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## MUSINGS FROM THE OIL PATCH

July 8, 2014

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

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### Environmental Battle Over Energy Sources In New England

**An official from Deepwater Wind suggested the project anticipated starting construction before the end of 2014, making it the first offshore wind farm in the United States**

A local news story trumpeted the award of another permit for the offshore wind project in Rhode Island state waters. This leaves Deepwater Wind, the developer of the project, one permit short of final approval to begin construction of the five-to-six wind turbines to be installed off Block Island. The project still needs approval for its power cable to ship the island's surplus power to shore. An official from Deepwater Wind suggested the project anticipated starting construction before the end of 2014, making it the first offshore wind farm in the United States. While environmentalists in Rhode Island are happy at this news, they now are aggressively pushing back on a regional energy plan to bring more gas to New England because the planning is being done in secret according to a story by *ecoRI/News*. Environmentalists are upset that renewables are being given short shrift in the planning while expansion of natural gas pipelines and power transmission lines are being pushed.

**CLF discovered correspondence between the states and the committee that was done in private**

The planning is being done by the New England States Committee on Electricity for the six-state region. The Conservation Law Foundation (CLF) discovered correspondence between the states and the committee that was done in private. The CFL is outraged about this development and attacked the parties for it along with expressing concern about the perception that the planners are willing to take high risks with the public's money, the region's energy progress and the region's climate.

The project being challenged is the 250-mile Northeast Expansion Project, from Wright, N.Y., to Dracut, MA., proposed by Kinder Morgan (KMI-NYSE), which will haul high-pressure natural gas extracted from the Marcellus and Utica formations in Pennsylvania and Ohio, respectively, to New England. Traditionally, New England's natural gas supply has come from Texas, Louisiana and

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Gulf of Mexico sources, augmented by gas from Pennsylvania and Ohio, along with power eastern Canada. The CLF argues that the planners should evaluate the Northeast Expansion project against expanding energy-efficiency programs and building more renewable-energy systems in the region.

### Exhibit 1. Pipeline Expansion Being Challenged



Source: *ecoRI News*

**As one would expect the environmental groups will fight that decision as they are concerned about the expansion's impact on air quality, water pollution, and the risk of explosions, forest fires and soil contamination**

**Some environmentalists claim that when you consider methane leaks from natural gas pipelines and wells, natural gas is not cleaner than oil and coal**

The Rhode Island General Assembly recently passed the Affordable Clean Energy Securities Act, which empowers the state's Public Utilities Commission to represent the state in this regional effort to expand the natural gas pipeline network and to boost the carrying-capacity of existing lines. This is appropriate given that Spectra Energy (SE-NYSE) is proposing expanding its Algonquin natural gas pipeline, a major supplier to the state. The plan involves building an additional 30 miles of pipeline and increasing the line's pressure enabling it to transport more gas into the region. When Spectra first proposed the Algonquin expansion in 2011, it anticipated demand would necessitate a 1 billion cubic feet a day (Bcf/d) capacity increase. Due to a lack of long-term utility commitments, the expansion will only be 0.33 Bcf/d. The CFL and the Green Party of Rhode Island are seeking a public hearing to address this proposed expansion. The Rhode Island Department of Environmental Management contends that the expansion and pressure-upgrade are part of a "minor source permit application" that does not necessitate a public hearing. As one would expect the environmental groups will fight that decision as they are concerned about the expansion's impact on air quality, water pollution, and the risk of explosions, forest fires and soil contamination.

People should understand that at one point, natural gas was the favored alternative of environmentalists because it was cleaner than oil and coal. Some environmentalists claim that when you consider methane leaks from natural gas pipelines and wells, natural gas is not cleaner than oil and coal. However, what truly undercut the environmental movement's love for natural gas was the American

**Exhibit 2. Gas Comes From Gulf Coast, PA & Canada**

Figure 2. New England natural gas supply system



Source: EIA

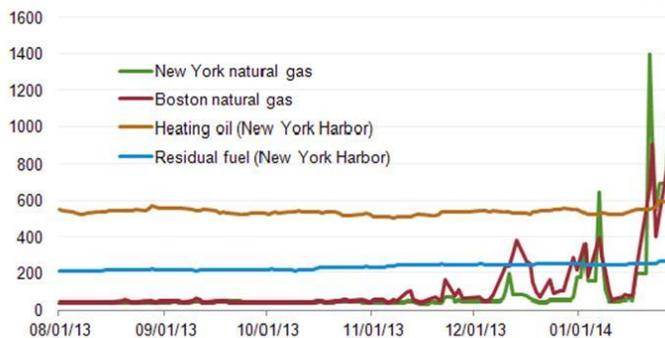
**Natural gas powers generators producing 52% of the region's electricity, up from less than 30% in 2001**

shale gas revolution that drove gas prices from double digit levels to the \$2-\$3 range. The price collapse removed the gas price umbrella over expensive renewable fuel projects enabling them to compete. The low gas price destroyed renewable energy economics, leaving them dependent on subsidies and state clean energy mandates. The battle over which fuel should power the New England electric grid is quite interesting. Natural gas powers generators producing 52% of the region's electricity, up from less than 30% in 2001. That fuel dependency became a costly proposition last winter when the extremely cold temperatures from the Polar Vortex hit the region. According to the *Christian Science Monitor*, natural gas prices at that time reached \$90 per million Btu, the energy equivalent of oil costing over \$500 per barrel.

**Exhibit 3. Winter Disrupted New England Energy Mix**

Figure 1. Northeast power market fuel choices

dollars per megawatthour



Source: U.S. Energy Information Administration based on Bloomberg, LP.  
 Note: Assumes a 12,733 British thermal unit per kilowatthour (Btu/kWh) heat rate for an oil-fired generator and a 11,576 Btu/kWh heat rate for a natural gas-fired generator.

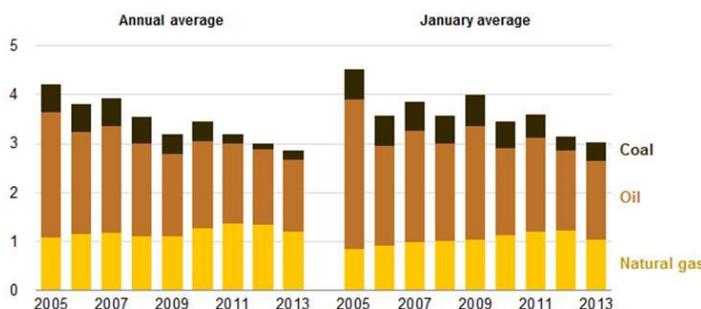
Source: EIA

**According to the Independent System Operator New England, during January 23-25, 2014, 24% of the region’s power was generated by oil**

In the Northeast region (New York and New England), about 30% of the electric generating capacity is able to switch between natural gas and oil, and 9% of capacity is solely-fueled by oil. According to the Independent System Operator New England, during January 23-25, 2014, 24% of the region’s power was generated by oil. Because of the risk of natural gas curtailment in severely cold periods, power plants that can switch fuels maintain stocks of oil and coal. The EIA chart in Exhibit 4 shows the average annual consumption of fuel by type for 2005-2013 by New England’s electric power industry compared to its fuel consumption for the month of January. Even though more natural gas was consumed in every January from 2005 to 2012, no January used more gas than the power plants consumed on average annually. That was not the case with the plants’ consumption of coal and oil.

