USDA

United States Department of Agriculture

ADVANCING

ReNewable Energy

Advancing ReNewable Energy and Energy Efficiency at USDA

In the 21st century, America has energy needs that are greater than ever before. We face new challenges to increase energy security, protect our environment, and create jobs to boost our economy. The U.S. Department of Agriculture (USDA) is working every day in every way to encourage and support the development, production, and delivery of clean, renewable, domestically produced energy. Our efforts cover the entire renewable energy supply chain: research and development activities; financial assistance to agriculture and forest producers for raising and harvesting energy crops; financing biorefineries that will produce renewable sources of fuel and power; and providing technical and financial assistance to agricultural producers and rural small business to assist them in becoming more energy efficient. We are working to lead the way for a clean energy future for our country.

How USDA Supports Our Energy Future

The USDA has a long history of supporting the research and development of renewable energy resources and is deeply involved in and committed to the Nation's quest for energy security. The Food, Conservation, and Energy Act of 2008 Act (Farm Bill) provides over **$1 billion** of mandatory funding during a 5-year period to support a comprehensive approach to energy efficiency and renewable energy development in rural America. The Farm Bill programs were designed to increase America's energy security, improve the environment, and strengthen rural economies through development and production of renewable energy and the creation of sustainable green jobs.

USDA has many programs to assist farmers, forest landowners, rural businesses, rural residents, and the Nation to respond to energy-related issues and opportunities. These range from basic scientific research to the development and commercialization of new technologies. They include outreach and education, technical assistance programs, financial support for infrastructure, and the adoption of biobased and energy-saving products by USDA itself. We support more efficient farming and sustainable feedstock production and management techniques; geothermal facilities; solar and wind farms; current and advanced bioenergy production supply chains; and biochemical and genomics research. USDA also supports modernization of the rural electric grid to support renewable energy development to move renewable electricity to markets, as well as the deployment of smart grid technologies.

USDA recognizes that renewable energy, energy efficiency, and conservation programs provide opportunities for economic growth and prosperity in rural America. USDA further recognizes that energy conservation in the production of food and other consumable products is important to producer and market costs, reduction of greenhouse gas emissions, and resource conservation.

USDA draws expertise from more than a dozen USDA agencies and offices, including:

- Agricultural Marketing Service
- Agricultural Research Service
- Departmental Management
- Economic Research Service
- Farm Service Agency
- Forest Service
- Foreign Agricultural Service
- National Agricultural Statistics Service
- Natural Resources Conservation Service
- National Institute of Food and Agriculture
- Office of the Chief Economist
- Rural Development, Rural Business and Cooperative Service
- Rural Development, Rural Housing Service
- Rural Development, Rural Utilities Service

USDA supports the entire supply chain of renewable energy production, from feedstock research and development to the consumer, through programs in:

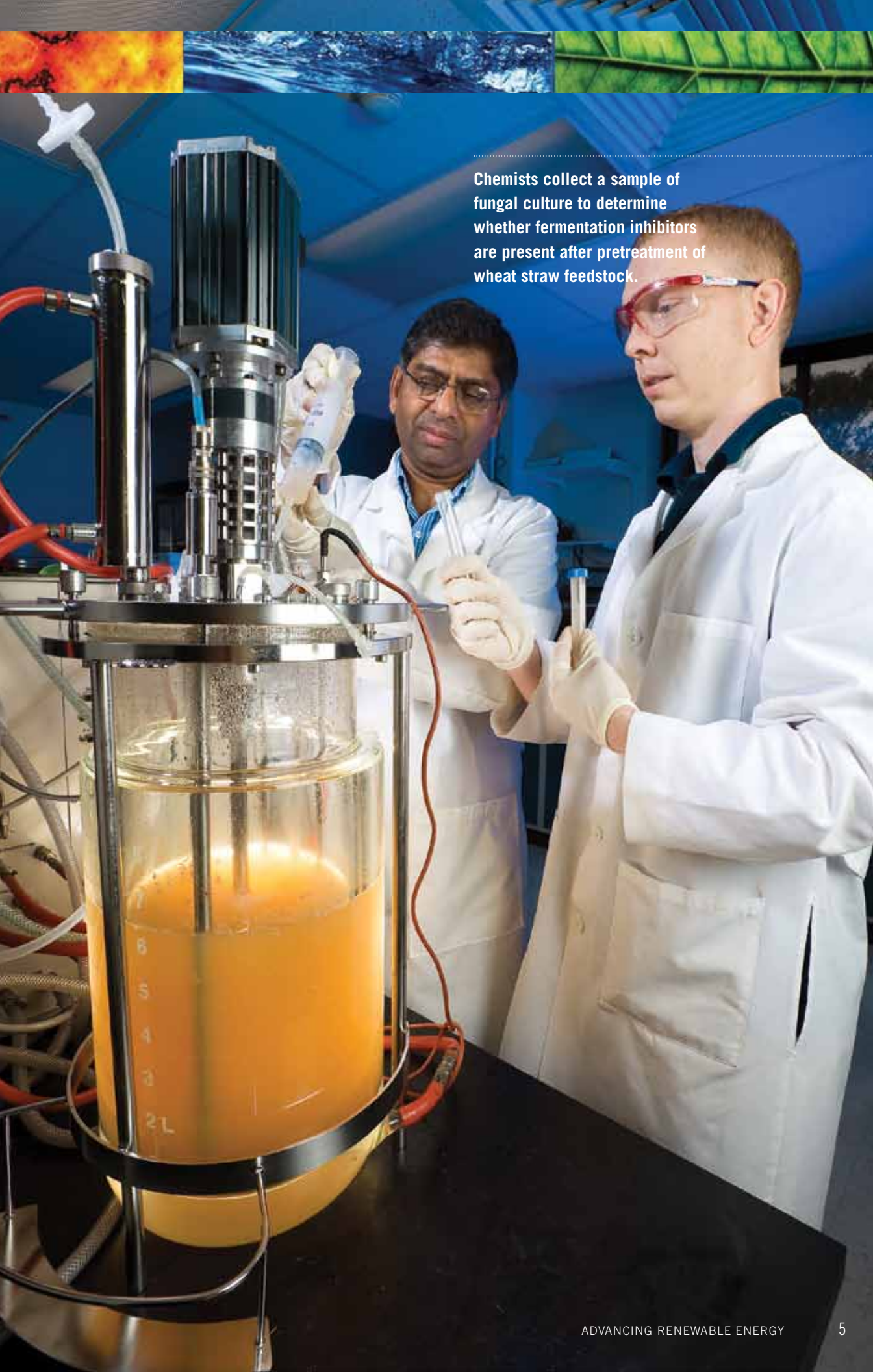
- Research and education
- Feedstock development and production
- Feedstock conversion and commercialization
- Renewable electricity production
- Energy efficiency and conservation
- Other USDA energy-related programs

