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## MUSINGS FROM THE OIL PATCH

October 25, 2011

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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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### Optimistic NPC Resource Study Did Not Consider Price

In the last *Musings* we wrote about the key conclusions from the recent National Petroleum Council (NPC) report on the resource potential for oil and natural gas in North America. The report, [Prudent Development: Realizing the Potential of North America's Abundant Natural Gas and Oil Resources](#), focused on how much additional oil and gas reserves were available and how their development would solve many of the energy challenges facing the U.S. We were enlightened about both the purpose of the study and the significance of its conclusions by a presentation by Andrew Slaughter, a manager with Shell Upstream Americas, who was one of the leaders preparing the report.

**The NPC report did not consider the price of oil and natural gas in reaching its conclusions**

Mr. Slaughter made one point several times, especially in response to some of the questions following his presentation. That point was that the NPC report did not consider the price of oil and natural gas in reaching its conclusions. We found that an interesting point given some of the pronouncements in the report. On the other hand, some of the report's key observations represent interesting points about how the government and the energy industry should intersect.

**In the future, regulation needs to be upgraded and reinforced in order to keep up with the shifting focus of the E&P industry**

Increasingly the development of these potential resources will rely on new and improved technology. Mr. Slaughter made the point that technology leads regulation. In the future, regulation needs to be upgraded and reinforced in order to keep up with the shifting focus of the E&P industry. In addition, regulation needs to be fixed in a way that the industry has certainty in order to allow it to commit to long-term investments based on the assumption of price stability.

Since all aspects of the oil and gas value chain are regulated, the issue of where and how regulation impacts the industry is critical. Due to the differences in geologies, the nature of resources and

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**State and local regulation of the oil and gas industry is preferable to a federal one-size-fits-all regulatory approach according to the NPC**

regional conditions, state and local regulation of the oil and gas industry is preferable to a federal one-size-fits-all regulatory approach according to the NPC. This approach is based on the belief that local regulators gain local knowledge that enables them to better administer the rules and more quickly adopt regulation to changed operating conditions. This has been the industry's argument against the possibility of federal regulation of hydraulic fracturing. Whether the industry can prevail in this debate remains to be seen. This is especially true given that the Environmental Protection Agency is planning to regulate air quality at the well site and has just announced plans to study what regulations are needed for handling of produced water.

**The NPC believes that ultimately carbon capture and sequestration (CCS) must become part of the energy production system if one wants to improve the environmental impact of oil and gas**

There was also a point made by the report that every energy source has an environmental impact, something that some environmentalists are loath to acknowledge. Mr. Slaughter said that there needs to be a framework to compare all the energy sources as the only way to get to the real environmental impacts and trade-offs between energy sources. He said the NPC believes that ultimately carbon capture and sequestration (CCS) must become part of the energy production system if one wants to improve the environmental impact of oil and gas. With respect to the idea of pricing carbon, the NPC didn't recommend a carbon tax. They said, however, that if the policy decision is to put a price on carbon then a tax is the most efficient way to achieve that objective.

**The NPC believes that North America can increase natural gas exports without harming the domestic supply/demand situation**

The ultimate conclusion of the NPC report was that the resource base is so huge that it is sufficient to support all the national objectives for energy sources to provide economic growth, be environmentally sensitive and improve national security. Of course, developing these resources must be done properly. In the long-term, the opportunity for growth rests with natural gas as oil's outlook at best is for modest near-term growth before entering into a long-term declining trend. Natural gas, on the other hand, has room for significant production growth at modest prices.

It is this latter conclusion that becomes somewhat troubling since we were told that price was never considered in the study. The belief is that the available resource potential can meet growing supply and demand trends at a moderate cost (not a market price) with plenty of the resource remaining. In fact, the NPC believes that North America can increase natural gas exports without harming the domestic supply/demand situation, and presumably moving the price higher. For this scenario to unfold we need to see a continuation of E&P companies operating in a world where capital destruction is not only accepted but rewarded. (Where is that fairyland?)

If low natural gas prices continue, how can we expect the resource potential to be developed since under full-cycle analysis it costs more to produce than the current market price? On the other hand, if the price spikes up to insure profitability for producers, one has to

wonder about the sensitivity of demand to the higher prices. By ignoring price signals in the marketplace, one has to question the optimistic conclusions envisioned in the NPC study.

## Global Economy Sputters – Energy Demand Eroding

Riots in Greece in reaction to the government's plans to institute austerity measures; Occupy Wall Street protests have spread globally; U.S. unemployment remains stubbornly high; China's economic growth is slowing; and Europe struggling to find its way to avoid a financial/liquidity crisis similar to 2008 - these are key story lines influencing the current global economic outlook and in turn forecasts for crude oil demand and prices. As a result of recent economic deterioration and concerns about further weakness, leading energy agencies are cutting their oil consumption forecasts for both 2011 and 2012.

**The data showed that the baby-boomer generation (55-64 years old) has done considerably better compared to its parents as they were approaching retirement in the 1970s, while the younger generation has not done nearly as well as their parents**

A key problem is a lack of consumption growth, which is sputtering due to stubbornly high unemployment and citizens' low confidence about a better future. The *Globe and Mail* contained an article detailing the difference in the plight of two significant age groups in Canada over the past generation. The article was based on the conclusions from a study by Professor Paul Kershaw, a political scientist at the University of British Columbia. The study examined the growth of average incomes for 25-34 year olds and those aged 55-64 for two four-year periods, 1976-1980 and 2005-2009. The purpose of the study was to see whether these two age groups were better or worse off over a generation. The data showed that the baby-boomer generation (55-64 years old) has done considerably better compared to its parents as they were approaching retirement in the 1970s, while the younger generation has not done nearly as well as their parents.

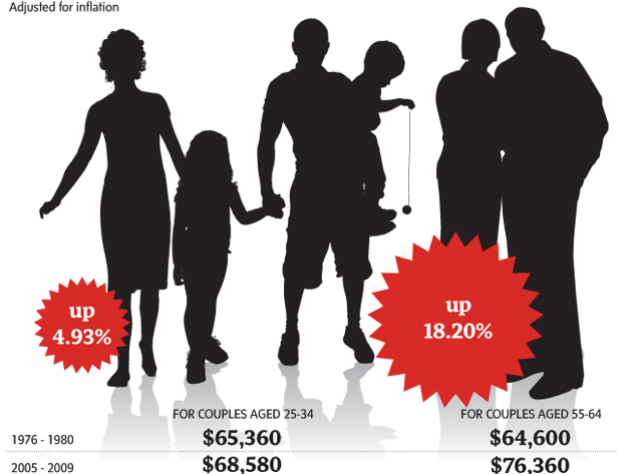
New families today have a lower standard of living than their parents' generation even though the Canadian economy has doubled since 1976. Average family income for the baby-boomers grew 18.2% compared to the younger generation's 4.9% rise. This weak performance came despite the help from a 53% increase in the contribution from young women to their family's income.

