



MUSINGS FROM THE OIL PATCH

September 25, 2012

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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

Ruling Footnote Says BSEE Fines To Hit Service Companies

While the two parties have not been able to reach an agreement, the company stated that it believes the settlement will be below the \$2.0 billion the company has already reserved

Transocean Ltd. (RIG-NYSE) disclosed in a recent 8K filing with the Securities and Exchange Commission that it and the U.S. Department of Justice have held discussions seeking to resolve some of the civil and criminal claims of the United States relating to the Macondo well blowout. While the two parties have not been able to reach an agreement, the company stated that it believes the settlement will be below the \$2.0 billion the company has already reserved and potentially around \$1.5 billion and will likely be paid out over a period of years. At issue are a number of considerations such as whether the settlement would include or exclude claims under the Natural Resource Damage Assessment Process under the Oil Pollution Act of 1990, the time period for the payment and the factual basis of a plea. RIG also acknowledged it has held no settlement discussions with either BP plc.'s (BP-NYSE) subsidiary BP America Production Co. or the Plaintiff's Steering Committee since February 2012.

There still is an opportunity for the offshore service industry to object to the process and authority BSEE is claiming in its regulatory expansion, but that window to appeal will close on October 15th

This disclosure highlights some of the issues at play in this battle over which company is responsible for the disaster and what their ultimate financial liability will be. A key issue has been the indemnification clauses in the various service company contracts with BP. These claims were brought before a court and the ruling on them contains a footnote that highlights the exposure offshore oilfield service companies will face due to the expansion of the Bureau of Safety and Environmental Enforcement's (BSEE) regulatory scope. We have covered this regulatory power grab in May 2011 but now that it is being institutionalized, maybe an examination of the footnote for its legal implications is in order. There still is an opportunity for the offshore service industry to object to the process and authority BSEE is claiming in its regulatory expansion, but that window to appeal will close on October 15th.

The key section of these rulings revolves around the issue of how public policy, including government penalties such as those mandated under the Clean Water Act can be handled contractually between BP and the service companies

The U.S. government weighed in on the side of BP on the issue of the inability to contractually shift government imposed penalties on service companies back to the oil company

“BP does not owe Transocean indemnity to the extent Transocean is held liable for civil penalties”

Service companies RIG, Halliburton (HAL-NYSE) and Cameron International (CAM-NYSE) had significantly different contracts with BP as it related to indemnification by the oil company for actions of each of the three service companies. Cameron elected to negotiate a settlement with BP earlier this year by agreeing to pay \$250 million to BP for whatever negligence might be assigned to CAM from the disaster. RIG's and HAL's disputes went to court late last year and were ruled on by a federal district court in early January. For our purpose in considering the offshore service industry's future, the key section of these rulings revolves around the issue of how public policy, including government penalties such as those mandated under the Clean Water Act (CWA), can be handled contractually between BP and the service companies. This issue was explored in the RIG ruling, which was handed down by the court on January 26, 2012.

RIG claimed that BP's indemnity obligation extended to damages, punitive damages and statutory penalties. RIG did acknowledge that the drilling contract it negotiated with BP did not provide indemnity in the event of intentional or willful misconduct in excess of gross negligence, but RIG also believes its actions do not rise to that level. On the other side, BP argued that even if RIG's interpretation of the contract is correct, public policy prohibits and invalidates a contractual indemnity that purports to exclude gross negligence, punitive damages or CWA civil penalties. The U.S. government weighed in on the side of BP on the issue of the inability to contractually shift government imposed penalties on service companies back to the oil company.

The court went to great lengths in its ruling to resolve the conflict between a release of claim and an indemnity, and then in deciding the conflict between the role of public policy in establishing penalties and indemnities under a fair contract. In reaching its decision, the court stated, “This issue creates tension between two policies: freedom of contract, which weighs in favor of enforcing the indemnity, and a reluctance to encourage grossly negligent behavior, which weighs against enforcing the indemnity.” After examining the issue and the limited amount of case law, the court ruled that “BP does not owe Transocean indemnity to the extent Transocean is held liable for civil penalties under Section 311(b)(7) of the CWA, 33 U.S.C. § 1321(b)(7). The Court does not express an opinion as to whether Transocean will be liable for such penalties.”

As interpreted by most observers, the court ruling was limited to any CWA penalties assessed against RIG. Those who questioned whether this ruling established a precedent for how future regulatory penalties might be adjudicated figured they would need to await the next legal battle. However, a close reading of the court's ruling with respect to BP's and HAL's indemnification court case, found a key in footnote seven. That footnote reads as follows:

BP contends that fines and/or penalties under OCSLA, like CWA civil penalties and punitive damages, are primarily designed to punish and deter, and therefore may not be shifted by contractual indemnity

“BP asserts in its Opposition Brief that the Bureau of Safety and Environmental Enforcement (“BSEE”) has initiated an enforcement action against Halliburton under OCSLA that may lead to a penalty assessment. (BP Memo. in Opp’n p.19-20, Rec. Doc. 4976-1 at 28-29). BP contends that fines and/or penalties under OCSLA, like CWA civil penalties and punitive damages, are primarily designed to punish and deter, and therefore may not be shifted by contractual indemnity. This contention appears correct; however, it is not entirely clear which fine or penalty BSEE threatens to impose upon Halliburton. BP has not cited to the specific statute or regulation under which BSEE is proceeding or presented documents that evince BSEE’s enforcement action. Consequently, while BP’s argument certainly appears meritorious, the Court defers ruling on this issue.”

The HAL ruling means that BSEE’s regulatory extension to offshore service companies carries the risk of significant financial exposure for the service industry

The federal court has certainly opened the door, with the support of the federal government who was supporting BP’s claims, for BSEE to levy penalties against oilfield service companies that cannot be contractually negotiated away to the lessee. The risk for service companies has increased immeasurably and without any proper rule-making or legislative authority. The HAL ruling means that BSEE’s regulatory extension to offshore service companies carries the risk of significant financial exposure for the service industry, a new consideration. That risk can arise from arbitrary rulings by BSEE. To us, all of this is evidence of the new world for offshore service companies. Unfortunately, we still perceive that the offshore service industry has yet to become mobilized against this regulatory expansion. Whether that is because company managers are not aware of the change in regulation, then we say shame on them. If it is because they believe that their historically positive dealings with Admiral James Watson, now retired and the head of BSEE, will absolve them of any claim, we say that is a highly risky business strategy.

We have heard several explanations why the service industry is not concerned

We have heard several explanations why the service industry is not concerned. One is that this risk can be mitigated by establishing a single rig subsidiary that would enter into the contract with the lessee. This is similar to what offshore drillers do internationally. The strategy however raises questions due to potential requirements for parent company financial guarantees. There is also the thought that insurance can be purchased with the cost shifted to the contract and essentially paid by the oil company client. Without an equal insurance premium reduction for the oil companies, we doubt they will be in favor of that solution. Will all rig day rates rise commensurately for this insurance, or will rates reflect the financial strength of offshore drillers? Another explanation was that if it becomes an issue, the service companies will just leave the Gulf of Mexico. What kind of business strategy is that?

There is another compounding problem with the insurance, which is that it is “joint and severable” meaning that companies are not only

Does anyone think the oil companies want the service companies inside their tent?

at risk for the damage from their mistakes but also for the damage from every other involved company's mistakes. To protect oneself, prudent companies will want to know exactly what every other company is doing, including the oil company. Does anyone think the oil companies want the service companies inside their tent?

