BIODIESEL: A PARTIAL SOLUTION TO MONTANA'S ENERGY WOES?

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A POSITIVE VIEW FROM AN OTHERWISE DISMAL SITUATION

You have read the daily energy headlines recently. Electricity and natural gas rates for NorthWestern Energy customers have increased substantially. Montana-Dakota Utility customers are also paying higher natural gas rates. NorthWestern Energy is on the brink of bankruptcy. Congestion on Montana's transmission lines restricts the free flow of electricity into and out of the state. Electricity blackouts plague the East Coast. Gasoline and diesel prices remain extremely high and volatile.

Is there any glimmer of sunlight on Montana's energy horizon? Is there any relief in sight? Do we Montanans give up and cry "uncle!!"? I don't think so. When other people think of Montanans, they usually conjure up images of rugged self-reliance, fierce independence, individualism, stability, self-sufficiency, and resiliency. The policy answers to our current energy dilemma are extremely complex and confusing, but at least a small part of the solution to our energy problems may lie in looking at alternative, nontraditional energy resources that mirror our own general character as Montanans.

The characteristics of energy resources that best reflect the general Montana persona are resources that we can produce ourselves, that are cheap and easily accessible, that are compatible with existing infrastructure and are very reliable, that are healthy to use, that minimize our dependence and reliance on others to supply and transmit needed energy, that help protect us from volatile energy prices, that are self-sustaining and renewable, and that, as a side bonus, create value-added jobs for Montanans. The production and use of alternative fuels, such as biodiesel, hydrogen, ethanol, and biomass, and alternative energy sources, such as wind generation and small-scale hydro-generation and solar generation, in addition to Montana's traditional energy sources could be instrumental in potentially stabilizing some of Montana's energy problems. Alternative fuels and alternative energy sources are just some of the many policy issues currently under consideration by interim committees of the Legislature and by state agencies in response to our current energy challenges. (See the Sidebar at the end of this article for more information.)

In order to appease Jeff Martin's (editor-in-chief of ***THE INTERIM***) penchant for fiscal as well as verbal restraint, I will confine the scope of this article to evaluating the potential of producing and using biodiesel fuel in Montana. If you would like more information on other alternative fuels and energy sources, keep track of the work of the Environmental Quality Council's Alternative Energy Subcommittee. The subcommittee will be evaluating alternative energy policy options during the interim. To monitor the Alternative Energy Subcommittee's work go to the subcommittee website at: http://www.leg.mt.gov/css/lepo/2003_2004/subcommittees/energy_group/default.asp.

WHAT IS BIODIESEL?

For those of us who use diesel in our cars, trucks, heavy equipment, school buses, and farm equipment, biodiesel may be a viable fuel supplement or replacement. So what is biodiesel? Imagine pulling up to your local McDonald's drive-through here in Montana and asking "May I have a Big Mac and fries and will you fill my diesel fuel tank with used french-fry oil, please." Although not entirely realistic, the Golden Arches scenario may not be as far-fetched as it seems. Biodiesel is an alternative fuel produced from biodegradable, nontoxic, renewable resources such as new and used vegetable oils and animal fats. Biodiesel, on its on own or combined with petroleum diesel fuels, can be used in any diesel engine with little, if any, modifications.[1]

HOW IS BIODIESEL MADE?

The recipe for biodiesel is fairly straightforward. Take vegetable oils or animal fats, or both, screen out any water, then add one part alcohol (we are not talking George Dickel here, but usually methanol) and a pinch of catalyst (sodium or potassium hydroxide). A chemical reaction takes place in a caldron that produces two products: fatty

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[1] See the Department of Energy's Alternative Fuels Data Center Website at: www.afdc.doe.gov/altfuel/bio_benefits.html.

acid methyl esters and a chemical compound called glycerol that is used in cosmetics and pharmaceuticals. Separate the fatty acids from the glycerol, and
voila. . . you have biodiesel.[2]

WHAT ARE THE ADVANTAGES OF USING BIODIESEL IN MONTANA?

