

Sun Grant Initiative

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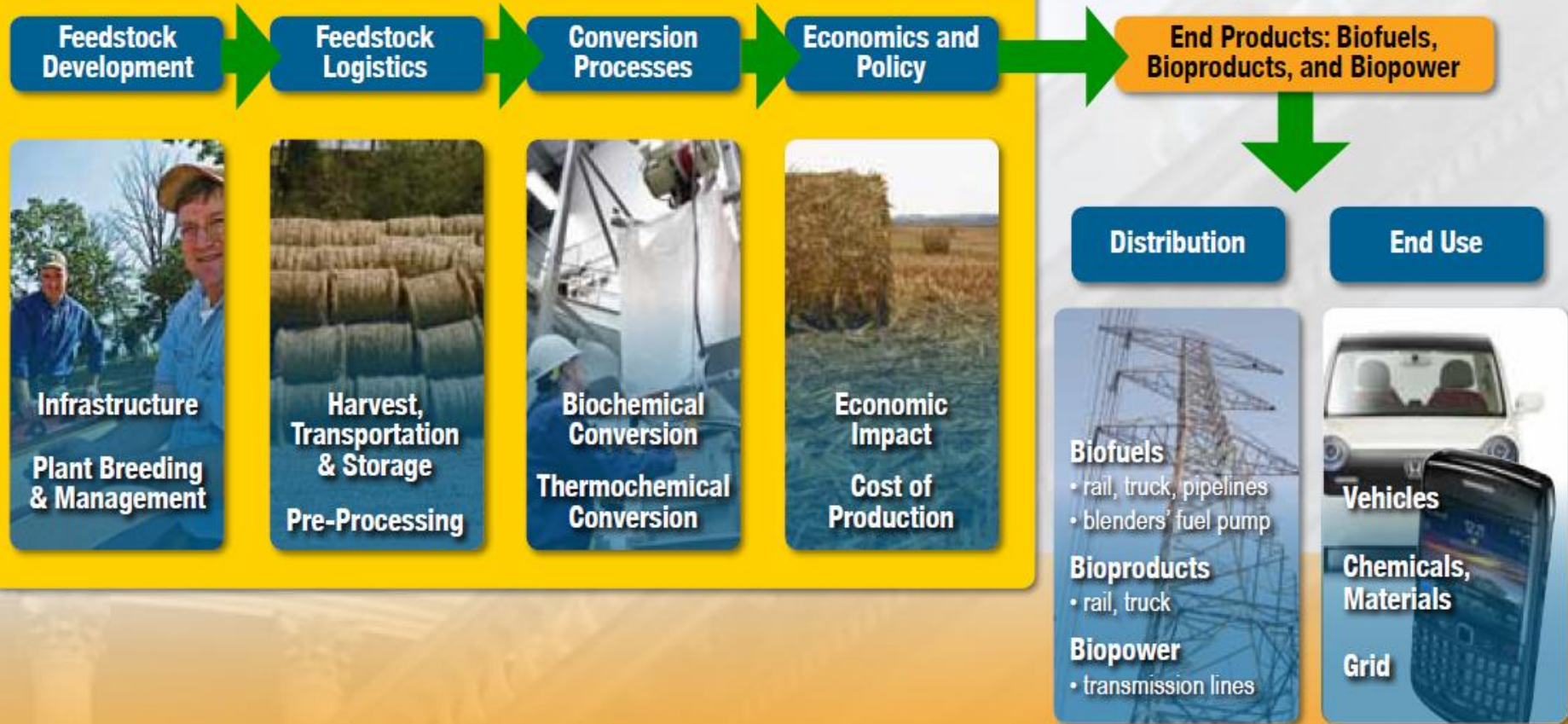
Director, North Central Sun Grant Center
South Dakota State University

Minnesota Renewable Energy Roundtable:
Renewable Chemicals
14 March 2018

- A consortium of the nation's land-grant universities addressing national bioenergy and bioproduct challenges at the local level and on a regional scale
- Supporting research and educational activities in the development of:
 - Biobased transportation fuels
 - Biobased products
- Authorized in 2002, 2008, and 2014 Farm Bills



