



**Keynote Address**

**Towards a New Oil Market Order: Heavy & Unconventional**

*World Heavy Oil Conference  
Beijing, China  
November 13, 2006*

by  
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## **Introduction**

The global oil market is in a state of transition.

This transition began in 2001, and has been characterized by volatility and high prices, reduction in spare capacity, high demand, re-ordering of energy security priorities, emergence of powerful national oil companies and, most significantly, the rise of the unconventional heavy oils such as oil sands and oil shale. Moreover, all of these developments are occurring against a geopolitical backdrop that includes a risk premium on prices resulting from the fallout from the September 11, 2001 Al-Qaeda attacks on America.

As a result of these mostly unexpected changes in the global oil market, various futures are in a serious competition to define the new global order for energy supplies. As evidenced by President Bush's January 2006 'Addiction to Oil' State of the Union address, proponents of alternative energy, conservation and peak oil have had success in promoting their visions of what the new energy market order ought to be and how it should be supported by government subsidies and private sector capital flows.

It is within this context that unconventional heavy oil is at a critical junction to emerge as the most important 'new' source of energy for the next century. With estimated North American deposits alone, of two trillion barrels in oils sands (Alberta) and shale (Utah, Colorado, Wyoming), the potential to define the new market order on the platform of massive heavy oil production volumes exists. The issue for investors then becomes one of verification of the reserve numbers (proven, probable) and a pricing mechanism to iron out price volatility by accounting for the geopolitical premium and reintroducing long-term price stability, an essential requirement for large-scale consumers like China and the United States, both in economic and political terms.

The successful development of Alberta's oil sands is shifting the center of gravity in the oil market from light/conventional to heavy/unconventional development. In the process, Canadian and U.S. energy security has been enhanced and the well-being of their economies sustained. In a similar fashion, China, as the second largest oil consumer has a convergence of interests with the United States and Alberta, Canada, to secure a new global

market order based on secure supplies of reasonably priced heavy oils, including those deposits found within Chinese territory, such as shale.

Between these three major producing and consuming jurisdictions (China, U.S., Alberta), sufficient capital, advanced technologies, and environmental safeguards exist to allow for a collaborative effort in the creation of an integrated market order based on long-term security of supply. Alberta's geostrategic standing as the leading global power in unconventional oil and its friendly relations with both China and the US allows for an '*Energy Security Corridor*' to arise between the three jurisdictions as a functional and essential component of an emerging new market in unconventional oil.

*"Thirty to forty years from now, the combination of price and new technology is going to make unconventional oil—heavy oil, tar sands,--conventional."*

--Lee Raymond, former CEO, ExxonMobil, Newsweek, Sept. 14, 2004

## **Oil Market in Transition: Geopolitics & U.S. Energy Security**

*“America is addicted to oil, which is often imported from unstable parts of the world. By applying the talent and technology of America, this country can dramatically improve our environment, move beyond a petroleum-based economy and make our dependence on Middle Eastern oil a thing of the past.”*

**–President George W. Bush**

State of the Union Speech, January 30<sup>th</sup>, 2006

*The high demand worldwide is rapidly reducing OPEC’s spare oil production capacity and taxing its ability to offset supply shortfalls that may occur elsewhere in the world. OPEC’s estimated excess or swing capacity has decreased from 15 million barrels per day in 1985, to less than 1 million barrels per day in 2004. The ability of Saudi Arabia to increase production to moderate world oil prices is now in question. Once OPEC’s spare production capacity is exhausted, worldwide competition for oil will cause a switch in the world petroleum economy from a buyers’ market to a sellers’ market. This situation will significantly increase oil prices, at a high cost to the U.S. and world economies.*

**-America’s Oil Shale: A Road Map for Federal Decision Making**

U.S. Department of Energy, December 2004

*Oil prices rose after Britain’s Royal Navy said coalition forces were helping guard oil installations in top exporter Saudi Arabia, in particular the Ras Tanura terminal, the kingdom’s primary export point, as part of stepped-up security following an al-Qaeda threat.*

**-Reuters**

Oct. 29, 2006

### **America’s Oil Addiction and the Persian Gulf Supply:**

The President’s declaration for a new energy security plan that would also reduce American reliance on Middle Eastern oil by 75 percent, or approximately 1.5 MmBbl/d by 2025 sent shockwaves across the global oil establishment, particularly the key players in Middle East crude exports to the U.S.: Saudi Arabia and potential major U.S. corporate investors in the

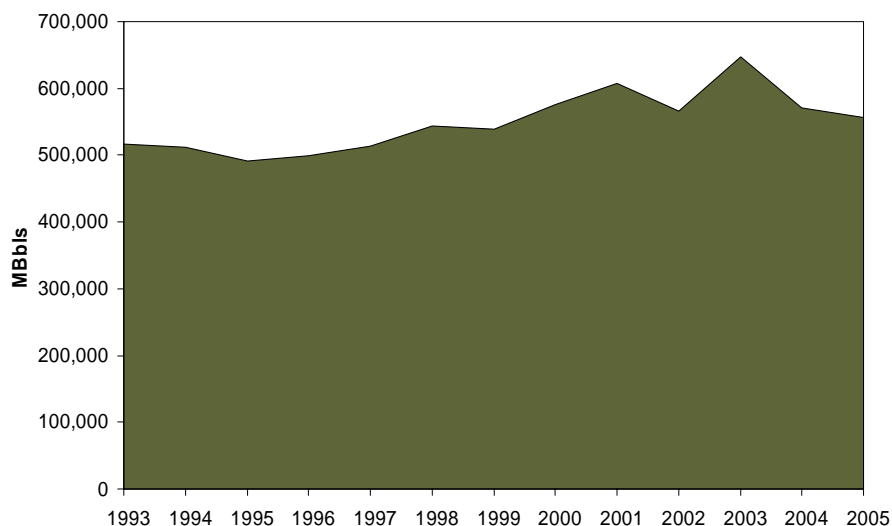
kingdom's energy sector. Saudi Oil Minister Al-Naimi expressed, in typical muted Saudi fashion, his deep consternation with the President's intention.

Speaking at a Houston energy conference on February 7<sup>th</sup> 2005, Al-Naimi said:

*“What concerns us, is all the talk about not wanting our oil, we have to consider that. It's not a major bump; it's something to take into consideration. We will continue to be a source of stability for the world energy market; we are addressing the problem of availability head on.”*

Al-Naimi understood that although President Bush had designated “the Middle East” from which to wean the America's oil addiction, Bush in fact was targeting Saudi Arabia, the source of the bulk (1.5 MmBbl/d; 7.4% of total U.S. consumption) of Middle Eastern or Persian Gulf crude to the U.S. The policy pronouncements of a U.S. President during a state occasion, as the Saudi oil minister knows full-well, could dampen or freeze investor confidence in Saudi Arabia's planned \$50 billion expansion of its oil sector.

**U.S. Crude Oil Imports from Saudi Arabia**



Source: U.S. EIA

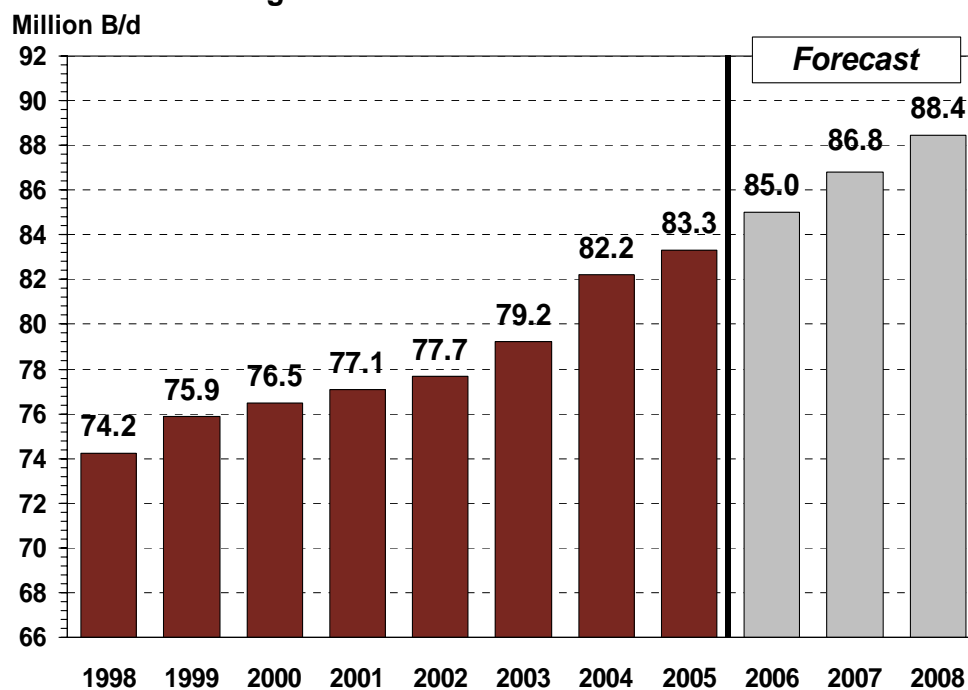
That expansion, in collaboration with the American energy firms, would boost production capacity to 12.5 MmBbl/d by 2009 with in-country refining capacity doubling to 6 MmBbl/d.