Biodiesel is renewable. According to the U.S. Department of Energy, it requires no engine modifications--you can use it in existing diesel engines.[3] It can be blended into existing petroleum diesel or used as a petroleum diesel substitute. Biodiesel is much less combustible than petroleum diesel, making it safer to handle. It reduces greenhouse gas emissions. It is approved for use as a registered fuel and fuel additive by the Environmental Protection Agency and has been designated as an alternative fuel by the Department of Energy and the U.S. Department of Transportation.[4] Biodiesel has been tested in a variety of unmodified diesel vehicles for 40 million road miles, including 120,000 miles in Yellowstone National Park.[5]

Biodiesel can be produced from certain varieties of canola, safflower, mustard, camelina, and crambe, all which can be grown here in Montana. Growing the raw materials in Montana and refining and producing biodiesel in Montana maybe a value-added proposition that has the potential to create jobs, revitalize rural Montana's economy, and promote alternative fuel development.[6]

WHAT ARE THE DISADVANTAGES OF USING BIODIESEL IN MONTANA?

Biodiesel is a relatively new technology. It is uncertain whether biodiesel and biodiesel blends affect engine performance, especially fuel economy, torque, and power.[7] Montana's cold climate may hinder the storage of biodiesel. The Department of Energy reports that although using biodiesel decreases the emission of many air pollutants, it also increases emissions of nitrogen oxides and more research and development is needed to resolve this problem.[8] Greater use of biodiesel may have potential revenue and tax impacts on the state.

The price of biodiesel may also be a concern. Feedstock costs account for a large part of biodiesel production costs. For example, the Department of Energy says that it takes 7.3 pounds of soybean oil at a cost of 20 cents a pound to produce a gallon of biodiesel.[9] This translates, for feedstock costs alone, into at least $1.50 a gallon of soy biodiesel. The Department of Energy also says that fats and greases cost less and produce less expensive biodiesel ($1 per gallon).[10] If the market price of biodiesel is greater than the market price of petroleum diesel, there may be very little incentive for Montana consumers to purchase biodiesel.

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2 For a more thorough and complete recipe for biodiesel see the Department of Energy's Website at www.afdc.doe.gov/altfuel/bio_made.html.

3 See footnote 2.

4 See the National Biodiesel Board FAQS Website at www.biodiesel.org/resources/faqs/.

5 For mileage numbers see footnote 4.

6 See the November 1, 2002, issue of Business MONTANA from the Governor's Office of Economic Development that touts the potential economic benefits of biodiesel in Montana.

7 See the Western Transportation Institute, College of Engineering, Montana State University's Evaluation of Biodiesel Fuel: Literature Review, July 2, 2003.

8 See the Department of Energy's Alternative Fuels Data Center Website at: www.afdc.doe.gov/altfuel/bio_general.html.

9 See the Department of Energy's Alternative Fuels Data Center Website at: www.afdc.doe.gov/altfuel/bio_market.html.

10 See footnote 9.

Distribution, storage, and access to biodiesel may also be a potential barrier to using this resource. Lack of uniform standards in neighboring states regarding the definition and use of biodiesel may hamper efforts to market biodiesel in Montana to interstate transport companies.

WHAT IS THE MONTANA EXPERIENCE TO DATE WITH BIODIESEL?

A number of activities have taken or are taking place in Montana regarding the use and production of biodiesel. Below is a brief summary of each activity.

1. House Bill No. 502, introduced by Rep. Holly Raser of Missoula last session, would have mandated that all diesel fuel sold for use in internal combustion engines contain at least 2% biodiesel fuel by volume. The bill was discussed but tabled by the House Transportation Committee because of the unanswered questions surrounding biodiesel.

2. In response to a letter from the House Transportation Committee during the 2003 Session, the Montana Department of Transportation (MDT) has initiated a research project in partnership with Montana State University that will focus on the viability of using biodiesel as an alternative fuel in MDT's vehicle fleet. The project entails the identification of biodiesel types, review of engine performance data, review of storage requirements, review of emissions and air quality impacts, assessment of potential for engine damage, review of tax issues, identification of advantages and disadvantages of biodiesel, and documentation of research findings. The project will take place over the 2003-04 legislative interim.

3. The Montana Department of Environmental Quality completed a demonstration project on the use of biodiesel fuel in Yellowstone National Park in December 2002. Biodiesel was produced from rapeseed oil and potato residues. The project documented results on performance and air quality emissions. Running a conventional diesel engine on 100% biodiesel, the truck operated normally for 121,000 miles and started well in cold weather. The department also noted reduction in a number of pollutant emissions, including nitrogen oxide.

