Building a Biomass to Sugar Value Chain
Supports Cluster Development in Canada



ABFC Conference

Miami, June 7, 2016

A.J. (Sandy) Marshall

Chairman, Bioindustrial Innovation Canada

Sarnia, Ontario

Bioindustrial Innovation Canada
A Sustainable Chemistry Alliance

Corn Stover to Sugar Value Chain Initiative

A Concrete Step towards a Relationship

Project initiated in 2012 to assess the value that could be created within this value chain

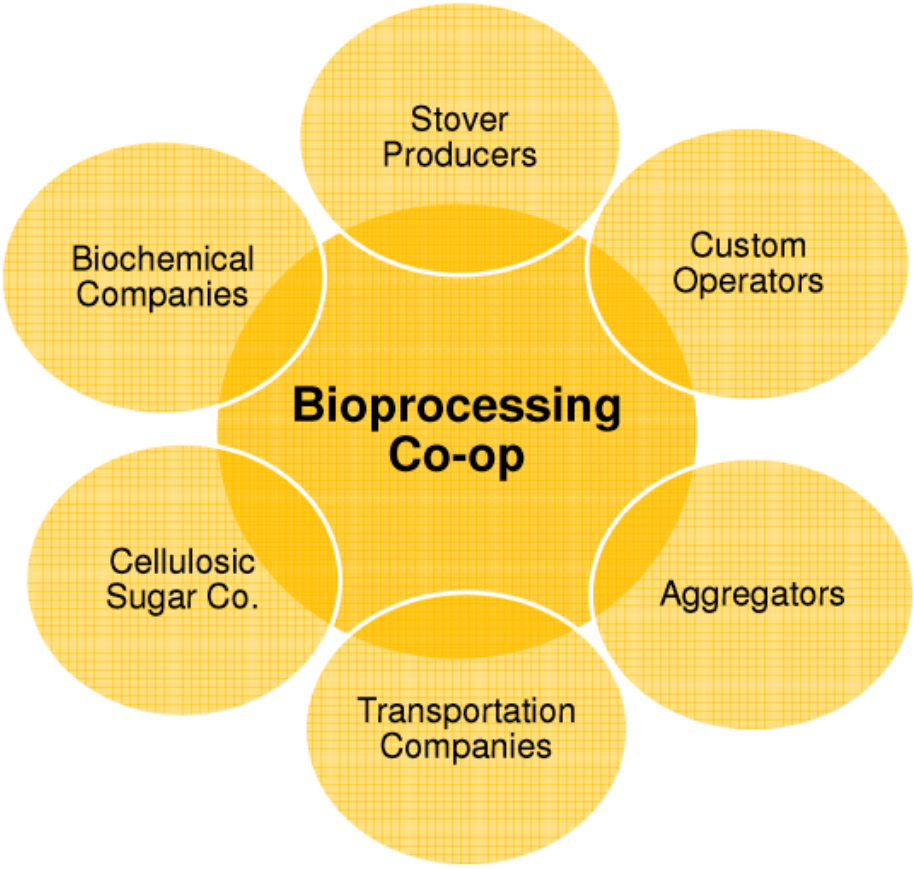
Participation along value chain from agriculture to the chemistry industries

Field trials and sugar extraction testing conducted

Costs were assessed transparently in various business models

Significant interest was generated within the agricultural community

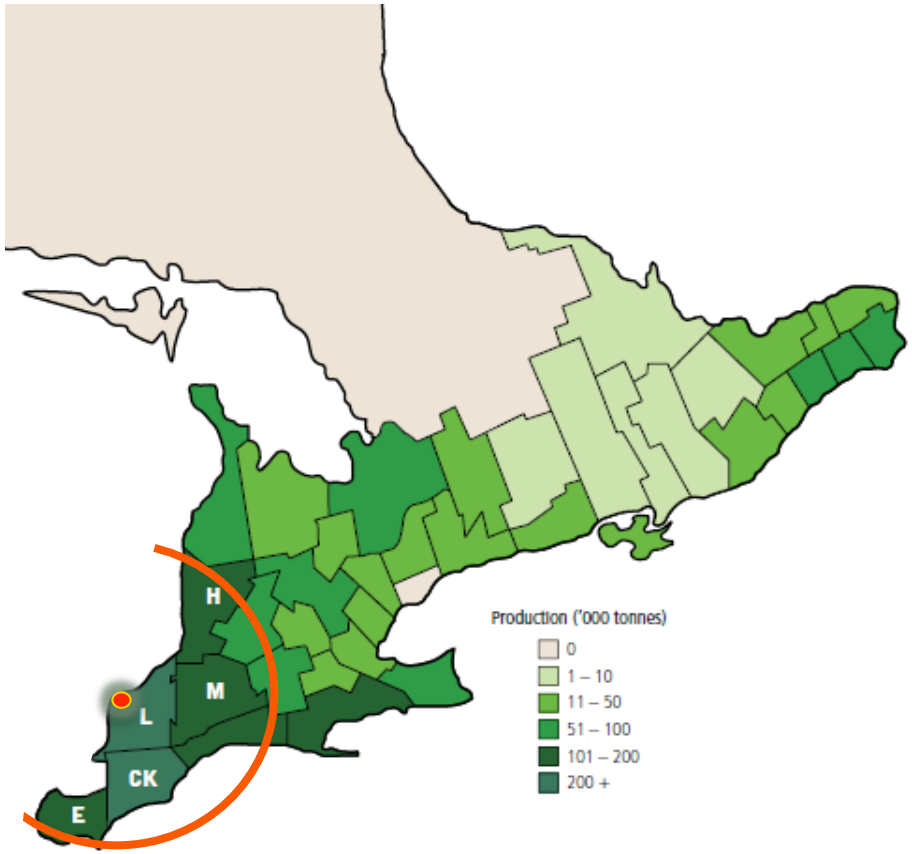
“Seeds of trust were planted”