According to the Jan/Feb 2005 issue of *The Bulletin*, OPEC’s monthly publication, it is unrealistic to believe that consuming countries (i.e., the United States) could reduce their dependence on the region that controls the vast majority of the world’s oil reserves (an estimated two-thirds of the world’s conventional deposits).

*“Uncertainties are compounded by consumer government policies aimed at moving away from oil – moreover, oil from specific global regions, principally as expressed by such consumers, for security of supply reasons...If some players choose to break the circle, then this could ultimately affect security of both demand and supply and perpetuate volatility, to the detriment of the market as a whole, as well as other sectors of the global economy....”*

The magazine argued that ensuring security of demand was the only way to provide for security of supply.

**Figure 18: World Crude Oil Demand**



Source: FirstEnergy Capital Corp., IEA.

## **An Unexpected Departure & Destabilizing Energy Market Factors:**

Quoted in the Financial Times on February 28, 2005, President Bush said, *“I spend a lot of time worrying about the disruption of energy because of politics or civil strife in other countries—because tyrants control the spigots and it is in our national interest that we become less dependent on oil.”*

What prompted the President to such a radical divergence on energy policy?

Testifying before the Senate Intelligence Committee two days after the President’s State of the Union address, U.S. Director of National Intelligence, John Negroponte, said that the combination of rising demand for energy and instability in oil producing regions, “is increasing the geopolitical leverage of key producing states.” He warned of the negative globalization consequences arising from intense competition for energy.

U. S. Secretary of State, Rice declared, *“I can tell you that nothing has really taken me aback more as Secretary of State than the way that the politics of energy is, I will use the word “warping”, diplomacy around the world.”*

Contributing to the Administration’s decidedly bleak view of America’s global standing in a world increasingly dominated by the geopolitics of oil likely included the following:

### **1 - New Downward Estimates of Persian Gulf Reserves:**

According to the January 2006 issue of the authoritative industry publication, Petroleum Intelligence Weekly (PIW), Kuwait’s proven oil reserves are 50 percent below the officially stated amount of 99 billion barrels, ranked fifth in the world after Saudi Arabia, Canada, Iran and Iraq. PIW claims that Kuwaiti proven reserves amount to only 24 billion barrels, with an equal amount in non-proven oil reserves. Kuwaiti members of parliament have demanded that the government provide detailed accounts of reserves in all Kuwaiti fields and reservoirs. Kuwait’s stated oil reserves represent close to 10 percent of global crude reserves, with a 2.5 MmBbl/d production volume. Should the PIW figures be accurate or close to accurate, Kuwait’s \$40 billion expansion project to increase production capacity to 4 MmBbl/d by 2020, with the help of international oil companies, could be jeopardized. Could a similar downward revision of the reserves numbers be applicable to countries like Saudi Arabia, Iraq and Iran? And does the White

House already know that such is the case? Continuing domestic parliamentary and public debate on Kuwait's true reserves numbers will no doubt raise the troubling issue as to whether the theories of "peak oil" are emerging as imminent market realities with perilous supply and pricing implications for consumers.

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In his book *Twilight in the Desert: The Fading of Saudi Arabia's Oil*, prominent Texas-based energy investment banker Matt Simmons raises serious questions about the quantitative and qualitative nature of Saudi conventional oil supplies. Simmons challenges the credibility and veracity of Saudi Arabia's oil account. Referring to Saudi claims on production and capacity, Simmons told *The Washington Post* in August 2004, "*They're basically lulling a lot of people into saying, 'We don't have anything to worry about.'*"

Implicit in Simmons' appraisal is that long-standing assumptions in regards to Saudi production, reserves, and excess capacity can no longer be the accepted standards for anticipating global pricing and supply. As a consequence, OPEC's own deliberations on global market conditions have come into question. As the world's largest producer (9.3 MmBbl/d in 2006), largest exporter in the world (7-8 MmBbl/d) and largest reserve holder (est. 262 billion barrels), Saudi Arabia cannot substantiate its claims and estimates because it does not provide the necessary empirical data for external verification. Saudi oil figures lack transparency. The Saudis' only response when challenged, Simmons says, is "trust me."

With respect to the reservoirs, Simmons makes the point that water injection has had an overall corrosive effect on the quality of Saudi reservoirs, suggesting that Saudi production decline may occur sooner than anticipated, despite the application of the latest oil drilling technologies. According to Simmons;

*"My worry is that too many other oil companies also believed these same technological tools would allow them to steadily grow their production from a reduced amount of wells drilled. Instead, it turned out that virtually every key oil producer utilizing these same tools sadly ended up seeing their production growth peter out. While the tools did extract more oil per well, they also simultaneously accelerated the recovery of the oil that could economically be produced from the well. In turn, this created decline rates never seen*

*before in existing production... however if my concerns are correct, the warning signals should be very easy to detect if Saudi Arabia begins to adopt a far higher standard of petroleum data transparency and begins reporting timely field by field production statistics which are supported by the average number of producing wells in each field.”*

The market impact of Simmons’ contentions becomes increasingly apparent when Canada’s oil sands proven reserves are factored into the debate. After the Alberta Energy and Utilities Board (AEUB) approved a 175 billion barrel increase in proven reserves to 180 billion barrels in late 2002, placing Canada second only to Saudi Arabia, reports in *The New York Times* (“Canada Builds a Large Oil Estimate on Sand,” June 18, 2003) claimed that those figures were exaggerated. What ensued was a little-noticed but highly significant verbal duel between Alberta (unconventional) and Saudi Arabia (conventional) over the ‘definition’ of proven reserves.

On June 21st, 2003, Alberta’s Energy Minister, Murray Smith told the *Financial Post* that Alberta was ready to open its books to back the AEUB estimates because they change the geopolitics of oil, boosting Canadian influence at the expense of other U.S. oil suppliers such as Saudi Arabia. “We are extremely happy to engage,” Smith said. “We are inviting the world community and the Department of Energy in the U.S. and the Energy Information Agency in Paris...to look at our books and examine them in a very clear and open fashion. We are asking them to examine Venezuela’s, Mexico’s, Saudi Arabia’s and other members of OPEC. This is going to be a long, interesting discussion about oil and gas. What are the true reserves?”

Responding June 18, 2003 to a *New York Times* question as to whether Saudi Arabia would publish field production data that would allow experts to assess Saudi depletion rates, Ali al-Naimi balked, saying, “I’m not in favor; it allows you to figure out reserves.”

