

ANNOTATED (PARTIAL) BIBLIOGRAPHY OF BIOFUEL INFORMATION

This bibliography is variously incomplete, depending upon the sub-heading. It might be best to treat this as a list of examples in a rapidly-changing and growing field of information.

Various Companies

Abengoa Bioenergy [<http://www.abengoabioenergy.com>]. St. Louis, Missouri. Cellulosic ethanol and biodiesel. International. One of the recipients of multi-million dollar US DOE grants (\$385 million) in 2006. Abengoa Bioenergy, headquartered in St. Louis, Missouri, is a company dedicated to the development of biofuels for transport, including bioethanol and biodiesel, to support sustainable development. Through different subsidiaries, Abengoa Bioenergy owns and operates facilities to producing and marketing bioethanol throughout the United States and Europe. Its growth strategy is based in improving cost-efficient manufacturing technologies, increasing production and markets –Spain, Germany, France, Sweden- and developing advanced biomass-to-biofuels conversion technologies. R&D activities are devoted to produce bioethanol from cellulose biomass and the development of new bioethanol-based products (E-85, E-diesel, fuel cells). Abengoa Bioenergy is a subsidiary of Abengoa S.A., a company which is headquartered in Sevilla, Spain. Abengoa is a technological company that applies innovative solutions for sustainable development in the infrastructures, environment and energy sectors. It is present in over 70 countries where it operates through its five Business Units: Solar, Bioenergy, Environmental Services, Information Technology, and Industrial Engineering and Construction.

Advanced BioRefinery, Inc. [<http://www.advbiorefineryinc.ca>]. Ontario. Portable bio-oil producing 50 dry ton per day pyrolysis units. Advanced BioRefinery Inc. is a company who's goal is to develop and commercialize affordable, transportable pyrolysis plants which can be used to generate high value heating fuel and chemicals cheaply by "going to the source", literally. By being able to convert biomass in the field and transform it into a high value, easily transported liquid, we can greatly improve the economic viability of pyrolysis. We can tap into previously unused or even problematic biomass sources and solve disposal problems and offset energy requirements in forestry operations and on-farm.

Arkenol Fuels [<http://www.arkenol.com>]. California. A group of "ARK" companies. Biorefineries. Pilot plant in Orange, CA. Transportation fuels and chemicals. Arkenol is a technology and project development company whose focus is the construction and operation of biorefineries on a worldwide basis to produce a variety of biobased chemicals and transportation fuels. These biorefineries utilize a proprietary technology, called concentrated acid hydrolysis, that converts various forms of biomass into simple sugars. It is from these sugars that many chemicals can be made.

Bluefire Ethanol [<http://www.bluefireethanol.com>]. California. Cellulosic ethanol. One of the recipients of multi-million dollar US DOE grants (\$385 million) in 2006. BlueFire Ethanol, Inc. is established to deploy the commercially ready, patented, and proven Arkenol Technology Process for the profitable conversion of cellulosic ("Green Waste") waste materials to ethanol, a viable alternative to gasoline. BlueFire's use of the Arkenol Process Technology positions it as the only cellulose-to-ethanol company worldwide with demonstrated production of ethanol from urban trash (post-sorted MSW), rice and wheat straws, wood waste and other agricultural residues.

BRI (Bioengineering Resources, Inc.) Energy [<http://www.brienergy.com>]. Ethanol and electricity. Developers of the BRI Renewable Energy Process, providers of the patented bacterial culture, chemicals and nutrients required for its operation, and consultants in plant design, construction and operation. The clean and cost effective process permits any carbon-based material to be converted into ethanol, electricity and other by-products. Worldwide, more than 50 patents have been awarded or are pending for its microorganisms, process and methods.

Catalyst Renewables [<http://www.catalystrc.com/lyonsdale.htm>]. Lyonsdale, New York. Co-gen 700 tons/day wood chips. Electricity to grid and steam heat to Burrows Paper Corporation. Partnering with SUNY-ESF.

Celunol (was BC International) [<http://www.celunol.com>]. Cambridge, MA. Cellulosic ethanol (ag waste, wood, bagasse, etc.). Bagasse plant in Jennings, LA, 1.4 million gals/year (small).

