

## MUSINGS FROM THE OIL PATCH

October 18, 2005

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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 oilfield service companies. The newsletter currently anticipates a semi-monthly publishing schedule, but periodically the event and news flow may dictate a more frequent schedule. As always, I welcome your comments and observations. Allen Brooks

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## Shifting Flows Drive Gas Pipeline Construction

**Projections for U.S. gas consumption call for annual increases of 1.5% - 2%, or the annual equivalent of 450 billion cubic feet**

Natural gas consumption in 2004 in the U.S. was 22.4 trillion cubic feet (Tcf), which accounted for about 27% of total U.S. energy consumption. Projections for U.S. gas consumption call for annual increases of 1.5% - 2%, or the annual equivalent of 450 billion cubic feet (Bcf). A recent projection suggests that this winter, natural gas demand in the U.S. will rise by 2.3%. Unfortunately, just as for crude oil, the U.S. is short of domestic natural gas supply. For many years we have relied on natural gas imports to satisfy our growing energy appetite. Those imports have largely come from Canada, although liquefied natural gas (LNG) imports from North Africa, West Africa and the Caribbean have begun to take a growing portion of this import flow in recent years. Even though studies show that the U.S. consumption of natural gas will grow faster than domestic supply, we appear to be doing little about expanding our natural gas pipeline and storage infrastructure in order to handle the inevitable growth in LNG and other imports, along with potential new domestic resources.

**Capital investment in new pipeline and storage facilities has been limited in recent years due more to the uncertainty of where imported LNG supplies will land**

Today, the United States has in excess of 297,000 miles of natural gas transmission pipelines. Our gas storage capacity totals 8.2 Tcf in 391 storage locations (depleted fields, salt caverns and aquifers). Much like the problems of the domestic refining industry, capital investment in new pipeline and storage facilities has been limited in recent years due more to the uncertainty of where imported LNG supplies will land and where new supplies will originate than from unattractive investment opportunities. The natural gas business operates within a fairly highly regulated industry. The regulations cover daily operations and financial returns. The regulated rate of return allowed for intrastate pipeline companies is healthy. So why is the gas pipeline industry reluctant to invest in new pipelines and gas storage facilities?

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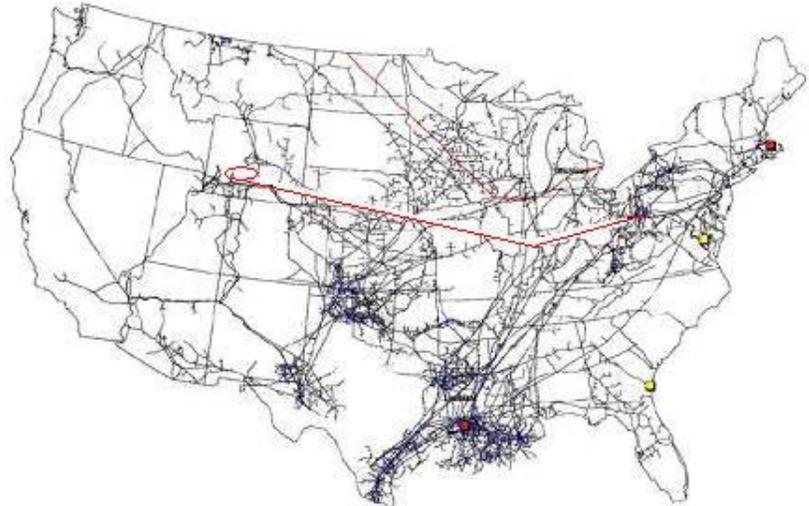
**Coal, which supplies about half the fuel for power generation plants, has largely retained its market share over the past 14 years**

In recent years, natural gas has accounted for a growing share of the domestic power generation industry's fuel supply, largely at the expense of petroleum. Coal, which supplies about half the fuel for power generation plants, has largely retained its market share over the past 14 years (51.7% in 1991 versus 50.1% for 2005). Natural gas has increased its market share from 12.4% to 17.9% over the period. This gain has come because many of the new power plants built in recent years have either had multi-fuel capabilities allowing the plant to fuel its boilers with the least expensive fuel, or have been sourced for natural gas. The biggest problem confronting the large, older coal-powered electricity plants is emission restrictions.

As crude oil prices have exploded over the past three years, power plants dependent on petroleum fuel have switched to natural gas. In addition, the push for cleaner burning fuels in the major population centers of the country has further helped natural gas gain a greater market share. The electric power generation industry has adjusted its business strategy in recent years to favor large baseload power plants fueled by the lowest cost fuel possible, primarily coal, and located at some distance from the electricity consumption. They have supplemented these power supplies by constructing, or contracting to purchase output from, quick starting, peak-shaving power plants. These intermittent power supply sources have largely been based on natural gas powered turbine plants and they are located close to the end user. As a result of this strategy switch, most of the peaking power plants are located within or extremely close to cities. That restricts the ability of having significant space for fuel storage, which further favors the use of natural gas that is piped directly to the plant.