**Baby-boomers have been a huge beneficiary from the doubling of home prices in Canada**

Another observation from the study is that baby-boomers have been a huge beneficiary from the doubling of home prices in Canada, which generally represents a family's largest asset. Since the mid-1970s, housing prices have risen by 76%. As a result, baby-boomers are heading into retirement with the highest incomes and more wealth than any previous generation of retirees. At the same time, the younger generation is faced with high-priced homes requiring larger mortgages while being inflicted with stagnant wages, high unemployment and pressures to help parents while raising children.

### Exhibit 1. Young Families Failing To Gain Economically The rise in Canadian median household income

Adjusted for inflation



|          | MEDIAN HOUSEHOLD INCOME<br>For couples 25-34, adjusted for inflation |          |                   | AVERAGE COST OF HOUSING<br>Adjusted for inflation |           |                   |
|----------|--|----------|-------------------|---|-----------|-------------------|
|          | 76-'80   | '05-'09  | PERCENTAGE CHANGE | 1976  | 2010      | PERCENTAGE CHANGE |
| CANADA   | \$65,360   | \$68,580 | 5%                | \$192,390   | \$339,045 | 76%               |
| B.C.     | \$72,820   | \$68,600 | -6%               | \$202,635   | \$505,178 | 149%              |
| Alberta  | \$70,780   | \$79,080 | 12%               | \$223,448   | \$352,301 | 58%               |
| Sask.    | \$62,720   | \$66,300 | 6%                | \$144,097   | \$242,258 | 68%               |
| Manitoba | \$59,660   | \$63,100 | 6%                | \$145,618   | \$222,132 | 53%               |
| Ontario  | \$67,540   | \$72,920 | 8%                | \$203,234   | \$342,245 | 68%               |
| Quebec   | \$61,300   | \$63,440 | 3%                | \$128,984   | \$248,699 | 93%               |
| N.B.     | \$53,380   | \$59,280 | 11%               | \$136,953   | \$157,240 | 15%               |
| N.S.     | \$55,900   | \$56,400 | 1%                | \$156,604   | \$206,186 | 32%               |
| PEI      | \$54,060   | \$56,920 | 5%                | \$90,829  | \$147,196 | 62%               |
| Nfld.    | \$51,660   | \$61,580 | 19%               | \$141,007   | \$235,341 | 67%               |

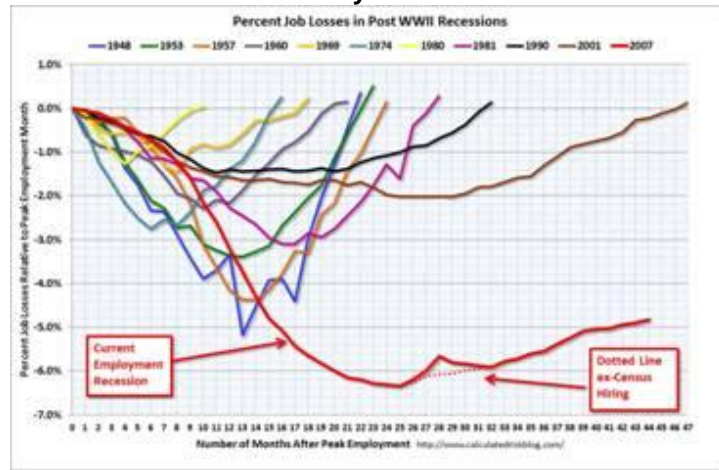
THE GLOBE AND MAIL ■ SOURCE: UNIVERSITY OF BRITISH COLUMBIA  
Source: *Globe and Mail*

**Job growth in this recovery is the worst of any period following the end of recessions since the Great Depression**

These income and wealth trends in Canada are similar to those in most developed economies around the world and are at the root of the Occupy Wall Street movement – a revolt over income inequality and a lack of prospects for an improvement in these conditions. One of the most demonstrative symbols of this problem is weak job growth following the end of the 2008-2009 recession. In fact, job growth in this recovery is the worst of any period following the end of recessions since the Great Depression.

If one examines the chart above, one finds that this recovery has been the weakest in job growth of any of the post-war recoveries. Each of the prior recoveries also required progressively longer time periods to recover all jobs lost in the recession compared to earlier recoveries. The pattern suggests structural problems exist within the U.S. labor market. The confirmation of that belief is the next

**Exhibit 2. Current Recovery Is Worst For Jobs**

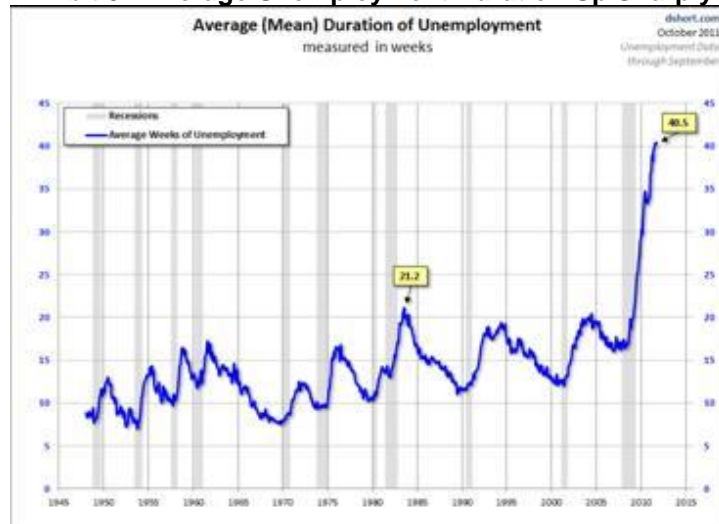


Source: Agora Financial

**Until we have a better understanding of the causes of this structural unemployment, the country will continue to operate below its growth potential**

chart showing the history of the average duration of unemployment. While most people are focusing on the near doubling in unemployment duration now compared to the last severe recession in the early 1980s, if one observes the overall pattern of unemployment duration it is clear there is an upward bias to the line since the end of World War II. The chart pattern suggests that the labor market’s structural issues are a function of other variables than merely the health of the economy. Is it a function of our educational system or maybe it is tied to shifting social values? Until we have a better understanding of the causes of this structural unemployment, the country will continue to operate below its growth potential, which limits the ability of the economy to provide adequate incomes for our citizens.

