



DuPont Danisco Cellulosic Ethanol, LLC

Cellulosic Biomass: Advancing America's Feedstocks for Energy

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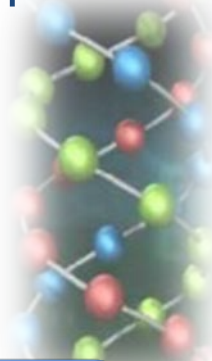
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DuPont Danisco Cellulosic Ethanol

- ▶ Wholly owned subsidiary of DuPont, started as JV in 2008
- ▶ DDCE's parents contributed \$140 million investment, Legacy IP, and millions of dollars of prior R&D to this venture
- ▶ We are focused on creating cost effective biochemical solution for sustainably converting cellulosic feedstocks such as corn residues & switchgrass to ethanol
- ▶ 250,000 gallon/year plant operational today in Vonore, TN
- ▶ Plan to startup our commercial biorefinery and license technology to customers



Cellulosic ethanol allows us to accelerate America's transition into the bio-economy by expanding opportunities for other advanced biofuels and bio-based products.



Demonstration Plant



**Vonore Grand Opening
Jan 29, 2010**



**“Grassline plant is
hatchery for big refineries”**

— Associated Press, Jan. 29, 2010



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DDCE Integrated CE Process™

Feedstock Pre-processing



- Increase bulk density
- Optimize feedstock particle size
- Maximize feedstock quality

Pretreatment



- Facilitate enzymes
- Minimize inhibitors
- Mild processing conditions

Saccharification



- High solids
- High sugar yield/titers
- Low enzyme loading

Fermentation



- C5/C6 utilization
- Efficient sugar conversion
- High ethanol titer

Distillation/ Separation



- Fuel grade ethanol
- Recover lignin filter cake for fuel use
- Recycle water



Technology for Commercialization

- Producing fuel-grade cellulosic ethanol from feedstocks at Vonore biorefinery
- Farm-to-fuel collaborations with Genera Energy, University of Tennessee, Ceres
- Flexible system processes stover, switchgrass, and other energy crops
- Optimizing, scaling up process to commercial production
- Plan to scale up to commercial facility for corn residue first, followed by energy crops including switchgrass & sorghum