**A new pipeline project was proposed in August to move gas from the oversupplied Rocky Mountain area to the supply-short northeast region**

According to the Energy Information Administration (EIA), in 2004 the gas industry added 1,450 miles of pipeline, down from the 2,243 miles added in 2003. Projections for miles of new pipeline to be constructed in 2005 call for another decline. By 2007, however, the projected miles of new pipeline to be built should more closely match 2003's total. In fact a new pipeline project was proposed in August to move gas from the oversupplied Rocky Mountain area to the supply-short northeast region. The 1,500-mile, 42-inch pipeline, will be designed to move 2 Bcf/d of gas from the Wamsutter region of Wyoming to a terminus at Clarington, Ohio, in the eastern part of that state. From there, a short connecting pipeline could be built to move the gas on to the Leidy Hub interchange point in western Pennsylvania from where the gas can then flow into the numerous northeastern and mid-Atlantic regional gas markets. The newly proposed pipeline (indicated in red on the map in Exhibit 1) will be built by a joint venture of Sempra Energy (SRE-NYSE) and Kinder Morgan Energy Partners L.P (KMP-NYSE) at an estimated cost of about \$3 billion.

**Exhibit 1. Kinder Morgan/Sempra Energy Proposed Pipeline**

**BP has announced that it will spend up to \$2.2 billion to double its production from the Wamsutter natural gas field in central Wyoming**

Source: EIA, PPHB

Just last week, BP (BP-NYSE) announced that it will spend up to \$2.2 billion to double its production from the Wamsutter natural gas field in central Wyoming. The investment should enable BP to double its natural gas daily output to 250 million cubic feet per day. It should also allow BP to recover the energy equivalent of 450 million barrels of oil from the field.

The Wamsutter gas field encompasses 1,700 square miles and is one of the nation's largest concentrations of tight gas sands. The field has produced 2 Tcf of gas from more than 2,000 wells. BP is the largest operator in the Wamsutter field with an interest in 352,000 acres. The company operates 950 gas wells and expects to drill another 2,000 wells over the next 15 years. The investment in this field is part of BP's plan to spend \$15 billion over the next 10 years in new onshore production in the lower 48 states.

**The Rocky Mountains has become one of the major natural gas production centers in the country**

The Rocky Mountains has become one of the major natural gas production centers in the country. In 2003, gas production in the Rockies accounted for 27% of total onshore production. According to the EIA's long-term energy outlook, this region may eventually account for 38% of onshore production and possibly overtake the Gulf of Mexico as the United States' largest gas producing region. A key indicator of the significance of this region has been the growth of the active drilling rig count in the Rockies.

**Exhibit 2. Rocky Mountain Active Rig Count**

<u>State</u>	<u>Jan. 2000</u>	<u>Oct. 2005</u>
Colorado	18	86
Montana	5	25
N. Dakota	7	25
Utah	14	26
Wyoming	<u>39</u>	<u>85</u>
Total	83	247
Total U.S.	775	1482
Pct. Total	10.7%	16.7%

Source: Baker Hughes, PPHB

**Kinder Morgan plans to build a pipeline to move re-gasified LNG from a new Louisiana terminal**

Almost as significant as the new Rockies pipeline proposal, was the September 21 announcement by Kinder Morgan of plans to build a \$490 million, 137 mile pipeline to move re-gasified LNG from the Louisiana terminal being built on the Gulf Coast in Cameron Parish by Cheniere Energy, Inc. (LNG-Amex), to Evangeline Parish in the south central portion of the state. The pipeline will provide interconnections with various interstate pipelines. This marks the first significant LNG-related pipeline construction project to be developed as a result of the effort to build new LNG receiving terminals in the United States. There was a pipeline expansion project recently completed for Trunkline Natural Gas in the Lake Charles, Louisiana-area to handle the increased LNG volumes that will be coming through Trunkline's expanded LNG terminal there.

**Projections by the EIA call for LNG imports by 2015 to account for 20% of total U.S. natural gas consumption**

In 2005, LNG volumes are projected to be 650 Bcf, or slightly less than 3% of total U.S. gas consumption. Projections by the EIA call for LNG volumes to grow to 4.33 Tcf by 2015 and further to 6.37 Tcf in 2025 when LNG imports will account for 20% of total U.S. natural gas consumption.