Research and Education

USDA provides leadership for the facilitation and development of regional systems for the sustainable production of biofuels and biobased products through collaboration with a wide range of partners, including other Federal agencies, State and local agencies, academic institutions, non-governmental organizations, tribes, and industry. By taking an integrated regional systems approach that addresses the entire technology and business supply chain, economically, socially, and environmentally sustainable systems may be developed to serve the unique opportunities that vary from region to region. Toward this end, USDA conducts and facilitates research and development programs and activities.

Research, Education and Economics (REE)/Agricultural Research Service (ARS) and Natural Resources and Environment (NRE)/Forest Service (FS) lead USDA's intramural research efforts on renewable energy through USDA Regional Biomass Research Centers located throughout the country, often close to major universities.

REE/National Institute of Food and Agriculture (NIFA) provides leadership and funding for USDA's extramural (outside) research, development, demonstration, education, and outreach activities through both competitive programs, such as the Agriculture and Food Research Initiative Sustainable Bioenergy Challenge, the USDA/U.S. Department of Energy (DOE) joint Biomass Research and Development Initiative (BRDI), the USDA/DOE Plant Feedstock Genomics for Bioenergy Program, Small Business Innovation Research (SBIR) Program, and non-competitive programs supporting universities. NIFA supports programs targeting workforce and human capital development for regional systems for the sustainable production of bioenergy and biobased products. NIFA's support to universities provides curricula and training for future scientists, technicians, analysts, and managers. (www.nifa.usda.gov) Cooperative Extension personnel work with farmers, processors, and rural communities to ensure that information on best regional practices relating to feedstock crop production and logistics is available.



Chemists collect a sample of fungal culture to determine whether fermentation inhibitors are present after pretreatment of wheat straw feedstock.

Feedstock Development and Production

Assistance is available to support many phases of the feedstock development process, from research through the collection, harvest, storage, and transportation phases, as well as the conversion phase. USDA REE, Forest Service, and Natural Resources Conservation Service are leading avancements by developing new "dedicated energy crops" (e.g., biomass sorghum, perennial grasses, energy cane, wood, and oil crops, including algae) and funding others' research in these crops that may be converted to second-generation advanced blending fuels (i.e., cellulosic ethanol) and third-generation advanced biofuels, such as biogasoline, biodiesel, and aviation fuel, that are compatible with existing distribution infrastructure and existing internal combustion engines. The NRCS Plant Materials Program has been working on bioenergy feedstock development and production for a number of years. We have developed a number of switchgrass varieties and are working on other feedstocks as well.

The Farm Service Agency runs the Biomass Crop Assistance Program (BCAP), which promotes the cultivation of non-conventional crop biomass for heat, power, biobased products, and biofuels. BCAP is authorized to fund two main types of activities. First, it will provide funding for producers of eligible renewable crops within selected project areas to receive payments up to 75 percent of the cost of establishing the crop and annual payments for up to 15 years for crop production. Second, it provides up to 2 years of funding for agriculture and forest landowners to assist with the cost of collection, harvest, storage, and transportation of the biomass to qualified biomass facilities that covert it into heat, power, biobased products, or advanced biofuels. (www.fsa.usda.gov/bcap)

Harvesting sweet sorghum: New, low-lignin sorghum germplasm lines developed by Agricultural Research Service and collaborating university scientists are now available for bolstering the grain crop's value as both a livestock feed and an ethanol resource.