Now we think it may be more like dealing with fly-paper - once you touch it you can't shake it loose

The deeper we dig into this regulatory expansion and its potential impact on the future for offshore service companies, the more concerned we become. We initially viewed the issue as the equivalent of peeling an onion. Eventually you shed all the outer layers and reach the solid body of the onion. Now we think it may be more like dealing with fly-paper - once you touch it you can't shake it loose. But the best description may be the child's game, Twister, where contestants try to put their hands and feet on untouched colored spots on a sheet in response to commands, even if it means reaching over, under and around other participants.

While many of our readers may think of us as a modern-day Don Quixote dealing with this issue, we will continue to challenge the regulatory expansion windmills. In our view, this issue is too important for the long-term health of the offshore oilfield service industry and the nation's future energy supplies.

Energy Industry Redesign And Implications For Its Future

The transaction is indicative of the seismic shift underway in global energy markets, much of which has been caused by the shale revolution

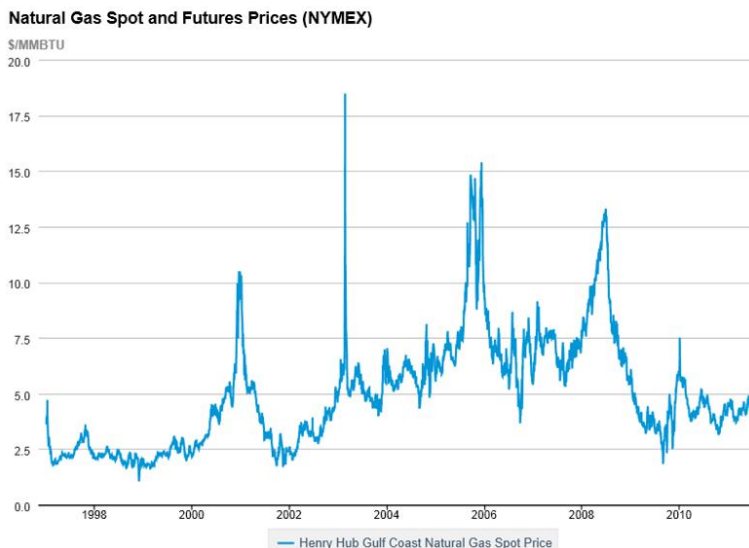
Last Thursday, Exxon Mobil Corp. (XOM-NYSE) announced the purchase from Denbury Resources Inc. (DNR-NYSE) of 196,000 net acres in the Bakken formation of North Dakota and Montana with a potential of 15,000 barrels per day of production during the second half of this year for \$1.6 billion in cash and the exchange of interests in some other fields. This deal increases ExxonMobil's acreage holdings in this oil-rich region by about 50% to 600,000 net acres. The transaction is indicative of the seismic shift underway in global energy markets, much of which has been caused by the shale revolution. The revolution and its results so far have turned thinking about domestic energy on its head. America, and North America, are perceived to have shifted from a shortage-driven environment to one marked by an energy surplus. That shift has forced people engaged in the energy business to re-examine their business strategies and planning for the future, while acknowledging that the shale revolution still has the potential to disappoint. The risk for business managers, which often doesn't receive sufficient attention, is that the results of the shale revolution could turn out to be less than the promoters predict. For months we have been trying to get our head around the changes underway in global energy markets driven by shales and how those changes might play out in the future.

Little did George Mitchell and his trusty band of explorationists at Mitchell Energy realize in the 1990s when they initially drilled a horizontal Barnett formation well and hydraulically fractured it that

That higher price plateau drove exploration activity and improvements in drilling and completion technology, which, in turn, produced the surge in shale gas production, and as a result cut gas prices about in half

they were unleashing a technological genie that would radically transform the energy industry. Many questioned what Mitchell was doing, but out of his company's necessity a revolution was born. People might challenge that view, but we would counter that one only look at the impact the surge in shale gas production in recent years has had in altering the trend in natural gas prices. From about \$2.50 per thousand cubic feet of gas (Mcf) in 2002, gas prices steadily climbed into the \$5.00 to \$7.50/Mcf range (see Exhibit 1). The spikes in gas prices during that period were all associated with specific events such as Hurricanes Katrina and Rita in late 2005 when offshore and coastal gas production was curtailed and prices soared above \$15/Mcf. That higher price plateau drove exploration activity and improvements in drilling and completion technology, which, in turn, produced the surge in shale gas production, and as a result cut gas prices about in half.

Exhibit 1. Recent History Of Natural Gas Prices



Source: EIA

The real impact from gas shale production, however, came during the past several years as gas' share of electricity generation reached 34.7% in July 2012

The greatest change in the United States has been the role of natural gas in generating electricity. Between 1990 and 2010, the share of electricity generated from natural gas nearly doubled from 12.3% to 23.8%. The real impact from gas shale production, however, came during the past several years as gas' share of electricity generation reached 34.7% in July 2012. The impact of gas shale production cannot be understated. In 2000, shale gas accounted for about 2% of total U.S. gas output. That share has now risen to about 40%. This increase has been the principle cause of the decline in gas prices. As the mix of fuels used to generate electricity shifted, utility executives would say, "the market made me do it" rather than "the mandate made me do it" as has been the case with increased electricity generated from renewable fuels. As the various state mandates for increased use of renewable energy

As an example of how America's energy thinking has been turned upside down, we only have to note that under the old thinking the country would have had dozens of terminals in operation by now to import and re-gasify LNG from overseas

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supplies in generating electricity gained traction, between 2008 and last July, the share of power from these green energy resources has expanded from 3.2% to 4.2%. This calculation excludes hydro power, which the Obama administration has not backed as a renewable resource. Including hydro power, the share of renewable energy has grown from 9.4% in 2008 to 10.8% in July.

As an example of how America's energy thinking has been turned upside down, we only have to note that under the old thinking the country would have had dozens of terminals in operation by now to import and re-gasify liquefied natural gas (LNG) from overseas. Instead, the government recently has approved the construction of liquefaction facilities at one import terminal to allow its owner to export domestic gas to foreign markets. Some 13 additional facility applications have been filed seeking approval to export natural gas. Completion of a study commissioned by the Energy Information Administration (EIA) to assist the Obama administration in deciding whether to approve any additional export facilities has been delayed for a second time this year and will not be ready until after the November election. This appears to be shades of President Obama's handling of the Keystone pipeline decision.

The success of gas shale well production overwhelmed the economics of E&P in driving down gas prices while at the same time igniting a land grab among producers. The concept that shale formations are spread broadly under basins producing oil and gas was translated into the belief that they could be exploited with manufacturing-type drilling and completion operations at lower than traditional E&P costs. These concepts brought new thinking about how the shale business would evolve. High well production, substantial gas reserves and low costs are the trifecta for exploration success! Dry holes were pronounced a thing of the past meaning that exploration risk for oil and gas companies was sharply reduced, further improving financial returns for shale fields. Improvements in horizontal drilling and fracturing technology enabled producers to boost initial production of wells and to theoretically expand the ultimately economic recovery factor. The problem that emerged with exploiting shale fields was that they required substantial capital. Capital to acquire leases; capital to drill the wells to hold the leases; capital to complete the wells; and capital to construct the necessary transportation facilities to move this new production to markets. Since many of the shale plays were in areas with limited pipeline infrastructure, production from wells was often delayed until new pipelines were constructed, at the same time the pressure to drill wells in order to hold expensive leases built. The collapse of natural gas prices under the onslaught of new shale gas production forced producers to shift their focus to liquids-rich gas plays in order to tap the natural gas liquids (NGL) market where prices were supported by high global crude oil prices. Then the industry discovered that its gas shale expertise could be applied to certain oil shale formations and a new boom was created.