As LNG volumes grow and existing onshore gas producing areas expand, there will be a need for additional pipelines. Existing pipelines will also need to be expanded. The challenge for the pipeline industry is determining where the new pipeline capacity needs to be located. That will require early determination of the location of LNG plants and investment commitments from gas producers such as the recent BP announcement. However, all of the long-term trends suggest that the pipeline construction industry is facing a much brighter future in coming years.

## NOIA Conference Highlights Coming New Age for Industry

The National Ocean Industries Association (NOIA) hosted its 2005 fall conference October 6-8 at the Broadmoor in Colorado Springs,

**The New Age for the Offshore Oil and Gas Industry is being born by the aftermath of Hurricanes Katrina and Rita**

Colorado. While there was no theme for this industry conference, the discussion among participants and the nature of some of the presentations pointed toward a theme. That theme can best be described as the New Age for the Offshore Oil and Gas Industry.

The theme emerged from the shared hurricane experiences related to Katrina and Rita among the participants. How companies survived or suffered; how the federal government and the Gulf Coast states responded; and how the offshore industry adjusts to a new and different future will shape this new age.

Hurricanes Katrina and Rita were two of the strongest storms to hit the United States, and they both slammed the offshore oil and gas industry along with the Gulf Coast refining infrastructure. These two storms came barely a year after Hurricane Ivan, another super strong storm, wrecked havoc on the offshore oil and gas producing industry - the damage from which has only recently been repaired. The accumulated damage of these three storms has forced the domestic energy industry and the country's citizens to make many adjustments to their operations and lifestyles. These changes, some of which are only beginning to emerge, will re-shape the future of our domestic energy business. That future industry may require oil and gas producers, and the oilfield service support industry, to operate differently than it has up to now. Moreover, the changes to this industry will come as the U.S. economy adjusts to sustained higher energy prices and restricted energy supplies.

**As a result of the damage inflicted on the Gulf Coast and the energy industry from Katrina, the federal government was forced to alter some of its oil and gas industry rules and regulations**

As a result of the damage inflicted on the Gulf Coast and the energy industry from Katrina, the federal government was forced to alter some of its oil and gas industry rules and regulations. The shutdown of offshore oil production and four major Gulf Coast refineries resulted in the federal government loaning crude oil from the strategic storage reserve to local refiners. This oil had been the target of numerous political attacks for its contribution to high crude oil prices. The argument was that by purchasing oil for the strategic reserve, we were merely adding to global oil demand and driving up the price. Now, however, many people see the advantage of having sufficient crude oil in storage close to the major refining center of the United States. The key unanswered question now is whether the federal government should help establish a strategic reserve for gasoline as it already has for heating oil in the Northeast?

The federal government also acted to temporarily suspend certain environmental and operational rules that would enable the refining industry to boost its output of gasoline. These temporary acts included suspending the requirements to use certain summer gasoline blends that generate marginally fewer emissions when burned. However, these gasoline blends require more crude oil to manufacture and they restrict the ability to more efficiently supply regional markets. Suspending the requirements to use these blends also makes it easier for the oil industry to import gasoline product from Europe where there has continued to be surplus gasoline supplies due to their products not being able to meet these boutique

**The government suspended the provisions of the Jones Act that prevents foreign-owned vessels from transporting supplies between two U.S. ports**

blend requirements.

The federal government also recognized that it needed to ease restrictions on the distribution of fuel supplies including gasoline, diesel and heating oil. The government suspended the provisions of the Jones Act that prevents foreign-owned vessels from transporting supplies between two U.S. ports. Up until the suspension, all coastal trade had to be done by Jones Act-qualified vessels, meaning that they were built in the United States, owned by at least a 75% U.S.-owned company and manned by U.S. seamen. Due to these restrictions, the number of Jones Act vessels has been declining steadily for many years. The impact of this shrinking fleet became apparent when we needed to move substantially greater volumes of fuel between U.S. ports due to the shut-down of petroleum product pipelines and limitations on the size of vessels that could enter various ports.

The Minerals Management Service (MMS) has streamlined the time it requires to issue certain permits in response to the need for the oil and gas industry to undertake emergency repairs to its offshore facilities. This action may suggest that the MMS and other offshore regulators may be able to further improve on the length of time it takes to grant offshore operators the authority to act. Only time will tell whether the MMS, or the other regulators, are able and willing to make that adjustment. However, we thought it interesting that Secretary of the Interior Gayle Norton, who spoke to the NOIA audience, did not want to encourage the thought that all of Washington's energy bureaucrats would be able to cut their permit review times. What Sec. Norton was admitting was that Washington remains the epitome of day-rate work!

