

Bioenergy Can Save Lives



At last month's *Advanced Biofuels Leadership Conferenc*, we were privileged to have 48 CEOs join us — I don't think more have ever been in one room at one time. We heard from Deputy Secretary of Agriculture Kathleen Merrigan — [nominated by TIME Magazine as one of the "100 Most Influential People in the World \[1\]"](#) — who gave us an overview of the USDA's vision for a continued revival of rural economies, improved energy security and reduced greenhouse gas emissions through the development of sustainable, advanced biofuels.

It is an important message — for biofuels will not succeed if they are not sustainable — economically, socially and for the environment — and we were delighted to have the Deputy Secretary share the USDA's vision.

Problems in the Fossil Oil Industry

In particular it is important that bioenergy becomes a catalyst for growth and change in developing economies. For we have known for some time that the future of the fossil oil-based economy is not a rosy one. The concept of peak oil has been around for some time — a mythical date after which oil production globally will reach a maximum and begin to fall. The U.S. government is beginning to discuss for the first time that such a maximum could be reached in the next two or three years.

If we have known for some time that the long-term outlook for fossil oils is tough, we have also had reminders that the near-term isn't much better. The explosion of an offshore oil platform in the Gulf of Mexico caused a tragic loss of life, and is resulting in a massive oil spill that is being compared to the Exxon Valdez disaster in terms of economic and environmental impact.

Oil shocks and oil disasters — long before the world runs out of oil it experiences shortages and disruptions— and shortages express themselves in price volatility as economies lurch from frantic competition for resources to fuel economic expansion.

Bioenergy Can Save Lives

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The competition results in a run up of prices, which is followed by the inevitable collapse of economies, ruined by the high price of energy.

Developing Nations are Most at Risk from Oil Shocks

Like low-lying coastal areas in times of flood, it is the developing economies that are most at risk from price volatility, and high oil prices, and the absence of stability. In developed nations, loss of economic stability is known to trigger recession and change of governments. In developing nations, the economic and political consequences can be far worse.

So we have good reason, on economic grounds alone, to look to biofuels to offset our dependence on fossil-based oils for our transportation fuels. But we have energy security to consider as well, and the global effort to reduce greenhouse gas emissions.

The Cost of Fossil Fuels in Military Expenditure and Soldier's Lives

With respect to energy security, consider this: it is estimated that ten percent of all U.S. military casualties come from the delivery of fuel. Even if it were true that none of the deployments of U.S. troops had anything to do with the protection of Middle Eastern oil fields and the sea lanes that connect the West to them — even if it were untrue that the cost of fuel in forward military areas reaches \$418 per gallon — the cost of delivering military fossil fuels is far too high in terms of human life.

The casualties are a direct outcome of the distance between oil fields and forward military areas. Biofuels have the potential to shorten supply lines, reduce costs, and save lives. Not to mention the reduction in the strategic value of certain bloody corridors the West feels obligated to defend, clear or secure.

So we have good reason, on energy security grounds, to explore the most effective ways to develop sustainable biofuels.

Food: the Product of Crops and Fuel

We have heard questions raised about fuel versus food, and it is proper that these questions have been raised. Let us not run away from them, or deny them, but listen to them, and respond.

We have heard concerns that the expansion of the biofuels industry in the Philippines would threaten the supply of cassava to food markets. Cassava, as we all know, is a vital staple food — not only in the Philippines but around the world.

But let us also remember that no one in the world eats raw cassava. Eaten raw, it forms a cyanide inside the body and causes severe sickness, and even death. It takes energy to turn cassava the crop into cassava the food. Plenty of energy. Food is what you have after you have applied energy to crops.

In many countries, energy is taken from forest biomass, converted into sticks to fuel

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a three-stone fire, and the forests are disappearing in Africa in ways that threaten more than long-term carbon counts. In Africa, wood collection is primarily the work of women and girls, and violence against women will increase when they have to roam farther from the village to find fuel for the cooking fire.

So let's not fall into the discussion of food versus fuel, because it is a false choice. We should instead be thinking in terms of food and fuel. They are interlinked in the village, and through fertilizers and tractor fuels, and through the global distribution system of food. We need both fuel crops and food crops, and badly, and now.

How Advances in Biofuels Benefit Good Sectors

Let me give you an example. At the Advanced Biofuels Leadership Conference, a company called Chromatin announced that they would deploy their gene-stacking technology towards the development of greatly enhanced yields for sorghum — a vital crop for both food and biofuels. The investment in Chromatin might never have happened without the potential of earning returns on the investment from both improvements in fuel as well as food. But the benefits will accrue not only in fuel production, but in food.

We recently heard about the use of camelina as a feedstock for aviation biofuels — with companies like United Airlines, American, Delta, British Airways, Lufthansa, and the FAA and Defense Energy Service Center joining us this week to detail their interest in new fuel sources. Wheat growers in the U.S. and Canadian plains are learning that camelina, used in rotation with wheat, can not only provide added income from the camelina crop, but can result in higher wheat yields for the food markets.

