

Quenching the Thirst for Foreign Oil

The United States consumes over 20 million barrels of oil each day, close to 70% of which is imported from outside our borders. Is President Bush's plan to reduce Middle Eastern oil by 75% in the next 20 years ambitious?

by Jim Leidel
OU Energy Manager
www.ouenergy.com



Since the US population will soon reach the 300 million mark, this equates to 24 barrels of oil consumed, per person, each and every year in our great country. Yes, that includes you... twwwenty-four barrels.

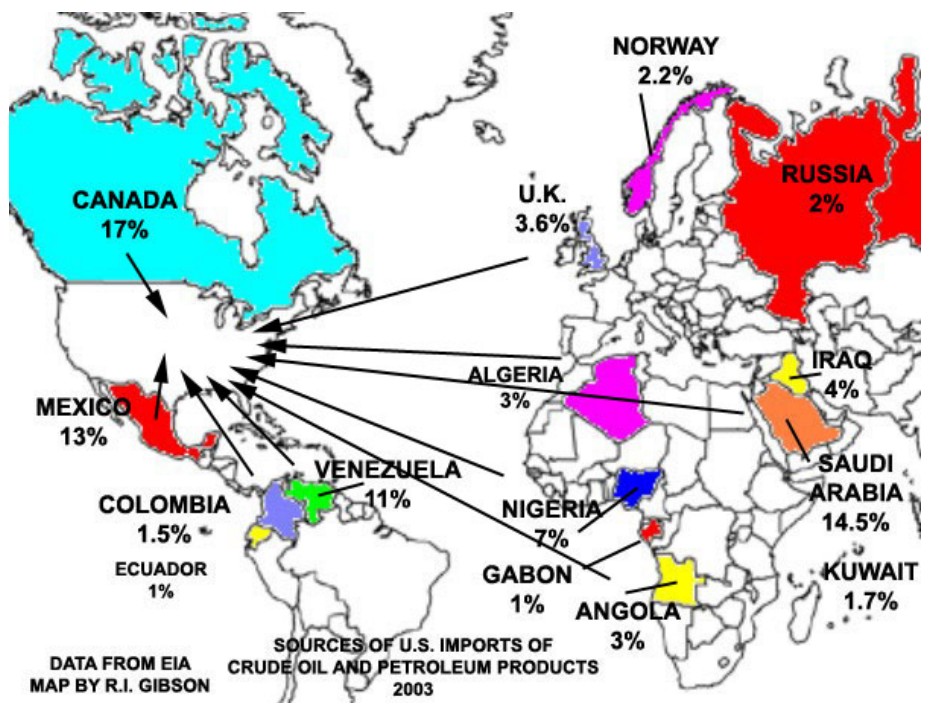
What is a barrel of oil, you might ask? Well, you might be able to visualize the typical 55 gallon metal drum. A barrel of oil is a touch smaller, at 42 gallons. Try placing 24 of these in your garage for safe keeping for your year's supply, or perhaps in your parent's garage. Now try putting in 24 of these for EACH member of your family. Get the picture yet?

Of each barrel of oil, around two thirds go toward the U.S. transportation sector. Yes, trains, planes, and automobiles. The interesting part about this story is that over 60%, or 12 million barrels per day (mb/day), of this supply must be trucked, shipped, or otherwise hauled into the good old U.S. of A. from other countries. Our closest neighbors to the north and south are two top suppliers, with Saudi Arabia and Venezuela, and Nigeria coming rounding out the top five. At the present price of \$60 per barrel, the volumes mentioned above equate to \$263 billion per year, paid to other countries for our imported oil.

Does this all seem a bit mind boggling? Beyond your control or your ability to change? Huge problems with energy and the environment loom larger than life, paralyzing the average Joe (or Jane) into apathy and inactivity.

For now, let's just ignore the huge energy induced issues we face with national security, climate change, pollution, acid rain, mercury laden fish, and let's look at this from another point of view.

What would it take to effect a serious change in just one aspect of our oil importation that causes many of us some concern during these past few years? If we look at the OPEC countries (minus Venezuela) which consist of Saudi Arabia, Iraq, Qatar, Kuwait, Libya, Indonesia, and the United Arab Emirates, they provide about 1/3 of our imports, or 4 mb/day. This is about 20% of the U.S. oil appetite.