**Exhibit 4. More Oil And Coal Used In January**

Figure 10. New England fuel consumption for power generation, annual vs. January average  
billion cubic feet equivalent per day



Source: U.S. Energy Information Administration



Source: EIA

**This 41-year old nuclear plant, scheduled to be shut in the fourth quarter of 2014 when its fuel cycle ends, had been generating 4% of New England’s electricity supply and about three-quarters of Vermont’s power**

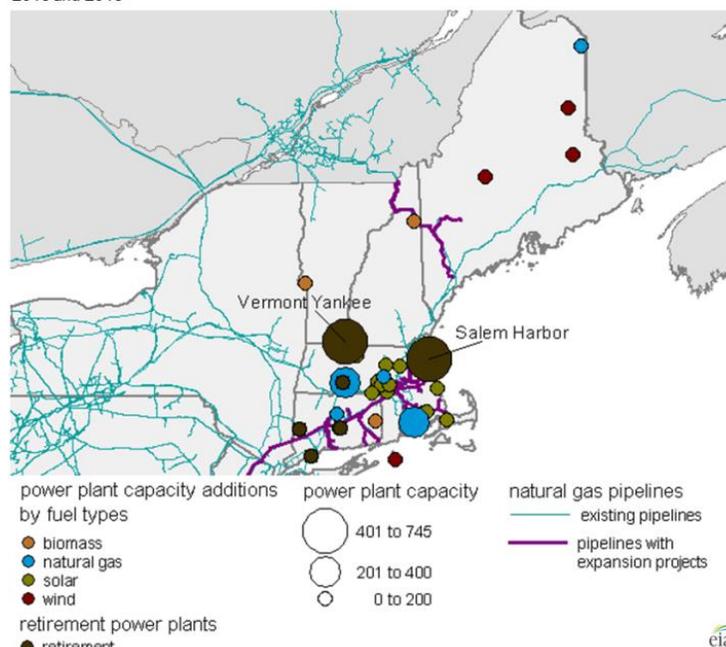
New England’s energy supply mix is changing, not just due to the growth of renewables, but also due to the closing of older power plants as result of regulatory changes and shifting economic conditions. Several major coal-powered generating plants are scheduled to be retired along with Entergy’s (ETR-NYSE) 620-megawatt Vermont Yankee nuclear power plant. This 41-year old nuclear plant, scheduled to be shut in the fourth quarter of 2014 when its fuel cycle ends, had been generating 4% of New England’s electricity supply and about three-quarters of Vermont’s power. In the coal area, the 1,055-megawatt Brayton Point power plant in southeastern Massachusetts, owned by Energy Capital Partners, is due to be closed in 2017. Dominion Energy Resources (D-NYSE) will shutter its 750-megawatt Salem Harbor coal- and petroleum-fired plant in Massachusetts in 2014 due to the cost to retrofit the plant to comply with environmental regulations. The New England electric grid operators are warning that the premature retirement of these power plants is reducing power supplies and will drive up electricity prices.

**The Department of Energy is providing \$150 million financing guaranty, which brings the project to 60% of the roughly \$2.5 billion needed to build the 120 turbine wind farm in Nantucket Sound**

Exhibit 5 shows changes underway in the New England power business for 2013 to 2016. If one examines the map, the red dot in the water south of Rhode Island is the Deepwater Wind project off the coast of Block Island. What one does not see is a red dot below the bright blue circle on Cape Cod, which is where the Cape Wind project is scheduled to be constructed. That project is still working its way through permitting and raising the financing necessary to build the project. We were intrigued to see last week that the Department of Energy is providing \$150 million financing guaranty, which brings the project to 60% of the roughly \$2.5 billion needed to build the 120 turbine wind farm in Nantucket Sound off Cape Cod, Massachusetts. The absence of a red dot means this project is still years away from being on line.

**Exhibit 5. New England Changing Energy Landscape**

Figure 9. New England planned energy infrastructure changes between 2013 and 2016



Source: EIA

**The court ruled that FERC had failed to analyze the broader cumulative environmental impacts of the project**

Given the intramural scrum underway among environmentalists and utility planners over how much more natural gas supplies are needed in the region, another legal development is disrupting the timing of this effort. At the beginning of June, a federal court tossed the Federal Energy Regulatory Commission’s (FERC) environmental review, and approval, of Kinder Morgan’s Northeast Upgrade project. The court threw out FERC’s analysis of the 40-mile segment of the project. The court ruled that FERC had failed to analyze the broader cumulative environmental impacts of the project. It also ruled that FERC had improperly segmented portions of the pipeline under separate reviews. The court said this was impermissible for purposes of determining the cumulative effects of

**FERC could petition the Supreme Court for a review or it could merely go to work reviewing pipeline applications under the more stringent conditions**

the project. What the decision means is that pipeline reviews will take longer and be more stringent and meticulous. It is also likely reviews will require the preparation of Environmental Assessments or Environmental Impact Statements that may take up to three years to complete from the time of pre-filing by a company.

Following the court's decision, FERC was left with few legal options. Since the ruling was handed down by a federal district court, FERC could appeal and ask for an *en banc* review before a full slate of judges. Since the district court's decision was unanimous, asking for a full court review doesn't offer much hope for a reversal. FERC could petition the Supreme Court for a review or it could merely go to work reviewing pipeline applications under the more stringent conditions.

**If we have another extremely cold winter or maybe even just a normal cold winter, the region is destined to face high and volatile power prices that could lead to brown-outs**

The court's decision over FERC's review process may be the critical wildcard in the electric power market outlook for New England. Whichever option FERC selects means a longer review time for every pipeline project. The decisions to close the Vermont Yankee and Salem Harbor power plants are probably irreversible, meaning that the power generation market will become tighter this coming winter. If we have another extremely cold winter or maybe even just a normal cold winter, the region is destined to face high and volatile power prices that could lead to brown-outs. Last February, ISO-New England held an auction to buy power for 2017 and 2018 in capacity markets. This is essentially buying an insurance policy that ensures power will be available in the future. However, ISO only secured a commitment of 33,700 megawatts of capacity supply, down from the 33,855 megawatts of capacity required. One megawatt powers about 1,000 homes. The shortfall could imperil 155,000 homes in the region. The megawatt deficit is a first for New England, which has maintained a surplus in megawatt capacity since the forward capacity market was established in 2006.