Feedstock Conversion and Commercialization

Through its NRE/FS and Rural Development grant and loan programs, USDA implements conversion and commercialization strategies and supports agriculture producers and forest landowners, rural small businesses, electric cooperatives, and other rural investors in utilizing renewable resources, such as biomass (ethanol, biodiesel, methane gas recovery), wind, solar, ocean, hydroelectric, and geothermal power.

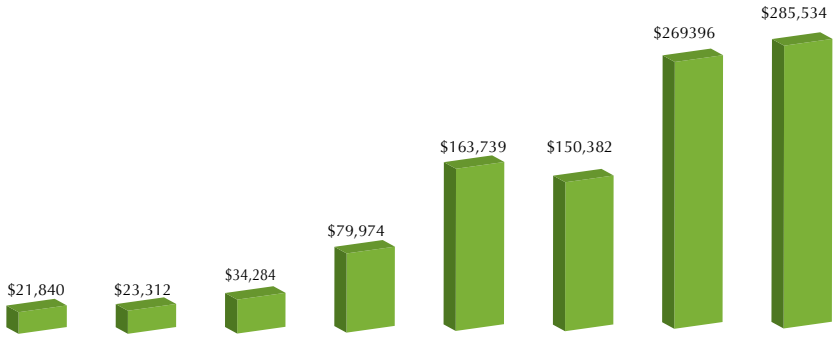
USDA regional Biomass Research Centers are developing sustainable supply chain strategies and science-based implementation plans designed to accelerate biofuels feedstock production and reduce transaction costs to feedstock producers and biorefineries. Regionalized biofuels feedstock production and conversion systems can minimize transaction costs and create new rural wealth. USDA is coordinating with DOE to enhance work underway through DOE's Regional Feedstock Partnerships and the Bioenergy Research Centers.

Woody biomass utilization:
The harvest, sale, offer, trade, or utilization of woody biomass to produce bioenergy and the full range of biobased products including lumber, composites, paper and pulp, furniture, housing components, round wood, ethanol and other liquids, chemicals, and energy feedstocks.

USDA Programs Supporting Feedstock Conversion and Commercialization:

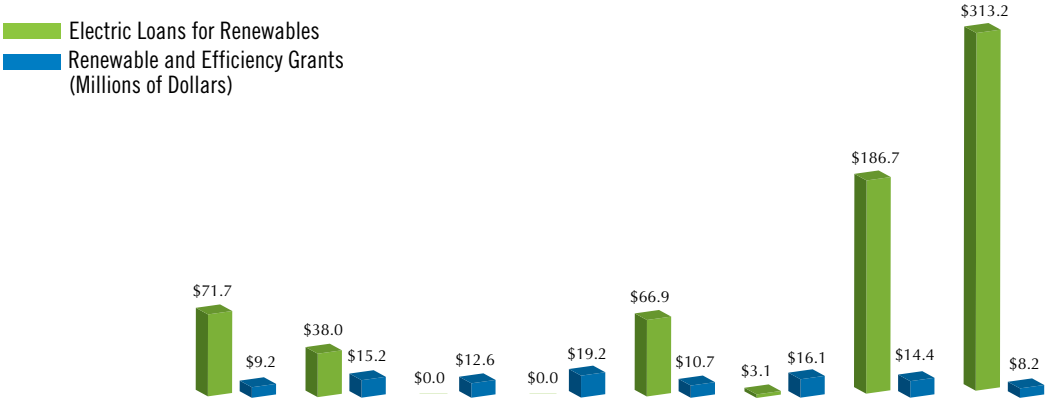
- **Biorefinery Assistance Program** provides loan guarantees of up to **$250 million** for the development, construction, and retrofitting of commercial scale biorefineries that produce advanced biofuels (fuels derived from renewable biomass, other than corn kernel starch). (www.rurdev.usda.gov)
- **Repowering Assistance Program** is a payment program to eligible biorefineries to encourage the use of renewable biomass as a replacement fuel source for fossil fuels used to provide process heat or power in the operation of these eligible biorefineries. (www.rurdev.usda.gov)
- **Bioenergy Program for Advanced Biofuels** payment program supports and ensures an expanding production of advanced biofuels (fuel derived from renewable biomass, other than corn kernel starch) by providing assistance payments to eligible advanced biofuel producers. (www.rurdev.usda.gov)
- **Rural Energy for America Program** (REAP) grant and loan guarantee program is designed to assist agriculture producers and rural small businesses. A producer or company can apply for a loan guarantee of up to **$25 million** or for a grant up to **$500,000**. The total grant cannot exceed 25 percent, and a combined loan guarantee and grant cannot exceed 75 percent of total project costs. This program funds renewable energy systems and energy-efficiency improvements. Energy audits and feasibility studies are also eligible for assistance. REAP also supports energy-efficiency efforts. (www.rurdev.usda.gov)
- **Woody Biomass Utilization Grants**, through the USDA NRE/Forest Service State and Private Forestry Technology Marketing Unit, help to improve forest restoration activities by using and creating markets for low-valued material and woody biomass removed from forest restoration activities on both public and private forest lands. These funds are targeted to help communities, entrepreneurs, and others turn residues from hazardous fuel reduction and forest health activities into marketable forest products and/or energy products. (www.fpl.fs.fed.us/research/units/tmu/tmugrants.shtml)

