in other words an income squeeze for middle income families.

If Germany’s experience is repeated, British utilities will see their financial strength sapped to the detriment of their shareholders and customers

There are six large utilities in the UK that provide the citizens their gas and electricity. These firms will be the ones who will be impacted by this Labor Party policy. They suggest these utilities will lose about £4.5 billion (\$7.2 billion) in revenues, although other estimates suggest the loss will be closer to £7 billion (\$11.2 billion). We doubt much thought has been given to the consequence of this loss of revenues for the companies. However, if Germany’s experience is repeated, British utilities will see their financial strength sapped to the detriment of their shareholders and customers.

Mr. Miliband went on in his speech to frame the discussion about utilities in the following manner: “Take the gas and electricity companies. We need successful energy companies, in Britain. We need them to invest for the future. But you need to get a fair deal and frankly, there will never be public consent for that investment unless you do get a fair deal. And the system is broken and we are

The cost impact may be lost on the public because electricity prices in Britain are lower than in a number of European countries and compared to the average price for the entire Eurozone

going to fix it.” A major problem with this rhetoric is that during the period when utility costs have been climbing (and are projected to continue to rise), England shifted from being a net natural gas producer to becoming a net gas importer. That change occurred in 2006. The shift has increased the cost of natural gas for all utilities that are now, depending on their existing domestic supplier relationships, subject to having to increase more liquefied natural gas (LNG). LNG coming to England is much higher priced than natural gas produced from the North Sea. The utility companies have done a poor job in explaining to their customers the impact of this supply shift. The cost impact may be lost on the public because electricity prices in Britain are lower than in a number of European countries and compared to the average price for the entire Eurozone. Only France has lower electricity costs, but it benefits from its large, low-cost nuclear power industry.

Exhibit 13. UK Electricity Is Not Expensive



Source: *The Economist*

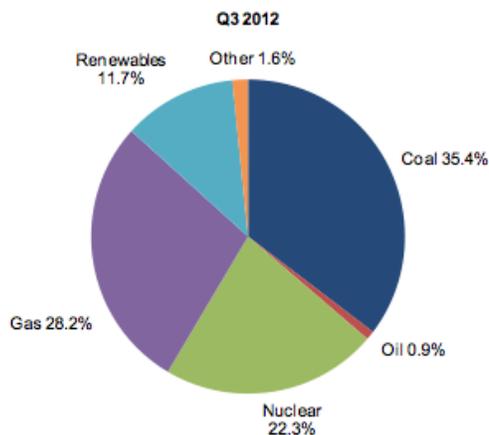
In 2008, the government investigated the utilities and found no evidence of collusion over price-setting

Mr. Miliband went on to make some other promises to his audience, and presumably he will be making the same offers to the voters during the campaign in 2015. He said, “Now the companies aren’t going to like this because it will cost them more but they have been overcharging people for too long because of a market that doesn’t work. It’s time to reset the market. So we will pass legislation in our first year in office to do that, and have a regulator that will genuinely be on the customers’ side but also enable the investment we need. That’s how Britain will do better than this.” In 2008, the government investigated the utilities and found no evidence of collusion over price-setting. It launched another investigation in 2010 that concluded the company’s tariffs were too complex for consumers to understand, but that is a function of the lawyers and communications

The investment needs are critical as the industry has to replace the generating capacity of dirty, coal-fired power plants

professionals. Nor are utilities extremely profitable. Profit margins are in the 4% to 5% range and the companies face massive investment requirements to meet the future power needs of the country. The investment needs are critical as the industry has to replace the generating capacity of dirty, coal-fired power plants that are due to go offline starting in the winter of 2014.

Exhibit 14. UK Electricity Output By Fuel Source



Source: *The Carbon Brief*

Based on a report issued by Ofgam, the British power regulator, spare generating capacity could decline over the next two years to 2-5%, or less than half of what it is now

The populism of giving the public “bread and circuses” usually comes along with unintended consequences. When those consequences emerge, the politicians are loath to admit they have any connection to their policies. People are already speculating that Mr. Miliband’s announced policy, which wouldn’t even begin until 2015, is already chilling investment in new UK power generating facilities. That could be crucial in terms of accentuating the possible power crunch the industry is facing beginning in 2014. Based on a report issued by Ofgam, the British power regulator, spare generating capacity could decline over the next two years to 2-5%, or less than half of what it is now. The industry is facing the closing of one-fifth of its existing power plants over the next 10 years. According to *Reuters*, the industry will lose 12 gigawatts of generating capacity in the next two years. They suggest that of the 13 operating coal-fired power plants, half will close by 2015 and possibly all will be shut down by 2023.