**We remember past situations in the late 1970s and early 1980s when weather conditions drove gas demand so high that the supply system was imperiled in trying to meet customer needs**

Lacking diversity in its power supply sources means that New England could be at risk of severe economic and social problems if natural gas supply falls short of projections. We remember past situations in the late 1970s and early 1980s when weather conditions drove gas demand so high that the supply system was imperiled in trying to meet customer needs. All interruptible gas demand was cut off as utilities and governments worked to sustain power and heat to the public and critical facilities. These episodes led to revamping the natural gas pipeline regulatory system. In the past, we always told investment clients to watch their weather charts closely during the winter. In those days we were favorably disposed to the full-page *USA Today* weather map of the North America. We warned investors that if they saw all white (extremely low temperatures) covering the Midwest, Northeast and Mid-Atlantic regions they knew gas demand would be strong. What they needed to watch was if the white extended to Oklahoma, Texas, Louisiana and the Gulf of Mexico. That would be an environment in which gas

**Eventually, if enough wells went off-line while demand remained high, pipelines would run out of gas**

wells would freeze up and stop flowing. Eventually, if enough wells went off-line while demand remained high, pipelines would run out of gas and have to draw on the line pack gas. We personally watched the natural gas pipeline industry come perilously close to that state. One can only imagine what the regulators and politicians would have done had that condition happened. We probably would be looking at a nationalized pipeline industry today. Given the way the government runs businesses, we should be happy the industry remains in private hands.

## Do Crude Oil Export Permits Signal A Change In U.S. Policy?

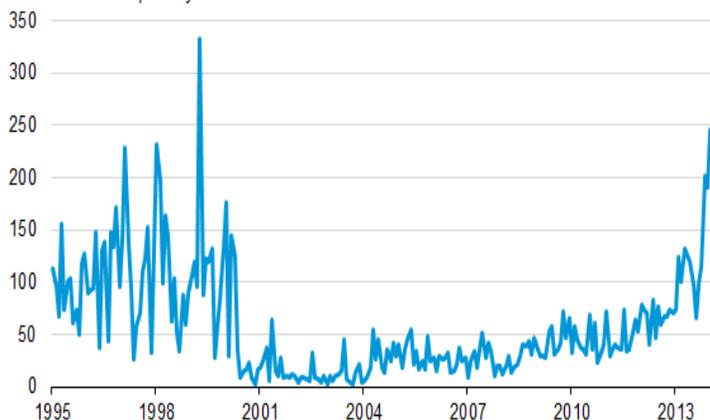
**Immediately, the question was posed as to whether these permit awards reflected a change in federal government policy with respect to the exporting of American crude oil, a ban that has existed since after the 1973 Arab oil embargo**

In late June, an article in *The Wall Street Journal* revealed that the U.S. Commerce Department’s Bureau of Industry and Security (BIS) had granted permits to two Texas producers, Pioneer Natural Resources (PNR-NYSE) and Enterprise Product Partners (EPD-NYSE), enabling them to export some of their Eagle Ford light oil output. Immediately, the question was posed as to whether these permit awards reflected a change in federal government policy with respect to the exporting of American crude oil, a ban that has existed since after the 1973 Arab oil embargo forced this country to examine the outlook for our domestic oil industry. Whether the U.S. should allow exporting some of its domestic output has become a hot topic among industry participants, economists and politicians. The concern is that the gains we have made in reducing our nation’s oil import bill as result of the tight oil and shale oil revolution would be lost as opponents of exports believe producers would elect to export their high quality oil to international markets that are willing to pay higher prices than available here. That eventuality would lead to higher domestic oil prices and higher heating oil and gasoline prices for consumers.

### Exhibit 6. Oil Exports Growing Despite Limits

U.S. crude exports (January 1995-April 2014)

thousand barrels per day



Source: EIA

**The U.S. has allowed small amounts of crude oil to be exported, but primarily to our neighbors to the north and south**

There are a couple of facts about the domestic oil market that should be kept in mind as we consider the export debate. First, the U.S. allows the oil industry to export refined petroleum products because our refining industry is capable of producing more refined product (gasoline, diesel, heating oil, etc.) than the country needs at certain times of the year. The U.S. has allowed small amounts of crude oil to be exported, but primarily to our neighbors to the north and south, as Exhibit 6 on the previous page demonstrates.

As often happens, it is the details that need to be focused on to understand what these permits allow and whether they signal anything other than one-off events. An article by Sandy Fielden, who tweets as @ThatEnergyGuy, discussed the permit issue. In the article, he presented an excellent discussion of the technical details of condensates, which are often described as light oil. He wrote about condensates in his article, saying:

**BIS regulations also define lease condensate as crude oil**

“Condensates are light hydrocarbons containing a significant percentage of naphtha range material. There is no universal standard for what defines a condensate, but some number between 50 and 55 degrees API gravity is typically the dividing line used to differentiate condensates from light crude oil. Some condensates can get much lighter, 80 degrees API or even higher. US condensate is arbitrarily divided into two broad categories. The first is lease condensate produced at or near the wellhead when it condenses from natural gas at surface temperature and pressure. Some lease condensate is also produced at the wellhead in stabilizer units designed to remove heavier hydrocarbons from natural gas. The second category is plant condensate, also known as natural gasoline, pentanes plus or C5+, that remains suspended in natural gas at the wellhead and is removed at a gas processing plant. Both categories of condensate are substantially similar in composition but the EIA arbitrarily defines lease condensate as crude oil and plant condensate as a natural gas liquid (NGL - pentanes plus). Furthermore, BIS regulations also define lease condensate as crude oil. As such, lease condensate is included in BIS regulations introduced in the 1970’s to restrict the export of US crude oil except to Canada or in specific circumstances from Alaska and California. Thus, lease condensate exports are prohibited even though plant condensate exports are perfectly legal.” *(Edited to eliminate references to prior articles and make text consistent with prior references.)*

**BIS appears to have changed the definition of what it means to be “processed through a crude oil distillation tower”**

So what is going on with the permits? BIS appears to have changed the definition of what it means to be “processed through a crude oil distillation tower.” Prior to the granting of these permits, the industry’s assumption was that in order to export lease condensate you needed to send it through a refinery distillation tower. Now the question is has BIS redefined the “refinery distillation tower” terminology to include treating condensate through a wellhead process called stabilization. Stabilization is the process used to

**A stabilizer is designed to make lease condensate stable and safer for pipeline transportation**

extract most field condensates, and it is done by separating out lighter, more volatile components of the condensate stream from its heavier liquids. The heavier products are sent into pipelines or stored in well site tanks to be picked up by trucks or to be shipped by pipelines later. A stabilizer is designed to make lease condensate stable and safer for pipeline transportation. The important point is that the stabilizer is designed to make condensates safer for transport and not to break it into its component parts.