## **2-Al Qaeda’s Oil War Strategy:**

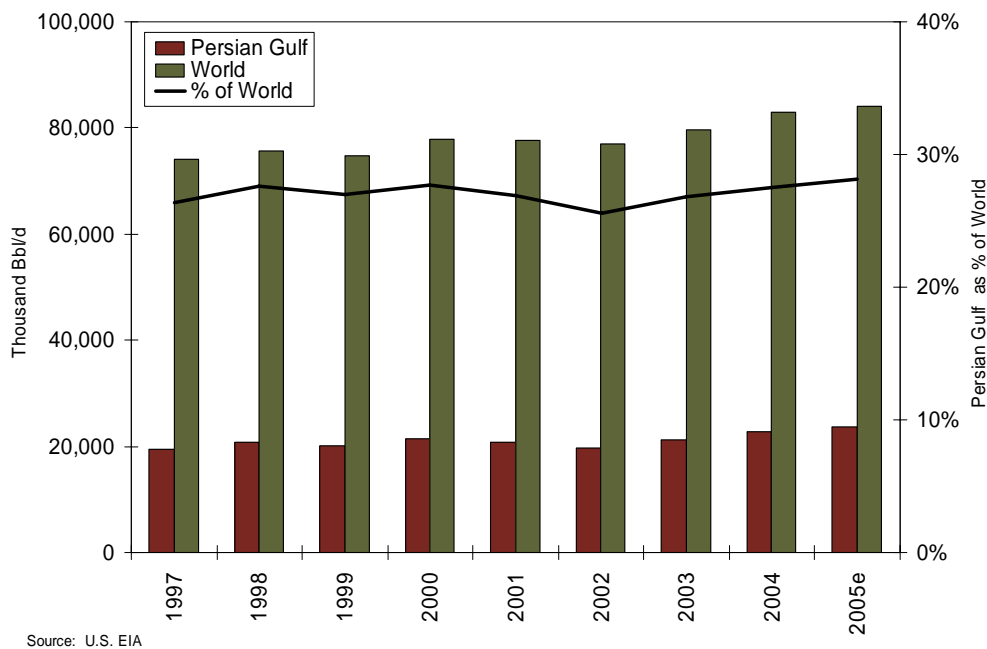
In a taped March 4<sup>th</sup> message by Osama Bin Laden’s deputy, Ayman Al-Zawahiri, *Al-Qaeda* called on its followers to launch attacks on the “economic infrastructure” of the West that will make the Western powers “bleed for years.” He also proclaimed, “we have to prevent the crusaders from stealing the Muslim’s oil, which is being drained in the biggest robbery in history.” The statement came a week after a foiled *Al-Qaeda* raid on the

massive Abqaiq processing facility in Saudi Arabia, a critical chokepoint in the kingdom's oil infrastructure that processes up to 6 million barrels a day. A moderately successful attack could slow production by 10 to 30 percent, resulting in a severe price spike due to supply disruption. Even the failed attack forced prices upwards by 3 percent, or close to \$2/Bbl.

In a presentation made to the 2006 Davos World Economic Forum, Dr. Robert Wescott, former Chief Economist at the US President's Council of Economic Advisors and Special Assistant the President for Economic Policy, concluded that should a disruption in supplies force oil above \$120 a barrel for a year because of coordinated terrorist attacks on oil facilities, the world's oil bill would be about 8 percent of world GDP, higher than at any time in modern history. Such oil prices would almost certainly precipitate a severe global recession. Meanwhile financial markets would likely judge these effects on global energy supplies more seriously than Iraq's 1990 invasion of Kuwait or the 9/11 attacks because of their continuing disruptive effect. Stock market valuations would likely fall more than they did after the Kuwait invasion or after 9/11.

The greatest threat to the Saudi infrastructure now comes from the possibility that Iraqi-based and trained jihadists, who have led the successful sabotage campaign against Iraq's economy by targeting its oil infrastructure, would now apply the same strategy and techniques against Saudi Arabia's oil installations. Particularly vulnerable would be the 12,000 miles of in-country pipelines. In 2005, close to 200 major attacks were launched against Iraqi oil sites, resulting in a \$6.25 billion loss of revenue. In January 2006, Iraq reported its lowest level of exports since the overthrow of the Saddam regime, less than 1,000,000 Bbl/d. In part as a result of the unanticipated and prolonged insurgency, U.S. officials estimate Iraqi reconstruction costs at more than \$50 billion.

### Comparison of Crude Oil Production



### 3-Regional Conflict in the Persian Gulf:

According to numerous sources, hoping to deter any U.S. plans for regime change, the Iranian leadership has prepared plans to attack oil facilities throughout the Persian Gulf, mine and shut down the Strait of Hormuz, which is the seagate for 14-15 MmBbl/d of Gulf crude exports and stimulate anti-U.S. uprisings from the Shiite communities in the Gulf oil-producing states of Iraq (60 percent Shiite), Kuwait (25 percent Shiite) and Saudi Arabia (majority Shiite in the oil-producing Eastern Province). Such actions, the Iranians hope, would spike oil prices so high (\$100+ per barrel) and cause such global economic dislocation that planned U.S. attacks on Iran would fold under pressure from neighboring countries like Saudi Arabia and Kuwait, whose economies and political stability are dependent on oil revenues. As Hezbollah has recently demonstrated, Iran has the military (conventional and unconventional) assets to sustain its threats as credible.

Former deputy commander of United States European Command (EUCOM), General Charles Wald, speaking at the September 2006 Global Business Forum in Alberta said, “Should the UN Security Council impose trade sanctions on Iran, oil prices could spike above \$100 a barrel.”

Even so, the American war calculus against Iran will likely take into account that the world's global oil reserves permit approximately 450 days of supply should Iran's 2.5 MmBbl/d in crude exports cease as a result of a U.S./Iranian military conflict. Why would the U.S. attack Iran and/or pursue regime change in that country at the risk of disrupting Persian Gulf crude exports? For the same reason, that U.S. forces rescued Kuwait from Saddam's 1990-91 invasion, namely to prevent a single hegemonic and anti-U.S. power – this time Iran instead of Iraq – from controlling all or most of the Persian Gulf oil-producing zone. The development of a viable Iranian nuclear weapons program would allow for an Iranian nuclear “security umbrella” over the Gulf, permitting Iran to pursue its strategic goal of regional petro-dominance without American interference. During a November 2, 2006 interview, President Bush defined the threat:

*“Osama bin Laden himself said that it's just a matter of time before the United States loses its will and retreats. I am deeply concerned about a country, the United States, leaving the Middle East. I am worried that rival form of extremists will battle for power...that they will topple modern governments, that they will be in a position to use oil as a tool to blackmail the West. People say, “What do you mean by that?” I say...If they control oil resources, then they pull oil off the market in order to run the price up...you couple that with a country that doesn't like us with a nuclear weapon and people will look back at this moment and say, ‘What happened to those people in 2006?’ and these are the stakes in this war we face.”*

Unless the United States can effect regime change in Iran using internal forces or succeed in a high-risk military endeavor against Tehran, the Iranian/U.S. (directly or via proxies) struggle over the Persian Gulf oil may continue for years to come, further increasing the uncertainty of Gulf oil supplies.

(On November 4, 2006 The Times of London reported that the International Atomic Energy Agency had named Saudi Arabia, Egypt, Tunisia and Morocco as seeking to build civilian nuclear energy programmes).

## Shifting Strategic Definitions:

President Bush's response to the oil market in general, and Saudi Arabia in particular, seems to reflect a White House worldview of a changing global order adversely impacting America's global standing and threatening its economic well-being. These concerns were summarized in the findings of the U.S. Department of Energy's America's Oil Shale report:

- In 2003, the world consumed 27 billion barrels of petroleum, but replaced only 3 billion barrels of reserves. Development of petroleum resources in other producing countries is unlikely to keep pace with rising demand and declining production. Mere perceptions of a coming supply shortfall may stimulate irrational behavior by nations and consumers. So whether the global supply shortfall begins as early as this decade, or as late as 2040, the nation needs to prepare now for a reduction in global petroleum supplies and the higher prices and economic impacts that will follow.
- The nation's rising dependence on oil imports from politically unstable sources places national energy and economic security at risk to supply interruptions caused by terrorist acts, political fiat, or natural disaster.
- Increasing geopolitical risk also deters the global petroleum industry from making long-term investments that are now needed to explore, find, and produce new oil supplies. This risk contributes to higher current world oil prices and cost of goods and exacerbates the long-term supply problem. (Ed. note: Saudi Energy Minister Al-Naimi reminded his Houston audience that 25% of crude prices or \$15/b at \$60/b, was due to geopolitical and/or speculative forces: "There is a substantial piece of the price, at least \$15 today that is not supported by fundamentals.")