**Safety of our energy supply comes through diversification of supply sources**

One thing that emerged from the government's hurricane response effort is a recognition that our oil and gas industry is geographically concentrated and safety of our energy supply comes through diversification of supply sources. That rationale is driving legislative efforts to grant states the opportunity to allow drilling off their coasts. The initial impetus for the opening of more of the country's offshore acreage came in the form of a provision in the recently passed energy bill that called for the government to conduct an effort to inventory all of our outer continental resources. That initiative may now provide a platform for states to move beyond the mere inventory effort and on to drilling and developing the resources found. This is not a given since there are initiatives that would restrict offshore exploration only to natural gas. Unfortunately, the industry hasn't developed as sophisticated a system that would enable wells to only be drilled for gas or oil, except within known gas or oil fields. As we always say, the drill bit has no idea what it is drilling for, and we would hate to see producers or drillers hauled off to jail for finding oil when they said they were looking for gas.

For the offshore industry, the governmental and political reaction to the storm damage has provided one of the greatest opportunities in recent years to gain increased access to the U.S. outer continental

**The future operation of the offshore oil and gas industry after the hurricanes will likely be different than from before**

shelf, and with less onerous and burdensome regulations. This does not mean the industry will be allowed, or will want to operate in a less safe or environmentally conscious manner. But the industry can point to the fact that no lives were lost offshore as a result of the recent hurricanes, no crude oil leaked from shut-in wells and only a minimal amount of natural gas escaped. Most of the gas that escaped was associated with ruptured pipelines, not failed wells.

The future operation of the offshore oil and gas industry after the hurricanes will likely be different than from before. For example, there will be questions raised about the need for as many supply locations along the coast for servicing the offshore industry. There are operational challenges to be addressed in this event. Likewise, there will be a number of operational changes that will come from the assessment of damage claims offshore. We expect a number of lawsuits dealing with drilling rigs damaging producing facilities and pipelines. There will be lawsuits involving companies and their insurance carriers over the adequacy of insurance carried for assets and business interruption coverage. There will be lawsuits by stockholders against managements for inadequate insurance coverage and the lack of disaster plans. As usual, the legal profession will be a major winner in the hurricane aftermath.

**Hurricane Katrina will mark a watershed event for the U.S. energy business**

As we have suggested before, Hurricane Katrina will mark a watershed event for the U.S. energy business. Whatever offshore oil and gas industry structures Katrina didn't damage, Hurricane Rita seemed to have hit. How the offshore industry operates in the future remains to be seen, but it likely will be different from how it operated before Katrina. Consumer energy consumption also will change. How much it drops and how sustained any reduction is will impact the long-term future of energy demand. It is still too early to make many absolute observations about change, but it is safe to say that there will be change. Companies will need to be alert to these potential changes and try to anticipate them in order to prosper in the future.

## Energy Demand Estimates Fall Again

**The IEA and the EIA have reduced their demand forecasts for 2005, but they continue to hold to their belief that demand will rebound in 2006**

Once again, the International Energy Agency (IEA) and the U.S. Energy Information Administration (EIA) have reduced their demand forecasts for 2005, but they continue to hold to their belief that demand will rebound in 2006. The IEA cut its 2005 global oil demand increase by 90,000 b/d to 1.26 million b/d. Their demand increase for 2006 remains unchanged at 1.75 million b/d. The demand revisions reflect the disruptions in economic activity in the United States as a result of the recent hurricanes and the jump in energy prices.

The EIA issued a revised Short Term Energy Outlook that calls for total U.S. energy demand growth to decline from 25.2 quadrillion British thermal units (Btus) in the third quarter of 2005 to 25.1

quadrillion Btus in the fourth quarter. The reduction reflects the impact of the hurricanes and high energy prices. This revised forecast now reflects only a 0.3% increase in demand for 2005 over 2004, compared to a 1.5% increase in 2004.

The EIA has a similar outlook to the IEA's forecast for global oil demand in 2005 and 2006. The EIA estimates that oil demand growth in 2005 now will be 1.2 million b/d, down from the 1.7 million b/d forecast in the prior Short Term Outlook. The EIA's new outlook for U.S. petroleum demand is telling. In 2005, it expects average demand of 20.5 million b/d, down 0.9% from 2004's level and 290,000 b/d less than in its prior Short Term Energy Outlook. For 2006, the EIA anticipates average demand of 21 million b/d, up 2.2% from 2005.

**The key question for 2006 remains the impact of high current oil and gas prices and what that does to petroleum demand**

The key question for 2006 remains the impact of high current oil and gas prices on petroleum demand? The declines in gasoline demand experienced since mid-August suggest that gasoline prices have reached a level that does induce conservation. Winter fuel demand will depend both on the level of economic activity and the weather. Fuel demand in the short-term is inelastic, but higher prices probably will have some impact on demand. The big question mark is what will happen to the economy in 2006?

