

Biodiesel -- a Solution?

There has been a fair bit of scuttlebutt in Vermont about biodiesel recently. Biodiesel is not a simple issue -- there are many pros and cons, as well as a few exciting new technological developments.

On the con side, biodiesel is seldom a renewable resource. This is because: 1) the farming methods used to grow biodiesel crops are not sustainable, 2) the processes for growing and processing the crops are heavily dependent on petroleum inputs, and 3) other ingredients used to make biodiesel are very energy intensive.

What's the soy link? In the U.S., for better and for worse, much of the development of biodiesel has come from the soybean industry. This is unfortunate for a number of reasons. To start with, most non-organic soybeans are now genetically engineered in order to make them resistant to (and the farmer dependent on) petroleum based herbicides & pesticides. In addition, soybeans yield less oil per acre than other crops, such as canola and sunflower.

Another big down side of biodiesel is that even if all available cropland in the U.S. were converted to growing biodiesel crops, it would still only satisfy half of our domestic needs for transportation fuels alone! This path would have the additional effect of mass starvation as food crops were converted to fuel crops. An article published in the U.K. *Guardian* describes the European Union's goal of increasing biodiesel use to 20% of total fuels by the year 2020. This will require the equivalent of using all of the United Kingdom's arable land. A more likely scenario is that food-producing areas of Africa will be used.

On the positive side of the biodiesel equation we have an urgent need for renewable fuels brought on by a number of looming monsters, namely global climate change and Peak Oil. Most people are familiar with global warming. The only scientists who discount it any more all seem to have links to big oil companies. The only new information is how much faster climate change is happening than anyone predicted, as evidenced by this fall's hurricane season and the melting polar ice caps.

'Peak Oil' is new territory for most people because it has not been discussed much in the major media. The concept was developed by a petroleum geologist names M. King Hubbert in the 1950's. He statistically analyzed domestic oil production and showed that it formed a bell curve when graphed over time. The big implication is that there is a 'peak' in the bell, after which production starts to decline, supplies dwindle, and an ever *increasing* amount of energy and money are needed to extract an ever *decreasing* amount of oil. After the peak oil production drops below demand and prices rise precipitously.

Hubbert's prediction for the U.S.'s domestic oil supply came true in 1972, coinciding with our first energy crisis. Students of his work have applied the Peak Oil theory to global oil production, and most serious predictions for the global peak fall between 2005 and 2015. Regardless of when the big peak occurs, life afterwards will be very different from life before it.

With these two monsters howling at the door, we all need to think very seriously about the choices we are making regarding lifestyle and energy consumption. Biofuels can be part of a transition to a sustainable energy economy. Commercial biodiesel requires one gallon of petroleum for the production of 3.2 gallons of biodiesel, on average, when all energy inputs are accounted for - fertilizers, processing, shipping, etc. Biodiesel can therefore diminish net petroleum use by two-thirds.

Another biofuel technology that is gaining prominence is the direct use of vegetable oil as fuels for car engines, tractors, building furnaces, boilers and the like. The process is to obtain waste vegetable oil (WVO), filter it, and heat it just prior to use. Other modifications may be required for the equipment but the fuel costs a lot less, is non-toxic, requires almost no petroleum inputs, does not contribute to global climate change, and smells like french fries when burned, or should I say freedom fries?

Other ways to beat back the monsters include bicycle commuting, buying local organic food, clotheslines, and retrofitting our buildings to be more energy efficient. We are feeding the monsters lavishly right now, and biodiesel may be one small piece of the puzzle to keep them at bay.

To build a truly sustainable biofuels industry in Vermont will require vision, tinkering, education, a lot of hard work and a healthy dose of Yankee skepticism.

Tad Montgomery is an Ecological Engineer in Brattleboro with 4-1/2 years of experience in biofuels. He is leading a workshop December 3rd that will teach how to convert cars and home furnaces to run on biofuels. Registration is at the Brattleboro Food Coop's front end desk.