**Exhibit 3. Average Unemployment Duration Up Sharply**



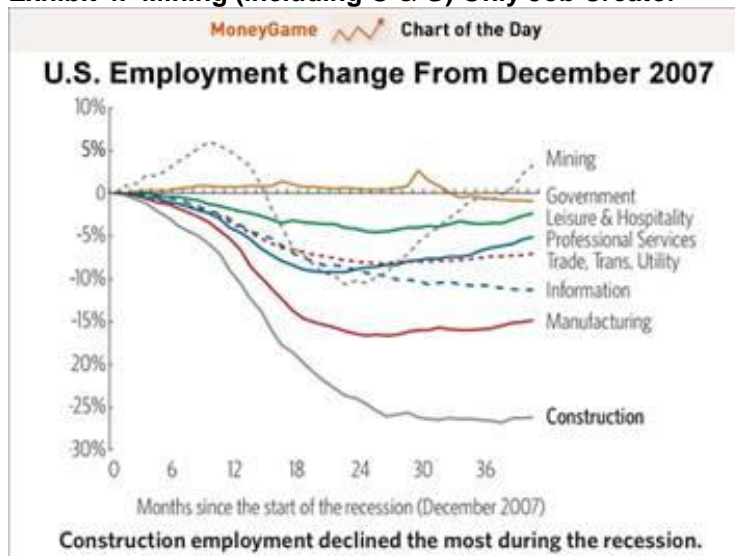
Source: Agora Financial



**Only mining showed job growth from the end of 2007**

The following chart shows that among a number of industries, only mining showed job growth from the end of 2007, or about six months before the financial crisis exploded in the fall of 2008. Even mining employment was hurt by the crisis, but because commodity prices recovered quickly, there was an incentive to hire more workers for this industry as 2009 unfolded. Oil and gas industry employment is included in the mining category.

**Exhibit 4. Mining (including O & G) Only Job Creator**



Source: Moneygame.com

**All the other countries in Europe are showing downturns in imports although Italy and the Netherlands are starting from levels above the 2008 base measurement period**

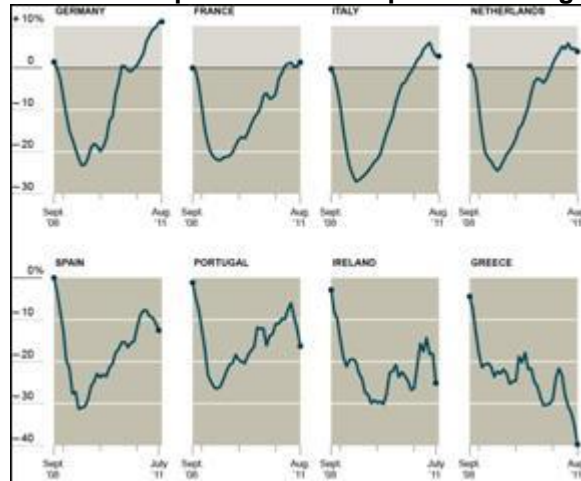
From the perspective of energy demand, the key question is what is happening to economic growth forecasts and what does it mean for oil consumption. A recent article in *The New York Times* discussed imports trends for selected European countries. The chart below is based on three-month averages of monthly data, which is then compared against the three-month average for June-September of 2008. The chart shows that Germany's imports are at a higher level than at the start of the financial crisis in 2008, although the latest monthly data showed a decline but not strong enough to alter the direction of the average. The data for France shows it has experienced a volatile pattern in recent months, but overall the country is about where it was in mid 2008. All the other countries are showing downturns in imports although Italy and the Netherlands are starting from levels above the 2008 base measurement period.

*The New York Times* article made the following observation about the import situation for these countries in Europe. "Trade volumes recovered after credit market conditions eased, and many economies began growing again. That trend is continuing for countries whose economies are in decent shape, but in others, the recovery in trade appears to be over. This time, the issue often a simple one: the buyers cannot afford what they used to buy."

**Because so much of Europe's government revenues are dependent upon consumption taxes, reduced consumer spending means a squeeze on government revenues**

If the consumers in most of these European countries cannot afford to buy what they used to that does not bode well for future consumption growth and improved economic activity. Moreover, because so much of Europe's government revenues are dependent upon consumption taxes, reduced consumer spending means a squeeze on government revenues. That suggests it will be a challenge for governments to find the money necessary to solve their sovereign debt problems.

**Exhibit 5. Imports Show European Suffering**

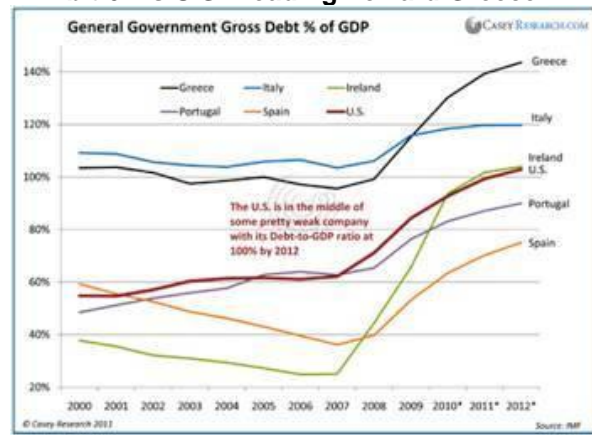


Source: *The New York Times*

**The United States is rapidly moving into the company of the most troubled European countries**

When we look at the sovereign debt situation, we see that the United States is rapidly moving into the company of the most troubled European countries based on the ratio of government debt to gross domestic product. While this is not a particular encouraging outlook, the size and strength of the U.S. economy should enable it to avoid the problems challenging the PIIGS (Portugal, Italy, Ireland, Greece and Spain) economies.

**Exhibit 6. Is U.S. Heading Toward Greece?**



Source: Casey Research

**It will take considerable time to correct these imbalances, or the economy needs to experience severe pain by letting asset prices fall**

For the U.S. economy to revive we need to stimulate consumer spending. To see how difficult that is, one only needs to look at the following chart. It shows retail sales adjusted for population growth and inflation. After those adjustments, current retail sales are about where they were in April 1998. What that means is that we are where we were before the blowout phase of the technology boom and the housing bubble. There was a huge amount of capacity – homes, retail and distribution space, and manufacturing plants – built to meet what now appears to have been artificially-stimulated spending spree. It will take considerable time to correct these imbalances, or the economy needs to experience severe pain by letting asset prices fall. So far the government has not been willing to inflict that pain on the citizens so it has resorted to economic stimulus and/or injecting large doses of liquidity into the financial system. It appears that neither of these actions has been able to correct the situation.

