Sustainable Production of Biofuels

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Sustainable system
- Environmental
- Economic
- Social

5 million tons biomass/yr - 400,000 acres
- Poplar-industrial growers
- Poplar-farmer-based partnerships
- Local residuals

400 million gallons/yr
100% infrastructure compatible biofuels

Vigorous Extension

Comprehensive Education
Feedstock – Trial Plantations
Feedstock – Supporting Research
**Conversion- ZeaChem Process**

**Biomass**
- Wood
- Grass
- Ag Residue
- Corn/Cane

**Hydrolysis**
- Sugars

**Gasification**
- Lignin
- Hydrogen
- Steam, Power

**C3 Fermentation**
- C3 Acid
- Hydrolysis

**C2 Fermentation**
- C2 Acid

**Propionic Conventional Refining/Petrochemical Units**
- Hydrotreat
- Dehydrate
- Oligomerize

**Conventional Refining/Petrochemical Units**
- Gasoline
- Propylene
- Jet
- Diesel
- Ethylene
- Ethanol

**ZeaChem Process**
- Steam, Power
Sustainability
Extension

Impacted Communities

Policy Makers

Students

Researchers

Industry Partners

Consumers
Education

- Community College
LCA Example – Production of Ethanol From Willow

Plantation Grown Willow

Bioconversion process – ASPEN model

Includes technosphere and environmental flows
SimaPro software; USLCI & Ecoinvent databases.

Distribution

Use

Electricity – co-product
Global Warming Potential

- Gasoline production and Use
- Disposal of solid wastes
- Avoided production
- Fuel distribution and use
- Conversion process
- Transport to refinery
- Ancillary Chemicals
- Feedstock production and harvesting
- CO2 absorption

Net emission
Conclusion

• Regional Sustainable Biofuels Industry Has Many Benefits
• Environmentally Sound, Economically Viable, Socially Acceptable
• Regional CAP Research Program Enables Development of a Sustainable Biofuels Industry
Buy Fresh Buy Local

Sustainably produced

Good for local economy

Rural development

Connection w/ product and producer
Sustainably produced

Good for local economy

Rural development

Connection with product and producer

GROW & REFINE LOCALLY
Acknowledgements