

The Quest for Oil in the New World Order

By Rudy Soliz

Professor of Business Administration, Marketing and International Business, Houston Community College.

Are we running out of oil? My research topic, “The Quest for Oil in the New World Order” has provided a better insight on the subject of the availability of oil. The research was a qualitative study. Five subject matter experts in the oil industry were interviewed as part of the study. I would like to thank and acknowledge those individuals who participated in my research. They were Joe Barnes, Research Fellow, Rice University, Lynn Cook Houston Chronicle Energy Editor James Baker III, and Institute for Public Policy, Eddie Habibi President and CEO, PAS, Jim Hackett, CEO Anadarko, and Matthew Simmons, Chairman Simmons & Company.

The topics evolved from the study were (1) the disruption of the world’s oil supply and its effect on the economies of the world, (2) the role of OPEC, and the role of Saudi Arabia (3) the impact of oil and the quality of life and (4) the question, “Are we running out of oil?”

The study asked six basic questions, which will be found in the body of this report.

Question 1. In 1973 Arab oil embargo was the oil supply disruption to cause major price increases and have global repercussions. U. S. domestic production fell by 6% between 1973 and 1975. Unemployment doubled to 9% and at the time there was no established mechanism to enable the Organization for Economic Cooperation Development countries to effectively respond and limit the economic impact of the supply disruption. Do you fear another “embargo” whether driven by OPEC or other world events?

While a true embargo will not happen because of the price of a barrel of oil today is over \$70. Oil producing countries both OPEC and Non-OPEC would not encourage an embargo or other incidents causing a disruption of oil. With increase players being involved in the production of oil an embargo would not have the same impact as what occurred in 1973. Some OPEC and Non-OPEC countries are struggling internally and cannot afford a disruption of revenues. A principle player in a disruption of oil would be Saudi Arabia. A change in the ruling government in Saudi Arabia could have an effect on the world's oil supply. I will address the role of Saudi Arabia later in this paper. Iran could also become a major player as far as a disruption in the world's supply of oil. At this point we do not know what will happen once the seeds of democracy are planted and a self-governing party becomes a reality in Iraq. The point being is that experts feel that an embargo as we experienced in the 1970's will not occur. However, a possible disruption of the world's supply of oil could become a reality based on the action of one government or even natural disasters.

Joe Barnes comments on an oil embargo.

My opinion the price is really, really high right now. I don't see why they would even want to consider it. I mean an embargo is, that they would simply withhold, I presume they would withhold oil. Now, I don't know how you would do an embargo in a world of spot markets because you would do an embargo in a specific country. I guess you would have to embargo the whole world market. So don't see how an embargo would work in today's market. (Barnes, 2006)

It appears the most serious risk is that demand surges ahead of supply shortages. This time around there is nothing artificial about the shortages. The problem is trying to get more oil out of very old fields and in the case of foreign oil there seems to be a lack of technology to help in the recovery.

Question 2. Should international institutions be called upon to coordinate strategies in response to a variety of future global energy problems?

The approach would be to have a body of responsible and knowledgeable individuals to come together and address the issue of energy. The roll of economics would play a major part in how a world organization would address the issue of energy. To cite Eddie Habibi, “Today the economics of the world survive on the business of energy. If you look at the U.S. and look at the impact the energy/oil has on our business economy. It is everywhere beyond transportation. It is in consumable goods. Everything we use comes from fossil fuels. Plastic bags, the cup you drink your coffee, suits, and running shorts. Fossil energy affects our quality of life.” (Habibi, 2006)

Quality of life and significant advancements in the 20th century were created by ‘modern energy’. The great energy milestones have been.

