Biomass Clusters: Building upon existing Industry

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Outline

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- BIC the catalyst
- Cluster concept
- Building off of strengths
- Clusters in Canada
- The Bioeconomy Model Cluster
- Story of necessity
- Changes driving Clusters
- The Canadian opportunity
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Bioindustrial Innovation Canada

Mission
- BIC provides critical strategic investment, advice and services to business developers of clean, green and sustainable technologies. Our expertise in commercialization builds a stronger Canada.

Vision
- To create jobs and economic value sustainably for Canada

Strategic Pillars
- Cluster Builder
- Critical Strategic Investment Fund
- Strong Leader for Commercialization

BIC support comes from:
- Agriculture and AgriFood Canada (AAFC)
- FedDev, Innovation Science and Economic Development
- MRI, Ministry of Research and Innovation, Ontario
CLUSTER CONCEPT
Michael Porter

A cluster is a geographic concentration of related companies, organizations, and institutions in a particular field that can be present in a region, province, or nation. Clusters arise because they raise a company’s productivity, which is influenced by local assets and the presence of like firms, and infrastructure that surrounds it.
KEY CONCEPTS

CLUSTERS Increase Productivity and operational Efficiency

CLUSTERS stimulate and enable Innovation

CLUSTERS facilitate commercialization and new business formation

Farm Coop to Biomass Processing to Sugars to chemicals to consumer products – the full value chain
What are Strength Requirements for a Cluster

• Expertise
• Knowledge
• Policy of Commercialization
• Feed stocks (Biomass)
• Supportive Communities
• Focused on Future

• A key Ingredient for success- Everyone on the same train
Early Hybrid Clusters Across Canada

Conversion of existing Industry to the twenty first Century Industries

Hybrid - Working with and leveraging existing industry and market infrastructure

Other Bioeconomy Clusters Forming Across the Country – Ontario- Thunder Bay; Port Colborne; Johnstown; Alymer; Alberta – Edmonton, Heartland; Manitoba, Winnipeg (Fibres); NS – Liverpool; others in Quebec and BC with forestry focus.
The Bioeconomy Cluster Model

The Model

- Will vary by location, feedstock, and focus (biochemicals; biomaterials; bioenergy, etc.)
- Will have training for the cluster businesses – College and/or University partners
- Will have access to Innovation and research facilities.
- Will have assistance for site information and development
- Will assist with accessing funding support
- Will have biomass access locally

Tapping the Power of Biomass
Integrating into the Hybrid Chemistry Value Chain

The key to growing a sustainable Bioeconomy

The Sarnia Model

- Fossil-based Feedstock
- Bio-based Feedstock
  - Ethanol
  - Butanol
  - Biodiesel
  - Cellulosic sugars

- Fuels
  - Biojet fuel

- Primary Chemicals
- Polymers
- Finished Products
  - Advanced Manufacturing

- Biomaterials
  - PLA
  - Butanediol
  - Monomers
  - Carbon Fibre
  - PET
  - Ecosphere

- End User
  - Lignin
  - NCC
  - Natural fibres
SARNIA CLUSTER
Story of Necessity

A Petroleum Cluster since 1860
Lead to growth and prosperity.
However in 1990’s it became a diminishing workforce
Hence a series of reviews and consultation lead to the decision to establish a green and sustainable cluster around the existing cluster.

Biobased Chemistry for two reasons:
- Maintain
- Build the Future
CHANGES DRIVING THE SARNIA CLUSTER

1. Changes in the Petroleum and Chemical Industry in North America
   - Restructuring
   - Shale gas
   - Old Facilities and limited expansion
   - Global Focus on Green and Sustainable
2. Climate Change and GHG reduction policies
3. Consumer demands for Environmentally Sustainable products
4. Innovations are leading the way
Sarnia Hybrid Cluster today

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
- BioAmber
- Cargill
- Enbridge
- Greenfield Energy
- Biox
- KmX
- SuncorEthanol
- Woodland Biofuels
- Greencore Technologies
- Ubiquity
- Comet
- Cellulosic Sugar Coop
Companies Are Moving To Locations Of Feedstocks, Large Markets And Capital

Markets are developing where biomass and capital are at:
- North and South America
- SE Asia and Australia
- China
- Europe (forestry and energy)
Global Trends Give Canada a Leadership Position

Biomass is the Key Ingredient and Canada has Large amounts of Agricultural and Forestry Biomass
WHY TODAY? CHANGE is a constant in Corn Production-BIOMASS will be part of the future

- 2010 – 165 bushels
- 1985 - 102 bushels
- 1960 – 40 bushels
International Connectivity – a Key to Growth for Clusters

BIC Partnerships
- Biobased Delta, Netherlands
- CLIB 2021, Germany
- Queensland, Australia
- Michigan Biotechnology Institute, United States
- VITO, Belgium
- Others: Malaysia; South Africa; and Argentina
SUMMARY

- CLUSTERS are key to building a Bioeconomy industry in Canada
- Canada has the key ingredients to be a global leader
- Consumers are going to demand the clean technologies and products when priced right.
- Biomass is the key ingredient to produce biofuels and energy, biobased materials, and Biobased chemicals.
- Hybrid clusters – a partnership of the old and new will be critical to create success.
- The 21st century, one where Canada can take a leadership role.
Thanks for Listening

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