Rural Business Renewable Investments, 2003-2010



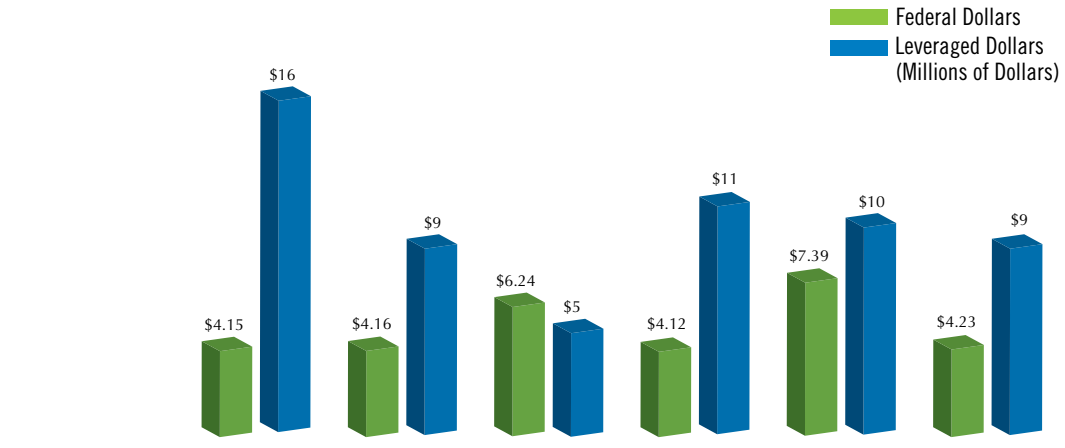
Year	2003	2004	2005	2006	2007	2008	2009	2010
Projects	114	163	158	412	436	764	1,559	2,609
Jobs Saved/Created	736	411	289	1,357	2,122	1,797	5,981	2,371

Rural Utilities–Infrastructure Renewable Energy and Efficiency Investments, 2003-2010



Year	2003	2004	2005	2006	2007	2008	2009	2010
Total	81.0	53.3	12.6	19.2	77.6	19.2	201.1	321.5
Jobs at 23 jobs per $million	1,863	1227	290	442	1,787	443	4,628	7,396

Forest Service Woody Biomass Utilization Grant Programs, 2005-2010



Year	2005	2006	2007	2008	2009	2010
Projects Funded	19	16	26	17	28	13
Jobs Saved/Created	48	61	222	271	107	NA
Green Tons Removed (thousands of tons)	93.9	120.9	438.9	535.0	212.7	NA