While many forecasters expect lower economic growth in the fourth quarter due to the impact of the hurricanes, if short-term interest rates continue to be raised in response to rising inflation and inflationary fears, economic activity next year could be hurt more than is generally anticipated. While underlying energy demand should remain healthy in 2006, petroleum prices could be lower making investors concerned about energy stock valuations.

## Interesting Wall Street View

**We think Jim Paulsen's observations about oil prices are worthy of consideration**

We found this week's *Barron's* interview with Jim Paulsen, the chief investment strategist of Wells Capital Management, very interesting. We are printing the answers to several questions, along with our editorial take. Paulsen is a solid and thoughtful analyst of economic and stock market conditions. We think his observations are worthy of consideration.

"Q. What's different this time?"

"A. ....Oil prices are a negative, but they are less of a negative when you look at the historical record. Energy costs in consumer budgets are about two-thirds of what they were in the late 'Seventies; they're 5.5% or so versus 8.5% of budgets then. Also, in the past, oil spikes didn't kill you. It was everything else that happened when oil went up. Today, you pay your \$2.50-\$3 for gas and you are kind of mad at that as you go back to your vehicle. But, as you are driving home, you go, 'Gosh, look at these new auto-

sticker discounts,' and then you stop off at Best Buy and buy a new digital camera for \$19.99. You stop by your mortgage broker and refinance, and by the time you get home, you're way ahead. The OPEC crisis of the 'Seventies didn't shut the system; it was that

when gas was going up, mortgage rates were also going up, and prices of consumer goods were going up, too." (Ed. Then you open your electric bill, your heating bill and the notices from FedEx and your bug spray firm about rate increases and surcharges due to rising energy costs.)

"Q. And you're expecting oil prices to drop?

"A. Yes. Oil went up \$20 in the two-three months prior to Katrina. Once Katrina hit, oil didn't go up anymore. Indeed, it came off and that tells me oil prices were already speculatively overextended going into that crisis. Rita blew through and didn't wreck as much damage as people feared and now oil is lower still. I'm not an oil expert. I don't intermittently know the supply-and-demand parameters of oil within the world. But I have looked at a ratio of the price of oil to non-oil commodities and that ratio, at least in the 'Seventies, 'Eighties and 'Nineties, was in a nice, fairly tight range. What we've done is blown far above that in this last cycle, and oil is much more extended relative to other commodities than it has been historically. If it were to trade back into that range, oil could be supported in relation to other commodities at about \$40. That's what I would guess is a more fundamentally based price of oil. That would be a non-speculative-trader, non-political-unrest premium, non-weather-related price of oil. That would still be up substantially from where oil has traded, and it is up for the reason suggest; better global growth. But the fact that no one has built capacity for years is the same story that could be told about any of the industrial commodities – copper, tin, steel scrap, aluminum and so forth – and they're all up, too, just not as much. There are decent odds that the oil and energy complex comes off, and we will still be quite a bit higher at the end of the day like other commodities...." (Ed. That scenario argues that energy industry fundamentals could remain relatively strong, but energy stock prices would fall hard for a while.)

**Oil could be supported in relation to other commodities at about \$40**

## Will the Oil Sands Need Nuclear Power?

Canada has emerged as the last great hope for oil production growth in North America as the country develops its heavy oil resources. Canada has 1.6 trillion barrels of bitumen in place in northern Alberta and, under current conditions, approximately 11% is recoverable, or 175 million barrels. Current oil production is about one million b/d. By 2015, oil sands production is expected to climb to 2.7 million b/d, according to a forecast from the Canadian Association of Petroleum Producers (CAPP). The problem with oil sands production is that it requires a substantial amount of energy to extract the oil from the sands, either by steam or electricity. The primary source of energy to generate the steam or electricity needed

**The current 4% of Canada's gas production that goes to fuel oil sands production could grow to 10%**

has been natural gas.

At the current time, oil sands production consumes 600 million cubic feet per day. If oil sands production grows to anticipated volumes, natural gas consumption will rise to 1.4 Bcf/d to 1.6 Bcf/d. That

means the current 4% of the country's gas production that goes to fuel oil sands production could grow to 10%. The problem with this additional natural gas consumption is that gas prices have climbed sharply in the past 12 months, up 45% or more.