Onshore shale plays represent an arena where E&P companies can play and importantly offers an easier way to grow reserves at modest cost

In the broader scheme of energy, the huge capital needs for shale provided an opportunity for the larger U.S. independents to expand their roles and for major integrated oil companies to return to the onshore U.S. market. The Macondo well disaster had increased the risk for working offshore and for many lesser sized companies may prevent them from even being able to work offshore. Onshore shale plays represent an arena where E&P companies can play and importantly offers an easier way to grow reserves at modest cost. To understand the magnitude of these industry-shaping developments merely contemplate the billions of dollars that have been invested in shale assets marked by the industry-shocking move of ExxonMobil to buy XTO, a smaller shale producer, for \$41 billion in late 2009. That step generated a tsunami of investments into shale plays by the majors, foreign majors and large independent oil and gas companies along with significant commitments from private equity funds and companies tapping the public market.

With the advent of the U.S. becoming an LNG exporter, much of our prior thinking needs to be reassessed

North America has led the shale revolution, but now it is spreading internationally to Europe, Australia and South America. Part of the impetus behind this expansion is geopolitics, and in particular the heavy dependence of Europe on Russian and North African natural gas supplies. Because of the decades-long expectation that the United States would become over time a huge LNG importer and that traditional LNG consumers' demand would also grow, substantial investment in global gas exploration has been justified. With the advent of the U.S. becoming an LNG exporter, much of our prior thinking needs to be reassessed. Fortunately, the Japanese nuclear accident last year and the rapidly developing global anti-nuclear power view may not only bail out some of these expensive LNG projects but also boost new ones. At the same time, take notice of the fact that Russia and Japan have agreed to develop LNG exports from Siberia. Geopolitics in spades – for Japan it means less dependence on South Pacific/Australian LNG supplies and brings on a new LNG supplier; for Russia it means a counter to possibility of reduced gas volumes moving to Europe.

This topic needs further development, but it requires more space and time than is currently available. We will continue exploring these themes (railcars, shipping, nuclear energy, etc.), not only because we find them fascinating, but because we believe they are very important considerations shaping the future energy industry.

Falling Oil Prices Provide Help For Obama In Election Race

Energy is the third most mentioned theme following jobs and the economy in this campaign

A recent analysis of television advertising during this campaign season conducted by *The New York Times* shows energy to be the third most mentioned theme following jobs and the economy. As the authors of the article pointed out, in the 2008 presidential campaign, global warming was the top public concern. They reached their conclusions by examining 184 energy-related advertisements in 2008 and 138 ads so far this campaign. The *Times* found that in

Now the debate is over how best to construct an energy strategy for the economy of the future – either President Obama’s “all-of-the-above” policy or Mitt Romney’s project energy independence

2008 “green ads” greatly outnumbered those for fossil fuels as reflected in the \$152 million spent on them compared to \$109 million spent on fossil fuel ads. This time the spending has flipped dramatically - \$153 million versus \$41 million – in favor of fossil fuel versus clean energy ads.

Does anyone remember that in the fall of 2008 BP plc. (BP-NYSE) was identifying itself as “Beyond Petroleum”? How about Chevron Corp. (CHV-NYSE) boasting about its commitment to renewable fuels and barely six months later Exxon Mobil Corp. (XOM-NYSE) invested \$600 million in a venture with Craig Venter, the founder of biotech company Synthetic Genomics, to develop transportation fuels from algae. Now the debate is over how best to construct an energy strategy for the economy of the future – either President Obama’s “all-of-the-above” policy or Mitt Romney’s project energy independence that includes steps to unshackle the potential of the energy business.

Despite the overwhelming fossil fuel donation advantage for Mr. Romney, it doesn’t seem to be helping him in his campaign

According to *The New York Times*, Mr. Romney’s campaign and political action committee has received \$13 million so far in campaign contributions from oil, gas and coal executives. President Obama has garnered only \$950,000 from the fossil fuel industry and a whopping \$78,000 from clean energy executives. Despite the overwhelming fossil fuel donation advantage for Mr. Romney, it doesn’t seem to be helping him in his campaign. In a recent *Washington Post/ABC News* poll of registered voters, President Obama is favored on who best can handle our energy needs over Mr. Romney by 49% to 41%. A *USA Today/Gallup* poll showed that 53% of voters surveyed preferred President Obama’s energy policy compared to only 40% who supported Mr. Romney’s plan. A recent *CNN* poll showed that President Obama’s energy policy garnered 7% more support than Mr. Romney’s.

The reality is that compared to the time of the 2008 campaign and today, gasoline prices are only a few pennies a gallon higher

While the Republicans tout that since President Obama took office, gasoline prices have doubled, the reality is that compared to the time of the 2008 campaign and today, gasoline prices are only a few pennies a gallon higher. We are all quick to forget that until the collapse of Lehman Financial in late September of 2008, the economy actually was moving up. Following that collapse, all financial markets seized up, credit evaporated and fears of an impending implosion of the world’s financial system mushroomed. The lack of liquidity caused companies to withdraw into defensive postures and to lay off people as business disappeared and global depression fears grew. Energy demand disappeared and as a result, crude oil prices went into a tailspin from their mid-summer peak of nearly \$150 per barrel to a winter low below \$40.

The recent 8% drop in oil prices from \$100 per barrel to the low \$90s suggests that gasoline pump prices, which have yet to adjust to the lower oil price, are on the cusp of a healthy decline. Part of the gasoline price drop anticipated will be tied to the normal seasonal

A study showed that the change in consumers' sentiment about the trend in gasoline prices is actually much greater than the actual percentage change in gasoline's cost

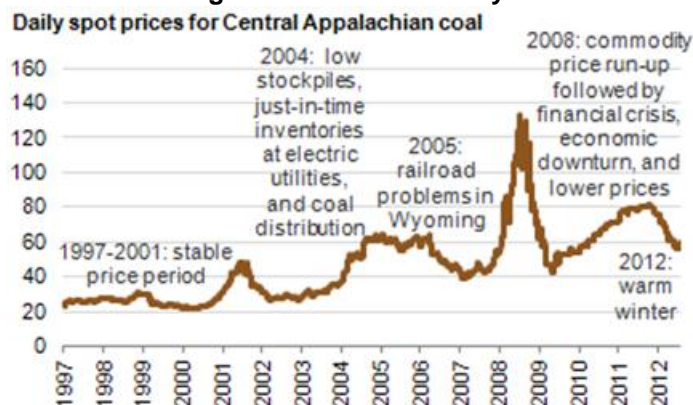
price trend of early fall. At the end of the summer and hot weather, oil refiners shift to producing gasoline that doesn't require certain blending components necessary during summer months to fight greenhouse gases. Eliminating these expensive blending ingredients from the gasoline mix helps lower its price normally. This is an important trend as a study several years ago by the Brookings Institute and the Baker Institute at Rice University showed that the change in consumers' sentiment about the trend in gasoline prices is actually much greater than the actual percentage change in gasoline's cost. While rising gasoline prices hurt President Obama's standing among voters earlier this year when pump prices soared well ahead of the traditional pre-Memorial Day run-up in gasoline prices and the speculation was on when we would hit \$5 a gallon, a sharp decline in pump prices during the next few weeks will help Democrats at the polls.

