PPHB
ENERGY INVESTMENT BANKING

MUSINGS FROM THE OIL PATCH

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

A Real Game-Changer – Saudi Aramco's ATP Effort?

Khalid A. Al-Falih, outlined for the first time in public, the company's new Accelerated Transformation Program that will transition Aramco from "an oil and gas company to a fully integrated global energy enterprise"

In a speech in Washington, D.C. in mid May, Saudi Aramco's President and Chief Executive Officer, Khalid A. Al-Falih, outlined for the first time in public, the company's new Accelerated Transformation Program (ATP) that will transition Aramco from "an oil and gas company to a fully integrated global energy enterprise." After reading the speech and other information about the program, one realizes this transformation may become one of the most significant game-changers impacting the international oil and gas, energy and chemical industries. The speech was delivered at a dinner in the capital city recognizing the men and women of the Saudi Aramco Management Development Seminar Class of 2011, part of a 30-year management development program. It is interesting that this program is held in Washington, but, as Mr. Al-Fatih explained, it reflects the long-standing ties of the Kingdom and the United States and the recognition that the "city provides for the participants to gain a better understanding of the complex economic and political factors that shape the formulation of international business strategy."

The "mutually beneficial interdependence of the world's leading consumer of energy and the world's largest petroleum exporter"

Mr. Al-Falih went on to cite the anchor of the relationship between the United States and Saudi Arabia as the "mutually beneficial interdependence of the world's leading consumer of energy and the world's largest petroleum exporter." While reciting the long history between the two countries and its people and how Americans and American oil companies helped build Saudi Arabia's oil company and its economy, he also stated Aramco's view of its key role in global energy markets. That role is "in fostering global energy security and petroleum market stability through both the reliability of its operations and its investment in significant spare production capacity."

The company is also working hard to develop renewable, nonconventional resources and environmentally beneficial technologies

In describing some of the changes the new Aramco will reflect, Mr. Al-Falih described how the company's upstream exploration and production business will extend its activities into frontier areas within the Kingdom, which includes the deep waters of the Red Sea, and developing new unconventional natural gas resources, including tight gas and shale gas. In the downstream sector, Aramco is pressing ahead with the massive expansion of its global refining capacity and continuing with refining and chemicals integration and expansion in the U.S., Korea and China. The company is also working hard to develop renewable, nonconventional resources and environmentally beneficial technologies. These latter efforts are underway despite Aramco's view that even 25 years from now the world will still derive the greatest portion of its energy supply mix from crude oil. In other words, Saudi Arabia will still be the major domo in the crude oil world!

Energy consumption patterns in the world are shifting as living standards in the developing world rise

Mr. Al-Falih went to great lengths to discuss how the world in which his company is operating is changing. These changes included energy consumption, technology, geopolitical and social relationships and environmental issues. He pointed out that energy consumption patterns in the world are shifting as living standards in the developing world rise. He believes that advanced technology continues to alter the ways in which Aramco will be running its business in the future.

But probably the biggest challenge for the new Aramco will be the demographic changes underway at the company, and in the Kingdom itself. Saudi Arabia has a very large youth population and Aramco is facing a significant number of employees who will be retiring during the next decade, just like virtually the entire energy industry. As a result of the above changes, and especially the demographic one, Mr. Al-Falih concluded: "Such challenges and opportunities are not met simply through production capacity increases or the development of another set of megaprojects; rather, they require a set of fundamental changes in the way we do business, in the expectations we have from our people, and in the expectations they in turn have from our company."

"…the future of the energy industry – and indeed, the global business environment – will be marked by greater complexity…"

Mr. Al-Falih closed his speech with the following point: "…the future of the energy industry – and indeed, the global business environment – will be marked by greater complexity…." He went on to say "that complexity will be coupled with significant new opportunities which hold tremendous potential and promise." The punch line, and the point that those of us in the energy industry must contemplate is: "That is why ten years from now, when the world looks at Saudi Aramco it will see a global energy company that still has that power to provide, but which also is better, faster and smarter, and even more capable of making a lasting difference in the Kingdom and beyond."

Exhibit 1. The Evolution Goal For Saudi Aramco

Source: ***Saudi Aramco News***

The ATP effort was the result of a year-long strategic review that involved detailed assessments of global and regional trends and the business challenges they potentially represent

An interesting release was issued at the end of May by Saudi Aramco News, which was a question-and-answer session with a number of senior Aramco executives answering questions about the ATP. The release began with a paragraph framing the issue thusly. "How would you like to see Saudi Aramco develop over the next 10 to 20 years? Gradually, through incremental changes and the odd improvement here and there? Or fulfilling its full potential through a fundamental transformation, not just reacting to events but creating new opportunities and proactively shaping its operating environment – inside and outside the company?" The news story related that the ATP effort was the result of a year-long strategic review that involved detailed assessments of global and regional trends and the business challenges they potentially represent for Aramco over the next two decades.

In response to a question about the timing of the ATP effort, the answer was that "many companies transform because they are faced with adversity, but the best transform while they are doing well in order to capitalize on opportunities and realize their full potential." This is an interesting and astute observation about how successful companies evolve.

The timing of the disclosure of the ATP initiative is curious

The statement buried in the Q-and-A that we found most interesting was that "the foundations of Saudi Aramco's future will remain in those reservoirs [the current prolific producing fields of Saudi Arabia], but the Kingdom and the company will have a future that is larger and more diverse." The timing of the disclosure of the ATP initiative is curious. It comes at the same time the media discovered that the Kingdom has begun a foreign relations effort aimed at creating an alliance of Muslim countries to provide a counter-balance to a militant Islamist Iran. When this effort was revealed, much was made about the alignment being really an attempt to support countries with aging despotic rulers. Many of the target

countries, however, have existing oil and gas production, some of which is in decline. They have their own national oil companies, but none of them are as technologically advanced as Saudi Aramco. Might Aramco become an agent of political development for the Kingdom in its effort to secure the alignment of these other countries?

Might the Kingdom be willing to structure more financially appealing deals with the governments than the IOCs?

Why couldn't Aramco replace the international oil companies (IOCs) that are working with the national oil companies in these countries? Might the Kingdom be willing to structure more financially appealing deals with the governments than the IOCs? While we have no answers to these questions, we think it is extremely interesting to play out a scenario of what this might mean for the IOCs, Aramco, the global oil industry and Middle East politics.

