

Biofuels: Key Renewable Energy?

Are biofuels the magic bullet to make the United States energy independent and more secure? Can crops and grains be made into clean, renewable fuels that help curb global warming caused by the burning of fossil fuels, while providing the foundation for a new “green collar” economy? The answers to these questions are a mix of “Yes” and “No”. There’s no single magic bullet to solve our energy problems, but biofuels are definitely a key part of the mix to foster a cleaner, renewable and sustainable energy future.

Biofuels are not some hypothetical technology of the future. Some biofuels, such as corn and sugar ethanol, are readily available now and competing aggressively with fossil fuels in the world market. Indeed, a gold rush mentality regarding biofuels, particularly corn ethanol, is occurring in the U.S., Europe and other countries. While the development and support of alternatives to oil is critical for the climate and U.S. national security, as the Gold Rush of the late 1800’s proved, “get rich quick” schemes without proper safeguards can have dire effects on the environment, economy and communities.

Biofuels do show much promise in helping the U.S. become more energy independent and there are significant environmental gains to be reaped from their development. But the potential gains for the climate, our environment and for agricultural producers depend completely on what – and how – new biofuels are produced. If not done correctly with careful, long-sighted planning, biofuel technology can have dramatic, unintended negative consequences for the health of our land and water, climate change, family farms and even world food supplies.

Biofuels Breakdown

- **Cellulosic biofuels** are fuels made from plant material, such as the leaves, stems and/or stalks of a plant. Biofuels can be derived from biological feed stocks (corn, soy, sugarcane, etc.) that are available as renewable sources of fuel. Biofuels can also be derived from wood, native grasses and oilseed crops.
- **Ethanol** is an alcohol-based fuel derived from crops, usually corn, barley, and wheat. Ethanol can be blended with gasoline in varying concentrations, such as 85 percent ethanol and 15 percent gasoline fuel combinations.
- **Biodiesel** is a low-polluting diesel alternative made from vegetable oils, animal fats and recycled cooking greases. Oil seed crops can be grown, crushed and turned into biodiesel.

The most common plant derived fuel manufactured in the U.S. today is corn-based ethanol made from corn kernels, while in the country of Brazil, sugar cane ethanol is found at every gas pump in the country. As demonstrated by the Sierra Club in a report entitled, *Destination Iowa: Getting to a Sustainable Biofuels Future*, the U.S. biofuels industry has seen enormous growth in a short period of time. According to the report, capacity has more than tripled from 1.7 billion gallons in 1999 to 6.2 billion gallons produced in 2007. And Iowa is responsible for nearly one-third of U.S. ethanol production, with twenty-eight ethanol refineries and a combined capacity of 1.9 billion gallons per year and thirteen biodiesel refineries capable of producing 260 million gallons per year.

The dramatic increase in corn ethanol production is the result of several factors, including federal requirements to replace the gasoline additive MTBE (methyl tertiary-butyl ether), a known groundwater contaminant, as well as concerns about global warming from fossil fuel usage and energy independence.

In Iowa and other states such as Montana, there is also keen interest in the potential of biofuel production to improve farmers’ livelihoods and revitalize rural economies.

Are All Biofuels Created Equal? Pitfalls of Corn Ethanol

Although corn ethanol may be this country’s most widely produced biofuel on the market today, there are conflicting opinions about whether or not corn ethanol is the best solution for the climate and the land.

One of the most glaring problems with corn pointed out by some members of the scientific and environmental communities, is the amount of energy needed to transform corn into ethanol fuel. Opponents argue that the energy from fossil fuels needed at the outset to produce ethanol negates any potential environmental benefits from corn. Furthermore, opponents contend that more large-scale corn crops lead to the destruction of forests, wetlands and grasslands, which store significant amounts of carbon and provide critical habitat to a variety of native plant, bird and wildlife species. There is also concern over the amount of toxic pesticides and fertilizers needed to grow corn in an economy of scale, and the subsequent impacts on soil and water.