The Keystone pipeline seems to have disappeared as a campaign topic, probably because gasoline prices are heading lower

President Obama's decision to kick the Keystone pipeline can down the road in order to demonstrate to his 2008 environmental support base that he remains the "environmental president" seems to have stood him in good stead. The Keystone pipeline seems to have disappeared as a campaign topic, probably because gasoline prices are heading lower. Likewise, the delay in the completion of the liquefied natural gas (LNG) export report until the end of the year has removed a potentially contentious issue from the campaign. Of course, we don't know what the report might conclude – whether to allow exports or restrict them. And then there is the question of whether the report's conclusion might have become a greater problem for the Republicans because they gain support from all the industries involved with one being a winner and the other a loser – the fossil fuel industry versus industrial consumers.

The challenge for Republicans in Ohio is that only a small portion of the state is engaged in coal mining and the number of jobs is small, and overwhelmed by automobile-dependent jobs where the bailout of GM and Chrysler are viewed as a positive for President Obama

One area where the Republicans appear to be making headway against President Obama is with the coal industry and in those states heavily dependent on its output for jobs. In the battleground states of Ohio and Virginia where the "war" against coal might resonate and help Republicans, the issue has become how environmental rules have limited coal demand and contributed to falling coal prices, declining mining company profitability and layoffs. The challenge for Republicans in Ohio is that only a small portion of the state is engaged in coal mining and the number of jobs is small, and overwhelmed by automobile-dependent jobs where the bailout of GM and Chrysler are viewed as a positive for President Obama. In Virginia, the decline in mine profitability has led to mine shutdowns and worker layoffs. So far, these trends have yet to help Republican candidate George Allen in his run to regain the Senate seat against former Democratic governor Tim Kaine.

Exhibit 2. Falling Coal Prices Mean Layoffs

Source: EIA

We will be watching the ongoing campaign to see whether energy issues become more or less important

We will be watching the ongoing campaign to see whether energy issues become more or less important and how they might shape the vote. Likewise, we will watch the trends in several of the key battleground states and how those trends might impact critical U.S. House and Senate races and the balance of Congressional power. Lastly, we will be watching the energy debate for signs of what the next administration may do, regardless of who wins the presidency.

Professors Say Wind Is Answer To Planet's Energy Needs

One researcher among the group says that by tapping the world's entire offshore waters and at higher altitudes theoretically could power the entire planet, and as soon as 2030

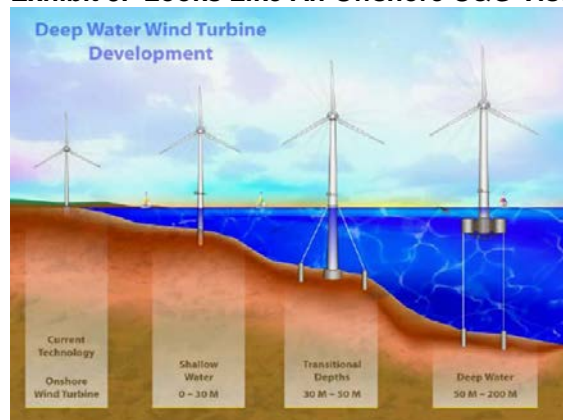
A recent study conducted by a group of researchers affiliated with the Atmosphere/Energy Program of the Department of Civil and Environmental Engineering at Stanford University suggests that the offshore wind resources in the area from Virginia to Maine could provide a third of all the energy required by the United States. Moreover, one researcher among the group says that by tapping the world's entire offshore waters and at higher altitudes theoretically could power the entire planet, and as soon as 2030. A minor problem is that to meet the East Coast supply, the wind industry would need to install 144,000 turbines, and to power the entire planet would require four million spinning blade facilities. Of course, no offshore wind turbines have been installed in U.S. waters and most of those installed offshore Europe are in sheltered and relatively shallow waters.

He estimates that within 50 nautical miles of the California coast there is 587 gigawatts of wind energy or the equivalent of 500 commercial nuclear power plants

To highlight both the potential and the challenges for offshore wind, Habib Dagher who runs the DeepCWind Consortium at the University of Maine pointed out that "California has a tremendous offshore wind resource." He estimates that within 50 nautical miles of the California coast there is 587 gigawatts of wind energy or the equivalent of 500 commercial nuclear power plants. The problem with exploiting this resource is that the water depth will necessitate the development of a whole new generation of turbines that would have to float rather than be pinned to the sea floor. A huge

advantage for offshore wind today is the 60+ years of offshore oil and gas facility developments that have enabled the industry to move from extremely shallow water depths to drilling and producing wells in water depths greater than 5,000 feet. Application of this technological history should enable the offshore wind industry to accelerate the pace of its development.

Exhibit 3. Looks Like An Offshore O&G Visual



Source: ABC News

The study is based on a theoretical modeling of the wind energy resource and its daily performance but lacks any economic or technical analysis

All the power purchase agreements negotiated between utilities and offshore wind farm developers in the U.S. and approved by state utility regulators carry mandatory annual price escalation clauses of 3.5% per year

In the introduction to the report, “US East Coast offshore wind energy resources and their relationship to peak-time electricity demand,” the key selling points for developing this resource according to the authors is that it lies close to the vast majority of the nation’s population, it has the ability to site underwater transmission cables that will help relieve the power congestion issues associated with over-land transmission cables, the wind turbines will be located out of sight and hearing of coastal residents, and importantly that offshore wind is greater and more stable than onshore wind across all the hours of the day. Research so far indicates that the pattern of peak wind energy generation more closely matches that of the states’ needs. Offsetting these positives, however, is the fact that the study is based on a theoretical modeling of the wind energy resource and its daily performance but lacks any economic or technical analysis.

The idea of offshore wind energy is being sold on the basis of its pollution-free energy, its stable cost and infinite potential. The research report was highlighted by a local ABC News story, which interviewed Mr. Jacobson, one of the study’s authors, who suggested that besides reducing pollution and increasing domestic energy resources, wind has a key competitive advantage over traditional fossil fuels in that it offers a stable price. In terms of offshore wind, this observation is questionable. All the power purchase agreements (PPAs) negotiated between utilities and offshore wind farm developers in the U.S. and approved by state utility regulators carry mandatory annual price escalation clauses of 3.5% per year. So what’s stable about that?

Another oversight in this analysis is that wind turbines don't last nearly as long as conventional fossil fuel power plants

The concept of wind energy's price stability is that the fuel (wind) is free. As Mr. Jacobson put it, "There's zero fuel costs once they're in the water. Coal and gas are depletable resources, so their cost will inevitably go up over time. The cost of wind energy will remain stable, and the wind resource is infinite." Another oversight in this analysis is that wind turbines don't last nearly as long as conventional fossil fuel power plants. In fact, wind turbines last about 16-20 years, which is a half to two-thirds the life of a conventional power plant although we are finding that many fossil fuel powered plants are lasting for 50-60 years, or three to five times the life of wind turbines. Never have we seen the cost to rebuild an offshore wind farm factored in to the comparative analysis presented to utility regulators when PPAs are presented for approval.

Exhibit 4. Controversial Wind Farm



SOURCES: ESRI; TeleAtlas; Cape Wind AP

Source: Cape Wind

The reporter jumped on the visual objection to Cape Wind as being completely eliminated by locating the turbines so far offshore that they are out of sight of land

The *ABC News* report about this wind energy study, in pointing out the absence of any US offshore wind farms, highlighted the Cape Wind project located in Nantucket Sound and its opposition from powerful political forces such as the Kennedy family of Massachusetts. The reporter jumped on the visual objection to Cape Wind as being completely eliminated by locating the turbines so far offshore that they are out of sight of land. Cape Wind has even created an image on its web site of how their wind farm would look from the beach, which is designed to overcome the "not-in-my-back-yard" (NIMBY) objection.