Sun Grant Initiative



SUSTAINABILITY



U.S. Department of Agriculture

- Sustainable Feedstock Production
- Biobased Products
- Regional Competitive Grants



Feedstock Development

- Plant Breeding
- Agronomic Management
- Sustainable Production
- Equipment Technology



Logistics

- Feedstock Production
- Harvest, Delivery, and Storage
- Transportation
- Pre-Processing



Conversion Processes

- Conversion Technologies
- Cost of Production
- Biological Conversion
- Thermochemical Conversion



System Analysis

- Industrial Ecology
- Feedstock Transport
- Biofuels Transport
- Delivery Infrastructure



Economics, Marketing, and Policy

- Economics and Policy
- Impact on Food, Feed, and Fiber Markets
- Economic Return
- Production Economics



Environmental Impacts

- Life Cycle Analysis
- Greenhouse Gas Emissions
- Carbon and Energy Balance
- NOX Emissions



U.S. Department of Energy

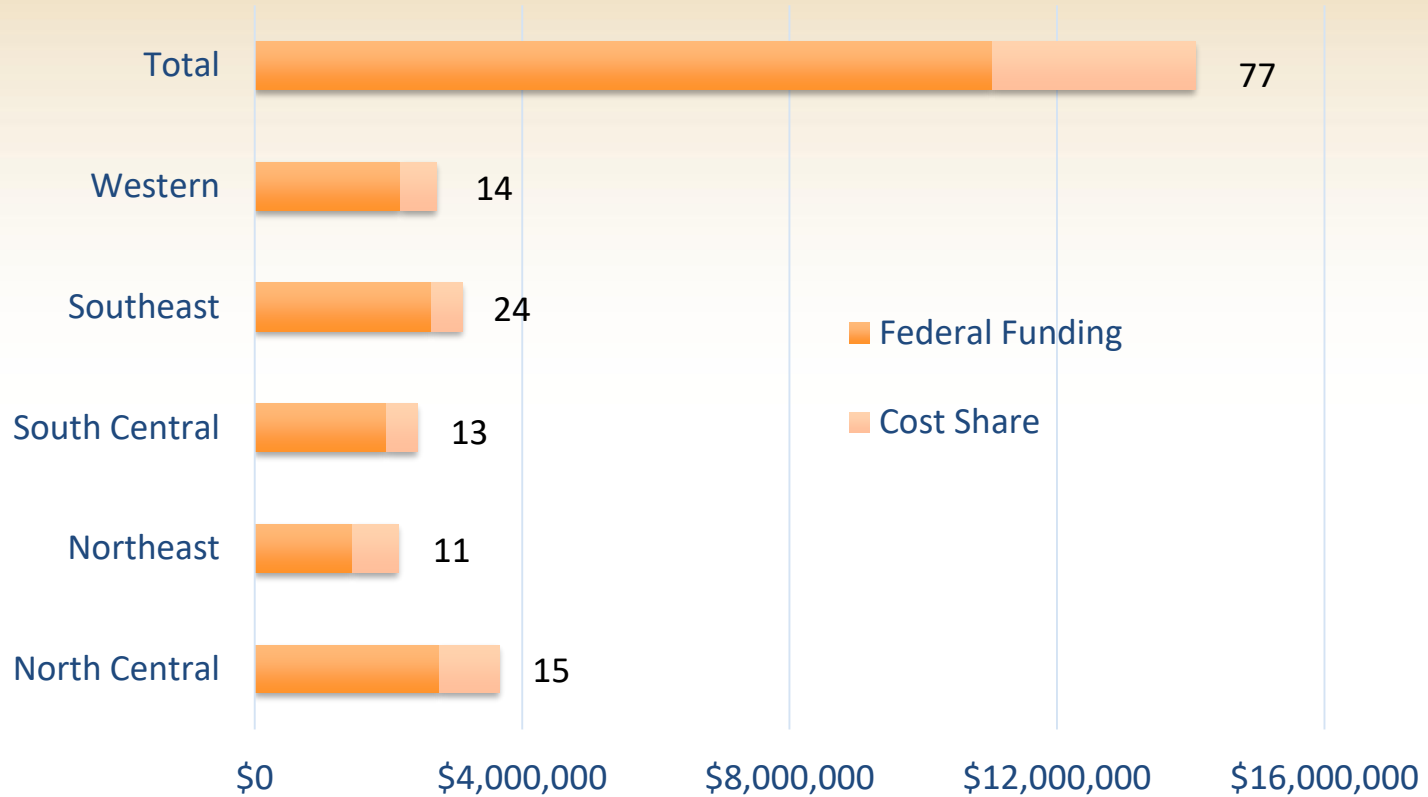
- Regional Feedstock Partnership
- Biobased Products
- Regional Competitive Grants



