THE « INSTITUT EUROPEEN DE LA BIORAFFINERIE DE BAZANCOURT-POMACLE » : A SUITABLE BUSINESS MODEL FOR THE ATLANTIC REGION?

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In a Nutshell

- Definition of a Biorefinery
- The Champagne-Ardenne’s Regional Agricultural Community: the Driving Force behind the Bazancourt-Pomacle Biorefinery?
- Bazancourt-Pomacle: Unique Value-creation Model – The BioAmber Case
- Can this Model be Replicated and How?
- Questions
Definition of Biorefinery

Biorefinery is the sustainable processing of biomass into a spectrum of marketable products and energy*

A few examples:

- C5 and C6 sugars, electricity and heat, lignin biorefinery using wood chips for bioethanol, electricity, heat, and phenols
- Syngas platform biorefinery for Fischer–Tropsch (FT) diesel and phenols from straw
- Oil biorefinery using oilseed crops for biodiesel, glycerin, and feed
- C6 sugar platform biorefinery for bioethanol and animal feed from starch crops

* IEA Bioenergy Task 42
The Bazancourt-Pomacle Biorefinery Location
The Bazancourt-Pomacle Biorefinery
The Bazancourt- Pomacle Biorefinery: A few Key Statistics and Member Companies

- 1200 full time and seasonal employees
- 800 indirect jobs
- 4 million tons of transformed biomass:
  - 2.6 M tons of sugar beets
  - 1 M tons wheat
  - 400,000 tons of other biomass

- Cristal Union (sugar beets to table sugar)
- Chamtor (wheat to starch and glucose)
- Cristanol (glucose/sucrose to bio-ethanol)
- Air Liquide (bio-CO₂)
- Soliance (cosmetic ingredients)
- Wheatoleo (bio-surfactants)
- Procethol 2G (second-generation ethanol)
Agriculture & Agribusiness in Champagne-Ardenne

- Total of 24,600 agricultural-related businesses
  - Represent 5% of all French agricultural operations
  - 50% for wine production
  - 30% major crops
  - 20% animal farming
- Added value around 6.9 billion Canadian dollars

- About 61% of the land occupied by those businesses
  - 49% arable land
  - 11% meadows
  - 1% vineyards
- 40,000 full time jobs
- 5.1 billion Canadian dollars of external trade surplus
PEOPLE WITH A VISION FOR GREENER CHEMISTRY, STRIVING TO MAKE A DIFFERENCE.
What is Succinic Acid

Succinic acid is a building block chemical that is used in a variety of products, including plastics, polyurethane, paints, lubricants, spandex and personal care ingredients.
Emerging Markets for Bio-based Succinic Acid

- **Paints & Coatings**: Improved corrosion inhibition, better mechanical properties, UV resistance.
- **Plastics**: Biodegradability, better impact and UV resistance.
- **Polyurethanes**: Improved durability and aesthetics.
- **Coolants & Corrosion inhibitors**: Improved corrosion inhibition.
- **Plasticizers**: Better mechanical properties.
- **Metal-work lubricants**: Improved stability.
- **Personal Care**: All natural, less irritating.
- **Food Solutions**: pH control & flavor enhancement.
Bioamber is a Producer of Bio-based Succinic Acid.

**BioAmber Process**
- Corn growing → Corn milling → Fermentation → Succinic acid

**Petroleum Process**
- Oil recovery → Naphtha cracking → Butane oxidation → Chemical conversion → Succinic acid

**INNOVATIVE biotechnology:**
- Cost structure is disruptive to the petrochemical industry
- Manufacturing has very low greenhouse gas emissions
- Business model does not rely on government subsidies

**FIRST MOVER advantage:**
- World’s largest succinic acid manufacturing facility
- Track record of delivering on important milestones

**STRONG IP portfolio:**
- Best in class yeast technology exclusively licensed from Cargill
- Patents and trade secrets for commercial design

**Plant is CERTIFIED**
BioAmber and Bazancourt – Key Interactions/Benefits

- Cristal Union (table sugar)
- Chamtor (starch and glucose)
- Cristanol (bio-ethanol)
- Air Liquide (bio-CO$_2$)
- Soliance (cosmetic ingredients)
- Wheatoleo (bio-surfactants)
- Procethol 2G (second-generation ethanol)
A Biorefinery’s Generic SWOT Analysis

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<tr>
<th>STRENGTHS</th>
<th>WEAKNESSES</th>
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<td>• Adding value to the sustainable use of biomass</td>
<td>• Involvement of stakeholders of different market sectors</td>
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<td>• Production of a spectrum of biobased products and bioenergy</td>
<td>• Variability in quality and energy density of biomass</td>
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<td>• Strong knowledge infrastructure available to tackle non-technical and technical issues</td>
<td>• Biomass value chains, including current/future market prices/availability not clear</td>
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<th>OPPORTUNITIES</th>
<th>THREATS</th>
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<td>• Makes a significant contribution to sustainable development</td>
<td>• Instability in fossil fuel prices</td>
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<td>• Strengthening the economic position of various market sectors (agriculture, forestry, chemical and energy)</td>
<td>• Global availability of renewable materials (climatic changes)</td>
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<td>• Development of multipurpose biorefineries in a framework of scarce raw materials and energy</td>
<td>• High capital investment required</td>
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<td>• Unknown short and long-term governmental policies</td>
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<td>• Goals and end users often focused upon single product</td>
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Key Stakeholders:

- Producers & Users
  - Upstream: growers, growers' association, COOP, manufacturers
  - Downstream: processors, distributors, manufacturers
- Financing Community
  - Local/regional banks; private sectors, governments
- Other Stakeholders
  - Economic Development Leaders
  - Advocacy Groups
  - Service Providers
  - THE PUBLIC

Remember: Rome wasn’t built in a day!
THANK YOU - MERCI

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