Finally, there is growing alarm among some scientists, environmentalists and food policy experts that the increased demand for corn in biofuels is driving up the

Resources

On the Web

25x25 Alliance
1626 Bellona Avenue
Lutherville, MD 21093
(410) 252-7079
<http://www.25x25.org/>

TIME Magazine (“The Clean Energy Scam”. Michael Grunwald, 3/27/08)
www.time.com/time/magazine/article

Montana Conservation Groups

(The groups listed have website links to several scientific and environmental reports/studies on biofuel technologies)

National Center for Appropriate Technology

3040 Continental Drive
Butte, MT 59701
(406) 494-4572
1-800-275-6228 (ASK-NCAT)
www.ncat.org

www.mtgreenpower.com
(provides links to several informative websites and biofuel studies)

Northern Plains Resource Council

220 S. 27th Street, Suite A
Billings, MT 59101
(406) 248-1154
www.northernplains.org

Western Organization of Resource Councils

220 S. 27th Street, Suite B
Billings, Montana 59101
(406) 252-9672
www.worc.org

Sierra Club - Montana Chapter

131 S Higgins Ave
Missoula, MT 59802
(406) 549-1142
www.sierraclub.org

Natural Resources Defense Council

40 West 20th Street
New York, NY 10011
(212) 727-2700
www.nrdc.org

cost of food commodities worldwide, leading to food shortages and hunger, especially in poor countries already suffering from malnutrition.

Counter Arguments

Proponents of corn ethanol, such as the “25 x ‘25” alliance, see things differently. “25 x ‘25” is a broad initiative of leaders in agriculture, forestry, labor, business and conservation, which calls for the U.S. to get 25 percent of its energy from renewable resources like wind, solar, and biofuels by the year 2025. The Alliance refutes claims made in a recent TIME Magazine article that cited a recent scientific study that lambastes many aspects of biofuel technology. Regarding TIME’s claims that increased crop production for fuels is leading to global food shortages, the Alliance counters in a letter to the magazine’s editors that current high food costs cannot be blamed on increased crop production for biofuels, but stems from high global energy costs, erratic weather and existing low food stocks.

25 x ‘25 particularly takes issue with what it sees as TIME’s wholesale dismissal of biofuels generally. As stated by the group in its letter, “Of particular concern is the ready dismissal of emerging technologies that will allow us to produce next generation biofuels from non-food feedstocks sustainably grown on underutilized and marginal lands not suited for food production...Researchers at Ohio State have concluded that the total potential of carbon sequestration in U.S. soils, counting croplands, grazing lands and woodlands, is nearly 600 million metric tons of carbon, or the equivalent of more than 2,200 million metric tons of carbon dioxide emissions - about 33 percent of total U.S. emissions.”

Finding a Solution in Diverse Grass Crops

The 25 x ‘25 alliance differs substantially with some scientists and biofuels experts regarding the efficacy and “greenness” of corn as fuel. However, the Alliance’s point about the benefits of developing biofuel crops on underutilized and marginal lands resonates with a broader spectrum of experts. In its report, *Destination Iowa*, the Sierra Club calls for the biofuels industry to look beyond corn to what it calls the “2nd Generation” of cellulosic biofuels, derived from grass crops. The report states, “Second-generation biofuels are expected to be considerably less harmful in terms of soil erosion and water degradation. These fuels will be derived mainly from quick-growing plants with high ratios of cellulose, such as fast-growing trees, grasses, and agricultural residues.”

In a report published by the Natural Resources Defense Council (NRDC), *Move Over Gasoline, Here Come Biofuels*, the group cites switchgrass as a promising source of cellulosic biofuel, due to its properties as a native, perennial prairie grass that does not require significant pesticides and fertilizers to grow. Furthermore, NRDC states that switchgrass uses water efficiently, has low nitrogen runoff, very low erosion, and increased soil carbon, and also provides good wildlife habitat and cover.