**Exhibit 7. U.S. Unwinds Impact Of '90s and '00s Boom**



Source: Moneygame.com

**Both the International Energy Agency (IEA) and the Organization of Petroleum Exporting Countries (OPEC) have reduced their forecasts for oil consumption for both 2011 and 2012**

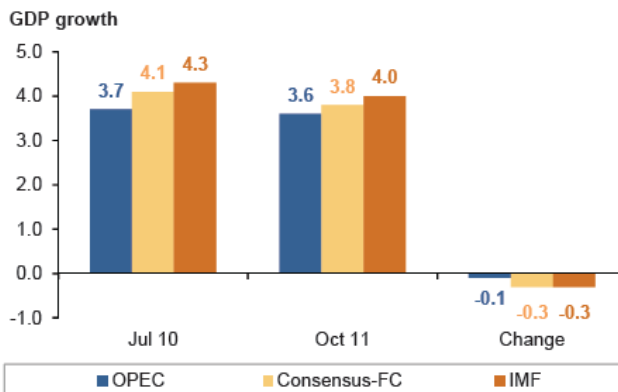
What does all this mean for energy demand? Both the International Energy Agency (IEA) and the Organization of Petroleum Exporting Countries (OPEC) have reduced their forecasts for oil consumption for both 2011 and 2012. The IEA is now forecasting an increase of 1.0 million barrels per day (mmb/d) for 2011, but that is down from the agency's original expectation of an increase of 1.4 mmb/d. For 2012, the IEA anticipates consumption to rise by 1.3 mmb/d, although that estimate is 0.2 mmb/d lower than its earliest forecast. The same situation exists at OPEC. They believe demand will rise by 0.9 mmb/d in 2011, some 500,000 barrels per day lower than their original projection. Since they only made their first estimate for 2012 in July, their recent reduction to a 1.2 mmb/d consumption growth is only off 10% from that earlier estimate. Currently, the U.S. Energy Information Administration (EIA) is more optimistic about



demand growth for both 2011 and 2012 as the agency is using growth estimates of 1.3 mmb/d and 1.4 mmb/d, respectively, for each year.

**Exhibit 8. Global Growth Slowing Down**

**Graph 1: Forecast for GDP growth, 2011**



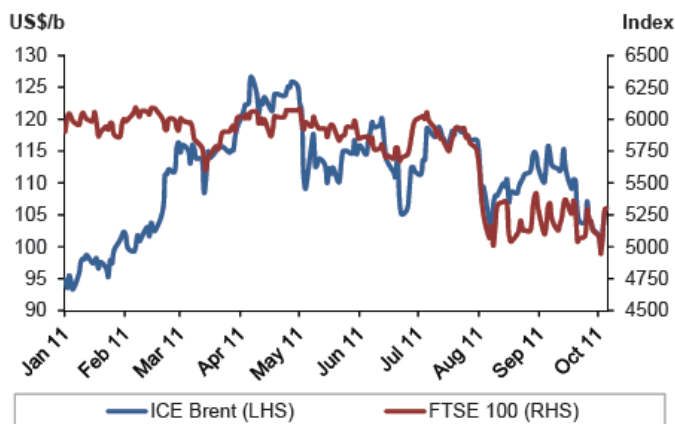
Source: OPEC

**As the growth estimates have been reduced, crude oil prices have fallen along with equity prices**

The reason for the reductions in demand forecasts is tied to lower projections of global economic growth and the possibility that even the most recent projections may prove optimistic. One can see that as the growth estimates have been reduced, crude oil prices have fallen along with equity prices.

**Exhibit 9. Slow Growth Hurts Oil Prices And Stocks**

**Graph 2: Crude oil price vs. equities**



Source: OPEC

**Until we can address the problems of the housing and auto industries and improve the labor market consumption growth will remain weak**

We continue to return to the same point we have made many times before. Until we can address the problems of the housing and auto industries and improve the labor market, i.e., reduce unemployment and under-employment, consumption growth will remain weak. That also means tax revenues for governments will remain tight, not

providing them with sufficient funds to help deal with the weakness in the financial sector and the sovereign debt crisis. Given these structural economic problems, it seems that global oil demand will continue to remain relatively weak. If oil prices stay healthy, the petroleum industry will continue to drill to produce more oil and gas to meet anticipated future demand growth. That could ultimately cause weaker oil and gas prices if demand doesn't increase. We are definitely at an inflection point for the petroleum industry making forecasting near-term commodity prices and oilfield activity levels challenging. Our best guess is that all forecasts need to have a negative bias for the foreseeable future.

## How To Question Reserve Reports Without Any Knowledge

**What followed was disclosure that a handful of E&P companies, active in the gas shale business, had received subpoenas from the SEC for their records of well performance and the economics of behind their reserve calculations**

In what now seems like the distant past, *The New York Times* wrote a series of articles suggesting that industry practitioners were raising questions about the economic performance of the gas shale wells and thus whether the extent of the resource was over stated. Those articles were written in late June and generated a firestorm of reaction within the natural gas industry, but also among Washington politicians. What followed was disclosure that a handful of E&P companies, active in the gas shale business, had received subpoenas from the Securities and Exchange Commission (SEC) for their records of well performance and the economics of behind their reserve calculations. The data was sought to compare with the companies' disclosure regulatory filings and investor presentations of the operational risks, production performance and economics of these gas shale wells. At the time the subpoenas were disclosed, we wrote about it in the Musings (last July), fully anticipating that there would be further disclosures. Since mid-summer, there has been no activity arising from the subpoenas.

**We were intrigued by the idea that the SEC has launched an investigation into gas shale reserves, well productivity and well economics and then is seeking to hire a petroleum engineer**

Our interest was piqued recently when we received a newsletter from an energy investment group we belong to that contained an employment ad for a petroleum engineer position with the SEC in Washington. We sent an email to the SEC requesting additional information about the opportunity, not that we were going to apply. Rather, we were intrigued by the idea that the SEC has launched an investigation into gas shale reserves, well productivity and well economics and then is seeking to hire a petroleum engineer. We wondered whether this position was to bolster a staff of petroleum engineers or was it a new position.

We received the usual email response – We have received your email request and someone from the SEC will respond in the next 24-48 hours. It wasn't until about four days later that we received a phone call from someone with the SEC. Unfortunately, we were unable to answer the phone so the caller left a voice message. The caller suggested that he had no idea whether the SEC employed any petroleum engineers and had no way of finding out. He suggested that we should contact the Fort Worth SEC office as that

**She told us that the Fort Worth office employed one petroleum engineer who had been hired earlier this year**

would seem to be the most likely office to employ such an individual. We did speak with the SEC official and ascertained that he had no idea what a petroleum engineer was, let alone whether the SEC employed any, and again received the suggestion to call the Fort Worth office.

We called the Fort Worth office and spoke with a lady there and asked whether the SEC had any petroleum engineers on its staff. She told us that the Fort Worth office employed one petroleum engineer who had been hired earlier this year. The SEC has 4,000 employees. That means if they hire another one in response to the Washington, D. C. office advertisement, the SEC will have a 100% increase in its technical talent for dealing with petroleum industry issues. Whether the new petroleum engineer position is a result of the proposed SEC study of gas shale disclosures we don't know, but we find it strange that they would inquire about technical information without having someone on the staff that could help frame the questions and review and interpret the data provided in response.

