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## Summary of Federal Biofuel Incentives

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The information collected in this report is meant to assist those interested in investments (both public and private) in biofuel energy. Various programs and policies have been enacted in recent years that affect the production and utilization of multiple renewable energy sources, including biomass. The following information summarizes the currently available federal incentives pertaining to biofuels, categorized by type, and while extensive is not intended to be exhaustive. The information is believed to be accurate as of the date of this report; however, many programs and initiatives change quickly, so individuals interested in specific programs should contact the appropriate agency to obtain the latest details. Internet addresses are provided at the end of each summary where available.

### **Grants and Loans/Loan Guarantees**

- **Business and Industry Guaranteed Loans.** This USDA program is designed to improve the economic environment of rural communities. One of the eligible purposes of the program includes “Commercially available energy projects that produce biomass fuel or biogas,” as well as the general purchase of equipment. Eligible participants include cooperative organizations, corporations, partnerships, or other for-profit or non-profit legal entities; Indian tribes; public bodies; or individuals. Projects should benefit rural areas, defined as areas other than cities or towns of populations greater than 50,000. Terms include an 80 percent maximum guarantee on loans up to and including \$5 million; 70 percent maximum guarantee on loans greater than \$5 million up to and including \$10 million; and 60 percent maximum guarantee loans greater than \$10 million. Real estate loans may be up to 30 years, equipment for up to 15 or the useful life, and working capital up to 7 years. The maximum loan to a single borrower is \$10 million, with some exceptions up to \$25 million.  
[http://www.rurdev.usda.gov/rbs/busp/b&i\\_gar.htm](http://www.rurdev.usda.gov/rbs/busp/b&i_gar.htm)

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- **Renewable Energy Program for America (REAP)**

*Loan Guarantees.* This portion of the USDA program is designed to assist farmers, ranchers and rural small businesses. Eligible agricultural producers must receive at least 50 percent of their income from their agricultural operations. A small business must be in accordance with the Small Business Administration's (SBA) small business size standards NAICS code. The program encourages the commercial financing of renewable energy and energy efficiency projects, including the purchase of renewable energy systems such as systems that may be used to produce and sell electricity. Loans may be up to 75 percent of a project's cost for a maximum of \$25 million. Maximum guarantees are 85 percent for loans of \$600,000 or less; 80 percent for loans greater than \$600,000 but less than \$5 million; 70 percent for loans greater than \$5 million up to \$10 million; 60 percent for loans greater than \$10 million up to \$25 million. An individual applies for REAP loans through a USDA Rural Development State Office. REAP is authorized through FY 2012.

<http://www.rurdev.usda.gov/rbs/busp/9006loan.htm>

*REAP Grants.* Similar in design to REAP loans, REAP grants are available for eligible feasibility studies for renewable energy systems including projects that will produce energy from wind, solar, biomass, geothermal, hydro power and hydrogen-based sources. The energy to be produced includes heat, electricity, or fuel. Grants are limited to \$50,000 for renewable energy feasibility studies and can be up to 25 percent of total project costs. Individuals also apply for REAP grants through the USDA Rural Development State Office.

<http://www.rurdev.usda.gov/rbs/busp/REAPFEAS.htm>

- **Rural Business Enterprise Grants (RBEG).** The goal of the RBEG program is to provide financing (through third parties) for small and rural emerging businesses. RBEGs may fund a wide variety of projects, which can include those involving biofuels. Eligible participants include rural public entities, Indian tribes, and rural private non-profit corporations. Projects should benefit rural areas, defined as areas other than cities or towns of populations greater than 50,000, and benefit small and emerging businesses, which have 50 new employees or less and less than \$1 million in projected gross revenues. RBEGs have no maximum level of grant funding but give higher priority to smaller projects. Individuals apply for RBEGs through the USDA Rural Development State Office. RBEG is an ongoing program.

<http://www.rurdev.usda.gov/rbs/busp/rbeg.htm>

- **Value-Added Producer Grants Program (VAPG).** The primary purpose of this program is to support the development of business plans and marketing strategies for value-added products. VAPGs can be used for farm-based renewable energy. They are made directly to independent producers, farmer cooperatives, agricultural producer groups, and majority-controlled producer-based business ventures. Value-added agricultural products refer to "any agricultural commodity or product that has been changed, produced, or segregated such that the market for the product has expanded and where the greater portion of the revenue derived from the value-added activity accrues to the producer of the commodity or product." The maximum award is \$300,000, and VAPG is an ongoing program. Those who wish to apply should contact their USDA Rural Development State Office for more information.