**RBN estimates there are 1.2 million barrels a day (mmb/d) of lease condensate being treated by stabilizers, which it predicts will grow to 1.6 mmb/d by 2018**

If BIS has redefined the amount of processing needed to transform lease condensate into a product that can be exported, then we would have a potential game-changing policy. Mr. Fielden blogs for RBN Energy and in his tweet he said that RBN estimates there are 1.2 million barrels a day (mmb/d) of lease condensate being treated by stabilizers, which it predicts will grow to 1.6 mmb/d by 2018. Presumably, all of this output would be eligible for export if BIS truly has changed its definition. What some people are wondering is whether this change in the treatment definition might encourage producers to treat other light oil streams in order to be able to export it. BIS has stated it has not changed the crude oil export policy and most industry analysts accept the statement at face value. They argue that BIS knows it would need congressional legislation to overcome the 1975 crude oil export ban. Given concerns among Washington politicians that allowing U.S. crude oil exports will help corporations and hurt consumers, it is hard to see any export legislation being approved.

**This move overthrew a practice outlined in the Outer Continental Shelf Lands Act (OCSLA) enacted in 1953**

We are not so sure we can accept the BIS statement at face value. We cite the industry's experience with the Bureau of Safety and Environmental Enforcement's (BSEE) actions enabling it to regulate offshore service companies as our rationale. In that case, the head of the agency announced the change to an audience of industry players at an Offshore Technology Conference meeting. He said BSEE always had that power and given what happened at the Macondo well blowout, the agency would exercise that power. This move overthrew a practice outlined in the Outer Continental Shelf Lands Act (OCSLA) enacted in 1953. The government was to regulate through the lessee/operator who held the license. Any issue with contractor actions would result in the operator being cited. The operator was then responsible for making sure the contractor corrected his actions.

**BSEE's regulatory shift also created joint and several liability requirements, meaning that each contractor and operator is legally liable for the actions of every other party working at the well site**

BSEE is now able to cite contractors directly for actions considered unsafe or in violation of offshore regulations. BSEE's regulatory shift also created joint and several liability requirements, meaning that each contractor and operator is legally liable for the actions of every other party working at the well site. As a result of Macondo litigation, the court determined that service contractors cannot contract immunity from fines related to violations of environmental laws. The offshore service industry recently became motivated to challenge

**The system of offshore regulation that worked for 60 years has been turned upside down by BSEE's action**

BSEE's regulatory shift, but it may be too late. Legal research has demonstrated that in the debate leading to the 1953 OCSLA legislation, contractors were removed from the final legislation. This suggests legislators understood the chaos that would come from the government regulating both contractors and lessees/operators. The system of offshore regulation that worked for 60 years has been turned upside down by BSEE's action. Given this history, we caution people who assume BIS isn't making a policy change to wait for more explanation.

**As light oil output continues to increase, the U.S. is experiencing a growing glut of this supply that is not easily used by the domestic refining industry**

In our view, the \$64 question about these permits is: Why now?

We will offer a view at a high level, recognizing that none of us truly knows the answer. The shale revolution has produced dramatic increases in domestic crude oil production that when coupled with demand reductions following the recession, the slow economic recovery and social considerations has cut our oil imports meaningfully. As light oil output continues to increase, the U.S. is experiencing a growing glut of this supply that is not easily used by the domestic refining industry. This glut is holding down U.S. commodity prices - currently trading at about a \$7 per barrel discount to Brent crude oil. Future oil prices point to the per-barrel-price-spread widening to \$11-\$12 meaning that domestic producers are losing revenues and profits, and presumably impacting their drilling activity. A change in the treatment definition for condensate that allows it to be exported would help producers. So why would the Obama administration, clearly unfriendly to the energy industry, want to help oil producers, possibly at the expense of consumers?

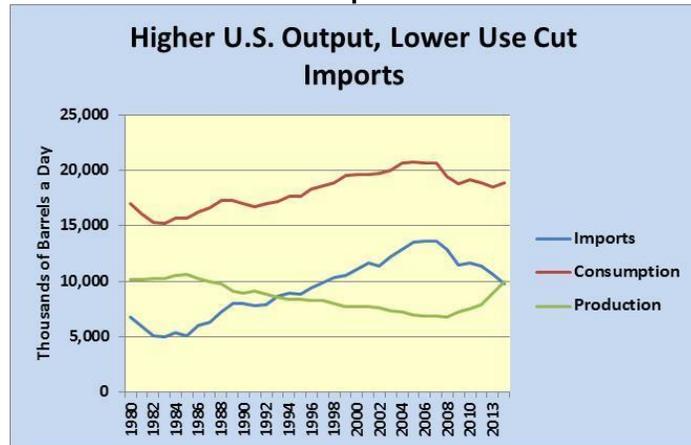
**The closing of the \$7 per barrel price spread between domestic and international oil prices equates to about 17-cents per gallon of gasoline**

Higher oil prices would encourage producers to continue increasing activity and add more jobs. More money would be spent adding stabilizer facilities to further expand output to be exported, again creating jobs. The closing of the \$7 per barrel price spread between domestic and international oil prices equates to about 17-cents per gallon of gasoline. That would lift average gasoline prices close to \$4 per gallon, which has historically been the crossover point in consumer use of oil and the types of cars they buy – more fuel-efficient and more alternative-powered vehicles. Less driving would increase demand for mass transit and maybe cause people to relocate from the suburbs to urban locations. Several of these outcomes are part of the Obama administration's long-standing environmental agenda. From a perverse point of view, these actions would contribute to higher output and reduced demand that would contribute to less imported oil.

**Democratic politicians would not be forced to vote prior to the mid-term election on whether to allow crude oil exports**

Another political aspect of a BIS export policy shift is that Democratic politicians would not be forced to vote prior to the mid-term election on whether to allow crude oil exports. From Senator Majority Leader Harry Reid's (D-Nev.) position, any action that avoids difficult political votes is a positive for his party in the upcoming election.

Exhibit 7. America's Oil Import Bill Has Gone Down



Source: EIA, PPHB

**We are certainly not placing any bets based on the analysis, and we are not certain that the BIS move is a major policy change, but then again we can't rule it out**

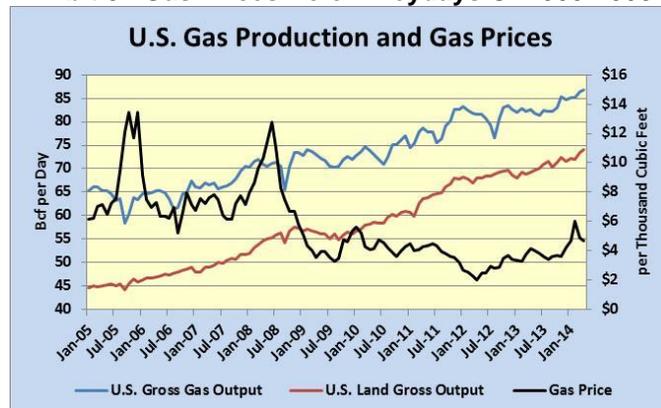
We fully understand if you think this armchair political analysis seems crazy. On the other hand, it might just be correct. We are certainly not placing any bets based on the analysis, and we are not certain that the BIS move is a major policy change, but then again we can't rule it out. If it is a stealth policy change, we will all be spending the balance of 2014 trying to understand how the energy industry will change.