- Big oil era began in 1901
- Electricity replaced coal, gas and kerosene generated light
- Internal combustion engine created cars
- Middle East oil created “cheap oil forever”
- Atomic energy created “free” electricity
- Piping natural gas created miracle of energy heat (Simmons, 2006)

There is some hope G-8 nations will be looking into the subject of the supply of oil. Last year at the meeting in St. Petersburg energy was supposed to be a priority. The bombing in London shifted the focus away from the subject of oil. “Energy and famine in Africa seem to be the two big issues the G-8 thinks about. China and India are being encouraged to have a strategic reserve. But I have never seen the UN do anything. I

think this is a global issue and that it is in the best interest that a global strategic plan be established.” (Cook, 2006)

Yeah! I mean the big one is the IEA, and that’s the one that there’s a coordination of stock piling and stuff like that. They’re based out of Indiana. It’s “International Energy Administration”, and there’s some coordination, they produce a lot of materials and data and there is coordination. The problem is that it does not include yet some major importing countries. It’s traditionally members of the IEA traditionally members of the OECD, they are the rich people. Richest country club . .

I would say we have a functioning vital institution for that we just need to make sure that you get countries like China into it, which they are not right now. (Barnes, 2006)

Let’s get back to the quality of life concerns. As previously cited fossil energy enhance our quality of life. Medical equipment, fiber optics, the cell phone all enhancements resulted from chemistry and fossil fuel. In my opinion unlike that of President Bush we do not have an evil addiction. The hydrocarbon industry is an essential ingredient that drives our economy. If costs continue to increase in energy cost look for the consumer to do less traveling, fewer people on airplanes, which means fewer people renting rooms and cars. Look for those people who rented the cars and rooms to us, the ticket agents, the flight attends not to have their jobs. In other words look for the economy to slow down. “Fossil fuels are essential to the economics of the world but for the comfort and quality of life we have created for ourselves.” (Habibi, 2006)

Have we been irresponsible in the use of fossil fuels? Probably so. Fossil fuels which were created in millions of years are now being used by a few generations at a very rapid pace. The question, which I addressed at the beginning, are we running out of oil and I will address this throughout the paper. Yes we are running out of oil. To cite one of the experts of this study, we are running out of oil. I’m not a Green Party guy either. Now we may run out in the next 500 years, but is that the responsible thing to do?

Even if it is the next 500 years it is that being responsible? Our attitude towards fossil fuel is no different to Bill Gates son blowing the Gates' wealth in two days. It is irresponsible. (Habibi, 2006)

Throughout 90% of 20th Century modern energy was virtually free. This was the energy miracle.

- Explosion in use of vehicles, trains, and planes
- Electrical appliances evolve into Silicon Valley
- “Suburbia” created cheaper and bigger homes
- The 20th century miracle primarily occurred in North America, Europe, and Japan
- By the end of century the miracle globalize us (Simmons, 2006)

Where does this leave us and our friends on the Earth? Technology, is part of the answer. With technology we must look at alternative resources. Solar, and wind are ideas. There still needs to be more work done in the areas of new or improving alternative methods of fuel.

I asked the question if the policies of OPEC nations and their stability if they would be able to attract technology?

This is a big problem that they have and it may have a huge impact on world production in the future. While these countries are extremely hesitant to bring in foreign countries in a big way, while in terms of foreign companies are not acceptable. That's one of the cheap ways to technology transfer, that's one of the cheap ways to get a capital. My answer is that a lot of these countries are not doing a very good job, and that means there'll be less production down the line. The worse case is probably Venezuela, where they made a conscious decision. Chavez and Rodriguez made a conscious decision that they will forgo huge amounts of investment and go for higher energy prices and they succeeded. The gamble has worked so far. Will this pay off in the future? I don't think so! (Barnes, 2006)

Among those of us in the West, conservation, mass transportation could also be an answer but it is my opinion (as I see larger and larger SUV's) that conservation is not part of our mind-set.

Question 3. How does the US and the world prepare for a greater production of non-OPEC petroleum?

Before addressing this question let's look at some historical information, which will help set the stage for today. In the 1960's exploration had discovered new frontiers and cheap energy seemly was "here to stay".

- Last giant Middle East oil field 1964 – 68
- Western Siberian oil and gas 1963 – 68
- Alaska North Slope 1967 – 68
- The North Sea 1969

The 1970's

- Oil in the United States peak
- Three Mile Island brought atomic energy to a halt
- Oil shock in 1979 creates gas lines again

The 1980's

In 1981 the drilling boom had peaked and in 1982 the rig collapse began. By 1990 most oil and gas players were out of business and the US rig count had declined by almost 90 percent.

