

# Growing Sustainable Bio-economy Clusters

## Biomass as a key ingredient



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**Bioindustrial  
Innovation Canada**  
*A Sustainable Chemistry Alliance*



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*Building Innovative Collaborations Across the Pacific*

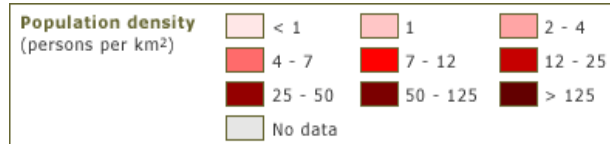
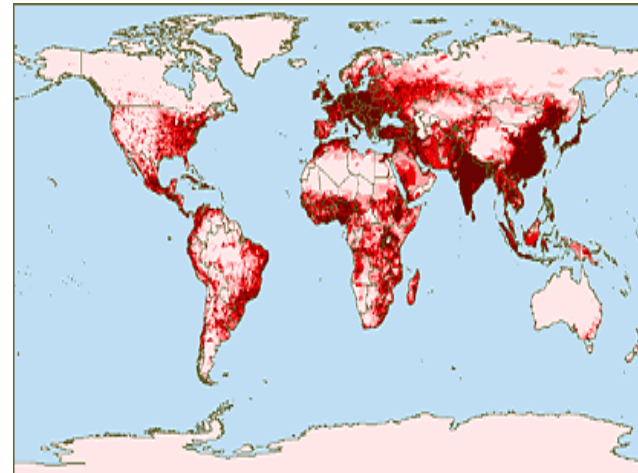
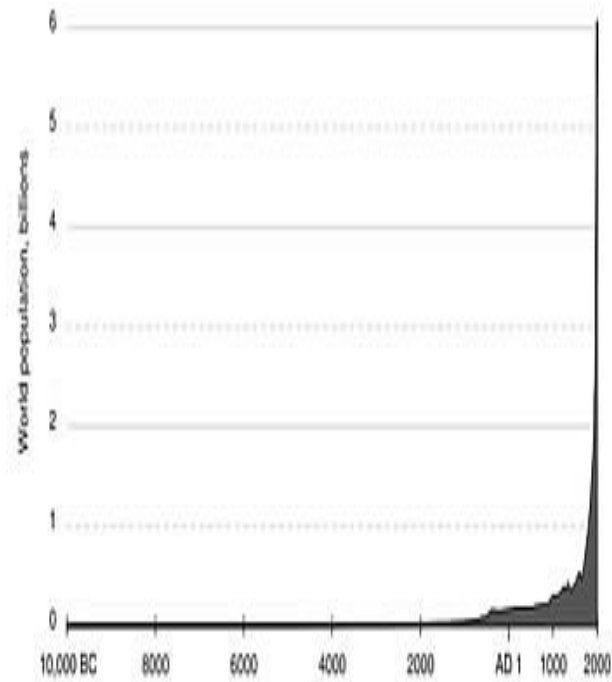