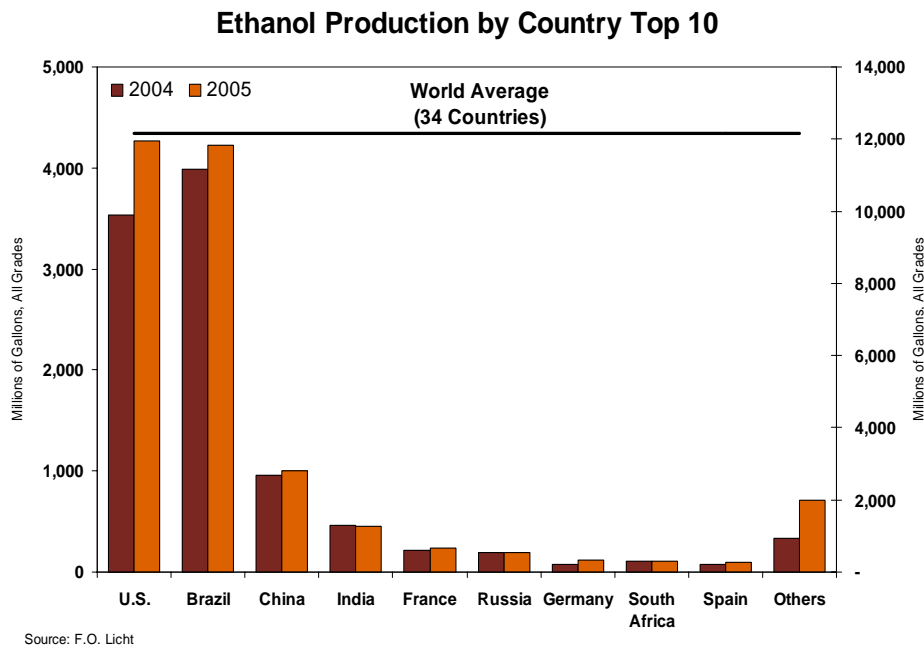
These conditions, along with limited global oil exploration opportunities and activity, underscore the increasing risk that America's growing reliance on imported oil poses to national security and economic vitality.

Hence President Bush's call for a new energy policy for the United States driven by commitment to alternative sources such as: ethanol, hydrogen fuel cells, and nuclear power.

## Alternative Energy Sources?

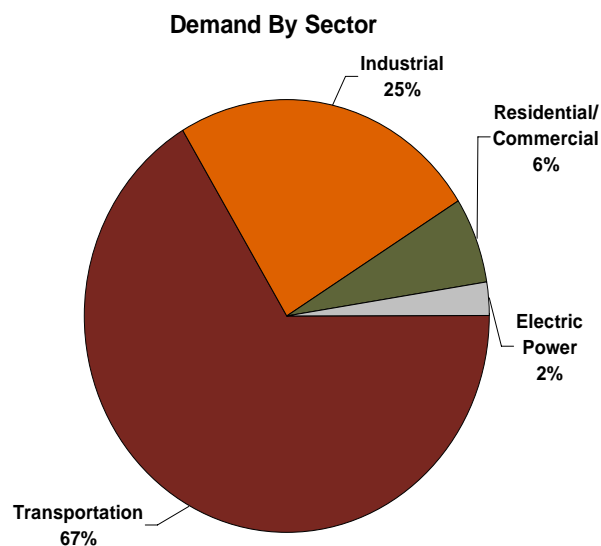
The President tried to make the case that U.S. energy security ought to come about through a reliance on home grown, alternative or exotic energy programs that would effectively begin the process that would terminate a U.S. economy based on oil. While much is laudable in the effort to promote alternative energy resources, the practicality of these solutions leaves much to be desired:

- In the case of hydrogen fuel cells, even a breakthrough in the technology would most likely require that the hydrogen be produced from a fossil fuel - natural gas. As well, the distribution and retail infrastructure for delivering hydrogen to consumers could take decades.
- With respect to ethanol, supporters often point to Brazil, which supplies close to 50 percent of its fuel with ethanol. The Wall Street Journal (Feb. 2<sup>nd</sup>, 2005 ) noted of Brazil, *“It took years of government subsidies totaling at least \$26 billion, plus tax breaks that cost several billion dollars more. Brazil mandated that the fuel be available at 29,000 fueling stations – a cost borne by state run oil giant Petrobras.”* Such a government-intervention scenario in the U.S. is extremely unlikely, if not altogether impossible.



Moreover, according to the International Energy Agency, ethanol can only be transported along existing pipelines as long as it is blended with petroleum products in concentrations of less than 10 percent, as higher amounts will corrode pipelines.

Given that the White House has signaled its desire commitment to reduce its dependency on Persian Gulf conventional crudes, and that alternative energy resources, particularly for the transportation sector that consumes 60% of the domestic oil market, are problematic solutions, how can the President achieve his goal of energy security and yet maintain healthy growth for the US, as well as the global economy.



### **Towards a New Market Order:**

*An enormous resource base of unconventional oil exists worldwide and particularly in the western Hemisphere, where significant quantities of hydrocarbons are found in oil shale, oil sand, and very heavy oil. These resources are deemed “unconventional” because they have been economically or technically infeasible to produce relative to conventional oil. However, as projected future oil prices continue to rise, technology improves and development costs fall, these known, secure resources become competitive and viable.*

### **--America’s Oil Shale: A Roadmap for Federal Decision-Making**

The issue for energy policy planners in the Administration, as was made evident by Mr. Negroponte's statements, is to adopt a new worldview on the global oil market – one that pivots on the record-breaking deposits of unconventional hydrocarbons found in North America's oil sands, shale and coal (CTL) whose cost effective development, thanks to technological innovations and higher prices, allows the United States a plentiful and secure supply of home-grown and allied crude supplies. Projected additional Canadian oil sands exports alone, to the U.S. of 1.5 MmBbl/d by 2015 or earlier would replace the prescribed shortfall from the Persian Gulf, at least 10 years ahead of the President's deadline.

To the many pressures forcing the Administration to these conclusions, one can add the concerns of many analysts that the world may already have reached "Peak Oil," the point at which global production sinks into a gradual but inexorable decline. This concept is generally attributed to M. King Hubbert, who used mathematical models in 1956 to predict that U.S. oil production would peak between 1965 and 1970, and then later applied the same methods to estimate global peak production to occur between 1995 and 2000.

But Hubbert's work assumed static production technology, much as the famously false global starvation predictions of Thomas Malthus in 1798 assumed that food production technology would not increase. In one analyst's words:

*No one can blame Malthus for not anticipating the invention of the tractor, combine, or other farming implements that made food production grow very much faster than he imagined that it would. . . But there is an intellectual sin for which Malthus might properly be held accountable: the arrogance to assume that his mathematical model was more infallible than its creator. Any predictive model rests on assumptions made by its architect; one of those assumptions, in Malthus's case, was that he could extrapolate the rate of growth of food production capacity.*

*In Hubbert's case, he assumed that the methods of oil production of which he and the rest of the world were aware at the time that he made his calculations were the only ones that would ever exist. The*

*growing production of oil in the Athabaskan oil sands disproves that assumption, and the likelihood that production from oil shale and other unconventional means will soon ramp up in earnest confirms that disproof.*

***The Perils of Mathematical Models***

Robert E. Heiler, Vice-President, GWEST

***FirstInsight: The Global Politics of Energy***, March 2006

According to Eric Johnson, Haliburton's vice-president of marketing; *"All the majors are looking at heavy oil plays. They believe that their technological breakthroughs that will enable regions like Canada's oils sands to be developed more efficiently than before."*

The OPEC-centric structural components of the oil market are being transformed by a wide of array post-9/11 global forces. Not only is it likely that Canada could replace Saudi Arabia as the world's largest storehouse of oil, but Russian production, having increased by 8-10 percent yearly, now matches Saudi volumes, thereby positioning Russia to lay claim to its stated goal of becoming the new "swing producer."

The rise of the oil sands, Venezuela's massive extra-heavy deposits, US oil shale potential, dramatic Russian production levels, unprecedented market reservations over Saudi capacity, demands for transparency in national oil accounts and the clout of national oil companies, signal a market system in transition, a transition requiring new definitions and assumptions that accurately reflect a new order in the global oil market as a result of the rise of unconventional heavy oils.

**North America's Unconventional Oil Corridor:**  
**A U.S.-Alberta Partnership**

Greg Melchin, Alberta's Energy Minister said Americans seem particularly keen to expand the US-Canada energy relationship to avoid becoming more dependent on volatile energy suppliers in the Middle East and elsewhere.

