

Biofuels UPDATE

Report on U.S. Department of Energy Biofuels Technology

Farmers Now Offered Soy-Based Biodiesel at the Pump

U.S. farmers have long promoted soy-based industrial-use products in an effort to increase soybean oil demand and raise the overall value of the product. Now in six midwestern states farmers have a new fuel option at the pump—an option they helped create—biodiesel.

Farm co-ops in 10 locations (see box) now offer farmers the opportunity to commercially purchase biodiesel for use in diesel engines. SoyGold, a branded biodiesel product manufactured by Ag Environmental Products (AEP) from 100% virgin soybean oil, is offered as a lubricity additive in premium diesel, at the pump or in bulk orders. An added incentive for farmers in all six states to buy the fuel is that the soy used in the biodiesel production was grown locally.

“This is a great opportunity to offer our farmers a product manufactured from something they grow on their own farms,” said Bill Pape, general manager of Freeman Co-op Oil/Fertilizer. “Not only does this product put money back into the local economy, it reduces engine wear on today’s expensive farm equipment.”

Until the SoyGold lubricity enhancer was made available, biodiesel marketers focused on urban mass transit bus systems, underground mines, and marine uses to sell the cleaner-burning biofuel. “Our research indicates

that a 1% to 2% blend of biodiesel added to diesel fuel results in a 30% increase in lubricity,” said Mike McCranie, a soybean farmer in South Dakota and a member of the National Biodiesel Board. “Based on the success of biodiesel in the Sioux Falls, South Dakota, bus fleet, we are looking for similar results on the farm as well.” That fleet has been using biodiesel in blends for more than a year, and maintenance costs are lower than those associated with buses that run solely on petroleum-based diesel.

“Each fueling location decides the percentage of SoyGold blend it will use,” said Doug Pickering, a partner at AEP. “To get the biggest bang for the buck, stations will probably use 1% blends.”

AEP currently provides soy-based biodiesel at 10 refueling stations in the Midwest. “This project is a way for us to get our product to the farmers, to create a demand, and to see if those farmers will continue to use biodiesel in blends with petroleum-based diesel,” said Doug Pickering, a partner at AEP. The 10 stations AEP supplies are located in:

- Alma, Missouri
- Assumption, Illinois
- Aurora, Nebraska
- Clay Center, Nebraska
- Firth, Nebraska
- Fredericksburg, Iowa
- Freeman, South Dakota
- Geneseo, Illinois
- Grand Island, Nebraska
- Lawrence, Kansas

Chesapeake Bay Boaters Improve Marine Ecology by Using Biodiesel at Nine Fueling Stations

Coastal Properties, owner of nine marinas that fuel more than 4,000 vessels annually, will begin to market biodiesel at all its stations. Neat biodiesel can be purchased either at the pump or in 5-gallon jugs with a standard label that explains how to blend biodiesel and conventional diesel at a 20:80 ratio.

“Coastal Properties was selected for this project because its marinas provide the broadest reach of recreational boating activity on the Bay,” said Jeff Horvath, chief executive officer of the National Biodiesel Board (NBB).

NBB is working with funds provided by the Minnesota Research

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and Promotion Council (MRPC) to introduce biodiesel to the entire Chesapeake Bay region. MRPC actively promotes biodiesel, and contributed more than \$1 million to NBB in 1996. NOPEC Corporation, a Florida-based company that works to develop earth-friendly solutions for diesel fuel problems, will provide the biodiesel fuel and distribution equipment. NBB will conduct outreach activities to educate local boaters and the community on the benefits of renewable fuels. The program is part of NBB's national effort to find niche markets in which consumers can use the clean-burning biodiesel, according to Deborah Boldt, spokesperson for NBB.

"Biodiesel is an immediate means of improving the water quality of the Chesapeake Bay," said Karen Miller, a spokesperson for NOPEC.



Alan Weber of the National Biodiesel Board looks on as Karen Miller of NOPEC describes the advantages of biodiesel to onlookers at the Annapolis Spring Boat Show.

Biodiesel was introduced to Chesapeake Bay boaters in August 1996, when Coastal Properties distributed biodiesel at Piney Narrows Yacht Haven and Mears Yacht Haven. "Sailboaters, who require relatively small quantities of the alternative fuel, were especially enthusiastic," said Mitchell Nathanson, President of Coastal

Properties. "Because biodiesel is odorless and less flammable than conventional fuel, they found it perfect to store on-board."

