

Biomass Program

Energy and Products from Renewable Domestic Resources

Enhancing Our Nation's Energy Security and Environment

Advances in plant science and process technologies promise to revolutionize the production of energy and products from biomass—the organic material provided by crops, trees, agricultural and forestry residues, and animal waste. Like fossil fuels, the energy in biomass comes from carbon, yet biomass is a renewable resource that is virtually inexhaustible and cleaner for the environment when managed correctly.

The U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy (EERE) recently consolidated its biomass research programs, creating the Office of the Biomass Program. The Office will be a major contributor to meeting the Administration's goal of significantly increasing America's use of biofuels, biopower, and bioproducts on a sustainable basis. A greater role for biomass will enhance our energy security, provide for a cleaner environment, and stimulate economic growth, particularly in rural communities.

Research Focus

The Office of the Biomass Program partners with U.S. industry to foster research and development of advanced technologies that can transform our nation's abundant biomass resources into clean, affordable, and domestically-produced biofuels, biopower, and high-value bioproducts. The two primary goals of the Office are to (1) reduce dependence on foreign oil by developing liquid fuels and (2) to create the domestic biomass industry. Key research and development areas include:

- **Thermochemical Conversion** – Thermochemical conversion can be used to create syngas for heat, power, or products. The Office is removing barriers to the cost-effectiveness and environmental viability of these processes.
- **Bioconversion** – Bioconversion can transform biomass resources into useful fuels and chemicals. The Office is investigating biological processing that integrates pretreatment, separations, and purification in a manner that is efficient and cost-effective.

Biomass Today

- *Current biomass electric generating capacity is about 12,300 MW, enough to meet the power needs of Massachusetts.*
- *In 2001, production of fuel ethanol reached 1.76 billion gallons and production of biodiesel equaled 20 million gallons.*
- *Current production of biobased textile fibers, polymers, adhesives, lubricants, soy-based inks, and other products is estimated at 12.4 billion pounds per year.*

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- **Industrial Biorefinery** – The industrial biorefinery is a promising strategy for processing renewable biomass, such as corn stover and other resources, into a range of biobased products, fuels, and power.
- **Biobased Products** – Biomass can be used in place of petrochemical feedstocks to produce value-added chemicals, such as biobased engine oils and solvents, biobased plastics, and improved enzymes.
- **Small Modular Biopower** – Research is being conducted to develop small modular biomass systems that will be commercially competitive in integrated heat and power applications in the 1 kW to 5 MW range.

The Office relies strongly on competitive solicitations to identify projects that support the program focus areas.

Through these solicitations, the Office funds projects with teams including the private sector, national laboratories, and universities.

Raising Awareness

Using a network of DOE Regional Offices and state-level contacts as well as its web site and the National Biomass Coordination Office, the Office disseminates the results of research to industry and educates consumers on the benefits of biomass.



Outreach activities by the Office raise awareness of current and potential roles of biomass in the United States. R&D results are communicated through technical papers, conferences, presentations, fact sheets, and a monthly newsletter. The Office also works closely with state and regional offices to perform outreach at the local level.

Successes to date in the biomass field have included:

- Fractionation of corn fiber and conversion to high-value chemicals
- Operation of small modular biomass gasifiers to produce electricity in rural areas
- Development and commercialization of a natural resin from bark residues for use in manufacturing plywood and strand board
- Development of the first global-scale polylactic acid (PLA) plant, producing more than 300 million pounds of PLA per year from a feedstock of locally grown corn (40,000 bushels/day).

A Strong Energy Portfolio for a Strong America

Energy efficiency and clean, renewable energy will mean a stronger economy, a cleaner environment, and greater energy independence for America. Working with a wide array of state, community, industry, and university partners, the U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy invests in a diverse portfolio of energy technologies.



U.S. Department of Energy
Energy Efficiency
and Renewable Energy

March 2003



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