



## The United States and Biofuels and Biobased Products Newsletter April 2013

**To our readers:** We, the Office of Agricultural Affairs U.S. Embassy France, would appreciate you informing us of your upcoming visits to the United States, as we can provide assistance with administrative procedures and organizing meetings. Please do not hesitate to share your comments with us, as we are here to facilitate these exchanges.

**Disclaimer:** The articles in this newsletter are from a variety of sources, and some may not represent official U.S. Government positions.

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# 1. Policy

## April 2013 - DOE renews funding for bioenergy research centers<sup>1</sup>

The U.S. Department of Energy announced it would fund its three Bioenergy Research Centers for an additional five-year period, subject to continued congressional appropriations. The three Centers—including the BioEnergy Research Center (BESC) led by Oak Ridge National Laboratory, the Great Lakes Bioenergy Research Center (GLBRC) led by the University of Wisconsin-Madison in partnership with Michigan State University, and the Joint BioEnergy Institute (JBEI) led by Lawrence Berkeley National Laboratory—were established by the Department's Office of Science in 2007 as an innovative program to accelerate fundamental research breakthroughs toward the development of advanced, next-generation biofuels.

The Centers have produced more than 1,100 peer-reviewed publications and over 400 invention disclosures and/or patent applications. Among the breakthroughs the Centers have achieved are new approaches for engineering non-food crops for biofuel production; reengineering of microbes to produce advanced biofuels such as "green" gasoline, diesel, and jet fuel precursors from biomass; and the development of methods to grow non-food biofuel crops on marginal lands so as not to compete with food production.

Established on the basis of a nationwide competition, each Center is designed to be a large, integrated, multidisciplinary research effort, funded at the rate of \$25 million per year. Emphasis in the next five years will be on bringing new methods and discoveries to maturity, developing new lines of research, and accelerating the transformation of scientific breakthroughs into new technologies that can transition to the marketplace.

For more information on the work of the Centers, visit <http://genomicscience.energy.gov/centers/>.

Press releases:

California: <http://newscenter.lbl.gov/news-releases/2013/04/04/doe-renews-jbei/>

Wisconsin/Michigan: <http://www.glbrc.org/?q=node/1855>

Tennessee: [http://www.ornl.gov/info/features/get\\_feature.cfm?FeatureNumber=f20130404-00](http://www.ornl.gov/info/features/get_feature.cfm?FeatureNumber=f20130404-00)

## March 2013 - USDA invites applications for renewable energy system and energy efficiency improvement projects<sup>2</sup>

USDA is seeking applications to provide assistance to agricultural producers and rural small businesses for energy efficiency and renewable energy projects. Funding is available from USDA's Rural Energy for America Program (REAP). Authorized by the Farm Bill, REAP is designed to help agricultural producers and rural small businesses reduce energy costs and consumption and help meet the Nation's critical energy needs. USDA is accepting the following applications:

- Renewable energy system and energy efficiency improvement grant applications and combination grant and guaranteed loan applications until *April 30, 2013*;
- Renewable energy system and energy efficiency improvement guaranteed loan only applications until *July 15, 2013*;

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<sup>1</sup> <http://science.energy.gov/news/in-the-news/2013/04-04-13/>

<sup>2</sup>

[http://www.usda.gov/wps/portal/usda/usdahome?contentid=2013/03/0057.xml&navid=NEWS\\_AUSUMS&navtype=RT&parentnav=ENERGY&edeployment\\_action=retrievecontent](http://www.usda.gov/wps/portal/usda/usdahome?contentid=2013/03/0057.xml&navid=NEWS_AUSUMS&navtype=RT&parentnav=ENERGY&edeployment_action=retrievecontent)

- Renewable energy system feasibility study grant applications through *April 30, 2013*.

Since the passage of the 2008 Farm Bill and through the end of Fiscal Year 2012, REAP has funded nationwide over 6,800 renewable energy and energy efficiency projects, feasibility studies, energy audits, and renewable energy development assistance projects.