Both grasses and low-input oil seed crops, such as camelina, provide significant promise for biofuels production in Montana. Perhaps the answer to the problem lies in native grass crops and oil seed crops that are environmentally friendlier, versus the specter of increased, large-scale industrial cornfields. Certainly, native grasses and oil seed crops make sense in Montana, where these plants are either already growing – or can be easily grown and harvested.

The potential benefits of biofuels are tremendous in Montana and for the country. According to the NRDC report, if produced correctly:

- “Biofuels can slash global warming pollution. By 2050, biofuels – especially cellulosic biofuels – could reduce our greenhouse gas emissions by 1.7 billion tons per year. That’s equal to more than 80 percent of current transportation-related emissions;
- Biofuels can be cost competitive with gasoline and diesel. Economists estimate that by 2015, we could produce biofuels for sale at prices equal to, or lower than, average gas and diesel prices;
- Biofuels will provide a major new source of revenue for farmers.

At \$40 per dry ton, farmers growing 200 million tons of biomass in 2025 would make a profit of \$5.1 billion per year. And that’s just the beginning. Experts believe that farmers could produce six times that amount by 2050;

- Biofuels can offer major land-use benefits. Certain biofuels crops could actually improve land that’s no longer productive.”

A Montana Approach to Promote Biodiesel Fuels

During the 2007 Montana Legislature, Senator John Bruggeman (R-Polson) introduced Senate Bill 432 to establish a state biodiesel standard to diversify Montana’s fuel sources through the use of clean, homegrown biodiesel. The bill was modeled after a similar, successful measure in Minnesota and required all fuel sold in Montana to contain a 2% blend of Montana-grown and produced biodiesel, with triggers to increase the blend to 5%, based on future in-state production capacity. SB 432 was meant to build Montana’s fledgling biodiesel industry and bring jobs and value-added agriculture to rural communities.

This measure had widespread support from Montana’s conservation community and the MT Graingrowers Association, the MT Farmers Union and Gov. Schweitzer’s office. The bill was opposed primarily by the petroleum and trucking industries - including Exxon-Mobil - the MT Petroleum Association and the MT Petroleum Marketers and Retailers. Although the bill passed the Senate, it unfortunately was voted down in the House.

Despite this setback, Biodiesel remains cost-competitive with petroleum and is carbon neutral. This renewable fuel can be easily sourced right here at home, so it can be expected that the next Montana Legislature will take another look at supporting biodiesel.

A Key Part of the Solution

Cellulosic biofuels are undoubtedly an important component of the solution to curb America’s dependence on foreign oil and the fossil fuels that contribute significantly to global warming. The production of biofuels is also a promising source of jobs and revenue for Montana’s agricultural producers and rural communities. But equally vital to a sustainable, cleaner and greener energy future is the continued market development of wind and solar energy, which are abundant in Montana, particularly wind energy. And energy conservation must be a cornerstone of any long-term energy policy.

It is critical for the Legislature to develop incentives and standards for biofuels to ensure the technologies deliver on their environmental promise. As stated by the NRDC in its report, “Just because biofuels can help solve global warming doesn’t mean that they will – unless we require them to. Creating standards based on performance, rather than technology, will unleash the power of competition on the market and result in biofuels that live up to their billing.”

Aggressive federal and state investment in research and development of cellulosic biofuels is also key. Industry needs encouragement to develop technologies that are also sustainable and environmentally sound. The government can spur the development through strategic investments and incentive programs and also through the encouragement of real consumer choices at the pump. NRDC points out that only one percent of gas stations around the country today have a biofuel pump. Providing choices for consumers depends on robust markets and infrastructure.

To foster energy conservation, the state legislature and the U.S. Congress can do much by supporting and expanding tax incentives and credits for increased energy efficiencies in our businesses, homes and vehicles. Biofuels are indeed an integral component of a long-term energy solution. But the most effective means for the Montana Legislature to address the issue lies in a multi-faceted, long view approach.