

# University of Tennessee Biofuels Initiative Overview

The University of Tennessee Biofuels Initiative (UTBI) is Tennessee's answer to the global challenge of securing sustainable, renewable, affordable energy while advancing the local economy and protecting the environment. The Tennessee Biofuels Initiative is a farm-to-fuel business plan developed by UT Institute of Agriculture researchers. One of the interesting challenges to jump starting a commercially viable non-food advanced biofuels industry is the chicken-and-egg problem of tying the production of feedstock to the capital intensive biorefinery. Tennessee has made an unparalleled commitment to lead the transition to an advanced biofuels economy with a commitment of \$70.5 million for the UTBI. Working on both the chicken and the egg at the same time, the comprehensive approach the state of Tennessee has taken spans the breadth of farm fields to filling stations and is a model for smart, sustainable development of this nascent industry.

Working with private industrial partners, UT aims to establish a dedicated energy crop (switchgrass) supply chain, demonstrate and improve the technologies used to create cellulosic ethanol, reduce the costs of production, and ultimately commercialize the technology across the state. Tennessee has the potential to produce over a billion gallons of ethanol each year, replacing 30 percent of the state's current petroleum consumption.

## Cellulosic Ethanol

Unlike traditional corn ethanol, cellulosic ethanol is fuel made from biomass sources such as switchgrass, wood chips, agricultural residues and other non-food plant material. Because it does not compete directly with food or feed uses, using dedicated perennial energy crops like switchgrass to produce cellulosic biofuels is seen as a viable way to produce affordable, sustainable, domestic fuel without raising food or feed costs. Switchgrass is an ideal biomass crop for Tennessee in that it has base yields of six to eight dry tons per acre, and can grow on land that may be unsuitable for other row crops with little need for fertilization.

## Pilot Scale Biorefinery

One of the key elements of the integrated Biofuels Initiative is a pilot-scale research and demonstration cellulosic ethanol biorefinery in East Tennessee, supplied by local biomass. For this endeavor, UT has established Genera Energy, LLC, a new company charged with constructing and operating the biorefinery that will be located in the Niles Ferry Industrial Park in Vonore, Tennessee. Genera is developing strategic partnerships and collaborations for the pilot scale biorefinery and research and development.

## Establishing the Supply Chain

The Tennessee Biofuels Initiative takes a farm-centric approach to feedstock development, working with local farmers to develop a program that provides direct payments to farmers for switchgrass production as well as one-on-one technical assistance through UT Extension and wide-ranging research related to all aspects of the feedstock supply chain.

In spring 2008, 723 acres on 16 farms located in six East Tennessee counties were enrolled in the incentive program and were planted to switchgrass. Expectations are to enroll additional acreage in spring 2009 and spring 2010, totaling more than 6,000 acres over the next three years. Switchgrass produced on participating farms will be utilized in the pilot scale biorefinery to produce ethanol as well as other products.

This unique partnership of state government, the University, and private industry has propelled Tennessee to be a leader in all aspects of cellulosic ethanol production.

Genera Energy