Between 1995 and 2005 technology revolution created a cheap era for oil and gas, and technology recovered more existing reserves and found easy ways to tap new oil and gas.

Between 2000 – 2005 exploration success grew dismal and the cost to develop increased 2 to 5 fold. During this period demand for oil grew in China, and US prosperity sent energy use to record highs. (Simmons, 2006)

It appears while there is a need for non-OPEC petroleum the Western World along with countries like China and India will still depend on OPEC petroleum. We must remember that the United States consumes one quarter of the world's oil. In the United States there seems to be oil coming out of the Rocky Mountain areas along with the deep waters of the Gulf of Mexico. In Nigeria as well as in Angola there is oil offshore. Offshore West Africa and the Caspian Basin also present opportunities, but their output does not meet the growing need. The next question is how willing are there public U.S. companies willing to risk investing in these countries. Kidnappings if you read the newspapers are as popular as watching the Yankees and Red Sox play baseball. Capital investment in these countries is a risk. If you are Exxon/Mobil and making \$1,000 per second should you be investing in these countries?

Non-OPEC oil has limited choices. We must remember that even some non-OPEC countries are located in the Middle East and there is the stability issue. What roles will the United Arab Emirates (UAE), Qatar, Indonesia play in the supply of petroleum? Canada has tar sands and can help in the production of oil. However, refining tar sand oil is high a cost to process. Still tar sands are another alternative.

I am not a scientist and whether the technologies exist to produce plug-in hybrid vehicles, flexible fuel vehicles which would run on alcohol generated from coal reserves, agricultural, industrial and municipal waste, or a mixture of gasoline and alcohol I just do not know. Are these alternative sources a good idea? Perhaps? The question is how do we fund research for these projects, when do we start and who specially pays for this research. One thousand dollars a second. Maybe Exxon/Mobil could be a source for this funding.

Let's end this section with the following comments.

- ❖ Conservation must play some role in answering question three.
- ❖ Will the next generation of fuels provides us the quality of life we want, the vehicles and the general transportation, which we have become a custom to?
- ❖ Buying less Saudi oil means sending less money to this government. A government, which in the past decades is giving large amounts of its oil revenue to mosques, and other institutions that, have ties to Islamic radicalism.
- ❖ The Saudis are the central bank of oil releasing supply to the world market when it was needed they withdrew supply to keep prices from going lower that the cartel would have liked.
- ❖ Warfare plaguing the Iraqi capital is home to large communities of Sunnis, Shiites and Kurds.
- ❖ So whom do you believe? Sheik Ahmed Azki Yamani, Saudi oil minister during the 1970's, answer the question if we are running out of oil "The Stone Age did not end for lack of stone and the oil age will end long before the world runs out of oil."
(Maass, 2005)

- ❖ Is there cheating when it comes to reporting oil reserves? You may recall that in 2002 a public traded company; Royal Dutch Shell admitted that it had overstated its reserves by 23 percent. This is a public traded company, that undergoes regular audits.
- ❖ If demand and depletion patterns continue every year the world will need to open enough fields or wells to pump an additional six to eight million barrels a day. At least two million new barrels a day are necessary to meet the rising demand and at least four million to compensate for the declining production of existing fields. That's like a whole new Saudi Arabia every couple of years. It cannot be done indefinitely. It's not sustainable. (Maass, 2005)

Other concerns as the world prepares for Non-OPEC oil include the following.

- There is no proof to OPEC's surge in Paper Barrel Reserves.
- Oil producing countries have irreversible declines in their reserves.
- Non-OPEC supplies are approaching peak production.
- Why is Non-OPEC in decline? Giant old fields are scarce and old. Most new fields are small and have peaked and declining fast.
- Russian fields are expecting to decline soon as well.
- 95 % of the world's proven oil and gas reserves are "un-audited."
- Once Middle East oil peaks, world oil has peaked.
- Kuwait, Iraq, Iran, Oman, Yemen, Syria, and Jordan have already peaked.
- UAE and Qatar are too small to matter.
- Saudi Arabia is all that matters. Can Saudi Arabia grow to 15 – 25 million barrels per day to help sustained demands?