If the UK economy stays in the doldrums for the next five years, the country’s power industry will probably survive its scheduled power plant shutdowns

National Grid (NGG-NYSE) predicts that peak power demand in the UK will fall by another 3-4 gigawatts by 2018-2019, after having already declined by five gigawatts over the past seven years. National Grid’s latest forecast is worse than its prior one because it now assumes a “more pessimistic economic outlook.” In other words, if the UK economy stays in the doldrums for the next five years, the country’s power industry will probably survive its scheduled power plant shutdowns. For British industry, this scenario presents mixed blessings – most power-hungry plants operate under

Coal supplied 39% of the UK's power output in 2012, up from 30% the prior year

interruptible contracts, meaning they can be cut off from power if higher priority customers need the electricity. Any recovery in the economy could be cut short by a lack of power, creating a vicious economic cycle.

Another challenge for the power industry is its increased reliance on cheap coal, an offshoot of the American shale revolution. Coal supplied 39% of the UK's power output in 2012, up from 30% the prior year. The problem is that the industry has maxed out on the number of coal-fired power plant hours allowed under the European Union emissions law much sooner than anticipated. That means other power sources will need to fill any future generation growth. Natural gas supplied 30% of power last year and projections call for it to eventually account for 60%. Natural gas power plants are low-cost and usually only require about 18 months to construct. However, the supply of natural gas from domestic sources is in decline meaning utilities banking on more natural gas must rely on expensive LNG supplies, inflating consumer power bills. That is part of the reason why the power industry supports development of UK gas shale resources, which are seen as a cheaper alternative to LNG. Following Mr. Miliband's speech, utility executives are now looking at how to raise electricity rates before the next election and what operational changes they can adopt to keep the grid from failing if power demands exceed its capacity. Power plants might be asked to operate at greater than peak rates for extended periods of time or the companies might reduce voltage by 3-5% in certain regions of the country to keep the power grid stable. Building new power plants may become the last option exercised. How does one say unintended consequences? Maybe it is spelled – disaster.

How A 30,000-foot View Can Often Prove Dangerous

Others often suggest that merely understanding the business outlook from the 30,000-foot perspective is sufficient

Some analysts and investors pride themselves on getting all the details right in their overall strategies while others often suggest that merely understanding the business outlook from the 30,000-foot perspective is sufficient. John Dizard, a columnist for the *Financial Times*, recently wrote a column about a topic that clearly exposed the potential for misreading a view from on high, not because it was inaccurate, but rather because one needed to understand some of the details to reach the correct conclusion. The subject Mr. Dizard was focusing on was something we have seen mislead smart people in the past into making huge capital commitments from which they are still recovering. His topic was the Baltic Dry Index (BDI), an esoteric measure of global shipping activity.

The BDI was a creation of the Baltic Exchange in London. The Baltic Exchange has a long and colorful history, tracing its roots to the Virginia and Baltick Coffee House in Threadneedle Street in 1744. The exchange was registered as a private limited company in 1900 and continues in that structure today. The Baltic Exchange is owned by its over 550 members and functions as the settlement

The assumption by these investors was that the spike in the BDI marked a change in global economic conditions and that it was a signal to buy the shares of shipping companies and other corporations highly levered to increased economic activity

location for freight futures traded by members and that are based on daily freight market prices and maritime shipping cost indices compiled by the organization's staff.

The most famous of the indices the Baltic Exchange prepares and publishes is the BDI. It also publishes a number of specific indices for petroleum tankers including indices for each of the four major classes of oil tankers (Panamax, Capesize, Supramax, and Handysize) and separate indices for those ships hauling crude oil (Baltic Dirty Tanker Index) and refined petroleum products (Baltic Clean Tanker Index).

The BDI index was created to be a simple reflection of the cost to move various raw material cargos by sea. The index covers the rates for 23 primary shipping routes globally and covers the cost for four ship types (those named in the oil tanker discussion above). As shown in Exhibit 15, there has been a dramatic upward move in the BDI at the end of the summer. The BDI move sparked significant investment interest from those investors who look at economic trends from 30,000 feet. The assumption by these investors was that the spike in the BDI marked a change in global economic conditions and that it was a signal to buy the shares of shipping companies and other corporations highly levered to increased economic activity.

