Building an Agricultural Biomass Industry in Canada

Dr. Murray McLaughlin

Biomass Quality Network Canada (BQNC)
OUTLINE

- BioDesign-A National Strategy
- Canada a Natural Choice
- Value Chain for Bioeconomy
- Biomass a key Ingredient
- Biomass Quality Network
- Clusters/BioHubs
- Summary
Why Spent Time on a National Strategy

• It was an ask by our industry Partners
• Canada was one of the few countries without one
• Without it what is our direction
• Partners across the Country asked for a strategy
FOUR KEY PRIORITIES

1. Creating Agile Regulations and Policy
2. Establishing Biomass Supply and Stewardship
3. Building Strong Companies and Value Chains
4. Building Strong Sustainable Ecosystems

Recommendations and Actions are developed for each Priority

www.CanadaBiodesign.ca
Strategy Summary

• With “A Shared Commitment” by industry, academic and government we will build a common vision for a more economically diverse and sustainable future – a thriving Bioeconomy will ensure “Growth, New markets, and Jobs” for our bioresources sectors – A Thriving Bioeconomy puts us on the path to a Circular Economy
Canada – the Natural Choice for the Bio-economy business

**BENEFITS**

- Access to Biomass – agriculture, forestry, marine and Municipal
- Access to market population of almost 480 million
- Access to ship, truck and rail transportation
- Access to a strong educated workforce
- Access to labour, fabricators, and funding support
Biomass ‘R and D’ to Innovation

Key Support Organizations

- UBC - Biomass and Bioenergy Research Group
- And others working together to build a bioeconomy future in Canada
- U Alberta - Biomass Energy Network
- Lambton College; Lakehead; Trois-Rivières; Laval; Dalhousie
- McGill - Bioresource Engineering
- Univ. Guelph - Bioproducts Discovery and Development Centre
The Value Chain for Bioproducts to Commercialization
"Our experience has been that Canada has a variety of advantages that encouraged us to locate our first manufacturing plant there. Specifically, we’ve found that the labor force is extraordinarily skilled across a broad array of disciplines and the history of manufacturing has been retained in the societal memory of Canada. We’ve also found the policy environment and goals to be remarkably clearly articulated, and that policy is implemented in a consistent way throughout Canada. This has made for a very efficient, predictable engagement with both the local and national governments."

John Bissell
CEO, Origin Materials
Canadian Biomass – Key to the Bioeconomy
Geography of Agricultural Biomass in Canada

Availability of agricultural and forest biomass in Canada (BIMAT, Agriculture and Agri-Food Canada, 2019). About 37 million dry tonnes of agricultural residues (e.g. wheat, barley, corn, oat and flax) are produced annually in Canada.
Agricultural Crops that Provide Biomass

- Corn
- Barley
- Wheat
- Oats
- Rye
- Fibre crops
  - Flax
  - Hemp
- Purpose Grown
  - Miscanthus
  - Switchgrass
Sustainable Biomass Management

- In Canada our **agriculture and forests fibres are sustainably managed** using a mix of our social, economic and environmental values, such as recreation, production of forest products and conservation.

- Our sustainable biomass management is **more than a goal – it is the framework** and principles for how provinces and territories manage the resources.

- Because of Canada’s sustainable biomass management, our **forests and Ag-biomass are part of the global climate solution**.

- Sustainably managing our **biomass creates jobs in thousands of communities** across Canada.
Biomass Quality Network Canada (BQNC)

MANDATE: create a Network in Canada to help capitalize on the abundant biomass available in Canadian Agriculture

PRIORITIES:
1. Establish a Central Organization for Canadian Agricultural Biomass Standards
2. Oversee a Robust Certification System Assuring Industrial and Consumer Confidence in Canadian Biomass
3. Deliver Quality Services that Meet the needs of Canada’s Agricultural Biomass Industry
BQNC
Mission and Vision

VISION
A vibrant and maturing Canadian bioproducts industry supported through a reliable, robust and consistent supply of agricultural biomass and an end-to-end supply chain that meets ongoing industry needs