We would expect the IOCs to place an even greater emphasis on the unconventional resources of North America and Europe

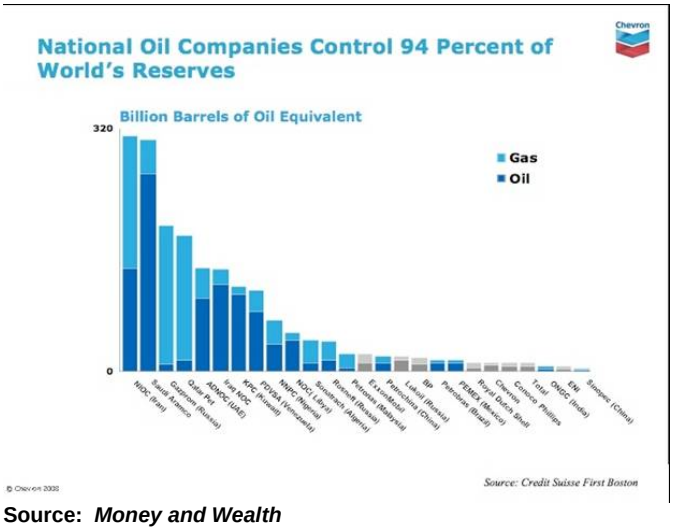
Today, national oil companies hold more than 95% of global oil reserves, up from less than 15% in the 1960s. Given this ownership mix, the IOCs have been able to work in many of the countries under cost recovery/profit sharing arrangements. Under our scenario, the IOCs could be displaced by Aramco under an arrangement that provides even more profit per barrel for the host governments. How might the IOCs respond? We would expect them to place an even greater emphasis on the unconventional resources of North America and Europe. There is little doubt but that the sandbox the IOCs currently play in would shrink, therefore to effectively use their cash flows they would have to ramp up spending and investment in these unconventional plays. The loss of some of their international opportunities would hurt the profitability of the IOCs, which in turn would force them to reassess how they allocate their cash flows between E&P investing and return of capital to shareholders. We would not be surprised if the IOCs became aggressive acquirers of domestic E&P companies as a way to build their exposures to unconventional resources. That would certainly alter the structure of the global oil and gas industry.

It would make the Aramco-influenced group of countries a more powerful group within OPEC

Inside the Kingdom, the ATP effort probably means that Aramco would be aggressively developing more lower-valued fuel supplies that could displace domestic oil use and provide the government with more oil available for export. The tie-in with other countries also would provide greater intelligence for Aramco about global oil reserves and productive capacity. It would make the Aramco-influenced group of countries a more powerful group within OPEC, or even an expanded OPEC. Saudi Arabia would be in position to exercise even greater control over global oil markets.

At the present time, on a barrel of oil equivalent basis, Iran controls the largest amount of oil and gas of any company, and it is slightly larger than Saudi Aramco. With greater influence over global oil and gas reserves, Saudi Arabia could exercise its oil market power in a geopolitical manner, similar to what happened in the 1970s through the mid 1980s. The big unknown in this scenario is who will provide

Exhibit 2. Role Of IOCs In Global Reserves



Source: ***Money and Wealth***

leadership for the Kingdom as its aging ruler and his aging brothers exit from the world stage.

Game-changers are always talked about, but true game-changers are seldom recognized at the time

As we learned about the ATP effort and the political maneuvering of the Saudi Royal family, and began to consider the possible ramifications, we were struck by the idea that this could be as big a game-changer for energy industry as the peaking of U.S. oil production in 1971. Game-changers are always talked about, but true game-changers are seldom recognized at the time. Their significance is only appreciated with appropriate hindsight. We nominate this development as a possible game-changer to watch.

UK Hydraulic Fracturing Report Supports Technology Use

The report is heavy with research and discussion of all the issues involved in developing gas shale resources

The UK Parliament has recently published a report from its House of Commons Energy and Climate Change Committee that examined the gas shale resources in the country and the use of hydraulic fracturing to extract the resource. The report is heavy with research and discussion of all the issues involved in developing gas shale resources. Members of the committee even traveled to the United States to meet with political, scientific and industry sources in order to gain the broadest spectrum of opinions on the various critical issues that need to be considered before reaching a conclusion on the environmental issues associated with gas shales.

An assessment of the report by analysts at the government research firm, Washington Analysis, concluded that "this research-intensive report could serve as a barometer for the US Environmental Protection Agency's (EPA) eventual study on the subject." They go on to point out that the EPA study is still in its "scoping" phase suggesting to the analysts that it will not be completed before 2013,

thereby preventing Congress from acting to possibly restrict the use of hydraulic fracturing. While that assessment should be considered good news for the natural gas industry, we would offer several cautions about accepting that view.

The EPA acknowledges that some of its research studies will not be completed by the date of its preliminary report

First, the EPA has said it will provide a preliminary report before the end of 2012. The EPA acknowledges that some of its research studies will not be completed by the date of its preliminary report, so the final report will not be completed until 2014. When one reads the initial proposal for the study, the EPA says it is designed to answer two overarching questions. Those are: Can hydraulic fracturing impact drinking water resources? And, what are the conditions associated with the potential impacts on drinking water resources due to hydraulic fracturing activities? It seems to us that the first question can never be completely dismissed as there will always be the potential for contamination, although the possibility is extremely low.

President Obama appointed a seven-member panel to examine and develop recommendations to better regulate hydraulic fracturing to assure it is done safely

Second, the EPA study is not the only one underway. Earlier this month, President Obama appointed a seven-member panel to examine and develop recommendations to better regulate hydraulic fracturing to assure it is done safely. The panel is headed by John Deutch, a professor at Massachusetts Institute of Technology and a former head of the Central Intelligence Agency, and includes six other high-profile individuals. The panel is to complete its work in 90 days, or by the end of summer, a year before the EPA preliminary study will be reported. There are two issues to consider about this action. First, it may reflect the White House's concern about the time necessary for the EPA study and the growing public concern about gas shale drilling. It may also reflect reaction to the recent Duke University and Cornell University studies about the dangerous aspects of hydraulic fracturing and gas shale drilling, even though these studies are being widely debunked by energy experts.

The defense will be that an expert panel had previously examined the gas shale safety issue and recommended the federal government take certain actions

Now that the government will have two bites at the apple, a cynic may conclude that the panel might recommend minimal actions by the federal government while proclaiming the overall safety of gas shale extraction. That would enable the Obama administration to claim it has addressed the safety concerns of gas shale while then pushing for federal regulation of the drilling/completion process for gas shale wells. That would then form the basis for the EPA to complete its study with the aim of further bolstering its regulation of the fossil fuels industry. The defense will be that an expert panel had previously examined the gas shale safety issue and recommended the federal government take certain actions. This may explain why both ExxonMobil (XOM-NYSE) and Chevron (CVX-NYSE), who have recently committed significant corporate assets to developing gas shale resources, have started advertising campaigns to educate the public about the safety of hydraulic fracturing. They may be signaling their concern about potential restrictions on extracting gas shale resources.

Exhibit 3. Exxon Ad Described As Misleading

Source: ProPublica.org

An ExxonMobil spokeswoman admitted that the drawing was not accurate

While it has not received much general media attention so far, *ProPublica*, the investigative reporting web site and a major antagonist to gas shale resource exploitation and use of hydraulic fracturing, challenged the well schematic used by ExxonMobil in its newspaper advertisement campaign. The ad (Exhibit 3) implies that all Marcellus wells are cased with multiple pipes and cement from the surface to their termination. The point of the ad is to show that these wells are fully protected with multiple lines of defense against possibly leaking natural gas into aquifers. In response to *ProPublica's* questioning whether it was correct that horizontal wells are fully lined with multiple casing strings, an ExxonMobil spokeswoman admitted that the drawing was not accurate. That point will be used by opponents of hydraulic fracturing to undercut in the public's mind the integrity of the company's safety claims. The National Resources Defense Council wrote about this issue in a letter to the editor of *The Washington Post* where the ad had appeared.

