

Biomass and Bioproducts North Dakota BioOpportunities Initiative

Worldwide two barrels of oil are used for every one discovered. Renewable energy must be developed to supply modern civilization's increasing appetite for energy as petroleum becomes more costly, and is an environmental and national security concern. The 21st century will see many petroleum-derived products replaced with biobased products made from renewable materials grown in farm fields and forests.

The biorefiners of the future will be inextricably connected to agriculture and forestry because biorenewable resources are produced from an ecosystem that needs to be conserved and renewed to ensure future production capacity. This system requires linkages among plant breeding, soil fertility, sustainable crop production, transportation and logistics, rural community leadership and infrastructure, bioprocessing, co-product utilization, work force development, risk management and marketing services, and additional topics.

Bioenergy and bioproducts present many opportunities for growth in rural communities. A sustainable North Dakota economy requires a balance of thriving and dynamic rural and urban communities. Public policy and federal legislation that strengthen the infrastructure of America's rural areas are being developed.

Like at many land-grant institutions, North Dakota State University faculty have been engaged for years in both fundamental and applied research and education related to biorenewable resources and biobased products. A systems approach is required to effectively develop technologies leading to commercialization of bioenergy and bioproducts.

The challenge is to think on a global scale, recognizing that what each accomplishes is a critical piece of the objective and that as a *team* we will succeed in synchrony with our state and nation.

NDSU
NDSU Extension Service
N.D. Agricultural Experiment Station
North Dakota State University

Vision

North Dakota is a leader in the development of renewable energy and biobased products.

Mission

North Dakota State University helps rural communities be sustainable through the production of renewable energy and biobased products.

NDSU's Resources

NDSU has a long history of helping the people of this state. Much of the focus has been on agriculture, natural resources and community development. NDSU Extension Service staff "change agents" are based throughout the state in every county. Similarly, NDSU has a wealth of scientific expertise distributed at seven Research Extension Centers across the state to support bioenergy and bioproducts research and development in North Dakota. The NDSU main campus is the apex of this structure as North Dakota's land-grant university. As a land-grant institution, the entire state is the NDSU campus.

Research, education and outreach programs of all NDSU colleges provide the critical mass for NDSU to truly lead a biorevolution.

Recent discussions across North Dakota have asked NDSU to consider how the university can develop visions that contribute to the expansion of renewable energy and bioproduct industries in the state. Over the past several months, NDSU leaders initiated an effort to facilitate new scientific interactions. NDSU faculty were asked to describe current renewable energy and bioproduct research projects and describe their vision for the future of North Dakota (appendix 1).

North Dakota BioOpportunity Challenge: A Time to Partner

Although NDSU has great capacity to lead the development and expansion of the renewable energy and bioproducts industries in North Dakota, growth will be accelerated through partnerships. In addition to NDSU capabilities, assistance from political leaders, commodity organizations, private industry leaders, community leaders and other higher education institutions is required. All these groups have unique perspectives and resources that can hasten development of these industries. Consequently, the following partnership proposal is being advanced.

NDSU BioInitiative Concepts for Success

Successful projects will:

- be based on systems thinking that requires team play for success
- create major statewide opportunities
- address social, economic and environmental, as well as physical and biological science, aspects of bioenergy and bioproducts
- be enhanced by including agency, industry and private partners
- involve several disciplines and colleges of the university, including outlying research and Extension resources.

NDSU BioOpportunity Workshop Tasks

Develop a framework that identifies:

- opportunities for North Dakota related to bioenergy and bioproducts
- tasks required to seize these opportunities
- roles for NDSU and its partners to support future successes
- resources required to achieve the vision and mission