

**Testimony of Joan L. Pellegrino, President
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ON BIOMASS ENERGY RESEARCH**

Department of Energy Fiscal Year 2009 Budget Appropriation

**Submitted to the Senate Committee on Appropriations
Subcommittee on Energy and Water Development**

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SUMMARY

This testimony pertains to the fiscal year 2009 (FY09) appropriations for biomass energy research, development, and demonstration (RD&D) conducted by the Department of Energy's (DOE) Office of Energy Efficiency and Renewable Energy (EERE), Biomass Program. This RD&D is funded by the Energy and Water Development Bill and performed under the heading of Energy Supply and Conservation, Energy Efficiency and Renewable Energy.

BERA recommends a total appropriation of \$275,000,000 in FY09 under Biomass and Biorefinery Systems R&D (Energy Supply and Energy Conservation), exclusive of earmarks. This is an increase of about \$50,000,000 over the U.S. Department of Energy request for FY09 for this programmatic area.

We feel this increase is necessary to meet goals for production of fuels from cellulosic biomass as stipulated under the Energy Independence and Security Act (EISA) of 2007. While the proposed DOE Bioenergy budget is an increase of \$27 million over the Administration's FY08 proposed budget, it reflects a decrease of \$49 million from the DOE Biomass Program's authorized level of (Sec. 932) \$274 million, and reducing funds available for important Integrated Biorefinery Demonstration Projects (Sec. 932(d)). **Technology demonstrations reduce technical and economic risk and accelerate the potential for private investment. They are a critical for reaching goals for biofuels production for 2022 and beyond.**

Specific lines items for the DOE biomass RD&D budget are as follows:

- \$20,000,000 for **Feedstock Infrastructure** development (regional partnerships, harvesting and storage technology)
- \$35,000,000 for **Biochemical Conversion Platform Technology** (conversion of agricultural residues, wood, forest residues and perennial crops to various fuels)
- \$35,000,000 for **Thermochemical Conversion Platform Technology** (conversion of plants, oil crops, energy crops, wood and forest resources to oils, long chain hydrocarbons, or other fuels/intermediates)
- \$175,000,000 for **Integrated Biorefinery Technologies** demonstrations
- \$10,000,000 for **Utilization of Platform Outputs: Bioproducts** (chemicals and materials as co-products)

BACKGROUND

On behalf of BERA's members, we would like to thank you, Mr. Chairman, for the opportunity to present the recommendations of BERA's Board of Directors for the high-priority programs that we strongly urge be continued or started. BERA is a non-profit association based in the Washington, DC area. It was founded in 1982 by researchers and private organizations conducting biomass research. Our objectives are to promote education and research on the economic production of energy and fuels from freshly harvested and waste biomass, and to serve as a source of information on biomass RD&D policies and programs. BERA does not solicit or accept Federal funding.

There is a growing realization in our country that we need to diversify our energy supply, develop technologies to utilize indigenous and renewable resources, reduce reliance on imported oil, and mitigate the impacts of energy on climate. Economic growth is fueling increasing energy demand worldwide and placing considerable pressure on already burdened energy supplies and environment. The import of oil and other fuels into the United States is growing steadily and shows no sign of abating. Industry and consumers alike are faced with rapidly rising and volatile costs for fossil fuels, especially petroleum and natural gas. A diversified, sustainable energy supply is critical to meeting our energy challenges and maintaining a healthy economy with a competitive edge in global markets.

Biomass is the single renewable resource with the ability to directly replace liquid transportation fuels. It can also be used as a feedstock to supplement the production of chemicals, plastics, and other materials that are now produced from crude oil. **In addition, gasification of biomass produces a syngas that can be utilized to supplement the natural gas supply and electricity from fossil fuels.** Production of power from biomass co-products for use in biorefinery processes greatly reduces the life cycle carbon footprint of biofuels. Fuels, chemicals, and power are already being produced from biomass, but on a small scale compared to the potential markets. While biomass will not solve all our energy challenges, it can certainly contribute to the diversity of our supply, and do so in a sustainable way, while minimizing impacts to the environment or climate.

The Energy Policy Act of 2005 created various incentives for diversifying our energy supply via the use of biofuels. In addition, the Energy Independence and Security Act (EISA) of 2007 put forth a mandate to increase use of alternative fuels for transportation, with a substantial portion to come from cellulosic biomass. To meet the ambitious goals of EISA will require aggressive support for RD&D to move technology forward and reduce technical and economic risk. Incentives are also needed to accelerate commercialization and deployment.