CleanTech Group, LLC [<http://www.cleantech.com>]. Investment group, \$3 trillion. Branch in Ann Arbor.

Diversa [<http://www.diversa.com>]. San Diego, CA. Enzymes. Partnered with Celunol. Enzyme technology for biofuels. Corn and cellulosic ethanol & biodiesel. Merged with Celunol in 2007.

Dyadic International [<http://www.dyadic.com>]. Jupiter, FL. Enzymes, biofuels, and biotherapeutics.

Dynamotive [<http://www.dynamotive.com>]. Ontario. Pair of wood-using plants. Pyrolysis to bio-oil. **Guelph-Evolution BioFuels** (200 tons biomass/day, 66,000 tons/year, 130,000 barrels/year), waste &

demolition wood. **West Lorne**-demo plant turning commercial (130 tons biomass/day), waste from Erie Flooring & Wood Products.

Enhanced Biofuels & Technologies (EBT) [<http://www.ebtplc.com>]. London, England and Tamilnadu, India. Ag feedstocks, fuels, algae. Several energy projects; biodiesel, ethanol, etc. Renewable energy links.

Flambeau River Papers [<http://www.forestrycenter.org/headlines.cfm?refid=97224>]. Park Falls, WI. Was Smartwood, bankrupt, bought by Johnson Timber (2006). Biorefinery, ethanol from pulp-making (18 million gallons/year). Energy self-sufficiency. No website, yet.

Genencor [<http://www.genencor.com/wt/home>]. Palo Alto, CA (8 USA mfg. and others international). Biocatalysts, enzymes, biochemicals, ethanol. Technology partners with other companies, including Mascoma Corp. \$17 million DOE grant in 2000.

Innovative Natural Resource Solutions LLC (INRS) [<http://www.inrsllc.com>]. Antrim, NH. Consultants. Bio-oil, wood energy, renewable energy, advocacy, economic development, land protection and management, forest certification, organizational management, and wildlife management and conservation.

Iogen Corporation [<http://www.iogen.ca>]. Ottawa, Ontario, Idaho plant. Cellulosic ethanol, enzymes, demo facility, commercial plant scheduled for Shelley, Idaho. One of the recipients of multi-million dollar US DOE grants (\$385 million) in 2006. Established in the 1970s, Iogen Corporation has become one of Canada's leading biotechnology firms. Iogen is the world leader in technology to produce cellulose ethanol, a fully renewable, advanced biofuel that can be used in today's cars. Iogen is also an industrial manufacturer of enzyme products with a focus on products for use by the pulp and paper, textile and animal feed industries. Iogen built and operates the world's only demonstration scale facility to convert biomass to cellulose ethanol using enzyme technology. This facility is located in Ottawa. Iogen is currently assessing potential locations for the world's first commercial prototype cellulose ethanol plant. In the long-term, Iogen intends to commercialize its cellulose ethanol process by licensing its technology broadly through turnkey plant construction partnerships. License fees and the supply of enzymes to the licensees' plants will generate income.

Laurentian Energy Authority Hibbing & Virginia, MN. Wood-based electricity and heat utility. Good example of partnership and government cooperation. Operational in 2006.

[slide show- <http://www.cleanenergyresourceteams.org/westcentral/biomass%20in%20Hibbing%20and%20Virginia-sm.pdf>].

Lignol Energy [<http://www.lignol.ca>]. Vancouver, British Columbia. Cellulosic ethanol, biorefineries, woody feedstocks, demo plant.

Maine Fractionation Development Center [<http://www.mainefdc.org>]. Rumford, Maine. Nurse organization to create biorefineries, such as the Maine Biodiesel, LLC. Six projects in 2007.

Fractionation Development Center is a non-profit organization that exists to identify, attract to Maine, and commercialize viable biomass-conversion technologies for the purpose of advancing energy security, economic activity, and sustainable resource use. The FDC does not engage in its own research and development. Instead, the FDC works with universities, federal labs, and private technology development labs in North America and Europe to bring the more attractive technologies to Maine. In evaluating the prospective technologies, the FDC uses its Technology Advisory Committee, made up of top-flight biomass conversion specialists from top-flight universities in America and Canada. Once a technology is settled on, the FDC engages industrial interest and partners via its Industrial Advisory Committee, a group of significant companies with interests in biomass technology or interests in Maine. Finally, the FDC uses its Financial Advisory Committee to critique and finance projects.

