

Opportunity in the Bio-Based Economy

Presentation

to the

Ontario East

Municipal Conference

by

Natural Capital Resources
Inc.

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Presentation Overview

- What is the “bio-based economy”?
- What is driving this new economy?
- Where is the impact likely to be the greatest?
- Where is our place in this new economy?

What is the 'bio-based' economy?

- Use of biological materials, processes and technologies to create economic value
- “Biological” could mean plants, shrubs and trees; animals; aquatic species; or microbes
- Processes and technologies could be metabolic, thermal, mechanical, electrical, or chemical
- Economic value: products (solid, liquid or gas); services
- These entities exist in a context: climate (temperature, moisture, wind), soils, mineral, geographic location in relation to markets... Mother Nature can be unpredictable

What is driving this new economy?

Desire to solve a problem ...

- Lower costs
- Improve product/ service performance
- Use assets (ex. equipment) to fuller advantage
- Avoid costs of downtime (consistency – quality, supply)

Desire to capture opportunity...

- Find a market niche (new product line/new features for existing product)
- Capture a world product mandate within large firm
- Apply an idea (ex. a new or transferred technology) in the marketplace

Where is impact likely to be greatest?

Sector — information taken from The Biotech Age: The Business of Biotech and How to Profit from It, Richard W. Oliver, McGraw-Hill, 2000	Share of US private-sector GDP (%)
Health services	6.32
Chemicals and allied products	2.21
Environmental services	2.20
Agriculture and forestry	1.57
Mining	1.47
Bioterials Manufacturing	15.89
Total (\$2,566.7 billion – Year 2000)	29.66

Where is our place in this new economy?

- Ask yourself what you bring to the table?
 - **Assets**
 - ***Sustainable Competitive advantage***
- Ask what the customer needs --- there is no substitute for talking directly to specific potential customers
- Look across the entire value chain --- from R&D to finished product/service
- Be prepared for hurdles --- financial, regulatory, market driven

Case Study: Biofibres



Case Study: Biofibres

- December 2003: focus group in Belleville
- **What do we bring to the table?**
 - Feral (wild) hemp genetics; adapted to climate
 - Experienced, licensed bio-pro prospector & breeder
 - Group of ‘pioneer’ growers
 - Soils well suited; ample land
 - Potential customers nearby
 - Researchers in/near region

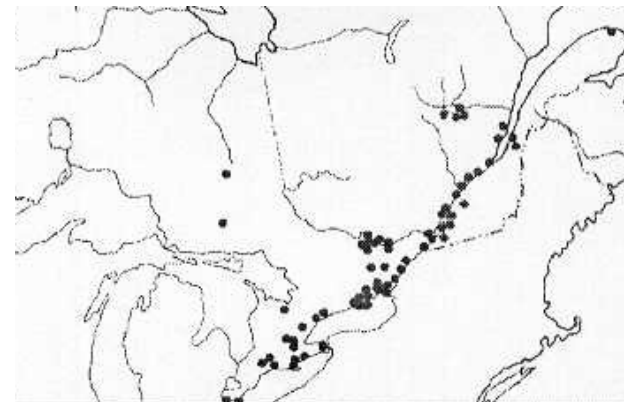


Figure - Apparent Distribution of Wild Hemp in Southern Ontario and Quebec; extracted from a map prepared by Dr. Ernie Small for the Government of Canada

Case Study: Biofibres

- **Q: What do customers need?**
- **A: Depends which customer...**
 - Absorbants
 - Animal bedding
 - Carpets/Floor Coverings
 - Composite filler & reinforcements
 - Construction materials
 - insulation, biomasonry, fibreboard, roadworks
 - Cordage (rope/twine)
 - Energy
 - Geotextiles
 - Non-wovens (+100 options)
 - Soil amendments
 - Specialty pulp and paper
 - Textiles

Case Study: Biofibres

- **What do customers need?**

- Substitute feedstock for petroleum, fibreglass, cotton
- Straight-forward transition in the production processes
- Same or better performance characteristics (could be as diverse as strength, softness, absorbency, wicking action, anti-bacterial action... or BTU value...depending on market segment)
- Consistency supply of high-quality fibre; 365 days/year
- Competitive price
- Environmental benefits

Case Study: Biofibres

Screening criteria used to focus on priority markets:

- Receptor capacity
- Prospects for meeting performance specifications
- Processing technology proven & available
- Initial capital investment for equipment of \$1.5M or less
- Non-oligopolistic markets
- Potential for demonstration-level production within year
- Required capabilities within or close to market

Case Study: Biofibres

Where is our place in this new economy?