What we haven't done is check on whether New York State, which issued subpoenas to three E&P companies and a data request to a fourth, as reported by the law firm of Andrews Kurth in an early September alert to clients, has any petroleum engineers on its staff. The alert stated, "According to the published reports, the subpoenas seek information as to whether the companies have accurately disclosed the estimated commercial life of shale gas wells, the prospects for their natural gas wells and reserve estimates. The companies that received the subpoenas were reportedly selected because New York State pensions have more than \$45 million invested in those companies and if the energy company disclosures are inaccurate New York State could lose some of its investment; they were not selected solely based on their operations in New York." If we had to guess, we believe New York doesn't employ petroleum engineers. They may hire some as consultants. Of course, the SEC can hire petroleum engineering consultants, also, but most likely not the prominent industry firms who would have conflicts of interest because they help E&P companies with their public documents filed with the SEC and state regulators.

**Mr. Markopolos wrote a book in which he documented his investigation and dealings with the SEC that failed to understand the scheme despite the documentation or lacked the interest in pursuing an investigation**

All of this brings us back to Harry Markopolos. For those who don't know of Mr. Markopolos, he was the financial fraud investigator who uncovered the Ponzi Scheme operated by Bernie Madoff. Mr. Markopolos began his investigation of the Madoff fund in 1999 and made multiple submissions of complaints to the SEC in Boston and New York providing documentation and information pointing to red flags demonstrating the existence of the scheme. Mr. Markopolos wrote a book, No One Would Listen: A True Financial Thriller, in which he documented his investigation and dealings with the SEC that failed to understand the scheme despite the documentation or lacked the interest in pursuing an investigation. Increasingly, the SEC has demonstrated that its staff is behind the financial industry

**Lacking petroleum specialists, the SEC is probably behind on the disclosure of gas shales**

in understanding new, sophisticated investment schemes and derivative securities. Lacking petroleum specialists, the SEC is probably behind on the disclosure of gas shales, too. We can only hope that their move to hire one or more petroleum engineers will enable the agency to better understand the technical aspects of E&P reserve calculations and well economics contained in the regulatory filings required of public companies and in their investor presentations. With a petroleum engineer or two, possibly the SEC will avoid another Bernie Madoff embarrassment.

## **Admiral Allen (Ret.) Has Family Chat With Offshore Execs**

**The breakfast speaker on the final morning was Coast Guard Admiral Thad Allen (Ret.), the National Incident Commander for the Macondo oil spill**

The National Ocean Industries Association (NOIA) fall meeting was held the week before last. The breakfast speaker on the final morning was Coast Guard Admiral Thad Allen (Ret.), the National Incident Commander for the Macondo oil spill and the principal federal officer dealing with the government's response to Hurricanes Katrina and Rita. He also was in charge of the Coast Guard's response to the 9-11 attacks, which included organizing the evacuation of an estimated 300,000 citizens from lower Manhattan following the collapse of the twin towers and the 7 World Trade Center building.

Admiral Allen requested from the audience permission for his talk to be "among family," which we interpreted to be an "off the record" discussion. Therefore, we cannot quote from his talk or give many details. However, we can report on some of his themes and pointers he offered the offshore industry executives in attendance in order to help them manage any future offshore disaster or accident.

The last time Admiral Allen spoke to this group was at NOIA's 2009 spring meeting in Washington, D.C. As he strode into the meeting room for his talk, he had a cell phone glued to his ear, which he put away as he walked to the podium. Transocean's Deepwater Horizon rig had exploded the night before and was listing and burning creating a serious pollution and safety situation for the Coast Guard. As he hung up his phone, Admiral Allen informed us he had been talking with Secretary of Homeland Security Janet Napolitano as they were coordinating arrangements for a White House briefing on the incident scheduled for later that day. With a month of duty remaining before his retirement, little did Admiral Allen know that he shortly would become the most important government figure in the oil spill and clean-up effort.

**It forced him to embark on one of the steepest learning curves imaginable and put him in the middle of what rapidly became a highly politicized event**

President Obama recognized (or it was pointed out) Admiral Allen's leadership talent and named him the National Incident Commander. While that position conferred important legal powers on Admiral Allen, including becoming the chief government briefer to the media about the oil spill and response efforts, it forced him to embark on one of the steepest learning curves imaginable and put him in the middle of what rapidly became a highly politicized event.

**These needs often created agendas in conflict with the technical challenges of stopping the spill and the logistics of the cleanup effort, but maybe more importantly they took time and energy away from the task of managing the response**

**One of the key lessons Admiral Allen preached to the executives was the powerful role of the social media and why it is important for companies, whenever there is a problem, to get involved in the discussion immediately**

Admiral Allen admitted he had no idea what a blowout preventer was until he showed up on the doorstep of Cameron International (CAM-NYSE) seeking to be educated. As he quickly discovered, the government had no knowledge or capability to deal with the well blowout, yet politicians at all levels and the general public were clamoring for solutions to the blowout and spill. Politicization of the spill response was one of Admiral Allen's themes.

As he explained, the laws governing oil spills are clear about the obligations of the responsible party. Unfortunately, there were some gray areas within the laws governing oil pollution that had not been clarified following their revision following the *Exxon Valdez* oil tanker spill in Alaska in 1989, even though Admiral Allen had pointed out the need for them to be addressed during a meeting with the then-incoming Homeland Security Secretary in late 2008. As he regaled the audience with the details of the challenges of capping the well, his over-arching theme was the disruption and frustration created by the need for politicians to be seen as actively representing their constituents. These needs often created agendas in conflict with the technical challenges of stopping the spill and the logistics of the cleanup effort, but maybe more importantly they took time and energy away from the task of managing the response.

During the spill, we always felt that the response effort resulted in the active parties being improperly deployed. For example, it seemed to us that the oil industry, led by BP (BP-NYSE), should have been in control of the effort to stop the spill while the government should have been handling the logistics of the clean-up effort. That would have been, in our mind, the proper use of the respective parties' expertise. Dividing the responsibilities in that manor would not have relieved the responsible party, in this case BP, from having to pay for the cost of the cleanup, but it would have probably made the effort more focused, coordinated and possibly quicker. After Admiral Allen's talk, we had a better understanding of why things happened the way they did.

One of the key lessons Admiral Allen preached to the executives was the powerful role of the social media and why it is important for companies, whenever there is a problem, to get involved in the discussion immediately. As he pointed out, the discussion will begin with or without the company being involved and in a position to disseminate correct information and dispel rumors and false information that would otherwise come to dominate the story. He quoted Winston Churchill's famous line that "A lie gets halfway around the world before the truth has a chance to get its pants on." Admiral Allen's message is critically important for companies dealing with accidents or false rumors, but most companies are not masters of the process – something that really needs to be established beforehand.