Mascoma Corporation [<http://www.mascoma.com>]. Cambridge, MA. Commercial plant opened in 2007, Rochester, NY. Partnerships between industry, academia, and government. Cellulosic ethanol, enzymes, technologies, processes, etc. Private venture capital and government grants.

MBI International [<http://www.mbi.org>]. Lansing, MI. Nurse organization to develop and commercialize innovation biotechnology ideas. Not yet much on the website (May 2007).

MEC Torrefaction, Inc. [<http://www.mectorrefaction.com>]. Victoriaville, Quebec. Sole North American company using torrefaction technology. They treat dimension lumber. Torrefaction might be used to manufacture higher energy, waterproof energy wood pellets.

Messersmith Industrial Combustion Systems [<http://www.burnchips.com>]. Bark River, MI. Michigan-based high-tech manufacturer of wood-chip energy systems. Listed on national biomass energy related analyses.

Michigan Biodiesel, LLC [<http://www.mibiodiesel.com>]. Bangor. Farmer and distributor co-op. B100 diesel.

Novozymes [<http://www.novozymes.com/en>]. Denmark (world HQ), North American operations in CA, NC, and VA. Enzymes, cellulosic ethanol, biochemistry, pharmaceuticals, etc. Novozymes biomass division is excited to play a leading role in the creation of an environmentally sustainable fuel ethanol industry based upon the conversion of lignocellulosic biomass substrates to ethanol and value-added products. Novozymes believes that the development of sustainable technologies will yield environmental and economic benefits essential to meet the needs of present and future generations.

Northeast Biofuels [<http://www.esf.edu/energycenter/bioproeng/default.htm>]. Fulton, NY. A giant corn ethanol plant (100 million gallons/year), partners with SUNY-ESF and state government. Production may begin in 2007.

Pacific Ethanol [<http://www.pacificethanol.net>]. California. Big ethanol producer, not necessarily cellulosic-based. The energy bill passed by Congress in 2005 requires an increase in ethanol use by refiners to 7.5 billion gallons by the year 2012. The market for ethanol in the United States has grown dramatically in recent years as states across the country have banned MTBE (Methyl Tertiary Butyl Ether), a fuel additive formerly required to increase octane levels of gasoline. Ethanol is the only other commercially viable additive that will bring gasoline into compliance with state and federal clean air regulations. In 2003, Californians consumed 750 million gallons of ethanol; 2004-2005 saw that number jump to 900 million gallons.

Poet (was Broin) [<http://www.poetenergy.com>]. Souix Falls, SD. Largely corn ethanol but has efforts in cellulosic ethanol (corn stover). One of the recipients of multi-million dollar US DOE grants (\$385 million) in 2006.

Range Fuels [<http://www.rangefuels.com>]. Georgia. Large wood-using ethanol/methanol plant for 2007, ~50 million gallons/year. One of the recipients of multi-million dollar US DOE grants (\$385 million) in 2006.

Renewable Energy Directory [<http://energy.sourceguides.com/index.shtml>]. Nearly 10,000 listings of businesses and organizations.

Royal Nedalco [<http://www.esf.edu/energycenter/bioproeng/default.htm>]. Netherlands. Major bio-ethanol producer in Europe. Many other products.

Sunopta Bioprocess Group [<http://www.sunopta.com/bioprocess/index.aspx>]. Brampton, Ontario. Process technology and equipment agreements with Royal Nedalco, Abengoa, Celunol, Greenfield, others. Cellulosic ethanol, other alcohols, other processes.

Syntec Biofuel [<http://www.syntecbiofuel.com>]. Vancouver, British Columbia. Cellulosic ethanol, transportation fuels, fermentation catalysts. Off-shoot of the University of BC.

Tamarack Energy [<http://www.tamarackenergy.com>]. CT, MA, NH and NY. Power plants (30+ mW) run on biomass, biodiesel (30 million gallons/year), other projects and technologies. Affiliated with Mascoma Corporation.

Xethanol [<http://www.xethanol.com>]. New York HQ, ethanol plant in Iowa (6 million gallons/year – small), Georgia (wood-using), cellulosic ethanol.