<http://www.rurdev.usda.gov/rbs/coops/vadg.htm>

- **Loan Guarantee Program.** This Department of Energy program is designed to encourage and accelerate early commercial use of new or significantly improved technologies in energy projects,

including biomass. The program is specifically not intended for technologies in the research and development stage. Limitations are not specified other than loans do not exceed 80 percent of total project costs. Although the loan guarantee program is a standing program, DOE requests applications for specific technologies and currently has no open solicitations.

<http://www.lgprogram.energy.gov/index.html>

- **Biomass Research and Development Initiative.** A joint USDA/DOE program that awards grants to eligible entities to research, develop, and demonstrate biomass projects. Both Departments issue specific requests for proposals. The main areas are: (1) Feedstocks Development, (2) Biofuels and Biobased Products Development, and (3) Biofuels Development Analysis. Awards range from \$1 million to \$5 million, and 20 percent and 50 percent cost-sharing is required on research and development projects and demonstration projects, respectively. Those eligible to participate include: institutions of higher education; National Laboratories; Federal and state research agencies; private sector entities; nonprofit organizations; or consortiums of two or more of the preceding entities. Pre-application process is complete for FY09. The program has funding authorized through FY2012. Those interested should contact their USDA Rural Development State Office for more information.  
<http://www.csrees.usda.gov/fo/biomassresearchanddevelopmentinitiative.cfm> ;  
[http://www.afdc.energy.gov/afdc/progs/view\\_ind\\_fed.php/afdc/378/0](http://www.afdc.energy.gov/afdc/progs/view_ind_fed.php/afdc/378/0)
- **Biomass Crop Assistance Program (BCAP).** This program provides financial assistance to agricultural producers to provide biomass material to facilities that will convert it to heat, power, biobased products, or biofuels. BCAP is initially providing assistance for the collection, harvest, storage, and transportation (CHST) costs of providing biomass. Producers can receive matching funds for the value of biomass provided to designated facilities for conversion, up to \$45 per ton; i.e., BCAP will pay what the biomass facility pays up to \$45 per ton. Twelve locations in Mississippi are designated as qualified biomass conversion facilities. Crops that receive commodity payments under the farm bill, invasive or noxious plants, animal waste and byproducts, food and yard waste, or algae are not eligible to participate in BCAP. Producers are eligible for payments up to two years and the program is scheduled to expire in FY2012. Interested individuals should contact their local Farm Service Agency office for information.  
[www.fsa.usda.gov/FSA/webapp?area=home&subject=ener&topic=bcap](http://www.fsa.usda.gov/FSA/webapp?area=home&subject=ener&topic=bcap)
- **Bioenergy Program for Advanced Biofuels.** This USDA program provides payments primarily to small agricultural producers to expand production of advanced biofuels, which are essentially those derived from renewable biomass other than corn-kernel starch. Producers enter into a contract that provides payments based on quantity and duration of advanced biofuel production. Individual payments may be limited to ensure their equitable distribution. A limit of five percent of funding is provided to eligible producers with a refining capacity over 150,000,000 gallons per year. Mandatory funding is available through FY 2012. The application process is complete for 2009. Those interested should contact their USDA Rural Development State Office for more information.  
<http://www.rurdev.usda.gov/RBS/BUSP/9005Biofuels.htm>
- **Biorefinery Assistance Program.** The program provides loan guarantees for the development, construction, and retrofitting of commercial-scale biorefineries producing advanced biofuels and other facilities, including wood products facilities and sugar mills. The maximum loan guarantee is

\$250 million per project, and the amount will be reduced by any other federal funding received for the same project. Terms for the guarantees are 80 percent of principal and interest for loans less than \$80 million; 70 percent of the amount in excess of \$80 million for loans between \$80 and \$125 million; and 60 percent for the entire loan for loans of more than \$125 million. Loans will be for no more than 20 years or 85 percent of the life of the project. Those projects using first-of-its-kind technology on a commercial scale are given preference. Projects must be located in rural areas, defined as areas other than cities or towns of populations greater than 50,000. Eligible participants include: institutions of higher education; National Laboratories; state or local agencies; private sector entities; farmer cooperatives, rural electric cooperatives; public power entities, or consortiums of two or more of the preceding entities. Those interested in applying should contact their USDA Rural Development State Office for more information.