The idea of wind powering the planet was thrown out by Mr. Jacobson who pointed out that "If we put half over the ocean and half over land, we'd need about 0.6% of the world's land for turbines. But all of that land, almost, is open space between the turbines that can be used for multiple purposes, including rangeland, cropland, pasture land or just plain open space. The rest is over the water."

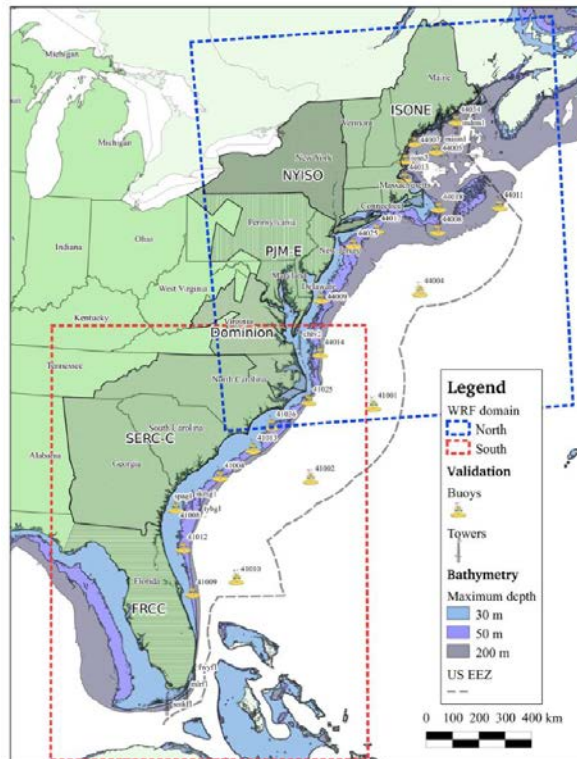
Exhibit 5. White Dots Mark The Wind Turbines



Cape Wind created this simulated photo to show what it says would be the view of its wind farm from Nantucket Island. The distance out to the turbines, seen as white dots on the horizon, is 13 miles.
 Source: Cape Wind

We know that farmers and ranchers have leased their land for wind farms and that they do use the space between the turbines. The idea that putting something out in the ocean presents few risks is in our view a naive assumption.

Exhibit 6. East Coast Areas Studied

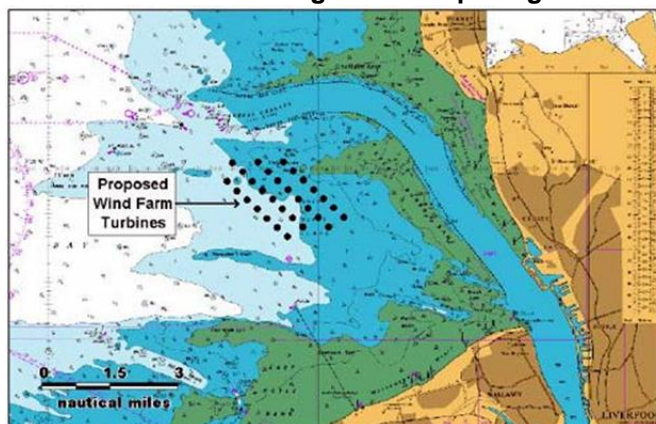


Source: Stanford Univ. study

This spacing would require a swath of the Atlantic Ocean 720 miles long and four miles wide

The Stanford study examined the entire East Coast of the United States for its wind potential, but ultimately focused in on the stretch from Virginia north to Maine. Besides offering slightly better offshore wind capacity than the southern section of the coast line, this region has less major hurricane risk. We will come back to the hurricane issue in a minute, but first let's examine the impact of the 144,000 offshore turbines the study says would be needed to meet its goals. The distance between the center of Maine and the center of Virginia is 720 miles, or 1,159 kilometers. In researching the placement of offshore wind turbines, we found that a new 25 3.6-megawatt turbine farm has been installed in the Burbo Offshore Wind Farm in Liverpool Bay, Wales. From the design of this wind farm, 20 turbines were located in an area of one square kilometer. If this relationship holds for the East Coast, then we will need 7,200 square kilometers of sea surface to locate the 144,000 turbines estimated for the project. This spacing would require a swath of the Atlantic Ocean 720 miles long and four miles wide.

Exhibit 7. Understanding Turbine Spacing - Burbo



Source: www.dongenergy.com

Source: Dong Energy

Based on this greater spacing, we could envision an ocean swath of 720 miles in length and upwards of 25 miles wide

A review of recent research about siting wind turbines has pointed up the loss of efficiency of those turbines that are deeper into wind farm arrays and thus the need to offset secondary rows. Additionally, there is a significant volume of recent research suggesting the need to spread wind turbines further apart in order to reduce the damage and efficiency losses from wind turbulence within the wind farm. The latest research suggests that turbines should be 8-10 blade lengths, or 4-5 rotor diameters apart. Other studies now suggest that wind turbines should be placed on surface blocks encompassing anywhere from 75 to 100 acres in size. Based on this greater spacing, we could envision an ocean swath of 720 miles in length and upwards of 25 miles wide. While all these wind turbines would be out of sight of land, they would present navigation and repair and maintenance challenges, besides increasing the demands on underwater transmission cables.

They focused on data suggesting that while the Atlantic Coast experiences hurricanes, the general absence of warm sea surface temperatures reduces the frequency and intensity of hurricanes

One of the engineers' claims for why the upper portion of the East Coast presented a favorable location for these tens of thousands of wind turbines is the region's low incidence of major hurricanes. They focused on data suggesting that while the Atlantic Coast experiences hurricanes, the general absence of warm sea surface temperatures reduces the frequency and intensity of hurricanes. According to the authors, data from 1851 to 2006 show that the states of Maryland, Delaware, New Jersey, New Hampshire and Maine experienced no hurricanes more powerful than a Category 2. The coasts of New York, Connecticut, Rhode Island and Massachusetts experienced several hurricanes of Category 3 strength, but no Category 4 or 5 hurricanes. The total number of Category 3 hurricanes for the East Coast states were as follows: Virginia (1), New York (5), Connecticut (3), Rhode Island (4), and Massachusetts (3). According to the data, no Category 4 or 5 hurricanes have ever hit the region from Maine to Virginia from 1851 to 2006, and only 64 Category 1-3 hurricanes have touched the same coastal area. In contrast, states such as North Carolina experienced 47 hurricanes with 12 being Category 3 or greater. Florida had 144 hurricanes with 37 being Category 3 or greater.

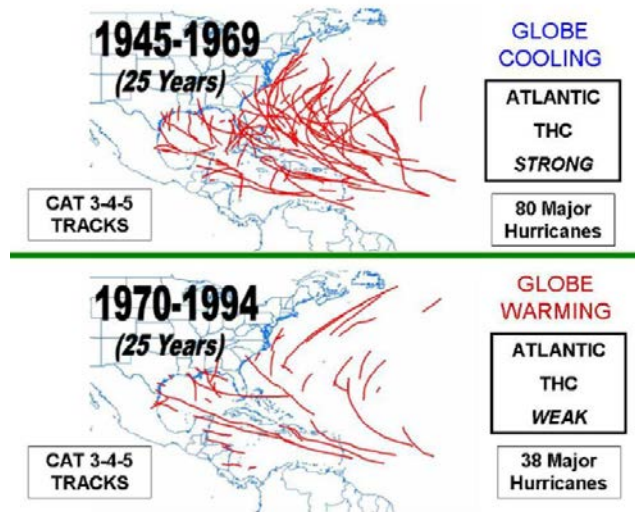
Americans who have lived through hurricanes will tell you that it only takes one, and it doesn't have to be among the most powerful to cause significant damage

While this analysis is interesting, those Americans who have lived through hurricanes will tell you that it only takes one, and it doesn't have to be among the most powerful to cause significant damage. The authors suggest that an offshore region without a significant hurricane history will make it easier for offshore wind farm developers to secure insurance. California engineers probably are not too familiar with the amount of wave action associated with even low-rated hurricanes and how the below-sea-level storm related activity can tear up pipelines as they have in the Gulf of Mexico, and we suspect would play havoc with submarine power transmission cables and surf zone cable-landing locations.

