

OBJECTIVES

The following objectives reflect the integrated activities at OSU. Researchers work synergistically, addressing the most important issues in the conversion of agricultural resources to liquid fuel and other value-added products.

- Maintain an active feedstock development program providing improved perennial grass varieties for central and southern U.S.
- Identify and enhance feedstocks for producing biobased products and energy, including assessing existing biomass resources and selected plant species, utilizing processed biomass waste, and determining optimal procedures for establishing and managing dedicated feedstock crops.
- Develop and/or employ energy efficient and cost effective harvesting, handling, storage and transportation systems.
- Enhance existing, while exploring and developing new, conversion technologies addressing biofuels, bioenergy and bioproducts.
- Determine sustainability of establishing biorefineries through economic and systems analyses, energy balances, and integrated models to quantify the environmental and economic impact of land conversion.
- Provide education about biobased products and energy through secondary education, undergraduate and graduate resident instruction; and through extension/outreach to a wide range of audiences.

COLLABORATIONS

Research and education is holistic, considering all aspects from feedstock development to the production of final products, where scientists and engineers are working as teams drawing on the expertise from many disciplines and research institutions. Those interactions and collaborations help in identifying and addressing the most critical issues in providing an economically viable and sustainable biobased production system. The results through center participants will lead to the establishment of biorefineries, potentially revitalizing rural areas in Oklahoma.

The OSU BioPEC welcomes requests for information and educational materials. Please contact us at:

Email: bioenergy@okstate.edu

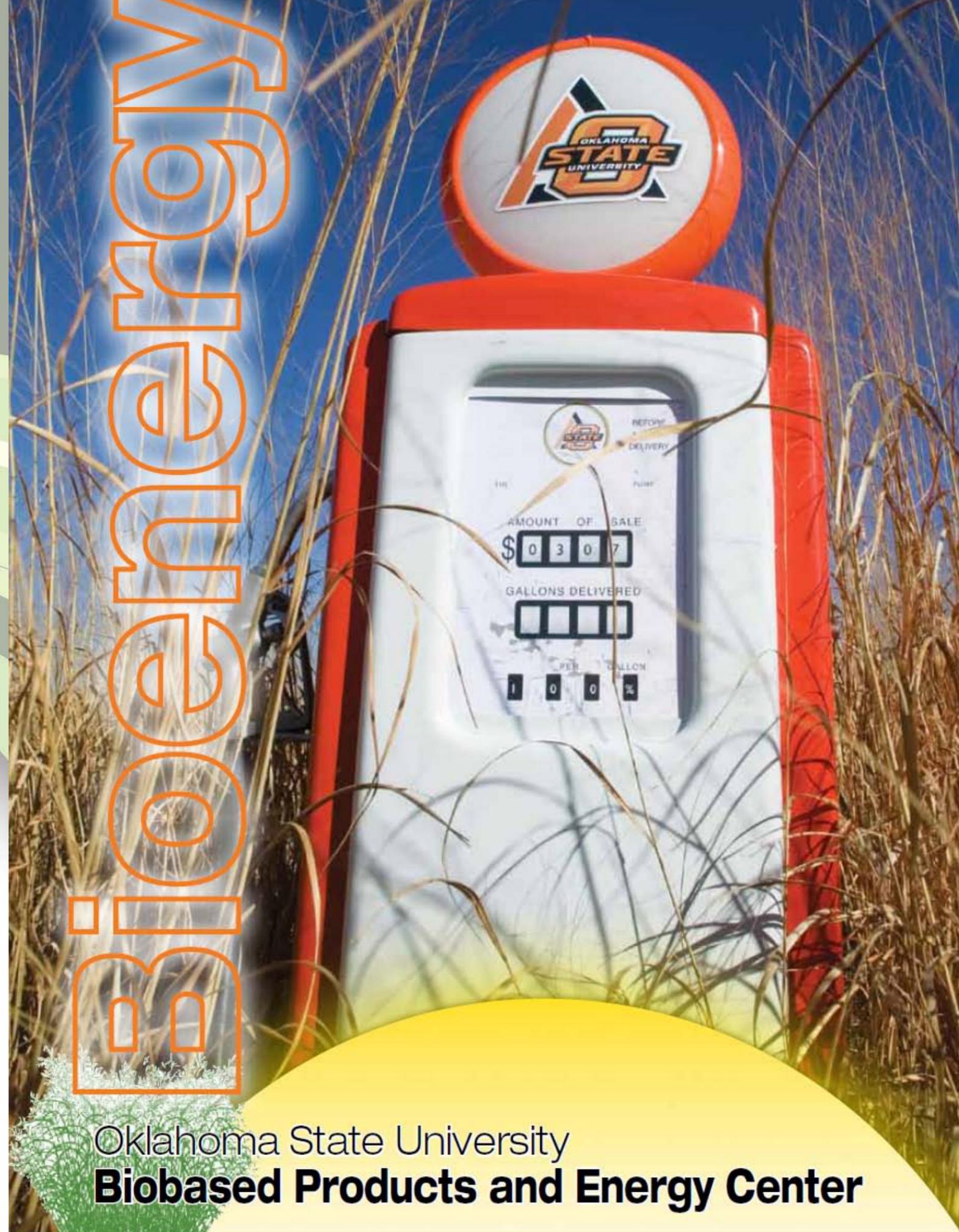
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Oklahoma State University
Biobased Products and Energy Center