### **February 2013 - EPA issues final rule for additional qualifying renewable fuel pathways under the RFS program<sup>3</sup>**

The U.S. Environmental Protection Agency (EPA) is taking final action to identify additional fuel pathways that the Agency has determined meet the lifecycle greenhouse gas (GHG) reduction requirements for biomass-based diesel, advanced biofuel, and cellulosic biofuel under the National Renewable Fuel Standard (RFS) program. This final rule describes EPA's evaluation of biofuels produced from camelina oil, which qualify as biomass-based diesel or advanced bio- fuel, as well as biofuels from energy cane which qualify as cellulosic biofuel. This final rule also qualifies renewable gasoline and renewable gasoline blendstock made from certain qualifying feedstocks as cellulosic biofuel. Lastly, the rule clarifies the definition of renewable diesel to explicitly include jet fuel. This clarification offers additional market certainty and opportunity for renewable diesel producers.

EPA's website on renewable fuels regulations and standards:

<http://www.epa.gov/otaq/fuels/renewablefuels/regulations.htm>

### **January 2013 - USDA: renewable energy system and energy efficiency improvement guaranteed loan and grant program - technology<sup>4</sup>**

Renewable Energy System and Energy Efficiency Improvement Grants announced in January 2013 must be used towards the project cost for the purchase, installation and construction of renewable energy generation systems. Eligible technologies under the program are divided into two categories:

- Renewable Energy Projects: (1) biomass, bio-energy, (2) biomass, anaerobic digesters, (3) geothermal, electric generation, (4) geothermal, direct use, (5) hydrogen, (6) solar, small, (7) solar, large, (8) wind, small, (9), wind, large, (10) hydroelectric, (11) ocean, (12) flexible fuel pump
- Energy Efficiency Improvements Projects include any energy savings measures to businesses or agricultural operations.

USDA's rural development energy programs: <http://www.rurdev.usda.gov/Energy.html>

### **September 2012 - EPA finalizes 2013 biomass-based diesel volume<sup>5</sup>**

The Environment Protection Agency established an applicable volume of 1.28 billion gallons for biomass-based diesel (BBD) for 2013. This volume represents an increase over the 1.0 billion gallons that was required in 2012, and will provide a substantial portion of the advanced biofuel

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<sup>3</sup> <http://www.epa.gov/otaq/fuels/renewablefuels/documents/420f13014.pdf>

<sup>4</sup> [http://www.rurdev.usda.gov/BCP\\_ReapResEei\\_Technology.html](http://www.rurdev.usda.gov/BCP_ReapResEei_Technology.html)

<sup>5</sup> <http://www.epa.gov/otaq/fuels/renewablefuels/documents/420f12059.pdf>

requirement of the Renewable Fuel Standard program. EPA sets this volume for 2013 based on consideration of the factors specified in the statute, including a consideration of biodiesel production, consumption, and infrastructure issues. As required under the statute, we also assessed the likely impact of BBD production and use in a variety of areas, including climate change, energy security, the agricultural sector, air quality, and others.

## **2. Economics**

### **March 2013 – New USDA- Dupont conservation collaboration to promote sustainable harvesting of biobased feedstocks for cellulosic ethanol<sup>6</sup>**

The joint agreement between USDA's Natural Resource Conservation Service (NRCS) and DuPont aims to set voluntary standards for the sustainable harvesting of agricultural residues for renewable fuel, and supports rural job creation, additional income for farmers, bio-based energy development, and the safeguarding of natural resources and land productivity.

The announcement involves the signing of a Memorandum of Understanding (MOU) between NRCS and DuPont. USDA, through NRCS, will provide conservation planning assistance for farmers who supply bio-based feedstocks to biorefineries as the industry begins to commercialize. Conservation plan, written for individual operations, will ensure sustainable harvest of corn crop residues while promoting natural resource conservation and land productivity. A conservation plan is a voluntary document, written in cooperation with farmers, which helps them protect natural resources while promoting a farm's economic sustainability.

Through the MOU, DuPont will develop a process to work with cooperating farms on sustainable harvest practices that help keep soil in the field and out of rivers, streams and lakes; promote healthier soils which help reduce flooding through increased infiltration rates, and provide for the efficient use of nutrients.

The first plant involved in this national agreement is northeast of Des Moines, Iowa, near the town of Nevada where DuPont is building a 30 million gallons/year cellulosic facility. This plant will use harvested residues from a 30-mile radius around the facility.