*"We can provide them with energy security".*

—Patrice Hill, Business Reporter, *Washington Times*  
The World and I, April 2006

*"I have no doubt that once industry is given access to our unconventional resources, we will quickly follow in the footsteps of Alberta, Canada. I have no doubt that the abundance of existing technology and continued growth in the global demand for oil will inevitably lead to a major shift toward the development of unconventional oil resources. And as this scenario unfolds, I believe the United States and Canada will emerge as the dominant energy powers in the world. It has been slow in coming, but the United States is slowly awakening to this fact. I commend our friends in Alberta for their active effort to call this to our attention, and their success in leading the way down this path...You also may have recognized the profound geopolitical shift that will likely occur over the next decade or two as the supply of conventional oil begins to dwindle in the Middle East, and the commercial production of our unconventional resources takes off in North America. We need to recognize the implications of this shift for our region. And the governments of Canada and the United States absolutely should be taking a proactive approach to preparing for that future."*

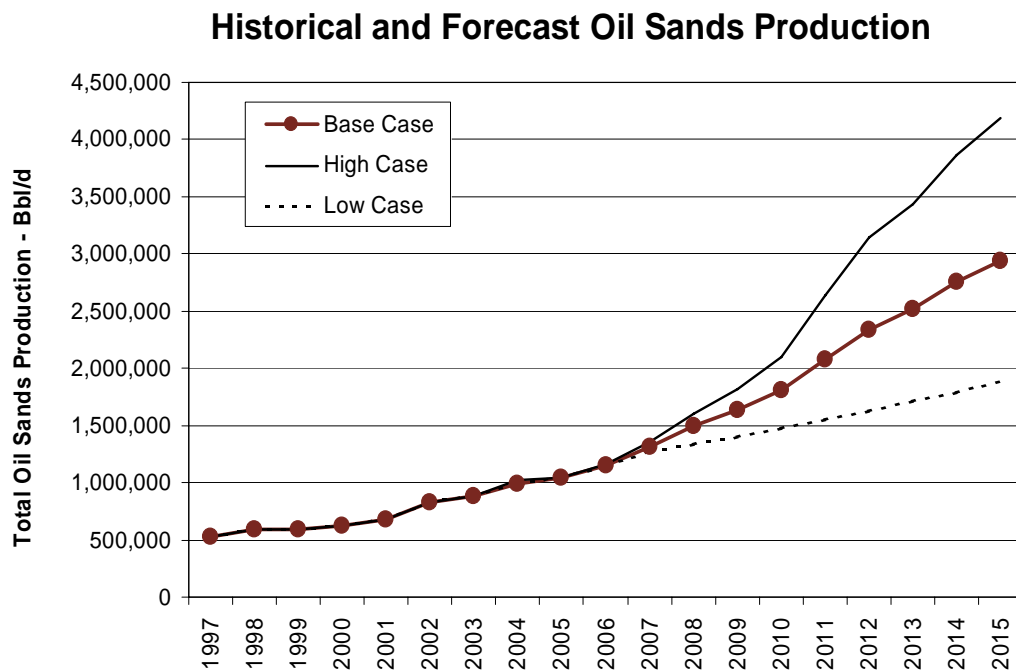
—*U.S. Senator Orrin Hatch*  
*Embassy of Canada, Washington, DC, October 17, 2005*

**Alberta: Developmental Model for U.S. Unconventional Heavy Oil:**

During his address at the Canadian Embassy in Washington, Senator Hatch (R-UT), a highly respected 29-year veteran of the U.S. Senate, outlined a legislative blueprint for a long-term U.S.-Canadian energy partnership based on the successful development of North America's massive unconventional resources in oil sands and oil shale. The speech examined the structural changes taking place in the global oil market as a consequence of Alberta's dramatic oil sands development (2006 est.: 1.1+ MmBbl/d) and the need for the United States to adjust its national security and energy security policies accordingly.

The Senator's bullish prognosis is based on two persuasive arguments:

- First, Alberta's triumph in converting its 174 billion barrels of proven oil sands reserves into massive volume crude production that could approach 4 MmBbl/d by 2015 and which is currently providing an ever-increasing supply of crude (2005 est: 12% of U.S. imports) to the American market.



\*Source: FirstEnergy Capital Corp.

According to a recent FirstEnergy Capital Corp report, (a leading Calgary-based energy-investment dealer) it is possible to forecast an 11MmBbl/d oil sands production level by 2046. Given new technologies like microbes in enhanced oil recovery, the potential of as much as 60 billion barrels in Saskatchewan oil sands deposits, and the likely addition of another 135 billion barrels of recoverable oil sands (total: 315 billion barrels) into the proven reserve category for Alberta, it was not surprising that Senator Hatch declared;

*“Alberta is now second only to Saudi Arabia in proven oil reserves and ninth in the world in oil production. This owes mostly to their successful development of oil sands. In Alberta, you have dozens of major oil*

*companies, using a variety of technologies and recovery methods going after very different types of oil sands resources, and in almost every case doing so for less than \$20 a barrel...It is a gigantic success story, and it began with Alberta's government deciding to promote the development of this resource and not giving up. Anyone watching what is happening up north will recognize that, before long, Canada will inevitably overtake Saudi Arabia as the world's oil giant. And Alberta clearly has its sights on increased annual production to match its growing reserves. Already at about a million barrels a day, Alberta's production is expected to double in the next five or six years. What does this all mean for the United States? I think it means a great deal. First, it means that the United States can enjoy a new gigantic source of oil from a friendly neighbor...our proximity to one another facilitates our energy relationship in countless ways...Alberta's success in developing oil sands is important to the U.S. in another way. It provides our nation with a successful model for developing our own unconventional resources."*

- Second, the application of the 'Alberta Model' to treat (via technology and government policies) unconventional oil deposits in the U.S., particularly oil shale. According to the interagency Task Force on Strategic Unconventional Fuels, Development of America's Strategic Unconventional Fuels Resources (Initial Report to the President and the Congress of the United States), June 2006:

*Alberta's massive oil sands resource is substantially larger than U.S. tar (oil) sands deposits, and differs in two fundamental aspects in composition. These compositional differences will require different technical approaches for extracting the bitumen from the mined sands. Nonetheless, the lessons learned from the evolution of technologies for Alberta oil sands development could contribute to accelerating the advancement of technologies applicable to the smaller resource. Further the approaches taken by the Province of Alberta to stimulate private investment, streamline permitting processes and accelerate sustainable development of the resource offer a valuable model that should be understood, considered and perhaps adapted to stimulate domestic oil sands, oil shale, coal to liquids and other unconventional fuels development.*

(Note: Such has been interest in Congress of Canada's rise to energy superpower status, that the Government of Alberta, through its Alberta

office in Washington, headed by Murray Smith, was invited to testify on December 7 2005, to the U.S. House Subcommittee on Energy and Air Quality hearing on Peak Oil. The submission was entitled, Alberta's Dramatic Crude Oil Growth in an Environment of Conventional Crude Oil Decline.)

### **Legislative Keys to US Oil Shale Development:**

Based on Alberta's successful approach to unconventional heavy oil development, the U.S. Department of Energy (DOE) has examined the potential of oil sands (est: 32 billion barrels in Utah) and oil shale deposits located in the western interior of the United States. With respect to oil shale deposits, DOE estimates that the Green River formation that covers the 16,000-square mile regional intersections of Utah, Colorado and Wyoming holds the largest known oil shale deposits in the world, close to 2 trillion barrels of oil. The findings of a December 2004 Department of Energy (DOE) study, America's Oil Shale: A Roadmap for Federal Decision Making" by the Office of Deputy Assistant Secretary for Petroleum Reserves and the Office of Naval Petroleum and Oil Shale Reserves concluded:



- That the United States, through a coordinated industry/government effort, could initiate an oil shale industry by 2011 with an ambitious goal of 2 MmBbl/d of production by 2020 and reaching an ultimate capacity of 10 MmBbl/d. These figures are based on DOE's estimate that as much as 750 billion barrels of oil shale has a richness of 25 gal./ton or greater and could be produced with current available technology
- For national security and economic interests, the United States must contain its growing vulnerability attributable to crude oil and refined product imports.