## Health Of The Natural Gas Market Good For Consumers

**Supply continues to grow, as well as storage volumes and gas prices are falling**

Developments in the natural gas market point to good news for consumers. Supply continues to grow, as well as storage volumes and gas prices are falling. These developments should provide comfort to consumers dependent on natural gas for heating and cooking, as well as the generation of electricity. The news may not be quite as favorable for producers who see gas prices falling closer to \$4 per thousand cubic feet (Mcf) from a range closer to \$4.90/Mcf.

Exhibit 8. Gas Prices Below Heydays Of 2005-2008

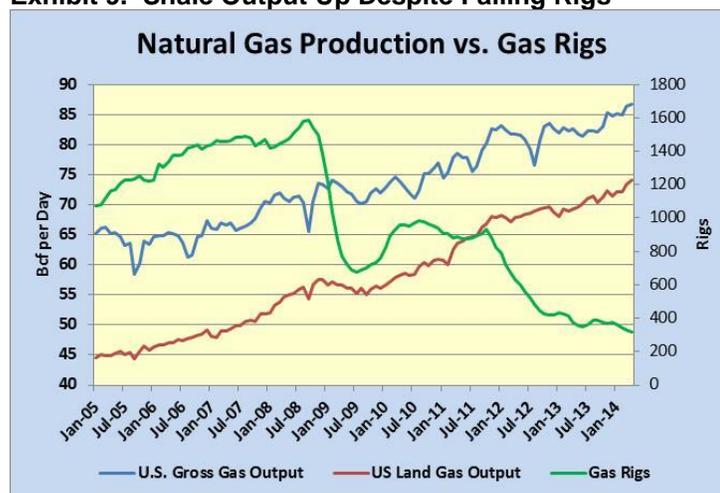


Source: EIA, PPHB

**The Form 914 gas production survey data showed that April production from the Lower 48 land market increased by 0.81 Bcf/d to 74.12 Bcf/d**

The Energy Information Administration (EIA) released an estimate of gross natural gas production for April 2014 of 86.76 billion cubic feet per day (Bcf/d), which increased by 0.56 Bcf/d from the revised March figure. Importantly, the Form 914 gas production survey data showed that April production from the Lower 48 land market increased by 0.81 Bcf/d to 74.12 Bcf/d. The only cautionary note we would offer is that the March 2014 Lower 48 land output was revised lower for the first time in seven months, extending back to the fall of 2013. At that time, a one month negative revision interrupted a string of months with positive revisions.

#### Exhibit 9. Shale Output Up Despite Falling Rigs



Source: EIA, PPHB

**In May, the gas rig count was higher than in April, which suggests output grew in that month**

We offer this possible offset to concern over March's downward revision: natural gas output has grown over the past eight months despite a falling gas-oriented rig count. In May, the gas rig count was higher than in April, which suggests output grew in that month, which will be reported at the start of August.

**So far this injection season, we are averaging slightly over 83 Bcf per week, the highest average weekly injection volume since the early 1990s**

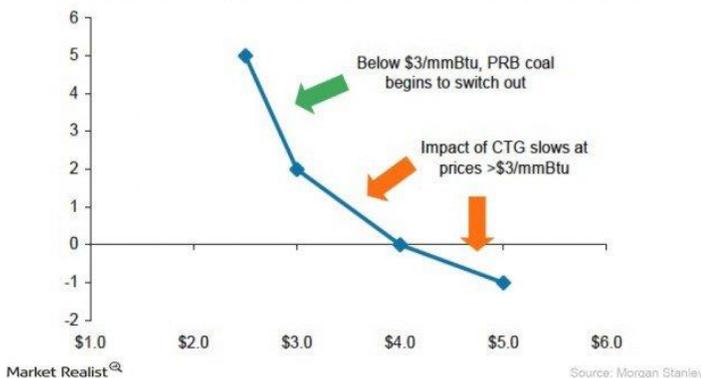
The other good news for gas consumers is that last week's storage injection was 100 Bcf, essentially in line with estimates. It marked the seventh consecutive week of triple-digit injections and the seventh week of equal or better injections than experienced in 2013. So far this injection season, we are averaging slightly over 83 Bcf per week, the highest average weekly injection volume since the early 1990s. Of course we are only about a third of the way through the injection season. The industry remains in a deep hole relative to reaching storage levels experienced in the past few years. We are entering the traditionally hot weather months, which should result in increased consumption leaving less gas for injection into storage. Increased gas production would help offset some of the increased gas usage, as well as continued over-performance of nuclear power plants. Utility fuel choice between gas and coal will depend on individual plant economics, but that choice could also help storage.

**Exhibit 10. Utility Gas Consumption Depends On Price**

**Momentum of Coal-to-Gas Switching**

**The Momentum of Coal-to-Gas Switching Slows At Gas Prices Above \$3/mmBtu**

(x-axis: NG price, \$/mmBtu; y-axis: 2013 est CTG vs. 2011 levels, bcf/d)



Source: *Market Realist*

**As prices have fallen closer to the \$4/Mcf level, we could begin to see more utility usage of gas to generate electricity**

Natural gas prices have fallen in the past week increasing the incentive for utilities to ramp up use of gas rather than coal. The analysis presented in Exhibit 10, shows what happened with respect to the consumption of natural gas versus coal during 2013. The chart shows that with a gas price of \$3 per million Btu, the utility industry would burn an additional 2 Bcf of gas relative to consumption in 2011. As prices have fallen closer to the \$4/Mcf level, we could begin to see more utility usage of gas to generate electricity.

**it remains to be seen whether Mother Nature will help or hurt demand during the balance of the summer**

While consumers have to be pleased by last week's gas market data points, it remains to be seen whether Mother Nature will help or hurt demand during the balance of the summer and whether gas production continues growing. If either or both trends change, the tone of the natural gas market could shift dramatically.

**Struggling To Make Electric Vehicles Mainstream**

**Year-to-date, LEAF sales are up almost 30% from the same period for last year**

Nissan (NSANY-OTC), the manufacturer of the LEAF electric vehicle (EV) has been the number one seller in the U.S. The June auto sales figures showed that Nissan sold 2,347 LEAF vehicles, up 5.5% over the sales for June last year, although they were down 770 units from May's sales results, which was the record month for sales. June marked the 16<sup>th</sup> straight month of record sales compared to the prior year month. Year-to-date, LEAF sales are up almost 30% from the same period for last year. So far in 2014, Nissan has sold 12,736 LEAFs versus 9,839 sold last year. Given its strong sales performance, one has to wonder about the latest announcement of the replacement battery pack pricing for the LEAF.