<http://www.rurdev.usda.gov/rbs/busp/baplg9003.htm>

- **Repowering Assistance.** This program is designed to provide grants or other payments to existing biorefineries to use renewable biomass to operate their energy systems. Eligible biorefineries must have been in existence on or before June 18, 2008, and must be in a rural area as defined above. \$20 million has been appropriated for the program in FY2009, which will remain available until exhausted. Funding is authorized through FY2012. Payments per applicant will be limited to 50 percent of total eligible project costs or \$5 million, whichever is less. The program is administered by USDA Rural Development.

<http://www.rurdev.usda.gov/rbs/>

- **Production Incentives for Cellulosic Biofuels.** The Energy Policy Act of 2005 authorized DOE to provide per gallon payments for the production of cellulosic biofuels until U.S. production reaches 1 billion gallons annually or August 8, 2015, whichever occurs first. DOE accepted comments on the program in 2006, but to date has not promulgated any regulations. Limitations on funding are no more than \$100 million in any one year; annual funding of \$25 million is authorized. Any facility in the U.S. producing cellulosic biofuels is eligible, providing permitting and financial requirements are met.

## Federal Tax Incentives

- **Volumetric Ethanol Excise Tax Credit (VEETC).** As of January 1, 2009, blenders of ethanol may qualify for a tax credit of \$0.45 per gallon of ethanol blended with gasoline. This credit is scheduled to expire December 31, 2010.

[http://www.afdc.energy.gov/afdc/progs/view\\_ind\\_mtx.cgi?user/AFS/US/0](http://www.afdc.energy.gov/afdc/progs/view_ind_mtx.cgi?user/AFS/US/0)

- **Biodiesel Tax Credit.** Taxpayers that use or sell at retail unblended biodiesel (B100) may qualify for a \$1.00 per gallon tax credit for biodiesel, agri-biodiesel, or renewable diesel. This credit expired December 31, 2009, but may be reinstated sometime in 2010.

[http://www.afdc.energy.gov/afdc/progs/view\\_ind\\_mtx.cgi?user/AFS/US/0](http://www.afdc.energy.gov/afdc/progs/view_ind_mtx.cgi?user/AFS/US/0)

- **Biodiesel Mixture Tax Credit.** Blenders may receive a tax credit of \$1.00 per gallon of biodiesel blended with diesel resulting in at least a 0.1 percent diesel mixture. Blenders must have produced

and sold or used the mixture as part of their business to be eligible for the credit. This credit expired December 31, 2009, but may be reinstated sometime in 2010.

[http://www.afdc.energy.gov/afdc/progs/view\\_ind\\_mtx.cgi?user/AFS/US/0](http://www.afdc.energy.gov/afdc/progs/view_ind_mtx.cgi?user/AFS/US/0)

- **Alternative Fuel Mixture Tax Credit.** Blenders may receive a tax credit of \$0.50 per gallon of alternative fuel blended to result in at least a 0.1 percent gasoline, diesel, or kerosene mixture. Alternative fuels that qualify include: compressed natural gas, liquefied natural gas, liquefied petroleum gas, liquefied hydrogen, P-Series fuel, liquid fuel derived from coal through the Fischer-Tropsch process, and compressed or liquefied gas derived from biomass. Blenders must have produced and sold or used the mixture as part of their business to be eligible for the credit. This credit expired December 31, 2009, (except for liquefied hydrogen, which expires September 30, 2014) but may be reinstated sometime in 2010.  
[http://www.afdc.energy.gov/afdc/progs/view\\_ind\\_mtx.cgi?user/AFS/US/0](http://www.afdc.energy.gov/afdc/progs/view_ind_mtx.cgi?user/AFS/US/0)
- **Small Ethanol (Agri-biodiesel) Producer Credit.** Producers of less than 60 million gallons annually of ethanol (agri-biodiesel) may qualify for an additional tax credit of \$0.10 per gallon on the first 15 million gallons produced a year. The ethanol credit is scheduled to expire on December 31, 2010, while the agri-biodiesel credit expired December 31, 2009, but may be reinstated sometime in 2010.  
<http://www.irs.gov/publications/p510/ch02.html>
- **Credit for Production of Cellulosic Biofuel.** Producers may receive a tax credit of \$1.01 per gallon produced. In the case of cellulosic ethanol, the credit is reduced by the amount of the VEETC and the Small Producer Credit, as applicable. The cellulosic biofuel producer credit is scheduled to terminate on December 31, 2012.  
<http://www.irs.gov/pub/irs-pdf/f6478.pdf>
- **Qualified cellulosic biomass ethanol plant property.** In the first year of operation, such plants may take a 50 percent additional depreciation deduction. The property must be placed in service before January 1, 2013.  
<http://www.irs.gov/pub/irs-pdf/p946.pdf>

