

Introduction

An interdisciplinary team at Oklahoma State University and cooperating institutions will potentially revitalize rural areas in Oklahoma and beyond by creating new ethanol production practices that will enhance and strengthen the state's multi-billion-dollar energy industry.

The OSU Biofuels Team is a multi-college, multi-institutional effort, with the current team encompassing scientists and engineers within the OSU Division of Agricultural Sciences and Natural Resources; the OSU College of Engineering, Architecture and Technology; the University of Oklahoma; and Brigham Young University.



Our system is unique in that we can utilize switchgrass, other grasses, crops, and associated cellulosic residues in ways that do not compete directly with agricultural food, feed or fiber needs; our scientists focus on cost-effective environmentally sustainable production practices that help reduce the nation's dependence on foreign oil.

Robert E. Whitson
Dean and Director, DASNR
Vice President of Agricultural
Programs at OSU

Bioenergy Thrusts

Research being conducted by the OSU Biofuels Team involves the study of several promising biomass-to-ethanol pathways. Support comes from the Oklahoma Agricultural Experiment Station, other DASNR and university funding allocated by the state legislature through the Oklahoma Bioenergy Center and external sources such as the U.S. Department of Agriculture, U.S. Department of Transportation and national Sun Grant Initiative.

Feedstock Development

The OSU Biofuels Team is examining the sustainable bioenergy potential of numerous lignocellulosic feedstocks, from straw and woody materials to sorghum, switchgrass and many other varieties of natural grasses. Prime benefits of these energy crops are that they could be produced on underutilized lands, have lower input requirements and are naturally adapted to specific, wide-ranging but still local environmental conditions.

Gasification-Fermentation Conversion Technology

In this thermochemical process, carbon materials are converted into synthetic gas using gasification technologies. After the chemical bonds are broken, microorganisms patented by the OSU Biofuels Team convert the resulting syngas into ethanol. The beauty of the OSU sys-



tem is that for every 1 unit of energy put into the process, more than 3 units of energy are returned. Traditional corn-based ethanol production provides 1.6 units of energy per 1 unit of energy input.

Coskata Inc., which is a national biology based renewable energy company, and automotive giant General Motors made international news in January 2008 when they announced their cooperative plans to reduce fossil fuel



Biomass

(1) Gasifier (2) Cleaning & Storage

(3) Bioreactor

(4) Distiller

Ethanol & Other Products