Climatic conditions currently are favoring more hurricanes traveling up the East Coast than in the recent past

Looking at the history of hurricane activity along the East Coast, we pulled several charts from the periodic hurricane forecasts produced by the Atmospheric Department at the University of Colorado. The first set of charts in Exhibit 8 shows the pattern of Category 3 and greater hurricanes for the 50 year period of 1945 to 1994. The charts were used originally to show the significant difference in climatic conditions and the resulting number of storms for different time periods. We are currently in a period more like 1945-1969. Additionally, climatic conditions currently are favoring more hurricanes traveling up the East Coast than in the recent past.

Exhibit 8. Return To Early Period A Risk

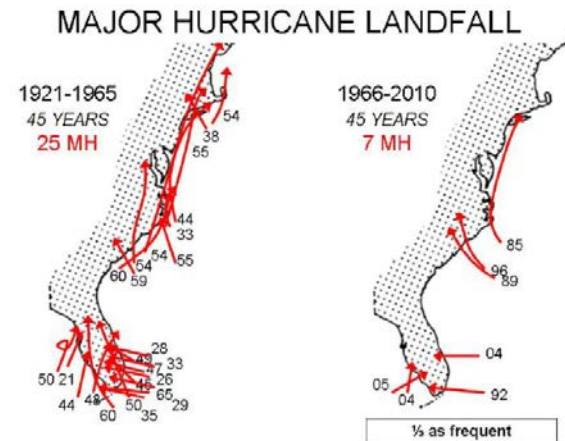


Source: CSU

The paths of these storms would impact the proposed locations of the wind farms the Stanford researchers suggest we need to build

When we look at major (Category 3 and greater) hurricane landings along the East Coast (Exhibit 9), while the numbers differ between the two periods, notice how many of them move straight along the coast from North Carolina to Long Island or Cape Cod. Clearly the paths of these storms would impact the proposed locations of the wind farms the Stanford researchers suggest we need to build.

Exhibit 9. East Coast Hurricane Risk

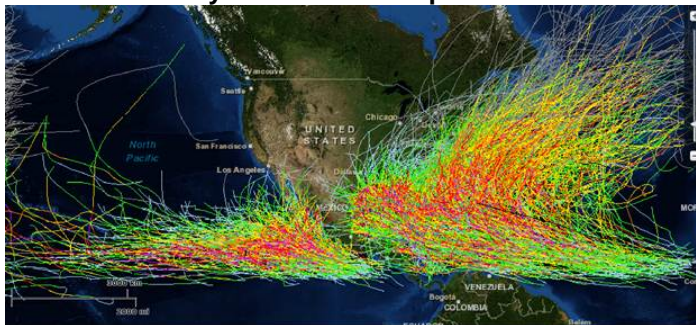


Source: CSU

The last image of hurricanes (Exhibit 10 on the next page) is from the National Oceanic and Atmospheric Administration's web site and it shows the path of all hurricanes for which the government has records. It is important to also remember that the history of tropical storm tracking is still relatively short. Until the advent of airplanes and satellites, many tropical storms in the Atlantic Ocean were often

never tracked or in some cases not even known. So when we site offshore facilities, we should be prepared for the possibility that future storm activity may be considerably different than the history we know.

Exhibit 10. Array Of Offshore Tropical Storms



Source: NOAA

If we use that average, the proposed 144,000 wind turbines ABC News suggests we need will cost \$2.9 trillion

Our last point about the *ABC News* article hyping the potential for powering the U.S. with wind energy is the cost. We will defer any discussion about the technological challenges of building and maintaining offshore wind turbines in the open Atlantic Ocean for another article. But we have been amazed by the ever escalating cost to build the 130-wind turbine Cape Wind project. What started off a decade ago with a cost projection of less than \$1.0 billion has now climbed to \$2.6 billion. That means that each turbine will cost somewhere around \$20 million. If we use that average, the proposed 144,000 wind turbines *ABC News* suggests we need will cost \$2.9 trillion. The whole planet power project would cost upwards of \$800 trillion. A shovel-ready project anyone?

Energy, Unemployment And The Health Of The U.S. Economy

There is nothing more important in determining the outlook for a nation's energy demand than understanding the health of its economy

There is nothing more important in determining the outlook for a nation's energy demand than understanding the health of its economy. This is especially true for the United States today as it faces a presidential election focused on dramatically different economic and governing philosophies of the candidates and their views about how fast the economy may grow and, in turn, how much energy the nation will need. Most people are aware of President Barack Obama's "all-of-the-above" energy strategy, which provides a number of popular talking points about him being open to all forms of energy while campaigning, but in reality means only a few energy sources will be favored. Those favored energy sources seem to be only "green" ones. On the other side of the issue is the Republican standard-bearer, Mitt Romney, who is advocating for increased development and use of domestic fossil fuel resources while mandating that very expensive green energy sources need to achieve commerciality on their own and without government mandates and subsidies.

Self-sufficiency seems to mean different things to different people, but on balance it suggests the U.S. will be importing significantly less energy than in the recent past

America's domestic oil and gas production is growing dramatically suggesting to some students of the energy business that the country is on track to eventually achieve self-sufficiency. The definition of self-sufficiency seems to mean different things to different people, but on balance it suggests the U.S. will be importing significantly less energy than in the recent past and may actually begin exporting meaningful energy volumes assuming government regulatory barriers are removed and no new ones erected. Just how much energy the country may wind up exporting is an open question, since it depends on the growth of our productive output, our increased consumption and legal barriers being lowered.

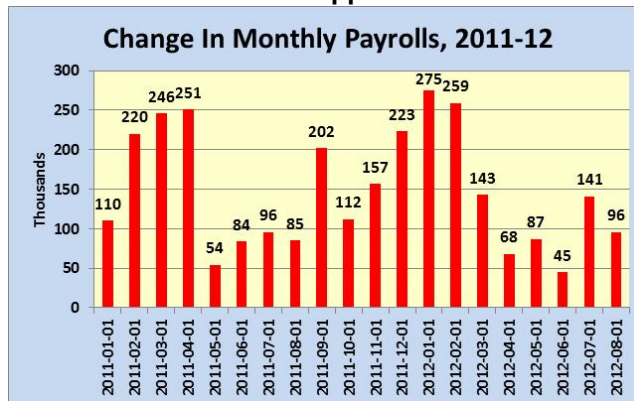
The traditional measure of the labor market's health is the unemployment rate

The answer to the question of how much energy consumption may grow is tied to the economic outlook. A key ingredient for predicting the economy's growth rate lies in understanding how the health of our labor market will influence future activity. The traditional measure of the labor market's health is the unemployment rate, which, following the latest monthly employment report showed the U.S. economy with 12.5 million unemployed workers, or an 8.1% unemployment rate. Despite the high rate, the unemployment rate for August improved by two-tenths of one percentage point from what was reported in July. Compared to a year ago, the unemployment rate has declined by one full percentage point, but part of the improvement is a reflection of changes within the dynamics of the American labor force combined with some private sector employment growth. We will examine some of these labor force dynamics later in this article.