ReNewable Electricity Production

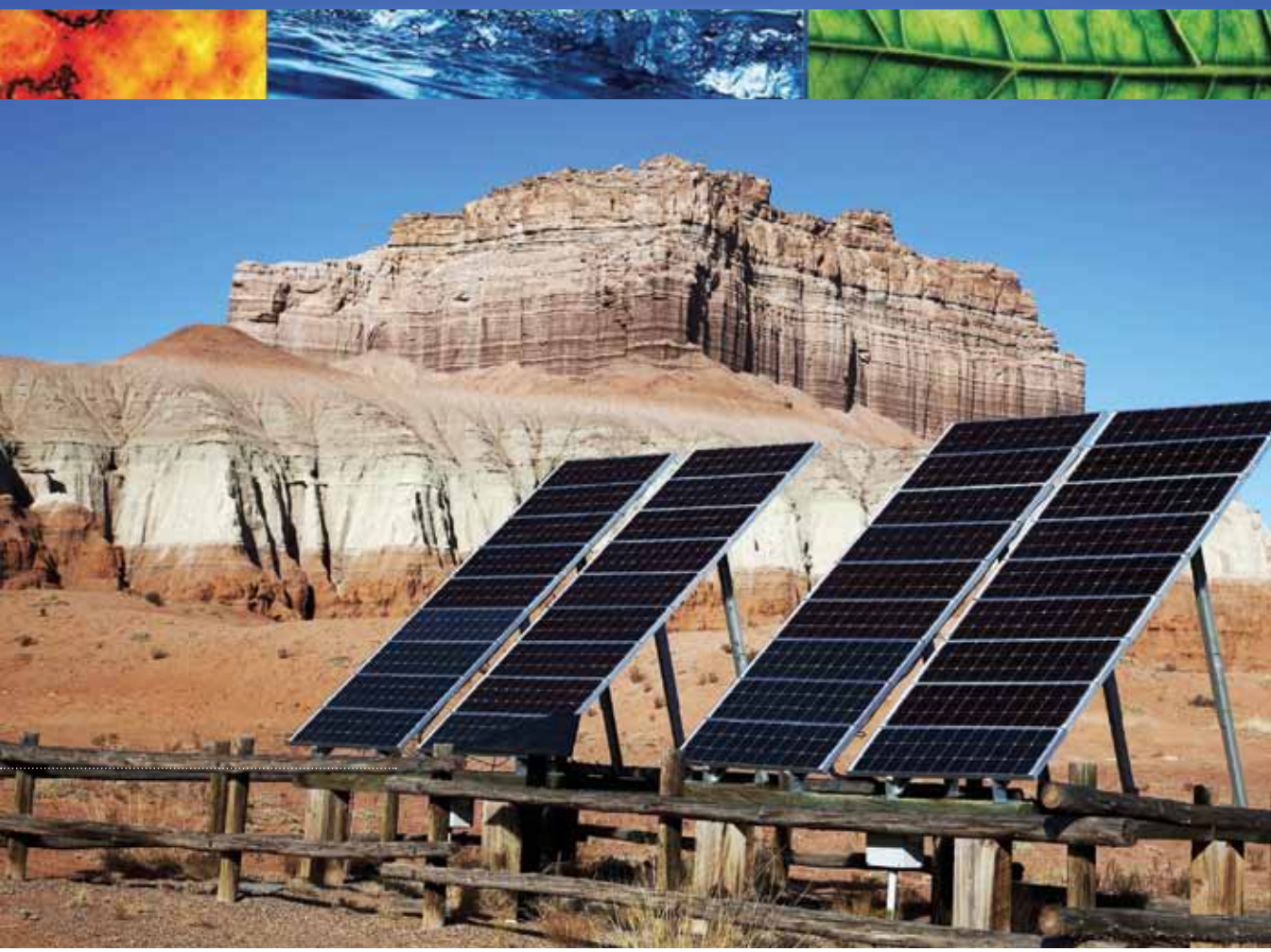
- **Electric Loan Programs**
  Through the Rural Utilities Service (RUS), USDA finances electric infrastructure in rural areas to ensure availability of modern, reliable, secure, and affordable electricity for rural communities and businesses, supporting the production and delivery of renewable energy and other domestic energy resources. Electric loans and loan guarantees are available to rural cooperatives, utilities, and other rural electricity providers for building and improving generation, transmission, and distribution facilities; on-grid and off-grid renewable energy systems; wind, solar, biomass, hydroelectric, and geothermal systems; and for energy efficiency and conservation programs. In FY 2009, RUS approved $186.7 million in rural electric infrastructure loans for renewable energy projects. In FY 2010, RUS awarded $313.2 million in renewable energy loans.
- **High Energy Cost Grants**
  The High Energy Cost Grant Program, administered through RUS, provides grants for rural communities with average home energy costs exceeding 275 percent of the national average to help meet generation, transmission, and distribution needs. Because renewable energy and energy-efficiency projects can be cost effective, USDA during 2009 awarded $10.2 million in grants for wind, solar, and biomass energy projects in extremely high energy cost communities.

The Rural Utilities Service (RUS) Electric Program provides funding to upgrade, expand, maintain, and replace America's vast rural electric infrastructure.

Energy Efficiency and Conservation

Increasing the energy efficiency of our rural small businesses, farms, and homes is a key priority for USDA. This involves reducing the consumption of fuel, fertilizers, and herbicides; adopting new energy technologies and equipment to optimize energy efficiency; and promoting the use of renewable energy in daily operations. An integral component of this efficiency initiative is to increase the sequestration of carbon dioxide through innovative farming and forest management techniques.

USDA's Agricultural Research Service (ARS) leads USDA intramural scientific research to enable new technologies and practices for increasing the energy efficiency of agricultural operations. USDA's Forest Service Research and Development (FS R&D) leads USDA intramural research to develop forest-based bioenergy and bioproduct options, systems, and strategies. USDA Natural Resources and Environment (NRE) agencies, the Forest Service and the Natural Resources Conservation Service (NRCS), ensure the health of the land through sustainable management. They work to prevent damage to natural resources and the environment, restore the resource base, and promote good land management. NRCS provides technical and financial assistance for farm and ranch energy audits, as well as Web-based tools to help farmers and ranchers reduce energy consumption. In addition, Rural Development has several programs dedicated to reducing energy costs and increasing energy efficiency for ag producers, rural small businesses, and homeowners.



Solar

The Rural Utilities Service (RUS) High Energy Cost Grant Program awarded $3 million to Sacred Power Corporation of Albuquerque, New Mexico, to install hybrid solar photovoltaic (PV) power stations for remote tribal homes in the Bird Springs, Coppermine and Inscription House Chapters of the Navajo Nation in Arizona. These systems will allow the off-grid homeowners to discontinue use of noisy and expensive gasoline generators for electricity. The grant also covers more energy-efficient appliances, lighting, and HVAC upgrades and necessary adaptations to the home for safety, reliability, and compatibility with the new renewable energy system.