Following his presentation, Admiral Allen was reminded by a



questioner about his last presentation to NOIA. The questioner wondered what it would take for Admiral Allen to be willing to go back to the White House, but the idea behind the question was for him to become the resident as opposed to being a visitor. The comment drew a warm round of applause as this audience recognized there was a real leader in the room.

## Rhode Island Wind Farm Hits New And Interesting Snag

**October 3<sup>rd</sup> may prove to be a significant date in the history of offshore wind development in Rhode Island**

October 3<sup>rd</sup> may prove to be a significant date in the history of offshore wind development in Rhode Island. On that date, Deepwater Wind, the developer of a 6-turbine demonstration wind farm off Block Island, filed an application for a federal lease off Rhode Island to construct a much larger wind farm. The filing was made on the last day possible for seeking potential leases in the federal waters stretching between Rhode Island and Massachusetts.

Deepwater Wind is proposing to construct a 200-turbine wind farm with a generating capacity of 1,000 megawatts (MW). Another company had suggested it might file a plan for the same area as Deepwater Wind, but it is unknown whether they actually did submit a plan. What we have seen reported is that seven other companies filed for leases in the target waters, but we don't know where they propose to lease acreage.

**Deepwater Wind plans to place wind turbines on the rocky ledge using concrete gravity foundations that can be lowered to the ocean bottom rather than driving steel piles into the ocean floor to pin steel jackets in place that would support the turbines**

The Deepwater Wind plan calls for locating its wind farm in an area encompassing 248 square miles off Rhode Island, but the company fully expects that if it receives the license it will use a much smaller area. The company had indicated its intent to file a plan as early as last December, but the plan submitted reportedly had some differences from the initial plan. The primary difference is to move the wind farm away from the southern edge of Cox Ledge, which is located east of Block Island and southwest of Martha's Vineyard. The Cox Ledge area is a popular commercial fishing area so the move from the southern edge to the middle of the ledge is a concession designed to win support from the fishermen. Deepwater Wind plans to place wind turbines on the rocky ledge using concrete gravity foundations that can be lowered to the ocean bottom rather than driving steel piles into the ocean floor to pin steel jackets in place that would support the turbines.

Deepwater Wind is optimistic it will receive a license after the Bureau of Ocean Energy Management has reviewed and evaluated all the proposals for the area. Earlier this year while visiting the New England region, Interior Secretary Ken Salazar indicated he expected that licenses for offshore wind power would be awarded in 2012. If so, and if Deepwater Wind receives a license, the company would be pushing to develop two offshore wind projects at the same time. Of course, that assumes that the other October 3<sup>rd</sup> event doesn't de-rail Deepwater Wind's first wind project.

**The court handed down its ruling notionally on July 1<sup>st</sup> and followed it up with a detailed written final order a few days later**

Toray Plastics (America), one of the largest employers in Rhode Island, along with Polytop Corp., had challenged in court the viability of the power purchase agreement (PPA) between Deepwater Wind and the local utility, National Grid (NGG-NYSE). The original PPA had been rejected by the Rhode Island Public Utilities Commission (PUC), but the state legislature moved to amend the state's renewable energy law to insure the approval of a slightly revised PPA. Following the PUC approval, the two companies filed an appeal, which by law had to be heard by the state Supreme Court. The court ruled in favor of the PPA and rejected the companies' complaints about the costly nature of the power under the PPA. The court handed down its ruling notionally on July 1<sup>st</sup> and followed it up with a detailed written final order a few days later. Therein came the opening for Toray.

**Toray filed its latest complaint with the PUC arguing that under the sunset provision of the PPA, the contract was terminated and is no longer in force as of June 30**

Toray filed its latest complaint with the PUC arguing that under the sunset provision of the PPA, the contract was terminated and is no longer in force. The company pointed out that within the PPA was a clause stating that the deal was automatically terminated if all regulatory approvals had not been obtained by June 30. The court's initial ruling came one day later and the final, binding ruling wasn't forthcoming until even longer after the June 30 date. Deepwater Wind claims that the two parties to the PPA agreed to waive sunset provision in a filing made during the summer. That makes perfect sense as it is a standard procedure when arbitrary dates are included in contracts dependent upon certain approvals being secured before that date. Toray points out, however, that the provision to waive the sunset provision was a part of the PPA so if the waiver wasn't filed before June 30, the termination date, that provision is also null and void.

We don't claim to be a lawyer, but the Toray logic seems pretty straight forward and correct to us. We aren't sure how a court can rule that ex post facto the termination of the agreement didn't happen because the companies exercised a clause in the PPA to avoid terminating the contract after its expiration date. This situation reminds us of the law firm that failed to file a patent document by the required date leaving its pharmaceutical company client with a product it couldn't protect. The law firm in that case has agreed to pay millions to the drug company for its timing oversight.

**So now we are waiting for either the court or the legislature to pull off the proverbial rabbit out of the hat trick!**

The state legislature has already twisted the law to dictate which specific measures the PUC had to use in evaluating the PPA in order to get it approved. Then the state Supreme Court saw fit to allow that twisted law to stand in its ruling. So now we are waiting for either the court or the legislature to pull off the proverbial rabbit out of the hat trick! We are sure there will be some novel legal theory created on which the Toray complaint will be rejected. Does "my dog ate my homework" count as a legal theory?

## The “Great Crew Change” Carries Potential Risks For Industry

Over a decade ago, petroleum industry human resource officials began focusing on the demographics of the industry and their companies. What they saw was a rapidly aging work force that created numerous challenges for companies, not the least of which was how were they going to obtain the necessary technical staff they felt they needed to manage their long-term growth. The demographic challenge became known as the “Great Crew Change” because it fit with the practice of the industry to have groups of workers (crews) switch off with others workers after the first group had worked a certain number of hours in the day or weeks in the month.

**The great crew change impact was focused on the lack of students enrolling in petroleum-related scientific disciplines**

For most of the early years of this century’s first decade, the great crew change impact was focused on the lack of students enrolling in petroleum-related scientific disciplines leading to positions such as geologists, geophysicists and petroleum engineers. According to data from industry consultant IHS, the peak age for oil and gas technical personnel was 43 in 2000, which rose rapidly to 50 in 2006. Projections show the peak age will reach 60 in 2012.

**IHS projected that half the petroleum industry is likely to retire within the next 10 years**

The bad news for the industry was summarized in a study produced by Schlumberger Business Consulting (SLB-NYSE) showing that by 2014, only 17,000 new petro-technical professionals would enter the workforce while 22,000 would be retiring, or a net shrinkage of 5,000 skilled workers. IHS projected that half the petroleum industry is likely to retire within the next 10 years placing a significant strain on the ability of the industry to continue to grow as it has in recent years. The Schlumberger study also found that due to the industry’s growth – both domestically and internationally – the recruitment target for technical staff in 2011 was 15% greater than the levels anticipated in 2009, further pressuring company capabilities and escalating wages and overall compensation in response to the pressure to hire staff.