Exhibit 15. Spike In BDI Misunderstood By Market



Source: Baltic Exchange

The BDI spike was caused by a unique set of conditions that were not understood or maybe not examined sufficiently by the investors who jumped on the thesis of a change in global economic conditions. The first issue is that the BDI is a price-driven index and does not consider volume, meaning that if shipping volume falls,

The sloshing has the potential of capsizing and sinking a ship in seconds, before it can signal a problem or even before the crew has time to abandon ship

usually the price of shipping the cargo also declines and the reverse is also true, but taken together – volume and price – provides a much clearer understanding of the strength or weakness of the market. In this case it was the Brazilian iron ore business. There had been a slowdown in iron ore demand from China's steel industry due to tightened credit conditions starting at the end of 2012 and into the first half of 2013. There was also a weather-related issue in Brazil. When it rains a large pile of iron ore gets wet and can liquefy. If the wet pile is on a ship, it can slosh back and forth with the movement of the ship in the waves. The sloshing has the potential of capsizing and sinking a ship in seconds, before it can signal a problem or even before the crew has time to abandon ship. As a result of the slowing economy in China, its iron ore inventories declined to very low levels. The wet weather prevented shipments moving earlier in the year. When the weather cooperated, iron ore shippers started chartering Capesize dry bulk carriers, which tend to be very large (170,000 ton displacement) haulers primarily of coal and iron ore. Iron ore represents about 25% of the global seaborne dry bulk trade. In turn, Chinese iron ore demand represents about 70% of the global iron ore trade. So when China ordered up more iron ore, a shortage of ships drove prices sky-high and the BDI soared. The problem was that the BDI was driven up by one class of vessels and one shipping route. The rise in the BDI was not associated with an expansion of global shipping volumes that would signal a change in economic activity, but rather only an extremely narrow niche market.

Without an understanding of how an industry's activity index is composed, you can be fooled into believing there are fundamental industry changes underway – either good or bad

The last time a Baltic index impacted a shipping sector was in 2003 and 2004 when China's oil demand soared due to the economic activity leading up to the nation hosting the Olympics. Tanker owners began projecting a continuation of the growth rate of oil imports and then started looking at where the oil would have to come from and how long it would take for ships to make the journeys. From those calculations it became evident that there was a shortage of tanker capacity, setting off a shipbuilding boom that ultimately contributed to the current glut of tankers, extremely low tanker rates and depressed shipping company earnings. Since most shipping companies operate with substantial debt loads, the condition of the tanker market has led to bankruptcies in recent years. The point of this discussion is that without an understanding of how an industry's activity index is composed, you can be fooled into believing there are fundamental industry changes underway – either good or bad. The reality, such as in this case, may be that minor distortions caused the index to move. Beware of making too many investment decisions from 30,000 feet.

No Arctic Shipping Route – A Blow To Global Warming?

Nils Andersen, head of Denmark's A. P. Møller-Maersk (AMKBF-OTC), was interviewed recently by the *Financial Times* regarding his tenure running one of the world's largest container shipping lines

He has set out a plan to build the non-shipping businesses of Maersk to help balance the earnings outlook for the company

with a fleet of 583 cargo vessels and over 2.6 million twenty-foot equivalent units (TEUs) that carries approximately 15% of the industry's cargo volume. Mr. Andersen, who began his career in the finance department of Nordic Sugar before switching to the beer company, Carlsberg, where he eventually rose to the CEO position before coming to Maersk, has been making a number of bold moves to change the culture and character of the Danish conglomerate. He has set out a plan to build the non-shipping businesses of Maersk to help balance the earnings outlook for the company. He has even introduced investor days at which analysts and investors spend a day meeting the senior and operating management of each of Maersk's divisions.

Maersk recently launched the second of its 20 planned Triple-E container ships. Ten of them will be delivered by June 2014. The Triple-E launch has come at a particularly bad time for Maersk as global trade has remained in the doldrums since the 2008 financial crisis and recession largely due to the anemic economic recovery.

Exhibit 16. Triple-E Ships To Alter Cargo Market Dynamics



Source: Maersk web site

The name Triple-E is derived from the three primary benefits of the new ship design – economy of scale, energy efficiency and environmentally improved

