

Testimony submitted on behalf of the

Sun Grant Initiative

To the

U.S Senate Committee on Agriculture, Nutrition and Forestry
Subcommittee on Energy, Science and Technology

The leadership of the Sun Grant Initiative appreciates the opportunity provided by Senator Thune to address the subcommittee on Energy, Science and Technology. As the Congress prepares to draft the next Farm Bill, the nation is at a critical juncture. Our future economic and strategic security is eroding because of excessive dependence on imported petroleum. It is also becoming increasingly clear that continued use of fossil energy passes on enormous environmental problems to future generations of Americans. American agriculture represents part of the solution toward reversing these concerns. American farmers, foresters, agribusinesses, and agricultural scientists can lead the world in development of agriculture-based energy systems; however, the Congress must enact policies, programs, and funding that empower these sectors.

Starch-based ethanol production in the United States has become an advanced industry because farmers, companies, and public scientists in land-grant universities have worked together. As priorities shift to exploit cellulosic resources, few people understand the magnitude of change that will be required to annually produce, transport and convert in excess of one billion tons of biomass annually. Farm bill policies will need to provide incentives to farmers and businesses that will bear the initial risks of a major transformation in agriculture. Moreover, the land-grant university system must be supported with additional resources to address immediate issues regarding cellulosic biofuels as well as conduct early basic research that will result in biofuels technologies that will be deployed in future decades. The Sun Grant Initiative has been planned to direct the enormous capabilities of the land-grant system and achieve a secure energy future, a quality environment, and a vibrant rural economy.

Figure 1. Predicted biomass feedstock production potentials by region. (De La Torre Ugarte et al. 2003. The economic impacts bioenergy crop production on US agriculture. USDA Office of Chief Economist, Office of Energy Policy and New Uses, Agric. Econ. Rp)

The Sun Grant Initiative (SGI) is a key component to the nation's development of domestic renewable energy. The SGI was authorized in 2004 as an amendment to the Farm Bill to harness the capacities of all land-grant universities to conduct research and educational program that emphasize agriculture-based renewable energy and products. Because of environmental differences, biomass and bioenergy production must be developed at regional and local levels (Figure 1). The SGI establishes a regional structure to develop integrated regional solutions to national issues. This regional approach provides a mechanism for strategically coordinating and

leveraging federal and state efforts. The products of the SGI will include improved national energy security, environmental remediation, and economic diversification. This work is essential for the nation's future prosperity and strategic security.

Energy goals set by President Bush (Twenty In Ten), the US Department of Energy (30 x 30), the private sector and interest groups (25 x 25) and Congress will require an unprecedented engagement of American agriculture in domestic energy production. The National Corn Growers Association projects that the North Central region alone has the potential to produce 65 billion gallons of biofuels annually from starch, oilseed, and cellulosic feedstocks. The United States has enormous resources to develop cellulose-based energy systems, but development of these industries will require unprecedented changes to agriculture, will present unique environmental risks, and will cause widespread social concern. Public research conducted at land-grant universities will be necessary to not only develop enabling technologies, but also research that will shed light on the impacts made on the environment, the economy, and society. The nation's land-grant universities have served a critical role in scientific advancement of agriculture and the SGI will focus their expertise and talent toward the energy needs and workforce development for the country. Recognizing that the SGI and land-grant system are assets, the 25 x 25 Initiative has endorsed full funding in FY2008 for the SGI.

Sun Grant Initiative Authorization

The Sun Grant Initiative was authorized in January 2004 as section 9011 under provisions of Title IX of the Farm Security and Rural Investment Act of 2002 (7 USC 8109). Additionally, SGI is authorized as section 5201(m) under provisions of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users of 2005 [SAFETEA-LU (23 USC 118)]. The authorized appropriation limit for fiscal years 2008 through 2010 is \$75 million for each year. The authorization culminated 3 years of planning and development by the land-grant universities and Congress. Since passage of the authorization, the SGI has developed collaborative working relations and projects with the U.S. Departments of Transportation, Energy, and Agriculture. Discussions are underway regarding future collaboration with EPA and the Department of Defense. Recently, the SGI has been assigned with specific tasks and proposed for \$4.5 million in the President's FY2008 Budget Request in the Department of Energy's Energy Efficiency and Renewable Energy Office of the Biomass Program (OBP).