When the August report was released showing a disappointing 96,000 new jobs added that month, the government also revised the prior two monthly reports lower

The last three quarters of economic activity as measured by the change in the nation's Gross Domestic Product (GDP) have reflected slowing growth. The GDP growth rate has slowed from 4.1% in the fourth quarter of 2011 to 2.1% in the first quarter of 2012 and to an estimated 1.7% rate for the second quarter. During these same periods, the average monthly increase in employment has been extremely volatile, having risen from a monthly average of 164,000 new jobs in the fourth quarter of 2011 to 226,000 in the first quarter of 2012. Then, however, the monthly average fell to 67,000 new jobs per month in the second quarter. Since the end of the second quarter we have had two monthly jobs reports showing an average monthly increase of 119,000 jobs. When the August report was released showing a disappointing 96,000 new jobs added that month, the government also revised the prior two monthly reports lower. The June and July monthly estimates were revised down by an average of 20,000 jobs per month.

Exhibit 11. Job Growth Appears To Slow In Summer



Source: BLS, PPHB

Is there something about a summer slump for the economy?

Following a robust jobs creation period from the end of the fourth quarter of 2011 through spring of 2012, the April through August reports, with the exception of July, have been extremely weak for new job creation. If we look just at the last three months, the economy was only able to create an average of 94,000 new jobs per month. That compares with a monthly average of 99,000 new jobs created in the prior three-month period. Interestingly, the pattern of weak job creation in this period seems largely to have been mirrored in 2011. That year, the weakest months for new job creation were May through August. Is there something about a summer slump for the economy?

Today, there are 261,000 fewer jobs than when President Obama was sworn into office

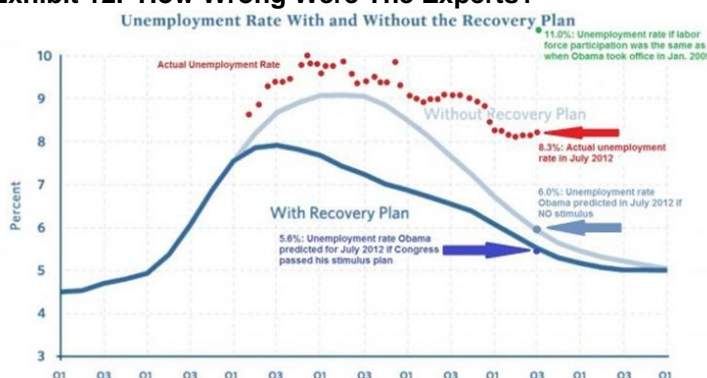
On the campaign trail, President Obama makes the claim that his administration has added 4.5 million new private sector jobs over the past 20 months. He fails to point out that during this same time period the public sector has shed half a million jobs, netting him only four million total new jobs. Today, there are 261,000 fewer jobs than when President Obama was sworn into office. Compared to election eve 2008, there are 1.7 million fewer jobs and 4.7 million fewer than from the period immediately prior to the financial crisis.

With the stimulus, the Obama administration argued, the unemployment rate would not exceed 8% and would fall to 5.6% by July 2012

During his first year in office, President Obama's economy lost 4.3 million jobs. This was during a time when the government stimulus program begun under President George W. Bush was in operation (TARP and a Social Security reduction) and President Obama pushed through his nearly \$900 billion stimulus spending package designed to create jobs through funding "shovel-ready" infrastructure construction projects. As part of the push to convince the American public and the members of Congress about the validity of this stimulus, President Obama's economists authored numerous op-eds and position papers demonstrating that without the stimulus package, the nation's unemployment rate would reach 9% and not fall below 6% before July 2012. With the stimulus, the Obama administration argued, the unemployment rate would not exceed 8% and would fall to 5.6% by July 2012. As we know, the reality was

quite different even with the stimulus as the nation's unemployment rate hit 10% and currently sits at 8.1% having never dipped below 8% since January 2009. Moreover, if the economy had the same labor force participation rate as it did when President Obama was inaugurated, the unemployment rate would be about 11% today.

Exhibit 12. How Wrong Were The Experts?



Source: Agora Financial

The civilian labor force participation rate has essentially returned to where it was at the beginning of the 1980s

One of the major changes in the domestic labor force has been the decline in the overall participation rate. Today, the rate is 63.5%, which has declined steadily since it peaked at 67.3% in April 2000. As shown in Exhibit 13, the civilian labor force participation rate has essentially returned to where it was at the beginning of the 1980s. If we go back just to 2007 before the financial crisis, the drop in the labor force participation rate means there are 4.6 million fewer jobs. Most of those who have left the labor force have gone back to school or on disability with a small portion electing to retire. The 2.1 million workers returning to school will re-enter the labor force and will likely drive the unemployment rate higher as they do.

Exhibit 13. Labor Force Participation In Decline

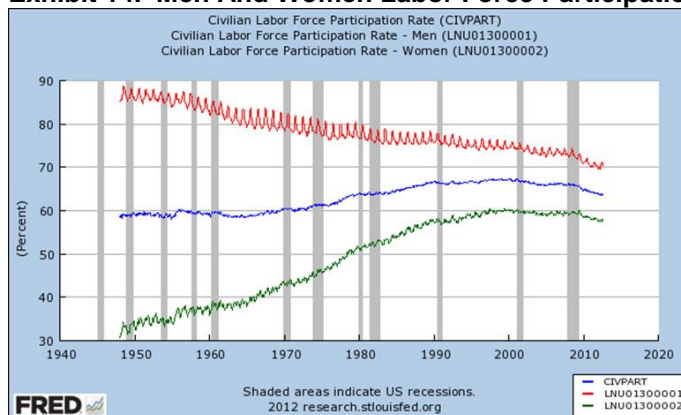


Source: St. Louis Fed

Since the 1950s, the participation rate of men has steadily declined hitting a new low

The most dramatic change in labor force dynamics has been the long-term increase in participation by women and the corresponding long-term decline of men. Exhibit 14 shows that since the 1950s, the participation rate of men (red line) has steadily declined hitting a new low. Women, on the other hand, increased their participation (green line) steadily until about 2000 when the rate stabilized, but in the past few years due to the financial crisis and the recession, their participation rate has declined, too. An explanation of what is happening with labor force participation is that we have been witnessing the impact of early retirements of the baby boomer generation coupled with a growing portion of the population deciding to stop seeking work and many more people applying for long-term disability status.

Exhibit 14. Men And Women Labor Force Participation



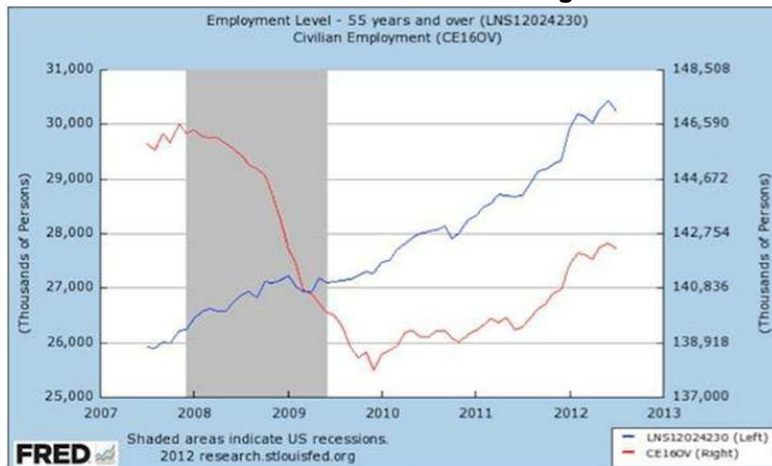
Source: St. Louis Fed

Employers value the skills and knowledge of older workers

One problem with the argument about the early retirements of the baby boomers is that the participation of those 55 and older continues to increase. As shown in Exhibit 15 (next page), the number of workers 55 years old and older (blue line) has risen steadily since 2007, although the increase has been volatile in the past few months. The number of older workers rose throughout the recession while overall employment fell. We think the continued growth in older workers is a contributory factor retarding the growth of the overall labor force participation rate. Older workers are not giving up jobs that would have been open for younger workers. It seems employers value the skills and knowledge of older workers, a phenomenon supported by a recent survey of employer attitudes toward older and younger workers that pointed out the lack of verbal, writing and dedication characteristics among younger workers, which is holding down their employment opportunities.