Saudi Arabian Energy Facts

- Five old super giant oil fields have produced ~ 90% of its oil
- Three other giant fields make up most of the balance
- All of their producing fields are mature, have depleted their highest quality oil and face serious water maintenance and corrosion problems.
- 35 years of intense exploration found little new oil (Simmons, 2006)

Are we in denial that we may be running out of oil?

Question 4. I spoke of the original 5 OPEC countries; in most cases these governments have not been stable. There appears to be issues with the stability of this part of the world. However, it is predicted that in the year 2030 51% of the world's supply of oil will come from OPEC. Should this be a concern?

Question 5 was not a question but this statement "Saudi stability. 9/11 and Saudi." It seems the responses to these two questions evolved into information which somewhat overlapped. Here are the responses to these questions.

The greatest blessing is your greatest weakness. In every single county if you have a lot of oil you are going to have some national groups trying to make grabs at it. Like what happen in Nigeria in the Niger Delta. You are going to have radical groups. They want independence. Saudi Arabia has no taxes because they do not need taxes. In America we had the saying of 'No taxes without representation.' Well guess what? Saudi Arabia has no representative government. The wealth of the Saudi Arabia is limited to the King and his family. Saudi Arabia is a kingdom with high male unemployment. There are reports that half of the population is under 25 and this group of young people is unemployed or under employed. This group is prime for the picking to join radical groups. This group who is kept uneducated, they are poor and you see all this wealth leaving their country and they feel they are due more internally. There will be turmoil. (Cook, 2006)

Saudi Arabia is not the only country where unrest exists among its young people but many of the OPEC nations have high unemployment rates. The younger population in Saudi, the non-kingdom the non-royal family are they a concern?

It is a concern; it's a very non-transparent society. I lived there years ago. It's a very difficult society to get a grip of. I think there's a serious discontent. There is a huge amount of unemployment and underemployment among men (young men) in particular. I think that is a big problem; I think there is risk of instability in the future. I don't think it's going to be in the form of some sort of Taliban regime taking over. I think that the most likely way they'll be a change in government is that Saudi Arabia will be some sort of fighting among the royal family, maybe to go to a prince less pro America. What they have we'll take. Any new government would be less pro-American. In other words the government of Saudi Arabia is significantly more pro American for whatever its worth than the population. Any pre elected government will be less pro American than the current policy. (Barnes, 2006)

This observation of the Saudi oil, wealth and political implications can be summarized with this information.

For the Saudi, the political ramifications of reduced demand for its oil would not be negligible. The royal family has amassed vast personal wealth from the country's oil revenues. If suddenly, Saudis became aware that the royal family had also failed to protect the value of the country's treasured resource, the response could be severe. The mere admission that Saudi reserves are not as impressively inexhaustible as the royal family has claimed could lead to hard questions about why the country and the world have been misled. (Maass, 2005)

Bin Laden has said "the fair price of oil is \$150 a barrel." Experts for a number of years have been saying that al Qaida has wanted to depose the government of Saudi Arabia. "I got an e-mail that said if you don't use much oil you won't be giving money to governments like Saudi Arabia who give money to radical groups who attack our interest." (Cook, 2006)

For a number of reasons Saudi Arabia becomes a political hot potato. One of the experts interviewed felt that President Bush failed in his State of the Union in addressing the oil use and the price of gasoline. This person felt that President Bush should have said it was our patriotic duty to stop using foreign oil. That would probably mean more gasoline taxes, luxury taxes if you drive an SUV. Mr. Habibi's opinion about the potential situation in Saudi Arabia is well taken.