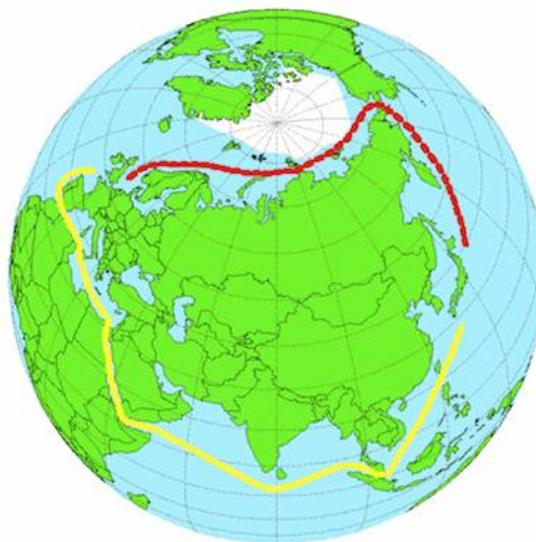
The Triple-E is 400 meters (1,312 feet) long and 59 meters (193 feet) wide. The ship has a U-shaped rather than a V-shaped hull allowing it to carry more containers. Despite only being four meters (13 feet) longer and three meters wider (10 feet) than Maersk's Emma Maersk, the company's prior largest container ship, the Triple-E's will be able to carry 2,500 more containers, or 18,000 TEUs. The name Triple-E is derived from the three primary benefits of the new ship design – economy of scale, energy efficiency and environmentally improved. While having a top speed of 25 knots, steaming at 20 knots would reduce fuel consumption by 37% and at 17.5 knots it would use half as much fuel. Another primary benefit of the ship's design is that carbon emissions per container will be 50% lower than the typical cargo ship on the Europe-Asia route and 20%

lower emissions than the Emma Maersk. The ship, however, is too large for American ports, but it is ideal for Asian and European ports. Additionally, the new ship is too large to pass through the widened locks being installed at the Panama Canal, but it will be able to pass through the Suez Canal aiding its travels between European and Asian ports.

Triple-E ships are “primarily a cost-saving initiative” in that they will reduce fuel costs by \$300-\$400 per container

In the interview, Mr. Andersen pointed out that the Triple-E ships are “primarily a cost-saving initiative” in that they will reduce fuel costs by \$300-\$400 per container for a round-trip between Asia and Europe. That is a huge economic advantage in such a highly competitive industry.

Exhibit 17. Arctic Route To Asia Is Shorter



Source: *Wikipedia*

The northeast passage would cut the time required to go between Asian and European ports by about a third, significantly reducing the cost of transporting manufactured goods

The most surprising observation about the container shipping business was Mr. Andersen’s view that the Northern Sea Route across the top of the world via the Arctic Ocean would not be realistic for at least 10 to 20 years, despite global warming proponents who have hailed the prospect of an ice-free Arctic region. The quest for the northeast passage as a cost-saving alternative to the Suez Canal for Asia-Europe trade has long been an objective of the global shipping industry. The northeast passage would cut the time required to go between Asian and European ports by about a third, significantly reducing the cost of transporting manufactured goods. According to Mr. Andersen, “The problem is you have to have icebreakers. You have to be very sure that you hit the right window during the year so you don’t run into icebergs, and things like that.”

The International Maritime Organization is working on a polar code for shipping standards for ships traversing the northeast passage

Russia is forecasting that most of the traffic using the northeast passage by 2021 will be hauling oil and gas from its northern coast to either Asia or Europe

and hopes to implement it by 2015. Russia is forecasting that most of the traffic using the northeast passage by 2021 will be hauling oil and gas from its northern coast to either Asia or Europe. Its projection is that the industry will be moving 15 million tons (110 million barrels) of oil and gas on that route compared to the 25 million tons (183 million barrels) of oil and gas and 930 million tons of cargo transported through the Suez Canal in 2011. According to Mr. Andersen, "The way global warming is going, of course there is the opportunity in a very far, very distant future that the northern sea route will open up and it will be a major shipping route. But it will definitely not be within the next 15 to 20 years in our opinion, so it's far too early to start constructing vessels for it." But what if we are entering a new global cooling period? Would that be a game-changer for people counting on an open Arctic Ocean?

"On the road again - Just can't wait to get on the road again"

This trip was slightly different since it covered a Sunday and a Monday, offering significantly different traffic perspectives

Texan Willie Nelson's iconic song – *On the road again*, regales us with the joys of traveling. At one point Nelson sings of "Goin' places that I've never been. Seein' things that I may never see again." That is how we approach our road trips between Houston and Rhode Island – we always see things we will never see again, but the important thing is to figure out what we are seeing actually has broader implications about the economy or life. Two weeks ago we made our season-ending trip from our summer home in Rhode Island back to Houston. Due to a commitment that put us in Storrs, Connecticut celebrating 50 years of the lacrosse program at the University of Connecticut on Saturday evening and a Tuesday afternoon flight to Colorado Springs to attend the fall meeting of the National Ocean Industries Association, we were forced to compress our drive into two days. We used to do the drive in two days when we had less free time, so we are familiar with the drill. Those past trips were usually done over one weekend or two weekdays. This trip was slightly different since it covered a Sunday and a Monday, offering significantly different traffic perspectives. As we left, we wondered how different traveling on these days might turn out to be.

