Oil Independence

We can achieve oil independence if we have the will to accept change and compromises. Even though China and India are consuming more oil, what we do will affect the world oil markets because the United States still consumes 24.8% of the world's oil. As a major importer (60% of our oil), we are funneling large sums of money into unstable and unfriendly countries. The result is that the United States has become an enabler of the violence in the Middle East, not by its action in Iraq and Afghanistan, but from the oil revenues that support despotic and extremist regimes.

Country (Top ten)	World Oil Usage (%)
United States	24.8
China	7.9
Japan	6.9
Russia	3.5
India	2.9
Canada	2.7
South Korea	2.7
France	2.6
Italy	2.3
Mexico	2.2

Through our oil imports, we are now funding the same countries that are determined to destroy us. We are spending billions of dollars and American lives in Iraq and Afghanistan to assure a stable world oil supply and to prevent radical Islamists from obtaining weapons of mass destruction. Wouldn't it be better to deny these organizations and countries the funds to pursue their radical ambitions? It can be done but not overnight without causing a major disruption within our economy. If we had started in 1970 with the Arab embargo, we would have been oil independent by now. We do not need to eliminate all imports. What we need to do is reduce out dependence just enough to eliminate having to import from unfriendly countries or areas of the world.

October 2006 Import Highlights: Released on December 14, 2006 (Energy Information Administration) Preliminary monthly data on the origins of crude oil imports in October 2006 has been released and it shows that two countries have each exported more than 1.4 million barrels per day to the United States. Including those countries, a total of five countries exported over 1.0 million barrels per day of crude oil to the United States (see table below). The top five exporting countries accounted for 66 percent of United States crude oil imports in October while the top ten sources accounted for approximately 86 percent of all U.S. crude oil imports. The top sources of US crude oil imports for October were Canada (1.704 million barrels per day), Mexico (1.481 million barrels per day), Saudi Arabia (1.322 million barrels per day), Venezuela (1.125 million barrels per day), and Nigeria (1.049 million barrels per day). The rest of the top ten sources, in order, were Angola (0.506 million barrels per day), Iraq (0.505 million barrels per day), Algeria (0.449 million barrels per day), Ecuador (0.315 million barrels per day), and Kuwait (0.234 million barrels per day). Total crude oil imports averaged 10.132 million barrels per day in October, which is a decrease of 0.571 million barrels per day from September 2006.

Canada remained the largest exporter of total petroleum products in October, exporting 2.145 million barrels per day to the United States. The second largest exporter of total petroleum products was Mexico once again (1.646 million barrels per day) which was a slight increase from last month of 0.077 million barrels per day.

Crude Oil Imports (Top 15 Countries) (Thousand Barrels per Day)					
Country	**Oct-06**	**Sep-06**	**YTD 2006**	**Oct-05**	**Jan - Oct 2005**
CANADA	1,704	1,747	1,750	1,516	1,594
MEXICO	1,481	1,441	1,621	1,463	1,531
SAUDI ARABIA	1,322	1,546	1,414	1,204	1,463
VENEZUELA	1,125	1,129	1,153	911	1,270
NIGERIA	1,049	966	1,059	1,103	1,058
ANGOLA	506	648	503	501	438
IRAQ	505	655	565	563	537
ALGERIA	449	453	361	216	226
ECUADOR	315	319	277	273	271
KUWAIT	234	227	173	271	218
BRAZIL	171	99	131	79	91
COLOMBIA	131	170	158	111	146
OMAN	129	48	44	38	23
NORWAY	120	76	99	145	126
CHAD	109	126	91	97	82

Total Imports of Petroleum (Top 15 Countries) (Thousand Barrels per Day)					
Country	**Oct-06**	**Sep-06**	**YTD 2006**	**Oct-05**	**Jan - Oct 2005**
CANADA	2,145	2,262	2,262	2,109	2,134
MEXICO	1,646	1,569	1,746	1,589	1,637
SAUDI ARABIA	1,382	1,564	1,456	1,351	1,560
VENEZUELA	1,354	1,384	1,436	1,255	1,556
NIGERIA	1,088	1,078	1,139	1,203	1,149
ALGERIA	810	796	666	496	484
ANGOLA	536	678	526	566	456
IRAQ	505	655	565	577	542
RUSSIA	361	534	382	435	443
VIRGIN ISLANDS	335	396	324	413	329
ECUADOR	322	326	284	275	279
KUWAIT	234	227	177	330	234
BRAZIL	207	191	195	192	147
UNITED KINGDOM	205	239	276	455	401
NORWAY	165	159	198	308	239