The Vital Importance of Increasing Farm Income

But there is more to the story than advanced technology. Biofuels are a means of improving rural incomes, and income per acre. Not only because of the higher yields that come from technology, but the higher yields that come from improved agricultural practices, the kind that result from increased investment in land management and agricultural education. Higher yielding lands can be left fallow, and allowed to recover, or planted with a soil-restoring biofuel crop. Today, too often fields are planted desperate with cash crop upon cash crops — in this way, they are driven to exhaustion and abandoned altogether, or converted to lower-value uses such as pasture.

We have heard much about the theoretical impact of land use change, when biofuels demand was supposed to drive higher prices are supposed to drive the conversion of pasture lands to crop lands. We hear less about the fact that the ethanol market in the U.S. continues to grow, yet we are looking at a two-year bear market for corn.

We hear still less about the devastating impact on small farmers in the developing world when exhausted land is dumped onto the pasture market, driving down land values and driving former farmers into the cities to become members of the new,

global refugee class.

The Conversion of Prime Farm Land to Housing

We hear less about the conversion of 23 million acres of prime U.S. cropland to developed residential and commercial land in the last generation — releasing untold amounts of carbon into the atmosphere and taking a potential 3.5 billion bushels of corn off the market. Why, that's almost as much as is used for U.S. ethanol production altogether. Yet we don't hear about it. Because the discussion about land use change is rarely a scientific discussion, or an economics discussion — it is a political discussion.

Land Use Change from Biofuels: A Rich Man's Argument

More than that, the analysis of the conversion of land use from pasture to crops is a rich man's discussion. Only a rich man could describe the conversion of pasture to crop land as a tragedy — in a world in which children will go hungry tonight. Children in developing nations cannot eat pasture grass and cannot afford the meat that is raised there. Though climate change is a vital, brutal, scary issue — it can only be the most important thing in the world to a person who has never known hunger. To the hungry — and to the dispossessed farmers around the world whose land cannot yield the income necessary to keep them on the land — we owe a higher focus. We owe them an unrelenting commitment to producing fuel to light their fires, power their farm vehicles, and given them products to raise their incomes.

The food crisis is not a crisis over a shortage of food — the world today produces more food per capita than at any time in its known history. It is a crisis of income.

Higher incomes produce smaller families, and smaller families consume less food, and can invest in better home and farm practices to reduce the carbon footprint. Though wealthy Westerners may not realize it, our world is still overwhelmingly a rural one, and no crisis of income can be resolved without addressing incomes on the farm. No crisis of stability can be resolved, no population explosion addressed, no real carbon solution deployed — until we have addressed the fundamental issue of rural income, which is also a key to human dignity. And no future is worth risking another era in which people are denied their human dignity.

Those who wish to lock carbon in the earth must first unlock the value in land.

But it takes more than a handful of advanced biofuels technologies to unlock land value — whether it is from marginal land, or using crop, forest or animal residues. It takes land itself — and a special type of land. The type of land that you find in the Philippines.

You Have a Friend in Bioenergy

If you have land with plenty of rainfall and sunshine and heat, you have a friend in bioenergy. Wind curves and insolation may not be ideal in the Philippines for solar

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and wind, but biofuels are made from crops that thrive in your conditions.

If you have land that grows sugarcane — that classic high-yield energy and food crop that has been magnificently improved in countries like Brazil and India — you have a friend in bioenergy. Advanced biofuels may use your sugarcane syrup, or not — but it will definitely provide you with options for higher income from your sugarcane bagasse.

If you have land that is flat in character and situated in the tropics, you have a friend in bioenergy. Even if your land is not productive for high-value crops, it may prove excellent for the production of microchips using lemna, algae, yeast or cyanobacteria as a platform.

If you have oilseed crops — you have a friend in bioenergy. Advanced biofuels not only use the oils, they can use the palm waste, the jatropha waste or the coconut waste. Any country with agricultural wastes can and should seek to maximize the income potential from biofuels. In bioenergy, residues are king.

Food for All, Fuel for All

Our work will not be finished until every farmer's income in the world provides a dignified, worthy living. We need fuel to turn crops into food, food for all who need it, and fuel for an advanced society. Only an advanced society can provide the citizens of every nation with the education, science and business leadership it will need to compete successfully in this century and the future beyond that.

Our work may not be complete for a long, long time. But it has begun, and it will continue, and it will succeed because technology will always find better ways to use land, and produce enough for all. As it was in prehistory, it will become again in time — we can build a world in which the living Earth can once again provide for all her children — and the fossil earth will be a resource we no longer need to tap.

Let us look at these conversations as a beginning — not as an end — and not consider that our conversation has concluded until we have forged all the partnerships that we can, based on the principles of economic, environmental, and social sustainability. The communities we represent deserve no less than our maximized effort to deliver the highest, best use of the land. Let us make sure we do it, and do it right, and start now.

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