Since the railroad has been powered by electricity for years, there weren't many diesel engines available

The most amazing observation was how light the traffic was on both days. We expected more problems early on in the trip due to problems with the local railroad. What does a railroad have to do with a road trip, you ask? Metro North, the commuter railroad that runs from southern Connecticut and Westchester County into New York City, is powered by electricity. A few weeks before we left, the railroad commenced repair work on one of the prime electricity cables that powers a stretch of track. On September 25, however, there was a massive electrical short that wiped out the substation that supplies power to an eight-mile stretch of track in the New York area. As a result of the power loss, the rail service had to switch to trains powered by diesel locomotives. Since the railroad has been powered by electricity for years, there weren't many diesel engines available. That meant the number of commuters that could be

According to media reports, all three primary highways into the city were jammed with backups stretching as much as 20 miles long

transported each day was cut in half. As of October 2nd, the railroad was able to get some power to the tracks and added additional diesel-powered locomotives bringing its commuter capacity up to 65% of normal. With rail commuting questionable, commuters turned to their other option – the car! According to media reports, all three primary highways into the city were jammed with backups stretching as much as 20 miles long. To relieve pressure, Connecticut's governor ordered all construction work on Interstate 95, one of the three primary routes into the city, to be stopped until the rail situation was resolved. Initial reports were that the patchwork repairs for the tracks would require three to four weeks, with an outside possibility that commuting could be impacted for a few months.

Not only was the traffic light, but the truck traffic was surprisingly light!

As we were going to be traveling through the I-95 work areas on a Sunday we felt there wouldn't be much of a problem given the construction moratorium. What we didn't have any idea about was whether highway traffic might be heavier than we were anticipating. To our surprise, the absence of any construction meant that all the traffic control barrels had been removed and we flew through the area. Traffic turned out to be extraordinarily light, but we couldn't be sure that it wasn't just because we were going through the region early on Sunday morning. As we continued through New York and New Jersey and into Pennsylvania, the traffic remained light. It must be a Sunday phenomenon we thought. Not only was the traffic light, but the truck traffic was surprisingly light! One set of trucks we passed heading south was hauling relatively new vehicles with Florida license plates. Although we can't be certain, it sure looked to us like the winter migration of rental cars, keeping up with the birds and the snowbirds.

It was also interesting that throughout the entire trip, we saw only about a half a dozen highway patrol and local police cars on our side of the road, but dozens of them on the other side

Traffic changed as we drove into and through Virginia. Fortunately, the heavy traffic and the missing trucks were all on the northbound side. Why were they heading north on a Sunday and not going south? We have no idea. It was also interesting that throughout the entire trip, we saw only about a half a dozen highway patrol and local police cars on our side of the road, but dozens of them on the other side. In fact, we saw what appeared to be an organized police traffic control effort in Pennsylvania. As we drove by, there were five police cars with flashing lights having pulled over five passenger vehicles. A short way along, there were two more police cars hiding behind a bridge. Our guess – Pennsylvania needs more revenue and traffic-tickets are an easy source.

The most surprising trend we noticed, since we stopped several times, was the deterioration in McDonald's quality

Our hotel just south of Chattanooga, Tennessee was not full Sunday night; nor was the parking lot of the neighboring hotel. Our favorite dinner spot – Cracker Barrel – was also surprisingly empty, but that again could be due to it being a Sunday night. The most surprising trend we noticed, since we stopped several times, was the deterioration in McDonald's quality. Maybe their revenue and earnings issues are a function of their lack of cleanliness and trained

We found virtually no difference between the highway traffic on Sunday and Monday

staff. Is this a demographic, a skills or a lack of training/supervision problem?

The Monday leg of our journey was only slightly different, highlighted by a five-mile stretch of stop-and-go traffic just outside of east Houston. It turned out to be another one of those famous mystery delays. When the traffic jam ended there were no police, broken-down vehicles or signs of an accident. Traffic on Monday was remarkably light, something we were not prepared for as it was the start of the workweek. There were very few trucks on either side of the highway – again a surprising development. We found virtually no difference between the highway traffic on Sunday and Monday. The bottom line of our trip – had we not had the traffic jam problem, we probably would have recorded our fastest trip time ever. Yes, the price of gasoline fell steadily as we headed south from Rhode Island, a welcomed condition.

Contact PPHB:
1900 St. James Place, Suite 125
Houston, Texas 77056
Main Tel: (713) 621-8100
Main Fax: (713) 621-8166
www.pphb.com

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