- Talked to specific customers about specific products
- Put together business case for a bio-processing facility to decorticate hemp; later flax (decorticate means separate outer fibre from centre core/hurd)
- Have now taken to seven public and private sector organizations
- Sponsoring agency now considering a proposal from private sector group to pursue this opportunity

... All thanks to champions and EODF!

Capacity Building May Be Needed

At time of EOOAP consultation, about a third of 155 projects were at the conceptual stage and another third were in general evidence stage.

Concept/Idea/
Intuition

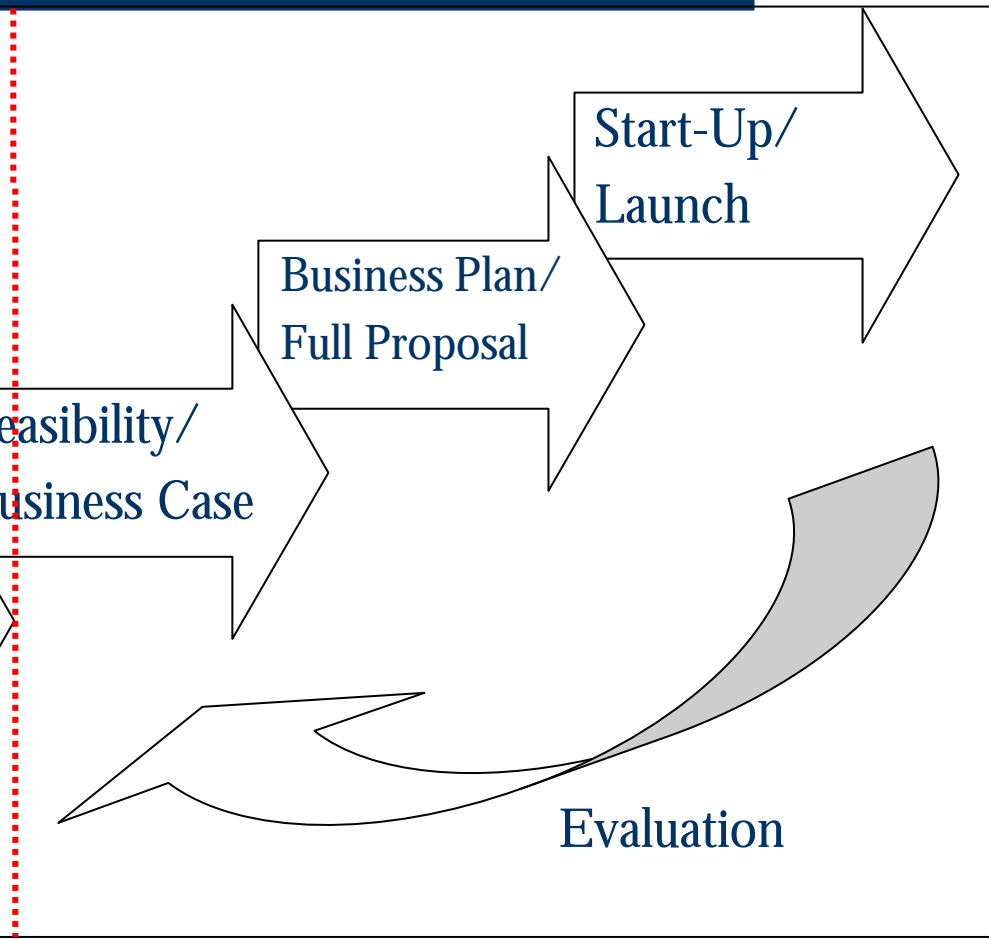
General
Evidence

Feasibility/
Business Case

Business Plan/
Full Proposal

Start-Up/
Launch

Evaluation



Case Study: Biofibres

- **Q: Where is our place in the new economy?**

- A: First, decortication facility...

Next...

- Related business start-ups (ex. specialty papers, energy, automotive components)
- Contributions to BR&E (ex. construction materials, pulp and paper)
- Vertical integration (ex. breeding programs, seed business, farm services – harvesting, equipment etc; R&D, analytical services)

Summary

- The transition is happening... and fast.
- Eastern Ontario has massive bio-assets
- Need is to...
 - Focus (ex. bioenergy, functional foods/ nutraceuticals, bioplastics could be next)
 - Build networks across the value chain
 - Talk to customers in target industries
 - Develop and make the business case to people with the passion and money to get the job done.