- Concerns about the reliability and stability of supply from key oil supplying regions increase the strategic importance of developing secure domestic energy resources to supplement declining oil production, reduced oil imports, defend the nation, and insure its ability to meet its global commitments. (The U.S. military consumes 300,000 barrels of fuel *daily*. According to Dr. Ted Barna, Assistant Deputy Under Secretary of Defense, the U.S. military is looking to streamline its fuel supplies by working toward cleaner and more domestic fuel supplies by 2010/11, which could be produced from the country's resources in coal, oil shale, biomass and petroleum coke.)
- The United States needs to establish a supply base for its future liquid fuel needs; the two options of significant magnitude to achieve this goal are oil shale and coal.
- The commercialization of the domestic oil shale industry would reduce the GDP impact of higher oil prices by \$800 billion by 2020, reduce the balance of payment deficit, increase federal and state revenues from taxes and royalties, and create thousands of new jobs.

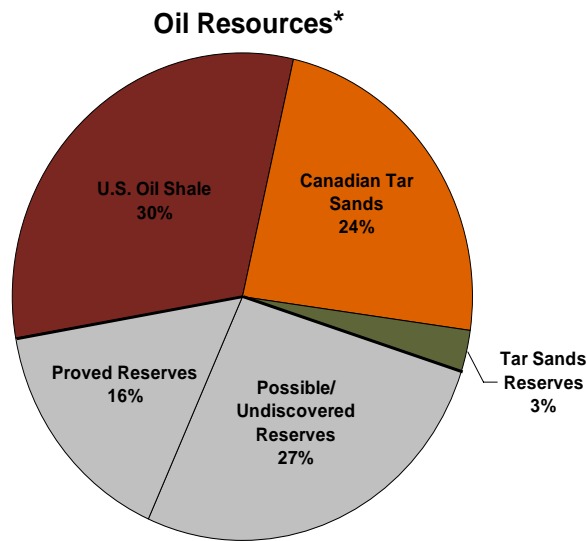
The report recognizes that the main barriers are economic and that massive capital investments over a long lead time would be required prior to revenue streams coming on line. Accordingly, the 2005 U.S. Energy Bill contains various provisions to stimulate capital formation and project investment.

### **Shale Commercialization:**

According to **Anton Dammer**, Director, Naval Petroleum and Oil Shale Reserves, U.S. DOE:

*“Commercializing the vast oil shale resources would complement the mission of the Strategic Petroleum Reserve (SPR), by measurably adding to the country’s energy resource base. Addition of oil shale to the country’s proved oil reserves could occur in a manner similar to the addition of 175 billion barrels of oil from Alberta tar sand to Canada’s proved oil reserves. As a result of the commercial success, oil from tar sand production now exceeds one million barrels per day. U.S. oil shale, which is as rich as tar sand, could similarly be developed and become a vital component in America’s future energy security.”*

***Strategic Significance of America’s Oil Shale Resource***  
March 2004.



\*Source: US, EIA, IAE Energy Outlook 2004

Senator Hatch indicated that current technologies would allow for the economic development of oil shale at \$40 a barrel. Other experts believe that the commercialization of the oil shale can be affected in \$25-\$30 range.

The most promising technology to commercialize oil shale is Shell's patented *insitu conversion process* that the company is developing at its research plant in the Mahogany deposit, Colorado. This process could produce high-quality transportation fuels from oil sands, shale and coal in an environmentally sound manner and a commercial-scale operation may be initiated in the near future.

### **Energy Bill Provisions & the US-Alberta Partnership:**

Given the strong probability that oil prices will remain well above those levels in the years to come, Senator Hatch sponsored the Oil Shale, Tar Sands Development Act as part (Section 369) of the 2005 Energy Policy Act that President Bush signed into law in August. Those provisions, meant to open the way for research programs and commercial leasing of the federal land containing oil shale, include:

- tax incentives allowing for speedy depreciation of equipment for producing oil shale and oil sands;

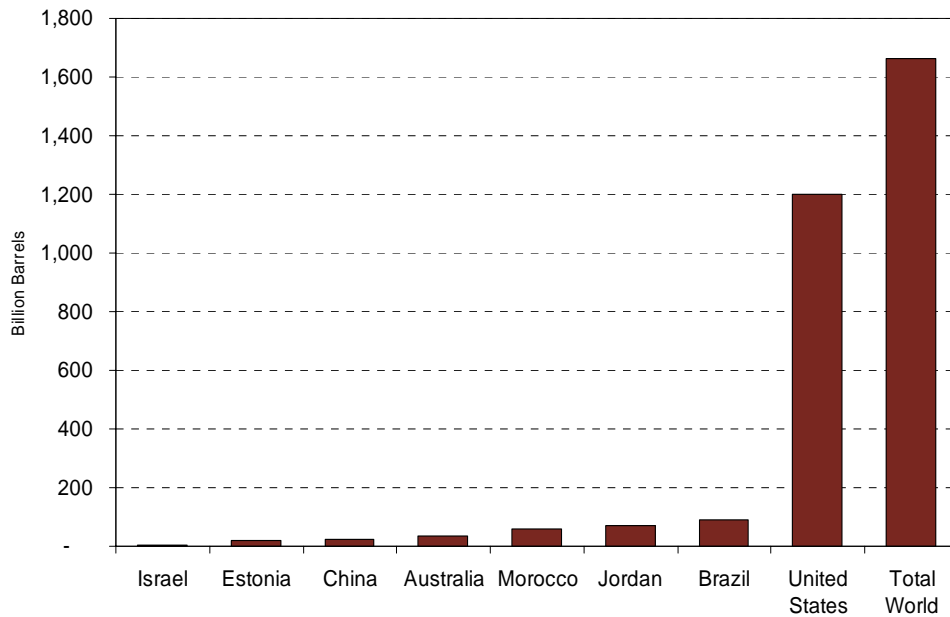
- cost-sharing provisions for government and industry following the Alberta model, where the provincial government provided for its oils sands producers in the early years of development;
- federal royalty relief, federal cost shares for demonstration programs, and advance procurement agreements by the military; and,
- a programmatic study requiring the Department of Interior to complete an environmental impact statement by February 2007 for a commercial leasing program for oil shale and oil sands resources on public land. Eighty percent of the resource sits on federal land.

According to Jim Bunker, former acting Energy Director for the Governor of Utah's economic development office and consultant to the U.S. Department of Energy, these industry incentives have already made an impact.

*"It's made them sit up and take notice," Bunker says. "The words I've heard from industry are that it appears as though government is genuinely interested in oil sands and shale. And if government is, then we should be. It's had that effect."*

Also included in Section 369 is a provision that formalizes the U.S. energy partnership with Alberta 'for purposes of sharing information relating to development and production of oil from tar sands, and similar partnerships with other nations that contain significant oil shale resources.'

### World Oil Shale Resources\*



\*Source: Strategic Significance of America's Oil Shale Resource: 2005 EIA Midterm Energy Conference.

Reflecting the provisions in the Energy Bill, the 2006 Task Force report to the United States government included the following recommendations:

- Reducing the rate of demand growth and increasing domestic fuels production are both necessary to reduce import dependence and enhance U.S. energy supply sector.
- Production of fuels from unconventional resources could reduce imports, reduce our nation's vulnerability to supply disruptions, and sustain or grow domestic economic activity. As such, America's unconventional fuels resources should be considered vital strategic assets of the United States.
- A "measured" approach to encouraging development of unconventional fuels resources, in which government actively mitigates or responds to major impediments and uncertainties to investment, could result in several million new barrels per day of production by 2035.

In summary, comprehensive US government reports and Congressional legislation sustain the conviction that a domestic oil shale industry could

'provide the needed bridge between conventional petroleum and future alternative energy sources as global petroleum supply peaks and begins its inevitable decline.'

## **Unconventionals: A Portal for China's Energy Security Strategy**

In 1993 China only imported 1% of its oil from foreign sources. By 2004 approximately 48% of its oil was imported, leaving China with an import dependency of approximately 3 million barrels per day. According to EIA estimates, China's oil demand will continue to rise, reaching approximately 14.2 million barrels per day by 2025. Of that 14.2 million, EIA forecasts that approximately 10.7 million will be imported.

