

Statement of

Kelly J. Tiller, Ph.D.
The University of Tennessee

Before the Senate Republican Conference
Forum on “More American Energy: Clean Energy Independence”

June 2, 2008

Chairman Corker, Senator Alexander, and Members of the Conference, thank you for the opportunity to speak to you today. My name is Kelly Tiller, and I am the co-director of Bioenergy Programs at the University of Tennessee.

Advanced conversion of sustainably produced biomass is our nation’s most viable near-term, renewable option for producing liquid transportation fuels, holding tremendous potential to loosen – if not break – the stranglehold foreign oil holds over us today.

Significant resources and efforts have led to recent advances in the readiness of cellulosic ethanol technology, allowing us to step beyond the challenges and limits we face with increased use of food and feed crops as a source of energy.

Next generation biofuels technologies are here today, but they are immature and unproven commercially. How can this nascent industry emerge from the current pilot and demonstration phase to achieve commercial scale quantities? More importantly, biofuels—even next generation advanced biofuels—is something we can do right or we can do wrong. How do we ensure that we achieve the profound, positive effects while minimizing and managing risks?

As we ramp up from an infant industry to a mature, sustainable industry, a number of elements must move up that ramp in parallel. To grow an advanced biofuels industry to maturity, we need more than accelerated R&D. We need an accelerated, integrated commercialization strategy that simultaneously addresses technical and economic challenges in three key areas: (1) feedstock supply, (2) biorefining, and (3) distribution and use.

The comprehensive approach the state of Tennessee has taken in developing a cellulosic biofuels industry that spans the breadth of farm fields to filling stations is a model for smart, sustainable growth of this industry. Tennessee has made an unparalleled commitment to lead the transition to a greener economy through advanced biofuels. In 2007, Tennessee Governor Bredesen committed more than \$70 million to the Tennessee Biofuels Initiative, a commitment the state has not only maintained, but strengthened by leveraging nearly a quarter billion dollars related to advancing sustainable biofuels through programs at the University of Tennessee and Oak Ridge National Laboratory.

The Tennessee Biofuels Initiative applies a systems approach to demonstrating a large scale integration of all elements of this new industry, including demonstration of farm production of 8,000 acres of switchgrass as an energy crop, that feeds a supply chain to transform that switchgrass crop into an efficient biomass feedstock, that feeds a 10% scale biorefinery converting that biomass feedstock into cellulosic ethanol, that feeds a system for local distribution and use of that 5 million gallons of clean fuel. This fully integrated, large scale, fully funded project provides a unique opportunity to address challenges that span the entire ethanol production value chain.

One of the key challenges for large scale commercialization is feedstock supply and cost. Today, farmers have little incentive to invest in producing a new, dedicated energy crop like switchgrass, which requires a couple of

years to reach full yield potential, in advance of a mature market demand for an energy crop feedstock. Large scale expansion of cellulosic biofuels production requires cracking this chicken-or-egg-first problem of feedstock farm supply and biorefinery demand.

The Tennessee Biofuels Initiative takes a farm-centric approach to feedstock development, providing up to \$12 million for direct payments to farmers for switchgrass production as well as one-on-one technical expertise and significant research related to reducing feedstock costs through improvements in switchgrass breeding, production practices and management, harvesting, densification, storage, contracting, transportation, handling, and pre-processing. The lessons being learned today producing energy crops on the first 723 acres under contract—spanning 7 counties within 50 miles of the biorefinery, including a wide variety of field types and soils, using farmers' existing equipment and resources and managerial skills—will lead to improvements and efficiencies in future contracts and crops adding about 7,000 more acres to the program over the next 2 years.

The Tennessee project also addresses other key challenges for large scale commercialization. The cellulosic biorefinery under development serves several important purposes: (1) demonstration of technology success at roughly 10% of commercially feasible scale; (2) opportunities to improve the process economics and incrementally increase the scale; (3) R&D capacity to introduce subsequent technology improvements as the industry matures; and (4) providing assurances to financial markets evaluating risks of investing hundreds of millions of dollars in new biorefinery projects. While our initial focus is on clean, competitive alternatives to petroleum based transportation fuels, our research-oriented demonstration scale biorefinery also provides important long-term research capacity for co-production of clean, renewable chemicals, products and power which can further improve the economics of the advanced biofuels industry and can further enhance environmental benefits.

Still other challenges relate to closing the loop between industrial scale biofuels supply and consumer demand. In Tennessee, we are working with local fuel distributors and blenders to address storage, transportation, and other infrastructure needs to ensure that we are providing local consumers with affordable products that are where they need them, when they need them, in a form they can use and understand, with minimal risks and maximum convenience.

In closing, cellulosic biofuels provide opportunities to develop region-specific solutions for the field to fill-up path and allow more flexible and sustainable utilization of land and other natural resources. Investors, communities, states, and regions are enthusiastic about the benefits advanced biofuels bring for rural economic development, local investment and jobs, new farm income, cheaper alternatives to gasoline, and cleaner air.

All of the building blocks are primed, they just need to be assembled in a logical and coordinated way that will allow all of the diverse elements of this industry to come together to realize the benefits advanced biofuels are poised to deliver. While R&D investments and policies to date have primarily targeted challenges in conversion technology, the truly integrated nature of the industry requires equal focus on feedstock supply and costs. Federal policy can have a profound effect on accelerating commercialization of advanced biofuels in a smart and sustainable way, especially if it includes:

- more funding for basic research, development and demonstration of regionally appropriate and sustainable energy crops;
- more incentives for farmers to bring non-food acreage into sustainable energy crop production;
- sharing the risks of early private financial investments in commercial scale production; and
- more funding for conversion technology R&D, as well as co-product research that can deliver more favorable economics for the industry.

Thank you again for the opportunity to appear before you today. This hearing is a strong statement about the commitment you are making to reduce our dependence on foreign oil with clean, environmentally friendly, affordable energy alternatives. It also emphasizes your recognition that a variety of complementary approaches and technologies can all contribute to meeting more of our energy needs from clean, domestic, renewable sources, and advanced biofuels has an important role to play in achieving this worthy goal.