University of Guelph, Ridgetown College 08-08-13

Corn Stover to Sugar Value Chain Initiative

Biomass available for full scale commercializaton

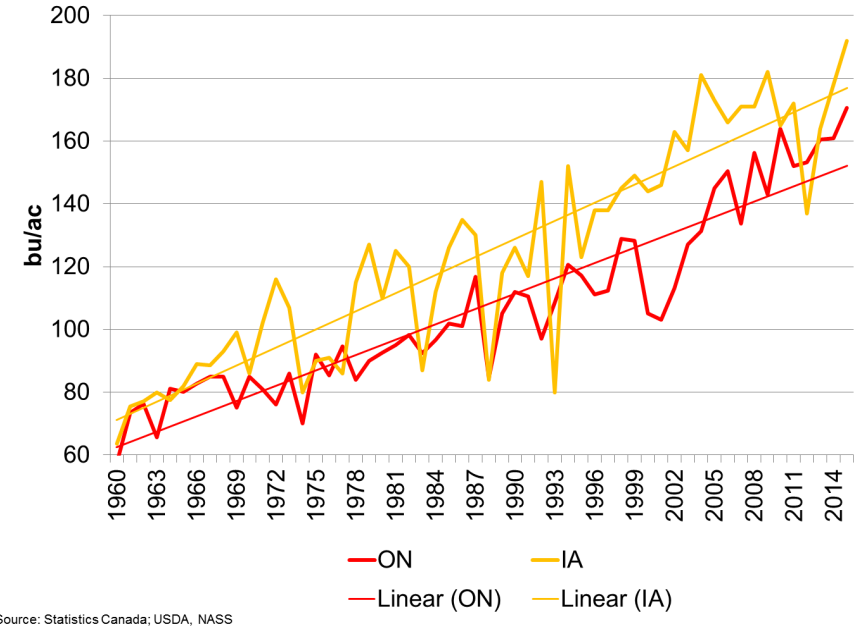


Located within Ontario's Agricultural Heartland

- **45% of soybeans and corn within 100km**

Five County Region around Sarnia

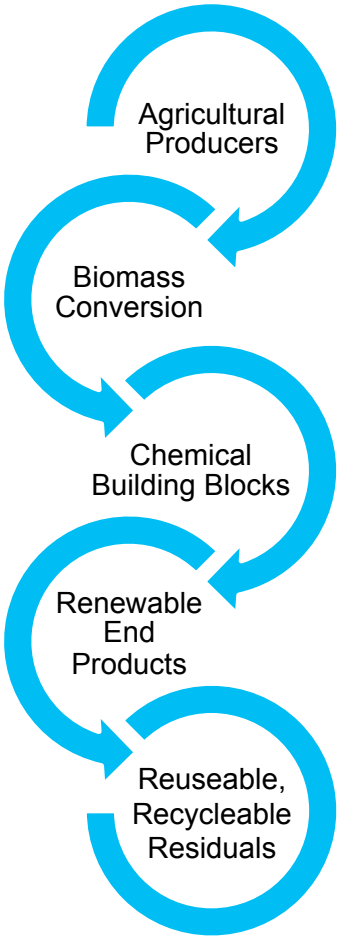
- **corn yields comparable to Iowa**
- **more than 1 million bone-dry tonnes sustainably harvestable corn stover available (2009)**