Retail marine markets have already been established in the Florida Keys (see *Biofuels Update*, Fall 1996) and the San Francisco Bay area.

New Jersey Biodiesel Project Receives \$120K DOE Grant

The U.S. Department of Energy's (DOE) Idaho Operations Office recently awarded a \$120K alternative fuel vehicle (AFV) grant to New Jersey's Division of Energy for use in the Burlington County school district, Northern New Jersey. The grant, Financial Assistance Program for State and Municipal Governments for the Demonstration of Light and Heavy Duty Alternative Fuel Vehicles, enables the school district to use biodiesel in 20% blends (B20) in 16 school buses during a 4-year period. The grant also allows Burlington County to operate one heavy-duty dump truck on B20. The four primary project objectives are:

- Demonstrate biodiesel in heavy-duty vehicles
- Educate and train state, local, and supporting industry personnel on the proper use of biodiesel as a safe vehicular fuel
- Collect and analyze emissions data and other information on in-use operation of a municipal school bus fleet that uses biodiesel and communicate the results to DOE's Idaho office
- Educate school bus riders (students) on the benefits of using alternative fuels to increase domestic energy security while improving air quality. The New Jersey Soybean Board is developing educational

materials for use in Burlington County schools.

Emissions testing on New Jersey's buses will be conducted by West Virginia University's transportable emissions testing laboratory (see *Biofuels Update*, Spring 1996). The fully equipped, trailer-mounted portable emissions testing facility is used for conventional vehicles and AFVs, and includes a chassis dynamometer, dilution tunnel, and instrumentation for measuring all regulated emissions. Eight buses will be equipped with a CMX catalytic converter muffler, which is manufactured by Engelhard Corporation, a New Jersey-based environmental

technologies organization. The catalytic converter will reduce hydrocarbon and carbon monoxide emissions by 50%, and reduce particulate matter by at least 25%, according to Denise Lenci, communications director at Engelhard. "This is the first technology to meet cost and performance standards established by the Environmental Protection Agency (EPA) under the Clean Air Act Amendments (CAAA) for diesel buses," said Lenci. Engelhard gained EPA approval in late 1996 for the converter, and has equipped more than 7,000 buses with it.

New Jersey has used various alternative fuels for almost 5 years for light-duty vehicle applications. Burlington County's school bus project is the state's first heavy-duty initiative. Because the buses can operate on B20 with no major changes to the power train, initial costs were almost nonexistent, according to Ellen Bourbon, alternative fuels project manager for New Jersey's Division of Energy. "Our schools, although concerned with air quality, have to be extremely budget conscious," said Bourbon. "That's why biodiesel was chosen for this project. Actually, the only incremental costs for this program were for the fuel itself." The DOE grant will provide \$36,000 to purchase and install an above-ground fuel storage tank, and \$84,000 to purchase 21,800 gallons of biodiesel.

"If this program, and others like it, show they can reduce a significant amount of petroleum, biodiesel may be a way for local government fleets to come into compliance with future Environmental Protection Act and current CAAA requirements," said Bourbon. Currently, the entire state of New Jersey is a severe nonattainment area, according to EPA regulations.

Renewable Energy: A Hot Topic in High School Debate Sessions

Renewable energy, often thought of as key to a sustainable future, is now a topic for high school debate teams.

"Renewable energy use is essential to aid in cleaning our environment and reducing ozone," said Dick Fawcett, a member of the National Federation of High School Associations. "Having students debate such an important topic can only lead to a better educated group of future leaders."

From early September 1997 through June 1998, more than

100,000 students will debate this important and controversial topic. From congressional legislation to conflicting reports on the environmental effects of the alternative fuels, renewable energy sparks arguments between petroleum advocates and alternative fuel proponents. If you are, or know of, a student who is debating renewable energy, contact the National Alternative Fuels Hotline at 800.423.1363 or hotline@afdc.nrel.gov.

DOE's Successful E85 Vehicle Program in Minnesota



Wally Lysle and Jan Reak with a 1996 Ford Taurus FFV in front of the Minnesota State Capitol Building.

The U.S. Department of Energy (DOE) recently released a case study entitled, *Special Funding Seeds Early E85 Vehicle Purchases and Infrastructure Development in Minnesota*, which details the Minnesota state fleet's history with ethanol-powered alternative fuel vehicles (AFVs),

and the success the program has achieved upon receiving a government grant to purchase AFVs.