"If hydraulic fractures combine with pre-existing faults of fractures that lead to [drinking water] aquifers or directly extend into aquifers, injection could lead to the contamination of drinking water supplies by fracturing fluid, natural gas, and/or natural occurring substances"

Third, comments from the House of Commons report about their meeting with EPA officials give a view of its concerns about the use of hydraulic fracturing and which may form the thrust of the agency's review. The report stated: "We heard during our visit to the US, that the US Environmental Protection Agency (EPA) believed that—from evidence it had gathered so far—that 'if hydraulic fractures combine with pre-existing faults of fractures that lead to [drinking water] aquifers or directly extend into aquifers, injection could lead to the contamination of drinking water supplies by fracturing fluid, natural gas, and/or natural occurring substances.'" The EPA's concern is similar to those we have heard for years from geologists and petroleum engineers involved in drilling gas shale wells in the Marcellus formation because of the significant faulting and undulating rock formations. While this may be a concern, to date there do not appear to be any examples of this occurring.

We hope Congress, the EPA and the Obama hydraulic fracturing

panel pay attention to the key conclusions from the UK Parliament study. The House of Commons report stated:

"113. We conclude that hydraulic fracturing itself does not pose a direct risk to water aquifers, provided that the well-casing is intact before this commences. Rather, any risks that do arise are related to the integrity of the well, and are no different to issues encountered when exploring for hydrocarbons in conventional geological formations. We recommend that the Health and Safety Executive test the integrity of wells before allowing the licensing of drilling activity.

"114. We recommend that the Environment Agency should insist that all companies involved in hydraulic fracturing should declare the type, concentration and volume of all chemicals they are using.

"115. We recommend that before the Environment Agency permits any chemicals to be used in hydraulic fracturing fluid, they must ensure that they have the capabilities to monitor for, and potentially detect, these chemicals in local water supplies."

The committee's recommendations are certainly ones the energy industry is comfortable complying with and the public should be happy to accept

Their conclusion is supported by all previous studies conducted of hydraulic fracturing activity. The committee's recommendations are certainly ones the energy industry is comfortable complying with and the public should be happy to accept, also. Our concern about the politicians in Washington and the various states where hydraulic fracturing has become an emotional and political issue is that the critics may have another undisclosed agenda; one that clearly did not underlie the UK House of Commons committee report. Our review of the facts and the science surrounding hydraulic fracturing supports the Parliament's conclusions. In our opinion, only an unspoken agenda can produce a bad outcome from the EPA and Presidential studies. That possibility explains our concern.

If U.S. Follows Canada's Fiscal Solution, Energy Use To Fall

Mr. Rosenberg suggested that the path for the U.S. from its financial difficulties would be to follow the path trod by Canada in the 1990s

We recently read with interest an economic commentary written by David Rosenberg, the chief economist and strategist at Canadian money management firm, Gluskin Sheff & Associates Inc. (GS-TSX). Previously, Mr. Rosenberg was the chief North American economist for Merrill Lynch. His May report focused on the financial problems confronting the United States due to its profligate spending habits and massive federal debt. Mr. Rosenberg suggested that the path for the U.S. from its financial difficulties would be to follow the path trod by Canada in the 1990s. The architect of Canada's financial restoration effort was former Finance Minister Paul Martin. Mr. Rosenberg pointed out that one reason the austerity program being undertaken by the UK has been well received by financial markets is that Mr. Martin is a consultant to the government on its effort.

At that peak, about half of Canada's debt was owned by foreign investors, like U.S. debt today

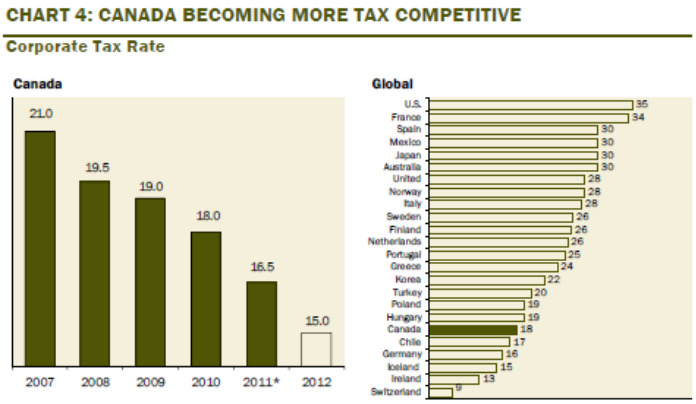
From the late 1960s to the early 1980s, Canada, under Prime Minister Pierre Trudeau's "Just Society" governance policy, engaged in massive deficit financing. At the start of the 1980s, Canada's federal debt-to-GDP ratio was stable around 30%. By the end of the decade, the ratio had risen to 50% and then approached nearly 70% by the mid-1990s. That peak ratio is about where the U.S. is today. At that peak, about half of Canada's debt was owned by foreign investors, like U.S. debt today. At one point in the 1990s, almost 40% of Canada's federal revenues were absorbed by interest expense on the steadily rising level of public debt.

Mr. Rosenberg estimates that a similar swing for the U.S. would imply a $1 trillion in tax increases and spending cuts

To reverse this situation, Canada endured years of austerity during which the government raised taxes, cut spending, privatized various government operations and re-wrote social contracts by instituting means-testing and claw-backs for social security. During that time, Canada's government spending as a percent of GDP fell from 17.4% to 12.1%. The impact was about a $50 billion cut in government spending. At the same time, the increase in taxes boosted the government's income relative to GDP from 17.0% to 18.2% extracting an additional $10 billion from the citizens. Mr. Rosenberg estimates that a similar swing for the U.S. would imply a $1 trillion in tax increases and spending cuts, remarkably similar to the recent comments from Vice President Joe Biden.

Mr. Rosenberg pointed out that Canada accomplished most of its financial improvement through spending cuts rather than increased taxes. As a result, Canada today sports one of the lowest top marginal corporate income tax rates in the world, which certainly helps its home-based companies' global competitive position.