MISSION
To accelerate adoption of Canadian biomass in bioproducts for all stakeholders through the: development and deployment of standards, methods and guidelines; management and monitoring of a certification system; and provision of value-added services
Focus of Biomass Quality Network

Industrial Bioproducts are separated into the following distinct sectors:

- **BioMaterials**: processed or engineered materials
- **BioEnergy**: solid fuels (straw bales and pellets) and renewable natural gas (RNG)
- **Biorefinery**: biochemicals and biofuels
Services currently being developed by BQNC

Test Methods and Standards:
- **Producer:** *Straw Bales Foreign Materials and Moisture Content Test Methods*
- **Processor:** *Fibre Length, Fibre Cleanliness, Fibre Fineness, Shive/Hurd Cleanliness, Compositional Analysis - Near Infrared Spectroscopy (NIR), National Renewable Energy Laboratory (NREL) Data Base*

Guidelines:
- **Producer:** *Organoleptic Assessment, Traceability, Sampling, Bale and Straw Consistency and Quality*

Grading/Compliance:
- **Grading Sheet**
- Materials Compliance Sheet

Services:
- **BQNC Certification Program**
CLUSTERS (BIOHUBS) are Unique – What it Takes to Build

• Belief in the need
• People
• Total commitment
  – every one on same train
• Patience
• Leadership
• Focus on the future
• Partnerships
  – governments, academic researchers, industry and international partners
Sarnia Cluster last Century and Earlier

Fossil Based

- Air Products
- BP Energy
- CF Industries
- DuPont
- Ethyl Corporation
- Exxon-Mobil
- Arlanxeo
- NOVA Chemicals
- Pembina
- Praxair
- Royal Dutch Shell
- Styrolution
- Suncor Energy
- TransAlta Energy

• 80% of Ontario soybeans and corn within 200km
80% of Ontario soybeans and corn within 200km

Fossil Based
- Air Products
- BP Energy
- CF Industries
- DuPont
- Ethyl Corporation
- Exxon-Mobil
- Arlanxeo
- NOVA Chemicals
- Pembina
- Praxair
- Royal Dutch Shell
- Styrolution
- Suncor Energy
- TransAlta Energy

Bio/Renewable Based
- LCY
- Cargill
- Enbridge
- Greenfield Energy
- Biox
- KmX
- Suncor Ethanol
- Woodland Biofuels
- Renix
- Comet
- Cellulosic Sugar Coop
- Origin Materials
- Benefuel
- Forge

Sarnia Hybrid Cluster - 21st century
Other Developing Bioeconomy Clusters in Canada

- Forestry: British Columbia and Alberta biogas and cellulosic cluster; Thunder bay, Ont.; Eastern Ontario; La Touque, Quebec
- Agriculture: Trois Riviere, Quebec; Sarnia, Ontario; Drayton Valley, Alberta; Saskatoon, crop oils; Winnipeg, BioMaterials; Maritimes, BioFibres
Summary

Biomass – key to Building the Canadian Bioeconomy

• Have a strong National Strategy
• Focus on Cluster development
• Strong support for Research and Development
• Recognize that Innovation is a key step to a solid Bioeconomy
• Commercialization is critical to success
• Remember, no one has all the answers, it takes partnerships

• From Field to Sugar to Chemicals and bioproducts
Funding Programs for Biomass in Canada

Biomass Funding Programs in Canada
• There are several programs that support Biomass/Bioeconomy development in Canada - Nationally and Provincially from Concept to Commercialization.
• For those new to funding in Canada the best starting point is a call with the CLEAN GROWTH HUB at ISED in Ottawa.

www.Canada.ca/ Clean Growth Hub
Thank you for Listening

- Dr. Murray McLaughlin
- Advisor to Canada’s Bioeconomy
- Chair – Biomass Quality Network Canada
  Murraymclaughlin@gmail.com
- Ph. 1-519-550-5525