# Outline

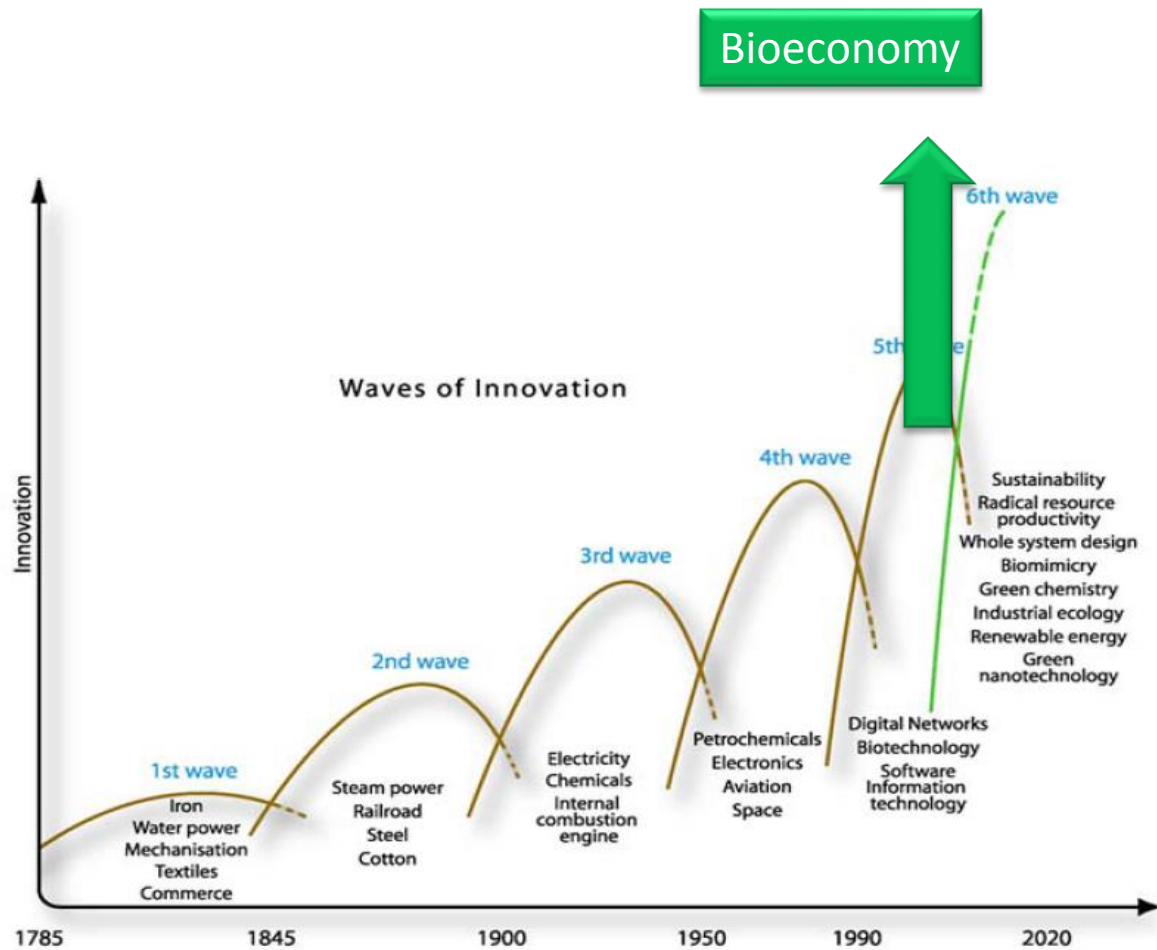
- Introduction
- Change
- Cluster Development – Sarnia model
- Bioindustrial Innovation Canada
- Facilities in cluster
- Opportunities and partnerships
- Summary