Exhibit 4. Canada's Low Tax Rate Is A Plus



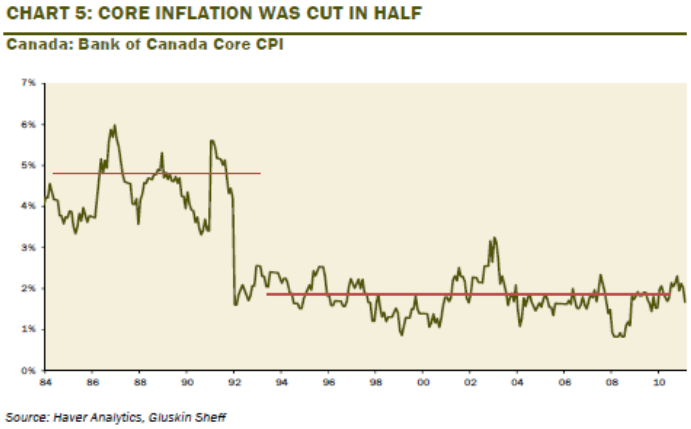
Source: David Rosenberg

The key message in Mr. Rosenberg's analysis is that the financial medicine necessary to correct the profligate spending and reduce the debt balance will create pain for the U.S. economy. He

The cut in the economic growth rate kept the country growing at 2.5% per year, a sub-optimal growth rate

estimates that the $1 trillion restraint over a five-year period will reduce real GDP growth by one full percentage point annually. That will be painful, but in Mr. Rosenberg's estimation will be well worth it for the benefits that will come later as the U.S. gains increased financial flexibility. In the Canadian experience, the cut in the economic growth rate kept the country growing at 2.5% per year, a sub-optimal growth rate. The benefit, however, was that Canada's core inflation rate was cut in half from 2% to 1%.

Exhibit 5. Low Inflation Was Canada's Reward



Source: David Rosenberg

The biggest difference between Canada then and the United States now is that Canada had a majority government that could act without needing help in influencing the decision-making process

There are two challenges for the United States. First, the U.S. debt ratio is about twice what it was for Canada. But possibly the bigger challenge will be mustering the political will to make the tough spending and taxing actions to control, and eventually reverse, the out-of-control federal government. The biggest difference between Canada then and the United States now is that Canada had a majority government that could act without needing help in influencing the decision-making process. Historically, what has worked best in the U.S. has been divided government because little legislation gets enacted.

During the past two years, it is our impression that the public has gotten ahead of the politicians in understanding that action is necessary if U.S. economic growth is to become more robust. The first battle was at year-end when the Obama administration was forced to accept policy changes in order to avoid a government shutdown. The next battle is underway over lifting the debt ceiling. We can look forward to 18 more months of these battles. During this time, it is hard to fathom the economy growing at a rapid rate, meaning energy demand will remain lackluster.

Frac Attack: Burning Water And Earthquakes

The war being waged by environmentalists against the use of hydraulic fracturing in developing natural gas shale wells has

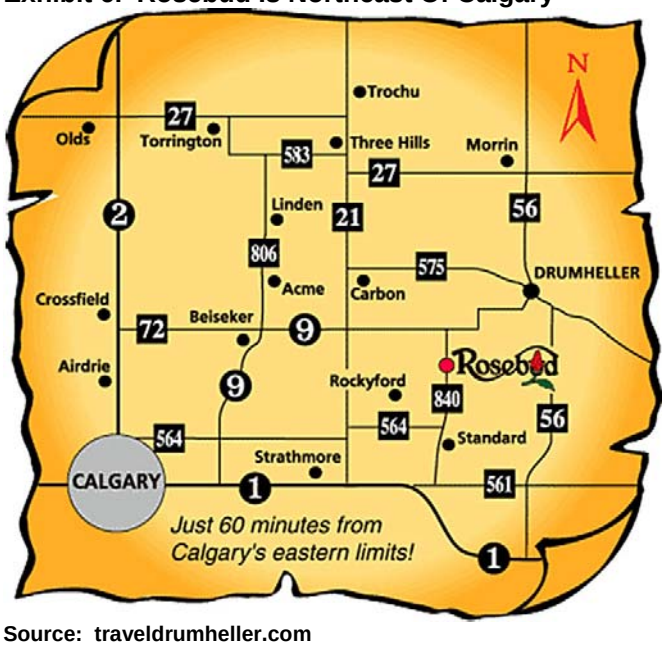
The plaintiff in the Canadian case against hydraulic fracturing has been invited to present at the 19th session of the Commission on Sustainable Development at the United Nations

expanded to western Canada. And the recent earthquakes in the United Kingdom and Arkansas are also considered tied to the fracturing of wells in the immediate areas. Based on the fact that the plaintiff in the Canadian case against hydraulic fracturing has been invited to present at the 19th session of the Commission on Sustainable Development at the United Nations later this year suggests that the future of unconventional gas shale development globally is under growing attack. The question is whether these attacks will lead to cessation of the gas shale resource development, or merely more aggressive and possibly uniform regulation.

The claim is that Ms. Ernst's water well, and water wells of some of her neighbors, have been contaminated with methane, butane and propane as a result of hydraulic fracturing of coal bed methane wells

In late April, lawyers for an oil and gas industry consultant, Jessica Ernst, filed a suit against EnCana Energy (ECA-NYSE) for failing to follow required notification rules and causing contamination of a water well along with the Energy Resources Conservation Board (ERCB) in Alberta and the Alberta government for failing to provide supervision and to adequately follow up on complaints about the condition of the water well. The well is on property near Rosebud, some 60 miles northeast of Calgary. The claim is that Ms. Ernst's water well, and water wells of some of her neighbors, have been contaminated with methane, butane and propane as a result of hydraulic fracturing of coal bed methane (CBM) wells drilled by EnCana. According to the complaint, the water wells draw from the Rosebud Aquifer that lies adjacent to the Carbon Thompson Coals and the Weaver Coals that form part of the Horseshoe Canyon formation that underlies most of Wheatland County and that is being drilled by EnCana.

Exhibit 6. Rosebud Is Northeast Of Calgary



Source: traveldrumheller.com

The complaint alleges that the contamination of Ms. Ernst's well is so bad that the water can be set on fire in dramatic descriptions of the size of the flames and that the water in toilets in the house actually bubbles. The complaint also states that isotopic fingerprinting authorized by Alberta Environment confirmed that the signatures of the chemicals in the wells matched the signatures from the gas being produced in the EnCana wells.

At shallow depths the risk of contamination must be managed because hydraulic fracturing operations are being conducted nearer the base of the groundwater aquifer

A recent report from the ERCB in its jurisdictional review of the challenges of regulating the development of gas shale resources highlighted the many issues that need to be considered and how various government and regulatory bodies around the world are addressing those challenges. A list of the broad categories of regulatory challenges includes: well spacing, hydraulic fracturing, water management, landowner/public concerns, environmental issues, the regulatory process, and information collection and dissemination. With respect to hydraulic fracturing, the ERCB acknowledged that at shallow depths the risk of contamination must be managed because hydraulic fracturing operations are being conducted nearer the base of the groundwater aquifer. In deeper zones that contamination risk is less likely due to the large vertical separation between the hydraulic fracturing operation and the aquifer. However, according to the ERCB, the claims of contamination have produced no cases with documented evidence that they were caused by hydraulic fracturing operations. The ERCB did recognize the need for disclosure of the chemicals used in hydraulic fracturing, but made no comment about the disclosure of the mixture of those chemicals.