You keep pressure long enough on a pot and something will have to give. In a refinery we have lots of pressure vessels but what you have on those are pressure release valves. We have alarms to warn you when it's gone too high and you take corrective action. We have had those alarms over the years in Saudi Arabia. But we didn't hear them. And why didn't we hear them? It is irresponsibility. The government knew about them, I knew about them. Why didn't the people in DC not know about them? How could the American Ambassador in Saudi not know about them? (Habibi, 2006)

Joe Barnes from the Rice University comments on Saudi Arabia and its stability:

I think it's been pretty stabled so far. One of the reasons we intended to have so call special relationship. I do not think this special relationship is for all source of reasons: One we overlook at the end of cold war when Saudi's regimes ferociously anti-communist so that's fine, which is gone away. The Saudis still would like to play the role of swing supplier and give more influence to the world that they would otherwise have, and the Saudis still because of their geology, and because of the nature of their fields, the Saudis often being considered will be price moderates, really because they have lots, and lots of oil. The price moderates are the people that have a lot of oil and what they want to do is avoid driving prices too high so that alternate forms shall come into currency and make that 35th year of oil production worthless. It's not true for countries like Indonesia, just pop it, pop it, because they don't have a lot. I don't think that Saudis want the current price, I think they think is too high. They can't do anything about because they don't have access capacity. (Barnes, 2006)

So I think as far as the United States would like to have more moderated oil prices there still some areas for United States and Saudi Arabia to cooperate.

Barnes comments further on Saudi Arabia:

Once again the relationship post 9/11, the Iraq war has changed the equation. The Saudis opposed the war and they feel it may need to release some conflict and they may be right. They are certainly glad to get rid of U.S. military presence; they got rid of most of it. The government of Iraq, Sadden Hussein is no longer a real threat. They are really concern because the big strategic winner so far in Iraq, so far is Iran, and the Saudis they must be looking with alarm at what's happening in Iraq today. So the relationship is troubled. (Barnes, 2006)

New York Times columnist and three time Pulitzer Prize winner Thomas Friedman writes that U.S. oil consumption has us supporting our enemies.

Friends, we are in the midst of an energy crisis, but this is not your grandfather's energy crisis. No, this is something so much bigger, for four reasons. First, we are in a war against a radical, violent stream of Islam that is fueled and funded by our own energy purchases. Second, the world has gotten flat and 3 billion new players from India, China and former Soviet Union just walked onto the field with their version of the American dream, a house, a car, a toaster and refrigerator. Third, because of the above, green energy saving technologies and designs for car, planes, homes, appliances, or office building will be one of the biggest industries in the 21st century. Tell your kids. Finally, if we continue to depend on oil, we are going to undermine the whole democratic trend that was unleashed by the fall of the Berlin Wall. Because oil will remain at \$60 a barrel and will fuel the worst regimes in the world, like Iran and will do the worst things for the world. (Friedman, 2006)

While a great deal was written about Saudi Arabia what about Iran? Iran has been in the world news with their efforts to build a nuclear program. Five major world powers and the United States are trying to provide “far-reaching proposals” that would bring “significant benefits” to Iran if they will stop its nuclear development. (Brinkhuis, 2006)

Question 6. The entire infrastructure of energy supply that supports both America's and the global economy – offshore platforms, pipelines, tanker refineries storage, generating facilities, transmission lines and distributions systems. This vast network was not designed with terrorism in mind. How does business and government create a system to protect us from terrorism?

As stated in this question the entire infrastructure of energy supply was built without terrorism in mind. This infrastructure includes pipelines, platforms, tankers, storage, generating facilities and distribution systems. Most of the experts expressed their concerns about the infrastructure system but only one spoke of the problem of terrorism and cyber infrastructure system mostly about competitive advantage and not about terrorism. While there have been incidents of terrorism in the world, no incidents have occurred in the U.S.

There is no question that security is a serious issue and the United States is vulnerable. Before reviewing the issues of infrastructure systems let's review the observations of one expert and his view on security and information technology/cyber security.

“Cyber security is an area that we are still learning about. Our company is in that business. If you were to put yourself in the shoes of a terrorist and take someone like Timothy McVay you go rent yourself a van/truck and fill it with ammonia and gasoline and you would park in front of a cat cracking unit. You walk away and use a remote control to blow it up. I don't know the impact of explosive but if it is like the Oklahoma City bombing you blow up a refinery from a couple of miles away. Without Cyber Security you can get into that plant, block the pressure valves and cause failures without have walked out of your apartment. With cyber security is a big and serious issue that something needs to be done something about. Cyber security is a greater risk than some nut going out and trying to blow up a bomb somewhere. (Habibi, 2006)

Home Land Security is helping and industry leaders appear to have made efforts to help with the security issue. Physical plants are probably the most secure from terrorist attack. Off shore platforms are somewhat secure as well. It is difficult to sneak up on a off shore platform. Also helping is the Coast Guard. Pipelines are more difficult to secure. In the US we have hundreds of miles of pipeline and it is impossible to secure.