## **Biomass-generated Electricity Incentives**

- **Renewable Energy Production Incentive (REPI) Program.** REPI was created in the Energy Policy Act of 1992, amended in 2005, for the purpose of providing financial incentives for producing renewable energy electricity. Renewable energy sources include solar, wind, geothermal, ocean, and biomass, with exceptions. Eligible electricity production facilities include non-profit electrical cooperatives, public utilities, and state/territorial/tribal governments. No incentive payment projects have been awarded to date to production facilities in Mississippi.

The REPI program provides payments for electricity generated by new qualifying renewable energy production facilities. Such facilities can receive annual incentive payments of \$0.015 per kilowatt hour, in 1993 dollars and indexed for inflation, for the first ten years of operation.

The Energy Policy Act of 2005 reauthorized the program for fiscal years 2006 through 2026. However, annual incentive payments are subject to the availability of appropriated funds and DOE can make no commitments beyond the funding in each fiscal year. Facilities must generate renewable energy electricity by September 30, 2016, to be eligible for incentive payments. Applications are submitted to the Department of Energy's Golden (CO) Field Office. DOE's web site for the program provides more information.

<http://apps1.eere.energy.gov/rep/>

- **Renewable Electricity Production Tax Credit (PTC).** Facilities producing and selling renewable energy electricity from qualified sources are eligible for a per kilowatt hour tax credit. These sources include closed-loop and open-loop biomass and municipal waste. Closed-loop biomass (i.e., organic material from plants grown specifically for use as energy) sources are eligible for a \$0.021 per kWh credit, while open-loop biomass (i.e., organic incidental and/or waste material used as energy) and municipal waste sources are eligible for credits of \$0.01 per kWh. Facilities must be operational by December 31, 2013. The duration of the credit is typically ten years, with the exception of some facilities that began in 2004 and 2005. The sources and deadlines were expanded by legislation in October 2008. The ARRA of 2009 allows taxpayers eligible for the production tax credit for new facilities to alternatively receive the business energy investment tax credit (see below) or receive a grant (also below) from the federal government.

<http://www.irs.gov/pub/irs-pdf/f8835.pdf>

[http://www.eia.doe.gov/oiaf/aeo/otheranalysis/aeo\\_2005analysispapers/prcreg.html](http://www.eia.doe.gov/oiaf/aeo/otheranalysis/aeo_2005analysispapers/prcreg.html)

- **Business Energy Investment Tax Credit (ITC).** The Energy Policy Act of 2005 and the Energy Improvement and Extension Act of 2008 modified the existing tax credit by expanding the duration and credit amounts for specific technologies. Most of the credits apply to systems in place by January 1, 2017. Solar, fuel cells, and small wind turbines can receive credit up to 30 percent of expenditures, with some limitations. Geothermal systems, microturbines, and combined heat and power can receive credit up to 10 percent of expenditures, again with some limitations.
- **U.S. Department of Treasury - Renewable Energy Grants.** In lieu of the PTC above, an eligible taxpayer may opt to receive a cash grant from the U.S. Treasury. The grants are for the technologies described above for the basis of the property that is put in place during 2009 and 2010, or for which construction begins in 2009 or 2010 and is in service by the specified credit termination date (varies by technology). Only tax-paying entities are eligible for the grant and applications must be submitted by October 1, 2011.