4. West Yellowstone boasts the first pump in Montana to offer biodiesel. The town's Econo-Mart is offering a blend of 10% biodiesel and 90% diesel primarily for use in Yellowstone National Park.

5. Peaks and Prairies Oils Seed Growers Cooperative received a grant from the U.S. Department of Agriculture in October 2002 to study the feasibility of producing oil seed crops for conversion into biodiesel. The growers' cooperative is in a partnership with Sustainable Systems, LLC, a Missoula-based renewable energy research, development, and commercialization company that will be responsible for converting the oil seed crops into biodiesel. The growers' cooperative has been working with both Montana State University and the University of Montana on this project.

6. The University of Montana has logged over 35,000 miles of biodiesel use in the "Bio-Bus". The Bio-Bus is a shuttle bus used on campus.

WHAT ARE MONTANA'S CURRENT POLICIES REGARDING BIODIESEL?

In 1995, at the request of the Environmental Quality Council, the Montana Legislature enacted an alternative fuels policy statement and implementing guidelines. The policy states that Montana encourages the use of alternative fuels and fuel blends to the extent that doing so produces environmental and economic benefits for the citizens of Montana.

Within the alternative fuels policy statement, the Legislature recommends several guidelines for the development of a state alternative fuels policy, including the following:

(1) the use of self-sufficient markets should be encouraged;
(2) any state alternative fuels program should have measurable benefits that are communicated to the public;

(3) state and local governments should be encouraged to set an example with their vehicle fleets in the use of alternative fuels and fuel blends. The state also encourages production of alternative fuels and fuel blends (90-4-1011, MCA).

In addition to the alternative fuels policy statement, state law allows an income tax credit for individuals and businesses of up to a 50% income tax credit for equipment and labor costs of converting vehicles to operate on alternative fuels. The tax credit is limited to $500 for the conversion of vehicles of 10,000 pounds or less gross vehicle weight and to $1,000 for vehicles over 10,000 GVW. The credit must be applied in the year the conversion is made, and sellers of an alternative fuel may not receive a credit for converting their own vehicles to operate on the alternative fuel that they sell (15-30-164 and 15-31-137, MCA).

State law also allows for incentives for ethanol and biodiesel blends that will be available for 4 years after an ethanol plant is constructed and begins operating in Montana. These incentives reduce motor fuel taxes to the consumer by 15% (15-70-204, and 15-70-321,MCA, and Chapter 568, L. 2001).

WHAT IS THE FUTURE OF BIODIESEL IN MONTANA?

State agencies, the federal government, the university system, private industry, Montana's agricultural sector, and the Montana Legislature have all expressed a high level of interest in biodiesel. The potential of creating a value-added agricultural product that would help revitalize Montana's rural communities in addition to supplementing Montana's energy needs is a tantalizing proposition. Unanswered questions remain regarding the cost and viability of using biodiesel in Montana. The Environmental Quality Council's Alternative Energy Subcommittee is interested in looking into the unanswered questions surrounding biodiesel use as well as evaluating a number of other alternative fuels. The subcommittee will conduct its investigation throughout the interim and report its findings and recommendations to the full Environmental Quality Council. If you would like to be on the Subcommittee's mailing list, please contact Todd Everts at (406) 444-3747 or teverts@mt.gov. The subcommittee will hold its first meeting on Oct. 8 in the state Capitol.

ENERGY SIDEBAR

There are a number of activities taking place this interim regarding Montana's energy issues. The bulk of the legislative energy policy work is being conducted by the Energy and Telecommunications Interim Committee. For more information on this committee, see the website address in this issue or contact Mary Vandenbosch at (406) 444-5367 or mvandenbosch@state.mt.us. The Legislative Consumer Counsel is also heavily involved in a variety of energy issues. For more information regarding the Consumer Counsel, contact Bob Nelson at (406) 444-2771 or robnelson@mt.gov. Governor Martz has recently appointed a task force to evaluate options regarding Montana's energy situation. If you would like more information regarding this task force, contact John Hines at (406) 444-3952 or jhines@nwppc.org. Another valuable source of energy regulatory information is the commissioners and staff at the Public Service Commission (PSC). The PSC website address is: http://www.psc.mt.gov/.

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