Energy security must be done globally. It is not just a police force. There is not a police force big enough. It has more to do with Chavez in Venezuela, with Morales in Bolivia, the Niger Delta, and processing plants. What about the pipelines, the Houston ship channel, where does the list stop?

Not too surprising some security problems exist overseas. There have been documented suicide bomber attacks on refineries in Iraq and Saudi Arabia.

“The problem of not having a cushion of access capacity. And now the whole world is using oil. If security is not done globally, you are going to have a false sense of security.” (Simmons, 2006)

Become knowledgeable about the Strait of Malacca. The Strait of Malacca is located between Sumatra and the Malay Peninsula. It links the Indian Ocean with the South China Sea and is one of the world’s most important sea passages. From an economic and strategic perspective it is as important as the Suez Canal and the Panama Canal. The Strait links India, Indonesia and China. The Strait carries 50,000 vessels per year. A quarter of all oil shipments carried by sea come through the Strait. It is expected to ship more oil because of increased consumption rises in China. Piracy attacks have become a problem for the Strait and it is a thought to be a target for terrorism.

Terrorism rests on the possibility that a large ship could be pirated and sunk at a shallow point in the Strait. The Strait is shallow and ships have to wait for the tide to go out to sea. A successful attack on a ship would effectively block the Strait. This would have a divesting effect on world trade.

Conclusion

If we run out of oil then what? The United States is counting on the Saudis to keep out supply of oil coming. Is this possible? Remember Saudi is our friend and they posses 22 percent of the world's oil reserves.” (Maass, 2005) There is oil in Saudi Arabia and the oil will last for a while. The technology is present (however at least one expert interviewed for this study feels that new technology is not getting to this and other oil producing countries) to get oil extracted from the deserts into their refineries and finally into our SUV's. Please remember I wrote earlier about the 1973 oil embargo when OPEC created an artificial shortage, today according to many experts the shortage or soon to be shortage is real. Picture more unrest in the world of OPEC or non-OPEC countries, and you will continue to see high prices for a barrel of oil. A worst picture would be a deadly terrorist strike that could effect the production of oil.

Stated clearly is the concern for the world's supply of oil. “The producers are not running out of oil, not yet, but their decades-old reservoirs are not as full and geologically spray as they used to be, and they may be incapable of producing, on a daily basis, the increasing volumes of oil that the world requires. ‘One thing is clear’, warns Chevron, the second-largest American oil company, in a series of new advertisements, ‘the era of easy oil is over.’ (Maass, 2005)

General comment is that anytime consumption exceeds production you are going to see the price of a barrel of oil increase. What will be the final price?

Let's make one thing perfectly clear. Saudi Arabia is the world's largest producer of oil. It produces 263 billion barrels per year, which is twice as much as Iran, which is second. (Maass, 2006) How much is left in the oil fields of Saudi Arabia? As you recall Saudi Arabia is not a representative government. That means they do not have to share

information about what is left in their oil fields. Saudi oil minister Ali al-Naimi addressed the issue of Saudi reserve in a speech in Washington D.C. "I want to assure you here today that Saudi Arabia's reserves are plentiful and we stand ready to increase output as the market dictates. I am quite bullish on technology as a key to our energy future. Technological innovation will allow us to find and extract more oil around the world." (Maass, 2005) If this is an accurate statement then why keeps Saudi information regarding their production a secret to the outside world?