<http://www.treas.gov/recovery/1603.shtml>

- **Qualifying Advanced Energy Project Investment Tax Credit.** The American Recovery and Reinvestment Act of 2009 created investment tax credits for manufacturing facilities that produce renewable energy technologies. These technologies include those used to produce energy from the sun, wind, geothermal, or other sources; fuel cells, microturbines, or energy-storage systems associated with hybrid automobiles; equipment for refining or blending renewable fuels; and energy-conservation technologies. Most personal property that is tangible and required for the production process is eligible. Other property, excluding buildings, is eligible only if it is an essential part of the production process. The Treasury will issue up to \$3.2 billion in credits. Upon certification a taxpayer

has one year to meet the certification requirements and three years to have a project in service. Taxpayers receiving this credit are not eligible for the business energy ITC above.

[www.irs.gov/pub/irs-pdf/f3468.pdf](http://www.irs.gov/pub/irs-pdf/f3468.pdf)

- **Modified Accelerated Cost-Recovery System (MACRS) and Bonus Depreciation (2008-2009).** Most types of solar, geothermal, and wind electricity-generating property have had a five-year depreciation schedule in place since 1986. The Energy Policy Act of 2005 and the Energy Improvement and Extension Act of 2008 both expanded the types of property eligible within these classifications. For certain types of biomass property the MACRS life is seven years. For renewable energy systems acquired and put in place in 2008, a 50 percent bonus depreciation provision was included in the Economic Stimulus Act of 2008. The American Recovery and Reinvestment Act of 2009 applied this provision retroactively to the 2009 tax year. The owner of eligible property can deduct 50 percent of the adjusted basis in 2008 and 2009, and the remaining adjusted basis is deducted over the normal schedule. To be eligible, property must have a recovery period of 20 years or less and have been acquired and placed in service during 2008 or 2009 (or 2010 in some cases).
- **Clean Renewable Energy Bonds (CREBs).** The Energy Policy Act of 2005 originally created CREBs to finance public sector renewable energy projects. The CREBs for which the Energy Improvement and Extension Act of 2008 and the American Recovery and Reinvestment Act of 2009 allocated funds (\$2.4 billion) have substantially different provisions than the original bonds. The technologies that qualify are basically the same as those for the energy PTC above. Electric co-ops, government entities, and certain lenders may issue CREBs, although the allocation is equally split (1/3-1/3-1/3) among public utilities, electric co-ops, and government entities. Although they are issued with a 0 percent interest rate and the borrower pays back only the principal, often CREBs are issued at a discount to find a buyer. Instead of interest the bondholder receives federal tax credits. Under the current allocation the bondholder receives 70 percent of the credit. Applications under this allocation are due by August 4, 2009, and applicants have three years to issue bonds upon approval.  
<http://www.irs.gov/taxexemptbond/article/0,,id=206034,00.html>
- **Qualified Energy Conservation Bonds (QCEBs).** Similar to CREBs are Qualified Energy Conservation Bonds (QCEBs), as they are qualified tax credit bonds. They may be used by state, local, and tribal governments to finance energy projects, including renewable energy production (specifically, “rural development involving the production of electricity from renewable energy resources;” “Expenditures with respect to research facilities, and research grants, to support research in (i) development of cellulosic ethanol or other nonfossil fuels. . . .”; and also “Demonstration projects designed to promote the commercialization of (i) green building technology, (ii) conversion of agricultural waste for use in the production of fuel or otherwise. . . .”) QCEBs were created by the Energy Improvement and Extension Act of 2008, which set an initial ceiling of \$800 million, but the 2009 stimulus bill expanded it to \$3.2 billion. The bonds function similarly to the CREBs above, and tax credits issued through the bonds are treated as taxable income for the bondholder. Unlike CREBs, however, there is no approval process but the QCEBs are allocated to states based on population. States in turn are required to allocate a portion of the funds to large local governments, defined as municipalities/counties with populations of 100,000 or more.  
<http://www.irs.gov/taxexemptbond/article/0,,id=206034,00.html>

- **TVA Generation Partners Program**

Residential, industrial or commercial power customers of the Tennessee Valley Authority (TVA) who install renewable electricity generation systems can receive premium payments for the electricity they generate. Eligible technologies include solar, wind, low impact hydroelectric, and biomass. TVA will purchase 100 percent of the electricity generated at a rate of \$0.12 per kWh in addition to the retail electricity rate for solar and \$0.03 per kWh above the retail electricity rate for wind, low-impact hydroelectric, and biomass. As an example, if a residential customer pays a power company 10 cents per kWh for the electricity used each month, then TVA will pay that customer 22 cents (10 cents plus a 12 cent guaranteed premium) per kWh for 100 percent of the electricity generated by a solar photovoltaic system. If the amount of electricity generated exceeds the amount consumed, then the local power company at its discretion makes a payment either monthly or annually for the additional electricity. TVA retains the rights to any renewable energy credits such as tradable credits. Participants receive a \$1,000 incentive to help offset start-up costs. Systems must have a minimum output of 500 watts AC but no more than 999 kilowatts. Participants receive guaranteed payments for ten years once the agreement with the local power company begins. As of October 2009, 91 distributors in TVA's area participate in Generation Partners. Participation by local power companies is voluntary.