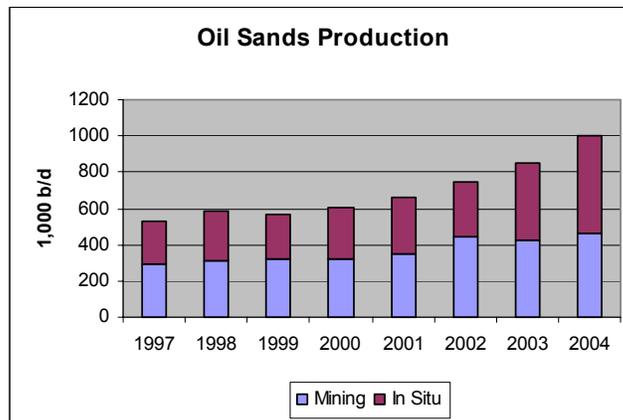
Total (TOT-NYSE), which holds permits on large fields in Alberta that contain oil sands, has announced that it is considering building a nuclear power plant to supply the energy it needs to produce its oil reserves. Not only does this plan indicate the challenge for the oil sands industry to keep production costs under control, but it also reflects the resurgence of nuclear power as an environmentally acceptable energy option.

**Total expects it could one day produce 200,000 b/d of heavy crude oil, close to 8% of the company's current global oil production**

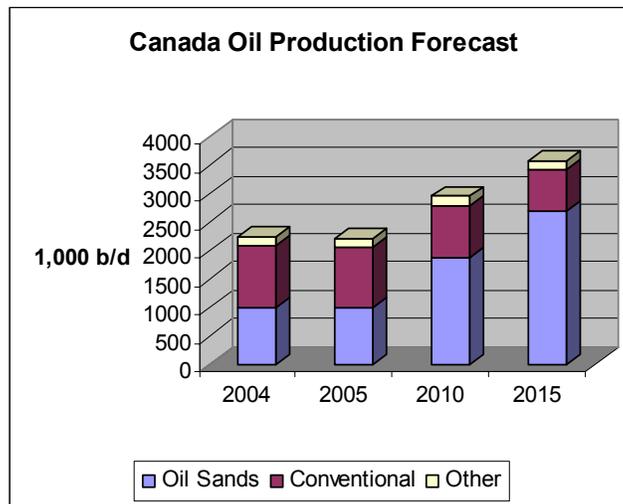
Total owns half of an oil sands permit in Alberta and has secured more heavy-oil acreage with the purchase of Deer Creek Energy Ltd. Total has said it plans to invest \$7 billion in Deer Creek, in addition to the \$1.4 billion it anticipates paying for the company. Total expects it could one day produce 200,000 b/d of heavy crude oil, close to 8% of the company's current global oil production.

Canada's National Energy Board estimates that cash operating expenses for steam-assisted oil sands production will average C\$8 to C\$14 per barrel. Total supply costs, which includes all costs associated with production (including operating expenses, capital costs, taxes, royalties and a 10% real, or 12% nominal, return on investment) will average C\$11 to C\$19 per barrel. For integrated mining and bitumen recovery and upgrading developments, cash operating expenses are projected to average C\$12 to C\$28 per barrel, with total supply costs between C\$22 and C\$28 per barrel. These cost estimates were based on lower than current natural gas prices; therefore there is an upward bias to the cost estimates.

**Exhibit 3. Canada's Record of Oil Sands Production**



Source: CAPP, PPHB

**Exhibit 4. Oil Sands Will Account for all of Canada's Growth**

Source: CAPP, PPHB

**The focus is on a new type of reactor, known as a High Temperature Reactor, with a capacity of around 500 megawatts, or about a third of the size of a typical reactor used by utility companies to produce electricity for large city grids**

If Total were to build a nuclear power plant, it could lock in stable electricity prices for the long-term, helping to control its future production costs. Total is discussing the nuclear plant with a French state-owned nuclear engineering company, Areva SA, to determine the type of reactor that might suit its needs. The focus is on a new type of reactor, known as a High Temperature Reactor, with a capacity of around 500 megawatts, or about a third of the size of a typical reactor used by utility companies to produce electricity for large city grids. With a nuclear reactor, Total would also avoid the issues of carbon dioxide and other greenhouse gas emissions that are becoming of increased concern for Canada's regulators who are considering the long-term development of the oil sands deposits. The burning of natural gas to fuel the recovery efforts adds significant carbon dioxide and other emissions that Canada would like to limit. While we don't know whether Total will elect to build a nuclear power plant, the disclosure that it is under consideration reflects how serious energy companies are in examining all the economic and environmental options available for the development of this significant global resource.

## Leadership in a World of Uncertainty

**Armitage focused on seven key world trends and their key risks and how they might impact foreign policy**

Former Deputy Secretary of State Richard Armitage spoke to the NOIA audience about "Leadership in Action." Mr. Armitage worked directly under former Secretary of State Colin Powell and was actively involved in the negotiations with countries leading up to the Iraq war and afterwards. He now has his own consulting firm. Mr. Armitage discussed some of the key challenges facing the United

States in the coming years. He focused on seven key world trends and their key risks and how they might impact foreign policy.

The key trends and their risks include:

1. Globalization – failed countries

The trend of increasing globalization will not be reversed, or slowed materially, unless certain countries fail in adjusting to the trend. A failure could cause social unrest and economic distress, which might result in serious challenges to the leading global economies.