BERA RECOMMENDATIONS FOR US DOE BIOMASS RD&D

BERA's recommendations support a balanced program of RD&D, including projects to develop and demonstrate advanced biochemical and thermochemical biomass conversion processes, a diverse slate of liquid transportation fuels, and co-production of fuels, chemicals, and power in integrated biorefineries. Our overarching recommendations are to:

1. **Invest in demonstration of technology** (as progress is made) to reduce risk (e.g., through loan guarantees, cost-shared projects, other mechanisms) and encourage private sector investment and commercialization.
2. **Explore a variety of fuels** beyond ethanol, including green diesel, green gasoline, jet fuels, algae diesel, pyrolysis oils, mixed alcohols, and others. Include fuels that can be easily integrated into existing infrastructure, and revolutionary fuels or feedstocks (algae). This will diversify options for different transport markets that depend heavily on petroleum.
3. **Fund a variety of conversion technologies**, both biochemical and thermochemical.
4. **Integrate sustainability** throughout RD&D to promote the use of biomass technologies that improve environmental performance and minimize impacts to land, water and air.

BERA's recommendations for funding for DOE biomass RD&D are shown in Table 1 and outlined below. Note that recommended budgets for demonstration projects do not include industry cost-share, which should be 50 percent or more.

Program Area	Description of RD&D	R&D	Demonstration	Total
Feedstock Infrastructure	Regional feedstock partnerships, joint development of storage and harvesting technology	\$15.0	\$5.0	\$20.0
Biochemical Conversion Platform R&D	Conversion of cellulosic biomass – agricultural residues, wood/forest residues, perennial grasses	\$20.0	\$15.0	\$35.0
Thermochemical Conversion Platform R&D	Conversion of wood/forest residues to pyrolysis oils or syngas	\$20.0	\$15.0	\$35.0
Platform Outputs: Integrated Biorefineries	Developing/validating biochemical and thermochemical conversion technologies in integrated biorefineries (e.g., 932 projects) and small scale biorefineries	\$10.0	\$165.0	\$175.0
Platform Outputs: Bioproducts	Co-production of chemicals and other products from biochemical and thermochemical output streams	\$5.0	\$5.0	\$10.0
TOTAL		\$70.0	\$205.0	\$275.0

Feedstock Infrastructure – Continue support for regional feedstock partnerships to ensure the optimal and sustainable production of feedstocks to meet demand on a regional basis. The U.S. Departments of Energy and Agriculture, in partnership with the Sun Grant Initiative universities and the members of the National Biomass State and Regional Partnership, established the Regional Biomass Energy Feedstock Partnership. Funding should be continued for these important partnerships, as they will help ensure that cost competitive biomass feedstocks are widely available in sufficient quantity and at an acceptable market cost. Increase funding for cost-shared activities with USDA on critical harvesting, storage and transport technologies to ensure a feedstock delivery infrastructure is available to meet the larger demand.

Platform Outputs: Support development/demonstration of integrated biorefineries – Activities should address promising biochemical and thermochemical processes in integrated biorefineries producing fuels, high-value products where possible, and potentially heat and power to meet processing demands. A diversity of technologies and feedstocks should be considered, as well as new fuel options (green diesel, jet fuel, algae, etc.). The object is to improve process efficiency and reduce cost, taking into consideration design, financing, permitting, environmental controls, waste processing, and sustained operations; feedstock acquisition, transport, storage, and delivery; and storage and delivery of products to market.

Conversion: Fund both biochemical and thermochemical conversion platforms as foundations for integrated biorefineries – The biochemical and thermochemical platforms are both important and could provide viable technologies for production of fuels and chemicals. BERA urges that both be funded to accelerate the development and demonstration of large-scale, synergistic integrated biorefinery systems. BERA urges that biochemical conversion research be funded at the amounts shown in Table 1, and that thermochemical conversion R&D for biomass gasification, pyrolysis, and synthesis of alternate liquid fuels be given equal priority. Both should focus on the use of cellulosic biomass, waste biomass, or novel concepts for feedstocks.

Platform Outputs: Invest in R&D to develop bioproducts that enhance the economic viability of the integrated biorefinery – BERA urges that funding be provided for R&D to enable economic production of commodity organic and high value chemicals as co-products in biorefineries. Biomass-derived fuels and chemicals combined would increase the product slate and provide greater opportunity for reducing fossil fuels consumption, while increasing the economic viability of the biorefinery. BERA urges that this effort include research on sugar intermediates, but that it be expanded to include direct conversion of other intermediates (such as those derived from gasification and pyrolysis) to fuels and commodity organic chemicals.

Reduce or eliminate earmarks – The level of earmarks in the last few years has limited new initiatives and led to premature reductions of scheduled programs by EERE. BERA respectfully asks the Subcommittee to carefully consider the impacts of all earmarks on EERE's biomass energy RD&D.