The mission of the Sun Grant Initiative is to:

- ? Enhance America's national energy security through development, distribution and implementation of biobased energy technologies.
- ? Promote diversification and environmental sustainability of America's agriculture
- ? Promote opportunities for biobased economic diversification in America's rural communities.

Figure 2. Sun Grant Initiative regions and regional Sun Grant Centers of Excellence as defined in 7 USC 8109.

A network of five land-grant universities serve as regional Sun Grant centers, including South Dakota State University, Oklahoma State University, the University of Tennessee, Oregon

State University, and Cornell University (Figure 2). The regional centers currently emphasize research, Extension, and educational programs on renewable energy technologies and promotion of biobased industries in rural communities. Each center will receive base Federal funding to establish them as leading research, extension, and higher education institutions for the biobased economy. The regional centers already facilitate ongoing and proposed Federal-funded research, extension and education programs in their respective regions. These programs embrace the multi-state, multi-function, multi-disciplinary integrated approach that is at the heart of the land-grant method of addressing national problems. Moreover, the centers interface their activities with other Federal agencies such as DOE, DOT, and EPA.

Other key guidelines that define how the regional Sun Grant centers are to function include:

? Funds are to be allocated evenly among the five regions

? No more than 25% of regional funds will be used directly for center's programs

? Remaining 75% of regional funds are to be allocated in the region to land grant institutions through competitive processes.

? Research, Extension, and educational programs on bioenergy and biobased products will include activities aimed at technology development and technology implementation.

Accomplishments Since Authorization

The SGI has worked with DOE-OBP, Idaho National Laboratory (INL), Oak Ridge National Laboratory (ORNL), and regional Governor's Associations to form a Regional Biomass Feedstock Partnership. The partnership is establishing complementary goals, objectives, milestones and accomplishments for biomass energy. Two Regional Biomass Workshops were hosted in 2006 by the University of Tennessee and South Dakota State University to identify regional needs for research and development. Participants included experts from research universities, Federal agencies, Congressional offices, industry, and non-governmental organizations. These workshops detailed the region's unique capacity to address the goal of sustainable production of a billion tons of biomass for energy purposes, focusing on creation of a new generation of biomass resources that support biorefinery needs. These regional partnerships also will enable development of more accurate cost supply information and improved communication with all elements and partners in the feedstock supply chain.

The SGI recently released a new web-based public resource for information on bio-based energy; the Sun Grant BioWeb (<http://bioweb.sungrant.org>). The Sun Grant BioWeb is a non-commercial, educational website that provides current information about biomass energy and bioproducts. This resource grew out of discussions with USDA-OCE and is funded mostly through DOE. It should be particularly valuable to agencies and organizations that are involved in policy development. The Sun Grant BioWeb will help stakeholders understand: (1) what biomass is, where it is, and how much is available; (2) ways that biomass can be converted to biofuels, biopower, and bioproducts; (3) the current state of biomass technology, research, production and use; and (4) biomass economics and policy.

The SGI is already underway in a limited and small scale. The 2005 SAFETEA-LU appropriated \$10.4 million for each fiscal year through FY2010. This funding is allocated equally to each of the five SGI Centers and regions. About 25% of these funds are being used by each Center to develop leading bioenergy transportation projects and about 75% of the

funds are being competitively awarded to land-grant universities within each SGI region. The priorities for the Centers and the regional competitive grants program have been developed collaboratively with DOT and an interagency panel that includes USDA, DOE, DOD and EPA.

What Will Be Done

With the full appropriation of the authorized \$75 million, the SGI will enable land-grant universities to lead the development of a biobased economy. Their land-grant responsibilities will be broadened beyond traditional agricultural issues to also encompass making significant advances in biobased industries for the benefit of independent farmers, rural communities and the public at large. Land-grant universities have a proven record of accomplishment of objective research and commitment to agriculture, rural families, and public service.