Now let's look at how we burn this fuel. Our domestic transportation sector guzzles 2/3rds of the total 20 mb/day, and let's assume that perhaps 2/3rds of this sector consists of cars and trucks... This is close to 9 mb/day used by cars and trucks.

Are you still with me?

This means that to cut out the 4 mb/day of our imported OPEC supply through changes to the transportation sector, we have to reduce from 9 to 5 mb/day. Put another way, we need to reduce our fuel consumption by somewhere around 45%, using today's figures. How do we get there from here? I'm glad you asked.

First, let's all admit that economic forces run our country. The vast majority of our decisions are not based on the environmental impact of the anticipated act. So the most influential item on the agenda should be economic disincentives to consume. Whether it is from taxes, terrorists, or tornadoes, an increased fuel price WILL change behavior. The present fuel taxes are less than 50 cents per gallon. Let Mr. Bush cut income taxes, and jack up the fuel tax in its place. We could offer tax credits for the super efficient and for the less financially fortunate among us. (*the 2005 Energy Bill does include tax credits for hybrids & diesels*) Smaller cars, fewer miles driven, and more attention to fuel economy could easily produce a 15% reduction in fuel consumption, through changed behavior, both in the auto showroom and on the road.

Next, let's not forget the wealth of engineering horsepower tucked under the hood of our motor city that could be unleashed on the technical challenge of increasing fuel efficiency. Hybrid vehicles, clean diesels, and a host of fuel sipping concepts can be applied to conventional spark ignition engines. Variable valve timing, variable compression ratio, idle reduction, continuously variable transmissions, stratified charge, not to mention homogeneous charge compression ignition could all be brought to bear to increase fuel automotive economy. Let's aim low here, and just pencil in a measly 20% improvement from our techno gear-heads. As of today, if you want a hybrid or diesel powered automobile (not an SUV), unfortunately, you are not able to buy American.

Lastly, we are not bound by some unwritten law to burn petroleum in our cars. Henry Ford's Model T was a flex-fueled vehicle, capable of running on ethanol, or grain alcohol. His company researched grains, vegetables, and corn stalks to find the best source of this "inexhaustible" fuel source.

"There's simply no two ways about this fuel question. Gasoline is going – alcohol is coming. And we might as well get ready for it now. All the world is waiting for a substitute for gasoline." *Henry Ford, December 1916 from a Detroit News interview.*

Today, over a million American made cars are on the road today which were designed as flex-fuel capable to run on a blend of anywhere from zero to 85% ethanol (E85). Check the inside of your gas-cap! You may already be a proud owner. Gasahol, or 10% ethanol works wonderfully in any gasoline engine, improving your octane while burning cleaner. There is already one Michigan ethanol plant located in the thumb area, and four new plants have been announced for construction.

At the Paris world exposition in 1900, a diesel engine ran on peanut oil (or earth-nut oil). Biodiesel can be made from any vegetable oil whether its fresh US grown soybean oil, or waste fryer oil from the Oakland Center. A simple process is used to convert the veggio oil into a clean burning, biodegradable diesel substitute that can be blended in any percentage with petro-diesel and used in any, unmodified diesel engine. Personally, I make my own biodiesel from waste oil, and my VW Passat TDI just loves the stuff. In Michigan, several biodiesel plants are in various stages of planning or construction.

If we mandated a 10% ethanol or biodiesel blends in all US motor fuels today, it would be challenging to produce from conventional corn and soybean markets. However, with ingenuity and emerging technologies we could surely make this a reality.

Let's sum up our savings. A 15% savings from economic incentivized behavior modification, a technology induced savings of 20%, and a 10% bio-fuel component will displace or otherwise avoid the desired 4 mb/day of OPEC petroleum. I do not believe that any of the above scenarios are overly optimistic, nor impractical. All are easily within reach of a motivated and informed American population in just a few years, not twenty. Herein lays our problem.

I sincerely hope that I've got you thinking. To continue this thought process, please visit ouenergy.com. You can learn how to make your own biodiesel, perhaps see what other alternative technologies are available, or to otherwise lighten your ecological foot print.

Jim Leidel
Energy Manager & PhD Candidate
www.ouenergy.com