**Exhibit 11. 2014 LEAF Electric Car**

Source: [youngmanblog.com](http://youngmanblog.com)

**The replacement lithium-ion battery pack for the LEAF will sell for \$5,499, after credit of \$1,000 for the old pack**

The company announced that the replacement lithium-ion battery pack for the LEAF will sell for \$5,499, after credit of \$1,000 for the old pack that must be traded in, plus installation fees and taxes. Nissan estimates installation will require roughly three hours of labor that based on labor rates of \$90 to \$120 per hour, adds another \$300 to the cost. Nissan also introduced a special installation kit to make the battery pack “backward compatible” with 2011 and 2012 models. That kit costs \$225.

**The 24 kilowatt-hour battery pack will employ new heat-tolerant chemistry cells that reduce the loss of capacity batteries normally experience when operating in very high temperatures**

The most interesting development is that the replacement battery pack will use new chemistry to address consumer criticisms of vehicle performance. The 24 kilowatt-hour battery pack will employ new heat-tolerant chemistry cells that reduce the loss of capacity batteries normally experience when operating in very high temperatures. The new battery chemistry cells will be deployed in all future LEAF vehicles starting with the 2015 model, now on sale. The new battery chemistry cells, however, will not extend the battery’s range or improve its performance. LEAF advocates call the new battery the “lizard battery” because it is more capable of resisting the damage from very high temperatures. Unlike other EVs, the LEAF uses positive cooling for its battery, meaning it sheds heat to the air rather than to either cooled air surrounding the battery pack or liquid coolant circulating through the battery pack itself. Battery capacity loss in extremely hot regions such as Arizona, Texas and Southern California has been a primary complaint of LEAF owners in those areas. Nissan anticipates these new battery chemistry cells will overcome consumer criticism and hesitancy for purchasing a LEAF. Auto analysts had been speculating that Nissan might introduce a higher capacity battery, but there was no hint of this in the company’s announcement. Nissan recommends replacing the battery pack when it falls to 70% of its initial capacity. The new sales plan replaces a lease plan Nissan had introduced in June 2013 that drew substantial criticism from vehicle owners.

**Nissan is providing a financing plan for replacement battery buyers**

Nissan is providing a financing plan for replacement battery buyers. They would pay \$100 a month for five years and then own the battery pack outright. The replacement battery pack is warranted for eight years or 100,000 miles against defects from manufacturing. It has a five-year or 60,000 mile warranty against loss of capacity beyond nine out of 12 bars of capacity, or roughly 70% of the original capacity.

**As of the end of June, Nissan has sold 125,000 LEAFs worldwide, with 56,000 in the United States**

Analysts estimate that Nissan is losing money on the replacement battery pack based on the pricing. They assume the company is counting on very low replacement demand initially and that future economies of scale in battery making will improve profitability, especially as EV sales grow. As of the end of June, Nissan has sold 125,000 LEAFs worldwide, with 56,000 in the United States. (We have not been able to find any statistics on how many LEAFs were purchased by government agencies.) Commentary from Nissan sales executives about their June results referenced the strong sales they experienced in Texas now that the state has introduced a \$2,500 tax subsidy for the purchase of EVs, except for the high-priced Tesla (TSLA-Nasdaq) vehicles. According to comments from Toby Perry, Nissan's director of EV Sales and Marketing, "Since the Texas state incentive went into effect in May; we've seen a big jump in LEAF sales in the Austin, Dallas and Houston markets. Our dealers are telling us that they saw more traffic in their stores, and they had their best LEAF sales performance in the last weekend in June."

**In 2011, Mr. Ghosn predicted that his combined companies would sell 1.5 million EVs by 2016**

As the market leader in plug-in EVs, Renault-Nissan CEO Carlos Ghosn has been a strong proponent of EVs and has made bold predictions about future growth for this market segment. In 2011, Mr. Ghosn predicted that his combined companies would sell 1.5 million EVs by 2016. Late last year in an interview with the *Financial Times*, Mr. Ghosn admitted that his forecast would not be met; not because the vehicle was too expensive, but due to a lack of EV-charging infrastructure. "I don't think the main issue today is the cost of the car," he said. "The main issue is infrastructure. It is normal. I would not buy a gasoline car if there were no gasoline stations."

**Research by many automakers shows that the installation of public charging infrastructure is as much about providing a perceived solution for range anxiety as it is for providing a place for EV owners to plug in**

With average daily commutes well under 30 miles a day, most EV owners don't need to charge anywhere during the day, but that doesn't eliminate the 'range anxiety' in potential EV buyers. Research by many automakers shows that the installation of public charging infrastructure is as much about providing a perceived solution for range anxiety as it is for providing a place for EV owners to plug in. The presence of public charging stations is akin to the comfort that comes for owners of typical autos by gasoline stations being nearby. This auto research suggests that more car buyers would purchase EVs if they knew they could recharge in an emergency away from home. This means that more charging stations are needed along with stations that can quickly charge cars.

Drivers do not want to be held captive for hours to recharge their car when the time to fill-up at a gasoline station is merely minutes.

#### Exhibit 12. 2013 Fiat 500e Electric Car



Source: [autoblog.com](http://autoblog.com)

**The company's plan is to sell the minimum number of EVs it is required by law to sell, at whatever financial loss the company must bear, and then not to sell one more**

**"At the speed right now, I'm seeing it more four or five years later."**

**The LEAF has yet to sell 3,000 cars in any month, and still seems to be dependent on tax subsidies, which probably is a reason why it priced its replacement battery pack as cheaply as it did**

We wonder what market research Fiat Chrysler (FIATY-NYSE) did. Its CEO Sergio Marchionne spoke about his company's 500e EV at the Brookings Institution in Washington, D.C. He told the audience, "I hope you don't buy it, because every time I sell one it costs me \$14,000." The reason the 500e exists is to meet zero-emission rules in California and elsewhere that might impose similar mandates. The company's plan is to sell the minimum number of EVs it is required by law to sell, at whatever financial loss the company must bear, and then not to sell one more. Mr. Marchionne also said that if automakers are forced to suffer losses on EVs in order to satisfy political policies, then the companies will be back in Washington asking for new bailouts.

In his *Financial Times* interview, Mr. Ghosn said, "We will not be there (his 1.5 million car sales target for 2016). "At the speed right now, I'm seeing it more four or five years later. We have to admit, it is slower than we thought. But it is slower for the reason that we thought infrastructure building would be faster. It is not."

After learning about making aggressive forecasts, Mr. Ghosn seems to have learned the classic point about forecasting – give a volume but not a date. In speaking during a CNBC interview when opening Nissan's Smyrna, Tennessee EV plant, he said, "We are now on a trend of 3,000 cars a month in the U.S., which is about 36,000 cars (per year). The next step is moving up to 4,000 a month which is going to be approximately 50,000." The LEAF has yet to sell 3,000 cars in any month, and still seems to be dependent on tax subsidies, which probably is a reason why it priced its replacement battery pack as cheaply as it did, attempting to dispel EV critics who said replacement battery packs would cost upwards of \$10,000.