**--U.S. Dept. of Energy, s.1837, Energy Policy Act 2005**

Alberta's Energy Minister Greg Melchin said investment from national oil companies would be welcome, because Alberta's regulatory structures were firm enough to ensure that reserves are developed independent of who's doing the investing. *"It's in our interest to attract investment from around the world. We've concluded that we can manage the issues that might arise from the involvement of these companies."*

**--Dow Jones Newswires**  
October 17, 2006

The United States and China announced a plan for regular high-level talks about their long-term economic relationship which U.S. officials said would not overshadow more immediate concerns such as the yuan exchange rate. U.S. Treasury Secretary Henry Paulson said, *"The relationship between the U.S. and China is the most important bilateral economic relationship in the world today. The world is watching us,"* adding that both countries needed to deal with their economic problems in a *"responsive constructive and creative way."*

**--Reuters**  
September 21, 2006

## **Beyond Traditional Notions:**

As noted by Zha Daojiong of the World Security Institute, China Program, energy security at the international level is a function of three basic requirements:

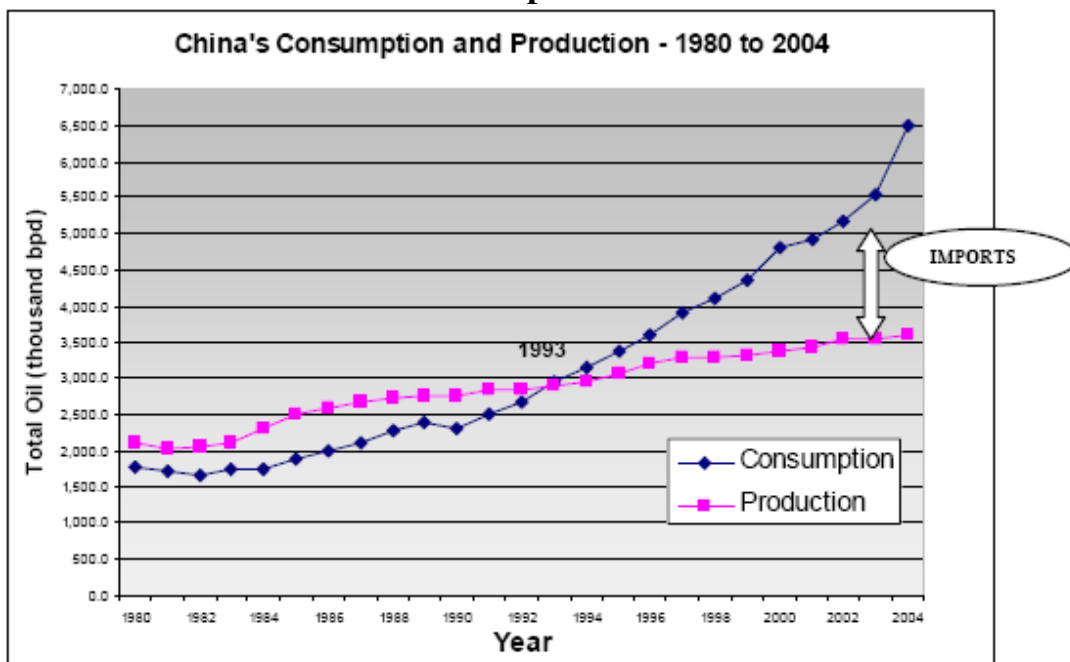
1. availability of energy required for stable economic and social development,

2. freedom from disruption of supply,
3. affordability of energy prices.

Calculations, then affecting energy security must necessarily deal with geopolitical forces and the national policies of countries, consumers and producers alike. Indeed, China's significant oil consumption from imported sources makes China economic circumstance reliant on global energy security calculations. The availability and reliability of reasonably priced oil supplies is the central question for China's achievement of energy security, as its oil production from conventional sources likely begins to decline by 2020.

More attention must be paid to the mutual dependence between China, as the world's second largest consumer, and various suppliers.

### China's Import Demand



Source: US DOE

In a presentation to the 2006 International Symposium on Energy Security: China and the World, BP's Group Vice President and Asia Regional President, Gary Dirks, praised China's efforts for energy security through the implementation of programs such as energy saving, expanding domestic

energy supply, diversifying energy sources, building a strategic petroleum reserve, promoting the development of renewable energies and developing oil substitutes. Although these are all sound elements of a national energy security policy, further development of China's energy security strategy can be strengthened by operational concepts that Dr Dirks identified as diversity, (i.e. energy technology structure to encourage development of new and innovative solutions), openness, (i.e. international investment), and partnership, (i.e. closer collaboration such as sharing views, jointly building energy infrastructure projects, carrying out technology research and development and investing in energy projects world wide).

### **Crafting a New Market Order: A Role for China?**

It is within this context of diversification, collaboration and market mechanisms, that China has an opportunity, not only to become a participant in potentially, the largest oil play since the rise of the Persian Gulf in the 1960s, but rather, as a 'founding member' crafting new order in global oil, along with the U.S. and Canada. That 'order' is anchored in an integrated North American energy system, and more specifically in the unconventional hydrocarbon corridor that runs along a 2,500 kilometer N-S axis from Northern Alberta and Saskatchewan southward through the massive Montana coal deposits to the oil sands and shale of Colorado, Utah and Wyoming. The potency of this hydrocarbon wonderland is evidenced by the recent announcement of partnership between EnCana and ConocoPhillips to create an integrated North American heavy oil business that would produce 400,000 barrels of Athabasca oil sands crude by 2015 from the current 50,000 barrels/day and expand heavy oil refining capacity in the United States to 550,000 barrels from the current 60,000. Randy Eresman, EnCana's President & Chief Executive Officer said, *"These partnerships provide greater certainty of execution for our oil sands projects by reducing cost and price risk and increasing confidence in our ability to achieve economic returns."*

The logic of business validated by the cost effectiveness of new technologies, economies of scale, and market demand insures that unconventional heavy oil development, both upstream and downstream, will increasingly, and at a rapid pace, characterize and dominate North America's oil sector, as well as that of other parts of the western hemisphere

from the North Slopes of Alaska to the Orinoco Basin of Venezuela and off-shore Cuba.

### **A Trilateral Engagement: Sands and Shale**

Chinese oil companies have engaged with Canadian counterparts like MEG, Enbridge, Husky and Synenco, and with the Governments of Alberta and Saskatchewan for purposes of cooperation, investment, supply and production. Speaking to China's interest in the oil sands, former Alberta Energy Minister Murray Smith said, "*Having access to the world market would be beneficial to Alberta's producers.*" Echoing the Smith's statement, Canada's Ambassador to China Robert Wright, while visiting Shanghai in February 2006, noted that Ottawa was working closely with a number of Chinese firms to encourage joint projects, "*Prospects for cooperation in the energy area look very good*". Both countries have subsequently increased joint cooperation in the area of infrastructure development, railway lines, ports and pipelines needed to transport Canadian oil to China's industrial, manufacturing and transportation sectors.

According to Ken Chew, IHS Energy, in 1961 China was producing one-third of its total oil from shale, and although current data is not complete, Mr Chew's 2005 calculations indicate that China is the world's largest producer (c. 4 million tonnes/yr) of shale for oil/chemicals, and second largest after Estonia (c. 13 million tonnes/yr for power and oil/chemicals combined). The US DOE places China's oil shale resources, with yield greater than 15 gal./ton, at 25 billion barrels. Professor Li Jian of China's Petroleum Exploration and Production Research Institute (Langfang) estimated that by the year 2020 China could produce upwards of 132 million barrels per year of crude from its oil sands with the most significant deposits of oil sands in the following provinces; North-West: Xinjiang and Qinghai; South-West: Tibet, Sichuan, Guizhou; South-Central: Guangxi; East: Zhejiang; North: Inner Mongolia. Ultimate recoverable reserves are estimated at 73 billion barrels.