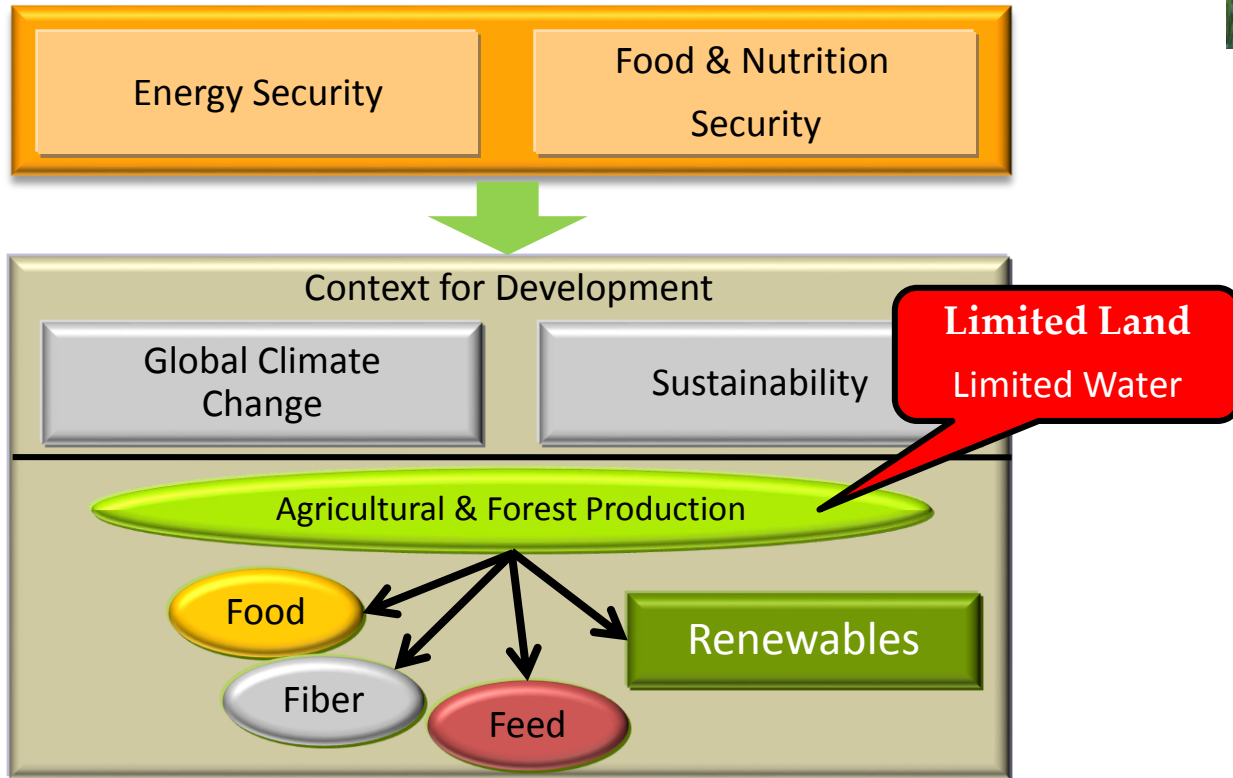
# World Population Growth



# R&D And Therefore Innovation Occurs In Cycles

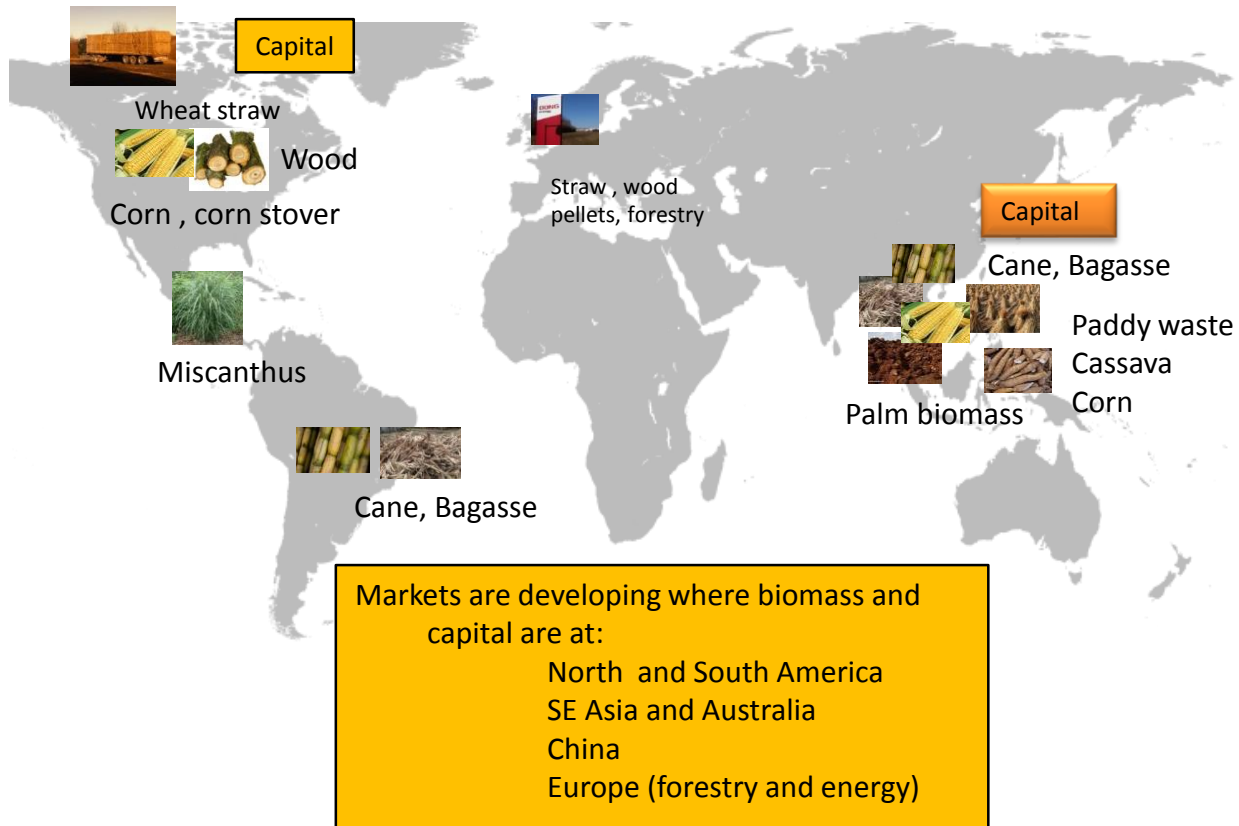


# Demands of Major Megatrends Will Drive Future Innovation





# Companies Are Moving To Locations Of Feedstocks, Large Markets And Capital



# CHANGE

“The ability to learn faster than the competition is often the only sustainable competitive advantage a company (or country) can have.”