**Between 1982 when the industry’s last great boom ended and 2000, according to the API, some half a million jobs were lost in the petroleum industry**

A 2007 study on industry hiring prepared by executive recruiting firm Boyden in conjunction with the University of Houston’s C.T. Bauer School of Business pointed out that between 1982 when the industry’s last great boom ended and 2000, according to the American Petroleum Institute, some half a million jobs were lost in the petroleum industry. At the time of the study, the authors put the average age of management and technical personnel in the petroleum industry at between 48 and 50.

In the middle of the decade, professors at Duke University conducted a study to determine whether the United States was actually falling behind the rest of the world in producing technically-trained youths that would imperil the nation’s global lead in this area. What the study concluded was that for every one million citizens, the United States was producing 750 technically-trained specialists

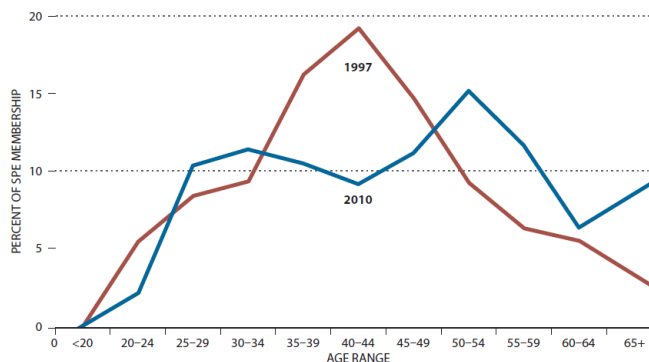
compared to 500 for China and 200 for India. Those figures would seem to belie the idea that the U.S. was losing its edge in highly technical industries such as the petroleum industry.

The recent National Petroleum Council (NPC) study on the resource potential of North America had a section on macroeconomics and the energy business. One subject addressed in that section was the energy industry's labor force challenges. It was also a subject touched on in a presentation we attended about the NPC study presented by one of the study's leaders. The charts in the NPC study of the age distribution of various scientific disciplines important for the operation of the petroleum industry showed the challenges confronting the industry by a rapidly aging employee population.

**Approximately 52% of SPE members are in the baby-boomer generation or older compared to only 38% for the general U.S. population**

One chart showed the age distribution of the members of the Society of Petroleum Explorationists (SPE) in 1997 compared to 2010. The chart showed how the peak age of the group has increased from about 42 years old to about 52 years. According to the figures, approximately 52% of SPE members are in the baby-boomer generation or older compared to only 38% for the general U.S. population. The energy industry has an old labor force!

**Exhibit 10. Petroleum Engineers Are Aging Rapidly**



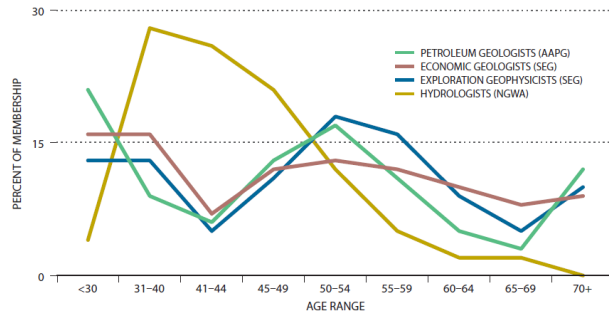
Source: Society of Petroleum Engineers.

Source: NPC

**The average age of hydrologists (water scientists), a hot new academic discipline given the growing attention being paid to our water supply problems, shows a much younger peak age, somewhere in the 31-40 age category**

A significant percentage of petroleum engineers and geologists working in the industry are within 10 years of retirement. An analysis of the age distribution of the various technical disciplines important to the oil and gas industry shows that 61% of the members of the American Association of Petroleum Geologists (AAPG) and 69% of the members of the Society of Exploration Geophysicists (SEG) are 45 years old or older. In contrast, the average age of hydrologists (water scientists), a hot new academic discipline given the growing attention being paid to our water supply problems, shows a much younger peak age, somewhere in the 31-40 age category as new scientists have been attracted to the perceived long-term growth prospects for the industry.

**Exhibit 11. Water Professionals Are Much Younger**



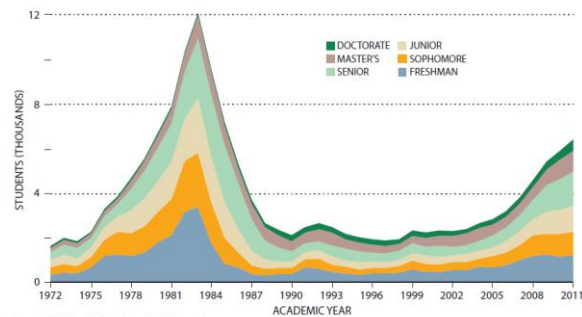
Sources: AGI Geoscience Workforce Program; data provided by the Society of Exploration Geophysicists (SEG), American Association of Petroleum Geologists (AAPG), Society of Economic Geologists (SEG), and the National Ground Water Association (NGWA).

Source: NPC

**If this recruitment effort proves successful, it is likely that the percentage of government technical employees 45 years or older will rise significantly**

Within the government sector, 72% of geologists and 75% of petroleum engineers are 45 years or older. Moreover, given the recent restructuring of the former Minerals Management Service, the resulting new agencies are actively recruiting technical talent. While the federal government has been actively recruiting on college campuses, the petroleum industry's needs have driven starting salaries and annual bonus opportunities to levels making it difficult for the government to compete. As a result, these new agencies are beginning to recruit retired petroleum industry technical staff hoping that lower salaries are less of a concern for scientists probably already collecting private industry pensions. If this recruitment effort proves successful, it is likely that the percentage of government technical employees 45 years or older will rise significantly. For the government, the great crew change is underway and maybe accelerating.

**Exhibit 12. More Tech Students Too Little Too Late**



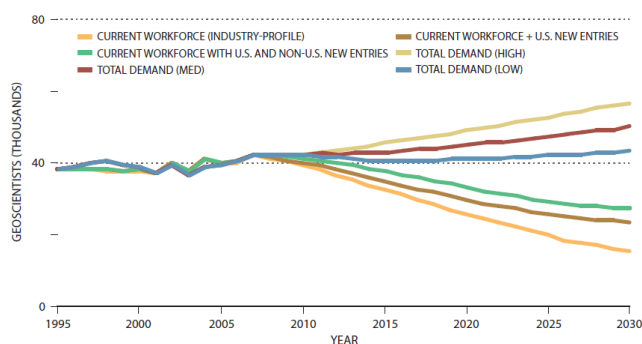
Source: Dr. Lloyd Heinze, Texas Tech University.