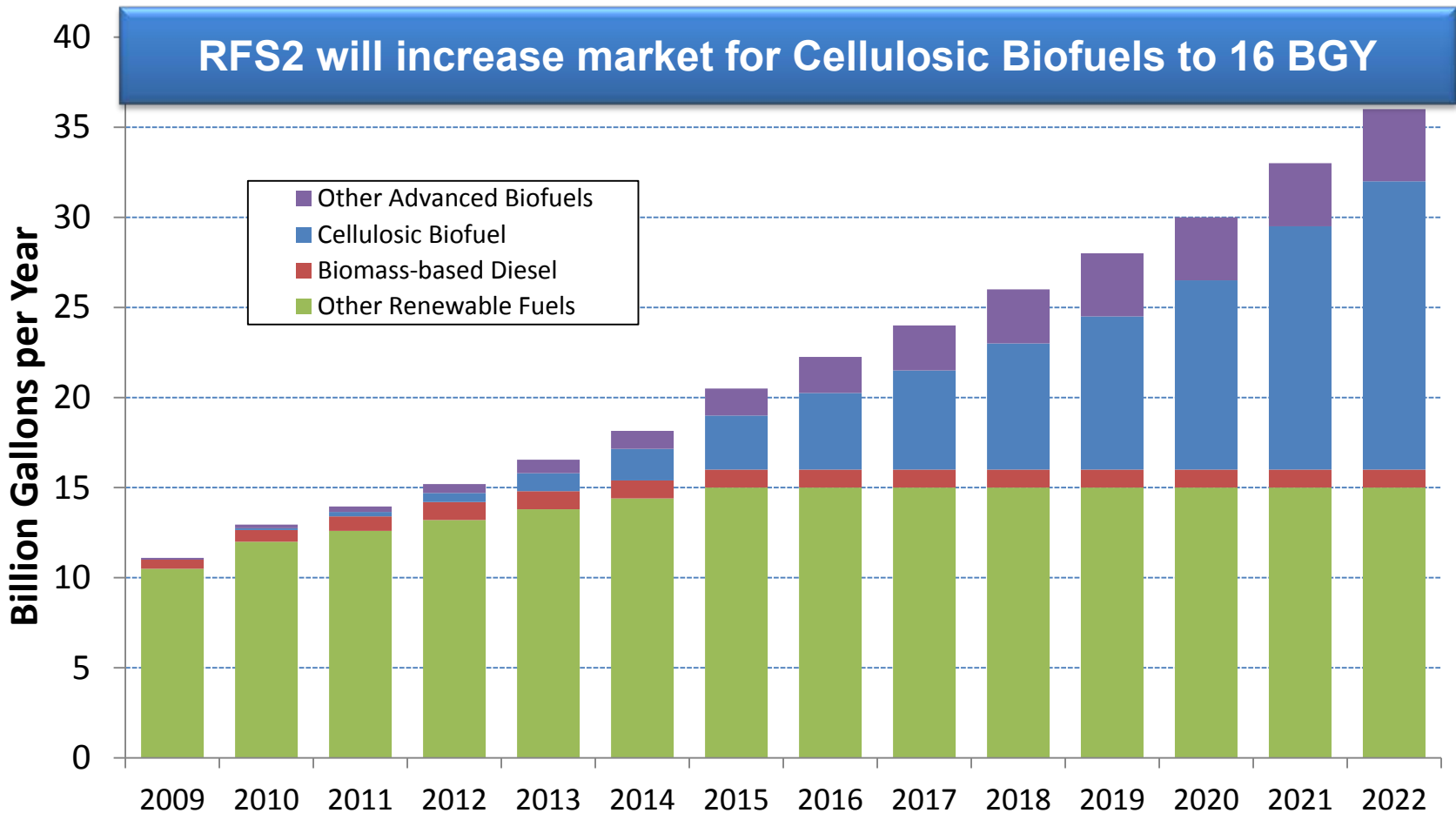


DDCE's technology is ready, and our customers expect policy to be clear, consistent and sustained for advanced biofuels.



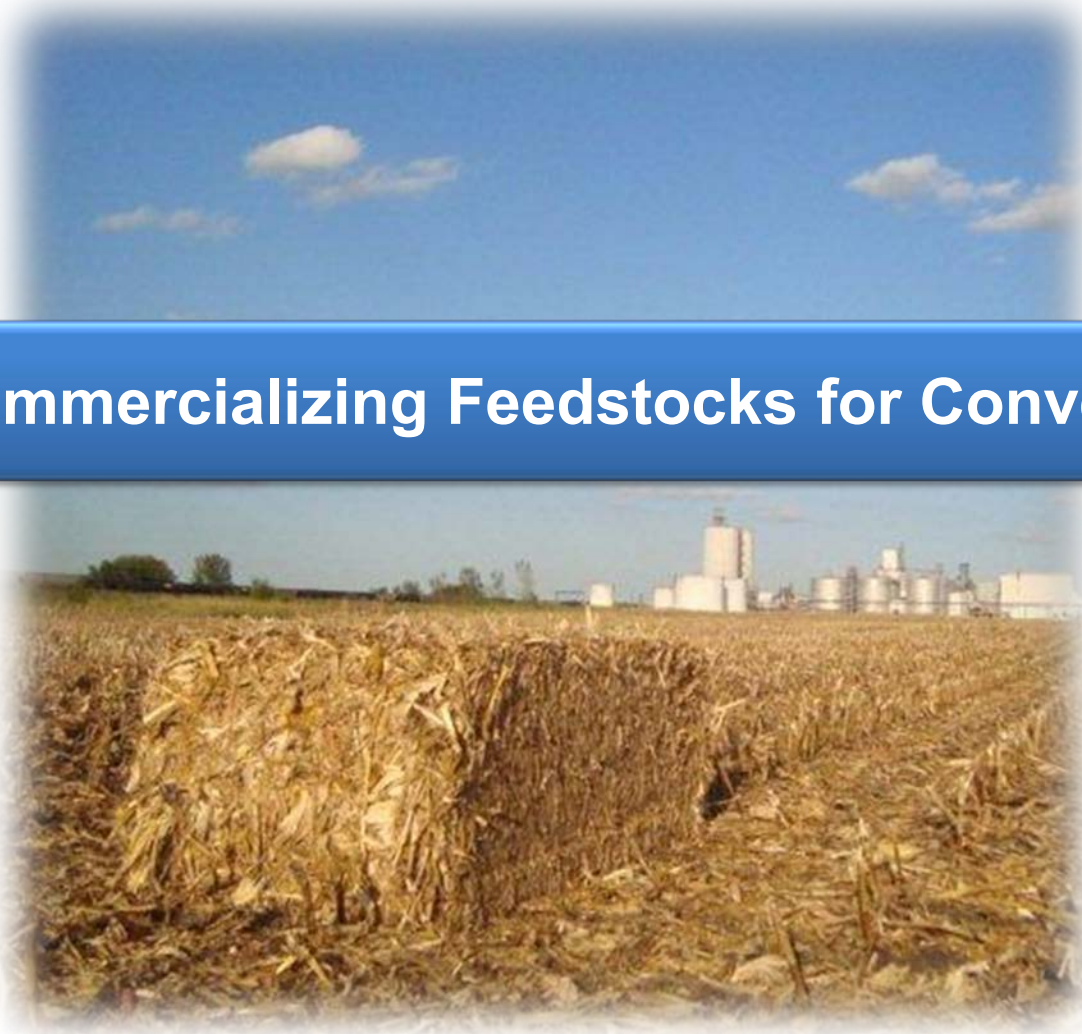
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Renewable Fuels Standard