2. World economic growth – the spread between the have and the have-not countries

While there may be periods of economic slowdown or even localized recessions, the basic assumption is that the world's economy should show moderate and sustained growth over the next 15 years. The risk to this assumption is that the spread between the rich and poor countries grows wider resulting in unstable political conditions in the have-not countries.

3. Aging population – social compact between generations

The world's population is going to get increasingly older. In the case of the United States, the country will actually become younger than many of our rivals and allies. The risk to a stable world is that the economic/social compact between generations breaks down. In that case, certain countries could experience severe social and economic consequences.

4. Rise of China – not a straight line

The 21<sup>st</sup> Century will be the Age of Asia. China is the most prominent country in the region at the current time, but it has not yet made up its mind on how it will develop its economy and society. The struggle between China and Japan has gone on for years. Prior to 1899, China was the power in Asia. From 1900 to 2005, with the exception of the four years of World War II, Japan has been the dominant regional power. Because of its strategic location for U.S. military bases that are key for intelligence gathering, military staging and political influence, Japan, not China, will have U.S. support.

5. Enough petroleum to 2020 – producing country stability

The critical assumption about world oil is that we are not peaking in our ability to meet global energy needs to 2020. However, this assumption is only as good as the

relative political stability of the key producing countries can be assured. The risk scenario is reminiscent of the

1979 Iranian revolution, which resulted in that country taking a substantial volume of global oil supply off the market for political, and not economic reasons, and which led to a huge spike in prices creating severe economic damage.

6. Urbanization – rise of mega cities (8+ million people) and their infrastructure

Much like the other major economic and social trends, urbanization of the world will continue in the future. However, as urbanization occurs, the rise of mega cities will be challenged by their infrastructure and any failure of these cities will create social and economic turmoil.

7. U.S. sole superpower to 2020 – will a nation or group of nations challenge?

The continued global political dominance by the U.S. should continue for the foreseeable future. The risk to global stability could come from a challenge by another nation or group of nations. That rivalry would force the U.S. to have to adjust its global role, much like it has had to do since the fall of the Former Soviet Union (FSU). The transition from one political system to another usually generates tension and political turmoil.

**By recognizing and monitoring these seven trends along with their key risks, it may be possible for managers and investors to anticipate potentially significant political and economic changes**

By recognizing and monitoring these seven trends along with their key risks, it may be possible for managers and investors to anticipate potentially significant political and economic changes. Besides these trends, Mr. Armitage also highlighted the impact of population growth on future political and economic developments. According to his analysis, if the world's population in 2020 were set to 100, then 16 people would come from Africa, 12 from South America and 13 from North America, with only 4 from the United States. There would be 7 people from the FSU and Eastern Europe with 5 from Western Europe and 3 from the Middle East. The important aspect of this analysis is to recognize that 19 people will be from China, 17 from India and 8 from the rest of Southeast Asia.

If one has not been impressed by the recent explosion in economic growth of the Chinese and Indian countries, one only needs to imagine a world where almost one in five people will be Chinese and one in six will come from India. The impact of these population growth trends, combined with the seven critical trends and risks discussed above, suggests that there will be many challenges to the political and economic status quo. These challenges likely will result in both positive and negative changes. Unfortunately, no one can predict what these changes might be or when they might occur.

## Are New U.S. Refineries the Answer?

**Due to the jump in gasoline, diesel and home heating oil prices, the federal government has responded with proposals to build new refineries, and possibly locate them on surplus military bases**

The forced shutdowns of the Gulf Coast refineries caused by Hurricanes Katrina and Rita have highlighted this country's vulnerability to petroleum product shortages. Due to the jump in gasoline, diesel and home heating oil prices, the federal government has responded with proposals to build new refineries, and possibly locate them on surplus military bases. According to the records, there has not been a new refinery built in the United States since 1976 when Marathon Ashland's Garyville, Louisiana plant was completed. The plant is jointly owned by Marathon Oil (MRO-NYSE) and Ashland Petroleum (ASH-NYSE). However, the management of Valero Energy Corp. (VLO-NYSE), the leading independent refiner in the country with a 13% market share, disputes this claim saying that its Corpus Christi refinery completed in 1981 was the last to be built. The disagreement appears to revolve around the fact that Valero's refinery was built around a small, existing fractionation plant. While we are not sure how to resolve this debate, the difference between 1976 and 1981 is sort of meaningless since we are still talking about a quarter of a century.