Government Agencies, Entities, and Efforts

National Renewable Energy Laboratory (DOE) [<http://www.nrel.gov>]

Located in Denver. An immense source of research and information. Partners with many companies and groups. Biomass is one of many programs. Biomass R&D efforts at NREL are focused on:

- *biomass characterization,*
- *thermochemical and biochemical biomass conversion technologies,*
- *biobased products development, and*
- *biomass process engineering and analysis.*

U.S. Department of Energy (DOE)

Another agency with a mass of information, lots of money, and several programs relevant to woody biomass conversion technologies.

Biofuels Program: <http://www1.eere.energy.gov/biomass>

The U.S. Department of Energy (DOE) has set a goal of displacing 30% of 2004 gasoline demand with biofuels, primarily ethanol, by 2030. Achieving this ambitious goal will require a rapid expansion of the fuel ethanol industry. Annual U.S. production will need to increase from about 4 billion gallons of corn grain ethanol to about 60 billion gallons per year from a variety of plant materials.

Biomass Program: http://www1.eere.energy.gov/biomass/program_areas.html

The U.S. Department of Energy (DOE) Biomass Program develops technology for conversion of biomass (plant-derived material) to valuable fuels, chemicals, materials and power, so as to reduce dependence on foreign oil and foster growth of biorefineries. Biomass is one of our most important energy resources. The largest U.S. renewable energy source every year since 2000, it also provides the only renewable alternative for liquid transportation fuel. Biomass use strengthens rural economies, decreases America's dependence on imported oil, avoids use of MTBE or other highly toxic fuel additives, reduces air and water pollution, and reduces greenhouse gas emissions. Today's biomass uses include ethanol, biodiesel, biomass power, and industrial process energy.

Biomass Feedstock Interface - The objective is to develop sustainable technologies capable of providing the necessary large supply of low-cost, high-quality lignocellulosic biomass to biorefineries that produce fuels, combined heat and power, chemicals, and other materials.

Sugar Platform - This involves the breakdown of biomass into raw component sugars using a range of chemical and biological processes. The objective of the Sugar Platform is to develop the capability of biomass to produce inexpensive sugar streams that can be used to make fuels, chemicals, and other materials that are cost competitive with conventional commodities. The residues from this process can also be used for power or to make other products.

Thermochemical Platform - The emphasis is on converting biomass or biomass-derived biorefinery residues to intermediates such as pyrolysis oil and syngas. These intermediates can be used directly as raw fuels or products, or may be further refined to produce fuels and products that are interchangeable with existing commercial commodities such as oils, gasoline, diesel, synthetic natural gas, and high-purity hydrogen.

Products R&D - This broad heading of products includes three market sectors: 1) fuels, 2) chemicals and materials, and 3) power. The products R&D portfolio focuses on bridging the gap between technology development and market demand by maximizing the value of all the components produced by the Sugar and Thermochemical Platforms. This research also supports the concept of producing multiple products from an integrated biorefinery.

Integrated Biorefinery - This is the ultimate deployment strategy for the Program. A biorefinery embodies a facility that uses biomass to make a range of fuels, combined heat and power, chemicals, and materials in order to maximize the value of biomass. The Program is taking a systems integration approach that translates the technical successes achieved in each of the other four core R&D areas to an integrated market-ready biorefinery. The goal of this R&D area is to establish integrated biorefineries through partnerships with industry and academia.

2007 DOE Cellulosic Ethanol Plant Grants - \$385 Million

Abengoa Bioenergy Biomass of Kansas, LLC of Chesterfield, Missouri, up to \$76 million.

The proposed plant will be located in the state of Kansas. The plant will produce 11.4 million gallons of ethanol annually and enough energy to power the facility, with any excess energy being used to power the adjacent corn dry grind mill. The plant will use 700 tons per day of corn stover, wheat straw, milo stubble, switchgrass, and other feedstocks. Abengoa Bioenergy Biomass investors/participants include: Abengoa Bioenergy R&D, Inc.; Abengoa Engineering and Construction, LLC; Antares Corp.; and Taylor Engineering.

ALICO, Inc. of LaBelle, Florida, up to \$33 million.