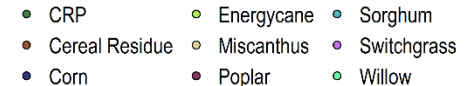
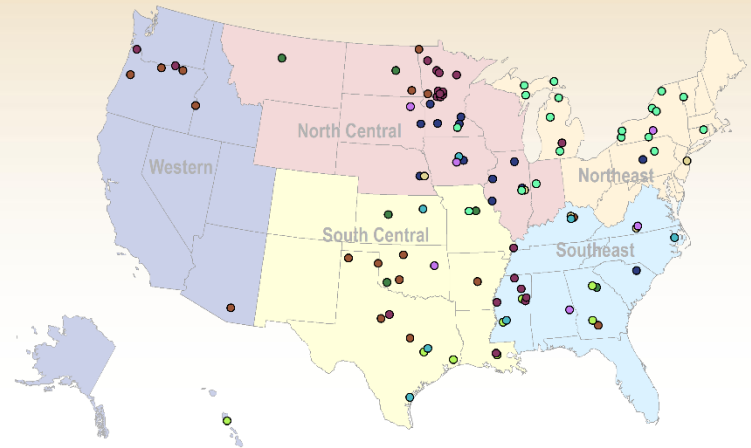
U.S. Department of Transportation

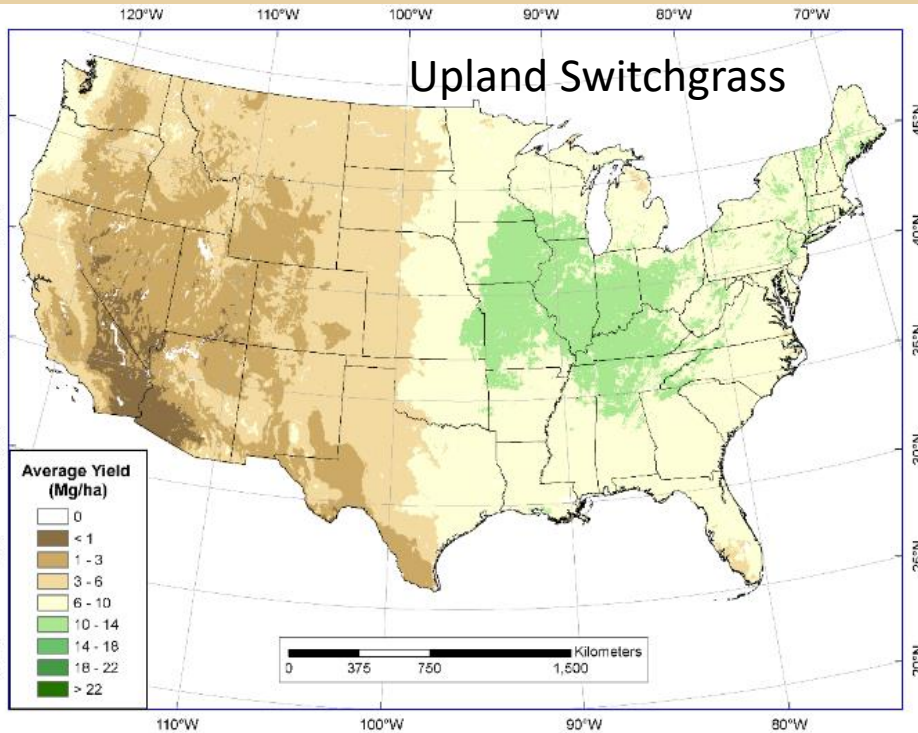
- Renewable Transportation Fuels
- Regional Competitive Grants