This decline in labor force participation partially explains why the pace of the labor market recovery is the worst since the 1930s. As shown in Exhibit 16 (next page), the percentage change in total employment has been plotted for every recession since the beginning of the 1970s. The lines show how employment changed

Exhibit 15. More Older Workers Are Working

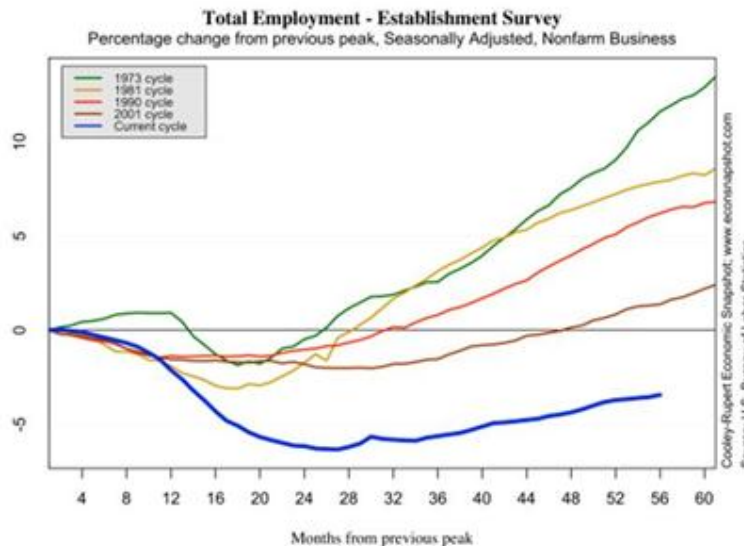


Source: St. Louis Fed

This recovery has been extremely weak and its pace continues to be weak

from the prior peak in activity. To understand the blue line (current cycle), the zero month would be when the recession started that ended 18 months later in June 2009 (six months after President Obama was inaugurated). The remaining 38 months reflect the period from June 2009 to August 2012. As that blue line shows, this recovery has been extremely weak and its pace (reflected by the slope of the line during its upturn) continues to be weak.

Exhibit 16. Current Recovery Slowest Since 1970



Source: Agora Financial

Part of the problem for the economy is that it still depends upon consumer spending for about 70% of its activity. With labor markets remaining challenged, which is reflected not only by the high

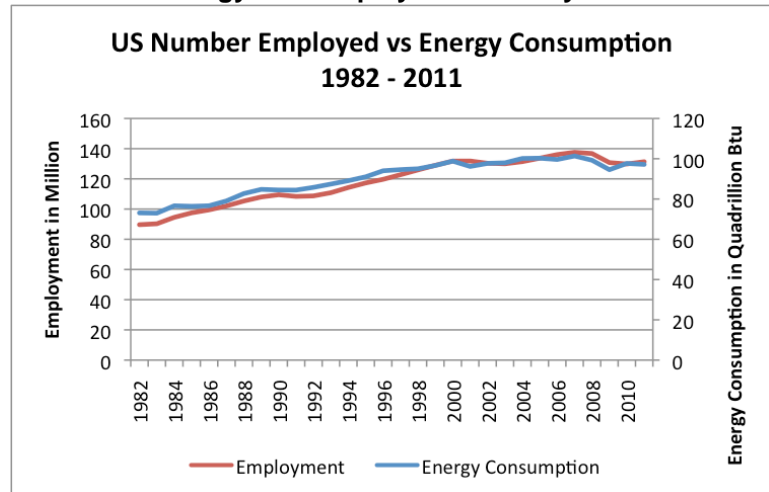
Without expanding incomes, the impact from lost wealth in the form of falling home prices due to the fallout from the collapse of the housing market has further stressed American families

This statement clearly acknowledges the importance of improving the labor market as the key to a sustainable economic recovery

unemployment rate but also by stagnant average hours worked and average hourly earnings for the typical American worker, consumer incomes are not growing. Without expanding incomes, the impact from lost wealth in the form of falling home prices due to the fallout from the collapse of the housing market has further stressed American families. They are struggling to meet their growing gasoline and food bills while trying to figure out whether they will have enough money to educate their children and to retire. The state of today's economy and our work force leaves open the question of what the catalyst might be to boost consumer spending and thus stimulate economic growth. Faster economic growth would lead to greater energy consumption.

The importance of the need for faster economic growth was highlighted by the Federal Reserve's recently announced new monetary quantitative easing (QE) strategy. The Fed plans to buy \$40 billion of mortgage-backed securities per month indefinitely until the agency believes the economic recovery is strongly established. In the Federal Open Market Committee's (FOMC) statement, it stated the following: "If the outlook for the labor market does not improve substantially, the Committee will continue its purchases of agency mortgage-backed securities, undertake additional asset purchases, and employ its other policy tools as appropriate until such improvement is achieved in a context of price stability." This statement clearly acknowledges the importance of improving the labor market as the key to a sustainable economic recovery.

Exhibit 17. Energy And Employment Closely Linked



Source: Gail Tverberg

The chart in Exhibit 17 comes from a report posted on the blog, [Our Finite World](#), authored by Gail Tverberg. The report is titled "The Close Tie Between Energy Consumption, Employment, and Recession." What Ms. Tverberg found was that there is a very strong correlation ($R^2 = 0.98$) between changes in total U.S.

Between 1996 and 2000, the economy did add 12 million new jobs, at a time when the labor force was 20% smaller than it is today

At issue for many of these skeptics is their belief that the U.S. economy has structural problems in the labor market that prevents the hiring of many of the country's 23 million currently unemployed and underemployed workers

employment and energy consumption. This would suggest that if the U.S. labor force continues to struggle adding jobs as it has for the past several years, it will be difficult to see any meaningful growth in energy consumption.

President Obama campaigns on the promise to grow the economy and add more jobs, although he seems not interested in spelling out what changes to his policies and actions will enable this promise to be met. Mr. Romney, on the other hand, says he has a plan to add 12 million new jobs over his term in office if elected president based primarily on exploiting domestic energy resources and reducing regulation and taxes to allow American businesses to grow. Many Democrats and economists scoff at Mr. Romney's job growth projection, however they fail to realize that between 1996 and 2000, the economy did add 12 million new jobs, at a time when the labor force was 20% smaller than it is today.

At issue for many of these skeptics is their belief that the U.S. economy has structural problems in the labor market that prevents the hiring of many of the country's 23 million currently unemployed and underemployed workers. They point to the existence of a large number of job openings being posted by American businesses and claims about the large number of new engineers and scientists needed. But that shortage argument has been around for decades – only the numbers seem to change. The concern appears to be growing due to the impending retirement of baby boomers, but many of the members of that generation are staying in their jobs longer creating an impediment for younger workers. We plan to visit the structural labor force issue, especially as it is reflected in worker education levels, in a future *Musings*.

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