The proposed plant will be in LaBelle (Hendry County), Florida. The plant will produce 13.9 million gallons of ethanol a year and 6,255 kilowatts of electric power, as well as 8.8 tons of hydrogen and 50 tons of ammonia per day. For feedstock, the plant will use 770 tons per day of yard, wood, and vegetative wastes and eventually energycane. ALICO, Inc. investors/participants include: Bioengineering Resources, Inc. of Fayetteville, Arkansas; Washington Group International of Boise, Idaho; GeoSyntec Consultants of Boca Raton, Florida; BG Katz Companies/JAKS, LLC of Parkland, Florida; and Emmaus Foundation, Inc.

BlueFire Ethanol, Inc. of Irvine, California, up to \$40 million.

The proposed plant will be in Southern California. The plant will be sited on an existing landfill and produce about 19 million gallons of ethanol a year. As feedstock, the plant would use 700 tons per day of sorted green waste and wood waste from landfills. BlueFire Ethanol, Inc. investors/participants include: Waste Management, Inc.; JGC Corporation; MECS Inc.; NAES; and PetroDiamond.

Broin Companies [now Poet] of Sioux Falls, South Dakota, up to \$80 million.

The plant is in Emmetsburg (Palo Alto County), Iowa, and after expansion, it will produce 125 million gallons of ethanol per year, of which roughly 25 percent will be cellulosic ethanol. For feedstock in the production of cellulosic ethanol, the plant expects to use 842 tons per day of corn fiber, cobs, and stalks. Broin Companies participants include: E. I. du Pont de Nemours and Company; Novozymes North America, Inc.; and DOE's National Renewable Energy Laboratory.

logen Biorefinery Partners, LLC, of Arlington, Virginia, up to \$80 million.

The proposed plant will be built in Shelley, Idaho, near Idaho Falls, and will produce 18 million gallons of ethanol annually. The plant will use 700 tons per day of agricultural residues including wheat straw, barley straw, corn stover, switchgrass, and rice straw as feedstocks.

logen Biorefinery Partners, LLC investors/partners include: logen Energy Corporation; logen Corporation; Goldman Sachs; and The Royal Dutch/Shell Group.

Range Fuels (formerly Kergy Inc.) of Broomfield, Colorado, up to \$76 million.

The proposed plant will be constructed in Soperton (Treutlen County), Georgia. The plant will produce about 40 million gallons of ethanol per year and 9 million gallons per year of methanol. As feedstock, the plant will use 1,200 tons per day of wood residues and wood based energy crops. Range Fuels investors/participants include: Merrick and Company; PRAJ Industries Ltd.; Western Research Institute; Georgia Forestry Commission; Yeomans Wood and Timber; Treutlen County Development Authority; BioConversion Technology; Khosla Ventures; CH2MHill; Gillis Ag and Timber.

Forest Products Laboratory. www.fpl.fs.fed.us/tmu/wood_for_energy/wood_for_energy.html Supplemental Bibliography 1. Energy from Wood. Forest Products Laboratory. Numerous topics. 63 papers.

Bain R., Scahill J, and Bergman R. 2004. The Use of Small Modular Biopower for Energy Production From Forest Fuel Reduction Activities. Quarterly Progress Report. National Renewable Energy Laboratory and Forest Products Laboratory. 22 p. [www.fpl.fs.fed.us/tmu/pdf/fs_quarterly_progress_report_january_2004.pdf]

Bergman R. and Zerbe J. 2004. Primer on Wood Biomass for Energy. USDA Forest Service, State & Private Forestry Marketing Unit, Forest Products Laboratory. Madison, Wisconsin. 10 p. [www.fpl.fs.fed.us/tmu/wood_for_energy/primer_on_wood%20biomass_for_energy.html]

Ince P. 1979. How to Estimate Recoverable Heat Energy in Wood or Bark Fuels. US Forest Service Forest Products Laboratory, GTR-FPL-29. 10 p. [www.fpl.fs.fed.us/documnts/fplgtr/fplgtr29.pdf]

USFS. 2004. Partial List of Biomass Combuster Manufacturers. USDA Forest Service, State & Private Forestry Marketing Unit, Forest Products Laboratory. Madison, Wisconsin. 3 p. [www.fpl.fs.fed.us/tmu/wood_for_energy/partial_list_biomass_combustor.html].