USDA Programs Supporting Energy Efficiency and Conservation:

- **Rural Energy for America Program (REAP)** energy-efficiency projects typically involve installing or upgrading equipment to significantly reduce energy use for agriculture producers and rural small businesses. These include projects that produce energy from wind, solar, biomass, geothermal, hydropower, and hydrogen-based sources. The projects can produce any form of energy including, heat, electricity, or fuel such as a dairy farm and food waste anaerobic digester creating biogas for on-farm or commercial use. Eligible energy efficiency projects reduce energy consumption and result in savings for the agricultural producer or small business owner such projects include retrofitting lighting, insulation, water heaters, refrigeration components, pumps, and drive devices with more efficient processes and equipment. Energy audits and feasibility studies are also eligible for assistance. (www.rurdev.usda.gov)
- **Conservation Innovation Grants (CIG)**, under the Natural Resources Conservation Service, is a voluntary program intended to stimulate the development and adoption of innovative conservation approaches and technologies while leveraging Federal investment in environmental enhancement and protection, in conjunction with agricultural production. Under CIG, Environmental Quality Incentives Program funds are used to award competitive grants to non-Federal governmental or non-governmental organizations, tribes, or individuals. (www.nrcs.usda.gov/technical/cig/)
- **Conservation Loan Program**–The Farm Service Agency (FSA) recently implemented a conservation loan program that can be used for the implementation of qualified conservation practices as outlined in an approved Conservation Plan developed by NRCS. Conservation activities that will be addressed with loan funds provided under the Conservation Loan Program include purposes consistent with the plan, including the adoption of any other emerging or existing conservation practices, techniques, or technologies approved by the U.S. Secretary of Agriculture. FSA will make direct conservation loans of up to $300,000, and guaranteed loans made by commercial lenders up to $1.12 million. FSA conservation loans can be made in conjunction with grants and other commercial financing. (www.fsa.usda.gov)

- **Environmental Quality Incentives Program (EQIP)** provides a voluntary conservation program for farmers, ranchers, and owners of private, non-industrial forest land that promotes agricultural production, forest management, and environmental quality as compatible national goals. EQIP offers financial and technical assistance to eligible producers with the installation or implementation of conservation practices on eligible agricultural land. Financial assistance for conservation activity plans such as the Agricultural Energy Management Plan, an on-farm energy audit, must be performed by a certified Technical Service Provider (see http://techreq.usda.gov/). EQIP funds may also be used to assist with implementation of some of the recommendations provided in an on-farm energy audit. (www.nrcs.usda.gov/programs/eqip/)
- **Single Family Housing Guaranteed Program includes the Rural Energy Plus initiative** to provide additional incentives to certain low and moderate income families, who might not otherwise qualify for homeownership, to purchase an energy-efficient home. (www.rurdev.usda.gov)
- **Home Repair Preservation Program** provides assistance to low and very low income rural homeowners for critical home improvements, including weatherization, insulation, and new heating systems. (www.rurdev.usda.gov)
- **Housing Preservation Grants** are also available under Rural Development for sponsoring organizations or rental property owners for the repair or rehabilitation of low and very low income multi-family housing, including energy-efficiency upgrades. (www.rurdev.usda.gov)

USDA Energy-Related Business Development Programs:

- **BioPreferred Program** was instituted by USDA to promote the awareness and use of more than 10,800 biobased commercial and industrial products (made from renewable plant and animal sources). USDA has an online catalog of more than 10,800 biobased commercial and industrial products. (www.dm.usda.gov/procurement/programs/biopreferred.htm)
- **Biodiesel Fuel Education Program** provides competitive grants to eligible entities to educate government and private entities that operate vehicle fleets and the public about the benefits of biodiesel fuel use. The Farm Bill provides $1 million in funds per year, from fiscal year 2009 to 2012.
- **Business and Industry Guaranteed Loan Program** was established to improve, develop, or finance business, industry, and employment and improve the economic and environmental climate in rural communities. This purpose is achieved by bolstering the existing private credit structure through the guarantee of quality loans up to $25 million that will provide lasting community benefits. (www.rurdev.usda.gov)
- **Value-Added Producer Grant Program** provides grants for planning activities and for working capital for marketing value-added agricultural products, and for farm-based renewable energy. Eligible applicants include independent producers, farmer and rancher cooperatives, ag producer groups, and majority-controlled producer-based business ventures. (www.rurdev.usda.gov)
- **Rural Business Enterprise Grant Program** facilitates development of small and emerging private rural business enterprises. (www.rurdev.usda.gov)
- **Rural Business Opportunity Grant Program** sustains economic development in rural communities with exceptional needs. (www.rurdev.usda.gov)
- **Rural Economic Development Loan and Grant Program** provides zero-interest loans and/or grants for sustainable rural economic development and job creation projects for Rural Development electric and telephone utility loan borrowers. (www.rurdev.usda.gov)

Wind

The Rural Utilities Service (RUS) approved a loan of $9.6 million to Fox Islands Wind, LLC to construct three 1.5 megawatt wind turbines in Vinalhaven, Maine. The project will supply electricity to Fox Islands Electric Cooperative, Inc., and any surplus electricity will be sold to the New England electric grid with the proceeds used to reduce electricity costs for the islanders.

Intra/Interdepartmental Collaboration

USDA is working within the Department and with other Federal departments and organizations on furthering renewable energy and energy efficiency; efforts include, but are not limited to, the following intra/intergovernmental agreements, councils, working groups, and boards.

USDA Energy Council
The USDA Energy Council mission is to advance the contribution of agriculture and forestry in rural America to promote the Nation's achievement of energy security through the effectiveness and efficiency of the Department's numerous energy-related programs and initiatives. Chaired by the Secretary of Agriculture and consisting of the Under Secretaries and other senior managers, the Energy Council leads the Department in policy development and efforts to reach all audiences to inform them about USDA energy programs and regulations. The Council ensures that these audiences are aware of the Department's comprehensive energy program and also understand how it fits into the United States' overall energy policy.

