

Developing a Biomaterials Industry in North Dakota



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Presented to:

NDSU Biomaterial Task Force

April 25, 2007

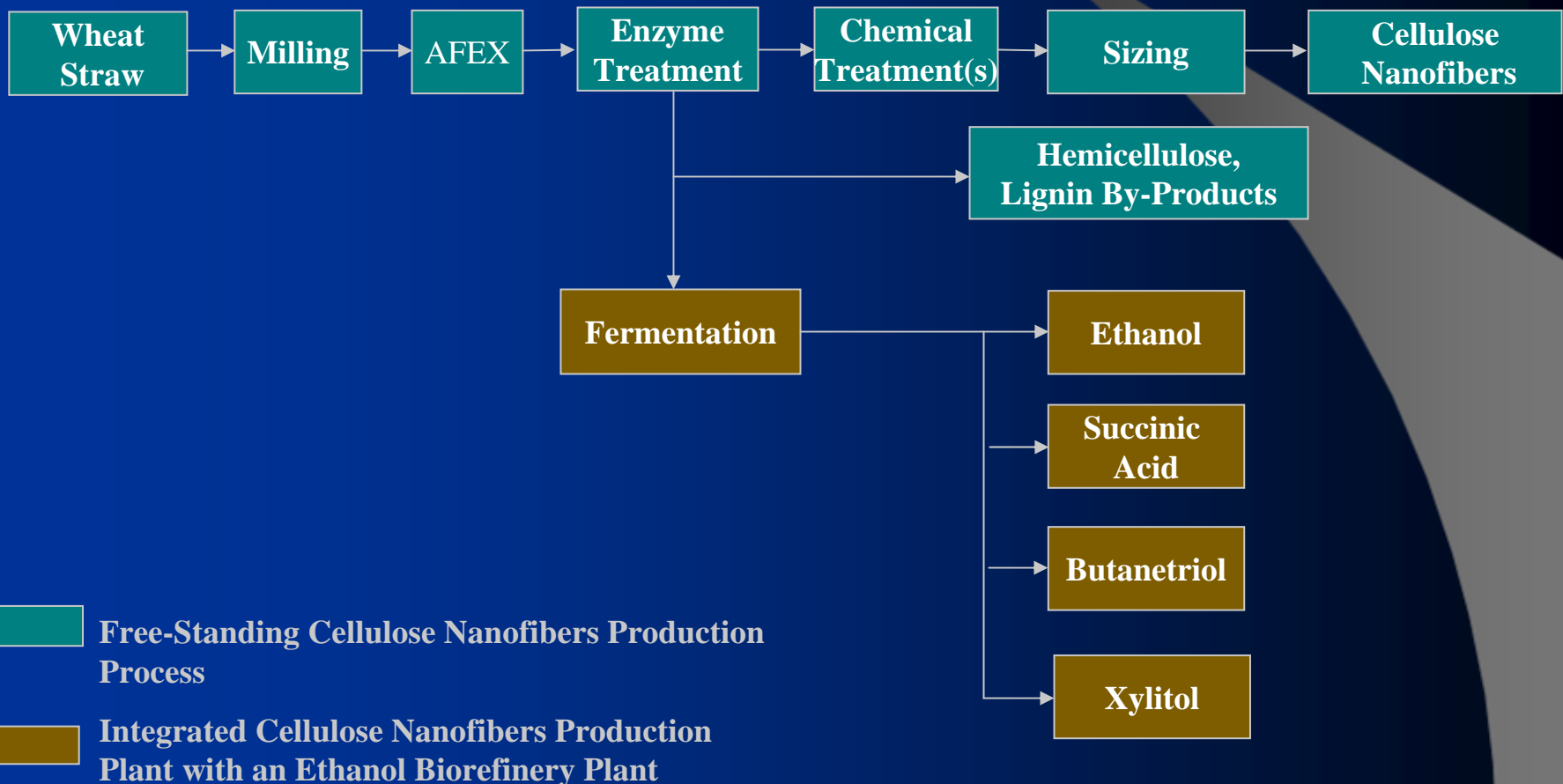


The Biorefinery Concept



- An integrated biorefinery could use the by-products of nanofiber production to produce ethanol and other high value chemicals.
- The concept is *economically attractive* as it *captures greater value* from biomass feedstock and reduces environmental impact.

Cellulose Nanofibers Biorefinery Process Flow Diagram



Cellulose Nanofiber Project

Michigan State University
MBI International

Business Partner: TBD

Ideas

Tech/Com.
Feasibility?

1

Preliminary
Investigation

Product
Concept

2

Detailed
Investigation

Value
Proposition

3

Development

Business
Plan

4

Validation

Marketing
Plan

5

Commercial
Launch

- Demonstration of CNF from recycled paper
- Demonstration of CNF from corn stover & wheat straw
- Definition of product specifications
- Established preliminary process economics
- Evaluate integration with ethanol plant

- Pre-Pilot process design and engineering
- Preparation and evaluation of CNF samples
- Preparation and evaluation of composite materials
- Refine process definition, design, engineering and capital and operating costs
- Pilot plant design and engineering

- Pilot plant construction
- Preparation and evaluation of large scale CNF samples
- Preparation and evaluation of large scale composite materials
- Refine process definition, design, engineering and capital and operating costs
- Validation of feedstock assumptions and integration feasibility with an ethanol plant

Related Work

- Economic analysis of bioenergy feedstocks
 - Costs of producing, harvesting, and transporting feedstock crops
 - Supply prices for feedstock crops

Related Work

- Socioeconomic impact of CRP
 - 2000 to 2003
 - Effects of CRP on local/regional economies

Questions?

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