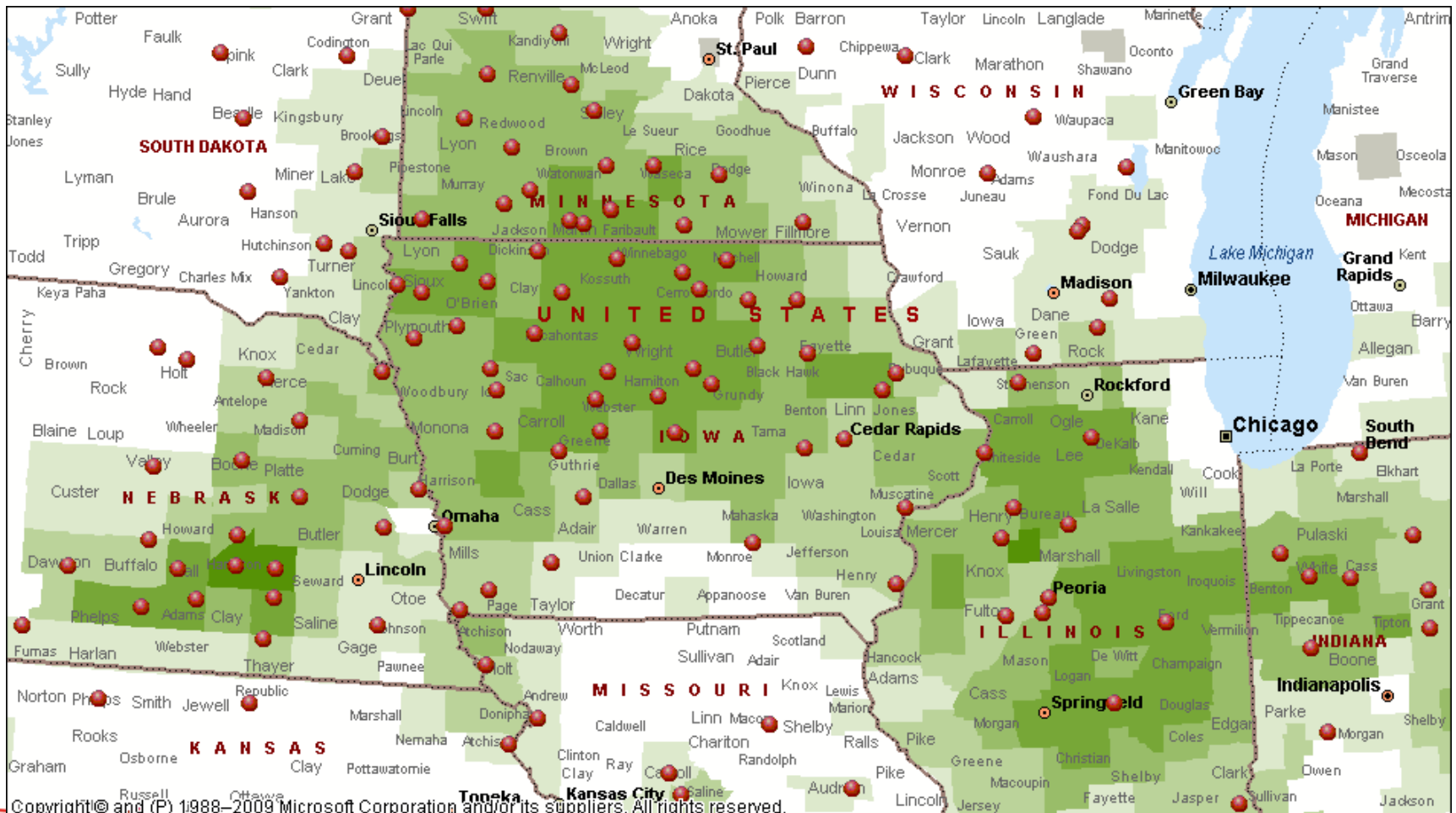
Commercializing Feedstocks for Conversion