Arie de Geus



# CHANGE is a constant in Corn Production-BIOMASS will be part of the future

- 2010 – 165 bushels
- 1985 - 102 bushels
- 1960 – 40 bushels

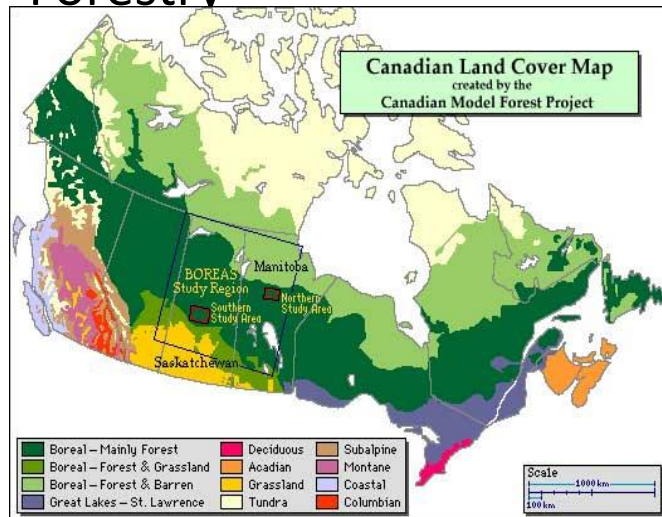




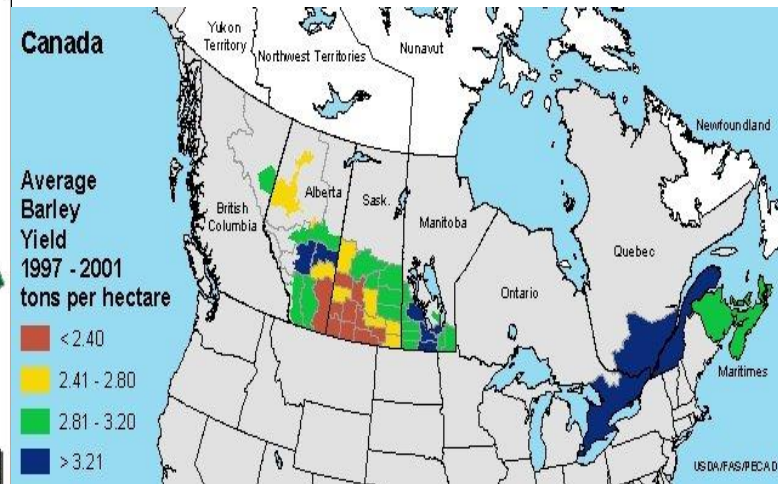
# Global Trends Give Canada a Leadership Position

Biomass is the Key Ingredient and Canada has Large amounts of Agricultural and Forestry Biomass