The approach to oil independence
The approach to oil independence is a three step program, with near term projects, those that can be implemented now with today's technology, midterm projects, those that will come online within ten years and long term projects, those that have the potential in twenty to thirty years. There is no single silver bullet to solve this problem. Multiple approaches are required. This includes more domestic drilling, greater vehicle fuel efficiency and alternate fuels.

Near Term
Two vehicle power technologies that exist today can start us on the path to energy independence. They are the hybrid and the clean diesel engine. The problem with these technologies is that they cost more than the conventional gas engine or require special fuels. This is where government can provide incentives to make the transition. Government should provide an energy credit of $3,000 for all vehicles that get 35 miles per gallon or better (town and road) and require the buyers of cars that get less than 35 miles per gallon to buy an energy credit of $3,000. Those that get less than 20 miles per gallon must buy a $6,000 credit.

Another approach is to provide all operating and properly registered cars with a gas credit card that will allow the owner to purchase a fixed amount of gas at market rates, equivalent to the average yearly mileage (15,000) at 35 miles per gallon (450 gallons). Additional credits can be purchased for a premium fee.

Implementing one or both of these approaches will encourage conservation and the move to higher mileage vehicles while at the same time allow those who require the larger vehicles to continue to drive.

One barrel of oil is 42 gallons which will yield 19.5 gallons of gasoline. In 2005 the U.S. used 360 million gallons of gas per day at an average mileage for all vehicles of 19.8 miles per gallon (18.5 million barrels of oil per day). In 2006 the growth of gasoline usage was 1%. Therefore the total usage today is about 18.7 million barrels of oil per day. If we were to improve our mileage to say 30 miles per gallon or a 51% improvement, we would save 9.7 million barrels of oil per day. This would eliminate our total requirement to import oil from the Middle East and unfriendly countries like Venezuela. At $130 a barrel for oil we would lower our balance of payments by $1.3 billion dollars per day or $65.6 billion for the year.

The use of biodiesel is another way of reducing oil usage in the near term. Biodiesel is a domestically produced, renewable fuel that can be manufactured from vegetable oils, animal fats, or recycled restaurant greases. Biodiesel is safe, biodegradable, and lowers serious air pollutants such as particulates, carbon monoxide, hydrocarbons, and air toxics. Blends of 20% biodiesel with 80% petroleum diesel (B20) can generally be used in unmodified diesel engines. With the rising costs of diesel fuel in 2005, the cost of biodiesel blends is comparable to No. 2 diesel.

Biodiesel has an energy content that is about 10% less than diesel No. 2 and about the same as diesel No. 1. In theory, adding biodiesel to diesel No. 2 should slightly reduce fuel economy, power, and torque. In reality, low-level blends are practically indistinguishable from conventional diesel.

One barrel of oil produces seven gallons of diesel fuel. The U.S. produces about 3.3 million barrels of low sulfur diesel fuel a day or 138.6 million gallons. This equates to 20 million barrels of oil per day. Switching to biodiesel would save 4 million barrels of oil per day.

Mid term

Half the automotive fuel in the United States could be replaced with ethanol by reformulating gasoline with ethanol derived from inexpensive farm wastes such as corn stems, cobs and leaves. Unfortunately, this process is too expensive at the present time. The present use of ethanol is derived from renewable agricultural crops such as corn or other grown grains (E-85, a blend of 85% denatured ethanol and 15% gasoline-like hydrocarbon primer). Ethanol presents three problems. The first is cost, the second is distribution and the third is energy content. Ethanol is corrosive to the pipelines that distribute fuel throughout the nation. Ethanol has just 60% of the energy content of gasoline resulting in lower mileage. The only way to make this a viable alternative in the near term is with government support to make it cost competitive with gasoline. There is also the social issue of trading food for fuel. The cost issue can be minimized by not having to pay farmers not to grow crops and use their excess production as fuel. Also there is the reduced military cost of not having to assure an open supply of oil (Iraq and Afghanistan).