USFS. 2004? Partial List of Multi-fuel Biomass Combuster Manufacturers. USDA Forest Service, State & Private Forestry Marketing Unit, Forest Products Laboratory. Madison, Wisconsin. 1 p. [www.fpl.fs.fed.us/tmu/wood_for_energy/partial_list_multi-fuel_combustor.html]

USFS. 2004? Wood Gasification Equipment. USDA Forest Service, State & Private Forestry Marketing Unit, Forest Products Laboratory. Madison, Wisconsin. 1 p. [www.fpl.fs.fed.us/tmu/wood_for_energy/wood_gasification.html]

USFS. 2004. Techline: Biomass for Small-scale Heat and Power. USDA Forest Service, State & Private Forestry Marketing Unit, Forest Products Laboratory. Madison, Wisconsin. 2 p. [www.fpl.fs.fed.us/documnts/techline/biomass-for-small-scale-heat-and-power.pdf]

Strigel M. and Meine C. (editors). 2001. Report of the Intelligent Consumption Project. Wisconsin Academy of Sciences, Arts and Letters and USDA Forest Service, Forest Products Laboratory. 39 pp. [www.fpl.fs.fed.us/tmu/wood_for_energy/intelligentconsumptionproject.pdf]

Zerbe J. 1987? Biofuels: Production and Potential. USDA Forest Service Forest Products Laboratory. 10 pp. [www.fpl.fs.fed.us/documnts/pdf1988/zerbe88a.pdf]

Zerbe J. 1993. Reduction of Atmospheric Carbon Emissions Through Displacement of Fossil Fuels. World Resource Review, Vol. 5, No. 4. 414-423.

Zerbe J. and Bergeman R. 2004. Basic Wood Energy Information. USDA Forest Service, State & Private Forestry Marketing Unit, Forest Products Laboratory. Madison, Wisconsin. 6 p. [www.fpl.fs.fed.us/tmu/wood_for_energy/basicenergyinformation.html]

Zerbe J. 1983. Energy Properties of Wood. In: Fuelwood Management and Utilization Seminar: Proceedings. 9-11 November 1982. East Lansing, MI. Michigan State University. Pp. 6-13. [www.fpl.fs.fed.us/documnts/pdf1983/zerbe83a.pdf]

USDA Grants. 24 January 2007 - Agriculture Secretary Mike Johanns today announced plans to propose \$1.6 billion in new funding for renewable energy, with a focus on cellulosic energy research and production, as part of the Administration's 2007 farm bill proposals. This funding will support President Bush's goal of reducing gasoline usage by 20 percent in the next ten years and will compliment an array of renewable energy-related efforts underway at the U.S. Department of Agriculture.

Non-Governmental Organizations, Trade Organizations

Note: There are more of these organizations but time did not allow a better search.

American Coalition for Ethanol (ACE) [<http://www.ethanol.org>]. Information, actions, documents, policy, etc. ACE is the grassroots voice of the U.S. ethanol industry, the nation's largest non-profit association dedicated to the use and production of ethanol. ACE members include ethanol producers, industry suppliers, associations, and individuals who care about renewable fuel.

BIO – Biotechnology Industry Organization [<http://www.bio.org>]. Lots of information, advocacy, papers, links, calendar, etc. About *biotechnology and GMOs (genetically modified organisms)* not specifically biomass energy/heat/fuels.

Bio-Pact [<http://biopact.com>]. European-African green energy connection. News service and information. The Biopact aims to use the potential for the production of bioenergy in the developing world, and most notably in sub-Saharan Africa, as a lever to create a new development paradigm in which access to energy, energy security and sustainability play key roles. Investing in bioenergy precisely offers a chance for the developing world to tackle both issues at once: it allows them to leapfrog beyond the climate damaging fossil fuel-based development parcours, and into a secure, sustainable and oil-independent future based on the exploitation of local biomass resources.

Dovetail Partners, Inc. [<http://www.dovetailinc.org>]. Consultants working in a variety of areas, including woody biomass conversion. Includes Jim Bowyer, retired from the University of Minnesota.

University / Research / State Government Groups

Note: These programs/projects/initiatives have been fairly difficult to find, so consider these as examples, not a comprehensive list.