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US Corn & Ethanol Production




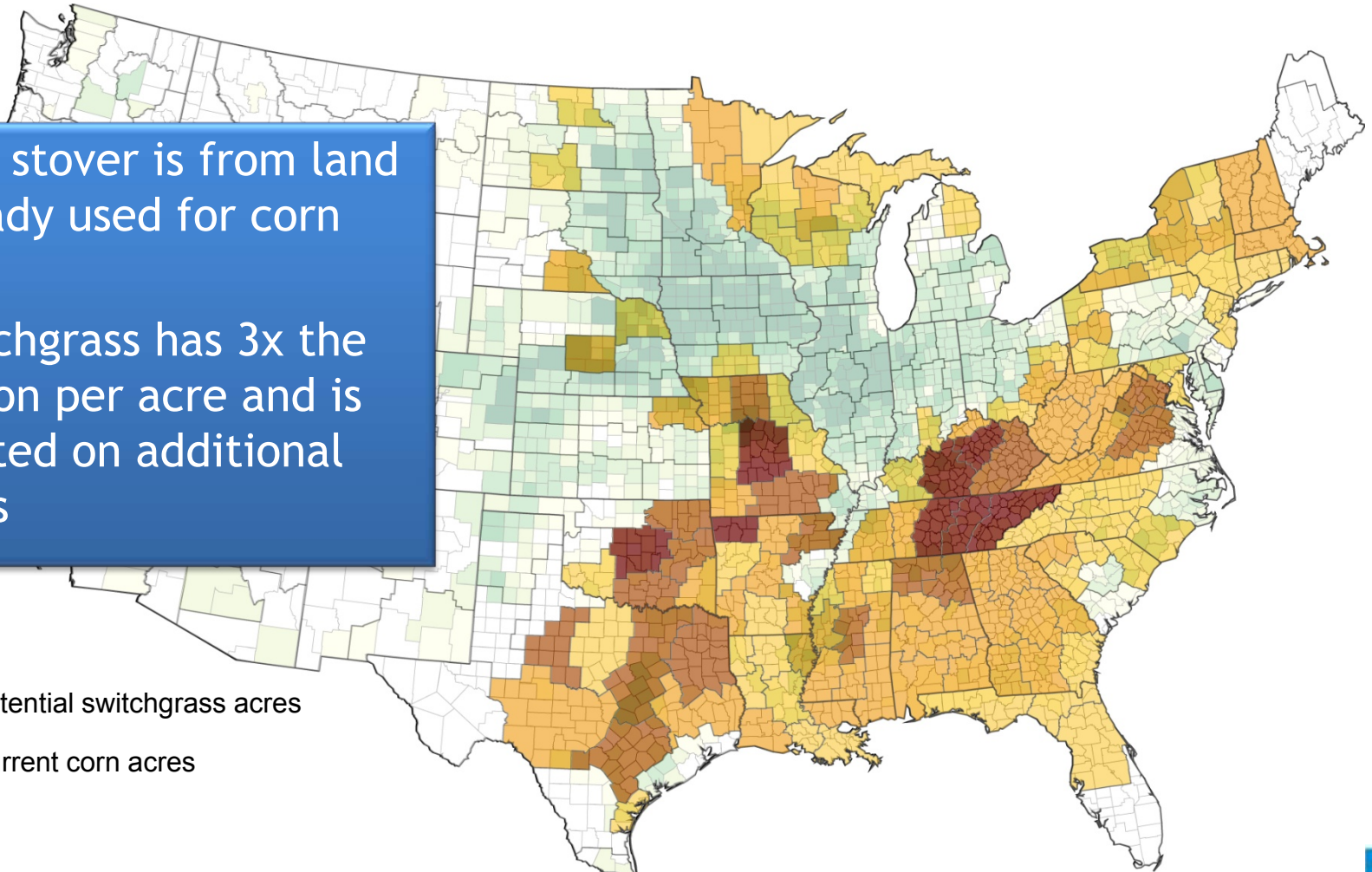
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Commercializing on Multiple Feedstocks