A 2.3-magnitude earthquake was recorded at the same site on April 1st

The latest twist in the gas shale debate occurred in the UK where Cuadrilla Resources suspended its hydraulic fracturing operations due to claims they were causing earthquakes. The British Geological Society (BGS) said it recorded a 1.5-magnitude earthquake on May 27th. Besides the BGS, experts from Keele University and the UK government's Department of Energy and Climate Change analyzed data from a site at Weeton in Lancashire about 10 kilometers from Blackpool. A 2.3-magnitude earthquake was recorded at the same site on April 1st. The UK experiences 20 to 30 of these low magnitude earthquakes each year. The quakes are not strong enough to cause any damage. The problem is that the area around Blackpool was not known to have experienced earthquakes until the drilling and hydraulic fracturing activity began.

According to Brian Baptie, a BGS seismologist, "We recorded a second earthquake on May 27 and it's in exactly the same place as the event on April 1. It appears to correlate with the fluid injection part of the fracking operations on the site." In Arkansas, according to the state's oil and gas commission and the Arkansas Geological Survey (AGS), they have found no evidence that drilling or hydraulic fracturing caused a series of earthquakes there this spring. In a

Exhibit 7. Blackpool Site Of Earthquakes

Source: Google Maps

telephone interview conducted by the *Globe and Mail*, AGS director Bekki White said, "As far as whether it is related to injection of fluids, we still have not determined whether it is or whether it is naturally occurring."

The events of the past several weeks indicate that the environmental battle over the use of hydraulic fracturing will be waged on the global stage

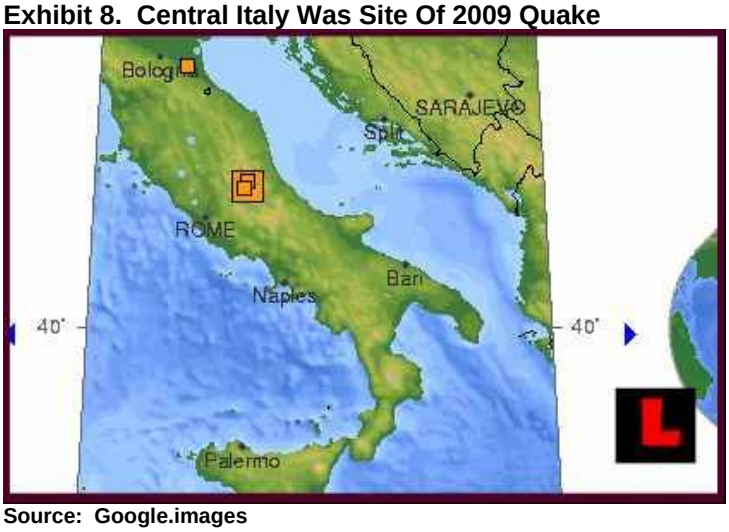
The events of the past several weeks indicate that the environmental battle over the use of hydraulic fracturing will be waged on the global stage. This battle is increasing pressure on governments that have welcomed the sudden energy windfall from the discovery of huge gas shale resources. As governments and the public raise concerns about the continued use of nuclear fuel, and they recognize the lack of scalability of renewable fuel solutions and their significant costs, we are sure they would love for the hydraulic fracturing war to go away. While jobs, health costs and taxes are listed as the key issues for deciding the next set of global elections, we wouldn't dismiss energy as becoming equally as important in deciding the world's next leaders.

Scientists: Forget About Peer Review; Fear Legal Action!

The president of Italy's National Institute of Geophysics and Volcanology, Enzo Boschi, and six other scientists and technicians are facing trail over their failure to predict the April 6, 2009,

earthquake that significantly damaged the medieval city of L'Aquila, the capital of Abruzzi, Italy. The 6.3-magnitude earthquake hit the area located about 55 miles northeast of Rome killing 208 people, leaving 65,000 homeless and damaging between 3,000 and 11,000 structures in the region.

Exhibit 8. Central Italy Was Site Of 2009 Quake



Source: Google.images

The seven defendants were placed under investigation last year according to a news story on the web site of the American Association for the Advancement of Science (AAAS). Judge Giuseppe Romano Gargarella said the defendants has supplied "imprecise, incomplete and contradictory information" in a press conference following a meeting of the Institute merely six days before the earthquake, as reported by the Italian newspaper *Corriere della Sera*. The paper further quoted the judge as saying that the defendants "thwarted the activities designed to protect the public."

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Mr. Boschi's attorney was shocked by the move and indicated that his client had been indicating that a large earthquake would be coming, although he didn't predict when. Moreover, according to the attorney, Mr. Boschi never tried to reassure the population of L'Aquila that there was no threat. Instead, he had made it clear that "at some point it is probable that there will be a big earthquake."

A spokesman for the U.S. Geological Survey (USGS) and other seismology experts and professors also expressed shock over the Italian legal action. They all expressed the view that the charges reflect a lack of understanding of the inability of experts to "predict" earthquakes. A posting on the USGS web site stated: "Neither the USGS nor Caltech nor any other scientists have ever predicted a major earthquake. They do not know how, and they do not expect to know how any time in the foreseeable future."

The charges reflect a lack of understanding of the inability of experts to "predict" earthquakes

As one of the professors explained to *LiveScience*, scientists don't

know how much stress it takes to break a fault, besides not knowing how much stress is actually down at the fault. While scientists can measure the deforming of the earth due to the stress, it is impossible to determine when stress gets to the point of breaking the fault and causing an earthquake.

One has to wonder how the Italian legal system couldn't figure out the inexact science of seismology and especially its ability, or lack of, to forecast earthquakes. But then again, Italy is home to the Vatican, which tried Galileo Galilei as a heretic in 1633 and forced him to recant his view that the Earth revolved around the sun, rather than the Church's teaching that the Earth was the center of the universe. Galileo had made the first complete astronomical telescope and used it to gather evidence to support his "radical" view of the role of the Earth and the sun. Some 350 years later the Vatican recognized that Galileo was correct and 16 years later actually rewrote its science history absolving Galileo of its heresy. Given that record, it is not surprising that Italy fails to understand, or accept, the science of seismology. We hope these scientists won't have to wait 350 years to be cleared.