### **March 2013 – USDA/ARS – Measuring the potential of switchgrass pellets<sup>7</sup>**

Researchers in USDA/Agriculture Research Service (ARS), Pennsylvania State University and Drexel University conducted a life-cycle assessment comparing costs of energy generation from coal, natural gas, fuel oil, and switchgrass in the form of energy-dense cubes, briquettes, and pellets. They calculated the economic outlays associated with switchgrass production throughout the supply chain and the amounts of greenhouse gases emitted during switchgrass production, densification, and conversion to heat and power. This included the first life-cycle inventory of switchgrass seed production and the greenhouse gas emissions associated with it, which the team developed using real-world information from a Pennsylvania producer.

The analysis indicated that 192 pounds of “carbon dioxide equivalent ,” or CO<sub>2</sub>e were emitted for

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[http://www.usda.gov/wps/portal/usda/usdahome?contentid=2013/03/0058.xml&navid=NEWS\\_RELEASE&navtype=RT&parentnav=LATEST\\_RELEASES&edeployment\\_action=retrievecontent](http://www.usda.gov/wps/portal/usda/usdahome?contentid=2013/03/0058.xml&navid=NEWS_RELEASE&navtype=RT&parentnav=LATEST_RELEASES&edeployment_action=retrievecontent)

<sup>7</sup> <http://www.ars.usda.gov/is/AR/archive/mar13/switchgrass0313.htm>

every ton of switchgrass dry matter that was grown, harvested, and delivered to densification plants for processing into pellets. More than 54 percent of these emissions were from nitrous oxide resulting from nitrogen fertilizer application, while farm equipment operation also produced substantial levels of greenhouse gases. The researchers calculated that using switchgrass pellets instead of petroleum fuel oil to generate one gigajoule of heat in residences would reduce greenhouse gas emissions by 146 pounds of CO<sub>2</sub>e. Using switchgrass pellets instead of natural gas to produce one gigajoule of heat in residences would reduce greenhouse gas emissions by 158 pounds of CO<sub>2</sub>e.

Totaling all costs associated with installing an appropriate residential heating system and fuel consumption, the team concluded that each gigajoule of heat produced using switchgrass pellets would cost \$21.36. Using fuel oil to produce the same amount of heat would cost \$28.22. The savings would be less in a commercial facility, because capital costs for a commercial biomass boiler, storage, and fuel-handling equipment are five times greater than the costs for components that use fuel oil.

### **February 2013 - USDA agricultural projections to 2022<sup>8</sup>**

USDA's 10-year projections for the food and agriculture sector cover major agricultural commodities, agricultural trade, and aggregate indicators of the U.S. farm sector, such as farm income and food prices. The projections are based on specific assumptions about macroeconomic conditions, policy, weather, and international developments, with no domestic or external shocks to global agricultural markets.

The report includes an analysis of the demand for biofuel feedstocks, projected to continue growing, although at a slower pace than in recent years. Expansion will continue to depend on biofuels policies. The United States, Brazil, the European Union (EU), Argentina, Canada, China, and Indonesia, accounted for more than 90 percent of world biofuel production, consumption, and trade in 2012. Their dominance in global biofuels markets is expected to change little in the coming decade. Between 2013 and 2022, aggregate production in these countries is projected to rise about 30 percent for biodiesel and 40 percent for ethanol.

### **November 2012 – USDA Report: biomass supply from corn residues: estimates and critical review<sup>9</sup>**

The revised estimates of corn stover cost and supply fit today's yield and input situation, and confirm that corn stover supplies could be a low cost feedstock for a low cost and extensive bioenergy industry. Supplies of 100 million metric tons of stover would be available to an established industry at a delivered plant price between \$37.5/ton and \$40.5/ton. Stover cost remains highly competitive in today's energy market.

Ample supplies of the lowest cost and sustainable supplies are likely found in the middle of the cornbelt: Illinois, Indiana, Eastern Ohio, and Iowa. Also, sections of other states have some very low-cost supplies: eastern Nebraska, southern Minnesota, southern Wisconsin, and southern Michigan. Lastly, considerable stover supplies would be available at a somewhat higher but still very competitive price in some new cornbelt areas: eastern North Dakota, central Wisconsin/Michigan, and perhaps western New York.