"We're very positive about AFV use," said Mike Roelofs, manager of energy programs for Minnesota's Department of Public Service. "We

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look at this program as one of the major focuses of our department for the next several years.”

With the help of a \$60,000 grant from the Council of Great Lakes Governments in 1993, Minnesota got a 4-year jump on Energy Policy Act (EPA) mandates for state purchases of AFVs. Minnesota used the grant to cover the incremental costs (\$800–\$900 per vehicle) of 10 flexible fuel vehicles (FFVs), along with the entire cost of the state’s first E85 fuel pump, located in St. Paul.

“Once we had the fueling capabilities and car experience, expansion in the E85 area was the most cost-effective approach to building credits toward EPA mandates,” said Roelofs.

Other costs associated with the E85 vehicles include fuel (see box) and the high cost of motor oil. Special synthetic oils for the E85 vehicles can cost as much as \$9.00/quart. In a field study on 15 E85 engines in Ford minivans

(see *Biofuels Update*, Winter 1997), conventional motor oil is currently being tested. If the results are positive, Minnesota fleet operators can follow the same procedure.

Currently, Minnesota state officials operate 90 AFVs, 76 of

which are E85 FFVs (see box). The vehicles are available to all state agencies. To receive more information on AFVs, or the case study highlighted in this article, contact the National Alternative Fuels Hotline at 800.423.1363.

State of Minnesota E85 Vehicles

	Vehicles	Annual Mileage
1993 Chevrolet Lumina:	30	15,000 – 40,000
1995 Ford Taurus:	7	10,000 – 20,000
1996 Ford Taurus:	39	no annual mileage accumulation data available

Fuel-Related Information

E85 Fuel Cost:	\$1.30/gallon wholesale (\$0.90/gallon with tax credit), \$1.63/gallon on a gasoline-gallon-equivalent basis, \$1.12/gallon with tax credit)
Fuel Tank Capacity:	18 gallons (1996 Ford Taurus)
Fuel Economy:	23.1 miles per gallon (1995 E85 Ford Taurus)
Range on E85:	410 miles (1996 Ford Taurus)

Legislative News Briefs

Federal

- S. 468—The “National Economic Crossroads Transportation Efficiency Act of 1997 (NEXTEA).” Co-sponsored by Senators John Chafee (R-RI) and Daniel Patrick Moynihan (D-NY), NEXTEA aims, in part, to extend the deadline for the ethanol tax incentive from 2002 to 2006.
- In June, Congressman Bill Archer (R-TX) released the details of his \$85 billion tax relief proposal. The proposal calls for early reduction and elimination of the federal ethanol tax incentive. Archer’s proposal, which passed

through the Commerce Committee June 9, calls for the following reductions and repeals:

- Reduce the ethanol tax credit and excise tax exemption from \$0.54 to \$0.51/gallon-
- Limit subsidy-eligibility production to the producer’s average production for 1993–1997
- Impose a \$0.51/gallon penalty on excess production during periods when the \$0.51/gallon subsidy is in effect
- Repeal all ethanol subsidies after December 31, 2000.

State

- Minnesota—S.F. 1635, a companion bill to H.F. 1856.1635 would

provide payments to certain producers of ethanol and other alcohols. The bill has been referred to the Minnesota Agriculture and Rural Development Committee.

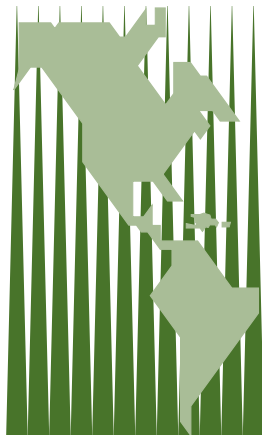
- Iowa—S.R. 109, introduced to the Iowa Agriculture Committee, requests that Congress maintain and renew its commitment to America’s corn growers and the ethanol industry by supporting a tax exemption and by taking other actions to increase the commitment to the production and use of ethanol
- Illinois—S.B. 908, introduced to encourage the development of renewable fuels in the Farm Economic Development and Renewable Fuels Act.