Source: NPC

**Enrollment remained relatively low throughout the 1990s and early 2000s before starting to climb after 2005**

An annual study of enrollment in petroleum engineering studies is conducted by Dr. Lloyd Heinze at Texas Tech University. It shows that enrollment peaked in 1983 and then declined rapidly along with the fortunes of the petroleum industry. Enrollment remained relatively low throughout the 1990s and early 2000s before starting to climb after 2005. But as pointed out by the NPC leader in his presentation, it is probably “too little, too late.”



**Exhibit 13. We Need More Tech Workers**

Source: AGI Geoscience Workforce Program.

Source: NPC

**The chart clearly shows a growing gap between trained workers and the number of workers needed in the future**

**If demographics result in about 20% of industry personnel having less than five years of experience, companies should expect about a 20% reduction in performance**

**We wonder whether the industry is setting itself up for larger failures as these younger managers gain “on the job” education**

That too little, too late outlook is shown in the chart above that projects the geoscientist workforce compared to three different outlooks for their demand. The chart clearly shows a growing gap between trained workers and the number of workers needed in the future. A problem in trying to correct this situation is the lack of university staff to educate the new scientists. This shortage reflects a shifting of university staff to scientific fields that do not lead to developing the target set of skills needed by the oil and gas industry. Correcting this staffing problem is an even greater hurdle than attracting new students to the scientific disciplines.

The troubling aspect of this great crew change is the potential cost to the industry. J. Ford Brett, managing director of PetroSkills, spelled out the potential cost in a magazine article. He suggested that if demographics result in about 20% of industry personnel having less than five years of experience, companies should expect about a 20% reduction in performance. In 2006, he pointed out, the E&P industry spent \$170 billion, meaning that the lack of training could cost the industry about \$35 billion.

We also wonder about the sea change underway in the C-suite of energy companies. As a result of past industry down-cycles, layers of younger managers and technical staff were let go in cost reduction efforts. Those workers were never replaced leaving significant voids in the age spread of employees. Today, the industry is actively pushing younger and somewhat less experienced employees into positions of leadership within companies. Without the opportunity to have made small managerial or technical mistakes in their earlier jobs, we wonder whether the industry is setting itself up for larger failures as these younger managers gain “on the job” education. We hope this will not be the case, but increasingly we are hearing from older industry professionals, especially those nearing retirement, who believe there is a strong possibility of this scenario unfolding.

We have also heard of energy companies hiring technical

**The consultants are often brought in because they have older employees who can identify the information the younger workers don't know**

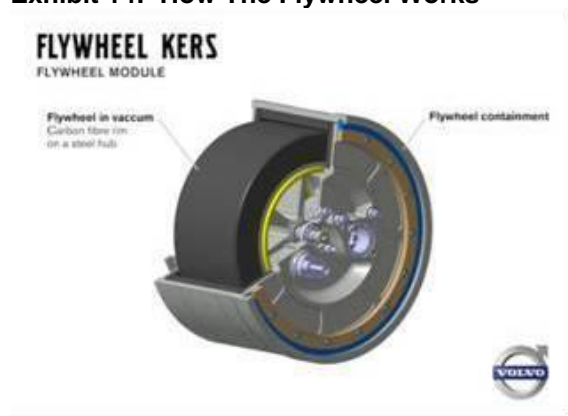
consultants to comb through their internal scientific information to help their staffs identify what information is already known by the organization, although maybe not known by the individuals. This is a recognition that company managers really don't know what they know or what they don't know, because they just don't know what information exists within their four walls. The consultants are often brought in because they have older employees who can identify the information the younger workers don't know. This is a potentially scary situation that needs to be monitored closely. The executive leadership change is a risk that many retiring managers and board members must be aware of and point out to the newly promoted individuals. Managing risk is the primary responsibility of managers and directors, and the impact of the great crew change is rapidly becoming a critical risk for companies and the industry.

## Volvo Trying Flywheel Energy Storage Technology

**Flywheels are not new technology as buses were powered by them back in the 1950s and Volvo used one with a diesel car model in the 1980s**

Swedish auto manufacturer, Volvo (VOLVY.PK), has announced that it is looking at flywheel energy storage technology in order to improve fuel economy without sacrificing performance. Volvo's announcement means it has joined with the likes of Jaguar and Ferrari in looking at kinetic energy recovery systems (KERS) to provide additional power and fuel economy. KERS has been used by Formula One but their system uses batteries and motors while Volvo's system is far simpler and cheaper. Flywheels are not new technology as buses were powered by them back in the 1950s and Volvo used one with a diesel car model in the 1980s.

### Exhibit 14: How The Flywheel Works

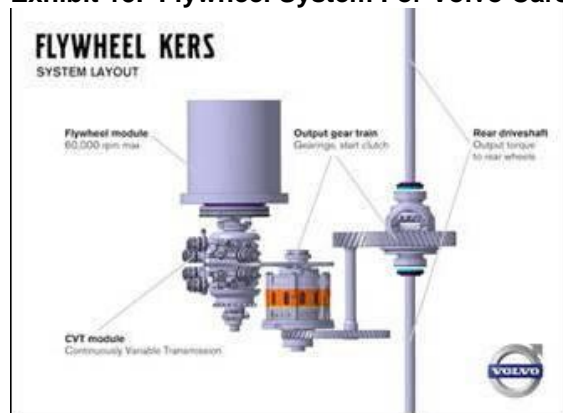


Source: Volvo

The Volvo system features a 5.8 kilogram carbon-fiber flywheel fitted to the rear axle of a front-wheel drive vehicle. The flywheel, mounted in a vacuum to reduce friction, is 20 centimeters in diameter and spins at up to 60,000 revolutions per minute during braking. When the driver brakes, the combustion engine shuts off and energy generated during braking is stored in the flywheel. As

the driver accelerates, the flywheel releases its energy through a continuously variable transmission, driving the rear wheels.

**Exhibit 15. Flywheel System For Volvo Cars**



Source: Volvo

**This technology allows a four-cylinder engine to accelerate like a six-cylinder powered vehicle while reducing fuel use by up to 20%**

Volvo says the flywheel's stored energy is sufficient to power the car for short periods but has a major impact on fuel consumption. The company has calculated that the engine can be turned off about half the time when driving. This technology allows a four-cylinder engine to accelerate like a six-cylinder powered vehicle while reducing fuel use by up to 20%. The system is most effective in stop-and-go traffic, when fuel economy typically plummets. It is interesting to see old technology being reconsidered in an attempt to boost performance and fuel economy in order to address the carbon emissions challenges in Europe. If left to their own devices, auto manufacturers will develop technologies to meet regulatory rules while delivering to customers satisfying vehicles. Government mandates such as the Obama administration is pushing for electric or compressed natural gas vehicles will do little but aggravate consumers, leave car dealers with lots of unsold cars and hurt car company profitability.

## Correction:

Toto is a Japanese company not Korean as we misstated in our bio-bike article in the last *Musings*.

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