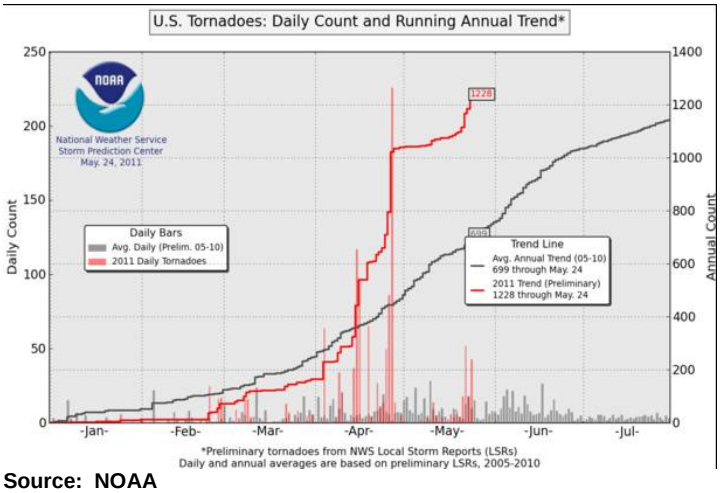
Italy is home to the Vatican, which tried Galileo Galilei as a heretic in 1633 and forced him to recant his view that the Earth revolved around the sun

Tornadoes Give Climate Change Supporters Ammunition

The central portion of the country, including parts of the Southeast, has become the target of significantly violent storms spawning a large numbers of tornadoes. The storms proved particularly deadly with a May 22nd storm devastating Joplin, Missouri and killing a reported 142 people, placing it number eight on the list of the 25 most deadly tornadoes in U.S. history. The tornado outbreak has also unleashed global warming supporters who claim that the number of violent storms confirms their belief that the nation is on a course for continued outbreaks of these deadly storms due to the rise in carbon dioxide in the atmosphere.

The tornado outbreak has also unleashed global warming supporters who claim that the number of violent storms confirms their belief that the nation is on a course for continued outbreaks of storms

Exhibit 9. Recent Tornadoes Make Year Look Bad



Source: NOAA

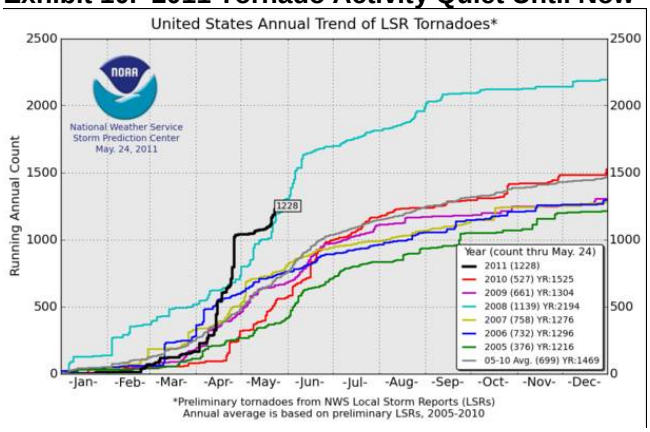
Several reporters turned to William Chamedies, an atmospheric scientist and dean of the Nicolas School of the Environment at Duke University, for his assessment of the climate and the increase in the number of tornadoes. He was quoted as saying, "It is almost impossible for us to pinpoint these specific events…and say they were caused by climate change." This is the conclusion of virtually every tornado expert interviewed. But Dr. Chamedies went on to make his case about the link of these storms to global warming by saying, "On the other hand we do know that because of climate change those kinds of events will very, very likely become more common, more frequent, more intense. So what we can say is that these kinds of events that we are seeing are consistent with climate change." This view was contained in the findings of a National Research Council Report commissioned by Congress and for which Dr. Chamedies was the vice chairman.

"So what we can say is that these kinds of events that we are seeing are consistent with climate change," said Dr. Chamedies

Dr. Brooks pointed out that the number of storms on those two days merely brought the May storm total close to the historical average for the month

The day after the outbreak of a significant number of tornadoes on May 24th and May 25th, National Public Radio (NPR) talked with Dr. Harold Brooks (no relation), a meteorologist with the National Severe Storm Laboratory at the University of Oklahoma, about the rash of storms. Dr. Brooks pointed out that the number of storms on those two days merely brought the May storm total close to the historical average for the month. Prior to those two days, this May was one of the slowest storm months on record. That comment is supported by the data from the National Oceanic and Atmospheric Administration (NOAA) for tornadoes from 2005 through 2011.

Exhibit 10. 2011 Tornado Activity Quiet Until Now



Source: NOAA

As Dr. Brooks pointed out, the Joplin tornado was not an outlier

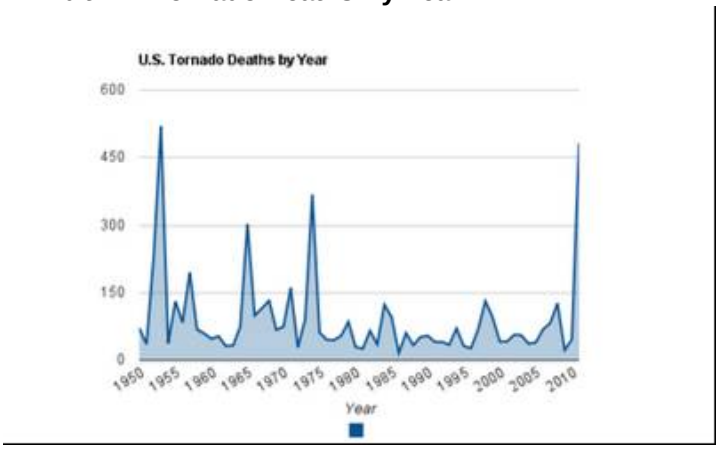
Dr. Brooks highlighted that the media focuses on the number of deadly storms and then expands their investigation into how this has become a serious problem due to some larger unexplained factor that must be considered. As Dr. Brooks pointed out, the Joplin tornado was not an outlier. It came on a day with a fewer-than-average number of tornadoes. He further pointed out that "if that tornado was five miles north or five miles south, no one outside the meteorological community would have noticed."

He did not see any trend in urban areas being hit, except possibly for the growth in urban communities

NPR pressed its case by questioning the rash of storms this year that have hit urban areas. They wondered whether this was a trend. Dr. Brooks responded that even though Birmingham and Tuscaloosa, Alabama and Joplin, Missouri have been hit, in 1998 Nashville, Tennessee was hit and the following year Oklahoma City was, too. He did not see any trend in urban areas being hit, except possibly for the growth in urban communities.

The more interesting phenomenon is that this recent outbreak in tornadoes ranks with the 1950s storm activity. In fact, there are three tornadoes on the top 25 deadliest list with Flint, Michigan ranking tenth (116 deaths), Waco, Texas at number 11 (114 deaths) and Worcester, Massachusetts at number 21 (90 deaths). A storm from 1955 was also on the list. The chart of tornado deaths by year contained in Exhibit 11 shows the impact of 1953 and the recent storm deaths.

Exhibit 11. Tornado Deaths By Year



Source: ***VOANews.com***

The data shows that the 1950s was the most deadly decade with 8.6 deaths per million of population

An even more interesting trend is the number of deaths from tornadoes by decades and their relation to the population of the country. The data shows that the 1950s was the most deadly decade with 8.6 deaths per million of population. That ratio has declined steadily until it hit only 1.9 deaths per million for the decade of the 2000s. Based on the first two years of this decade, we would appear to be on an upward trend that might take us back closer to the 1950s, but there are many more years of weather to be experienced before we know whether that claim might prove correct.