## Forestry

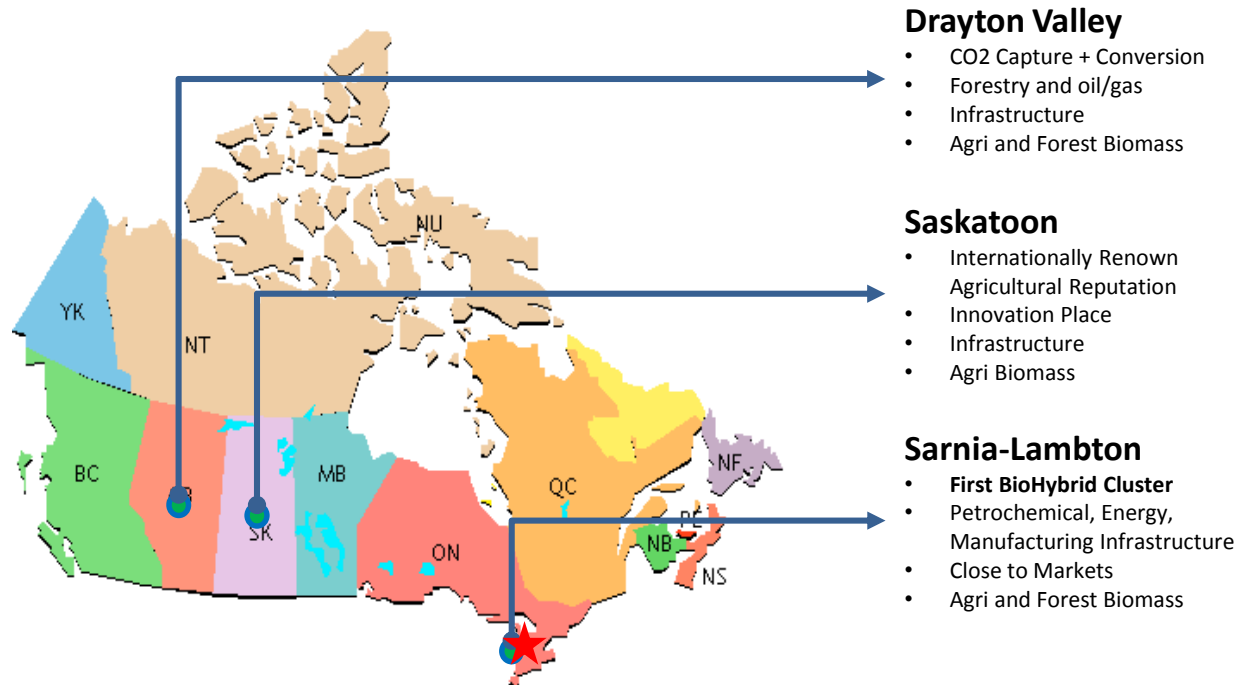


## Agriculture



# Early Hybrid Clusters Across Canada

## Converging Fossil and Bio-Based Industries



Working with and leveraging existing industry and market infrastructure

# What is needed to Build a Hybrid Cluster

- Expertise
- Knowledge
- Policy of Commercialization
- Feed stocks
- Supportive Communities
- Focused on Future
- A key Ingredient for success-  
Everyone on the same train



# The Cluster Concept Sarnia, 2002

- WHY? Changes in the Petroleum and Chemical Industry in North America

Restructuring

Shale gas

Old Facilities and no expansion

Global Focus on Green





# The Community of Sarnia Lambton Coalesced Around a Strategy

- A Strategy: Hybrid Chemistry
- A Vision: World Leading Hybrid Chemistry Cluster
  - Create a sustainable and green future through partnerships to develop the cluster
  - build on your strengths

The Community seen a new Future



# Bioindustrial Innovation Canada Mission: Create jobs, economic value sustainably for Canada

## *How we do it*

Commercialize bio-based and sustainable chemistry technologies through networking and investment