These efforts will revitalize rural communities and enhance the nation's energy security. The primary challenges that must be faced include:

- ? Develop biobased industries that can coexist with and complement petroleum based industries.
- ? Develop biobased industries that improve the environment and protect air, water, soil, and other natural resources.
- ? Develop biobased industries that diversify American agriculture and complement food production.
- ? Develop industries that provide opportunities for the growth and prosperity of rural America.

The transition to agriculturally-based industries will create economic opportunities for other sectors of the US economy through creation of high-tech companies and jobs. Through SGI, the US will continue to be a world leader in technology and innovation for future high-technology commerce and trade. We will not only produce biomass feedstocks, we will also lead the world in the technologies and the intellectual property that makes this transition to a biobased economy possible.

Based on stakeholder input, planning with Federal agencies, and coordination with regional land-grant institutions, the SGI will address regional barriers to biomass energy development.

Key activities will include:

▫ Biomass Resource Assessment

Develop preliminary supply curves for regional feedstocks.

▫ Education and Outreach

Report on the outcomes of regional biomass workshops and continue to improve the Sun Grant BioWeb.

Work with the Cooperative Extension Service to provide basic bio-energy production information and training.

▫ Crop Breeding and Genetics

Develop an inventory of work done on the genetic evaluation of perennial herbaceous, woody, and other crops for energy use. Example candidate species include switchgrass, big bluestem, prairie cordgrass, reed canarygrass, Miscanthus, poplar, and willows.

Form regional teams to conduct research on breeding, genetics, physiology, and pest management.

▫ Research on Agronomic and Environmental Issues

Form regional teams to conduct field-based research on production systems, basic management, and environmental stewardship. Management research would emphasize sustainability and diversity.

Basic production research on biomass feedstock improvements

Inventory and model biomass feedstock resources through GIS and satellite technologies.

▫ Natural Resources

Form regional research teams to conduct research on biomass production impacts on wildlife, soil, water, and air.

▫ Integrating Production Management Systems

Form regional research teams to conduct research on biomass production economics and sustainability.

▫ New Processes and Enabling Technologies

Form regional research teams to improve processing efficiencies and capture value from biomass feedstocks.

Indicators of success for the SGI will be through scientific publications, patents, licenses, startup businesses, implementation of new technologies, effective Extension programs, graduates from new university programs in renewable energy, and other objective measures of advanced economic development.

2007 Farm Bill Request

The Congress will undoubtedly consider many new provisions and programs to support bioenergy and bioproducts in the 2007 Farm Bill. We appreciate the opportunity to work with the Congress to insure that there is sufficient research and education outreach to support these new programs, and that the bioenergy research and education programs of the Farm Bill are carefully coordinated. The current authorization for the SGI addresses the critical overarching goals for bioenergy and bioproduct development for the country. As new programs to support the efforts of farmers, ranchers, and foresters to produce bioenergy are developed, as new strategies emerge to support our rural communities through the development of alternative energy resources, we ask for the opportunity to work with the Congress to ensure that the SGI authorization is responsive and can adapt to ensure that our research and education objectives fully support these new efforts. Research and education outreach alone will not ensure the necessary development of bioenergy developments to transition to a new energy economy, but without focused and coordinated research and education efforts, it will not be possible at all.

We respectfully request that the Congress reauthorize the Sun Grant Initiative as a critical component of the Energy Title of the Farm Bill (Section 9011 of the 2002 Farm Bill). Although the current SGI authorization will continue to FY2010, the goals and mission of the SGI to support the development of agriculturally-based energy resources will be best served if the SGI is concurrent and integrated with the other essential agricultural programs of the Farm Bill. Because of the enormous goals of the President's Twenty-In-Ten Initiative, we request that the authorized funding limits for the SGI should be increased to \$100 million per fiscal year.