The challenge for our transportation fuel supplies has been the growth in motor fuel consumption in the United States as sport utility vehicles (SUVs) have accounted for a growing portion of the country's vehicle fleet. Since 1990, fuel consumption has increased by more than 24%. Government forecasts call for another 48% increase by 2025. At the same time demand is expanding, refinery capacity has been stagnant or declining as a number of smaller refineries have been shut down. In 1980, there were more than 300 U.S. refineries, but by 2003 that count had dropped to 149. The ability of refiners to expand their capacity has come through marginal expansions of plants, referred to as "creep," or through refinery purchases. For example, the Garyville plant was expanded from 232,000 b/d to 245,000 b/d in 2004 and the company's Detroit plant is expanding from 74,000 b/d to 100,000 b/d in 2005.

**Refinery acquisitions have also been a major part of the restructuring of the domestic petroleum industry**

Refinery acquisitions have also been a major part of the restructuring of the domestic petroleum industry. The five largest refiners in the U.S. (ExxonMobil (XOM-NYSE), ConocoPhillips (COP-NYSE), BP, Valero Energy and Royal Dutch Shell (RDS-NYSE)) control over half (56.3%) of domestic refinery capacity. The top ten refiners control 83.6%. Only ten years ago, the top five companies held about one-third (34.5%) of domestic refining capacity and the top ten held 55.6%. The recently approved merger of Valero Energy and Premcor boosted the combined company's market share to 13%.

In order to alleviate the domestic refined product shortage in this country, we need to look at both new facilities and expansions of existing facilities. Mr. Bill Greehey, head of Valero Energy, in an interview with Reuters News Service, argues that because we are becoming more dependent on product imports every day, the

**Greehey also says that the federal government should permanently phase out the Jones Act**

government should be focused on expanding existing refineries rather than trying to build new ones. The government should work to speed up permitting for expanding and upgrading refineries. "If we want to add capacity in a hurry, they need to figure out how to speed up the permitting (for expansions)," said Greehey. "The economics for new refineries don't work."

Greehey also says that the federal government should permanently phase out the Jones Act that restricts domestic shipping trade to U.S.-owned, -built and -manned vessels. This would ease the movement of refined product from where it is refined to where it is consumed. More important, Greehey calls for the delay of new environmental fuel regulations in order to assure adequate fuel supplies for this winter. These new regulations include lower limits for sulfur in fuel and the lifting of the oxygenate requirement for gasoline. Can these demands be met in a non-crisis environment and for a short period of time?

**Unfortunately for refiners, about half of Americans live within 50 miles of the coast**

Expansion of existing refineries is easier than building new ones. The greatest problem for the industry is that refineries should be located close to where either the oil is produced or the ports into which it is imported. The largest clusters of refineries are located near the water and population centers of the United States: the Gulf Coast, coastal California, the Great Lakes and the Northeast. Unfortunately for refiners, about half of Americans live within 50 miles of the coast. Because of the concentration of people and wealth near the coasts, land is simply more valuable the closer you get to the water. As a result, shore-dwellers have the most to lose from developments that might affect the quality of life.

**The recent hurricanes will make it tough to justify building any new refineries along the Gulf Coast, but expanding some of the existing refineries is a distinct possibility**

As an example of this problem, in California between 1985 and 1995, 10 refineries were shut down representing 20% of the state's refining capacity. Moreover, the California Energy Commission in a recent report stated, "it is unlikely that new refineries will be built in California." The reason being that the citizens are concerned about the environmental impact of refineries, their contribution to smog, the traffic of large trucks carrying hazardous materials they generate and the potential for leaks in the event of an earthquake. The recent hurricanes will make it tough to justify building any new refineries along the Gulf Coast, but expanding some of the existing refineries is a distinct possibility. The only new refinery being considered is one targeted for Arizona that has recently received its air quality permit, but is still years away from operation.

The willingness of oil companies to invest in new grass roots refineries seems lacking. While refinery margins have been very good in recent years, they follow years of dismal returns that contributed to many of the smaller refineries being shut down in the 1980s and 1990s. In addition, the oil companies are wondering about demand trends in the United States in the face of continuing declining domestic crude oil production. Security of demand is important to help justify the huge capital investment in new refineries.

As pointed out by one environmental organization, improved vehicle fuel economy standards can significantly alter fuel demand. In 2004, the Environmental Protection Agency (EPA) found out that the average fuel economy of the fleet was 20.8 miles per gallon (mpg) compared to 22.1 mpg in 1987, a six percent decline. In 1987, 28% of new vehicles sold were light trucks compared to 48% in 2004. If fuel economy standards for passenger vehicle could be raised from 27.5 mpg to 40.5 mpg, and for light trucks (including SUVs and vans) from 20.7 mpg to 27.5 mpg by 2015, gasoline consumption would drop by one-third. Will the U.S. accept this magnitude of change? Only time will tell.

## Need A Speaker or Discussion Leader?

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