In a Wall Street Journal report (September 12, 2006), Mr Zhang Guobao, Vice-Chairman of China's National Development and reform Commission called on the U.S. and China to jointly develop oil fields to 'protect against the risks of supply disruption and the rising costs of productions that both countries face'. In the same the month, the Task Force on Strategic Unconventional Fuels issued the following recommendation:

*Just as the United States may stand to benefit from advances in oil sands technologies developed in Alberta, there is significant potential for U.S. companies to learn from the experiences of other nations in oil shale development, and for other countries to benefit from the experience of the United States.*

*Given these findings, it is the recommendation of the Task Force that the Department of Energy craft partnerships to exchange technology information and engage in other collaborative efforts that can accelerate the advance of oil shale technology and industry development in the United States and other oil shale bearing countries of the world.*

The nexus of China's energy relationship with North America is the development of unconventional heavy oils that all three countries possess in highly significant amounts. The commonality of this resource base combined with economic interdependence (Canada and China rank as the first and second largest trading partners with the United States; together the three countries consume over 35% of the world's oil supply while producing 1/6th of global supply) means that the three countries have an overriding responsibility to sustain economic growth by ensuring that energy supplies are plentiful and prices reasonable. As previously noted, any serious disruption of supply to China and the United States with subsequent price increases will lead to severe global dislocation with unforeseen political consequences. Even without supply disruption, prices may well climb beyond a tolerable level. Co-founder of the Quantum Fund, and Wall Street guru, Jim Rogers, (Forbes, October 30<sup>th</sup>, 2006) believes oil prices will approach \$100 a barrel before the commodity boom ends.

Just as Edmonton, Regina and Ottawa have engaged with Beijing on matters relating to energy, so too have Washington and Beijing signaled their intent to seek a functional relationship based on common interests in energy security and unconventional heavy oil development.

| <b>TOP WORLD OIL CONSUMERS 2004</b> |                |                            |
|-------------------------------------|----------------|----------------------------|
| <b>Rank</b>                         | <b>Country</b> | <b>Million barrels/day</b> |
| 1                                   | United States  | 20.7                       |
| 2                                   | China          | 6.5                        |
| 3                                   | Japan          | 5.4                        |
| 4                                   | Germany        | 2.6                        |
| 5                                   | Russia         | 2.6                        |
| 6                                   | India          | 2.3                        |
| 7                                   | Canada         | 2.3                        |
| 8                                   | Brazil         | 2.2                        |
| 9                                   | South Korea    | 2.1                        |
| 10                                  | France         | 2                          |

Source: US DOE

### **New Mechanisms for a New Order:**

From the October 20th, 2006 report (“Plan to cut OPEC supply will come at a Price”) of the Financial Times:

*Until four years ago OPEC whose 11 members rely on oil revenues for almost their entire budget, was quite content with international oil prices at \$30/b. But as prices have risen so has the countries’ spending.*

*All the countries have become increasingly addicted to their new-found oil wealth. Saudi Arabia, which got by on \$15 a barrel oil in the mid 1990s, now needs at least \$38 a barrel to meet its current pace of spending, which grows 20 per cent annually, according to SAMBA, a Riyadh-based bank. By 2010, analysts estimate, the price tag of the kingdom’s generous social policies and lavish upkeep of the royal family will need to be funded by \$65-a-barrel oil prices.*

Corrosive structural weakness within OPEC, the lack of new conventional supplies, and oil increasingly utilized as an instrument of statecraft and weapon of war, marks a decaying and debilitating system that once provided stability, predictability and affordability in the global oil market.

*Not all that long ago, the answer to such problems would have come from OPEC. Historically, the public statements that invariably followed the behind-the-scenes arm-twisting within the world's most powerful cartel were treated as gospel by global markets, and oil commodity futures prices reacted accordingly. For as long as anyone can remember, OPEC has been the glove outlining the invisible hand allegedly controlling the international oil market. And for just as long, consumers have benefited from the comfort of this controlling presence.*

*Today, however, the situation is quite different. Despite the cartel's best efforts, mounting evidence points to the fact that OPEC has become increasingly ineffective in reining in high oil prices. And with the disappearance of the preferred "price band" for OPEC crude (\$28-\$32 per barrel), some wonder whether the cartel still has any interest at all in bringing prices down.*

*This impotence derives from a confluence of factors. With estimates for crude oil demand steadily being revised upward, market fundamentals are working against the cartel. And with most of the additional supply to meet this demand projected to come from non-OPEC producers, the cartel is facing a dramatic diminution in influence.*

***Thinking Beyond OPEC***

Frederick Cedoz, Vice-President, GWEST

Journal of International Security Affairs, No. 10, Spring 2006

Oil price volatility, in particular, is a cancer that will eat away at China and America's economic health unless a prescription can be found that will stabilize prices in a manner to allow unconventional oil to emerge as the primary new source of fuels that Chinese and North America must have.

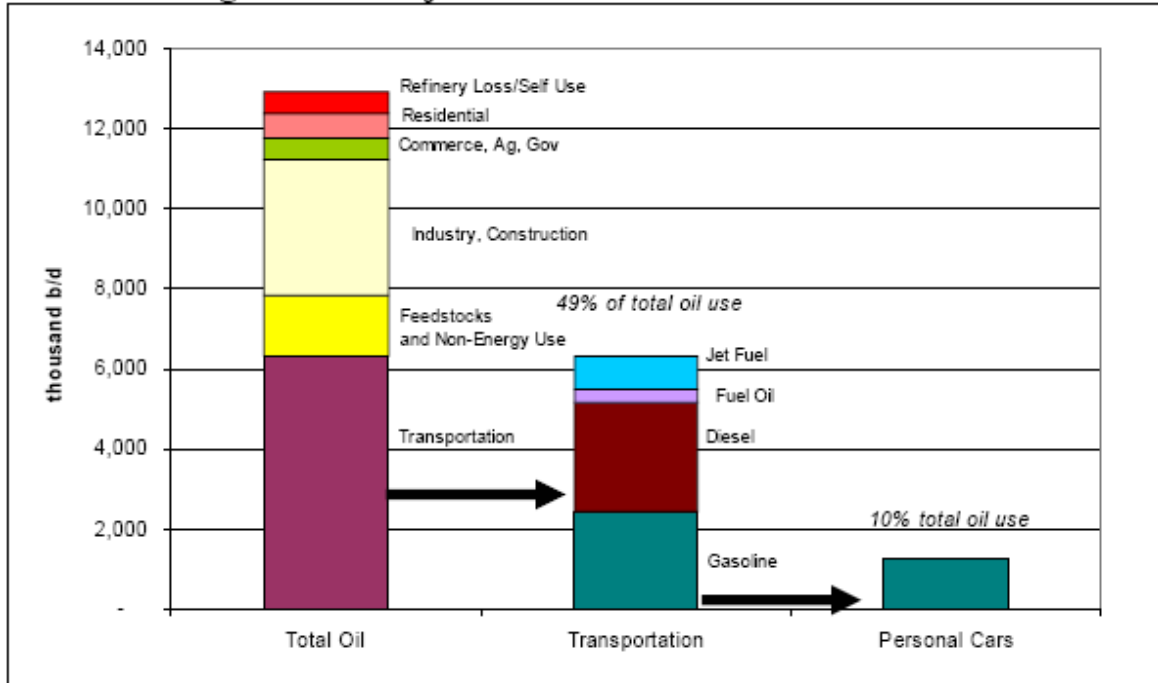
## **Recommendation:**

Within this geopolitical context, Beijing, Edmonton and Washington, ought to give consideration to the establishment of a new and entirely appropriate mechanism to examine issues needed to enhance and consolidate energy security strategies that go beyond domestic plans of conservation, production and infrastructure, and/or military deployments to secure supply, and which include;

- 1) The meaning & definition of 'Proven Reserves' as a consequence of empirically based methodologies such as those derived by the Alberta Energy & Utilities Board (AEUB) that provide transparency and credibility for investors; and the acceptance of unconventional hydrocarbons: oil sands, shale, coal liquefaction in the new calculus;
- 2) A new Pricing Mechanism based on a consumer/producer consensus of affordability as to the minimum level needed to sustain heavy oil development; and that also reexamines the definition and function of 'spare capacity' in light of strategic petroleum reserves supplemented with projected new production volumes from unconventional heavy oil production;
- 3) The impact of the Speculative Market on global commodity prices and emerging economies and what, if any, corrective measures may be required; and whether a revalued and freely floating foreign exchange system for the yuan could serve to cushion the impact of oil price shocks on the Chinese economy.

With the emergence of unconventional oils, a Chinese, American and Canadian perspective on energy security requires government/industry generated strategic planning combined with an appreciation and acceptance of market principles, to permit for a cooperative and collaborative mechanism that secures a return to stability in pricing and reliability in supply.

## Projections for Oil Use in China – 2020



Source: US DOE