The claim about climate change, which really means the increase in global warming, and the number of tornadoes is further refuted by data about the long-term trends in both the number of storms and rising temperatures. The two charts below show clearly that while average temperatures, measured for the March through August time period of each year, have risen between 1950 and 2010, the number of strong tornadoes (F3 to F5) during the period declined. These

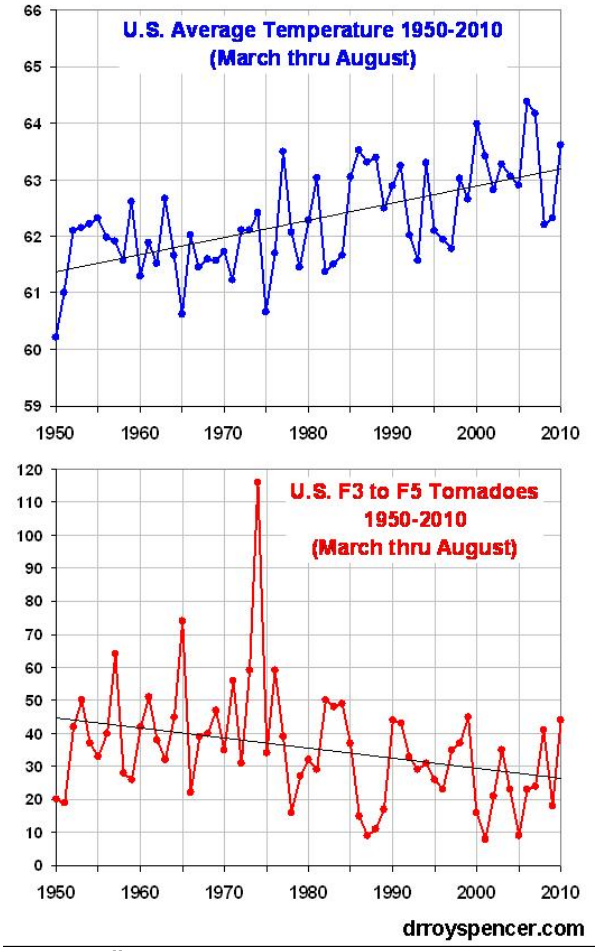
Exhibit 12. Tornado Deaths By Decade

Decade	Total Deaths	Deaths/Million
1950s	1,419	8.6
1960s	942	4.9
1970s	998	4.7
1980s	522	2.2
1990s	579	2.2
2000s	556	1.9
2010s	420	

Source: NOAA, *brianposts.blogspot.com*, PPHB

charts suggest that there has been no direct relationship between global warming and an increase in tornadoes.

Exhibit 13. Tornadoes And Temps Inversely Related



Source: *Climate Depot*

They have moved away from the use of global warming, opting instead for climate change, as it enables them to tie any extreme weather event to their idea of what is disrupting a peaceful environment

Fear of global warming creating serious weather events that cause death and damage has become a strong weapon for environmentalists. They have moved away from the use of global warming, opting instead for climate change, as it enables them to tie any extreme weather event to their idea of what is disrupting a peaceful environment. This is how we find extreme heat and drought cited as due to climate change just as winter blizzards and super cold temperatures are. While we are not interested in debating the global warming or climate change case, we recognize its proponents will use all extreme weather events to attempt to further their cause. As a result, we expect the start of the hurricane season on June 1st will provide another opportunity for these global warming proponents to claim that an "above average" or "above normal" tropical storm season is the result.

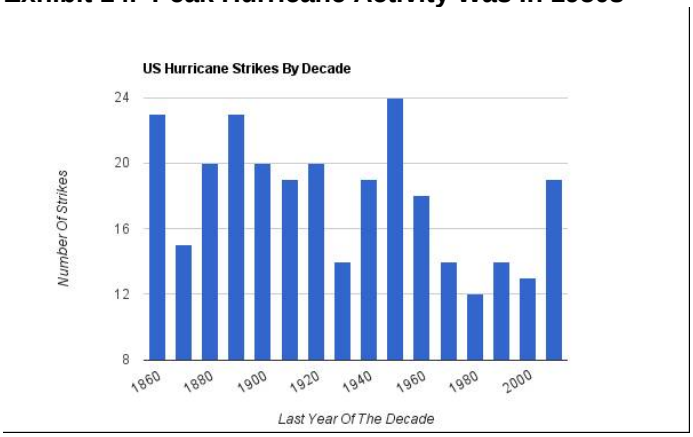
We have previously reported on the various weather forecasting services that have made forecasts of the number of tropical storms and hurricanes suggesting that this season will be very active, and more importantly, has an increased chance of some of these storms making landfall on the U.S. coastline. While climate scientists have tried to link global warming with the recently increased tropical storm activity, they have not been able to make the case convincingly. Dr. William Gray of the Department of Atmospheric Science at Colorado State University has undertaken extensive research that shows that there is no correlation between rising temperatures and carbon dioxide concentration in the atmosphere and increased tropical storm activity. That, however, will not deter the global warming supporters from trying to make the case each time a new tropical storm or hurricane emerges.

Both periods had similar, although slightly different, weather phenomenon that explained their high activity

What is interesting is the coincidence of increased tornado activity and more tropical storms and hurricanes. The even more interesting coincidence is that these two weather events also were quite active during the 1950s. A 2005 paper by Gerald Bell and Muthuval Chelliah at NOAA's Climate Prediction Center showed that the period 1950-1969 and 1995-2004 were both marked by above normal Atlantic hurricane activity. Both periods had similar, although slightly different, weather phenomenon that explained their high activity. The years 1950-1969 exhibited a strong link to the leading topical multidecadal mode, which is a series of climate conditions that foster formation and strengthening of tropical storms in the Atlantic basin. Likewise, 1995-2002 was associated with a sharp increase in amplitude of the second leading tropical multidecadal mode. There was a very strong West African monsoon circulation pattern and near-average sea surface temperatures across the central tropical Atlantic basin during 1950-1969 compared to modestly enhanced West African monsoons and exceptionally warm Atlantic sea surface temperatures during 1995-2004. It is the fact that this set of variables was quite similar during the two time periods, which helps explain the rather heavy storm activity in the 1950s and currently, while these same conditions did not exist

during the intervening period when storm activity was dramatically reduced.

Exhibit 14. Peak Hurricane Activity Was In 1950s



Source: NOAA

Since 1960 and through 2008, the U.S. averaged 14 hurricanes per decade, or 1.4 storms per year

Prior to 1960, the United States average about 20 hurricane strikes per decade, or two per year. Since 1960 and through 2008, the U.S. averaged 14 hurricanes per decade, or 1.4 storms per year. The number of storms was lower in 2009 but significantly higher in 2010. The result may be a slight increase in the average number of storms. While climate change supporters will focus on last year, statistically the number of storms has declined from earlier periods, even though there were similar climate variables existing during the two bookend periods. If 2011 proves as active as the forecasters are predicting, then the climate change supporters will be trying to reinvigorate their case.