USDA Energy Council Coordination Committee (ECCC)
The ECCC, consisting of staff from all USDA mission areas who work on energy issues, coordinates energy-related activities among USDA agencies and performs duties as assigned by the Secretary, the Energy Council Chair, or the Energy Council as a whole.

Biomass Research and Development (BR&D) Board
USDA, along with the U.S. Department of Energy (DOE), co-chairs the Board, which coordinates the Government-wide research initiative and activities for the purpose of promoting the use of biobased products, power, and biofuels. Members of the BR&D Board also include the National Science Foundation, the U.S. Environmental Protection Agency, the U.S. Department of the Interior, the U.S. Department of Defense, the U.S. Department of Transportation, and the Office of Science and Technology Policy. (www.brdisolutions.com)

The BR&D Technical Advisory Committee
This Committee, a group of approximately 30 individuals from industry, academia, and State government, is responsible for providing guidance to the BR&D Board on the technical focus of the Biomass Research and Development Initiative (BRDi). (www.brdisolutions.com)

Biofuels Interagency Working Group (BIWG)
President Obama established the Biofuels Interagency Working Group, to be co-chaired by the Secretaries of Agriculture and Energy and the Administrator of the U.S. Environmental Protection Agency. The BIWG works with the BRDi Board in undertaking its work. In his directive, the President called on the Secretary of Agriculture to preserve current renewable energy industry employment and to develop a comprehensive approach to accelerating the investment in and production of American biofuels and reducing our dependence on fossil fuels. The BIWG will develop the Nation's first comprehensive biofuel market development program. (www.epa.gov)

U.S. Department of Navy (DON) Memorandum of Understanding
USDA is working with DON to support initiatives to reduce energy consumption derived from fossil fuels, to increase clean energy production from renewable energy sources to meet transportation needs, and to support the Secretary of the Navy's Great Green Fleet Initiative.

U.S. Environmental Protection Agency (EPA) Interagency Agreement
The purpose of this Interagency Agreement between EPA and USDA is to leverage and utilize each other's expertise and resources, to include advancing deployment of commercially ready anaerobic digestion and biogas use technologies that reduce investment and operational risk to farm owners. (www.epa.gov/agstar)

The Innovation Center for U.S. Dairy Memorandum of Understanding
USDA and the Innovation Center for U.S. Dairy are taking steps aimed to create a sustainable future for the dairy industry. USDA is assisting with the center's work toward the goal of reducing the U.S. dairy industry's greenhouse gas emissions by 25 percent by the year 2020. An additional goal is to accelerate and streamline the process for adopting anaerobic digesters by the United States dairy farm operators through various USDA programs.

Farm to Fly With Commercial Aviation Initiative
USDA, Boeing, and the Air Transport Association of America, Inc., are working together to accelerate the availability of commercially viable sustainable aviation biofuels in the United States to increase domestic energy security, establish regional supply chains, and support rural development.

National Agricultural Research, Extension, Education and Economics (NAREEE) Advisory Board - Renewable Energy Committee

Congress created the Renewable Energy Committee as a part of the NAREEE Advisory Board in 2008. The committee annually submits to the Advisory Board a report that contains its findings and any policy recommendations to the USDA in preparation for the annual budget. The committee also consults with the BR&D Technical Advisory Committee.

Bioenergy Science Team (BEST)

The Bioenergy Science Team is comprised of USDA scientists who work collaboratively to coordinate science and technology efforts across the Department in support of advancing bioenergy production. BEST also serves as a resource for scientific information for Departmental decisionmakers.

Wood to Energy Initiative: Building a Forest Restoration Economy

NRE is coordinating an interagency team from the Forest Service, Rural Development, and Farm Service Agency to build opportunities for utilizing wood from hazardous-fuels treatment and small-diameter thinning as a feedstock source for biofuel and bioenergy. Our aim is to expand and better utilize this material as biomass that can help forest health treatments be economically viable. In the process, the initiative is helping to reduce our dependency on foreign oil, putting people to work in green jobs, restoring healthy forests and rangelands, reducing fire risks to the land and communities, and improving water quality. Activities under the Wood to Energy Initiative currently focus on project development, strategic technical assistance, joint outreach, and providing a clearinghouse for Federal funding programs that support this sector.

USDA Energy Programs Are Making a Measurable Impact

Aggressive actions by USDA and other Federal agency partners to advance the Nation's energy goals have already made a considerable impact on the U.S. rural economy and the evolving renewable energy landscape:

From 2003 through 2009, more than $1.1 billion in USDA Rural Development investments were distributed to renewable energy systems and energy-efficiency initiatives. These State-level investments total a savings/production of approximately 13.6 billion kilowatt hours of energy, the equivalent of a 14.4-million-metric-ton reduction of CO_2 emissions. That replaces, on average, 77.90 billion barrels of oil (fossil fuels), which has the effect of removing 3.24 million vehicles from the road, and saves/creates 6,964 jobs.