Catalyze the establishment of networked hybrid clusters in Canada

**VALUE DRIVEN** (*high quality jobs, economic wealth and environmental sustainability*)

### **FOCUSED ON DELIVERING COMMERCIALIZATION**

Identifying Opportunities

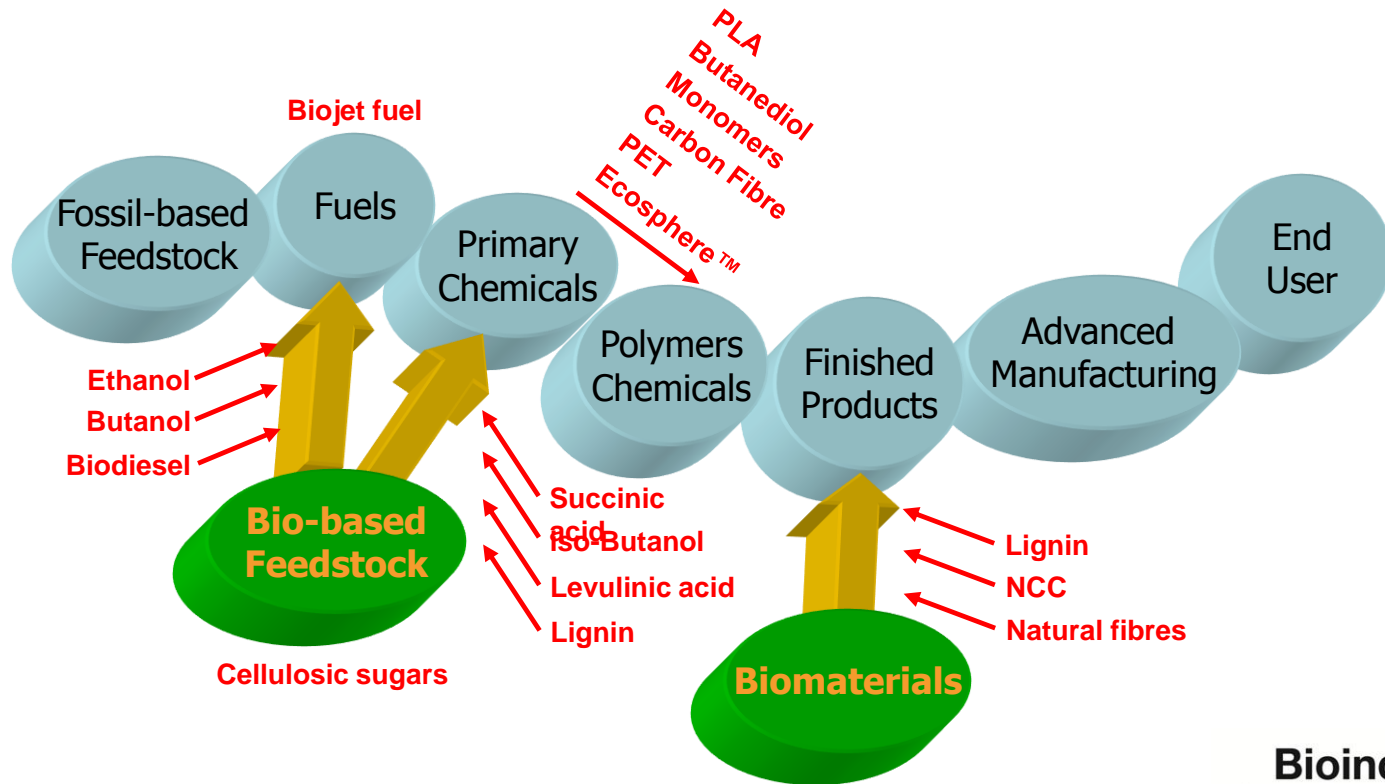
Obtaining Results

Creating More Opportunities

Repeating the Success

# Integrating into the Hybrid Chemistry Value Chain

## The key to growing a sustainable bioeconomy



# The Opportunities: Pilot facilities and Industrial Brownfield Sites

There are three companies in the accelerator today- Woodland Biofuels; GreenCore Technologies; and KmX

The Two BioIndustrial Parks are attracting tenants





# Creating Success

- BIC manages a fund through SCA that functions as a catalyst to change the Valley of Death to the Valley of Hope.
- To date - invested 5.3 million dollars in 14 companies, which translated into these companies raising 144 million in that round.
- Three companies have completed IPO's for a total of 205 million
- Not all are winners
- Over the last 5 years we have seen job creation of 335 direct jobs; 1588 indirect jobs and 783 construction jobs

# Opportunities to Build New Industries in Partnership with existing

- Bio-refinery processes for biomass utilization and value add technology platforms
- Marketing of bio-products from food and biomass processing
- Biomass production and engineering:
  - Novel biomass production systems
  - Crop, livestock and forest residues
  - Newer bio-fibre products
  - microbial and algae derived biomass