Climate scientists have convinced the politicians that Chicago's climate by the end of the century will resemble that of Baton Rouge, Louisiana rather than its historical northern weather

These climate change supporters, however, are succeeding in influencing politicians. The decisions being made by governments in response to the cajoling from climate change "scare scenarios" is demonstrated by Chicago. A recent extended article in *The New York Times* described how climate scientists have convinced the politicians that the city's climate by the end of the century will resemble that of Baton Rouge, Louisiana rather than its historical northern weather. As a result, Chicago has banned the planting of white oaks, the state tree of Illinois, in favor of swamp oaks and sweet gum trees from the South. They also are adding vegetation to roofs and are considering air conditioning for all the city's 750 schools.

The climate scientists have modeled that Chicago would have summers like those of the South with as many as 72 days with temperatures over 90 degrees. For most of the past century the city has averaged fewer than 15 days. Likewise, by 2070 the city could expect 35% more precipitation in winter and spring, but 20% less in summer and fall. The computer models demonstrate that heat-

related deaths could soar to 1,200 a year and that the rapidly changing temperatures could cause significant deterioration in the condition of building facades, bridges and roads. Termites also could become a serious problem, while they are virtually non-existent today.

They are rebuilding bike lanes and parking spaces with permeable pavers allowing 80% of rainwater to filter through to the ground below

As a result of these disastrous predictions, Chicago is undertaking to rebuild its alleys and streets, which account for 25% of ground cover, to allow water to seep into the ground rather than all run off into the drainage system. They are rebuilding bike lanes and parking spaces with permeable pavers allowing 80% of rainwater to filter through to the ground below. They are using a new pavement material that includes recycled tires enabling the concrete to expand in heat and contract in cold without cracking or buckling. The city has undertaken a tree planting effort, spending $10 million a year, to increase the tree cover from 11% in 1991 to a goal of 23% this decade. We were intrigued that it costs about $4,500 per tree. Maybe that's because they eschew local trees such as white oak, ash and Norway maples and instead import trees native to the South.

It appears these Chicago politicians are not about to let this crisis go to waste

While the famous quote, "Never let a good crisis go to waste," is attributable to the current Chicago mayor, Rahm Emanuel, this remaking of Chicago began under former mayor William Daly. However, we guess the quote reflects the modus operandi of all Chicago politicians, and consultants, too. The scary thing is how much investment is being redirected under this plan to projects that may prove worthless, or at least not efficient if global warming doesn't continue as the computer models predict. It appears these Chicago politicians are not about to let this crisis go to waste.

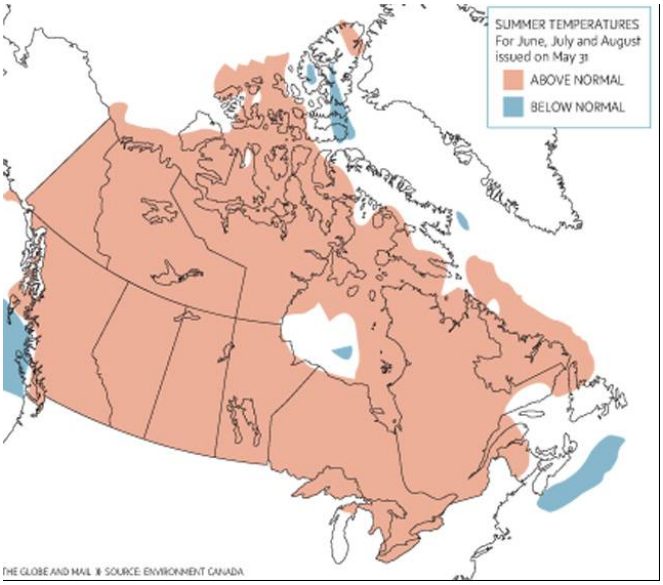
Will Canada's Summer Help Global Warming Proponents?

There is almost no part of Canada that will not be above normal according to the forecast

Environment Canada, the country's official weather forecaster, released its summer projections last week calling for a warmer than normal summer. For those Canadians who have endured a seemingly endless winter marked by periods of bitter cold temperatures and heavy snows, a warm summer will be positive respite. Amazingly, there is almost no part of Canada that will not be above normal according to the forecast, with the exception of a small part of the west coast encompassing Victoria Island off Vancouver, British Colombia. There may also be a small stretch of below normal temperatures in the far north and off Nova Scotia on the East Coast.

Last summer was the third warmest since the weather service began compiling records in 1948. We are sure that hot temperatures will be cited by global warming proponents as further evidence of the impact of increased carbon emissions. The problem for global warming proponents is that the evidence continues to mount that the planet experienced warmer periods in the past when carbon

Exhibit 15. A Warmer Summer In Canada



Source: ***Globe and Mail***

emissions were not anywhere near today's levels suggesting something other than humans and the burning of fossil fuels was the cause.

The proponents of global warming worked hard in the mid 1990s to try to eliminate the Medieval Warm Period from the temperature records

In the years surrounding 1000 AD the historical records in Europe clearly demonstrated extreme warmth. That time is referred to as the Medieval Warm Period and was characterized by the Vikings settling and farming Greenland and extensive grape growing and wine making in the UK. The proponents of global warming worked hard in the mid 1990s to try to eliminate the Medieval Warm Period from the temperature records as their computer models forecasting the cataclysmic outcome from further global warming couldn't replicate that historical warm era. "We have to get rid of the Medieval Warm Period" was the theme of one of the many emails uncovered from the Climate Research Unit at the University of East Anglia in the UK. Once they had to confront the existence of this warm period in Europe, their explanation was that it was a regional phenomenon and nowhere else on the planet was as warm. That thesis is being increasingly discredited.

First, the Chinese Academy of Meteorological Sciences documented that their country was one degree warmer during the Medieval Warm years than today. The Chinese Academy used data showing where citrus crops were grown and subtropical herbs cultivated to demonstrate this temperature comparison. Even data from the United Nations Intergovernmental Panel on Climate Change (IPCC) showed that Japan was warmer than now.

The latest temperature data comes from an extensive study, recently published in the *Proceedings of the National Academy of Sciences*,

Examination of the lake's sediments supports the position that South American temperatures were equally as warm as the rest of the world during the Medieval Warm Period

examining the oxygen content and other natural ingredients contained in the sediments from a lake in Peru. Because of the unique shape of the lake, it has been possible to examine the climate and temperature over the last nearly 2,300 years. Examination of the lake's sediments supports the position that South American temperatures were equally as warm as the rest of the world during the Medieval Warm Period. Increasingly, the proponents of the global warming theory must seek out other possible climatic explanations to support their fears of the calamity facing the planet as average temperatures continue to increase. Interestingly, numerous governments attending the recent G8 meeting of world leaders in France announced they will not be taking further steps to reduce greenhouse gas emissions as set forth under the terms of the Kyoto treaty for curbing carbon emissions.

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