The point is not that we are running out of oil per se; although as much as half of the world's recoverable reserves are estimated to have been consumed, about a trillion barrels remain underground. Rather they are concerned with what is called capacity, which is the amount of oil that can be pumped to the surface on a daily basis. These experts still a minority in the oil world contend that because of the peculiarities of geology and the limits of modern technology it will soon be impossible for the world's reservoirs to surrender enough oil to meet daily demand. (Maass, 2006)

Matthew Simmons comments, "Then Saudi Arabian oil output will clearly have peaked. The death of this great king meaning Ghawar, leaves no field of vaguely comparable stature in the line of succession. Meaning twilight at Ghawar is fast approaching. Saudi Arabia clearly seems to be nearing or at its peak output and cannot materially grow its oil production." (Simmons, 2006) Matt Simmons has predicted that we will look back and comment that \$55 a barrel was cheap. He also predicts that a barrel of oil will hit triple digits and he is not suggesting low triple digits.

What helps in keeping oil prices up? There is a fear factor, a fear factor based on terrorism. Recall that bombers tried to attack a major oil processing plant in Saudi Arabia but failed. These bombers were linked to al-Qaida. In Nigeria rebels have affected the flow of almost 500,000 barrels of oil by attacking pipelines and export terminals. Again, there have been kidnappings of foreign oil workers in the Niger Delta.

Let's not stop in the Middle East as far as terrorism. Look at South America and the Anti-American dictators in Venezuela and Bolivia. These countries cannot be the best place for American public companies to invest their record setting earnings.

Supply disruptions in Nigeria, decreased production in Iraq; 5 percent loss because of hurricanes Katrina and Rita damage have added to the price of oil.

Why is the cost on oil so high? The short answer the demand is up and the supply is down. Why is the demand up? China is now second in the world in the consumption of oil. Add India to this variable and we now have two countries with populations eight times that of the United States. There has been a great deal of industrialization and this industrialization leads to huge amounts of energy being used.

These are the 21st century's most serious questions:

- Could the end to sustainable energy supply growth be nearing?
- How soon could "peak oil and gas" arrive?
- How long would peak stay at a plateau.
- How could supply then decline?
- Is peak oil more likely than peak natural gas?
- Impact of high prices kills demand and aids supply.
- Hard work, innovation and ingenuity solves energy problems.

Solutions

Conservation, and alternative fuels are probably at the top of list, followed by new technology, and increased spending in Research and Development as well as more capital spending by "Big Oil" at the refinery level and increased in drilling where it has been politically incorrect to drill. It has been reported that the Arctic Ocean may hold oil

reserves. “The entire Arctic rim is already one big exploration machine. I was nearly crucified for talking about this by some of the more politically environmentally friendly people out there. But is a fact.” (Brinkhuis, 2006)

Coal has been suggested as another alternative fuel. There appears to be enough coal reserves to last for at least two hundred years at the present rate of use. These reserves are probably greater than oil and natural gas reserves present in the United States. However, there are drawbacks, “Coal is one of the largest man-made sources of the gases responsible for global warming” (Romero, 2006). Not everyone is in agreement on the effects of coal and global warming. Two companies; American Electric and Peabody Energy are moving ahead in the clean and environmentally safe use of coal. Company executives with American Electric and Peabody Energy believe that their plants are better for the environment. Plans are being made to build plants in Ohio, West Virginia, Wyoming, which would add to their plants already in Illinois, and Kentucky. The knowledge of making gas from coal has been in existence for more than a century. Coal gasification plants are in operation in the United States, Spain and the Netherlands. Gasification plants are used to send carbon dioxide where it is injected into old oil fields to force more crude oil from the ground. Peabody appears to be a player in the coal industry. It was reported by the Center for Responsive Politics, an independent research group that tracks money in politics, that Peabody was the coal industry’s largest political contributor giving a reported \$641,059 in 2004 to Republicans.

The last suggestions would be those of Sadad al-Husseini, the former Aramco executive who suggested, “If we had two dozen Texas A&M’s producing a thousand new engineers a year and the industrial infrastructure in the Kingdom with the drilling rigs and

power plants, we would have a better chance, but you can not put that into place overnight.” (Maass, 2005)

My final comments are those of a graduate of Texas A&M Lynn Cook, “Finding oil in the desert, much like finding oil in Texas isn’t as easy as it used to be.” (Cook, 2006).

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