No matter what approach we take, we will always need a secure source of oil. To that end we need to recognize the need to continue to drill for oil within the continental United States. This means the National Wild Life Reserve, domestic public lands and off shore sites on both coasts. This does not mean we throw out the environmental concerns, but recognize the tradeoffs needed to deal with the Middle East today. Because of the high costs and time involved, it will take many years to bring new sources of oil online.

U. S. oil production peaked in 1970 at 11.3 million barrels per day. In 2005 it was down to 5.2 million barrels per day. This downward slope guaranties that we will be more dependent on imported oil in the future. Government energy policy that makes available access to public lands for oil exploration and drilling could make a difference.

Shale oil and coal are another source of auto and diesel fuels. We have enough coal to last us 250 years. The technology exists to convert these resources into fuel for not only transportation but for the generation of electricity. The problems are cost and the environmental impacts.

The processing steps that convert coal into gasoline, diesel and aviation fuel are several with potential environmental burdens real. The technology is known, having been developed 80 years ago in Germany. The process was not economical as long as oil cost less than $35 a barrel. Today, crude oil is hitting more than double that price and coal conversion now become economically feasible. Montana alone has 120 billion tons of coal to produce fuels. This could yield 180 billion barrels of SynFuels. South Africa depends entirely on Synfuel and is energy independent.

Oil shale is a general term applied to a group of rocks rich enough in organic material (called kerogen) to yield petroleum upon distillation. The kerogen in oil shale can be converted to oil through the chemical process of pyrolysis. During pyrolysis the oil shale is heated to 445-500 °C in the absence of air and the kerogen is converted to oil and separated out in a process called "retorting". The United States has 1.0-1.2 trillion barrels of shale oil in the Rocky Mountain area.

If a technology can be developed to economically recover oil from oil shale, the potential is enormous. There are two conventional approaches to oil shale processing. In one, the shale is fractured in-situ and heated to obtain gases and liquids which are recovered from wells. The second is by mining, transporting, and heating the shale to about 450 degrees C, adding hydrogen to the resulting product, and disposing of and stabilizing the waste. Both processes use considerable water. The total energy and water requirements together with environmental costs have so far made production uneconomical until now.

Currently, the in-situ process is the most attractive proposition due to the reduction in standard surface environmental problems. However, in-situ processes does involve possible significant environmental costs to aquifers, especially since current in-situ methods may require ice-capping or some other form of barrier to restrict the flow of the newly gained oil into the groundwater aquifers.

Shell, in 2005, claimed that they could produce oil from shale using their in-situ process for an estimated $50 per barrel. If this is true why has Shell not acted and started production. There are two reasons, first, the federal government currently owns 72% of all known oil shale in the US and second, during the oil crisis of the seventies, people thought that oil supplies were peaking, expected oil prices to be around seventy dollars a barrel for some time to come, and invested huge amounts of money in refining oil shale, money that they lost. Because of the large sums that were lost in the past there is considerable reluctance to invest in oil shale at this time. Investors are waiting to see if oil prices really will remain this high.

To make shale oil conversion a reality, the federal government has to open public lands to the in-situ process (minimum environmental impact approach) and guarantee a floor price for the oil for say $50 a barrel for 30 years to assure investors a return on their investment.

Long Term

The holly grail of the future is to eliminate the internal combustion engine and convert to the hydrogen fuel cell as a power source. Hydrogen and fuel cells have the potential to solve several major challenges facing America today: dependence on petroleum imports, poor air quality, and greenhouse gas emissions. Unfortunately, an economically viable system is still twenty or thirty years away from reality. Yes, there are demonstration vehicles presently on the road.

Hydrogen can be produced using diverse, domestic resources including fossil fuels, such as natural gas and coal (with carbon sequestration); nuclear; and biomass and other renewable energy technologies, such as wind, solar, geothermal, and hydro-electric power. The overall challenge to hydrogen production is cost reduction.