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<sup>8</sup> <http://www.ers.usda.gov/publications/oce-usda-agricultural-projections/oce131.aspx>

<sup>9</sup> <http://www.usda.gov/oce/reports/energy/Biomass%20Supply%20From%20Corn%20Residues-Nov-2012.pdf>

## **September 2012 – Iowa State University report: biobased automobile parts investigation<sup>10</sup>**

The automotive industry has a very large potential to utilize biobased materials. The use of biobased products has been increasing, yet there are still many parts that may be replaced with biobased materials. This investigation has developed a collaborative list of parts in the top-selling automobiles manufactured in the United States. From this list of parts, an impending list of parts that have the potential to use biobased materials was developed. The list of industry associations, along with contact information for automobile manufacturers in the United States, enables discussions to begin on expanding the current automotive parts made from biobased materials with the assistance of a champion from the industry.

A summary table of automotive parts thought to have the greatest potential to be made of biobased material was compiled. This list of potential biobased parts may be expanded with emerging biobased advances. A majority of biobased parts currently being used was found to be in the interior of the vehicles.

## **Renewable Fuels Association's new publications**

- Pocket Guide to Ethanol 2013<sup>11</sup>
- Renewable Fuels Association Annual Industry Outlook, 2013<sup>12</sup>

## **3. Science**

### **March 2013 - DOE advanced technologies for biology brochure<sup>13</sup>**

The U.S. Department of Energy (DOE) Joint Genome Institute (JGI) Strategic Planning for the Genomic Sciences workshop was convened by the DOE Office of Science's Biological and Environmental Research Program (BER) on May 30–31, 2012. The goal was to explore DOE JGI's role in addressing DOE mission-critical scientific questions and in contributing data and knowledge to enable a new generation of research highly important to systems biology. This report represents the discussions and findings of that workshop.

### **January 2013- USDA announces investments in bioenergy R&D<sup>14</sup>**

Agriculture Secretary Tom Vilsack announced \$25 million to fund research and development of next-generation renewable energy and high-value biobased products from a variety of biomass sources. The projects announced are funded by USDA's National Institute of Food and Agriculture (NIFA) through the Biomass Research and Development Initiative, established in the 2008 Farm Bill. The

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<sup>10</sup> <http://www.usda.gov/oce/reports/energy/Biobased%20Automobile%20Parts%20Investigation%20Report.pdf>

<sup>11</sup> <http://www.ethanolrfa.org/pages/rfa-pocket-guide-to-ethanol>

<sup>12</sup> <http://ethanolrfa.org/page/-/PDFs/2013%20RFA%20Outlook.pdf?nocdn=1>

<sup>13</sup> [http://genomicscience.energy.gov/userfacilities/StructuralBiology\\_flyer.pdf](http://genomicscience.energy.gov/userfacilities/StructuralBiology_flyer.pdf)

<sup>14</sup> [http://www.nifa.usda.gov/newsroom/news/2013news/01112\\_brdi.html](http://www.nifa.usda.gov/newsroom/news/2013news/01112_brdi.html)

funded research will help increase the availability of alternative renewable fuels and biobased products to diversify the nation's energy resources. The Department of Energy will make additional awards through this program. Each award was made through a competitive selection process.

Grant recipients are required to contribute a minimum of 20 percent matching funds for research and development projects and 50 percent matching funds for demonstration projects. Awardees must pursue projects that integrate science and engineering research in three areas: feedstocks development, biofuels and biobased products development, and biofuels and bioproducts development analysis. The following projects have been selected for awards: Kansas State University (camelina as biofuel and bioproduct feedstock); Ohio State University (anaerobic digestion system from animal manure, agricultural residues, woody biomass and energy crops); Ceramatec, Inc., Salt Lake City, Utah (conversion of lignocellulosic biomass to infrastructure-compatible renewable diesel, biolubricants, animal feed and biopower); and USDA-Agricultural Research Service, Eastern Regional Research Center, Wyndmoor (conversion of forest residues, horse manure, switchgrass and other perennial grasses into biofuels and high-value specialty chemicals).