Source: Statistics Canada; USDA, NASS

Development of Cellulosic Sugar Production Capacity

Raw material sourcing anchors creation of value chain



Vision:

- An operating agricultural biomass to end-products supply chain by 2020 which is profitable and sustainable for all participants

Target:

- Construction of a cellulosic sugar conversion plant in Southern Ontario by 2018 processing up to 250,000 tonnes of agricultural residue

Project Timing and Cost:

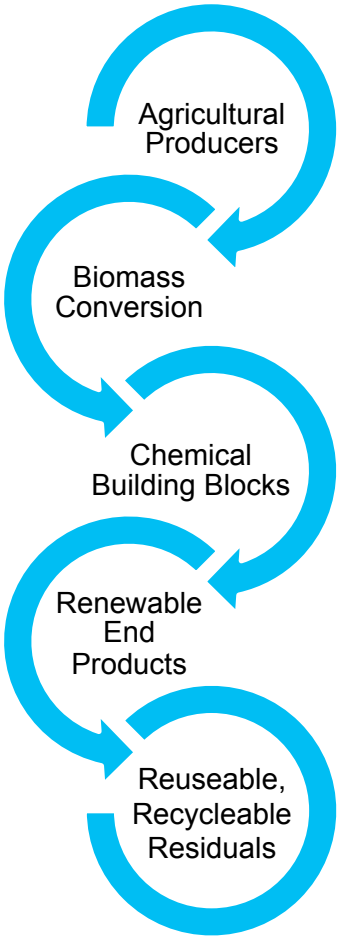
- Sixteen month project (Nov 2014 to Feb 2016) costing $500,000

Contributors:

- Consumer Group Partners: BioAmber, IGPC, Jungbunzlauer
- Supply Side Partners: GFO, CSP Cooperative, OFA
- Government: Agricultural Adaptation Council (AAC) - $300K
  Alberta Innovates - $50K
- Bio-industrial Innovation Canada (BIC), Ontario Agri-Foods Technology (OAFT)

Development of Cellulosic Sugar Production Capacity

Project process and key outcomes



Process:

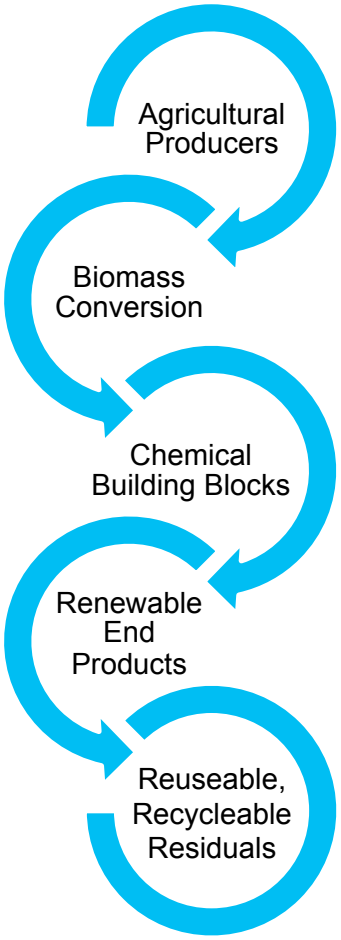
- 19 technology providers screened vs. decision criteria
- Samples from 8 providers analyzed vs. consumer group specifications and performance under micro-fermentations
- 8 sites visited
- 4 technology providers selected for biomass processing trials and further validated for product quality, mass and energy balance, process efficiencies, economics
- Existing agricultural Cooperative would partner with a technology provider to commercialize first cellulosic sugar production facility

Outcome:

- BIC provided recommendations to CSP Cooperative
- CSP Cooperative engaged with COMET Biorefining Inc to develop a business case for the Farm to Sugar Value Chain

Farm to Sugar Value Chain Business Case

Second Project Initiated to Create Offering Statement



Project Timing and Cost:

- Four month project duration from Dec 2015 to March 2016
- Total project cost of $110,000

Contributors:

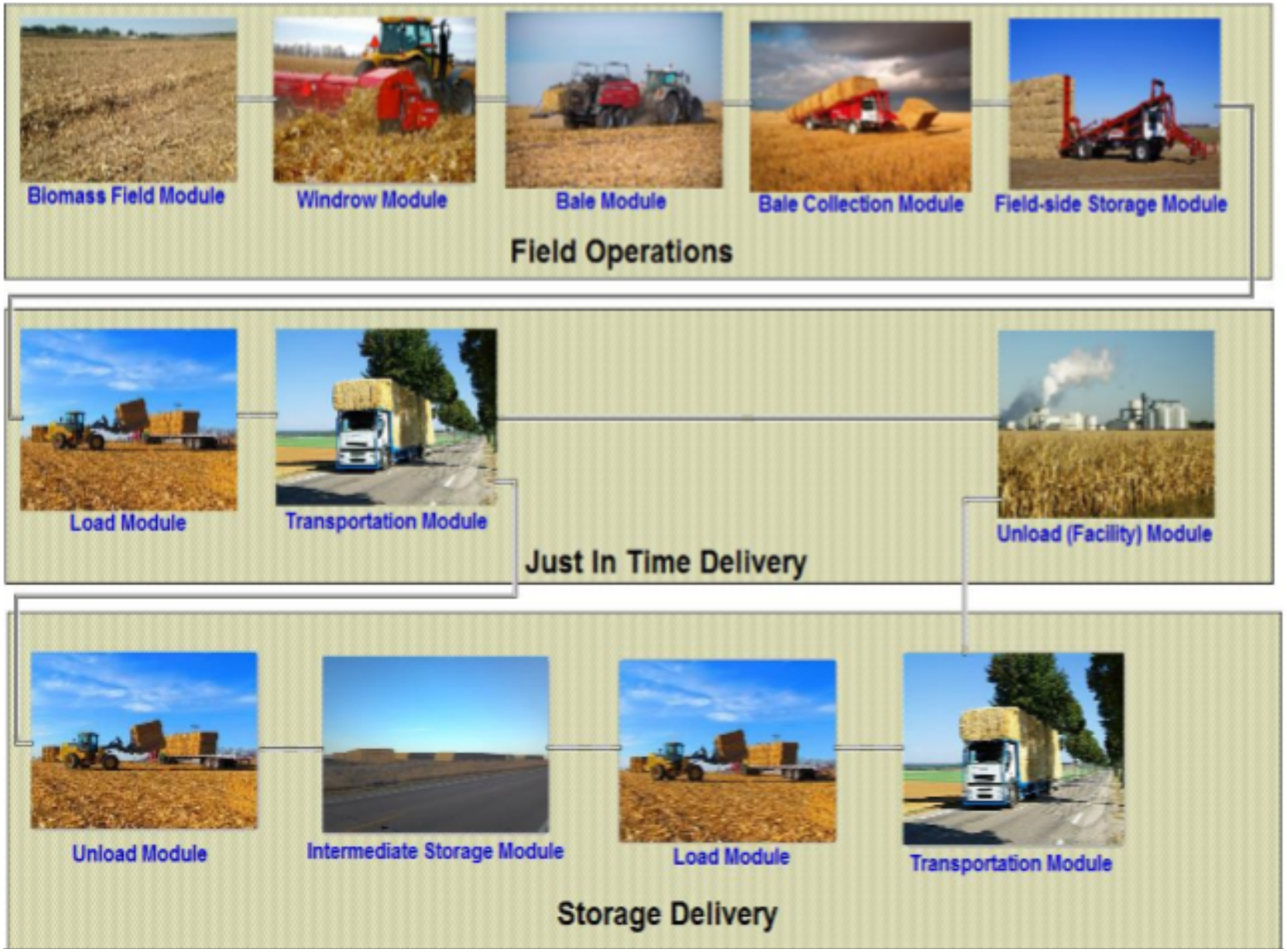
- Technology Partner: COMET Biorefining Inc.
- Supply Side Partner: Cellulosic Sugar Producers Cooperative with support from Agris Co-operative
- Government: Agricultural Adaptation Council (AAC) - $50,000
- Bio-industrial Innovation Canada (BIC), OAFT

Outcome:

- Develop a business case for a supply chain to cellulosic sugar plant processing 75,000 tonnes/year of corn stover
- If appropriate, develop and market an Offering Statement for the Cellulosic Sugar Producers Cooperative

Aggregation, Transportation and Storage Logistics

Active Management is Critical to Control Costs



Building a Biomass to Sugar Value Chain in Canada

Current Status and Next Steps

Current Status:

- Cooperative approved the jointly developed business plan for the agricultural biomass to sugar value chain
- Cooperative signed an MOU with Comet Biorefining to collaborate on the development of a sustainable agricultural biomass supply chain in southwestern Ontario
- Comet selected Sarnia as the location for its commercial scale biomass-derived sugar facility consuming 60,000 dry tonnes of corn stover or wheat straw

Next Steps:

- Conduct initial meetings with selected small groups of producers
- Create and gain approval of an Offer Statement to support an equity raise
- Complete equity raise and finalize supply agreements (Fall 2016)
- Initiate Cooperative operations and establish the biomass supply chain with first partial harvest planned for Fall 2017

Thank you - Discussion