Cornell University. 19 January 2007. To help advance technologies that convert perennial grasses and woody biomass to ethanol, Cornell professor of biological and environmental engineering Larry Walker will use a \$10 million grant from the Empire State Development Corp. to upgrade Cornell's industrial biotechnology laboratories.

Governors. October 2006 Ethanol Producer Magazine. At least six different governors from both political parties have announced plans within the past month to increase biofuel production and use in their states. Some of these plans contain specific proposals while others contain sweeping reforms. CT, GA, IL, IN, NJ, WI.

Michigan Tech. Wood-to-Wheels (W2W) is a Graduate Enterprise whose goal is to increase the overall efficiency of converting solar energy captured in forest and other biomass resources into products for transportation using ethanol, biodiesel, and green diesel as high energy-density carriers. The W2W Enterprise is identifying and addressing the technical and societal barriers to sustainably producing forest resources, processing biomass to create ethanol, biodiesel and other co-products, and then utilizing the bio-fuels and co-products in vehicle and engine applications.

North Carolina Biotechnology Center. [<http://www.ncbiotech.org>]

The world's first government-sponsored organization dedicated to developing the biotechnology industry. Our mission is to provide long-term economic and societal benefits to North Carolina through support of biotechnology research, business and education statewide.

Oklahoma. 2007. Gov. Brad Henry on Tuesday proposed the creation of a world-class Oklahoma Bioenergy Center to develop fuels that would lessen the country's dependence on foreign oil. If approved by the Legislature, the center would pool researchers from Oklahoma as well as other parts of the country to focus on biofuel research, development and education.

Purdue University. 19 March 2007. Purdue will find out this summer whether it will be home to one of three \$125 million centers to be funded by the Department of Energy to focus on turning cellulosic biomass into fuel at a commercially viable cost. 28 March 2007. Purdue University will get up to \$5 million in federal money to work on converting straw and other biomass material into fuel, the Department of Energy announced Tuesday. Purdue, a national leader in biofuels research, is getting one of five multimillion-dollar grants. The other four were awarded to companies. 19 April 2007. A joint BioEnergy project of Archer Daniels Midland Company (ADM) and Purdue University has been selected to receive funding by the U.S. Department of Energy (DOE) to further the commercialization of cellulosic ethanol.

SUNY-ESF [<http://www.esf.edu/communications/news/2006/12.20.ethanolgrant.htm>]. Lyondsale, NY. \$10.2 million grant for biorefinery development, cellulosic ethanol. Work with Catalyst Renewables (see above).

University California-Davis. 19 September 2007. Chevron Corp. will fund up to \$25 million in research at UC Davis in the next five years to develop affordable, renewable transportation fuels from farm and forest residues, urban wastes and crops grown specifically for energy. The researchers will address the vast range of variables -- from genetics to thermochemical reactions to economics -- that will be involved if many of our cars and trucks are to be powered in the future by something other than gasoline and diesel fuel.

Michigan Government Groups

Michigan Economic Development Council

On 20 April 2007, MEDC is convening the first meeting of the Cellulosic Biofuels Working Group. The "purpose is to develop a statewide economic development strategy as it relates to cellulosic biofuels" for Michigan.

Michigan Renewable Energy Commission

<http://www.renewablefuelscommission.org>

Established in 2006 as part of a bill package.

Michigan Renewable Energy Program

<http://www.michigan.gov/mpsc/0,1607,7-159-16393---,00.html>

Part of the Michigan Public Service Commission, committees: biomass, solar, wind, economic impacts, and financing.

North Central Bioeconomy Consortium (NCBEC), www.ncbioconsortium.org

Mostly agricultural crops, at this time. Created in April 2007 by the directors of state agriculture departments and university Extension and agricultural experiment stations from Michigan and 11 other Midwestern states. Besides Michigan, other states in the consortium are IL, IN, IA, KS, MN, MO, NE, ND, OH, SD, and WI. Together, these states have the potential to produce half to two-thirds of the nation's perennial bioenergy crops. The NCBEC has already received a \$100,000 grant from the Energy Foundation of San Francisco to coordinate regional public policy development and research for a renewable energy future. The consortium is also collaborating with the Midwest Governors' Association on policy review and development for a proposed energy summit to be held later this year.