In 2010, USDA Rural Development was able to allocate more than $285.5 million toward energy-related projects through programs authorized through the Title IX energy provisions in the 2008 Farm Bill: the Biorefinery Assistance Program, Repowering Assistance Program, Bioenergy Program for Advanced Biofuels, and Rural Energy for America Program. These investments assisted in the production of 882.1 million gallons of advanced biofuels, saved or created an estimated 2,371 jobs, helped 5,250 businesses, realized 4.67 billion kWh in energy savings, and reduced 7.7 million metric tons of CO_2/greenhouse gas emissions.

During 2008-2010, approximately 30 grants totaling about $30 million were jointly awarded by USDA Cooperative State Research, Education, and Extension Service (CSREES, now NIFA) and DOE to accelerate fundamental genomic research of cellulosic bioenergy feedstock crops, such as fast-growing trees, shrubs, and grasses.

During 2009, more than 10 grants totaling more than $20 million were jointly awarded by CSREES (now NIFA) and DOE for biomass feedstock genetic development and production, conversion of biomass to biofuels and biobased products, and life-cycle assessment to determine economic and environmental impacts of production. In 2010, eight grants totaling more than $31 million were jointly awarded by NIFA and DOE for biomass feedstock genetic development and production, conversion of biomass to biofuels and biobased products, and life-cycle assessment to determine economic and environmental impacts of production.

Biomass:

USDA's Rural Utilities Service awarded a High Energy Cost Grant of $1,081,392 to Maine School Administration District No. 58 (MSAD 58) in Franklin County. This rural area in Maine is heavily dependent on fuel oil for its heating needs. With funding provided by USDA, MSAD 58 partnered with Skanden Energy LLC, from San Diego, CA, to purchase and install a wood pellet heating system to provide heat and hot water to the school buildings to replace its oil-fired boilers, displacing imported oil with a local, renewable fuel supply.

Geothermal Heat Pump (GHP)

Elkton Locker & Grocery
$65,000 Grant;
$65,000 Loan Guarantee
Rural Energy for America Program (REAP)
RD, Rural Business-Cooperative Service

Steve and Diane Hammer of Elkton, South Dakota, looked for a way to expand their successful meat locker business, "Big Daddy's Meats," into a full-service grocery store. The town of Elkton had been without a grocery for several years. A REAP "Combo" for a GHP helped the Hammer's bring a grocery to their small town in a cost-effective and environmentally sustainable way. Big Daddy's Grocery is now heated and cooled entirely by geothermal energy.

Energy Efficiency Improvement (EEI)

Reverse Osmosis Filtration
Sechler's Sugar Shack
$6,050 Grant
Rural Energy for America Program (REAP)
RD, Rural Business-Cooperative Service

Everett and Chris Sechler have been tapping maple trees in Southwestern Pennsylvania since 1983. They applied for a REAP grant to install a new reverse osmosis machine to help separate the sugar from the water in maple sap. Traditional separation involves energy-intensive evaporation. Reverse osmosis allows 75-80 percent of water to be removed from the sap before boiling off the remainder. The fuel and time savings are substantial. "This is something practical. It allows maple syrup producers to save resources, and it helps the sugar maker to make choices that help the environment and our economy."

70 percent fuel savings: 4.25 to 1.2 gallons of fuel oil per gallon of maple syrup

Anaerobic Digester

Neighborhood Energy, LLC
$357,990 Grant;
$326,770 Loan Guarantee
Rural Energy for America Program (REAP)
RD, Rural Business-Cooperative Service

225 kW Generator –1.75 million kWh per year
When Matthew Maxwell returned from Boston to his family's rural Vermont farm, he knew that the dairy industry had changed. "Milk prices were low. I mean REALLY low. I knew we had to diversify to survive."

Maxwell Farms' Neighborhood Energy, LLC, joined the Central Vermont Public Service (CVPS) Cow Power program, becoming the fifth farm to use an anaerobic digester.

REAP - $357,990 Grant + $326,770 Loan Guarantee
- $250,000 VT Clean Energy Development Fund,
- $100,000 CVPS Grant (Cow Power)
- $75,000 from VT Agency of Agriculture

The project has a variety of benefits:
- High-value animal bedding
- Nutrient solids
- Net Income – $225,000/year

Anaerobic Digester

USDA Rural Development's Business and Cooperative Programs provided a loan guarantee of $951,638 through its Rural Energy for America Program (REAP) to AGreen Energy, LLC (AGE). It financed an anaerobic digester at Jordan Dairy Farm in Rutland, MA, the first of the five systems in a regional anaerobic digester project. The AGE project brings together the five family farms, a regional waste recycling company, and an advanced energy technology provider to provide renewable energy in an environmentally friendly way to help sustain agriculture in the State. Each cow on the farm will produce enough electricity to power one average Massachusetts home for a year.

ONLINE ASSISTANCE:

USDA Energy Website: **www.usda.gov/energy**

The Energy Matrix:

Visit USDA's Energy Matrix (**www.energymatrix.usda.gov**) to access information about any USDA energy-related program.

USDA Offices, Mission Areas, and Agency Websites:

Visit www.usda.gov to access all USDA offices, mission areas, and/or agencies listed within this publication.

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