Ethanol Production Plants in the United States

Company	Location	Contact/Phone	Capacity (in millions of of gallons)
A.E. Staley Manufacturing Company	Decatur, IL	Gary Town 217.423.4411	40
AGP	Omaha, NE	John Campbell 402.496.7809	30
Al Corn Clean Fuels	Claremont, MN	Randall Doyle 507.528.2494	13
Archer Daniels Midland	Decatur, Peoria, IL Cedar Rapids and Clinton, IA	Martin Andreas 800.637.5824	910
Brimm Energy	Torrington, WY	Jim Glancy 800.669.3607	3
Broin Enterprises	Sioux, SD	Jeff Broin 605.543.5091	7
Cargill Corn Milling	Blair, NE	Pat Bow 402.533.4150	70
Cargill Ethanol	Wayzata, MN	Terry Jafoni 612.742.7575	35
Chief Ethanol Fuels, Inc.	Hastings, NE	Roger Burken 800.233.9948	38
Chippawa Valley Ethanol Company	Benson, MN	John Huffman 320.843.4813	15
Coors Brewing Company	Golden, CO	Fred Varani 303.277.2057	1.5
Corn Plus	Winnebago, MN	Steve Core 507.893.4747	15
ESE Alcohol, Inc.	Leoti, KS	Todd Long 316.375.4904	1.2
Georgia Pacific Corp.	Bellingham, WA	Jan Draut 360.650.6171	7.5
Golden Cheese of California	Corona, CA	Dermot O'Brien 909.737.9260	2.7
Grain Processing Corporation	Muscatine, IA	Alan Fikes 319.264.4286	10
Heartland Corn Products	Winthrop, MN	Bill Adcock 507.647.5000	12
High Plains Corporation	Wichita, KS	Ray Friend 316.269.4310	20
Jonton Alcohol, Inc.	Eddinburg, TX	Rick Ramirez 210.842.3378	1.2
J.R. Simplot Company	Caldwell, ID	Don Southard 208.459.0071	3
J.R. Simplot Company	Heyburn, ID	Stan Steward 208.678.3571	3
Midwest Grain Products	Marshall, MN	Richard Jurgenson 507.537.2676	80
Minnesota Clean Fuels	Dundas, MN	Scott Erickson 507.663.7704	1.2
Morris Ag. Energy Inc.	Morris, MN	Bruce Jordan 320.589.2931	7.5
Nebraska Energy LLC	Aurora, NE	Thomas Kell 402.694.3635	30
New Energy Company	South Bend, IN	Todd Allsop 219.233.3116	88
Pabst Brewing Company	Olympia, WA	Larry Sidor 360.754.5000	0.7
Parallel Products	Cucamonga, CA	Rick Eastman 909.980.1200	4
Pekin Energy Company	Pekin, IL	Ron Miller 309.347.9200	100
Permeate Refining	Hopkinton, IA	Bob Lehman 319.926.2261	1.5
Reeve AgriEnergy, Inc.	Garden City, KS	Lee Reeve 316.275.7541	10.5
Renewable Oxygenates Industries	Plover, WI	Bob Billingsly 715.342.9696	3
Stroh's Brewery	Winston Salem, NC	Dave Galloway 910.650.8050	0.5

Source: Information Resources, Inc.

Upcoming Event



THIRD BIOMASS CONFERENCE OF THE AMERICAS

Montreal, Quebec, Canada
The Sheraton Centre
August 25 - 28, 1997

NREL to Organize DOE-Funded Biomass Conference during August

The Third Biomass Conference of the Americas will be held August 24-29, 1997, in Montreal, Québec, and will provide an international forum to support the development of a viable biomass-based industry. It will focus on

applications of biomass (plants, crops, residues, and wastes), and emphasize ways to operate a profitable business in the biomass industry. Technical subjects will include resource base, heat and power, biofuels, and business development opportunities for biomass-related industries.

The National Renewable Energy Laboratory (NREL) and Natural Resources Canada are jointly organizing the conference. Sponsors include the U.S. Department of Energy, the U.S. Environmental Protection Agency, and Agriculture and Agri-Food Canada.

Technical subjects will include:

- Resource Base
- Environmental Impact and Sustainability
- Heat and Power
- Pyrolysis and Bio-oils
- Chemicals and Materials
- Biofuels
- Anaerobic Digestion
- Systems Integration
- Economics and Business

For more information, visit the conference web site at www.nrel.gov/bioam

or contact: Joan Ross
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email: joan_ross@nrel.gov

Making a Business from Biomass in Energy, Environment, Chemicals, Fibers, and Materials

BiofuelsUPDATE

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