Biobased Products: Funding and Projects by Region (2008-2017)

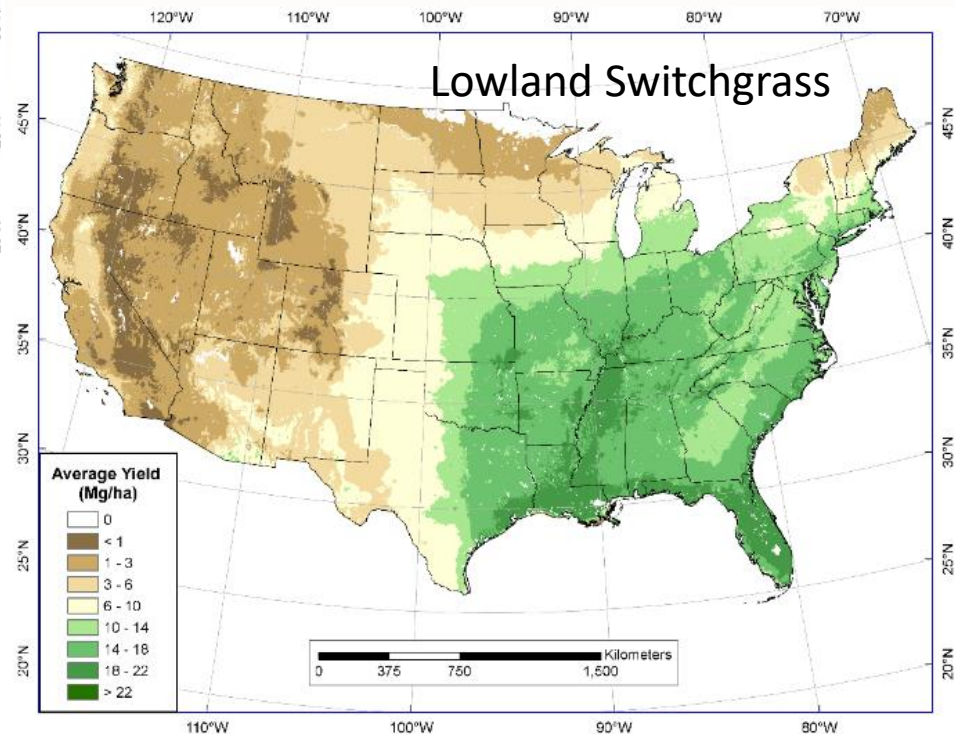


- Sun Grant/Land Grant/DOE/USDA-ARS partnership
- Funding
 - DOE—\$20+ million
 - Cost Share—\$5+ million
- Feedstock field trials
 - Woody species
 - **Poplar, willow**
 - Corn stover
 - Small grain residue
 - Herbaceous crops
 - **Energycane, Sorghum, CRP**
 - **Miscanthus, Switchgrass**





- National yield potential maps for several biomass species
- Publicly available data sets



- Broad scope of projects across bioenergy value chain
- Primarily early stage projects that may not have been funded in other programs
- Projects have often been catalyst for further research activity
- Strong linkage to industry

- Gregg Johnson—University of Minnesota
 - Feedstock development for renewable chemicals and other bioenergy
- Goutham Vemuri—Sasya LLC
 - Developing renewable chemicals from biomass sugars
- Qi Hua Fan—Michigan State University
 - Energy storage options using renewable products



Photo by Matt Darr, Iowa State University