**Mercedes-Benz recently demonstrated a diesel-hybrid sedan that traveled 1,200 miles on a single tank of fuel, or 60 miles per gallon**

A writer on the web site *Inside EVs* speculated that the LEAF's price needed to be cut from its current \$32,000 level to under \$25,000 in order to boost sales to the 3,000 cars per month level, or the second generation LEAF needed to be able to comfortably deliver a minimum of 125 miles on a single charge with the vehicle priced at the current level. Maybe one of the challenges for EVs is that competitive vehicles without range anxiety are making huge mileage improvements. Mercedes-Benz (DDAIF-OTC) recently demonstrated a diesel-hybrid sedan that traveled 1,200 miles on a single tank of fuel, or 60 miles per gallon. With competition like that, it is reasonable to predict that EVs will remain a niche vehicle market segment and not likely to revolutionize the automobile business. Will that mean automakers will fall short of attaining President Barack Obama's 54.5 miles per gallon CAFE standard by 2025? Remember, in calculating that standard, EVs are counted twice while hybrids are counted 1.6 times a conventional internal combustion engine vehicle. Look for more government money to go to charging stations, subsidies for EV purchases, easier access to high occupancy vehicle lanes, and possibly clean vehicle mandates, much like renewable fuel standards. Maybe Mr. Marchionne will change his mind about selling more 500es.

## Canada And Its Natural Resource Economy Challenge

**A focal point of the currently deteriorating relationship has been the Keystone XL pipeline**

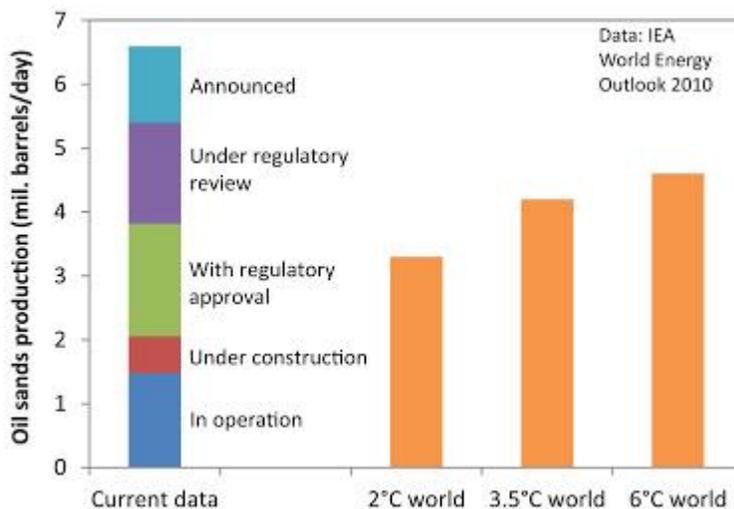
For decades, Canada has been a supplier of natural resources and agricultural goods to the United States. Historically, relations between the two countries have been good with minor disagreements at times, but generally we have had a symbiotic relationship. That positive relationship existed until the arrival of our current president and his administration. A focal point of the currently deteriorating relationship has been the Keystone XL pipeline. While the debate over approving the construction of the pipeline leg across the Canadian/US border has been the contentious point, below the surface has been Washington's disdain for Alberta's oil sands. In a May 9, 2012, Op-ed for *The New York Times*, global warming activist James Hansen, a climate scientist formerly director of NASA's Goddard Institute for Space Studies, wrote "If Canada proceeds (to exploit its oil sands resources), and we do nothing (about climate change), it will be game over for the climate." The 'game over' quote has become to mean that any exploitation of Canada's oil sands will add so much carbon emissions into the atmosphere that the planet will experience global temperatures well above the Intergovernmental Panel on Climate Change's (IPCC) acceptable climate model that allows only a 2° C increase by 2100.

A blog by Simon Donner, a professor in the Geography Department of the University of British Columbia discussed the debate over the carbon intensity of the oil sands. He pointed to an "article published by Neil Swart and Andrew Weaver that found the total amount of carbon stored in the oil sands is 'only' sufficient to raise the world's

**“If all the oil sands projects with regulatory approval go ahead, oil sands production will exceed the level expected to occur in a +2°C world”**

temperature by 0.24-0.50°C.” Based on this conclusion and the fact that exploitation of the oil sands would take years to occur, the Keystone pipeline would have minimal impact on global warming, not “game over” as Mr. Hansen claims. But Mr. Donner goes on to point out that based on modeling by the International Energy Agency (IEA), “if all the oil sands projects with regulatory approval go ahead, oil sands production will exceed the level expected to occur in a +2°C world. If the projects under regulatory review all go ahead, oil sands production will be higher than that in the IEA’s +6°C scenario.”

**Exhibit 13. Oil Sands Volume Impacts Temperatures**



The first column is existing, planned and announced oil sands projects; The orange bars are oil sands production in the IEA future scenarios. Production is assumed to be 80% of capacity, following the IEA methods.

Source: **Simon Donner**

**Canadians may finally understand, if they don’t already, that they need to develop alternative oil and gas export routes**

To the extent our environmental movement can convince President Obama to reject the Keystone pipeline permit, despite a favorable environmental report by the State Department, Canadians may finally understand, if they don’t already, that they need to develop alternative oil and gas export routes. The recent decision to approve the Northern Gateway pipeline project that would move bitumen from the Athabasca oil sands deposit an export terminal on the Pacific Coast may be a step in executing a new national energy strategy. There are doubts the pipeline will be built. TransCanada Corp. (TRP-NYSE) still must recertify its Keystone permit in South Dakota, which will face opposition. At the same time, it continues to develop its Energy East oil export pipeline to the Atlantic coast.

To better understand the tension between Canada and the United States, a column in the *Ottawa Citizen* written by Mark Kennedy discussed an interview of Bruce Heyman, the new U.S. ambassador to Canada, conducted by former Canadian ambassador to the U.S., Frank McKenna. We quote from the article below:

**“The U.S. ambassador to Canada found himself publicly on the defensive”**

“The U.S. ambassador to Canada found himself publicly on the defensive Monday night over his country’s delay in deciding whether to approve the proposed Keystone XL pipeline.

“And the person putting him on the hot seat was none other than a former Canadian ambassador to the U.S.

“The exchange occurred after American ambassador Bruce Heyman delivered a speech to an Ottawa audience that touched on topics such as the economy, energy and the environment, and global affairs.

“Afterward, as the dinner crowd assembled by the Canada 2020 think tank looked on, Heyman sat down to take questions from Frank McKenna, a former New Brunswick premier who later became Canada’s top envoy to the U.S.