MISSION

To conduct research and provide educational programs in environmentally-sound biobased product and energy development leading to the establishment of sustainable bioenergy and bioproducts industries in Oklahoma.

GOALS

- Strengthen basic research foundation in feedstock development and conversion technologies.
- Provide undergraduate and graduate training for future biobased economy workforce.
- Formulate teams of university personnel to determine the most appropriate opportunities in feedstock production and conversion applications for specific regions in Oklahoma.
- When and where appropriate, establish producer-based feedstock demonstration plots of selected perennial grasses, such as switchgrass.
- Establish OSU as one of the predominant lignocellulosic biomass research universities in the U.S.

What is Biobased Products and Energy Center?

Oklahoma State University's Biobased Products and Energy Center (BioPEC) was created in the Division of Agricultural Sciences and Natural Resources to conduct basic and applied biobased renewable energy research and educational programs.

BioPEC is composed of faculty from Agricultural Economics, Biochemistry and Molecular Biology, Biosystems and Agricultural Engineering, Chemical Engineering, Microbiology and Molecular Genetics, and Plant and Soil Sciences departments representing three OSU divisions.



OSU Has a Strong History of Renewable Energy Research and Education

Teaching
A major focus is to educate the next generation of engineers and scientists in renewable resource utilization. Programs are targeted at all levels, including pre-college students and teachers, undergraduate and graduate students, industrial collaborators and the general public.

Research
OSU continues to expand research efforts, addressing the critical issues in further establishing renewable energy industries. Areas of emphasis include enhancing productivity of potential feedstocks, improving conversion technologies, and optimizing the value of co-products and by-products.

Extension
It is critical to extend the renewable energy knowledge base to the community. Decision-making tools are being developed and used by a resource team to help local leaders evaluate renewable energy options in their region. These tools may include economic analysis models, local utility infrastructure evaluation and predictive tools for land-use changes.

OSU is committed to developing the necessary tools and relevant expertise to help community leaders and residents make sound decisions about renewable energy development while balancing economic, social and environmental considerations.

OKLAHOMA IMPACTS

- Availability of an in-depth regional assessment tool to assist local community leaders in identifying biomass production potential and biobased industry opportunities.
- Having the Oklahoma populace embrace biobased energy and products.
- Recognizing Oklahoma State University as one of the predominant lignocellulosic bioenergy research universities in the U.S.
- Establishing true bioenergy and biorefinery industries in the state.

RESEARCH AREAS

FEEDSTOCK DEVELOPMENT

Maintain an active feedstock development program providing improved perennial grass varieties for central and southern U.S.

Researchers: **Ramanjulu Sunkar, Million Tadege, Yanqi Wu**



FEEDSTOCK PRODUCTION

Identify and enhance feedstocks for producing biobased energy and products, including assessing existing biomass resources and selected plant species, utilizing processed biomass waste, and determining optimal procedures for establishing and managing dedicated feedstock crops.

Researchers: **Gopal Kakani, Tyson Ochsner, Jason Warren**



CONVERSION TECHNOLOGIES

Enhance existing, while exploring and developing new, conversion technologies addressing biofuels, bioenergy and bioproducts.

Researchers: **Clint Aichele, Hasan Atiyeh, Nurhan Dunford, Babu Fathepure, Ray Huhnke, Ajay Kumar, Josh Ramsey, Rob Whiteley, Mark Wilkins**



LOGISTICS

Develop and/or employ energy efficient and cost effective harvesting, handling, storage and transportation systems.

Researchers: **Danielle Bellmer, Michael Buser, Carol Jones**



ECONOMICS and MODELING

Determine sustainability of establishing biorefineries through economic and systems analyses, energy balances, and integrated models to quantify the environmental and economic impact of land conversion.

Researchers: **Francis Epplin, Scott Frazier, Rodney Holcomb, Phil Kenkel**



Photos Courtesy of Oklahoma State University