<http://www.tva.com/greenpowerswitch/partners/>

## Glossary

The following definitions are excerpted from the Alternative Fuels and Advanced Vehicles Data Center Glossary, available from <http://www.afdc.energy.gov/afdc/glossary.html>, and the USDA Economic Research Service Bioenergy Briefing Room Glossary, available from <http://www.ers.usda.gov/Briefing/Bioenergy/glossary.htm>.

**Advanced Biofuel**—Biofuels derived from renewable biomass other than corn-kernel starch (according to the Food, Conservation, and Energy Act of 2008, or 2008 Farm Act), including biofuel derived from cellulose, hemicellulose, lignin, and from sugar and starch other than cornstarch. Also includes ethanol from waste materials (crop residues, vegetative waste, animal waste, food waste, and yard waste); diesel-equivalent fuel derived from renewable biomass, including vegetable oil and animal fat; biogas; butanol; and butanol or other alcohols produced by the conversion of organic matter from renewable biomass. The Energy Independence and Security Act of 2007 specifies that advanced biofuels have lifecycle greenhouse gas emissions at least 50 percent less than baseline (2005) lifecycle greenhouse gas emissions for gasoline or diesel.

**Alternative Fuel**—Methanol, denatured ethanol, and other alcohols; mixtures containing 85% or more by volume of methanol, denatured ethanol, and other alcohols with gasoline or other fuels; natural gas; liquefied petroleum gas; hydrogen; coal-derived liquid fuels; non-alcohol fuels (such as biodiesel) derived from biological material; and electricity. 'P-Series' fuels were added to this list since the original definition in the Energy Policy Act of 1992.

**B100**—100% (neat) biodiesel.

**Biobased products**—A product determined by the Secretary of Agriculture to be a commercial or industrial product (other than food or feed) that is composed in whole or in significant part of biological products, including renewable domestic agricultural and forestry materials, or an intermediate ingredient or feedstock (according to the 2008 Farm Act).

**Biodiesel**—A biodegradable transportation fuel for use in diesel engines that is produced through transesterification of organically derived oils or fats. Biodiesel is used as a component of diesel fuel. In the future it may be used as a replacement for diesel.

**Biomass**—Renewable organic matter such as agricultural crops; crop waste residues; wood, animal, and municipal waste, aquatic plants; fungal growth; etc., used for the production of energy.

**Biorefinery**—According to the 2008 Farm Act, the term means a facility (including equipment and processes) that converts renewable biomass into biofuels and biobased products, and may produce electricity.

**E10 (Gasohol)**—Ethanol mixture that contains 10% ethanol, 90% unleaded gasoline.

**E85**—Ethanol/gasoline mixture that contains 85% denatured ethanol and 15% gasoline, by volume.

**Feedstock**—Any material converted to another form of fuel or energy product. For example, cornstarch can be used as a feedstock for ethanol production.

**Renewable biomass**—According to the 2008 Farm Act, renewable biomass is:

Materials that are byproducts of preventive treatments (e.g., trees, wood) that are removed to reduce hazardous fuels, to reduce or contain disease or insect infestation, or to restore ecosystem health; would not otherwise be used for higher value products; and are harvested from National Forest System land or public lands in accordance with public laws, land management plans, and requirements for old-growth maintenance.

Any organic matter that is available on a renewable or recurring basis from non-Federal land or land belonging to Indian tribes, including renewable plant materials (feed grains, other agricultural commodities, other plants and trees, algae), waste material (crop residue, other vegetative waste material including wood waste and wood residue), animal waste and byproducts (fats, oils, greases, and manure), construction waste, and food waste/yard waste.

**Transesterification**—A process in which organically derived oils or fats are combined with alcohol (ethanol or methanol) in the presence of a catalyst to form esters (ethyl or methyl ester).