“McKenna wasted no time in getting to the point: Why won’t President Barack Obama’s administration make up its mind on the proposed pipeline to ship bitumen from Alberta to the U.S. Gulf Coast?

**“Keystone is an issue that is a proxy for a lot of Canadians”**

“Keystone is an issue that is a proxy for a lot of Canadians,’ said McKenna, who added that Canadians believe they deserve better treatment and a quicker answer.

**“We could be years waiting”**

“We could be years waiting,’ he said, in reference to the most recent U.S. delay in April that stems in part to a legal action in Nebraska.

“That doesn’t seem fair to Canadians. On this one, we don’t feel the love.’

“Heyman said the U.S. is following a “process” that requires extensive examination of the issue and a review of three million comments submitted to the government.

“People are very emotional and excited about this issue on all sides,’ said Heyman.

“We understand this is a serious issue for Canadians. This is also a really serious issue for Americans.’

**“Heyman urged McKenna to look beyond the irritants caused by such issues”**

“Heyman urged McKenna to look beyond the irritants caused by such issues and realize that the Canada-U.S. relationship is strong. He compared it to buying a brand-new car and being distracted by a small scratch; better to appreciate the car itself.

“McKenna asked if the U.S. is willing to discuss a joint greenhouse gas emissions reduction plan. The American ambassador said his country is willing to talk about that.

“But we’re not setting this up as a quid pro quo,’ he said of the

**The testiness of the relationship between Canada and the U.S. over a number of economic and political issues surfaced in these interviews**

Keystone decision.

“Heyman said that whatever problems Canada and the U.S. experience from ‘one issue,’ the broader solid relationship will prevail.

“We’ll get through this,’ he said.”

Note the comment that the review process could take “years” as the State Department deals with the three million public comments it received during the last open review period – the vast majority of which are form letters, a point Ambassador Heyman acknowledged in a different interview. He also pointed out the legal challenge to the pipeline route approval and how that forced the State Department to grant more time (unlimited) to the other government agencies that need to sign off on the Keystone permit application, a point not raised in the McKenna interview. The testiness of the relationship between Canada and the U.S. over a number of economic and political issues surfaced in these interviews. The deteriorating relationship should be further motivation for Canada to move forward on developing an energy strategy based on exports to non-U.S. markets.

## Warmists And Storm Damage; Here Is A Mindset Problem

**The warmists also point to the higher costs that have come from the increased storm damage**

People worried about global warming always point to the fact that higher temperatures will cause sea levels to rise, increase the intensity and frequency of hurricanes and tornadoes, as well as make droughts worse. The warmists also point to the higher costs that have come from the increased storm damage. Because there have been very few storms to hit the U.S. coast in recent years, the warmists focus on the extensive damage Super Storm Sandy inflicted on coastal communities in New Jersey and New York. Sandy was a marginal hurricane that actually was only a tropical storm when it came ashore in the New York City area.

**As the train passed through western Connecticut, he began to notice a “disturbing trend”**

*The Westerly Sun* newspaper in Rhode Island carries a weekly article called “On the Docs” written by Captain Fred DeGrooth, a native of the area and with 30+ years of experience navigating Rhode Island’s coastal waters. We usually check his column to learn what is happening in the local harbors and offshore waters, along with keeping up on environmental issues. In his latest column, Capt. DeGrooth wrote about needing to attend a meeting in New York City so he chose to take an Amtrak train from Westerly. His meeting ended early so he caught an earlier train back to Rhode Island. Unfortunately, the Internet was out on the train so he passed the time looking out the window. As the train passed through western Connecticut, he began to notice a “disturbing trend.” To quote him, “The train was traveling along Long Island Sound. Beautiful views of the bays, estuaries, and rivers began to pass by and then it hit me. Why am I looking at the coastline? The most

**“If they had decided to move the tracks inland, the bridges could have been torn down along the coast, opening up rivers, bays and estuaries creating, you guessed it, an estimated \$1 billion increase in real estate valuation!”**

valuable resource and most expensive real-estate we have in the Northeast?”

Curious about why the railroad had laid its tracks right along the coast, Capt. DeGrooth decided to research the railroad industry. He wrote about railroad history and the high-speed trains of the Northeast Corridor – the Metroliner and Acela. He found some interesting facts and perplexing questions. Again, quoting Capt. DeGrooth: “Here is the real head-shaker: the government spent \$1.2 billion on the project, including upgrading rail and all the bridges along our coastline between Boston and DC, plus millions of dollars electrifying overhead lines on those same tracks. Experts say if they had removed the rails along the coastline and built the tracks alongside or in the middle of Interstate-95, the cost could have been cut in half, saving \$500 million. Here is another head-scratcher: If they had decided to move the tracks inland, the bridges could have been torn down along the coast, opening up rivers, bays and estuaries creating, you guessed it, an estimated \$1 billion increase in real estate valuation!”

#### **Exhibit 14. How To Open Coastal Connecticut**



Source: Amtrak

**What appears to be lost on Capt. DeGrooth is that all this development would come at a cost – increased risk of damage from hurricanes and Nor'easters**

By tearing down the bridges, Capt. DeGrooth points to opening up the rivers, bays and estuaries for boaters, and presumably increased water flow, but we're not completely sure about that fact. But the most important point seems to be that the removal of the bridges would create \$1 billion in increased real estate valuation, which would only come from increased development of the coastline. This would translate into more people living and working along the coast with high-priced homes and other structures. What appears to be lost on Capt. DeGrooth is that all this development would come at a cost – increased risk of damage from hurricanes and Nor'easters. More coastal development not only increases the risk of damage and potential loss of life, but it also changes the way nature deals with storm surges and flooding. These risks are potentially higher today than they might have been a few years ago. Meteorological

**A law to increase flood insurance premiums was derailed by politicians who didn't want to hurt people who could not afford the rate hikes despite it being good fiscal policy**

conditions in the Atlantic basin have changed with the result that we are now in a pattern in which most of the hurricanes, instead of targeting the Gulf Coast, will now aim their furry at the East Coast. This shift brings us to a hurricane pattern similar to that which prevailed during the 1940s to early 1960s.

With a National Flood Insurance Program rapidly going broke due to low premiums and high losses from the increased coastal development, promoting more coastal development is a recipe for increased financial pain. A law to increase flood insurance premiums was derailed by politicians who didn't want to hurt people who could not afford the rate hikes despite it being good fiscal policy. In order to limit the cost, property owners can elevate their structures above the projected storm surge or self-insure, options people are reluctant to elect. If warmists are really concerned about global warming and rising seas, they would stop trying to promote coastal development. We doubt Capt. DeGroot thought beyond the increased coastal development that would occur if the Amtrak train bridges were removed. Moving the train tracks inland might be a wise insurance move against future storm damage, but it should not happen at the risk of increasing coastal development unless the residents are willing to assume all the risk of storm damage. Not a very likely proposition.

**Notice: The Next Issue Of The Musings Will Be July 29<sup>th</sup>**

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