### **January 2013 - Corn cobs on deck for cellulosic feedstock<sup>15</sup>**

Corn crop residues are often left on harvested fields to protect soil quality, but they could become an important raw material in cellulosic ethanol production. Research conducted by USDA/Agriculture Research Service indicates that soil quality would not decline if post-harvest corn cob residues were removed from fields. This work supports the USDA priority of developing new sources of bioenergy. ARS led studies that compared runoff rates and sediment loss from no-till corn fields where postharvest crop residues were either removed or retained.

The team concluded that even though cob residues did slightly delay the onset of runoff, sediment loss rates were not significantly affected by the presence or absence of the cobs. The results indicated that the cobs could be removed from other residue and used for bioenergy feedstock without significantly interfering with the role of crop residues in protecting soils.

A related study examined how the removal of cob residues affected soil nutrient levels. Over the course of a year, sampling indicated that cobs were a source of soil potassium, but that they weren't a significant source of any other plant nutrients.

### **December 2012 - USDA grants support sustainable bioenergy production<sup>16</sup>**

USDA's National Institute of Food and Agriculture (NIFA) awarded \$10 million research grants through the Agriculture and Food Research Initiative (AFRI). AFRI's sustainable bioenergy challenge area targets the development of regional systems for the sustainable production of bioenergy and biobased products that: contribute significantly to reducing dependence on foreign oil; have net positive social, environmental, and rural economic impacts; and are compatible with existing agricultural systems.

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<sup>15</sup> <http://www.ars.usda.gov/is/pr/2013/130131.htm>

<sup>16</sup>

[http://www.usda.gov/wps/portal/usda/usdahome?contentid=2012/12/0360.xml&navid=NEWS\\_AUSUMS&navtype=RT&parentnav=ENERGY&edeployment\\_action=retrievecontent](http://www.usda.gov/wps/portal/usda/usdahome?contentid=2012/12/0360.xml&navid=NEWS_AUSUMS&navtype=RT&parentnav=ENERGY&edeployment_action=retrievecontent)

The long-term goal for the research projects, which were selected through a highly competitive process, is to implement sustainable regional systems that materially deliver liquid transportation biofuels to help meet the Energy Independence and Security Act goal of 36 billion gallons per year of biofuels by 2022. The programs focus on the many environmental, social and economic benefits and trade-offs associated with decisions and policies regarding the where, when, and how of national and regional biofuels development. Projects were awarded in four areas: 1) policy options for and impacts on regional biofuels production systems, 2) impacts of regional bioenergy feedstock production systems on wildlife and pollinators, 3) socioeconomic impacts of biofuels on rural communities, and 4) environmental implications of direct and indirect land use change

### **August 2012 - DOE Joint Research Institute strategic planning for the genomic sciences<sup>17</sup>**

The U.S. Department of Energy (DOE) Joint Genome Institute (JGI) Strategic Planning for the Genomic Sciences workshop was convened by the DOE Office of Science's Biological and Environmental Research Program (BER) on May 30–31, 2012. The goal was to explore DOE JGI's role in addressing DOE mission-critical scientific questions and in contributing data and knowledge to enable a new generation of research highly important to systems biology. This report represents the discussions and findings of that workshop.

### **August 2012 - USDA DOE plant feedstock awards<sup>18</sup>**

Integrating the U.S. Department of Energy's capabilities in genomic sequencing and analysis for production of biofuels with the USDA long experience in crop improvement, DOE and USDA are working together to fund projects that accelerate plant breeding programs and improve bioenergy feedstocks. Investigators in these projects are characterizing the genes, proteins, and molecular interactions that influence lignocellulosic biomass production. In 2012, nine projects were selected for USDA/DOE awards totaling \$11.5 million.

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<sup>17</sup> <http://genomicscience.energy.gov/userfacilities/jgi/futuredirections/index.shtml>

<sup>18</sup> [http://genomicscience.energy.gov/research/DOEUSDA/usda\\_doe\\_handout.pdf](http://genomicscience.energy.gov/research/DOEUSDA/usda_doe_handout.pdf)

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