Since hydrogen is not available in significant quantities in nature in pure form, the main present way of getting hydrogen is steam methane reforming, and this will probably remain the most economical way as long as methane (natural gas) is available cheaply and in large quantities, and hydrogen is required only in small quantities. With the price of methane going up because of scarcity, hydrogen in the future will be obtained by splitting water H_2O into hydrogen H_2 and oxygen O_2.

Assuming we are trying to limit our use of fossil fired power stations because of environmental issues; our only recourse is wind, hydroelectric and nuclear. Below is a table of the nation's energy generation by source for the year 2005. The renewable resource number is made up of wood, black liquor, other wood waste, municipal solid waste, landfill gas, sludge waste, tires, agriculture byproducts, other biomass, geothermal, solar thermal, photovoltaic energy, and wind. As you can see, doubling the renewable resource will not make much of a change. Hydroelectric power is already at its limit with many environmentalists pushing for rivers to be returned to their original state.

The only viable clean source of future energy is nuclear. Major advances in safety have been made in reactor design. The use of nuclear power is controversial because of the problem of storing radioactive waste for indefinite periods, the potential for possibly severe radioactive contamination by accident or sabotage, and the possibility that its use in some countries could lead to the proliferation of nuclear weapons.

Source	Percent of Total 2005
Coal	49.6
Petroleum Liquids	2.5
Petroleum Coke	0.6
Natural Gas	18.7
Other Gasses	0.4
Nuclear	19.3
Hydroelectric	6.6
Renewable Resources	2.3

For transportation, a key driver for hydrogen is that it must be cost-competitive with conventional fuels and technologies on a per-mile basis in order to succeed in the commercial marketplace.

Developing safe and reliable hydrogen storage technologies that meet performance and cost requirements are critical to achieving a future hydrogen economy. Hydrogen storage will be needed for both vehicular applications and for stationary power generation and for hydrogen delivery and refueling infrastructure. Vehicles will have to have the ability to carry enough hydrogen on-board to enable a driving range of greater than 300 miles.

Cost is a major consideration. In 2002, typical fuel cells had a catalyst content of $1000 per kW of electric power output. Ford recently unveiled a six-passenger fuel cell-powered Explorer that can travel 350 miles on a single tank of hydrogen fuel. The vehicle features a 60-kW fuel cell. This would translate into costing $60,000 just for the fuel cell alone. The goal is to drive the cost down to $30 per kW of electrical power output.

Summary

We have two choices facing us. We can stay the course and continue doing what we are doing, dealing with foreign entanglements (Iraq and Afghanistan). Being dependent on foreign countries that are not necessarily our friends, having our economy held hostage or we can make the changes necessary to become energy independent. If we choose to make the change do not think that OPEC will not react to protect their interests. Their first reaction will be to lower the price of oil to just below the cost of alternate fuels as they have done in the past. That is why it is important to provide a floor price on these alternate sources of energy. I am sure that there will be a human cry from the left about subsidies to the oil industry. Isn't it better to spend money on domestic energy support that benefits America than to send our money and troops to the Middle East?

Here is the ten step program to energy independence.

1. Institute an energy incentive program of $3,000 credit for new vehicles that achieve 35MPG or better. Require new vehicles to buy a $3,000 credit for under 35MPG and $6,000 below 20MPG
2. Institute a system to provide all operating and properly registered cars with a gas credit card that will allow the owner to purchase a fixed amount of gas at market rates, equivalent to the average yearly mileage (15,000) at 35 miles per gallon (450 gallons). Allowing additional credits to be purchased for a premium fee. A simpler alternative to this is to increase the price of gas to discourage consumption and provide the cash incentive to buy high mileage vehicles.

3. Adjust the price of biodiesel and gasohol (E85) to be competitive to oil based fuels through the tax structure.
4. Support the research for a cost effective approach to converting agricultural wastes, such as corn stems, cobs and leaves to ethanol.
5. Open public lands on and off shore to exploration and drilling for oil and gas. Develop shale oil.
6. Support the research into environmentally safe conversion of shale oil and coal conversion.
7. Provide price supports for alternate fuels.
8. Support the research in hydrogen fuel cells.
9. Support the development of the infrastructure necessary to support the alternate fuels.
10. Support the rapid expansion of nuclear energy.

If we do all of the above, in thirty years we could be energy independent.