- ▶ Corn stover is from land already used for corn
- ▶ Switchgrass has 3x the carbon per acre and is planted on additional acres






 Potential switchgrass acres

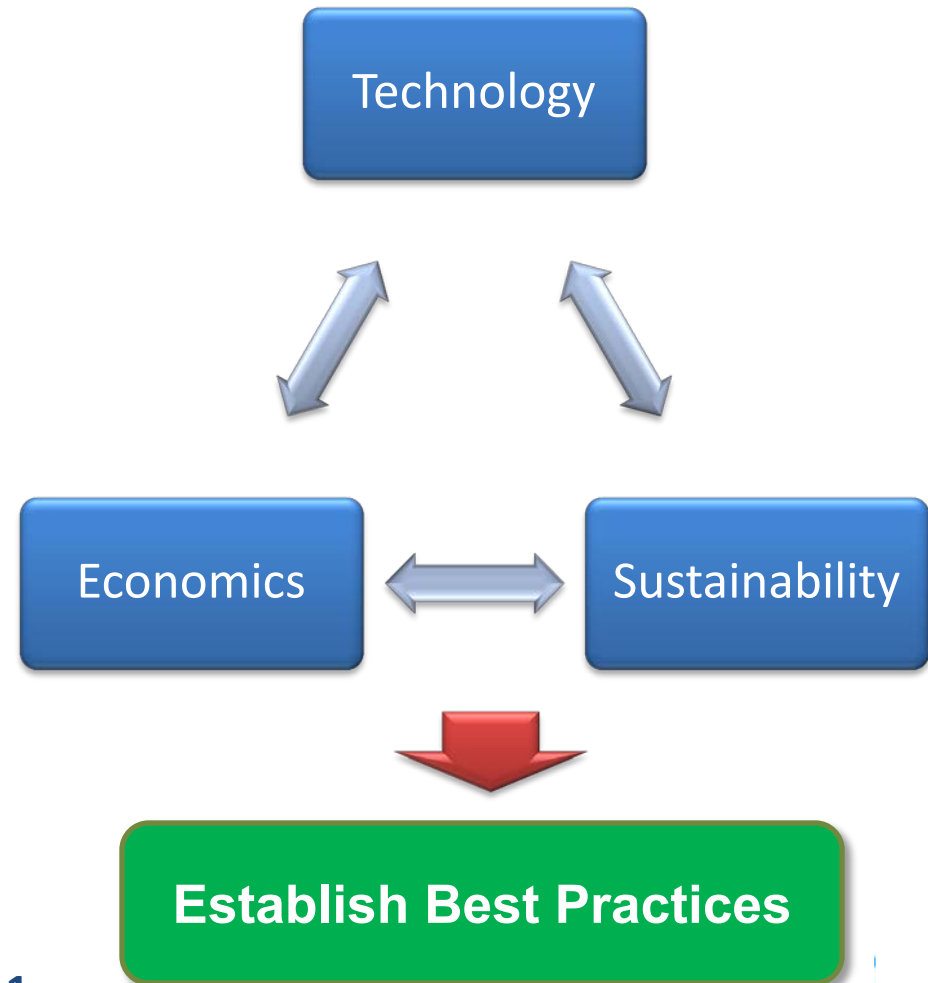
 Current corn acres



Source: DDCE, Univ. Tenn., USDA

Biomass Supply Chain

Supply Chain Segment	Equipment
 <p>Farmer Contracts</p>	-
 <p>Biomass Collection</p>	Tractors, balers <i>Rakes, stalk choppers, stackers</i>
 <p>Storage</p>	Storage sites, infrastructure, tarps,
 <p>Transport</p>	Trucks and trailers delivering to plant
 <p>Preprocessing & Delivery</p>	Grinding stations & related infrastructure





Field Experience



Thank You



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