# Sarnia Hybrid Cluster today

## Fossil Based

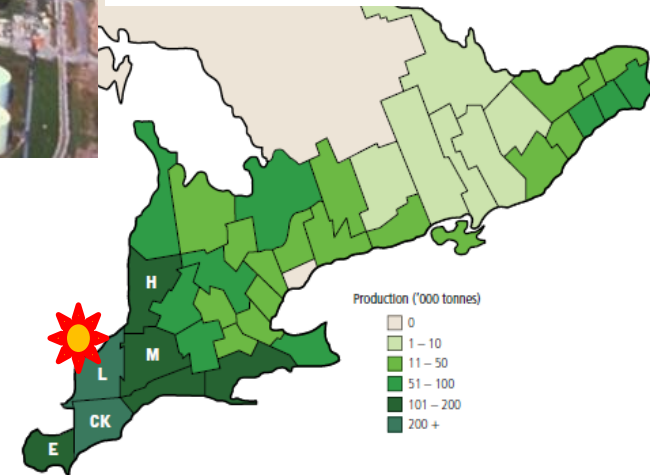
- Air Products
- BP Energy
- CF Industries
- DuPont
- Ethyl Corporation
- Exxon-Mobil
- LANXESS
- NOVA Chemicals
- Ontario Power Generation
- Pembina
- Praxair
- Royal Dutch Shell
- Styrolution
- Suncor Energy
- TransAlta Energy



## Bio/Renewable Based

- BioAmber
- Cargill
- Enbridge
- Greenfield Ethanol
- Methes Energy
- KmX
- Solutions4CO2
- Suncor Ethanol
- Woodland Biofuels
- Greencore Technologies
- Platform

•80% of Ontario soybeans and corn within 200km

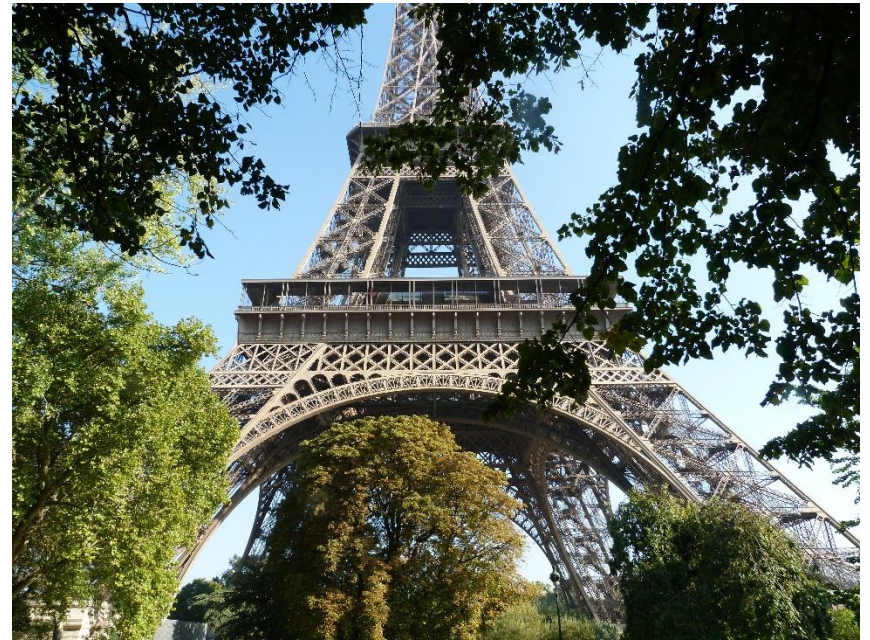




# International Connectivity – a Key to Growth

## **BIC Partnerships (MOU's)**

- Biobased Delta (Netherlands)
- Queensland Australia
- Michigan Biotechnology Institute (United States)
- Others:Malaysia;South Africa;and Argentina





# Connectivity and Partners to Share Success

A Sample of our Connectivity through Established Relationships

## Canadian Industry



## Public Sector and Not for Profit



## International



# Summary

We are in a world of CHANGE, rapid Change, which provides us with a tremendous opportunity as a nation and Community to be global leaders

## **The Opportunities:**

1. An **opportunity** to demonstrate global leadership in bio-based and sustainable industry with Sarnia as model to build from.
2. An **opportunity** to integrate the fossil based, non-fossil and biogenetic industries by encouraging hybrid development
3. An **opportunity** to create a national sustainability strategy to add value to regional and Canadian natural resources
4. An **opportunity** to create international partnerships to make a better world

# Thanks for Listening



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