

Washington Post

All Biofuels Are Not The Same

By Vinod Khosla

Monday, June 16, 2008; Page A19

Last month the Wall Street Journal accused me of advocating subsidies for food-based ethanol. I ought to "take a vow of embarrassed silence," it said, for claiming that ethanol's contribution to the food crisis is "overblown." The Journal's claims would be laughable if the stakes were not so high.

Cellulosic biofuels offer a chance to have an environmentally meaningful impact on petroleum use while benefiting farmers, entrepreneurs and consumers. I have many investments in biofuels companies. Some say I believe in biofuels because I have invested in them. The truth is that I invest in biofuels because I believe they can help our environment, economy and national security.

Just as the word "drug" can refer to aspirin or cocaine, "biofuel" refers to a variety of products that vary dramatically in their environmental impact and effects on food prices. For instance, biodiesel from food oils such as soybean or palm oil has traditionally created environmental negatives. But corn ethanol has been a stepping stone to cellulosic ethanol, a preferred alternative that is likely to achieve unsubsidized market competitiveness with oil within a few years.

We face an energy crisis, an environmental crisis and a terrorism crisis all related to oil. High-cost options to reduce consumption, such as hybrid and electric cars, sound good but are unlikely to materially reduce carbon emissions. To have a meaningful impact, at least half of the next billion cars manufactured on this planet must be low-carbon. The only cost-effective option (measured in cost per ton of carbon emissions avoided or grams of carbon emissions per mile driven) likely to achieve broad market acceptance in the next 20 years is cellulosic-fuel cars.

Unfortunately, biofuels are the target of interested parties' paid campaigns. The Grocery Manufacturers Association, for example, is waging a multimillion-dollar campaign against ethanol; the American Petroleum Institute is more concerned about food prices than oil prices. Slogans about how much corn and water are required to produce a gallon of ethanol are repeated frequently. In fact, a 16-ounce steak takes about the same amount of corn and more water. Should we ban steaks, too? Similarly, hybrid cars are hyped, but we seldom hear that they reduce carbon emissions about as much as corn ethanol, and at a cost that is substantially higher than flex-fuel cars.

Congress has required oil refiners and fuel blenders to use up to 36 billion gallons of renewable fuels produced in America annually. Critics fault this renewable fuels standard, but reducing it could be disastrous for energy security and the environment. It would be smarter to build into the standard flexibility related to the price and availability of cellulosic fuels. Sufficient biomass exists as waste from forestry operations alone to meet the cellulosic fuels mandate (21 billion gallons) in the 2007 energy bill. All 36 billion gallons could be produced, at prices approaching \$1 per gallon, within 10 years, if we include agricultural crop waste, municipal organic waste and sewage. By adding winter cover crops to about half of the land used for agriculture, land that sits idle during winter, we could replace most of our gasoline imports. By some agronomists' estimates, winter cover crops could produce 450 million tons of biomass a year within 10 years and more than 750 million tons by 2030. That by itself would be enough to replace much of our imported gas -- without an additional acre of land being used for biofuels production.

Rising food prices are of course a concern, but principally blaming ethanol production is illogical. "On the international level . . . only 3 percent of the more than 40 percent increase we have seen in world food prices this year is due to the increased demand on corn for ethanol," Agriculture Secretary Ed Schafer said last month. Oil prices affect the U.S. consumer price index for food two to three times as much as corn prices, the global analysis firm LECG has found. If biofuels were taken off the market, Merrill Lynch estimates, oil prices would climb 15 percent, putting further upward pressure on food prices.

For the urban poor, rising food prices are disastrous, but for the developing world's rural poor (about 67 percent of those who live on less than a dollar a day), food price increases can boost incomes as subsistence farms become

more economic. That's why developing countries such as India and Brazil have pressed to reduce Western food subsidies and increase food prices -- so their farmers can generate income. Cellulosic biofuels, because of biomass's potential for raising rural incomes, may be among the most valuable poverty alleviation tools we have for Africa.

The environmental effect of corn and cellulosic ethanol also depends on their source. If ethanol is produced on lands that displace food production into rain forests, its environmental effect will be negative. But continuing to burn coal and oil would be bad, too. A better option lies in national and international policies that create incentives for countries such as Brazil and Malaysia to preserve their rain forests through carbon credits while banning biofuels (and maybe all agricultural exports) from countries that do not meet rain forest deforestation reduction targets. Meanwhile, cellulosic ethanol production can reduce carbon emissions 75 percent while producing ethanol at a lower cost than corn ethanol and gasoline. To incentivize production of biofuels that are environmentally beneficial, I have suggested a carbon, land, air quality and water (CLAW) impact rating for all biofuels, much like the LEED environmental rating for homes.

If corn ethanol had not paved the way, and our renewable fuels standards did not exist, I would be far less inclined to invest in cellulosic ethanol. But if we reduce renewable fuel mandates, as some suggest, we are likely to reduce investment in next-generation cellulosic fuels instead of focusing on improving the quality of biofuels and reducing our oil dependence. As one of the larger investors in cellulosic and waste-based biofuels research, I should know.

All biofuels are not equal. Done right, cellulosic biofuels offer a scalable and economic way to reduce petroleum use and have a meaningful impact on the environment while benefiting farmers, entrepreneurs and consumers.

The writer is founder of the venture capital firm Khosla Ventures.

<http://www.washingtonpost.com/wp-dyn/content/article/2008/06/15/AR2008061501454.html>

Hawai'i BioEnergy (HBE) is a corporation established by three of Hawai'i's largest landowners: Kamehameha Schools, Grove Farm Company Inc., and Maui Land & Pineapple Company, Inc. Other partners include leaders from the venture capital community - Vinod Khosla (co-founder of Sun Microsystems), Pierre Omidyar (founder of eBay) and Finistere Ventures.